

GENERAL PRODUCT CATALOG

ROLLER CHAIN & POWER TRANSMISSION COMPONENTS



TSUBAKI[®]

LEADING THE MOVEMENT

Powering Your Every Need

Tsubaki's wide range of power transmission and motion control products are here for your various operational needs. From the simplest to the most complicated applications, we have the right product for you. Quality is guaranteed. Expect to get maximum performance from any of our products.

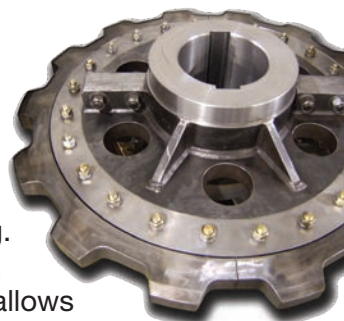
Engineering Class Chains

With experienced engineers who understand the changing demands of the market, Tsubaki proudly features heavy-duty engineered chain designed to withstand rigorous operating conditions across a range of applications. Tsubaki offers a full lineup of engineering class chain, from Drive, Roller Conveyor, Steel Bushed, Welded Steel, Drop Forged, Bar to Pin and service programs such as the ProService® Life Cycle Field Service Package.



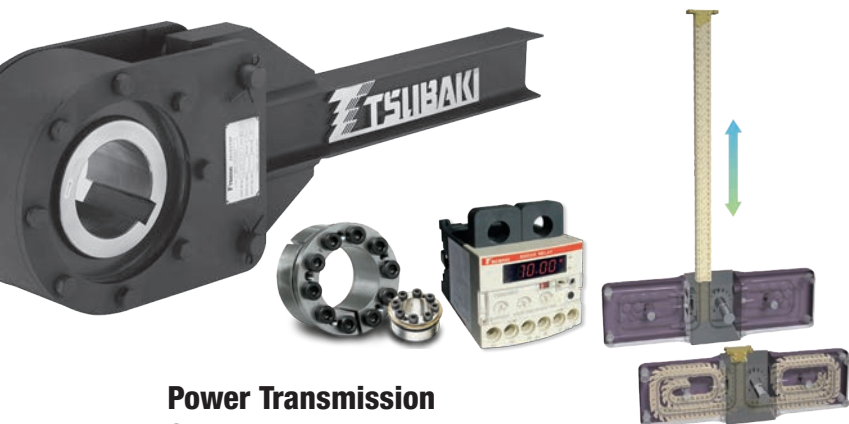
Sprockets

It has to be precise and strong. Extensive design, engineering, and manufacturing capability allows us to produce a wide variety of Made-To-Order (MTO) sprocket products for a multitude of applications. From one-off custom to high volume OEM sprocket requirements, Tsubaki has you covered.



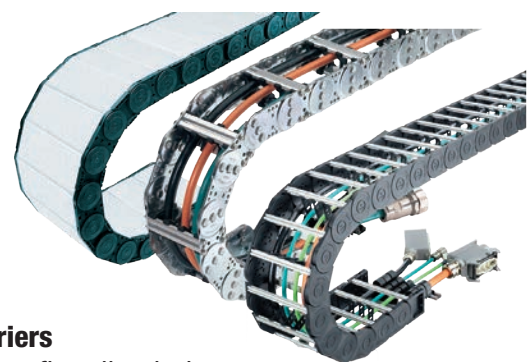
Power Transmission Components and Backstops

Quality designs and features are key when it comes to clutches and backstops. From preventing reverse rotations to overheating, Tsubaki clutches and backstops are designed to outperform the competition. With a variety of innovative power transmission solutions from overload protection to keyless shaft mounting devices to custom zip chain lifters, Tsubaki has your solution.



Cable & Hose Carriers

It is not a one-size-fits all solution. Not all applications can be solved by one type of carrier. Tsubaki KabelSchlepp's cable & hose carriers can come in nylon, steel and hybrid materials. Whether you have an extremely heavy cable package or an ultra long travel length, we have got the perfect carrier for you.



100 YEARS. 70 LOCATIONS. 1 MISSION.

For more than 100 years, Tsubaki has developed and manufactured the highest quality products for power transmission, material handling and motion control. An intense focus on innovation and an unwavering commitment to quality has helped us consistently meet the evolving needs of our customers since 1917.

Today, we have more than 26 manufacturing sites globally and our products are sold in more than 70 countries. Our international presence affords us access to the brightest minds in engineering, many of whom have contributed to the development of our industry leading products and services.



Don't see what you need? Call us at 800-323-7790 and we will make it!

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ANSI Roller Chains

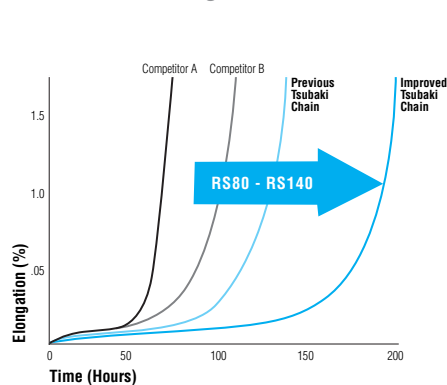
Why Tsubaki Chain?



Longer Wear Life

Tsubaki roller chains last up to twice as long as previously manufactured chains due to the reliability and durability of the solid bushing and patented lube groove design. This technology covers sizes 80-140 in carbon steel chains. The solid bushings are precisely round while the grooves on the inner wall of the bushing holds lubricant where the chain needs it most. The result is a longer lasting chain.

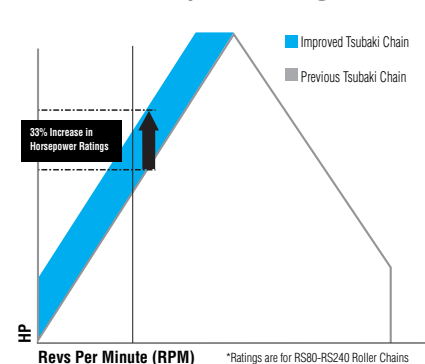
Wear Elongation Curve



Higher Horsepower Ratings

Tsubaki ANSI roller chains can handle up to 33-percent more horsepower allowing your application to increase drive performance without increasing chain size. Tsubaki chains may also allow your application to transmit the same horsepower with a smaller pitch chain. The improvement comes from a ring-coining process for slip-fit style connecting links.

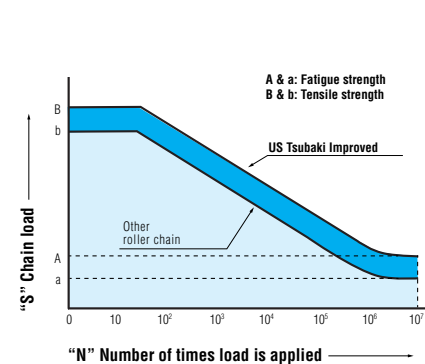
Horsepower Ratings



Greater Fatigue Strength

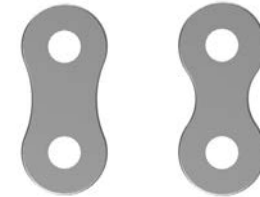
Tsubaki chains are designed to have greater fatigue strength. The wider-waist of the link plates puts more metal where it's needed most. This means less downtime, reduced operating costs, and better application efficiency. These benefits impact your application in one major way - the bottom line.

S-N Curve



Assurance of Greater Fatigue Strength:

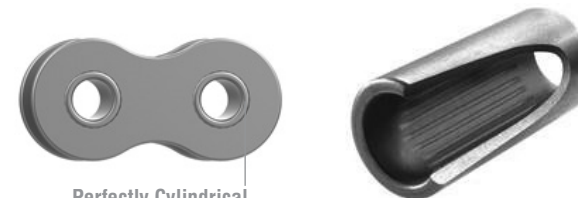
The wider waist of the Tsubaki link plates ensures greater fatigue strength for all chain sizes and styles. Fatigue strength (Maximum Allowable Load) of each chain size can be found in the ANSI Chain section of this catalog.



Tsubaki Other Brands

Longer Wear Life & Less Set-up time:

- Tsubaki has decreased initial wear elongation to .01% and increased the life by up to 2x as long in many applications. When there isn't time to adjust and readjust a chain during installation, Tsubaki roller chains are the very best solution.
- Tsubaki uses a special pre-lubrication process that vastly increases chain wear life.
- Improved Tsubaki roller chain sizes 80-140 have the patented Performax™ solid lube groove bushings. By retaining the lube in the grooves of the bushing, it allows lubrication to stay in the key pin and bushing friction point.



Perfectly Cylindrical Inside Bushing Wall

Patented Performax™ solid lube groove bushing

Shot Peened Parts:

Link plates and rollers are shot peened for greater fatigue strength.



Factory Preloading:

Tsubaki roller chains are preloaded using a process that involves the chain, under tension running through a loading table (see below). This allows all key components to seat properly thus eliminating initial set up elongation. This process is commonly referred to as prestressing the chain.



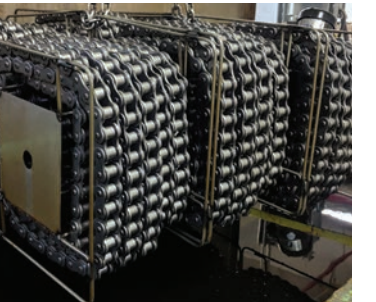
Heat Treatment:

Chain durability depends heavily on the proper heat treatment of the wear components. The use of advanced heat-treatment methods allows for Tsubaki roller chains to maintain a high level of durability.



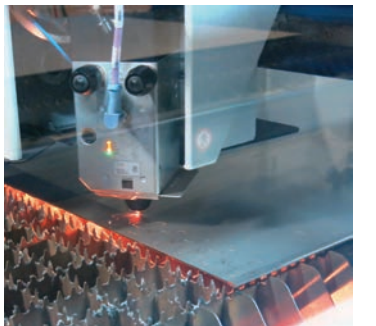
Prelubrication:

A special lubrication is applied by hot-dipping the chain in an oil bath prior to packaging. This will help to ensure that the lube penetrates the key friction wear points of the chain.



Laser-Express™ – Custom Capabilities:

No specialty attachment for roller chain is too complex for Tsubaki. With its Laser-Express™ production line, even the most unique attachments are simple. No special tooling or lengthy lead times are needed. Parts can be directly created from even the most complex CAD and SolidWorks® drawings.



A Completely Automated Manufacturing Process:

The manufacturing of Tsubaki roller chains employs advanced automated techniques. The specialized equipment used in each process ensures that all parts are uniform and of the highest quality. The adjacent image shows an assembled solid bushing placed in the roller link.

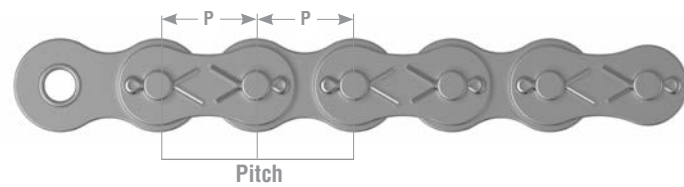


The below information provides information on the basics of roller chain construction:

Basics of Roller Chain

1. Chain Pitch:

Chain pitch, otherwise known as chain size, is the distance from pin center to pin center. Pitch is always measured in inch increments.

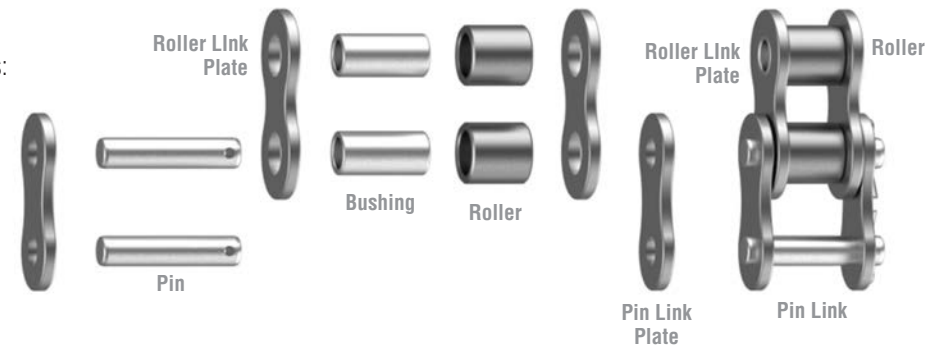


ANSI Standard Chain Pitch Sizes

Pitch#	Pitch in Inches	Pitch #	Pitch in Inches
25	1/4"	100	1 1/4"
35	3/8"	120	1 1/2"
40	1/2"	140	1 3/4"
41	1/2"	160	2"
50	5/8"	180	2 1/4"
60	3/4"	200	2 1/2"
80	1"	240	3"

2. Chain Construction:

Roller chain is constructed of four components: pins, plates, rollers and bushings.



3. Connecting Links:

In most applications, roller chain is used in a continuous loop. This loop is often times connected with a connecting link. In normal conditions, spring clip (size 60 and smaller) or cotter-pin style links (80 through 240) are used. For more severe applications, press-fit links are used.



4. Offset Links:

When a continuous length of chain has an odd number of pitches, an offset link (often referred to as half-links) is used. Offset links are available in one-pitch and two-pitch styles. One-pitch offsets are weaker than plain chain and are not recommended in high-impact load, and high-speed applications.



5. Chain Cut-To-Length:

One of the unique offerings from Tsubaki is the ability to cut any chain in our offering to the desired length needed for your application. This eliminates unnecessary waste and unnecessary down time.

Chain Size	R = Riveted C = Cottered	Cut = Cut to length
40	R	CUT

6. Chain Reel and Box Stock:

Roller chains are also available on 50-foot and 100-foot reels. Sizes 25-60 are available in 100-foot reels. Size 80 is available on 50-foot reels. All standard stock Tsubaki roller chains are available in 10-foot boxes.

RB	= Riveted 10-foot box (each box includes one connecting link)
CB	= Cottered 10-foot box (each box includes one connecting link)
R50	= 50-foot reel (Includes 5 connecting links)
R100	= 100-foot reel (Includes 10 connecting links)

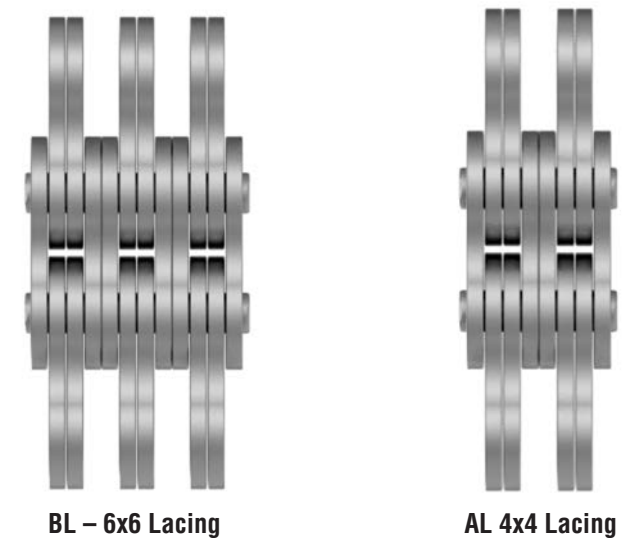
7. Heavy-Duty Series Chains:

For applications where roller chains are exposed to higher loads, greater shock loads, or severe duty high-torque style applications, Tsubaki manufactures a complete line of Heavy Duty series roller chains.

H	= Heavy Series
T	= Thru-hardened pin series
HT	= Heavy with thru-hardened pin
Super	= Super Series
HSuper	= Super Heavy Series
ULTRASUPER	= Ultra Super Series

8. Leaf Chains:

Tsubaki manufactures a complete line of leaf chains. There are two series that Tsubaki manufactures – AL series and BL series. BL series chains are a heavier version of the AL series and come with a larger pin and plate. Chains are identified by lacing and can be cut to specified lengths.



BL - 6x6 Lacing

AL 4x4 Lacing

9. British Standard Chains (BS/DIN)

Along with a complete line of ANSI series roller chains, Tsubaki also manufactures a line of British Standard roller chains. These chains are made to the BS 228/DIN8187 specification. These chains are made from the same materials as the standard ANSI chains – perfect for replacement on imported equipment or newly manufactured equipment that will be exported.



British Standard Chain

10. Lube-Free Chains

Tsubaki is the market innovator in lube-free roller chain technology with its Lambda[®] and Xceeder[®] lube-free chain options. What makes these chains unique is the ability to run without any external lubrication. Lambda[®] chains come in two styles: Drive (LAM) and conveyor (L designation). Xceeder[®] is made with a felt seal and extra-wide bushing to keep contaminants out and the lubrication in.



Lambda[®]

Xceeder[®]

11. Harsh Environment Chains:

Not every operating environment is a perfect one for roller chain. From heat to heavy levels of dirt and contamination, a chain like Tsubaki Titan[®] is needed. Titan[®] provides a harder surface, low friction pin which greatly reduces the wear in the pin and bushing area.



Titan[®] Chain

12. Corrosion Resistant Chains:

Tsubaki offers a complete line of roller chains to handle situations where the chain will come into contact with chemicals for washdown or clean-room environments that require more than carbon steel. From the Tsubaki Neptune[®] (NEP) and Nickel Plated (NP) chains to a complete line of stock stainless steel – 304 (SS), 600 (AS), 316 (NS) and our new Super Stainless[™] product line.



Neptune[®]

Nickel Plated

Stainless Steel

Super Stainless[™]

Common Roller Chain Applications

Tsubaki manufactures a complete line of roller chains for a wide variety of applications. From very basic drive applications, to conveying applications – Tsubaki has you covered.

Roller chains with attachments, chains for harsh environments, applications that require lube-free chains, situations where heavy duty and high shock load capable chains are required, and applications in the most corrosive environments – Tsubaki has a chain to fit that and many more applications.



Heavy-duty, Multi-Wide Drives



Accumulation Systems



Lube-Free Drive applications



Matched Strand Conveyor



Chain drives for outdoor applications



Customized Packing



Harsh Environment Drives



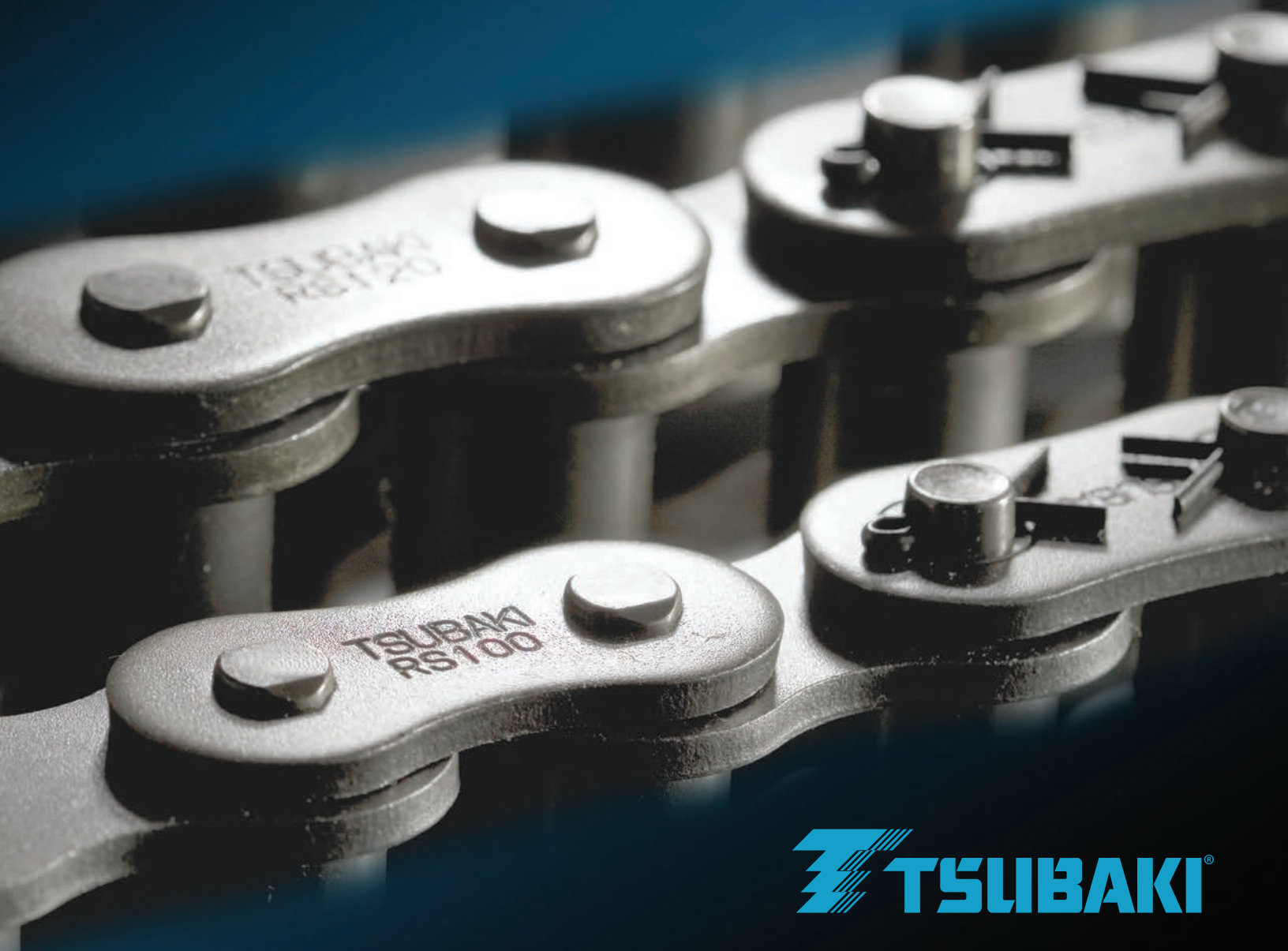
Accumulating Conveyor



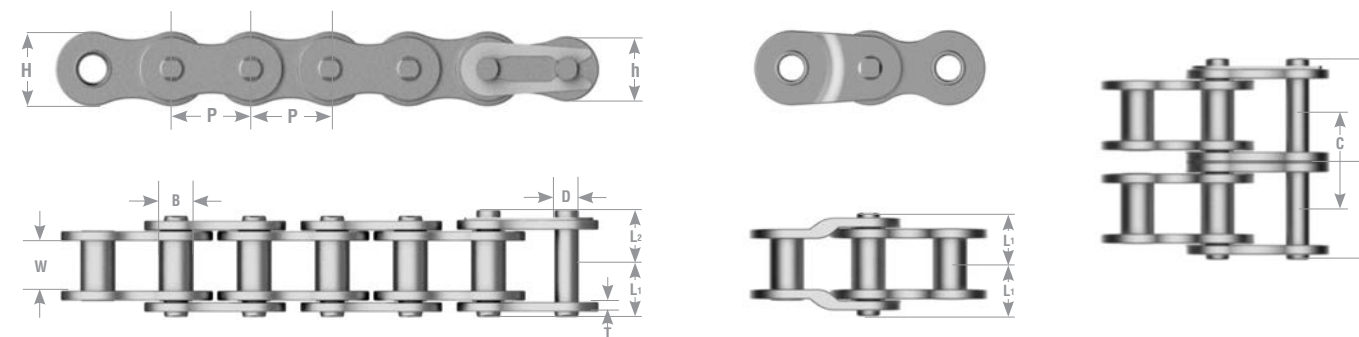
Multi-Strand Conveying

ANSI CHAINS

ANSI chains from Tsubaki provide the strength, reliability and durability that is required in the toughest environments. With the Tsubaki Performax™ Bushing in sizes 80-140 – single and multi-wide strands. Tsubaki ANSI chains help reduce downtime and improve reliability while decreasing equipment repair costs.



No. 25



	P	Bush dia.	W	t	T	h	H	D
25	0.250	0.130	0.125	0.030	0.030	0.199	0.230	0.091
25H	0.250	0.130	0.125	0.030	0.040	0.230	0.230	0.091

TSUBAKI Chain Number	Number of Strands	Pin Length L1+L2	Dimensions L1	Dimensions L2	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength (lb)	Tsubaki Average Tensile Strength (lb)	Maximum Allowable Load (lb)	Approximate Mass lb/ft
25RB	1	0.327	0.150	0.177	-	Riveted	780	1,050	140	0.094
25-2RB	2	0.579	0.276	0.303	0.252		1,560	2,100	240	0.181
25-3RB	3	0.831	0.402	0.429	0.252		2,340	3,150	350	0.282
25HRB	1	0.347	0.158	0.189	-		-	1,320	170	0.114

Notes:

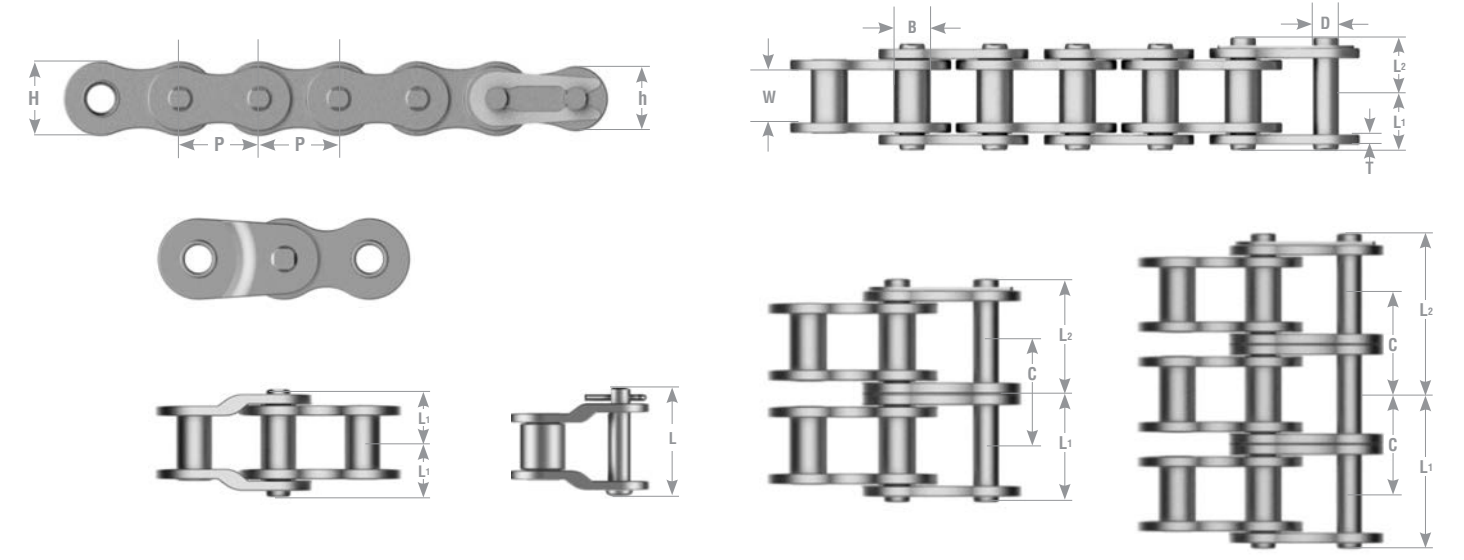
- "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 - Offset links for RS25 are only available in two-pitch offset links. The maximum allowable load is the same as shown in the table above.
 - No offset links are available for BF25H.
 - RS25 and BF25H are bushed chains.
- *Maximum allowable load when using an M-type connecting link is 80% of the above.

No. of Small Sprocket Teeth	Maximum Speed - Small Sprocket (RPM)																								
	50	100	300	500	700	900	1200	1500	1800	2100	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	10000
	A										B														
11	0.03	0.05	0.15	0.23	0.31	0.38	0.50	0.60	0.71	0.82	0.95	1.13	1.29	1.38	1.15	0.99	0.86	0.75	0.67	0.59	0.54	0.48	0.44	0.40	0.35
12	0.03	0.05	0.16	0.24	0.34	0.42	0.54	0.66	0.78	0.90	1.05	1.23	1.42	1.57	1.31	1.13	0.98	0.86	0.76	0.68	0.62	0.55	0.51	0.47	0.40
13	0.04	0.07	0.17	0.27	0.36	0.46	0.59	0.72	0.84	0.98	1.14	1.34	1.54	1.74	1.49	1.27	1.10	0.97	0.86	0.76	0.70	0.63	0.58	0.52	0.44
14	0.04	0.07	0.19	0.30	0.39	0.50	0.64	0.78	0.93	1.06	1.23	1.46	1.68	1.89	1.66	1.42	1.23	1.07	0.95	0.86	0.78	0.70	0.64	0.59	0.50
15	0.04	0.07	0.20	0.31	0.43	0.54	0.68	0.84	0.99	1.14	1.33	1.57	1.81	2.04	1.84	1.57	1.37	1.19	1.06	0.95	0.86	0.78	0.71	0.66	0.55
16	0.04	0.08	0.21	0.34	0.46	0.58	0.74	0.90	1.06	1.22	1.43	1.69	1.93	2.19	2.02	1.73	1.50	1.31	1.17	1.05	0.94	0.86	0.78	0.72	0.62
17	0.04	0.08	0.23	0.36	0.48	0.60	0.79	0.97	1.14	1.30	1.53	1.80	2.07	2.33	2.23	1.90	1.65	1.45	1.27	1.14	1.03	0.94	0.86	0.79	0.67
18	0.05	0.09	0.24	0.38	0.52	0.64	0.84	1.02	1.21	1.39	1.62	1.92	2.20	2.48	2.43	2.07	1.80	1.57	1.39	1.25	1.13	1.02	0.94	0.86	0.74
19	0.05	0.09	0.25	0.40	0.55	0.68	0.89	1.09	1.29	1.48	1.72	2.02	2.33	2.63	2.63	2.24	1.94	1.70	1.52	1.35	1.22	1.11	1.01	0.93	0.79
20	0.05	0.09	0.27	0.43	0.58	0.72	0.94	1.15	1.35	1.56	1.82	2.15	2.47	2.78	2.83	2.43	2.11	1.84	1.64	1.46	1.31	1.19	1.09	1.01	0.86
21	0.05	0.11	0.28	0.46	0.60	0.76	0.99	1.21	1.42	1.64	1.92	2.27	2.60	2.92	3.06	2.60	2.25	1.98	1.76	1.57	1.42	1.29	1.18	1.07	0.93
22	0.05	0.11	0.30	0.47	0.64	0.80	1.05	1.27	1.50	1.73	2.01	2.37	2.74	3.08	3.27	2.79	2.43	2.12	1.89	1.69	1.52	1.38	1.26	1.15	0.99
23	0.07	0.12	0.31	0.50	0.67	0.84	1.10	1.34	1.57	1.81	2.12	2.49	2.87	3.23	3.50	2.99	2.59	2.27	2.01	1.80	1.62	1.48	1.34	1.23	1.06
24	0.07	0.12	0.34	0.52	0.71	0.89	1.14	1.39	1.65	1.89	2.21	2.61	3.00	3.38	3.73	3.18	2.76	2.43	2.15	1.92	1.73	1.57	1.43	1.31	1.13
25	0.07	0.13	0.35	0.55	0.74	0.93	1.19	1.46	1.72	1.98	2.32	2.72	3.14	3.54	3.93	3.38	2.94	2.57	2.28	2.04	1.84	1.68	1.53	1.39	1.19
26	0.07	0.13	0.36	0.56	0.76	0.97	1.25	1.53	1.80	2.07	2.41	2.84	3.27	3.69	4.10	3.59	3.11	2.74	2.43	2.17	1.96	1.77	1.62	1.49	1.27
28	0.08	0.15	0.39	0.62	0.83	1.05	1.35	1.65	1.94	2.24	2.61	3.08	3.54	4.00	4.44	4.01	3.47	3.06	2.71	2.43	2.19	1.98	1.81	1.66	1.42
30	0.08	0.16	0.42	0.66	0.90	1.13	1.46	1.78	2.09	2.41	2.82	3.33	3.82	4.30	4.79	4.45	3.86	3.38	3.00	2.68	2.43	2.20	2.01	1.84	1.57
32	0.09	0.16	0.44	0.71	0.97	1.21	1.56	1.90	2.25	2.59	3.02	3.57	4.09	4.61	5.14	4.89	4.25	3.73	3.31	2.96	2.67	2.43	2.21	2.02	1.73
35	0.09	0.19	0.50	0.78	1.06	1.33	1.72	2.11	2.48	2.84	3.33	3.93	4.51	5.08	5.65	5.61	4.85	4.26	3.78	3.38	3.06	2.78	2.53	2.32	1.98
40	0.11	0.21	0.58	0.90	1.22	1.53	1.98	2.43	2.86	3.29	3.85	4.53	5.20	5.87	6.53	6.85	5.94	5.22	4.63	4.13	3.73	3.38	3.08	2.83	2.43
45	0.13	0.24	0.64	1.03	1.39	1.74	2.25	2.76	3.25	3.73	4.37	5.15	5.91	6.66	7.42	8.15	7.08	6.22	5.51	4.93	4.45	4.04	3.69	3.38	2.88

Note:

- When using one pitch offset links (OL), HP ratings are 80% of the above. Two pitch offset links (2POL) can be used at 100% of the above values.
- Multiply the value given above by the multiple strand factor (page 251 Table 2) in order to obtain the transmission horsepower of multiple strand chain.
- For lubrication systems A, B & C, refer to pages 257 & 258 for explanation. Please consult Tsubaki for use of horsepower ratings to the right of the boundary line.
- Refer to page 251, "Procedures for Selecting Roller Chain."

No. 35



Chain No.	P	B	W	T	H	h	D
35	0.375	0.200	0.188	0.050	0.354	0.307	0.141

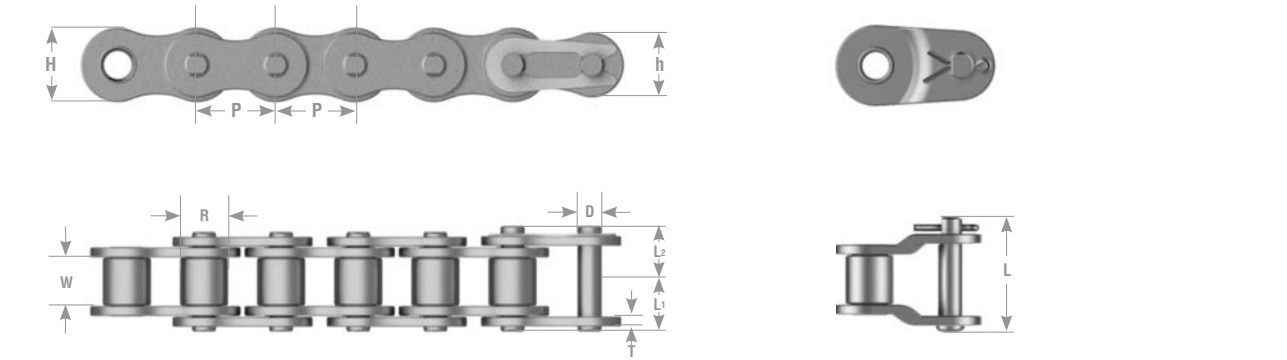
TSUBAKI Chain Number	Number of Strands	L1+L2	L1	L2	L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength (lb)	Tsubaki Average Tensile Strength	Maximum Allowable Load	Approximate Mass lb/ft
35RB	1	0.500	0.230	0.270	0.531	0.399	Riveted	1,760	2,530	480	0.22
35-2RB	2	0.898	0.429	0.469	0.965		Riveted	3,520	5,070	810	0.46
35-3RB	3	1.295	0.630	0.665	1.362		Riveted	7,590	7,600	1210	0.70

- Notes:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Offset links for RS25 are only available in two-pitch offset links. The maximum allowable load is the same as shown in the table above.
 3. No offset links are available for BF25H.
 4. RS25 and BF25H are bushed chains.
 *Maximum allowable load when using an M-type connecting link is 80% of the above.

No. Of Small Sprocket Teeth	Maximum Speed - Small Sprocket (RPM)																													
	Lubrication System A										Lubrication System B										Lubrication System C									
	50	100	300	500	700	900	1200	1500	1800	2100	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	10000					
11	0.16	0.30	0.78	1.23	1.66	2.09	2.71	3.31	3.90	4.48	3.86	2.94	2.33	1.90	1.60	1.37	1.18	1.03	0.93	0.82	0.74	0.67	0.62	0.56	0.48					

- Note:
 1. When using one pitch offset links (OL), HP ratings are 80% of the above. Two pitch offset links (2POL) can be used at 100% of the above values.
 2. Multiply the value given above by the multiple strand factor (page 251 Table 2) in order to obtain the transmission horsepower of multiple strand chain.
 3. For lubrication systems A, B & C, refer to pages 257 & 258 for explanation. Please consult Tsubaki for use of horsepower ratings to the right of the boundary line.
 4. Refer to page 251, "Procedures for Selecting Roller Chain."

No. 37, 38, 41



	P	Roll dia.	W	T	t1 Conn plate	H	h	D
37	0.500	0.307	0.134	0.039	0.047	0.386	0.331	0.143
38	0.500	0.307	0.189	0.043	0.047	0.386	0.331	0.143
41	0.500	0.306	0.251	0.049	0.049	0.386	0.331	0.141

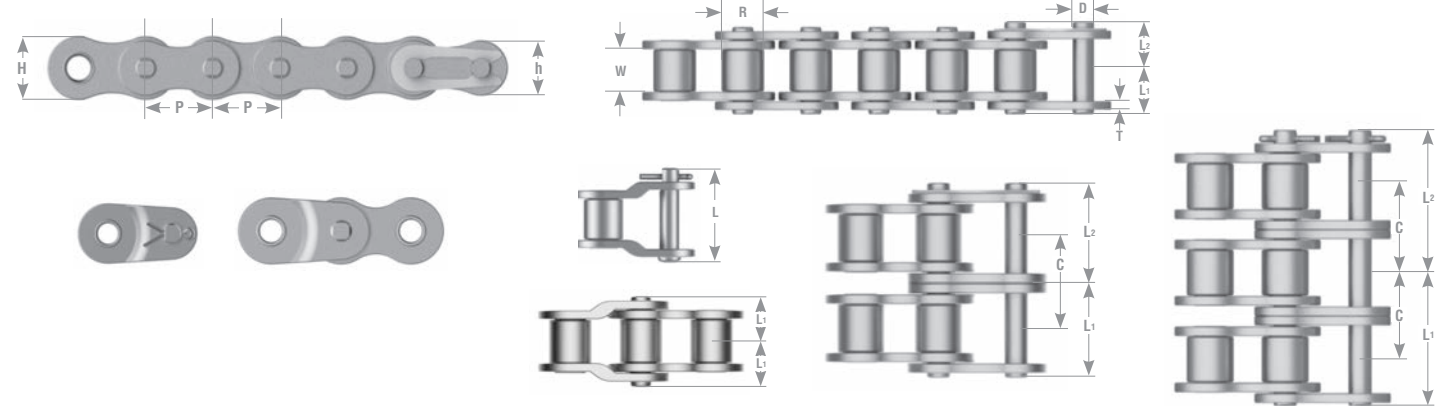
TSUBAKI Chain Number	Number of Strands	L1+L2	L1	L	ANSI Standard Min. Tensile Strength (lb)	Tsubaki Average Tensile Strength	Maximum Allowable Load	Approximate Mass lb/ft	
43RB	1	0.433	0.201	0.490	1,508		2,116	309	0.19
42RB	1	0.516	0.236	0.555			2,116	309	0.24
41RB	1	0.579	0.266	0.594			2,646	507	0.28

- Notes:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Maximum allowable load when using an M-type connecting link is 80% of the above.

No. of Small Sprocket Teeth	Maximum Speed - Small Sprocket (RPM) - 41 Roller Chain																																			
	Lubrication System A												Lubrication System B												Lubrication System C											
	10	25	50	100	200	300	400	500	700	900	1000	1200	1400	1600	1800	2100	2400	2700	3000	3500	4000	5000	6000	7000	8000											
11	0.04	0.09	0.16	0.31	0.56	0.82	1.06	1.29	1.76	2.20	2.25	1.72	1.35	1.11	0.94	0.74	0.60	0.51	0.43	0.35	0.28	0.20	0.15	0.12	0.09											

- Note:
 1. When using one pitch offset links (OL), HP ratings are 80% of the above. Two pitch offset links (2POL) can be used at 100% of the above values.
 2. Multiply the value given above by the multiple strand factor (page 251 Table 2) in order to obtain the transmission horsepower of multiple strand chain.
 3. For lubrication systems A, B & C, refer to pages 257 & 258 for explanation. Please consult Tsubaki for use of horsepower ratings to the right of the boundary line.
 4. Refer to page 251, "Procedures for Selecting Roller Chain."

No. 40



	P	Roll dia.	W	T	H	h	D
40	0.500	0.312	0.312	0.060	0.472	0.409	0.156

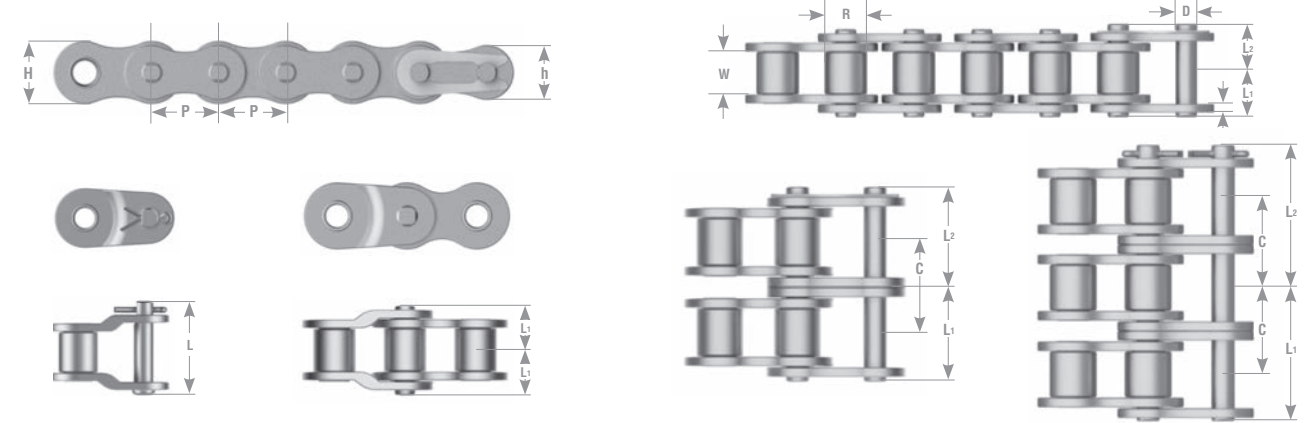
TSUBAKI Chain Number	Number of Strands	L1+L2	L1	L2	L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength (lb)	Tsubaki Average Tensile Strength	Maximum Allowable Load	Approximate Mass lb/ft
40RB	1	0.717	0.325	0.392	0.717	0.566	Riveted	3,125	4,290	810	0.43
40-2RB	2	1.283	0.608	0.675	1.319		Riveted	6,250	8,580	1370	0.85
40-3RB	3	1.843	0.892	0.951	1.886		Riveted	9,376	12,870	2020	1.28
40-4RB	4	2.409	1.177	1.232	2.453		Riveted	12,500	17,160	2670	1.7
40-5RB	5	2.980	1.461	1.520	3.024		Riveted	15,625	21,450	3150	2.12
40-6RB	6	3.547	1.744	1.803	3.591		Riveted	18,750	25,740	3720	2.55

Note:
 1. "RB" designation indicates 10° box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 3. Maximum allowable load when using a two-pitch offset link (2POL) is 100% of the above.

No. of Small Sprocket Teeth	Maximum Speed - Small Sprocket (RPM)																																																																																																																																																																																																																																																																								
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11	0.08	0.19	0.35	0.64	1.21	1.73	2.24	2.74	3.70	4.65	5.11	6.02	6.81	5.58	4.67	3.70	3.03	2.55	2.15	1.72	1.41	1.01	0.76	0.62	0.50	6.36	5.31	4.22	3.45	2.90	2.47	1.96	1.60	1.14	0.87	0.68	0.58	8.01	6.71	5.31	4.36	3.65	3.11	2.47	2.02	1.45	1.10	0.87	0.71	8.88	7.43	5.89	4.83	4.04	3.45	2.74	2.24	1.60	1.22	0.97	0.79	9.79	8.18	6.49	5.31	4.45	3.81	3.02	2.47	1.77	1.34	1.07	0.87	10.7	8.97	7.11	5.82	4.88	4.17	3.31	2.71	1.94	1.48	1.17	0.97	11.7	9.76	7.75	6.34	5.31	4.55	3.61	2.96	2.11	1.60	1.27	-	12.7	10.5	8.41	6.88	5.77	4.92	3.92	3.21	2.29	1.74	1.38	-	13.7	11.1	9.08	7.43	6.22	5.31	4.22	3.45	2.47	1.88	1.49	-	14.8	12.4	9.76	7.99	6.71	5.73	4.55	3.71	2.66	2.02	1.60	-	15.8	13.2	10.5	8.57	7.19	6.13	4.87	3.98	2.86	2.17	1.72	-	16.9	14.1	11.2	9.16	7.68	6.56	5.20	4.26	3.06	2.32	1.84	-	18.0	15.0	11.9	9.76	8.18	7.00	5.54	4.55	3.25	2.47	1.96	-	18.9	16.0	12.7	10.4	8.70	7.43	5.89	4.83	3.45	2.63	-	-	17.0	13.5	11.0	9.24	7.89	6.25	5.12	3.66	2.76	-	-	-	19.0	15.0	12.3	10.3	8.81	7.00	5.73	4.09	3.11	-	-	-	21.1	16.8	13.5	11.4	9.76	7.75	6.34	4.55	3.45	-	-	-	23.2	18.4	15.0	12.6	10.8	8.54	7.00	5.00	-	-	-	-	26.6	21.1	17.2	14.3	12.3	9.76	7.99	5.73	-	-	-	-	32.5	25.7	21.1	17.6	15.0	11.9	9.76	7.00	-	-	-	-	38.6	30.6	25.1	21.1	18.0	14.2	11.7	-	-	-	-	-

Note:
 1. When using one pitch offset links (OL), HP ratings are 80% of the above. Two pitch offset links (2POL) can be used at 100% of the above values.
 2. Multiply the value given above by the multiple strand factor (page 251 Table 2) in order to obtain the transmission horsepower of multiple strand chain.
 3. For lubrication systems A, B & C, refer to pages 257 & 258 for explanation. Please consult Tsubaki for use of horsepower ratings to the right of the boundary line.
 4. Refer to page 251, "Procedures for Selecting Roller Chain."

No. 50



	P	Roll dia.	W	T	H	h	D
50	0.625	0.400	0.375	0.080	0.591	0.512	0.200

TSUBAKI Chain Number	Number of Strands	L1+L2	L1	L2	L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength (lb)	Tsubaki Average Tensile Strength	Maximum Allowable Load	Approximate Mass lb/ft
50RB	1	0.874	0.406	0.469	0.890	0.713	Riveted	4,880	7,050	1,430	0.70
50-2RB	2	1.594	0.762	0.833	1.646		Riveted	9,760	14,100	2,430	1.39
50-3RB	3	2.307	1.118	1.189	2.358		Riveted	14,640	21,150	3,580	2.08
50-4RB	4	3.020	1.474	1.545	3.075		Riveted	-	28,200	4,730	2.76
50-5RB	5	3.732	1.831	1.902	3.787		Riveted	-	35,250	5,590	3.45
50-6RB	6	4.449	2.189	2.260	4.504		Riveted	-	42,300	6,590	4.14

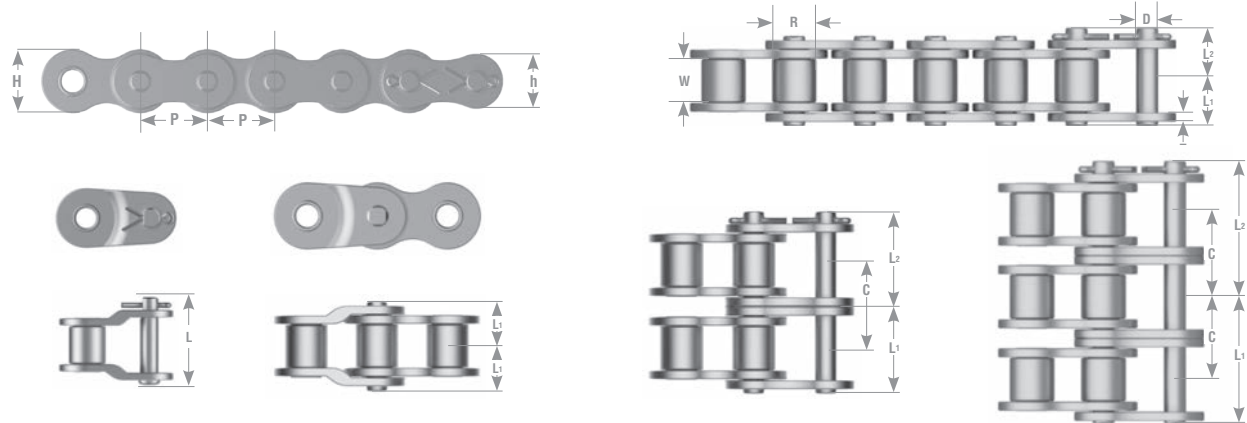
Note:
 1. "RB" designation indicates 10° box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 3. Maximum allowable load when using a two-pitch offset link (2POL) is 100% of the above.

No. of Small Sprocket Teeth	Maximum Speed - Small Sprocket (RPM)																																																																																																																																																																																																																																																																																																																																										
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11	0.16	0.38	0.71	1.33	2.48	3.58	4.64	5.66	7.67	9.62	10.6	10.3	8.14	6.65	5.58	4.43	3.62	3.04	2.59	2.07	1.68	1.41	1.21	1.05	0.93	10.6	8.42	6.22	4.82	3.93	3.23	2.63	2.16	1.68	1.31	1.05	0.87	13.2	10.4	8.56	7.16	5.70	4.65	3.90	3.33	2.64	2.16	1.81	1.56	1.34	-	14.8	11.7	9.56	8.02	6.36	5.20	4.36	3.73	2.95	2.43	2.02	1.73	1.50	-	16.4	13.0	10.6	8.89	7.05	5.77	4.83	4.13	3.27	2.68	2.25	1.92	1.66	-	18.0	14.3	11.7	9.79	7.76	6.36	5.32	4.55	3.61	2.95	2.47	2.11	1.84	-	19.7	15.7	12.8	10.7	8.50	6.96	5.83	4.99	3.96	3.23	2.71	2.31	2.01	-	21.2	17.0	13.9	11.7	9.27	7.59	6.36	5.42	4.30	3.53	2.95	2.52	-	-	22.5	18.5	15.2	12.7	10.0	8.22	6.89	5.89	4.67	3.82	3.21	2.74	-	-	23.7	20.0	16.4	13.7	10.8	8.89	7.44	6.36	5.04	4.13	3.46	2.95	-	-	25.1	21.5	17.6	14.8	11.7	9.57	8.02	6.84	5.42	4.44	3.73	3.18	-	-	26.3	23.1	18.8	15.8	12.5	10.2	8.60	7.34	5.82	4.76	4.00	3.41	-	-	27.6	24.7	20.1	16.9	13.4	11.0	9.19	7.84	6.22	5.10	4.28	-	-	-	29.0	26.3	21.5	18.0	14.3	11.7	9.79	8.35	6.64	5.42	4.55	-	-	-	30.2	27.9	22.8	19.2	15.2	12.4	10.4	8.89	7.05	5.77	4.83	-	-	-	31.5	29.6	24.3	20.2	16.1	13.2	11.0	9.43	7.47	6.13	5.14	-	-	-	32.7	33.1	27.0	22.7	18.0	14.8	12.3	10.5	8.35	6.84	5.74	-	-	-	34.2	36.7	30.0	25.1	19.8	16.4	13.7	11.7	9.27	7.59	-	-	-	-	35.7	40.4	33.3	27.8	22.0	18.0	15.2	12.9	10.2	8.35	-	-	-	-	37.2	46.3	38.1	31.6	25.1	20.7	17.2	14.8	11.7	9.56	-	-	-	-	38.8	56.5	46.4	38.8	30.7	25.1	21.1	18.0	14.3	-	-	-	-	-	40.3	65.6	55.1	46.1	36.6	30.0	25.1	21.5	-	-	-	-	-	-	41.8	74.0	63.7	54.1	44.6	38.1	32.7	28.8	-	-	-	-	-	-

Note:
 1. When using one pitch offset links (OL), HP ratings are 80% of the above. Two pitch offset links (2POL) can be used at 100% of the above values.
 2. Multiply the value given above by the multiple strand factor (page 251 Table 2) in order to obtain the transmission horsepower of multiple strand chain.
 3. For lubrication systems A, B & C, refer to pages 257 & 258 for explanation. Please consult Tsubaki for use of horsepower ratings to the right of the boundary line.
 4. Refer to page 251, "Procedures for Selecting Roller Chain."

ANSI CHAINS

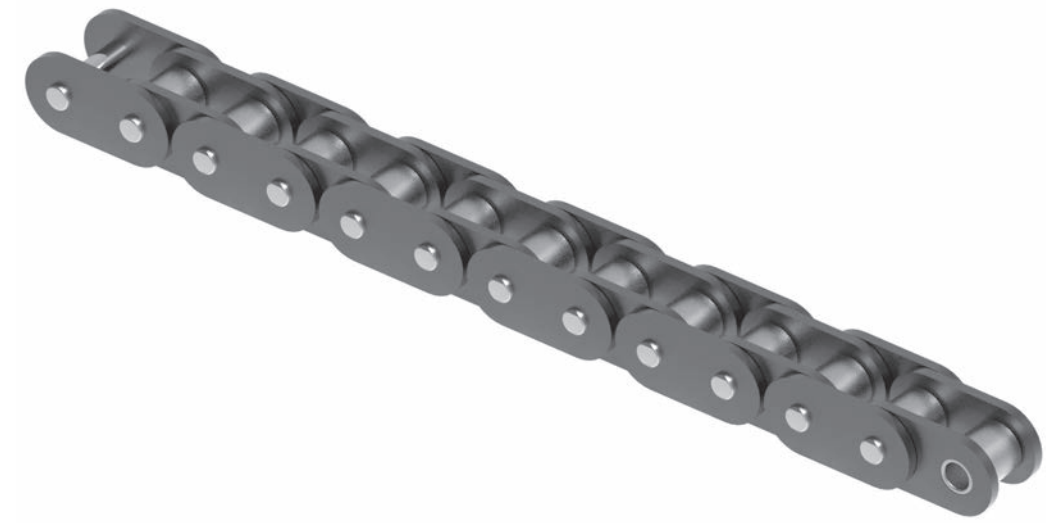
CONVEYOR SERIES



	P	R	W	T	H	h	D
240	3.000	1.875	1.875	0.375	2.850	2.457	0.937

TSUBAKI Chain Number	Number of Strands	L1+L2	L1	L2	L	Transverse Pitch C	Pin Type	ANSI Standard Min. Tensile Strength (lb)	Tsubaki Average Tensile Strength	Maximum Allowable Load	Approximate Mass lb/ft
240RB	1	4.071	1.886	2.185	4.201	3.458	Rivet/Cotter	112,500	154,320	22,260	16.46
240-2RB	2	7.531	3.618	3.913	7.811		Rivet/Cotter	225,000	308,640	37,850	32.32
240-3RB	3	10.984	5.348	5.636	11.272		Rivet/Cotter	337,500	462,970	55,660	48.11
240-4RB	4	14.453	7.079	7.374	14.732		Riveted	450,000	617,290	73,480	63.90
240-5RB	5	17.913	8.809	9.104	18.189		Riveted	562,500	771,610	86,840	79.70
240-6RB	6	21.370	10.539	10.831	21.657		Riveted	675,000	925,940	102,420	95.49

Note:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Maximum allowable load when using a one-pitch offset link (OL) is 65% of the above.
 3. Maximum allowable load when using a two-pitch offset link (2POL) is 100% of the above.



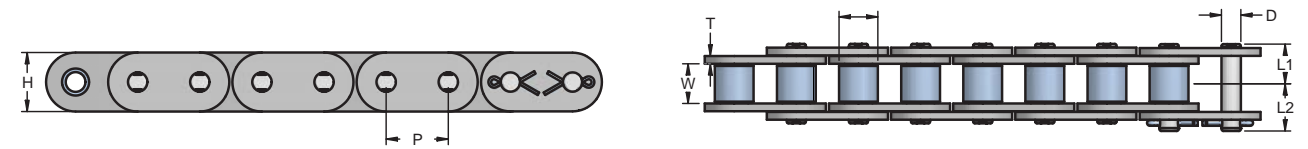
Tsubaki Conveyor Series chains provide a high quality conveying medium for material handling equipment, road building machinery, farm implement equipment, bakery applications, packaging and numerous other applications. From driving, to conveying this is yet another offering from Tsubaki to meet your application requirements.

To better understand the terminology, here is how Tsubaki Conveyor Series chains are identified

- C = Conveyor or straight side bar.

No. of Small Sprocket Teeth	Maximum Speed - Small Sprocket (RPM)																			
	5	10	15	20	25	30	40	50	60	80	100	125	150	175	200	250	300	350	400	450
	A					B										C				
11	9.28	17.8	25.7	33.3	40.8	48.0	62.1	76.0	89.6	116	142	173	204	235	264	271	271	228	186	157
12	10.1	19.6	28.3	36.6	44.8	52.7	68.3	83.4	98.3	127	156	190	224	257	291	298	298	260	213	
13	11.0	21.3	30.8	39.8	48.8	57.4	74.4	91.1	107	139	170	208	244	282	316	325	325	294	240	
14	11.8	23.2	33.4	43.2	52.8	62.2	80.6	98.6	116	150	184	225	266	304	343	353	353	327	268	
15	12.6	24.9	35.9	46.5	56.9	67.1	86.9	106	125	162	198	243	286	329	370	380	380	363	298	
16	13.5	26.7	38.5	49.9	61.0	71.9	93.2	114	134	174	212	260	306	351	397	401	401	361	327	
17	14.3	28.6	41.2	53.2	65.2	76.7	100	122	143	185	227	278	327	375	402	402	402	377	359	
18	15.2	30.3	43.7	56.7	69.3	81.7	106	129	153	197	241	295	347	400	406	406	406	390	377	
19	16.0	32.1	46.4	60.1	73.5	86.6	112	137	161	209	256	312	369	424	425	425	425	408	390	
20	16.9	33.5	49.1	63.6	77.6	91.5	119	145	170	221	271	330	389	443	443	443	443	424	408	
21	17.7	35.4	51.6	66.9	81.8	96.4	125	153	180	233	286	349	410	463	463	463	463	440	424	
22	18.5	37.1	54.3	70.4	86.1	101	131	161	189	245	299	366	432	464	464	464	459	455	422	
23	19.4	38.1	57.0	73.9	90.3	106	138	169	198	257	314	385	453	496	496	496	481	469	448	
24	20.2	40.5	59.7	77.4	94.5	111	145	177	208	270	330	402	475	531	531	531	504	483		
25	21.1	42.1	62.4	80.9	98.8	116	150	184	217	282	345	421	496	550	550	550	520	496		
26	21.9	43.9	65.0	84.4	103	121	157	192	227	294	359	439	518	561	561	561	532	510		

Note:
 1. When using one pitch offset links (OL), HP ratings are 80% of the above. Two pitch offset links (2POL) can be used at 100% of the above values.
 2. Multiply the value given above by the multiple strand factor (page 251 Table 2) in order to obtain the transmission horsepower of multiple strand chain.
 3. For lubrication systems A, B & C, refer to pages 257 & 258 for explanation. Please consult Tsubaki for use of horsepower ratings to the right of the boundary line.
 4. Refer to page 251, "Procedures for Selecting Roller Chain."



Single Pitch

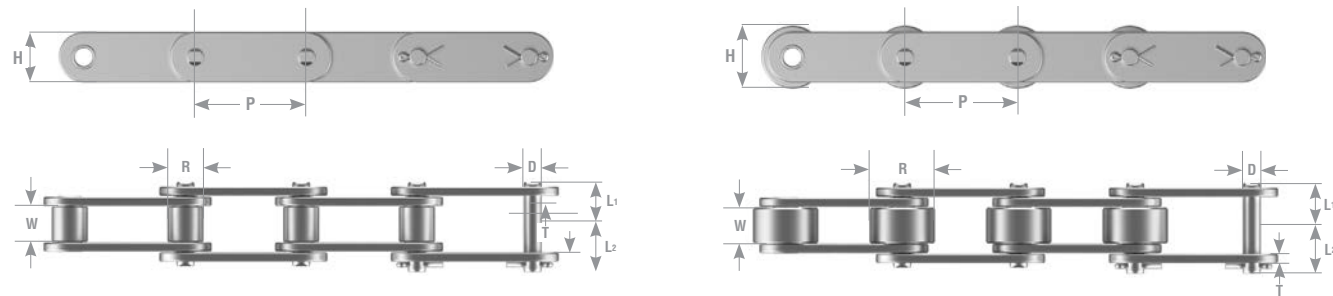
Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Pin			Plate		Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.	No. of Links per 10 ft.
				D	L1	L2	T	H				
C40RB	0.500	0.312	0.312	0.156	0.325	0.392	0.060	0.472	3,750	595	0.34	120
C50RB	0.625	0.400	0.375	0.200	0.406	0.472	0.080	0.591	6,170	970	0.56	96
C60RB	0.750	0.469	0.500	0.234	0.573	0.652	0.125	0.677	9,040	1,410	1.01	80
C80RB	1.000	0.625	0.625	0.312	0.720	0.823	0.156	0.906	15,400	2,400	1.62	60
C100RB	1.250	0.750	0.750	0.375	0.858	0.965	0.187	1.160	24,300	3,840	2.38	48
C120RB	1.500	0.875	1.000	0.437	1.203	1.203	0.219	1.380	34,000	5,380	3.41	40

DOUBLE PITCH CONVEYOR SERIES



How to identify conveyor chains

- (20) in front of the chain sizes (i.e. 2040) indicates double pitch
- H = Heavy side bar construction
- 2 = Oversized roller construction
- D = Delrin plastic oversized rollers



Double Pitch

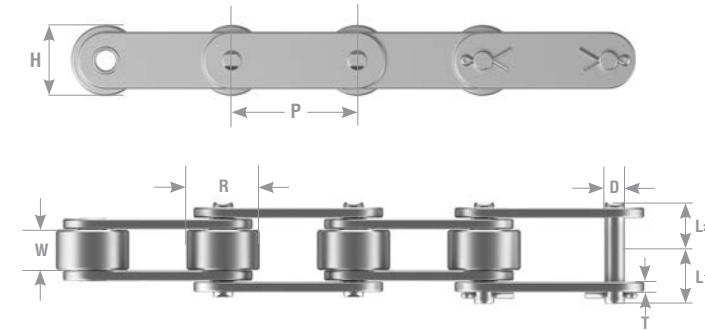
Tsubaki	Pitch	Roller Diameter	Width Between Roller Link Plates	Pin			Plate		Transverse Pitch	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.	No. of Links per 10 ft.
				D	L1	L2	T	H					
STANDARD ROLLER TYPE													
C2040RB	1.00	0.312	0.312	0.156	0.325	0.392	0.060	0.472	NA	3,750	595	0.34	120
C2050RB	1.25	0.400	0.375	0.200	0.406	0.472	0.080	0.591	NA	6,170	970	0.56	96
C2060HRB	1.50	0.469	0.500	0.234	0.573	0.652	0.125	0.677	NA	9,040	1,410	1.01	80
C2080HRB	2.00	0.625	0.625	0.312	0.720	0.823	0.156	0.906	NA	15,400	2,400	1.62	60
C2100HRB	2.50	0.750	0.750	0.375	0.858	0.965	0.187	1.160	NA	24,300	3,840	2.38	48
C2120HRB	3.00	0.875	1.000	0.437	1.203	1.203	0.219	1.380		34,000	5,380	3.41	40
C2160HRB	4.00	1.125	1.250	0.562	1.514	1.514	0.281	1.850	NA	58,000	9,190	6.02	30
OVERSIZED ROLLER TYPE													
C2042RB	1.00	0.625	0.312	0.156	0.325	0.392	0.060	0.472	1.028	3,750	595	0.58	120
C2052RB	1.25	0.750	0.375	0.200	0.406	0.472	0.080	0.591	1.283	6,170	970	0.87	96
C2062HRB	1.50	0.875	0.500	0.234	0.573	0.652	0.125	0.677	1.539	9,040	1,410	1.47	80
C2082HRB	2.00	1.125	0.625	0.312	0.720	0.823	0.156	0.906	1.924	15,400	2,400	2.37	60
C2102HRB	2.50	1.562	0.750	0.375	0.858	0.965	0.187	1.160	2.055	24,300	3,840	3.90	48
C2122HRB	3.00	1.750	1.000	0.437	1.061	1.203	0.219	1.380		34,000	5,380	5.46	40
C2162HRB	4.00	2.250	1.250	0.562	1.337	1.514	0.281	1.850	2.437	58,000	9,190	9.21	30

- Note:
1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Refer to attachment chain section for attachment dimensions.
 3. Heavy side plates are used for C2060H (2) and up. (H) indicates heavy side bars.
 4. Spring clip type connecting links will be provided for sizes C2040-C2060H including oversized rollers.
 5. (2) indicates oversized roller style.

CONVEYOR SERIES: DELRIN ROLLER



Delrin roller conveyor series chains have a plastic (polyacetal resin) roller to offer a smooth, quiet operation and long wear life. Stainless steel chain with plastic rollers is also available for those applications where corrosion resistance is required.



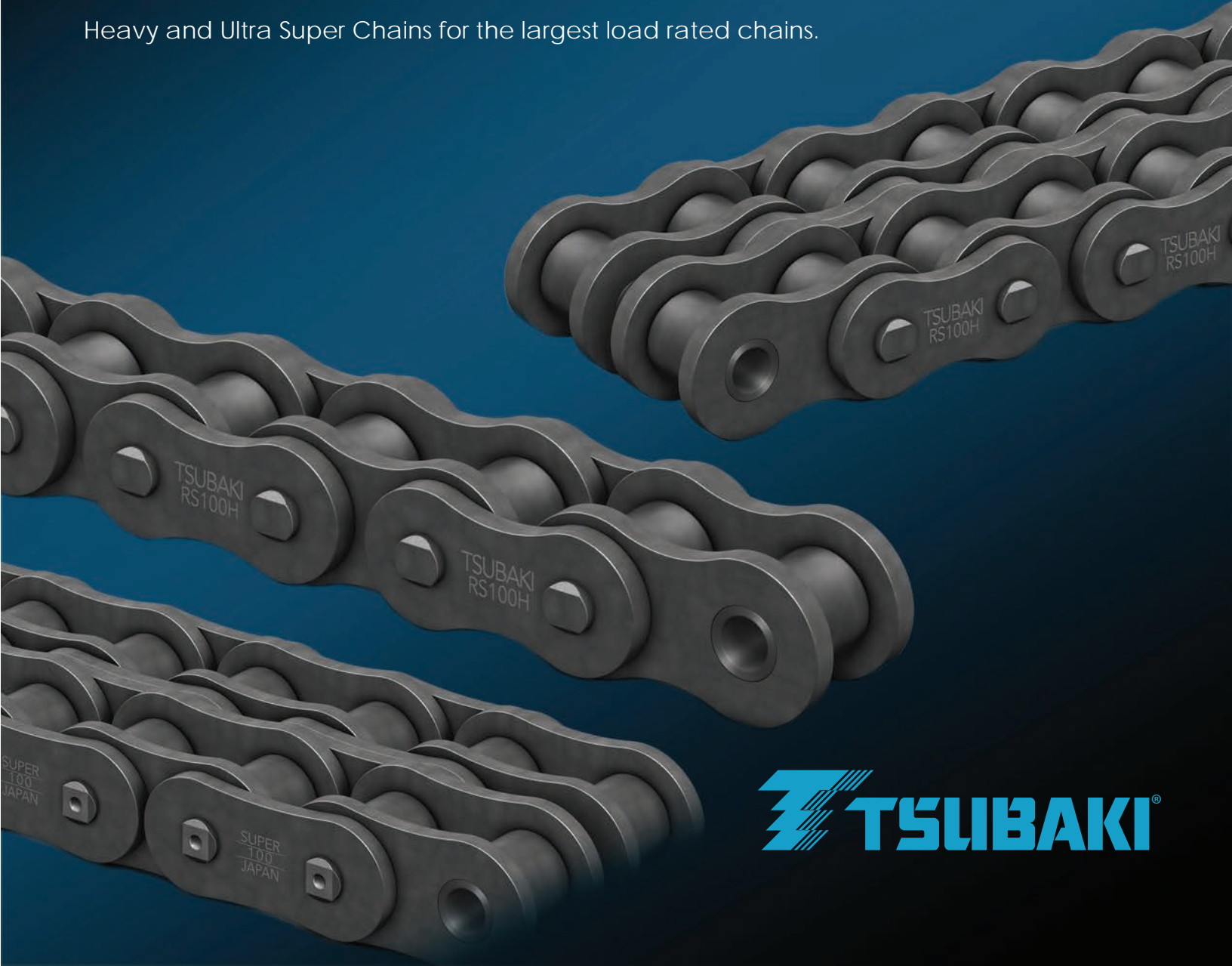
Delrin Roller - Double Pitch

Tsubaki	Pitch	Roller Diameter	Width Between Roller Link Plates	Pin				Plate		Average Tensile Strength	Maximum Allowable Load*	Maximum Allowable Roller Load*	Approx. Weight lbs/ft.	No. of Links per 10 ft.
				D	L1	L2	L1+L2	T	H					
C2042DRB	1.00	0.625	0.312	0.156	0.325	0.392	0.717	0.060	0.472	3,700	100	44	0.33	120
C2052DRB	1.25	0.750	0.375	0.200	0.406	0.472	0.878	0.080	0.591	6,100	154	66	0.57	96
C2062HDRB	1.50	0.875	0.500	0.234	0.573	0.652	1.225	0.125	0.677	9,000	231	110	0.98	80
C2082HDRB	2.00	1.125	0.625	0.312	0.720	0.823	1.543	0.156	0.906	15,400	397	200	1.77	60
C2102HDRB	2.50	1.562	0.750	0.375	0.858	0.965	1.823	0.187	1.160	24,000	573	286	2.52	48

- Note:
1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Refer to attachment chain section for attachment dimensions.
 3. Heavy side plates are used for C2060H (2) and up. (H) indicates heavy side bars.
 4. Spring clip type connecting links will be provided for sizes C2040-C2060H including oversized rollers.
 5. (2) indicates oversized roller style.

HEAVY-DUTY CHAINS

When just a standard ANSI carbon steel roller chain won't do, Tsubaki completes its line of ANSI chains with a full line of Heavy-Duty series roller chains. Tsubaki offers many options to handle the most rugged and high-load applications. Heavy chains, "T" series chains for better shock load, "HT" series got greater ultimate tensile strength, and a full series of Super, Super Heavy and Ultra Super Chains for the largest load rated chains.



HEAVY DUTY CHAINS

Tsubaki offers the most complete line of roller chains for tough applications that require extra performance, like material handling and construction. Heavy Series Chains are directly interchangeable with standard ANSI chains and require no special equipment modifications or sprockets.

T Series

Chains have thru-hardened pins for higher ultimate tensile strength and greater shock resistance.



H Series

Chains have thicker link plates and longer pins than standard roller chains. They handle up to 10 percent higher loads.



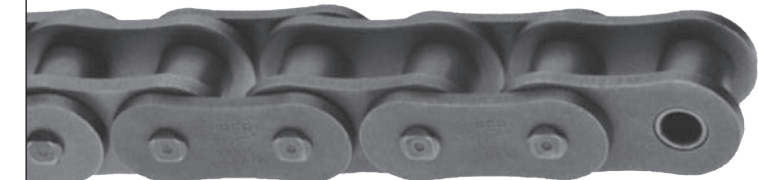
HT Series

Chains have thru-hardened pins and thicker link plates for 15 to 30 percent higher ultimate strength and even more shock load resistance.



Super Series

Chains have wider-waist link plates, ball-drifted pitch holes, and through-hardened pins for greater shock resistance and 25 to 30 percent higher maximum allowable loads.



H-Super Series

Chains have the same features as Super Series, plus wider-waist and thicker link plates for even higher maximum allowable loads.

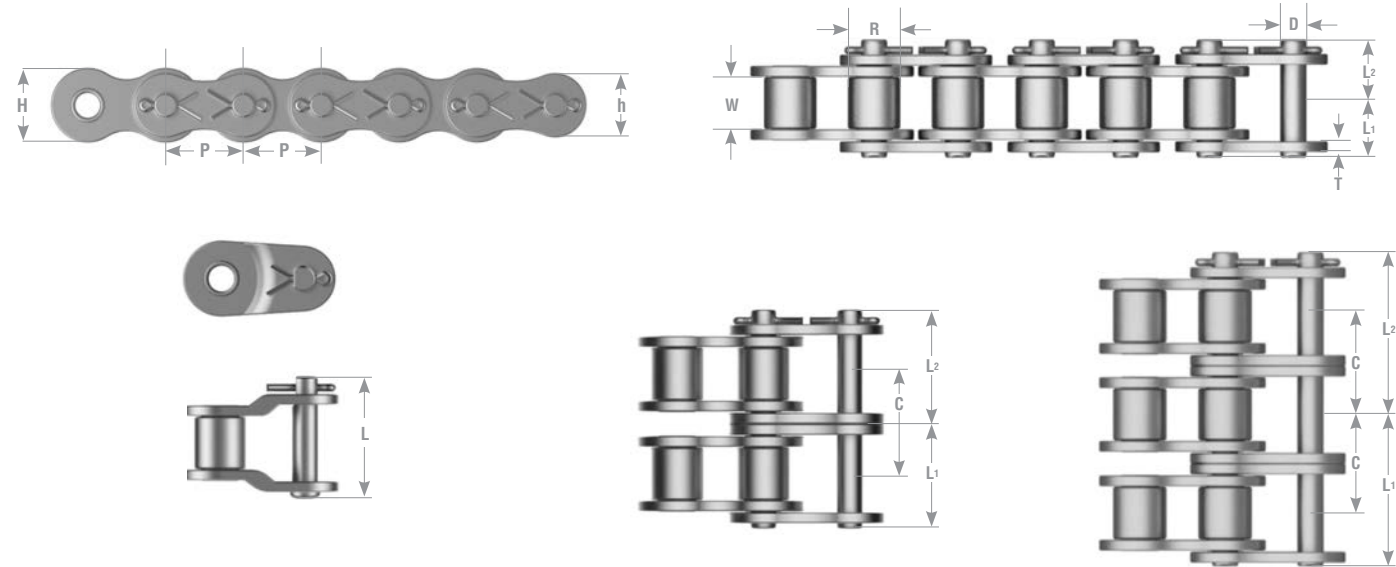


Ultra Super Series

Chains provide the highest ultimate tensile strength and maximum allowable loads of any Tsubaki roller chain. In some applications, these chains can transmit virtually twice the load of their standard equivalents.



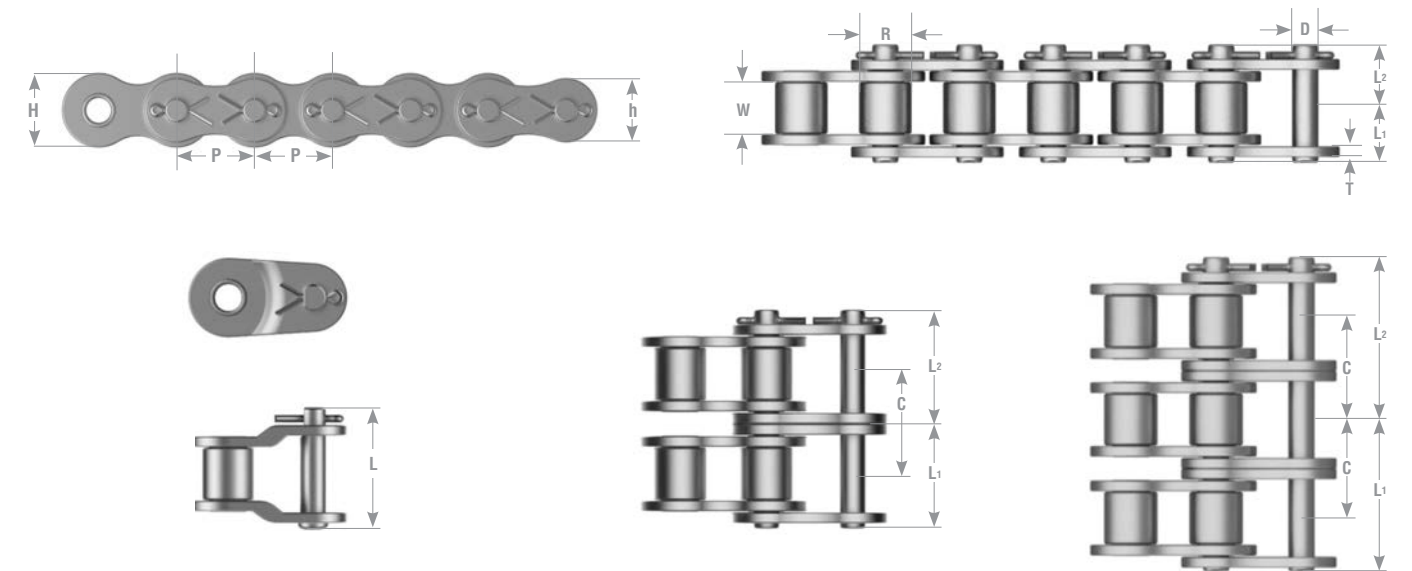
HEAVY SERIES



Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Plate			Pin			Transverse Pitch C	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	h	D	L1	L2				
SINGLE STRAND													
60HRB	0.75	0.469	0.500	0.125	0.072	0.214	0.015	0.583	0.669	NA	9,920	2,200	1.21
80HRB	1.00	0.625	0.625	0.156	0.094	0.272	0.024	0.720	0.823	NA	17,640	3,630	2.08
100HRB	1.25	0.750	0.750	1.870	0.125	0.339	0.030	0.858	0.965	NA	26,460	5,510	3.07
120HRB	1.50	0.875	1.000	0.219	0.188	0.500	0.050	1.061	1.203	NA	37,480	7,270	4.38
140HRB	1.75	1.000	1.000	0.250	0.134	0.425	0.040	1.138	1.303	NA	48,510	9,590	5.54
160HRB	2.00	1.125	1.250	0.281	0.188	0.496	0.040	1.337	1.514	NA	60,630	12,500	7.35
200HRB	2.50	1.562	1.500	0.375	0.250	0.579	0.050	1.689	1.894	NA	103,630	17,600	12.33
240HRB	3.00	1.875	1.875	0.500	0.312	0.717	0.060	2.157	2.453	NA	152,140	25,300	19.54
DOUBLE STRAND													
60H-2RB	0.75	0.469	0.500	0.400	0.375	0.878	0.080	1.094	1.177	1.028	19,840	3,700	2.41
80H-2RB	1.00	0.625	0.625	0.463	0.500	1.087	0.094	1.362	1.465	1.283	35,280	6,100	4.15
100H-2RB	1.25	0.750	0.750	0.625	0.625	1.398	0.125	1.630	1.736	1.539	52,920	9,300	6.07
120H-2RB	1.50	0.875	1.000	0.750	0.750	1.678	0.156	2.024	2.165	1.924	74,960	12,300	8.67
140H-2RB	1.75	1.000	1.000	0.875	1.000	2.118	0.187	2.165	2.343	2.055	94,370	16,300	11.01
160H-2RB	2.00	1.125	1.250	1.000	1.000	2.307	0.219	2.555	2.740	2.437	121,260	21,200	14.64
200H-2RB	2.50	1.562	1.500	1.125	1.250	2.705	0.250	3.230	3.437	3.083	207,260	29,900	24.51
240H-2RB	3.00	1.875	1.875	1.406	1.406	3.075	0.281	4.146	4.445	3.985	304,280	43,000	38.47
TRIPLE STRAND													
60H-3RB	0.75	0.469	0.500	1.562	1.500	3.299	0.312	1.608	1.691	1.028	29,760	5,500	3.60
80H-3RB	1.00	0.625	0.625	1.875	1.875	4.071	0.375	2.006	2.108	1.283	52,920	9,000	6.21
100H-3RB	1.25	0.750	0.750	1.562	1.500	3.299	0.312	2.402	2.504	1.539	79,380	13,700	9.10
120H-3RB	1.50	0.875	1.000	1.875	1.875	4.071	0.375	2.988	3.126	1.924	112,400	18,100	12.99
140H-3RB	1.75	1.000	1.000	1.562	1.500	3.299	0.312	3.195	3.560	2.055	141,550	23,900	16.48
160H-3RB	2.00	1.125	1.250	1.875	1.875	4.071	0.375	3.778	3.955	2.437	181,890	31,200	21.93
200H-3RB	2.50	1.562	1.500	1.562	1.500	3.299	0.312	4.774	4.985	3.083	310,890	44,000	36.81
240H-3RB	3.00	1.875	1.875	1.875	1.875	4.071	0.375	6.144	6.439	3.985	496,420	63,200	57.33

Note: 1. "RB" designation indicates 10° box riveted. Cottered, cut-to-length and reel stock available upon request.
 *2. Please refer to the technical resource section, "Selection for Slow Speed."

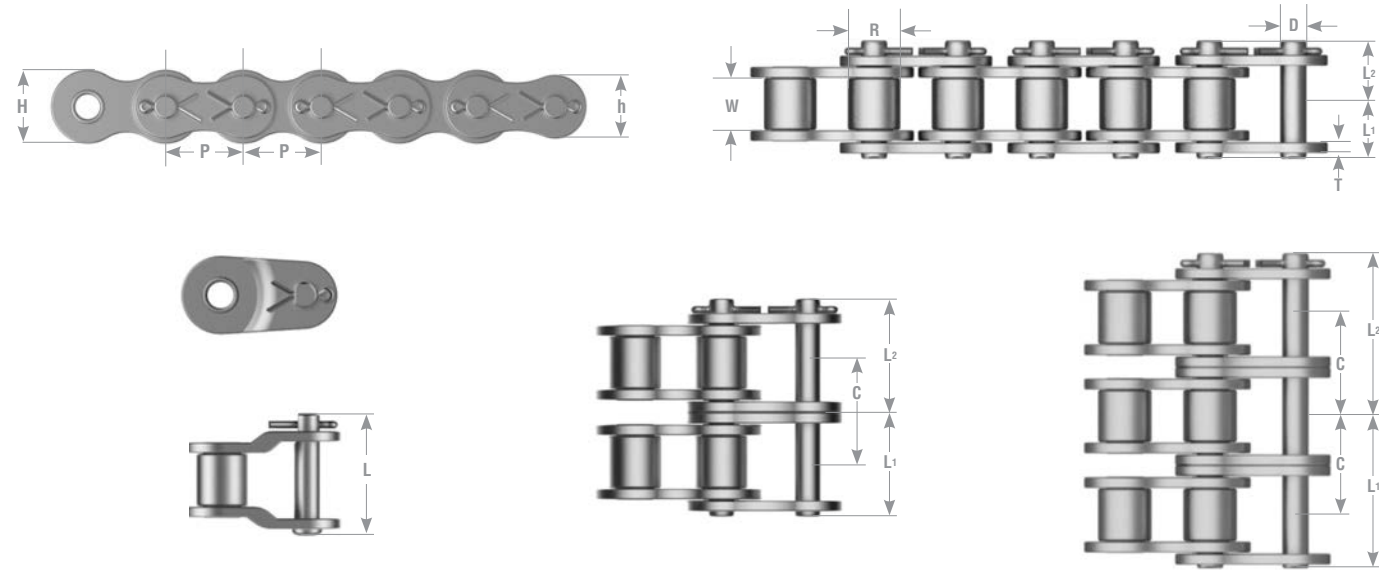
T SERIES



Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Plate			Pin			Transverse Pitch C	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	h	D	L1	L2				
SINGLE STRAND													
60TRB	0.75	0.469	0.500	0.094	0.713	0.614	0.234	0.506	0.581	NA	10,300	1,980	1.03
80TRB	1.00	0.625	0.625	0.125	0.949	0.819	0.312	0.640	0.758	NA	17,600	3,300	1.79
100TRB	1.25	0.750	0.750	0.156	1.185	1.024	0.375	0.778	0.900	NA	27,400	5,070	2.68
120TRB	1.50	0.875	1.000	0.187	1.425	1.228	0.437	0.980	1.138	NA	39,700	6,830	3.98
140TRB	1.75	1.000	1.000	0.219	1.661	1.433	0.500	1.059	1.248	NA	52,800	9,040	5.03
160TRB	2.00	1.125	1.250	0.250	1.898	1.638	0.562	1.254	1.451	NA	68,300	11,900	6.79
200TRB	2.50	1.562	1.500	0.312	2.374	2.047	0.781	1.535	1.764	NA	105,800	16,090	11.08
240TRB	3.00	1.875	1.875	0.375	2.850	2.457	0.937	1.886	2.185	NA	154,200	22,260	16.46
DOUBLE STRAND													
60T-2RB	0.75	0.469	0.500	0.094	0.713	0.614	0.234	0.955	1.033	0.897	20,600	3,370	2.04
80T-2RB	1.00	0.625	0.625	0.125	0.949	0.819	0.312	1.217	1.335	1.153	35,200	5,620	3.54
100T-2RB	1.25	0.750	0.750	0.156	1.185	1.024	0.375	1.484	1.606	1.408	54,600	8,620	5.27
120T-2RB	1.50	0.875	1.000	0.187	1.425	1.228	0.437	1.874	2.031	1.789	79,400	11,610	7.86
140T-2RB	1.75	1.000	1.000	0.219	1.661	1.433	0.500	2.022	2.211	1.924	105,800	15,370	9.97
160T-2RB	2.00	1.125	1.250	0.250	1.898	1.638	0.562	2.407	2.604	2.305	136,600	20,230	13.47
200T-2RB	2.50	1.562	1.500	0.312	2.374	2.047	0.781	2.947	3.175	2.817	211,600	27,350	21.93
240T-2RB	3.00	1.875	1.875	0.375	2.850	2.457	0.937	3.618	3.913	3.458	308,600	37,850	32.32
TRIPLE STRAND													
60T-3RB	0.75	0.469	0.500	0.094	0.713	0.614	0.234	1.404	1.502	0.897	30,900	4,960	3.05
80T-3RB	1.00	0.625	0.625	0.125	0.949	0.819	0.312	1.795	1.909	1.153	52,800	8,270	5.30
100T-3RB	1.25	0.750	0.750	0.156	1.185	1.024	0.375	2.191	2.313	1.408	82,200	12,680	7.91
120T-3RB	1.50	0.875	1.000	0.187	1.425	1.228	0.437	2.772	2.929	1.789	119,100	17,080	11.76
140T-3RB	1.75	1.000	1.000	0.219	1.661	1.433	0.500	2.986	3.179	1.924	158,400	22,600	14.92
160T-3RB	2.00	1.125	1.250	0.250	1.898	1.638	0.562	3.561	3.758	2.305	204,900	24,760	20.17
200T-3RB	2.50	1.562	1.500	0.312	2.374	2.047	0.781	4.360	4.585	2.817	317,400	40,230	32.94
240T-3RB	3.00	1.875	1.875	0.375	2.850	2.457	0.937	5.348	5.636	3.458	462,600	55,660	48.11

Note: 1. "RB" designation indicates 10° box riveted. Cottered, cut-to-length and reel stock available upon request.
 *2. Please refer to the technical resource section, "Selection for Slow Speed."

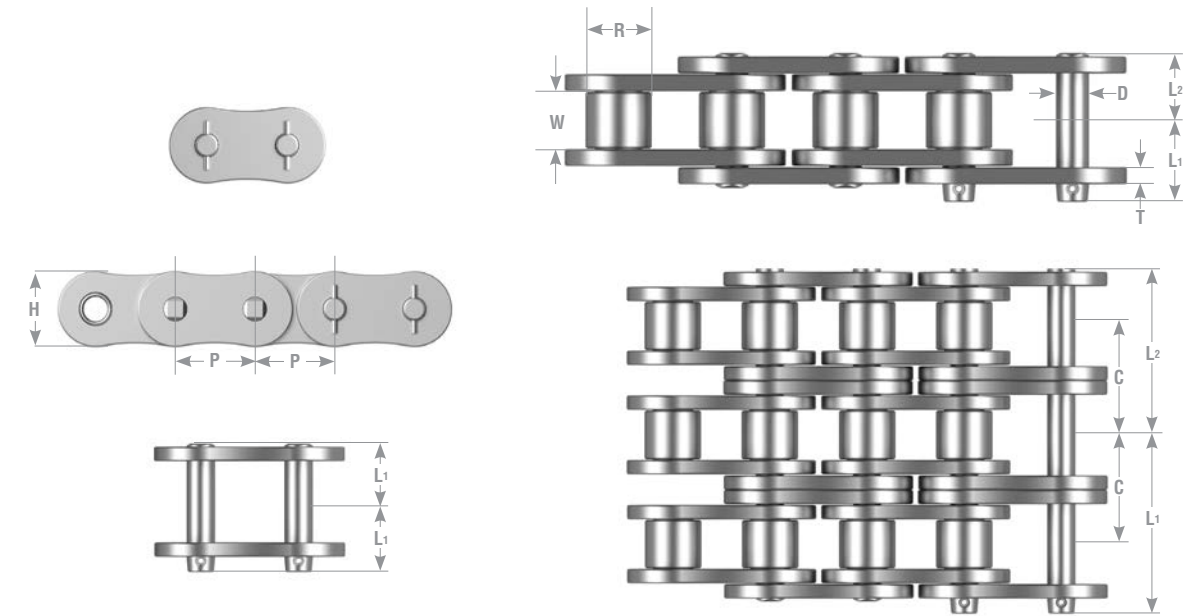
HT SERIES



Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Plate			Pin			Transverse Pitch C	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	h	D	L1	L2				
SINGLE STRAND													
60HTRB	0.75	0.469	0.500	0.125	0.713	0.614	0.234	0.582	0.669	NA	12,500	2,200	1.21
80HTRB	1.00	0.625	0.625	0.156	0.949	0.819	0.312	0.720	0.823	NA	20,900	3,630	2.08
100HTRB	1.25	0.750	0.750	1.870	1.185	1.024	0.375	0.858	0.965	NA	31,900	5,510	3.07
120HTRB	1.50	0.875	1.000	0.219	1.425	1.228	0.437	1.061	1.203	NA	43,000	7,270	4.38
140HTRB	1.75	1.000	1.000	0.250	1.661	1.433	0.500	1.138	1.303	NA	56,200	9,590	5.54
160HTRB	2.00	1.125	1.250	0.281	1.898	1.638	0.562	1.337	1.514	NA	71,600	12,500	7.35
200HTRB	2.50	1.562	1.500	0.375	2.374	2.047	0.781	1.689	1.894	NA	125,600	17,600	12.33
240HTRB	3.00	1.875	1.875	0.500	2.850	2.457	0.937	2.157	2.453	NA	198,400	25,300	19.57
DOUBLE STRAND													
60HT-2RB	0.75	0.469	0.500	0.400	0.713	0.614	0.234	1.094	1.181	1.028	25,100	3,700	2.41
80HT-2RB	1.00	0.625	0.625	0.463	0.949	0.819	0.312	1.358	1.492	1.283	41,800	6,100	4.15
100HT-2RB	1.25	0.750	0.750	0.625	1.185	1.024	0.375	1.630	1.736	1.539	63,900	9,300	6.06
120HT-2RB	1.50	0.875	1.000	0.750	1.425	1.228	0.437	2.024	2.171	1.924	86,000	12,300	8.65
140HT-2RB	1.75	1.000	1.000	0.875	1.661	1.433	0.500	2.163	2.343	2.055	112,400	16,300	10.98
160HT-2RB	2.00	1.125	1.250	1.000	1.898	1.638	0.562	2.555	2.736	2.437	143,000	21,200	14.61
200HT-2RB	2.50	1.562	1.500	1.125	2.374	2.047	0.781	3.230	3.437	3.083	251,300	29,900	24.46
240HT-2RB	3.00	1.875	1.875	1.406	2.850	2.457	0.937	4.146	4.461	3.985	397,900	43,000	38.46
TRIPLE STRAND													
60HT-3RB	0.75	0.469	0.500	1.562	0.713	0.614	0.234	1.614	1.720	1.028	37,700	5,500	3.60
80HT-3RB	1.00	0.625	0.625	1.875	0.949	0.819	0.312	1.998	2.120	1.253	62,800	9,000	6.20
100HT-3RB	1.25	0.750	0.750	1.562	1.185	1.024	0.375	2.400	2.510	1.539	95,900	13,700	9.08
120HT-3RB	1.50	0.875	1.000	1.875	1.425	1.228	0.437	2.984	3.134	1.924	129,000	18,100	12.96
140HT-3RB	1.75	1.000	1.000	1.562	1.661	1.433	0.500	3.191	3.370	2.055	168,600	23,900	16.46
160HT-3RB	2.00	1.125	1.250	1.875	1.898	1.638	0.562	3.778	3.961	2.437	214,900	31,200	21.88
200HT-3RB	2.50	1.562	1.500	1.562	2.374	2.047	0.781	4.774	4.982	3.083	377,000	44,000	36.73
240HT-3RB	3.00	1.875	1.875	1.875	2.850	2.457	0.937	6.144	6.439	3.985	595,200	63,200	57.43

Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 *2. Please refer to the technical resource section, "Selection for Slow Speed."

SUPER SERIES



Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Plate			Pin			Transverse Pitch C	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	h	D	L1	L2				
SINGLE STRAND													
80SUPERRB	1.000	0.625	0.625	0.125	0.949	0.819	0.312	0.640	0.758	NA	19,100	4,510	1.89
100SUPERRB	1.250	0.750	0.750	0.156	1.185	1.024	0.375	0.778	0.900	NA	28,500	7,280	2.86
120SUPERRB	1.500	0.875	1.000	0.187	1.425	1.228	0.437	0.980	1.138	NA	41,800	9,480	4.23
140SUPERRB	1.750	1.000	1.000	0.219	1.661	1.433	0.500	1.059	1.248	NA	55,000	12,790	5.40
160SUPERRB	2.000	1.125	1.250	0.250	1.898	1.638	0.562	1.254	1.451	NA	70,500	16,520	7.25
180SUPERRB	2.250	1.406	1.406	0.281	2.134	1.843	0.687	1.404	1.671	NA	92,621	19,260	9.56
200SUPERRB	2.500	1.562	1.500	0.312	2.374	2.047	0.781	1.535	1.764	NA	113,500	22,480	11.85
240SUPERRB	3.000	1.875	1.875	0.375	2.850	2.457	0.937	1.886	2.185	NA	165,200	31,240	17.22
DOUBLE STRAND													
80-2SUPERRB	1.000	0.625	0.625	0.125	0.949	0.819	0.312	1.217	1.335	1.153	38,400	7,680	3.78
100-2SUPERRB	1.250	0.750	0.750	0.156	1.185	1.024	0.375	1.484	1.606	1.408	57,300	12,360	5.63
120-2SUPERRB	1.500	0.875	1.000	0.187	1.425	1.228	0.437	1.874	2.031	1.789	83,800	16,110	8.36
140-2SUPERRB	1.750	1.000	1.000	0.219	1.661	1.433	0.500	2.022	2.211	1.924	110,100	21,730	10.70
160-2SUPERRB	2.000	1.125	1.250	0.250	1.898	1.638	0.562	2.407	2.604	2.305	141,100	28,100	14.40
180-2SUPERRB	2.250	1.406	1.406	0.281	2.134	1.843	0.687	2.707	2.967	2.592	185,243	32,820	18.87
200-2SUPERRB	2.500	1.562	1.500	0.312	2.374	2.047	0.781	2.947	3.175	2.817	227,000	38,210	23.46
240-2SUPERRB	3.000	1.875	1.875	0.375	2.850	2.457	0.937	3.618	3.913	3.458	330,400	53,280	34.19
TRIPLE STRAND													
80-3SUPERRB	1.000	0.625	0.625	0.125	0.949	0.819	0.312	1.795	1.909	1.153	57,500	11,300	5.64
100-3SUPERRB	1.250	0.750	0.750	0.156	1.185	1.024	0.375	2.191	2.313	1.408	85,800	18,180	8.45
120-3SUPERRB	1.500	0.875	1.000	0.187	1.425	1.228	0.437	2.772	2.929	1.789	125,600	23,600	12.53
140-3SUPERRB	1.750	1.000	1.000	0.219	1.661	1.433	0.500	2.986	3.179	1.924	165,200	31,920	16.02
160-3SUPERRB	2.000	1.125	1.250	0.250	1.898	1.638	0.562	3.561	3.758	2.305	211,500	41,360	21.57
180-3SUPERRB	2.250	1.406	1.406	0.281	2.134	1.843	0.687	4.004	4.272	2.591	278,763	48,100	27.26
200-3SUPERRB	2.500	1.562	1.500	0.312	2.374	2.047	0.781	4.360	4.585	2.817	241,700	56,200	35.24
240-3SUPERRB	3.000	1.875	1.875	0.375	2.850	2.457	0.937	5.348	5.636	3.458	496,800	78,230	51.14

Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Four-pitch offset links (4POL) available for single strand only.
 3. Connecting links are slip fit M-type connecting links (MCL) and press fit F-type connecting links are (FCL) available.
 4. Maximum allowable load when using a four-pitch offset link (4POL) is 85% that of the above values.
 5. Carbon steel sprockets with hardened teeth should be used with Super Series chain.
 6. Please refer to the technical resource section, "Chain Drive Selection."

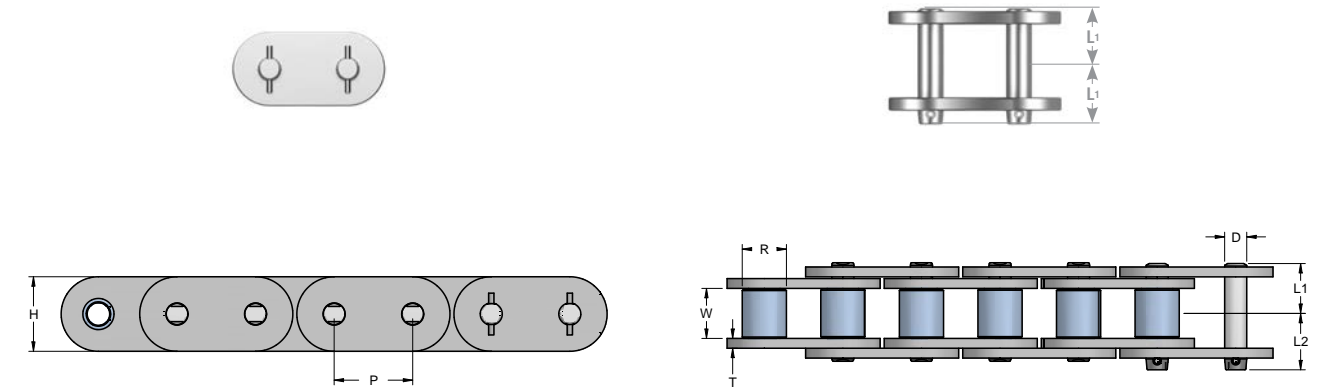
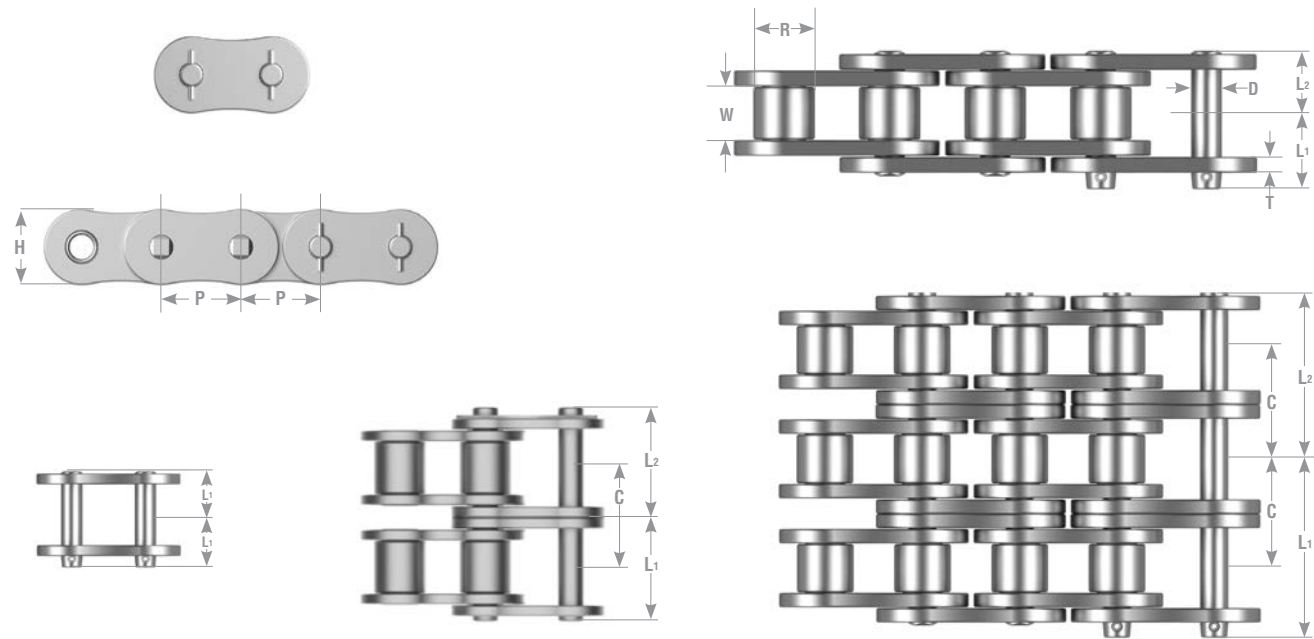
SUPER H SERIES



ULTRA SUPER SERIES



HEAVY DUTY CHAINS



HEAVY DUTY CHAINS

Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Plate			Pin			Transverse Pitch C	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	h	D	L1	L2				
SINGLE STRAND													
80HSUPERRB	1.000	0.625	0.625	0.156	0.949	0.819	0.312	0.720	0.823	NA	22,000	5,622	2.21
100HSUPERRB	1.250	0.750	0.750	0.187	1.185	1.024	0.375	0.858	0.965	NA	32,600	8,818	3.28
120HSUPERRB	1.500	0.875	1.000	0.187	1.425	1.228	0.437	1.061	1.203	NA	44,000	12,125	4.66
140HSUPERRB	1.750	1.000	1.000	0.219	1.661	1.433	0.500	1.138	1.303	NA	57,300	15,366	5.97
160HSUPERRB	2.000	1.125	1.250	0.250	1.898	1.638	0.562	1.337	1.514	NA	72,700	20,238	7.88
200HSUPERRB	2.500	1.562	1.500	0.375	2.374	2.047	0.781	1.689	1.894	NA	134,400	27,359	13.22
240HSUPERRB	3.000	1.875	1.875	0.500	2.850	2.457	0.937	2.157	2.453	NA	207,200	37,853	20.47
DOUBLE STRAND													
80-2HSUPERRB	1.000	0.625	0.625	0.125	0.949	0.819	0.312	1.362	1.465	1.283	44,000	9,436	4.38
100-2HSUPERRB	1.250	0.750	0.750	1.560	1.185	1.024	0.375	1.630	1.736	1.539	65,200	14,991	6.39
120-2HSUPERRB	1.500	0.875	1.000	0.187	1.425	1.228	0.437	2.024	2.165	1.924	88,100	20,613	9.08
140-2HSUPERRB	1.750	1.000	1.000	0.219	1.661	1.433	0.500	2.165	2.343	2.055	114,600	24,361	11.68
160-2HSUPERRB	2.000	1.125	1.250	0.250	1.898	1.638	0.562	2.555	2.736	2.437	145,500	32,606	15.44
200-2HSUPERRB	2.500	1.562	1.500	0.312	2.374	2.047	0.781	3.230	3.437	3.083	268,900	41,226	25.86
240-2HSUPERRB	3.000	1.875	1.875	0.375	2.850	2.457	0.937	4.146	4.445	3.985	414,400	57,717	40.16
TRIPLE STRAND													
80-3HSUPERRB	1.000	0.625	0.625	0.125	0.949	0.819	0.312	2.006	2.108	1.283	66,100	13,889	6.55
100-3HSUPERRB	1.250	0.750	0.750	0.156	1.185	1.024	0.375	2.400	2.504	1.539	97,800	22,046	9.50
120-3HSUPERRB	1.500	0.875	1.000	0.187	1.425	1.228	0.437	2.988	3.126	1.924	132,200	30,314	13.50
140-3HSUPERRB	1.750	1.000	1.000	0.219	1.661	1.433	0.500	3.191	3.356	2.055	171,900	35,825	17.39
160-3HSUPERRB	2.000	1.125	1.250	0.250	1.898	1.638	0.562	3.778	3.955	2.437	218,200	47,951	22.99
200-3HSUPERRB	2.500	1.562	1.500	0.312	2.374	2.047	0.781	4.774	4.982	3.083	403,400	60,627	38.50
240-3HSUPERRB	3.000	1.875	1.875	0.375	2.850	2.457	0.937	6.144	6.439	3.985	621,700	84,878	59.87

- Note: 1. Offset Links are not available for H-Super Chain.
 2. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 3. Press-fit connecting links will be supplied.
 4. Carbon steel sprockets with hardened teeth are suggested with H-Super Chain.
 5. *Please refer to the technical resource section, "Chain Drive Selection" for proper chain selection.

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Link Plate		Pin			Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	D	L1	L2			
100ULTRASUPER	1.250	0.750	0.750	0.187	1.185	0.375	0.858	0.965	33,500	8,800	3.41
120ULTRASUPER	1.500	0.875	1.000	0.219	1.425	0.437	1.061	1.203	47,800	12,100	4.85
140ULTRASUPER	1.750	1.000	1.000	0.250	1.661	0.500	1.138	1.303	61,200	15,300	6.21
160ULTRASUPER	2.000	1.125	1.250	0.281	1.898	0.562	1.337	1.514	76,700	20,200	8.19
200ULTRASUPER	2.500	1.562	1.500	0.375	2.374	0.781	1.689	1.894	130,200	27,300	13.76
240ULTRASUPER	3.000	1.875	1.875	0.500	2.850	0.937	2.157	2.453	191,800	37,800	21.29

ATTACHMENT CHAINS

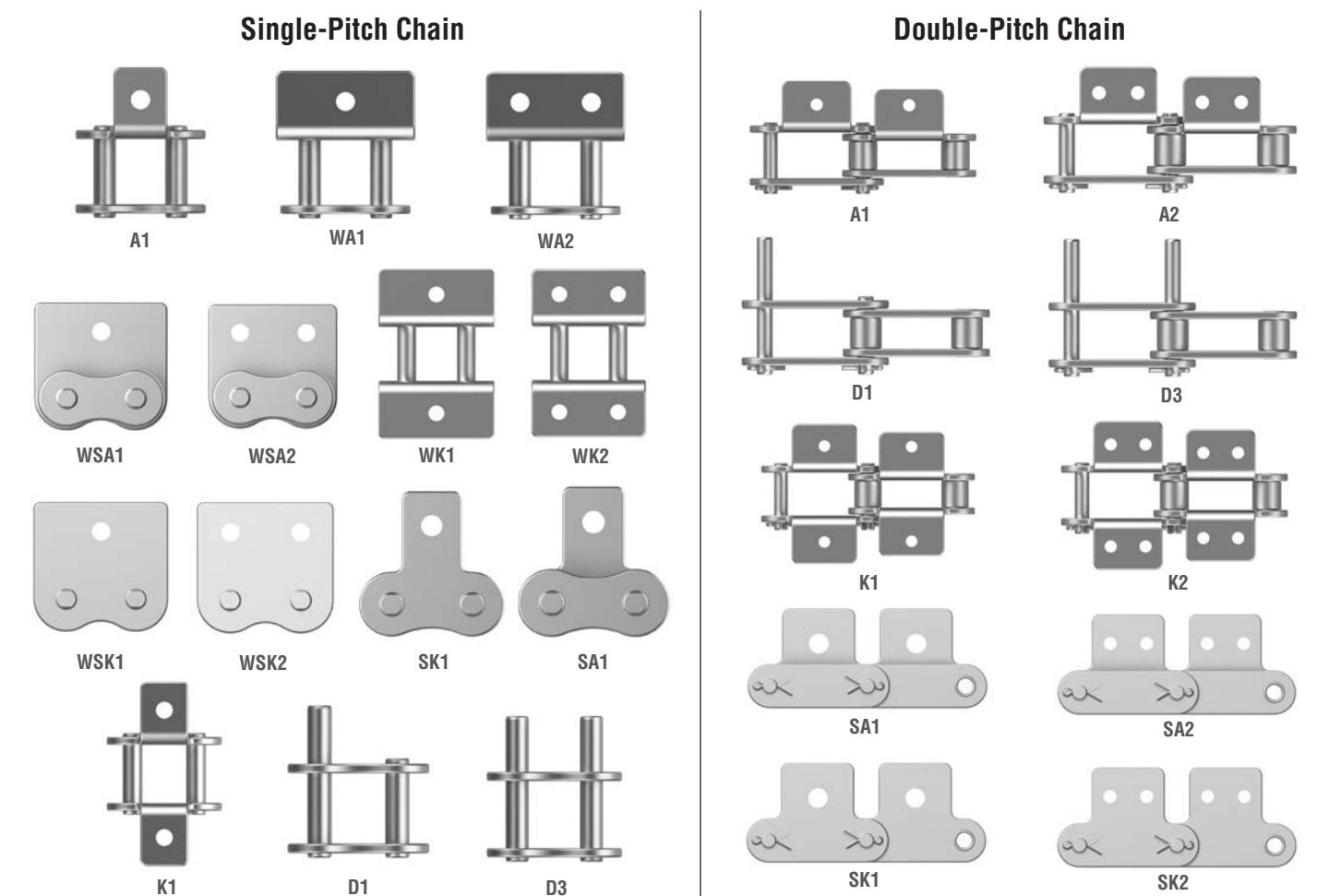
The core to what has made Tsubaki an industry leader in roller chain manufacturing continues to be attachment chains.

Tsubaki stocks a complete offering of standard roller chain attachments in single and double pitch chains. Additional offerings include attachments for lube-free, anti-corrosion, British Standard, hollow pin, and curved chains.



ATTACHMENT CHAINS

Tsubaki offers a complete line of attachments from stock to meet your conveying needs. The standard attachments Tsubaki stocks includes:



Converting from other Manufacturers Chains

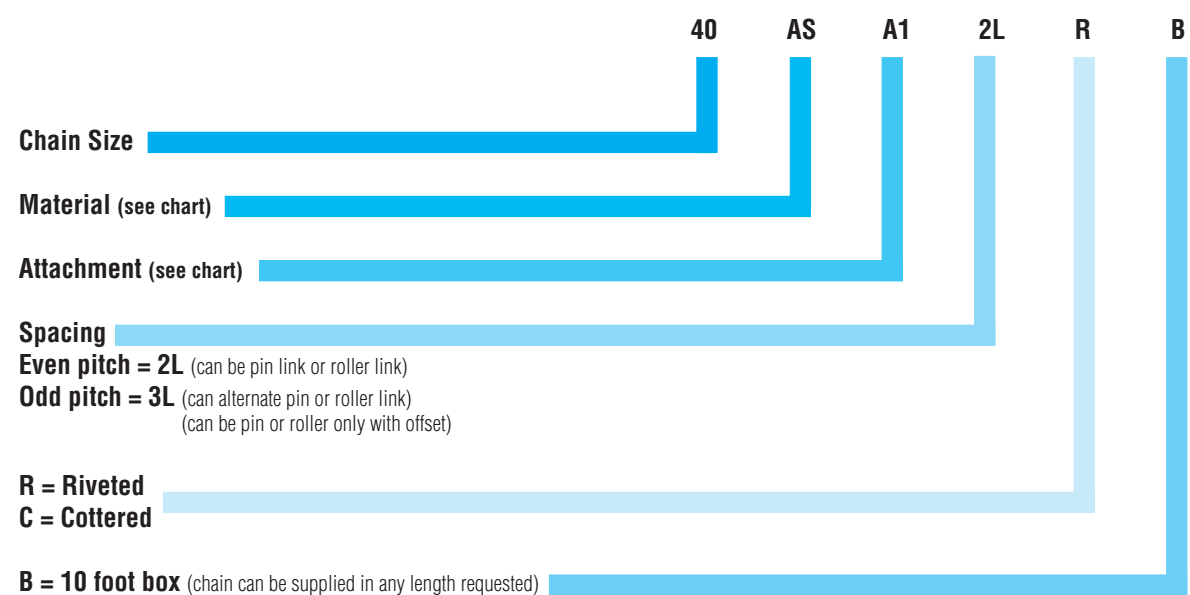
Pitch	Tsubaki No.	Competitors No.	Full Description
Single and Double Pitch	A-1	B-1 one hole	bent attachment, one side, one hole
	K-1	B-2 one hole	bent attachment, two sides, one hole
Double Pitch	SA-1	S1 one hole, M35	straight attachment, one side, one hole
	SK-1	S2 one hole, M1	straight attachment, two sides, one hole
	D-1	E1	one extended pin
	D-3	E2	two extended pins
	A-2	B1 two holes	bent attachment, one side, two holes
	K-2	B2 two holes	bent attachment, two sides, two holes
Single Pitch Wide Contour	SA-2	S1 two holes, M35-2	straight attachment, one side two holes
	SK-2	S2 two holes, M2	straight attachment, two sides, two holes
	WA-1	WCB1 one hole	wide contour, bent attachment, one side, one hole
	WA-2	WCB1 two holes	wide contour, bent attachment, one side, two holes
	WK-1	WCB2 one hole	wide contour, bent attachment, two sides, one hole
	WK-2	WCB2 two holes	wide contour, bent attachment, two sides, two holes
	WSA-1	WCS1 one hole, WM35	wide contour, straight attachment, one side, one hole
	WSA-2	WCS1 two hole, WM35-2	wide contour, straight attachment, one side, two holes
	WSK-1	WCS2 one hole, WM-1	wide contour, straight attachment, two sides, one hole
	WSK-2	WCS2 two holes, WM-2	wide contour, straight attachment, two sides, two holes

All attachments can be customized, please consult factory for details.

ATTACHMENT CHAINS

Choosing Tsubaki Attachment Chains

This is how a Tsubaki part number for attachment chain will read.....



How to order attachment chains:

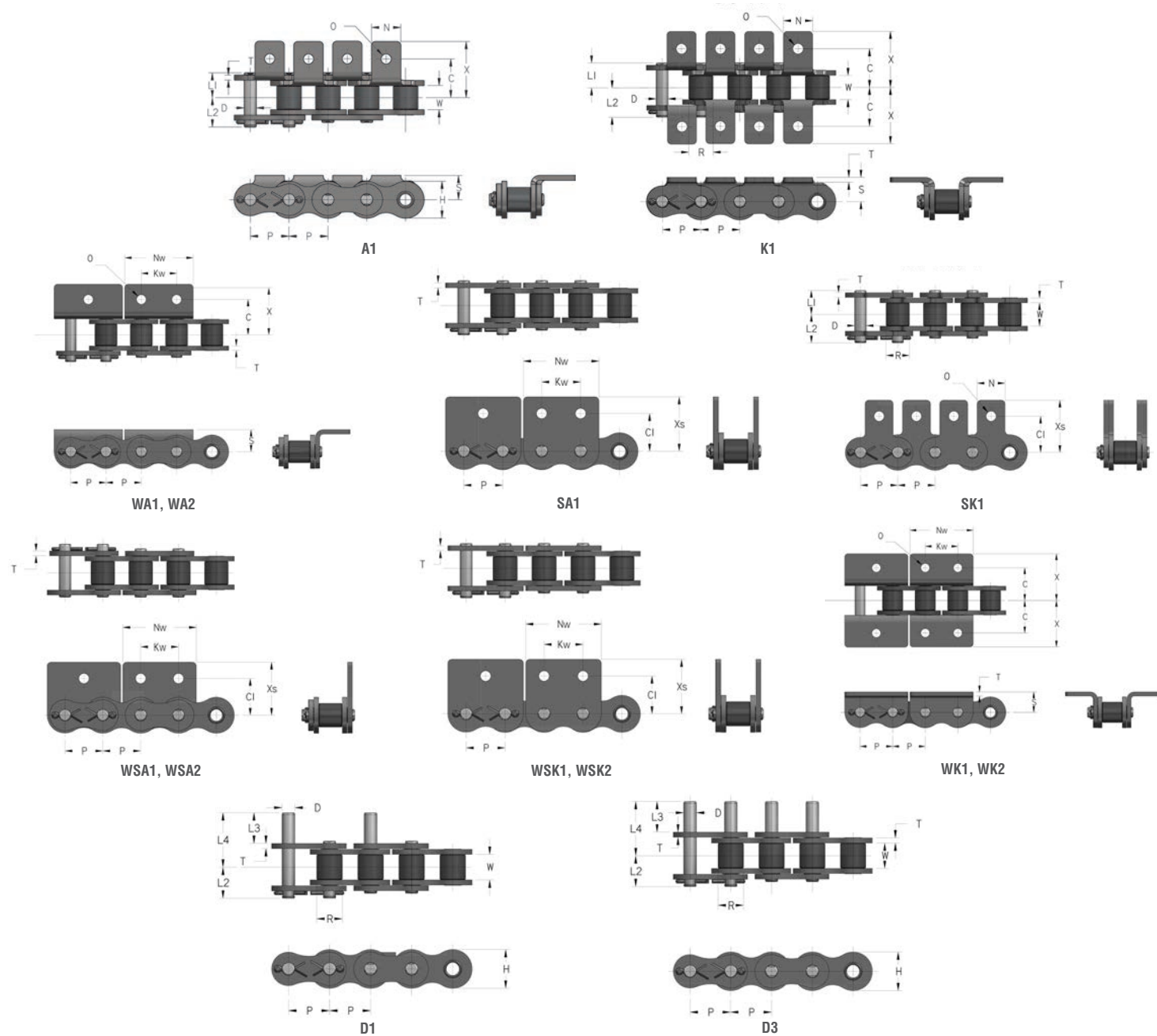
1. Chain Size
2. Material – see guide above
3. Construction – riveted or cottered
4. What kind of attachment – see listing above
5. Spacing – Distance between attachments
 - a. Even pitch spacing attachment is on the pin link or roller links (Please specify)
 - b. Odd pitch spacing – attachment will alternate inside link (Roller) outside link (pin).
Attachment can also appear on outer links at odd pitch spacing using offset links.
6. Length of chain – Count number of attachments and spacing
7. Repeats – If spacing is unusual, how often does a group of attachments repeat.

How to choose the right attachment chain material:

Type of Chain	Material Designation	For this Style of Application or Operating Condition
Carbon Steel		Standard Applications
Nickel Plated	Nickel Plated (NP)	Mildly corrosion resistant
Neptune®	Neptune (NEP)	Wet or outdoor conditions including saltwater.
304 (SS) Stainless	304 (SS)	High or low temperatures and corrosive environment including acids and alkalis.
316 (NS) Stainless	316 (NS)	Extreme corrosive environment. Low or high temperatures, and low magnetic permability.
600 (AS) Stainless	600 (AS)	Combination of strength and durability in corrosive environments.
Lambda®	Lambda (L)	When lubrication is near impossible including food packaging.
Super Stainless™	Super Stainless (SUPERSS)	When strength of carbon steel is needed and corrosion resistance cannot be sacrificed.
Titan®	Titan (TT)	Harsh, dirty environments.

NOTES

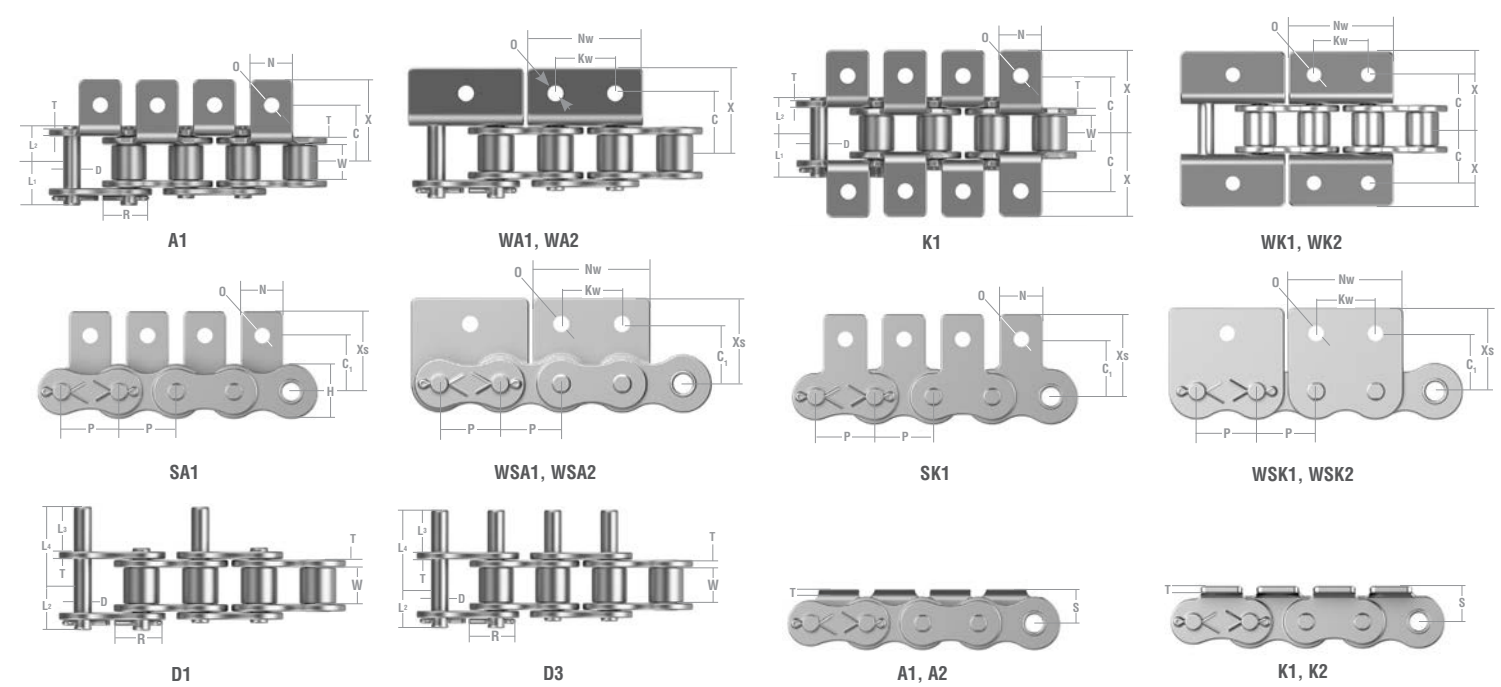
SINGLE PITCH ATTACHMENTS



Tsubaki Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Plate		Pin			Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				H	T	D	L1	L2			
25RB•	0.250	0.130*	0.125	0.230	0.030	0.090	0.150	0.189	926	143	0.094
35RB•	0.375	0.200*	0.188	0.354	0.050	0.141	0.230	0.270	2,120	342	0.22
41RB	0.500	0.306	0.250	0.386	0.050	0.141	0.266	0.313	2,120	353	0.27
40RB	0.500	0.312	0.312	0.472	0.060	0.156	0.325	0.392	3,750	595	0.43
50RB	0.625	0.400	0.375	0.591	0.080	0.200	0.406	0.472	6,170	970	0.70
60RB	0.750	0.469	0.500	0.713	0.094	0.234	0.506	0.581	9,040	1,410	1.03
80RB	1.000	0.625	0.625	0.949	0.125	0.312	0.640	0.758	15,400	2,400	1.79
100RB	1.250	0.750	0.750	1.185	0.156	0.375	0.778	0.900	24,300	3,840	2.68
120RB	1.500	0.875	1.000	1.425	0.187	0.437	0.980	1.138	34,000	5,380	3.98
140RB	1.750	1.000	1.000	1.661	0.221	0.500	1.059	1.248	45,900	7,280	5.03
160RB	2.000	1.125	1.250	1.898	0.250	0.562	1.254	1.451	58,000	9,190	6.79

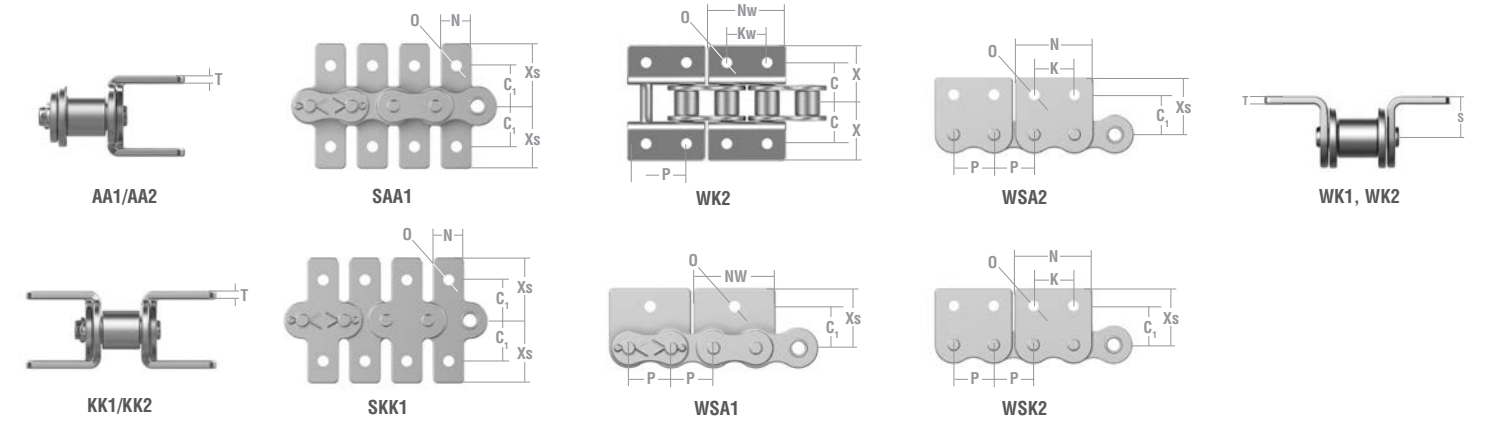
Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request
 2. Spring clip conn links for sizes 25-60, cotter style conn links 80 -160
 3. Rollerless
 *4. Bushing Diameter
 5. Attachments chains available in 304, 600, 316 Stainless
 6. Attachment chains available in Neptune® and Nickel Plated.

SINGLE PITCH ATTACHMENTS



Tsubaki Chain No.	Attachment									Additional Weight Per Attachment		
	C	C1	N	O	S	X	XS	L3	L4	A-SA	K-SK	D-1
25RB	0.281	0.313	0.220	0.134	0.187	0.421	0.459			0.001	0.002	
35RB	0.375	0.375	0.311	0.102	0.250	0.563	0.573	0.375	0.575	0.002	0.004	0.002
41RB	0.469	0.500	0.375	0.141	0.281	0.646	0.656	0.375	0.608	0.004	0.007	0.002
40RB	0.500	0.500	0.375	0.141	0.312	0.701	0.685	0.375	0.658	0.004	0.009	0.002
50RB	0.625	0.625	0.500	0.205	0.406	0.921	0.907	0.469	0.827	0.007	0.013	0.002
60RB	0.750	0.720	0.626	0.205	0.469	1.110	1.057	0.562	1.011	0.015	0.031	0.007
80RB	1.000	0.969	0.752	0.268	0.625	1.441	1.396	0.750	1.327	0.029	0.057	0.015
100RB	1.250	1.252	1.000	0.342	0.780	1.768	1.732	0.938	1.642	0.057	0.115	0.027
120RB	1.500	1.437	1.126	0.386	0.906	2.197	2.081	1.125	2.020	0.097	0.194	0.044
140RB	1.750	1.750	1.375	0.448	1.125	2.420	2.437	1.312	2.274	0.157	0.313	0.066
160RB	2.000	2.000	1.500	0.516	1.250	2.840	2.750	1.500	2.654	0.214	0.428	0.099

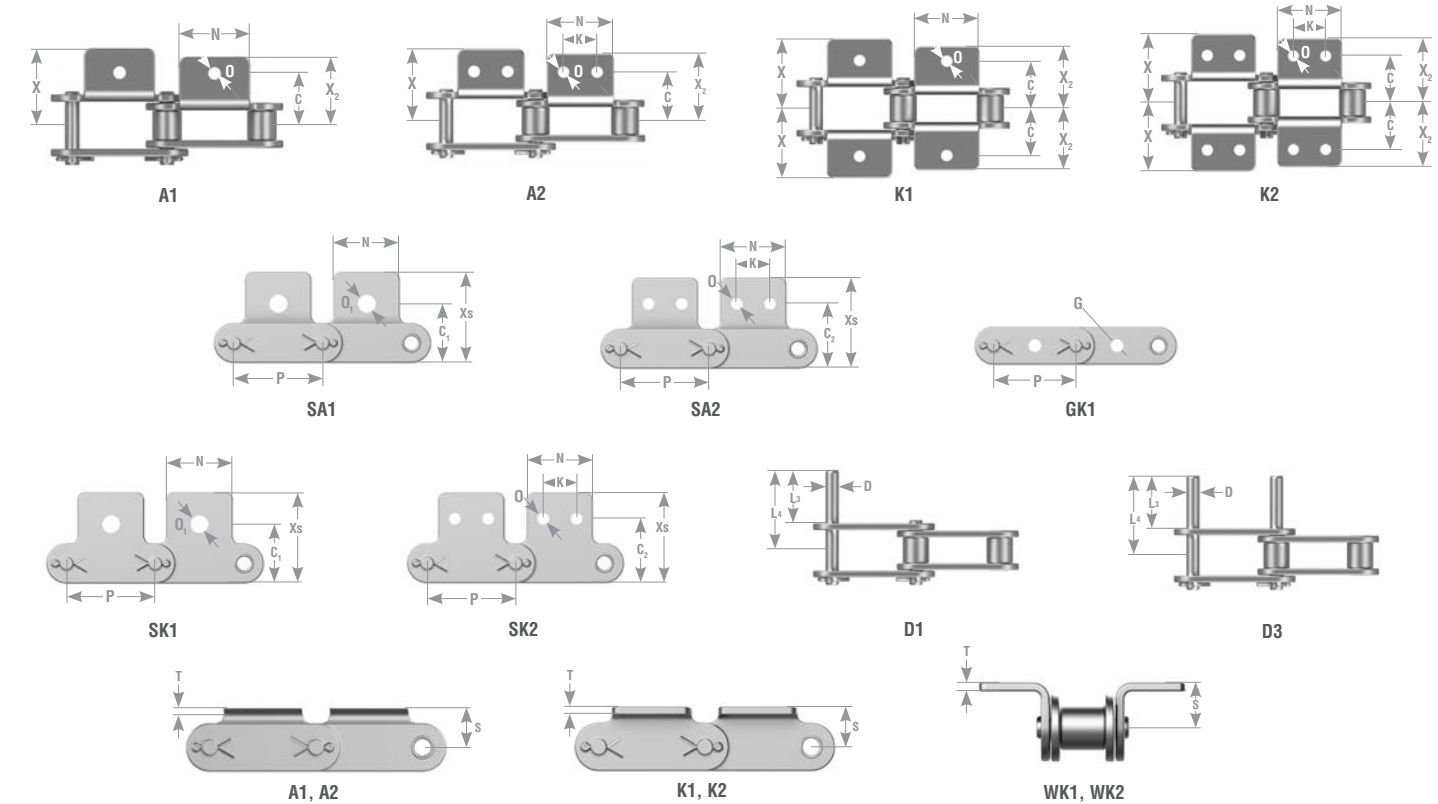
Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request
 2. Spring clip conn links for sizes 25-60, cotter style conn links 80 -160
 3. Rollerless
 *4. Bushing Diameter



Tsubaki Chain No.	Attachment									Additional Weight Per Attachment				lbs/att
	C	C1	N	O	S	X	XS	NW	KW	AA, SAA	KK, SKK	WA, WSA	WK, WKK	
40RB	0.500	0.500	0.375	0.141	0.312	0.701	0.685	0.097	0.500	0.007	0.014	0.007	0.014	
50RB	0.625	0.625	0.500	0.205	0.406	0.921	0.907	1.210	0.625	0.013	0.026	0.015	0.030	
60RB	0.750	0.750	0.626	0.205	0.469	1.110	1.057	1.460	0.750	0.031	0.062	0.026	0.052	
80RB	1.000	1.000	0.752	0.268	0.625	1.441	1.396	1.940	1.000	0.057	0.114	0.062	0.124	
100RB	1.250	1.252	1.000	0.342	0.780	1.768	1.732	1.768	1.250	0.121	0.242	0.121	0.242	

Note: Spring clip connecting links for sizes 40-60, cotter style for sizes 80-100.

DOUBLE PITCH ATTACHMENTS



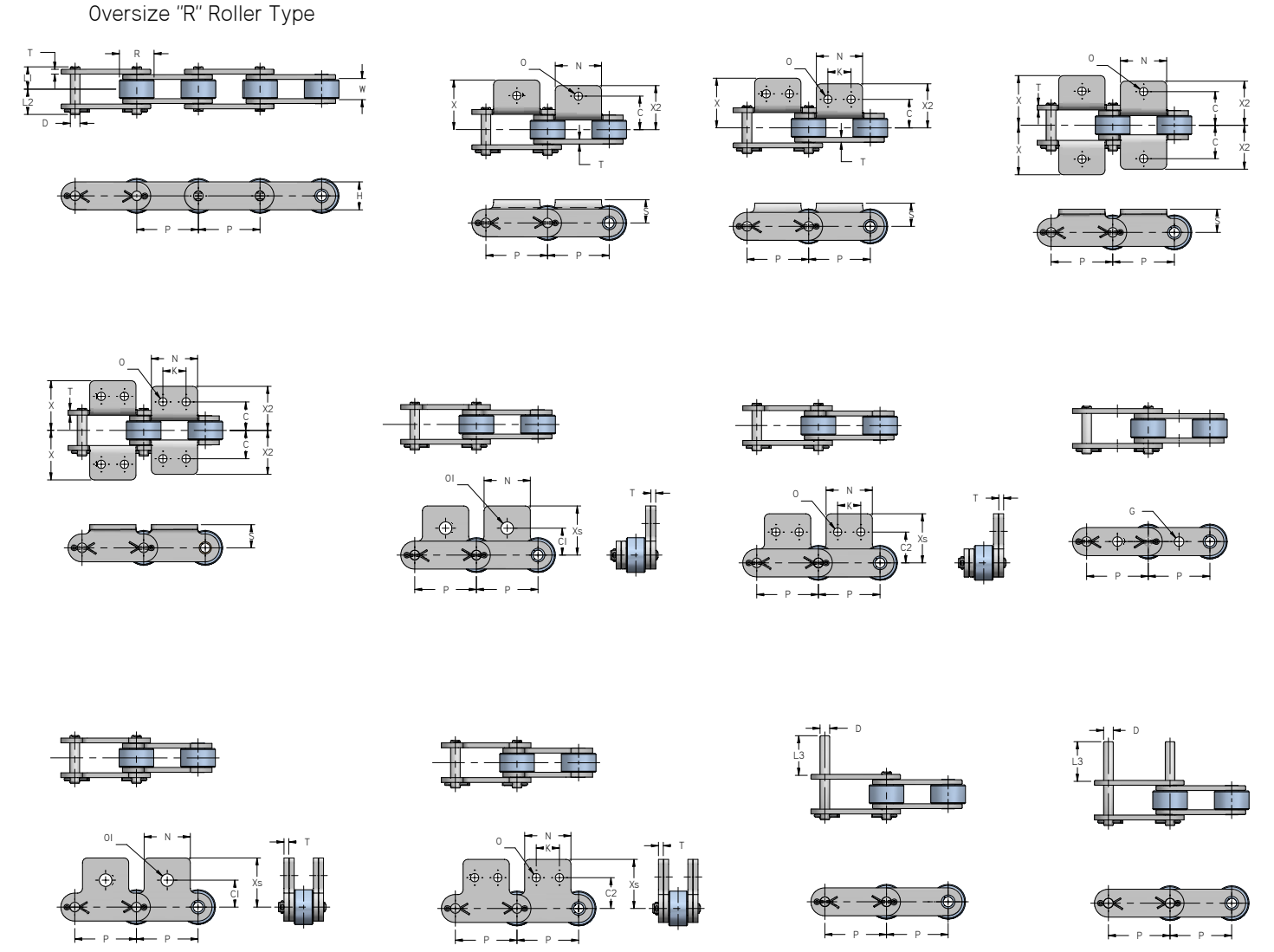
Tsubaki	Pitch	Roller Diameter	Width Between Roller Link Plates	Pin			Plate		Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.	Additional Weight Per Attachments		
				D	L1	L2	H	T				A-SA Att.	K - SK Att.	D-1 Att.
STANDARD ROLLER														
C2040RB	1.000	0.312	0.312	0.156	0.325	0.392	0.472	0.060	3,750	595	0.34	0.007	0.013	0.002
C2050RB	1.250	0.400	0.375	0.200	0.406	0.472	0.591	0.080	6,170	970	0.56	0.130	0.260	0.004
C2060HRB	1.500	0.469	0.500	0.234	0.573	0.652	0.677	0.125	9,040	1,410	1.01	0.037	0.075	0.007
C2080HRB	2.000	0.625	0.625	0.312	0.720	0.823	0.906	0.156	15,400	2,400	1.62	0.071	0.141	0.015
C2100HRB	2.500	0.750	0.750	0.375	0.858	0.965	1.160	0.187	24,300	3,840	2.38	0.132	0.265	0.026
C2120HRB	3.000	0.875	1.000	0.437	1.061	1.203	1.380	0.219	34,000	5,380	3.42	0.221	0.441	
C2160HRB	4.000	1.125	1.250	0.563	1.337	1.514	1.850	0.281	58,000	9,190	6.02	0.448	0.895	
OVERSIZED ROLLER														
C2042RB	1.000	0.625	0.312	0.156	0.325	0.392	0.472	0.060	3,750	595	0.58	0.007	0.013	0.002
C2052RB	1.250	0.750	0.375	0.200	0.406	0.472	0.591	0.080	6,170	970	0.87	0.130	0.260	0.004
C2062HRB	1.500	0.875	0.500	0.234	0.573	0.652	0.677	0.125	9,040	1,410	1.47	0.037	0.075	0.007
C2082HRB	2.000	1.125	0.625	0.312	0.720	0.823	0.906	0.156	15,400	2,400	2.37	0.071	0.141	0.015
C2102HRB	2.500	1.562	0.750	0.375	0.858	0.965	1.160	0.187	24,300	3,840	3.90	0.132	0.265	0.026
C2122HRB	3.000	1.750	1.000	0.437	1.061	1.203	1.380	0.219	34,000	5,380	5.46	0.221	0.441	
C2162HRB	4.000	2.250	1.250	0.563	1.337	1.514	1.850	0.281	58,000	9,190	9.21	0.448	0.895	

Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request
 2. Spring clip conn links for sizes C2040-C2060H, cotter style conn links C2080H-C2160H.
 3. Heavy side plates are standard on chain sizes C2060H-C2160H.

Tsubaki	A-1, A-2, K-1, K-2 Attachments															SA-1, SK-1, SA-2, SK-2 Attachments					D-1, D-3, GK-1 Attachments			
	Chain No.	X	X2	C	S	K	N	O	XS	C1	C2	K	N	O	O1	T	D	L3	L4	G				
C2040RB	0.763	0.693	0.500	0.358	0.374	0.752	0.142	0.780	0.437	0.535	0.374	0.752	0.142	0.205	0.060	0.156	0.375	0.658	0.161					
C2050RB	0.953	0.866	0.626	0.437	0.469	0.937	0.205	0.969	0.563	0.626	0.469	0.937	0.205	0.268	0.080	0.200	0.469	0.826	0.201					
C2060HRB	1.245	1.150	0.844	0.579	0.563	1.126	0.205	1.205	0.689	0.752	0.563	1.126	0.205	0.343	0.125	0.234	0.562	1.076	0.240					
C2080HRB	1.602	1.441	1.094	0.752	0.752	1.500	0.268	1.594	0.874	1.000	0.752	1.500	0.268	0.406	0.156	0.312	0.750	1.392	0.319					
C2100HRB	1.970	1.770	1.312	0.922	0.937	1.875	0.323	1.984	1.125	1.250	0.938	1.875	0.323	0.516	0.187	0.375	0.938	1.708						
C2120HRB	2.400	2.160	1.562	1.093	1.125	2.250	0.386	2.361	1.312	1.468	1.125	2.250	0.386	0.578	0.219	0.437	1.125	2.087						
C2160HRB	3.060	2.780	2.062	1.437	1.500	3.000	0.516	3.093	1.750	2.000	1.500	3.000	0.516	0.771	0.281	0.562	1.500	2.719						

Note: 1. Attachments for standard and oversized rollers have the same dimensions except for dimension "G."
 2. Attachment spacing done at customer request - location can be on the pin or roller link.
 3. Spring clip type conn links are used from sizes C2040-C2060H. Cotter pin style conn links for sizes C2080H-C2160H.
 4. Dimensions "O", "O1", and "G" show actual hole dimensions.

DOUBLE PITCH ATTACHMENTS - DELRIN ROLLERS



Double Pitch Attachment Chain with Delrin Rollers

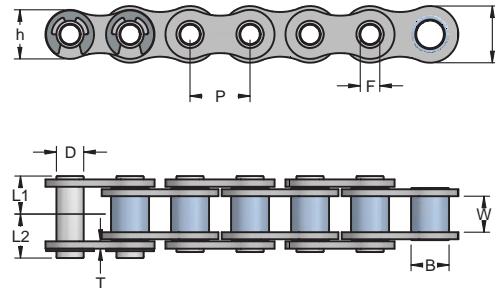
Tsubaki	Pitch	Width Between Roller Link Plates	Roller Dia.	Pin			Plate		Average Tensile Strength	Maximum Allowable Load	Maximum Allowable Roller Load lbs/Roller	Approx. Weight lbs/ft.	Additional Weight Per Attachments		
				D	L1	L2	H	T					A-SA Att.	K - SK Att.	D-1 Att.
C2042DRB	1.000	0.312	0.625	0.156	0.325	0.392	0.472	0.060	3,700	100	44	0.33	0.007	0.013	0.002
C2052DRB	1.250	0.375	0.750	0.200	0.406	0.472	0.591	0.080	6,100	154	66	0.57	0.013	0.026	0.004
C2062HDB	1.500	0.500	0.875	0.234	0.573	0.652	0.677	0.125	9,000	231	110	0.98	0.037	0.075	0.007
C2082HDB	2.000	0.625	1.125	0.312	0.720	0.823	0.906	0.156	15,400	397	200	1.77	0.070	0.141	0.015
C2102HDB	2.500	0.750	1.562	0.375	0.830	0.965	1.160	0.187	24,000	573	286	2.52	0.132	0.264	0.026

Chain No.	C	C1	C2	K	N	O	O1	S	T	X	X2	XS	D	L3	L4
C2042DRB	0.500	0.437	0.535	0.374	0.752	0.142	0.205	0.358	0.060	0.760	0.693	0.780	0.156	0.374	0.663
C2052DRB	0.626	0.563	0.626	0.469	0.937	0.205	0.268	0.437	0.080	0.953	0.866	0.969	0.200	0.469	0.827
C2062HDB	0.844	0.689	0.752	0.563	1.126	0.205	0.343	0.579	0.125	1.240	1.110	1.205	0.234	0.563	1.081
C2082HDB	1.094	0.874	1.000	0.752	1.500	0.268	0.406	0.752	0.156	1.602	1.441	1.594	0.312	0.752	1.398
C2102HDB	1.312	1.125	1.250	0.938	1.875	0.323	0.516	0.922	0.187	1.950	1.650	1.984	0.375	0.937	1.687

ATTACHMENT CHAINS

ATTACHMENT CHAINS

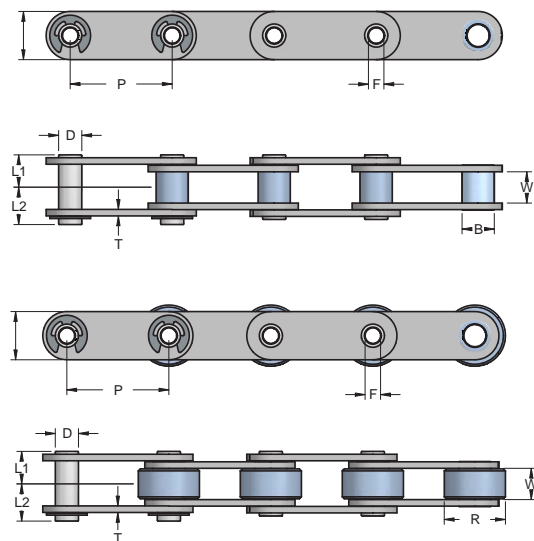
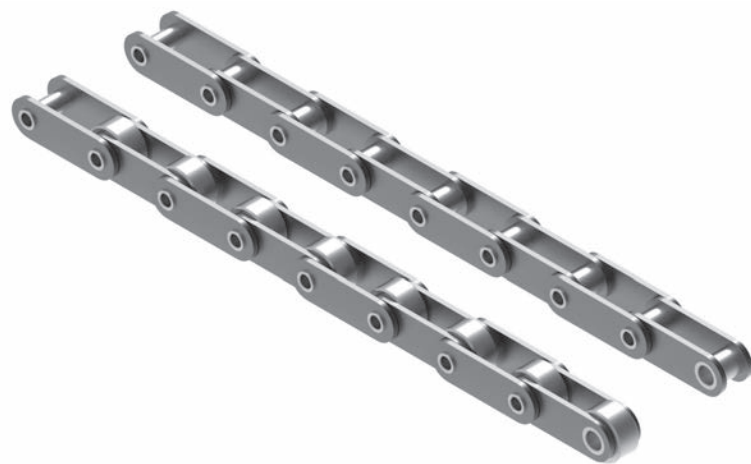
HOLLOW PIN CHAINS



Single Pitch Hollow Pin

Standard attachments are available for Hollow Pin (HP) chain. Cross rods may be inserted without taking the chain apart.

Tsubaki Chain No.	Pitch P	Width Between Roller Link Plates W	Bushing Diamater B	Pin				Plate		Average Tensile Strength	Maximum Allowable Load	Approx. Weight lbs/ft
				D	F	L1	L2	H	T			
40HPB	0.500	0.312	0.312	0.224	0.157	0.315	0.374	0.472	0.060	2,430	397	0.36
50HPB	0.625	0.375	0.400	0.284	0.202	0.396	0.459	0.591	0.080	4,410	705	0.58
60HPB	0.750	0.500	0.469	0.330	0.236	0.494	0.561	0.713	0.094	5,950	948	0.85
80HPB	1.000	0.625	0.625	0.448	0.316	0.640	0.701	0.949	0.125	10,800	1,720	1.60

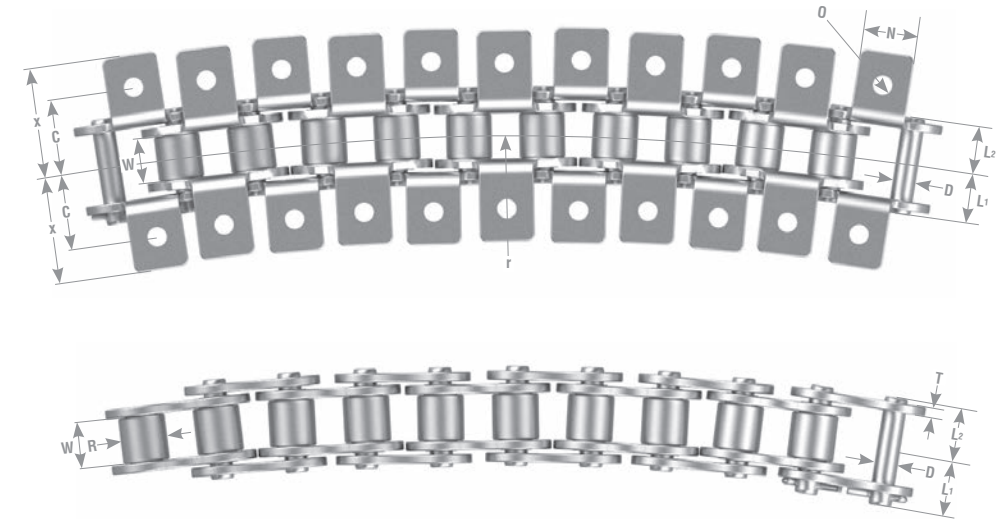


Tsubaki Chain No.	Pitch P	Width Between Roller Link Plates W	Roller Diameter B	Bushing Diameter R	Pin				Plate		Average Tensile Strength	Maximum Allowable Load	Approx. Weight lbs/ft
					D	F	L1	L2	H	T			
STANDARD ROLLER													
C2040HPB	1.000	0.312	0.625		0.224	0.157	0.315	0.374	0.472	0.060	2,430	397	0.36
C2050HPB	1.250	0.375	0.750		0.284	0.202	0.396	0.459	0.591	0.080	4,410	705	0.58
C2060HPB	1.500	0.500	0.875		0.330	0.236	0.494	0.561	0.677	0.094	5,950	948	0.85
C2080HPB	2.000	0.625	1.125		0.448	0.316	0.640	0.701	0.906	0.125	10,800	1,720	1.60
OVERSIZED ROLLER													
C2042HPB	1.000	0.312		0.625	0.224	0.157	0.315	0.374	0.472	0.06	2,430	397	0.55
C2052HPB	1.250	0.375		0.500	0.284	0.202	0.396	0.459	0.591	0.08	4,410	705	0.81
C2062HPB	1.500	0.500		0.875	0.330	0.236	0.494	0.561	0.677	0.094	5,950	948	1.38
C2082HPB	2.000	0.625		1.125	0.448	0.316	0.640	0.701	0.906	0.125	10,800	1,720	1.89

CURVED CHAINS

Tsubaki Curved chain has the additional clearance between the pins, bushings, roller links and pin links to allow for extra flexibility and greater lateral displacement. The basic dimensions of this chain are equal to the dimensions of standard roller chains.

NOTE: Tsubaki's unique design of the curved chain does not taper the pin diameter. This allows the pin diameter to be uniform throughout the chain.



Tsubaki Chain No.	Pitch P	Width Between Roller Link Plates W	Roller Diameter R	Pin				Plate			Average Tensile Strength	Maximum Allowable Load	Min. Radius of Side Bow Inches r
				D	L1	L2	L1 & L2	H	h	T			
35CURB	0.375	0.188	0.200*	0.125	0.238	0.301	0.539	0.354	0.307	0.050	1,800	210	10
40CURB	0.500	0.312	0.312	0.156	0.333	0.384	0.717	0.472	0.409	0.060	3,480	420	14
50CURB	0.625	0.375	0.400	0.200	0.417	0.488	0.905	0.591	0.512	0.080	5,420	640	16
60CURB	0.750	0.500	0.469	0.234	0.522	0.593	1.115	0.713	0.614	0.094	7,830	900	20
80CURB	1.000	0.625	0.625	0.312	0.659	0.789	1.448	0.949	0.819	0.125	13,840	1,560	24

Tsubaki Chain No.	Approx. Weight lbs./ft	Attachment					Additional Weight Per Attachment lbs./ft	
		C	N	O	S	X	A Att.	K Att.
35CURB	0.22	0.375	0.311	0.102	0.250	0.571	0.002	0.003
40CURB	0.41	0.500	0.374	0.141	0.315	0.709	0.004	0.009
50CURB	0.68	0.626	0.500	0.205	0.406	0.933	0.007	0.013
60CURB	0.94	0.750	0.625	0.205	0.469	1.122	0.015	0.031
80CURB	1.66	1.000	0.752	0.268	0.626	1.461	0.029	0.057

NOTE: Rollerless (bushing only)

British Standard Roller Chain



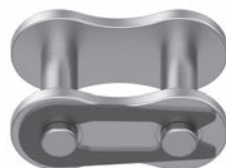
To go with its industry leading ANSI roller chains, Tsubaki also manufactures a complete line of British Standard (BS 228 - 8187). These chains meet the International Standards Organization metric dimensions (ISO 606).

British Standard roller chains from Tsubaki are manufactured in various styles including the following:

- Lube-Free (Lambda®)
- Neptune®
- Nickel Plated
- Stainless Steel
- Attachment Chains

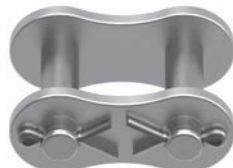
Tsubaki manufactures various sizes and multi-wide widths for an easy drop-in replacement for imported equipment or newly manufactured machinery set for export. These chains are made to the high quality and manufacturing standards that Tsubaki uses in all roller chains it manufactures.

Spring Clip-Style Connecting Link



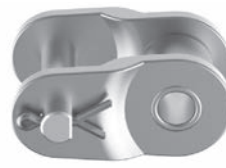
Available for RF06B-RS16B

Cotter-Style Connecting Link



Available for RS20B-RS40B

One-Pitch Offset Link

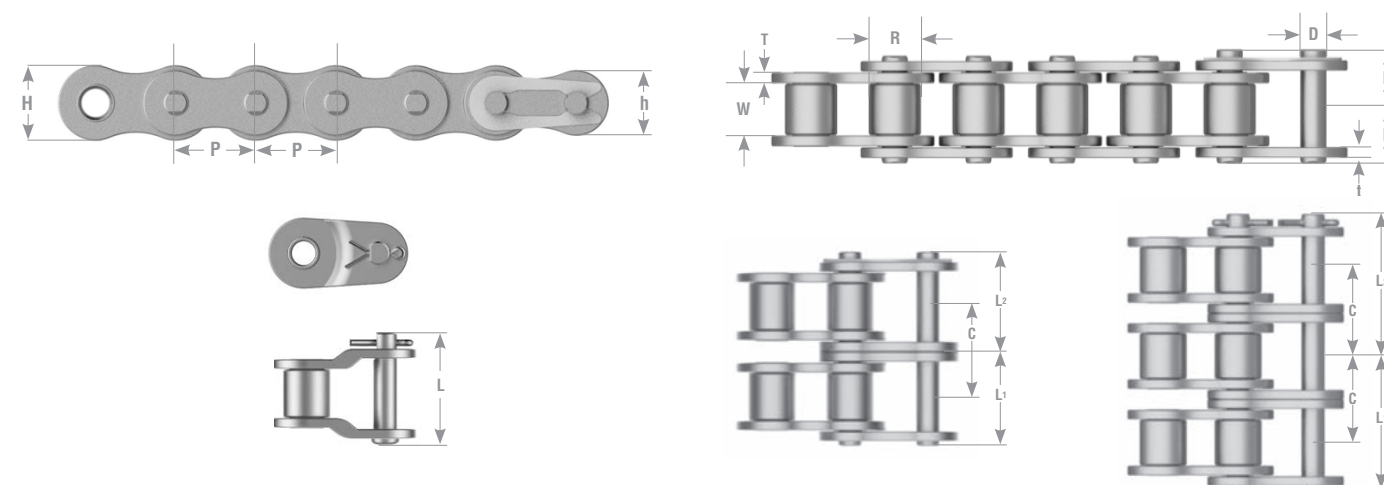


Slip-fit type
Consult factory for use recommendations

Two-pitch Offset Link



Press-fit and riveted type
Not available for size RS20B and up.

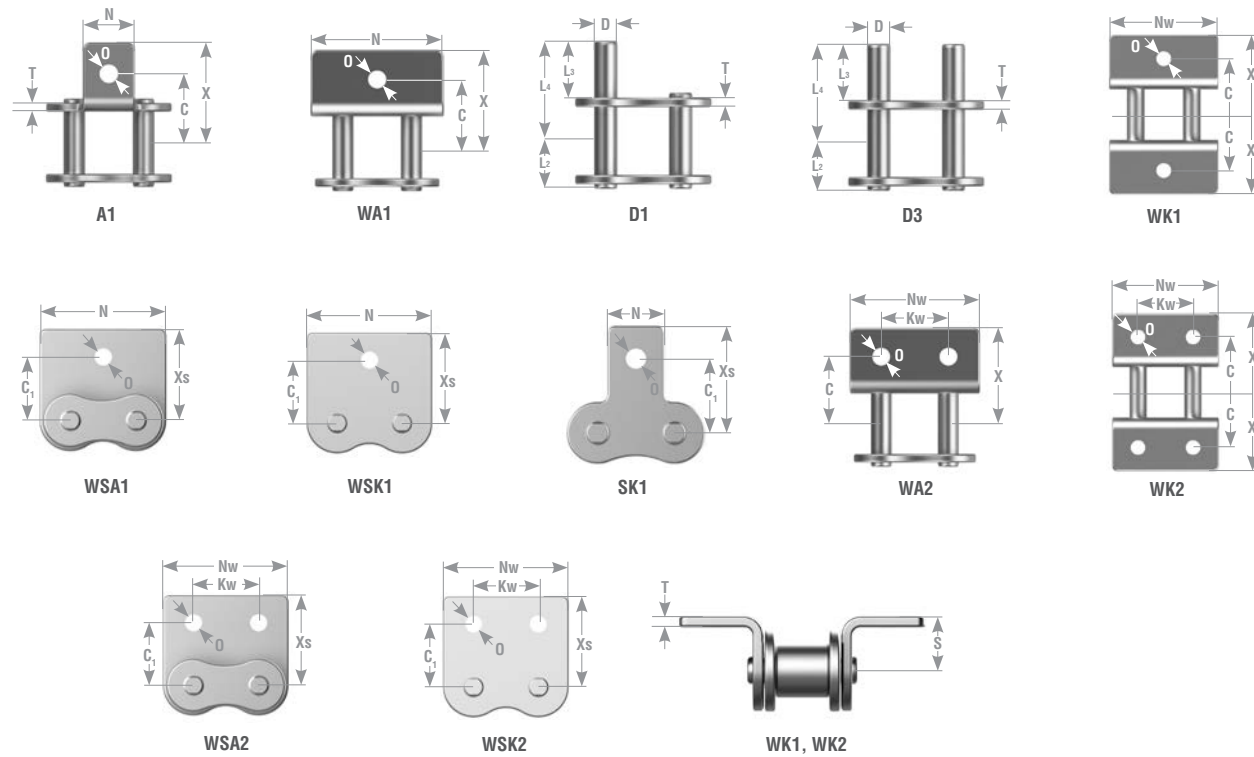


Tsubaki	ISO BS/DIN NO.	Pitch	Roller Dia.	Width Between Roller Link Plates	Pin Dia.	Pin Length	Pin Length	Roller Link Plate Thickness	Pin Link Plate Thickness	Plate Height	Transverse Pitch	Min. Tensile Strength	Max. Allowable Load*	Approx. Weight lbs/ft.	No. of Links per 10 ft.
		P	R	W	D	L1	L2	T	t	H	C				
SINGLE STRAND															
RF06BRB*	06B	0.375	0.250	0.225	0.129	0.240	0.303	0.050	0.040	0.323	-	2,023	438	0.26	320
RS08BRB	08B	0.500	0.335	0.305	0.175	0.329	0.395	0.060	0.060	0.465	-	4,271	854	0.47	240
RS10BRB	10B	0.625	0.400	0.380	0.200	0.376	0.443	0.060	0.060	0.579	-	5,170	1,016	0.64	192
RS12BRB	12B	0.750	0.475	0.460	0.225	0.437	0.512	0.070	0.070	0.634	-	6,969	1,387	0.84	160
RS16BRB	16B	1.000	0.625	0.670	0.326	0.699	0.783	0.156	0.125	0.827	-	15,737	2,945	1.82	120
RS20BRB	20B	1.250	0.750	0.770	0.401	0.783	0.912	0.173	0.134	1.024	-	22,054	4,136	2.59	96
RS24BRB	24B	1.500	1.000	1.000	0.576	1.051	1.254	0.236	0.220	1.315	-	37,543	6,092	5.01	80
RS28BRB	28B	1.750	1.100	1.220	0.626	1.278	1.474	0.295	0.248	1.433	-	44,962	8,430	6.35	68
RS32BRB	32B	2.000	1.150	1.220	0.701	1.264	1.484	0.276	0.248	1.661	-	57,326	9,217	6.89	60
RS40BRB	40B	2.500	1.550	1.500	0.901	1.545	1.774	0.335	0.315	2.083	-	83,854	11,465	10.99	48
RS48BRB	48B	3.000	1.900	1.800	1.151	1.941	2.315	0.476	0.394	2.512	-	127,017	17,310	16.80	40
DOUBLE STRAND															
◇ RF06B-2RB*	06B-2	0.375	0.250	0.225	0.129	0.441	0.506	0.050	0.040	0.323	0.403	3,822	746	0.50	320
◇ RS08B-2RB	08B-2	0.500	0.335	0.305	0.175	0.603	0.669	0.060	0.060	0.465	0.548	7,194	1,452	0.90	240
RS10B-2RB	10B-2	0.625	0.400	0.380	0.200	0.699	0.773	0.060	0.060	0.579	0.653	10,004	1,726	1.24	192
RS12B-2RB	12B-2	0.750	0.475	0.460	0.225	0.819	0.901	0.070	0.070	0.634	0.766	13,713	2,019	1.68	160
RS16B-2RB	16B-2	1.000	0.625	0.670	0.326	1.321	1.407	0.156	0.125	0.827	1.255	28,776	5,013	3.62	120
RS20B-2RB	20B-2	1.250	0.750	0.770	0.401	1.509	1.631	0.173	0.134	1.024	1.435	44,287	7,037	5.14	96
RS24B-2RB	24B-2	1.500	1.000	1.000	0.576	2.004	2.205	0.236	0.220	1.315	1.904	75,311	10,364	9.84	80
RS28B-2RB	28B-2	1.750	1.100	1.220	0.626	2.450	2.646	0.295	0.248	1.433	2.345	84,078	14,343	12.63	68
RS32B-2RB	32B-2	2.000	1.150	1.220	0.701	2.411	2.636	0.276	0.248	1.661	2.305	109,032	15,669	13.51	60
RS40B-2RB	40B-2	2.500	1.550	1.500	0.901	2.970	3.197	0.335	0.315	2.083	2.846	160,963	19,491	21.50	48
RS48B-2RB	48B-2	3.000	1.900	1.800	1.151	3.740	4.110	0.476	0.394	2.512	3.591	224,809	29,450	33.60	40
TRIPLE STRAND															
◇ RF06B-3RB*	06B-3	0.375	0.250	0.225	0.129	0.646	0.705	0.050	0.040	0.323	0.403	5,598	1,097	0.75	320
◇ RS08B-3RB	08B-3	0.500	0.335	0.305	0.175	0.876	0.943	0.060	0.060	0.465	0.548	10,678	2,135	1.34	240
RS10B-3RB	10B-3	0.625	0.400	0.380	0.200	1.026	1.100	0.060	0.060	0.579	0.653	15,017	2,540	1.88	192
RS12B-3RB	12B-3	0.750	0.475	0.460	0.225	1.205	1.283	0.070	0.070	0.634	0.766	20,682	2,967	2.55	160
RS16B-3RB	16B-3	1.000	0.625	0.670	0.326	1.949	2.035	0.156	0.125	0.827	1.255	43,163	7,374	5.36	120
RS20B-3RB	20B-3	1.250	0.750	0.770	0.401	2.226	2.349	0.173	0.134	1.024	1.435	66,319	10,341	7.70	96
RS24B-3RB	24B-3	1.500	1.000	1.000	0.576	2.956	3.157	0.236	0.220	1.315	1.904	112,405	15,242	14.62	80
RS28B-3RB	28B-3	1.750	1.100	1.220	0.626	3.623	3.820	0.295	0.248	1.433	2.345	125,893	21,087	18.95	68
RS32B-3RB	32B-3	2.000	1.150	1.220	0.701	3.563	3.783	0.276	0.248	1.661	2.305	163,886	23,155	20.10	60
RS40B-3RB	40B-3	2.500	1.550	1.500	0.901	4.393	4.621	0.335	0.315	2.083	2.846	242,794	28,776	32.09	48
RS48B-3RB	48B-3	3.000	1.900	1.800	1.151	5.535	5.906	0.476	0.394	2.512	3.591	341,710	43,388	50.40	40

Note: * Flat shape link plate.

◇ Middle link plate has one solid plate.

RB = 10 foot stocked box including one connecting link. Cut-to-length strands and reel stock available upon request.



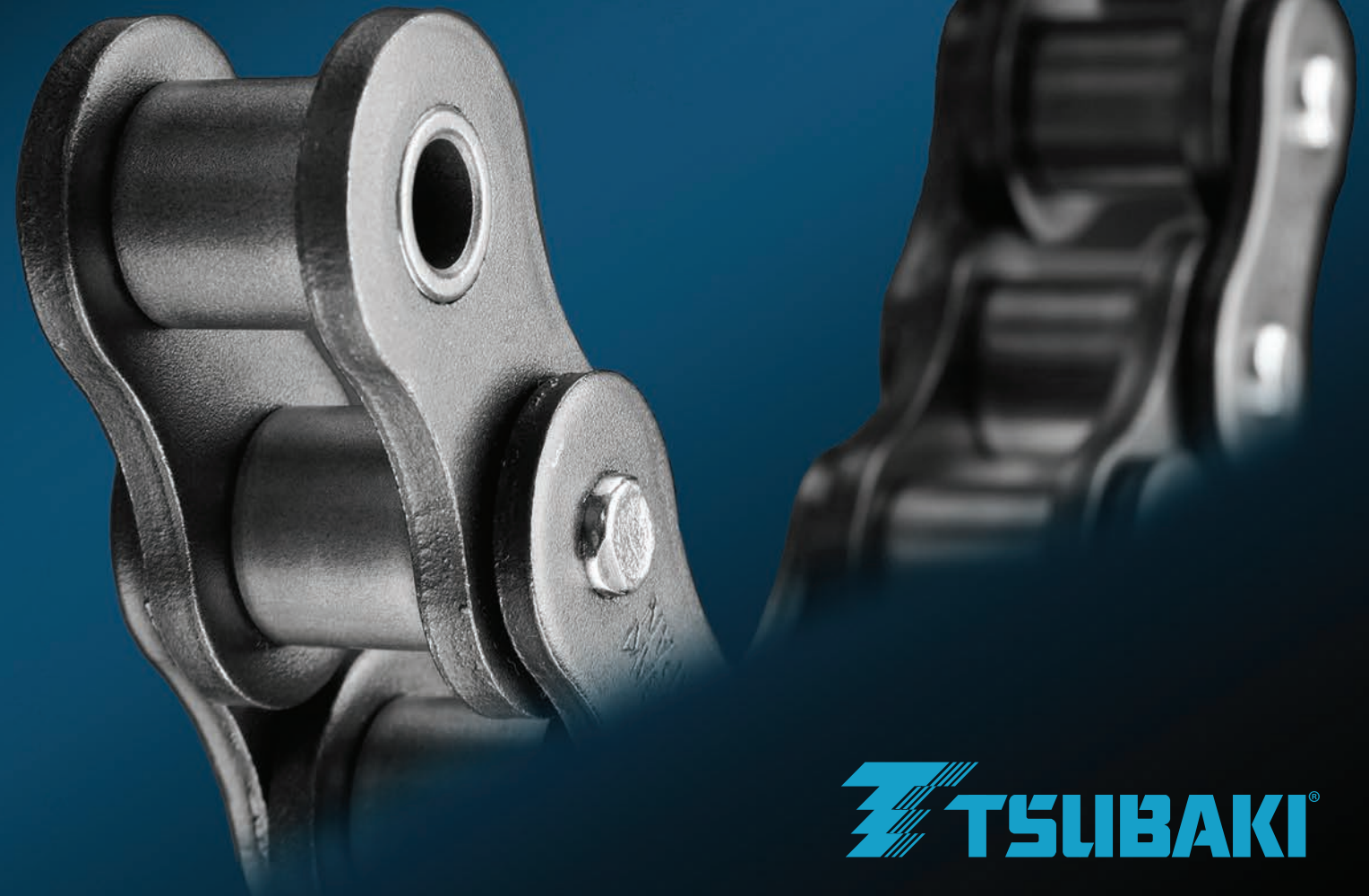
Tsubaki	Pitch	Width Between Roller Link Plates	Roller Dia.		Pin	Link Plate					Offset Pin	Minimum Tensile Strength	Approx. Weight lbs/ft.
Chain No.	P	W	R	D	L1	L2	H	h	T	t	L		
RS08BRB	0.500	0.305	0.335	0.175	0.328	0.395	0.472	0.409	0.063	0.063	0.732	2,900	0.47
RS10BRB	0.625	0.379	0.400	0.200	0.375	0.443	0.578	0.539	0.060	0.060	0.819	3,500	0.64
RS12BRB	0.750	0.459	0.475	0.225	0.437	0.512	0.633	0.633	0.070	0.070	0.960	4,960	0.84
RS16BRB	1.000	0.670	0.625	0.325	0.699	0.785	0.826	0.826	0.156	0.125	1.547	13,500	1.82

Tsubaki	A1, K1, SA1, SK1 Attachments									D1, D3 Attachments		
Chain No.	C	C1	N	O	S	X	X2	Xs		D	L3	L4
RS08BRB	0.468	0.500	0.448	0.165	0.350	0.75	0.675	0.759		0.175	0.374	0.667
RS10BRB	0.625	0.625	0.500	0.196	0.401	0.875	0.811	0.901		0.200	0.468	0.799
RS12BRB	0.750	0.874	0.649	0.279	0.531	1.175	1.094	1.261		0.225	0.562	0.949
RS16BRB	0.937	0.941	0.956	0.263	0.598	1.47	1.354	1.342		0.325	0.751	1.389

Tsubaki	WA1, WA2, WK1, WK2, WSA1, WSA2, WSK1, WSK2 Attachments								
Chain No.	C	C1	O	S	X	Xs	Nw	Kw	
RS08BRB	0.500	0.515	0.192	0.350	0.799	0.814	0.968	0.500	
RS10BRB	0.625	0.653	0.196	0.401	0.899	0.929	1.181	0.625	
RS12BRB	0.687	0.692	0.216	0.448	1.009	1.015	1.370	0.751	
RS16BRB	1.125	1.023	0.318	0.625	1.545	1.444	1.811	1.000	

LUBE-FREE CHAINS

Tsubaki Lube-Free Lambda® chains are ideal for applications where lubrication is difficult or not possible, from drive and conveyor styles to corrosion resistant and British Standard, Tsubaki has a complete product offering to maximize performance in lube-free applications.



Lambda[®] Chains

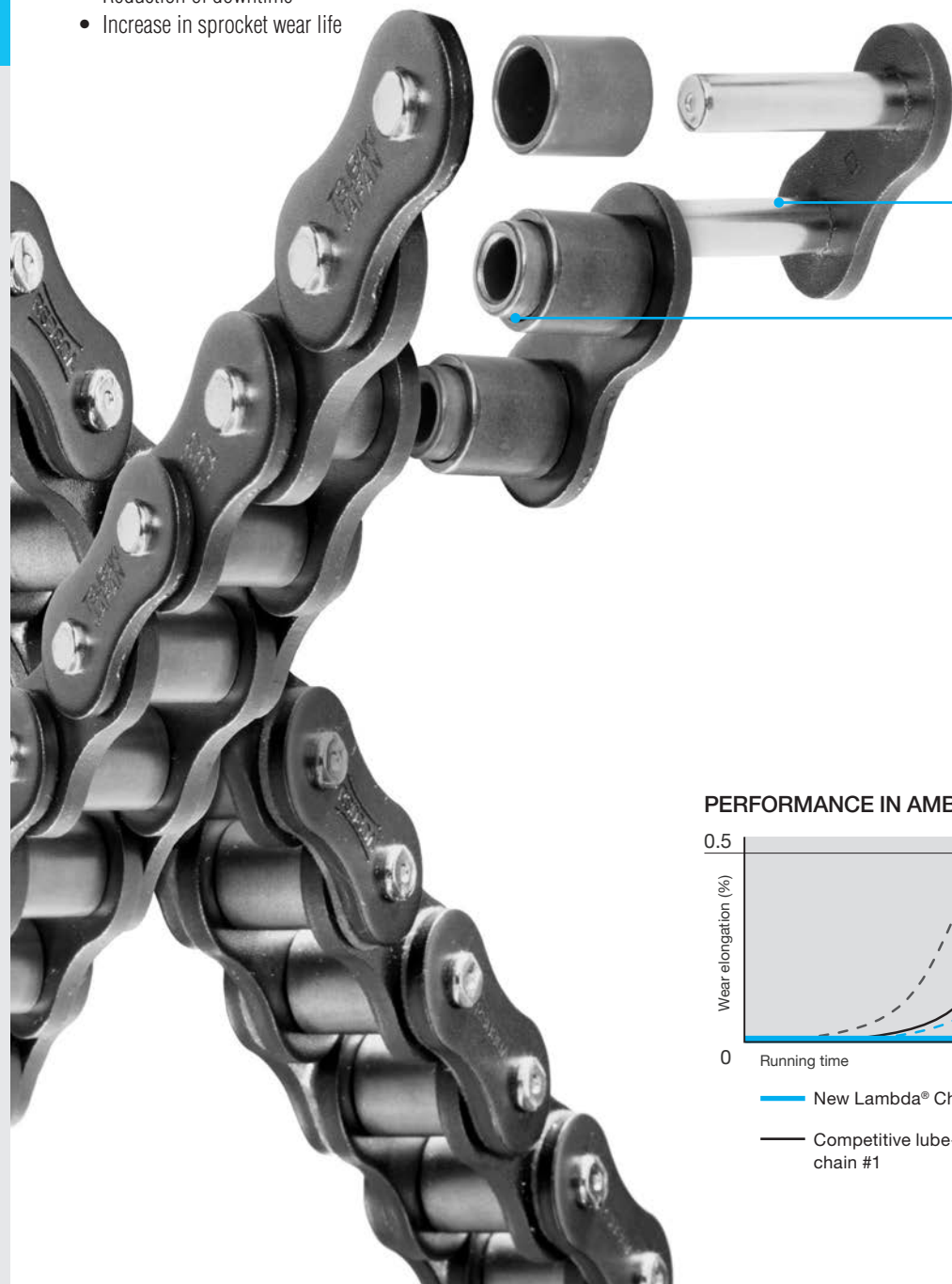


Tsubaki revolutionized the use of oil-impregnated sintered bushings when it first launched Lambda[®] chain in 1988. Since then, Lambda[®] chain has earned its reputation in a number of industries as a cost-saver, reducer of down time and a proficient reducer of maintenance and upkeep.

Lambda[®] chain is now supplied with food-grade lube bushings. The NSF-H1 food-grade lubricant bushing expands the range of applications that Lambda[®] can be found while maintaining the consistent quality Lambda[®] chain is known for.

Benefits of Lube-Free Chain

- No additional lube needed
- Elimination of contamination
- Environmentally friendly
- Reduces maintenance and replacement costs
- Reduction of downtime
- Increase in sprocket wear life



STANDARD LAMBDA[®] CHAIN FEATURES

Operating range 14°–302°F (-10°–150°C) for use in a broad range of applications

Nickel-plated pins for superior bearing surface and corrosion resistance

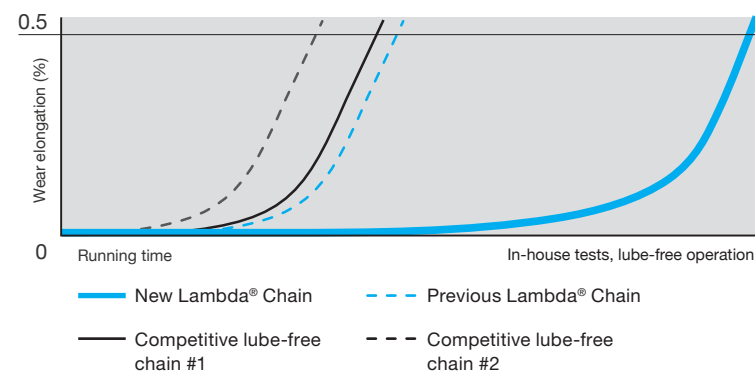
NEW AND IMPROVED!
Sintered bushings with NSF-H1 high-temperature food-grade lubricant for optimal performance in lube-free environments

Black oxide plates for extra corrosion resistance

Hardened components for maximum performance under standard load capacities

Ring-coined connection links for superior plate strength

PERFORMANCE IN AMBIENT TEMPERATURES 14°–302°F (-10°–150°C)



Specialty Lambda[®] Chain Options

- Lambda[®] Chain with Neptune[®] coating
- Lambda[®] Chain with Nickel Plated coating



Xceeder[®]-Lambda[®]

- Extended wear life beyond standard Lambda[®]
- Special, patented, felt-seal to protect from excessively dirty environments
- Operating temperature same as standard Lambda[®]



High-Temperature Lambda[®]

- Operating Temp Range 14° - 446°F -10° - 230°C
- Exterior Includes NSF-H3 Food Grade Lube
- Bushing use NSF-H1 high temperature food-grade lubricant



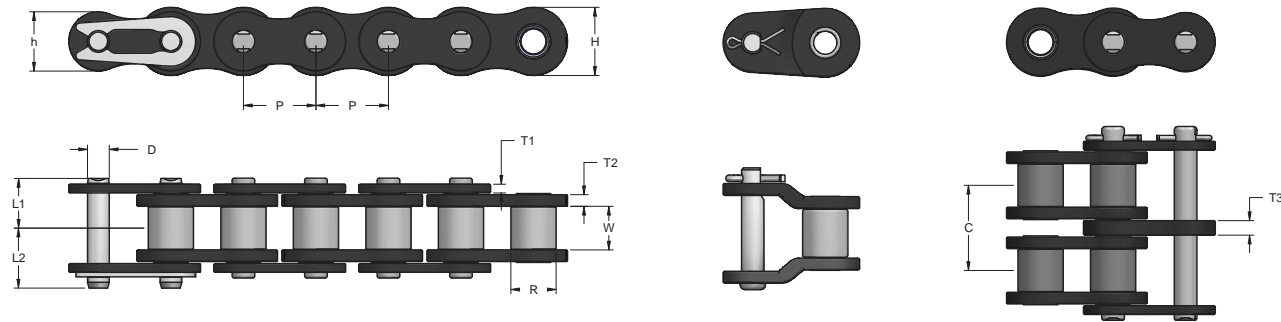
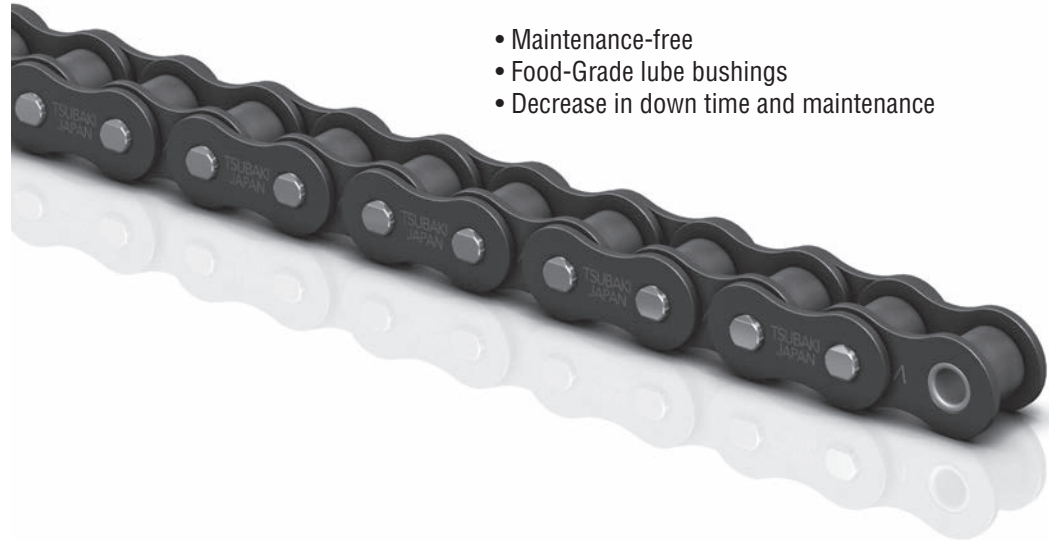
LUBE FREE CHAINS

LUBE FREE CHAINS

DRIVE LAMBDA® CHAINS



- Maintenance-free
- Food-Grade lube bushings
- Decrease in down time and maintenance

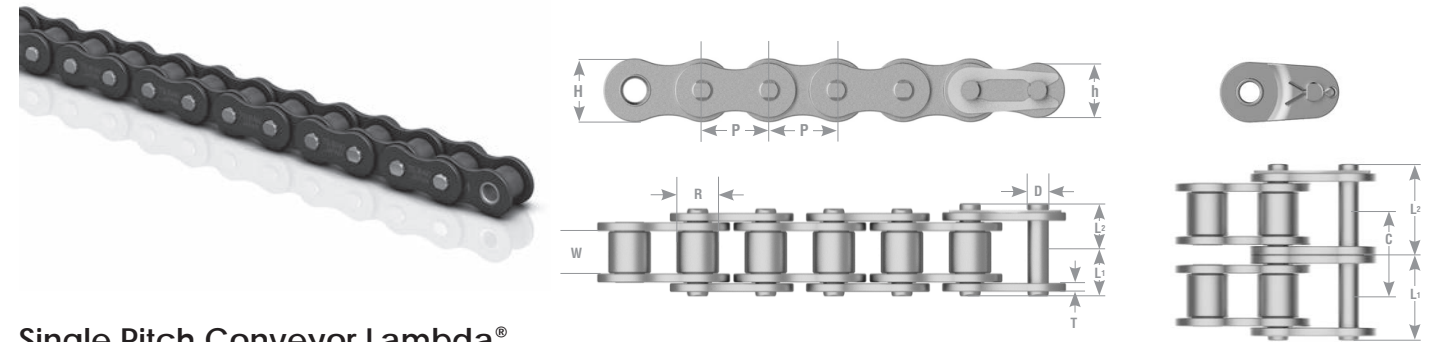


Single Pitch Drive Lambda®

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W **	Pin			Link Plate				Transverse Pitch C	Minimum Tensile Strength	Allowable Speed (Ft./Min.)	Approx. Weight lbs/ft.	No. of Links per 10 ft.
				D	L1	L2	T1	T2	H	h					
SINGLE STRAND															
40LAMRB	0.500	0.312	0.297	0.156	0.344	0.411	0.060	0.080	0.472	0.409	NA	3,970	500	0.47	240
50LAMRB	0.625	0.400	0.365	0.200	0.423	0.490	0.080	0.094	0.591	0.512	NA	6,390	450	0.75	192
60LAMRB	0.750	0.469	0.483	0.234	0.541	0.618	0.094	0.125	0.713	0.614	NA	9,040	400	1.16	160
80LAMRB	1.000	0.625	0.609	0.312	0.675	0.797	0.125	0.156	0.949	0.819	NA	16,090	300	1.86	120
100LAMRB	1.250	0.750	0.736	0.375	0.813	0.939	0.156	0.187	1.185	1.024	NA	24,000	266	2.89	96
120LAMRB	1.500	0.875	0.974	0.437	1.014	1.179	1.870	0.220	1.425	1.228	NA	33,070	166	4.30	80
140LAMRB	1.750	1.000	0.974	0.500	1.091	1.268	0.220	0.252	1.661	1.433	NA	43,400	166	5.44	68
160LAMRB	2.000	1.125	1.228	0.562	1.289	1.482	0.252	0.281	1.898	1.638	NA	57,300	166	7.06	60
DOUBLE STRAND															
40-2LAMRB	0.500	0.312	0.297	0.156	0.628	0.695	0.060	0.080	0.472	0.409	0.567	3,750	500	0.94	240
50-2LAMRB	0.625	0.400	0.365	0.200	0.781	0.848	0.080	0.094	0.591	0.512	0.713	6,170	450	1.48	192
60-2LAMRB	0.750	0.469	0.483	0.234	0.990	1.061	0.094	0.125	0.713	0.614	0.898	9,040	400	2.28	160
80-2LAMRB	1.000	0.625	0.609	0.312	1.250	1.368	0.125	0.156	0.949	0.819	1.154	15,400	300	3.70	120
100-2LAMRB	1.250	0.750	0.736	0.375	1.516	1.638	0.156	0.187	1.185	1.024	1.409	24,300	266	5.78	96

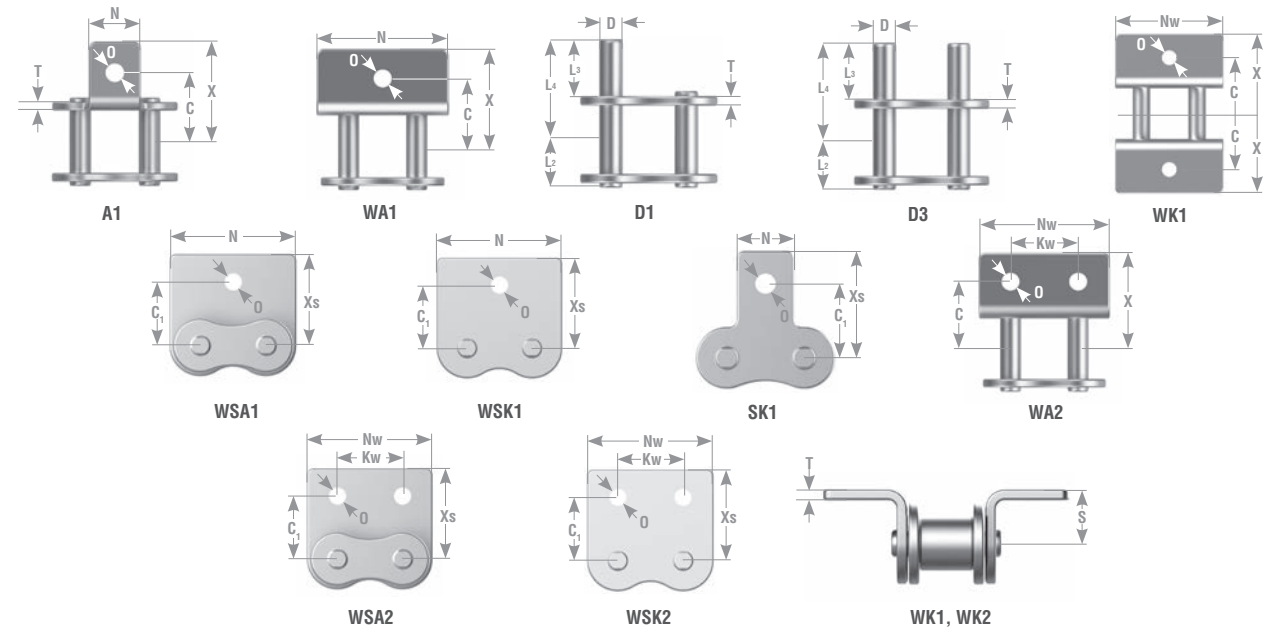
Note:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Refer to attachment chain section for attachment dimensions.
 3. Drive Lambda® Connecting Links cannot be used with conveyor series connecting links.
 **Width between roller link plates (W) is slightly narrower than ANSI chain. Chain can still be used on standard ANSI sprockets.

CONVEYOR LAMBDA® CHAINS



Single Pitch Conveyor Lambda®

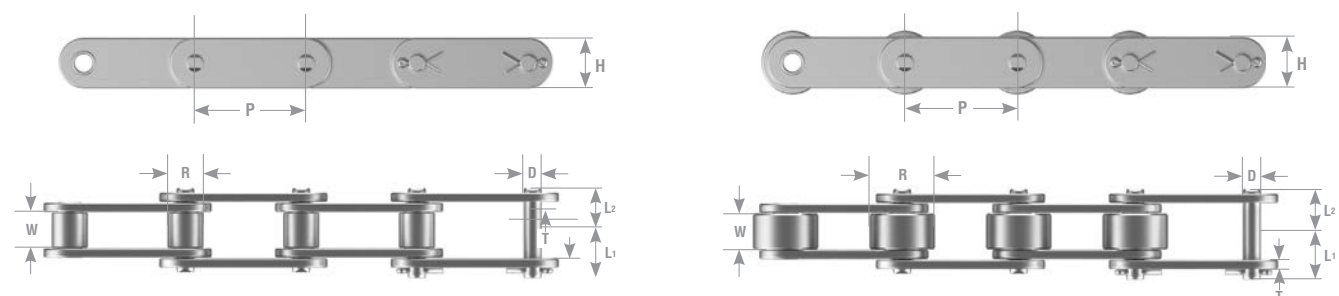
Tsubaki Chain No.	Pitch P	Width Between Roller Link Plates W	Roller Dia. R	Pin			Offset Link Pin L	Link Plate H	Link Plate Thickness T	Roller Link Plate Height h	Maximum Allowable Load	Approx. Weight lbs/ft.
				D	L1	L2						
35LRB▲	0.375	0.188	0.200*	0.118	0.230	0.270	0.531	0.354	0.050	0.307	342	0.22
40LRB	0.500	0.313	0.311	0.156	0.325	0.392	0.717	0.060	0.409	0.409	595	0.43
50LRB	0.625	0.375	0.400	0.200	0.405	0.472	0.890	0.080	0.512	0.512	970	0.70
60LRB	0.750	0.500	0.469	0.234	0.506	0.581	1.110	0.094	0.614	0.614	1,410	1.03
80LRB	1.000	0.625	0.625	0.312	0.640	0.758	1.441	0.125	0.819	0.819	2,400	1.79
100LRB	1.250	0.750	0.750	0.375	0.778	0.900	1.720	0.157	1.024	1.024	3,840	2.68
120LRB	1.500	1.000	0.875	0.437	0.980	1.138	2.165	0.187	1.228	1.225	5,380	3.98
140LRB	1.750	1.000	1.000	0.500	1.059	1.248	2.343	0.220	1.433	1.433	7,275	5.03



Tsubaki Chain No.	Attachment Dimension									Additional Weight Per Attachment		
	C	C1	N	O	S	X	Xs	L3	L4	A-SA	K-SK	D-1
35LRB▲	0.374	0.374	0.311	0.134	0.250	0.563	0.563	0.573	0.375	0.002	0.004	0.002
40LRB	0.500	0.500	0.374	0.141	0.315	0.701	0.701	0.685	0.375	0.004	0.008	0.002
50LRB	0.626	0.626	0.500	0.205	0.406	0.922	0.922	0.907	0.469	0.006	0.013	0.004
60LRB	0.750	0.720	0.626	0.205	0.469	1.110	1.110	1.057	0.563	0.015	0.030	0.006
80LRB	1.000	0.969	0.752	0.268	0.626	1.441	1.441	1.396	0.752	0.028	0.057	0.015
100LRB	1.250	1.252	1.000	0.343	0.780	1.768	1.768	1.732	0.937	0.057	0.114	0.026
120LRB	1.500	1.437	1.126	0.406	0.906	2.197	2.000	2.083	1.126	0.097	0.194	0.044
140LRB	1.752	1.752	1.374	0.469	1.126	2.484	2.252	2.500	1.311	0.156	0.313	0.066

Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Spring clip conn links for sizes 25-60, cotter style conn links 80-140.
 3. Rollerless.
 *4. Bushing Diameter.

DOUBLE PITCH LAMBDA® CHAINS



Double-Pitch Lambda®

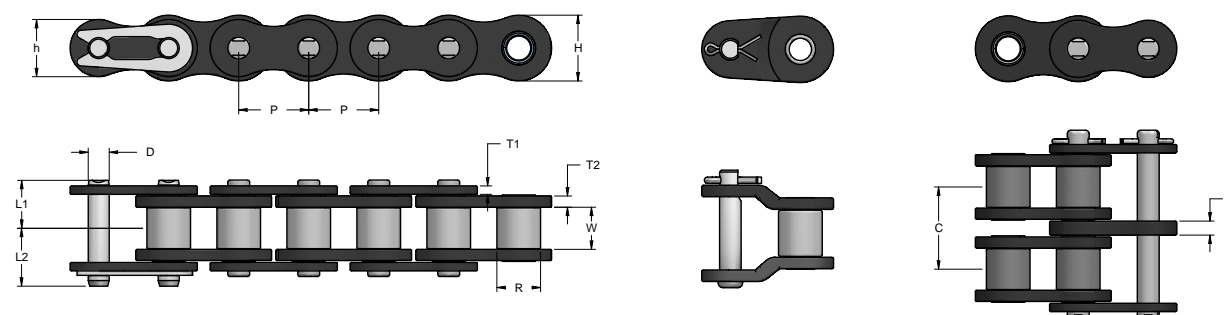
Tsubaki Chain No.	Pitch P	Width Between Roller Link Plates W	Roller Diameter R	Pin			Link Plate		Maximum Allowable Load	Approx. Mass Per Roller (lbs/ft)	Additional Weight Per Attachments (Lbs)		
				D	L1	L2	H	T			A-SA Att.	K - SK Att.	D1 & D3 Att
STANDARD ROLLER													
C2040LRB	1.000	0.313	0.312	0.156	0.325	0.392	0.472	0.060	595	0.34	0.006	0.013	0.002
C2050LRB	1.250	0.375	0.400	0.200	0.406	0.472	0.591	0.080	970	0.56	0.013	0.026	0.004
C2060HLRB	1.500	0.500	0.469	0.234	0.573	0.652	0.677	0.125	1,410	1.01	0.037	0.074	0.006
C2080HLRB	2.000	0.625	0.625	0.312	0.720	0.823	0.905	0.156	2,400	1.62	0.070	0.141	0.015
C2100HLRB	2.500	0.750	0.750	0.375	0.858	0.965	1.126	0.187	3,840	2.38	0.132	0.264	0.026
C2120HLRB	3.000	1.000	0.875	0.437	1.061	1.203	1.354	0.220	5,380	3.42	0.220	0.441	
OVERSIZED ROLLER													
C2042LRB	1.000	0.312	0.625	0.156	0.325	0.392	0.472	0.060	595	0.58	0.006	0.013	0.002
C2052LRB	1.250	0.375	0.750	0.200	0.406	0.472	0.591	0.080	970	0.87	0.013	0.260	0.004
C2062HLRB	1.500	0.500	0.875	0.234	0.573	0.652	0.677	0.125	1,410	1.47	0.037	0.074	0.007
C2082HLRB	2.000	0.625	1.125	0.312	0.720	0.823	0.905	0.156	2,400	2.37	0.070	0.141	0.015
C2102HLRB	2.500	0.750	1.562	0.375	0.858	0.965	1.126	0.187	3,840	3.90	0.132	0.264	0.026
C2122HLRB	3.000	1.000	1.750	0.437	1.061	1.203	1.354	0.220	5,380	5.46	0.221	0.441	

Note:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Spring clip conn links for sizes C2040-C2060H, cotter style conn links C2080H -C2160H.
 3. Heavy side plates are standard on chain sizes C2060H-C2160H.

LAMBDA® FOR CORROSION RESISTANCE



- Operates in temperature up to 302°F
- Ideal for mildly corrosive environments
- Long-lasting, food-grade lube bushings



Nickel-Plated Lambda®

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W**	Pin Link Plate Thickness T1	Roller Link Plate Thickness T2	Roller Link Plate Height H	Pin Link Plate Height h	Pin Dia. D	Pin			Approx. Weight lbs/ft.
									L1	L2	L	
40NPLAMRB	0.500	0.312	0.297	0.060	0.080	0.472	0.409	0.156	0.344	0.411	0.787	0.47
50NPLAMRB	0.625	0.400	0.365	0.080	0.094	0.591	0.512	0.200	0.423	0.490	0.945	0.75
60NPLAMRB	0.750	0.469	0.483	0.094	0.125	0.713	0.614	0.234	0.541	0.618	1.260	1.16
80NPLAMRB	1.000	0.625	0.609	0.125	0.156	0.949	0.819	0.312	0.675	0.797	1.571	1.86
100NPLAMRB	1.250	0.750	0.736	0.156	0.187	1.185	1.024	0.375	0.813	0.939	1.870	2.89
120NPLAMRB	1.500	0.875	0.974	0.187	0.220	1.425	1.228	0.437	1.014	1.179	2.323	4.30
140NPLAMRB	1.750	1.000	0.974	0.220	0.252	1.661	1.433	0.500	1.091	1.268	2.508	5.40

Note:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Refer to attachment chain section for attachment dimensions.
 3. Available in Double-pitch and multi-wide Lambda® on a made-to-order basis.

Neptune® Lambda®

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W**	Pin Link Plate Thickness T1	Roller Link Plate Thickness T2	Roller Link Plate Height H	Pin Link Plate Height h	Pin Dia. D	Pin			Approx. Weight lbs/ft.
									L1	L2	L	
40NEPLAMRB	0.500	0.312	0.297	0.060	0.080	0.472	0.409	0.156	0.344	0.411	0.787	0.43
50NEPLAMRB	0.625	0.400	0.365	0.080	0.094	0.591	0.512	0.200	0.423	0.490	0.945	0.70
60NEPLAMRB	0.750	0.469	0.483	0.094	0.125	0.713	0.614	0.234	0.541	0.618	1.260	1.03
80NEPLAMRB	1.000	0.625	0.609	0.125	0.156	0.949	0.819	0.312	0.675	0.797	1.571	1.79

Note:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Refer to attachment chain section for attachment dimensions.
 3. Available in Double-pitch and multi-wide Lambda® on a made-to-order basis.

DRIVE XCEEDER® CHAIN



LAMBDA
ADVANCED LUBE FREE CHAIN



Xceeder® Lambda® chain extends the wear resistance of ordinary Lambda® chain by including oil-impregnated felt-seals between each pin link plate. The special Lambda® Logo and patented seals hold in the lube while keeping excessive dirt out.



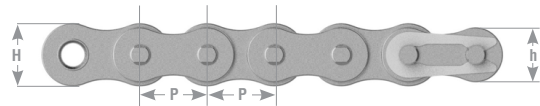
Selection Guidelines:

- Operating Temperatures: 14°F - 302°F

Connecting Links:

- 40DX-60DX = clip style
- 80DX - 100DX = cottered style
- 40DX-100DX = Stocked in 10 foot boxes

Use on Standard Carbon Steel, hardened-tooth sprockets.



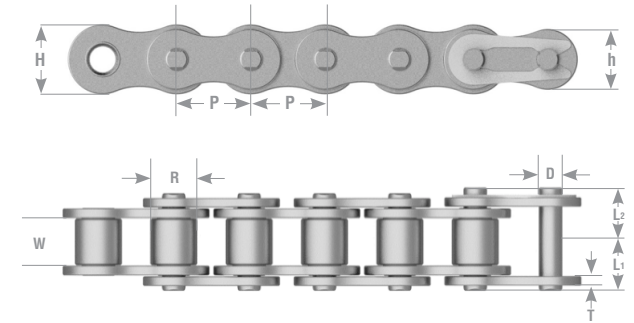
Drive Xceeder®

Tsubaki	Pitch	Roller Diameter	Width Between Roller Link Plates	Link Plate		Pin				
Chain No.	P	R	W	T1	T2	H	h	D	L1	L2
40DXRB	0.500	0.312	0.297	0.060	0.080	0.472	0.409	0.156	0.370	0.437
50DXRB	0.625	0.400	0.365	0.080	0.094	0.591	0.512	0.200	0.449	0.516
60DXRB	0.750	0.469	0.483	0.094	0.125	0.713	0.614	0.234	0.583	0.650
80DXRB	1.000	0.625	0.609	0.125	0.156	0.949	0.819	0.312	0.720	0.823
100DXRB	1.250	0.750	0.736	0.156	0.187	1.185	1.024	0.375	0.858	0.965

Note:
1. Due to the felt seals, Xceeder® Chain link length is slightly longer than standard Tsubaki chain.
2. Offset links for Xceeder® chain are not available.

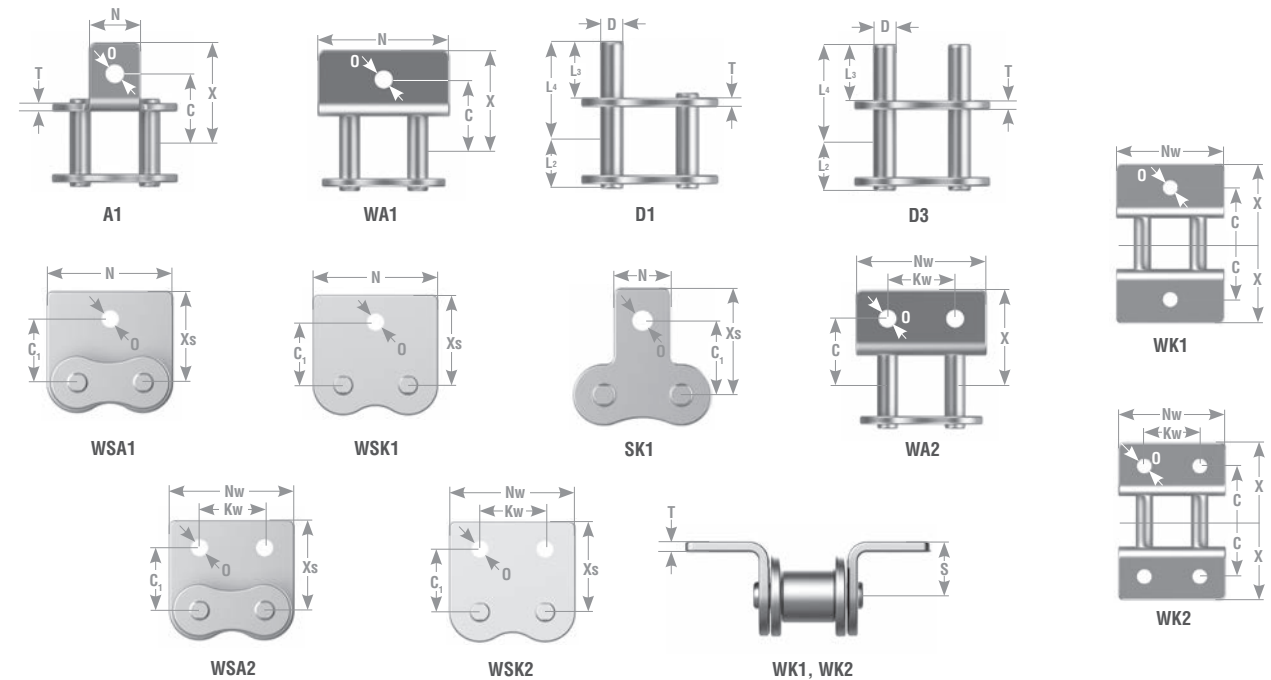
Tsubaki Chain No.	ANSI Minimum Tensile Strength	Xceeder® Average Tensile Strength	Approx. Weight (lbs/ft)	No. of Links/10 ft.	Allowable Speed (ft./Min)
40DXRB	3,125	4,300	0.47	240	490
50DXRB	4,880	7,050	0.75	192	442
60DXRB	7,030	9,920	1.16	160	393
80DXRB	12,500	17,600	1.86	120	295
100DXRB	19,530	26,500	2.89	96	262

CONVEYOR XCEEDER® CHAINS



Conveyor Xceeder®

Tsubaki	Pitch	Roller Dia.	Width Between Roller Link Plates	Pin	Link Plate		ANSI Min. Tensile Strength	Xceeder® Avg. Tensile Strength	Xceeder® Max. Allowable Max. Tension	Approx. Weight (lbs/ft)			
Chain No.	P	R	W	D	L1	L2	T	H	h				
40CXRB	0.500	0.312	0.297	0.156	0.350	0.417	0.060	0.472	0.409	3,125	4,300	816	0.47
50CXRB	0.625	0.400	0.365	0.200	0.433	0.500	0.080	0.591	0.512	4,880	7,050	1,430	0.75
60CXRB	0.750	0.469	0.483	0.234	0.539	0.614	0.094	0.713	0.614	7,030	9,920	1,980	1.16
80CXRB	1.000	0.625	0.609	0.312	0.673	0.791	0.125	0.949	0.839	12,500	17,600	3,310	1.86
100CXRB	1.250	0.750	0.736	0.375	0.811	0.929	0.156	1.185	1.024	19,530	26,500	5,070	2.89



Chain No.	C	C1	N	O	S	X	X2	Xs	A & SA Att	K & SK Att
40CXRB	0.500	0.500	0.375	0.141	0.315	0.724	0.701	0.685	0.004	0.009
50CXRB	0.625	0.626	0.500	0.205	0.406	0.949	0.921	0.907	0.007	0.013
60CXRB	0.750	0.720	0.625	0.205	0.469	1.441	1.110	1.057	0.015	0.031
80CXRB	1.000	0.969	0.752	0.268	0.625	1.476	1.441	1.396	0.029	0.057
100CXRB	1.250	1.252	1.000	0.342	0.780	1.795	1.768	1.732	0.057	0.115

Note:
1. Due to the felt seals, Xceeder® chain pin length is slightly longer than standard Tsubaki chain.
2. The "X" dimension is also longer on Xceeder® attachments than on standard attachment chain. Please verify all dimensions for proper clearance.

HIGH-TEMPERATURE LAMBDA® CHAINS

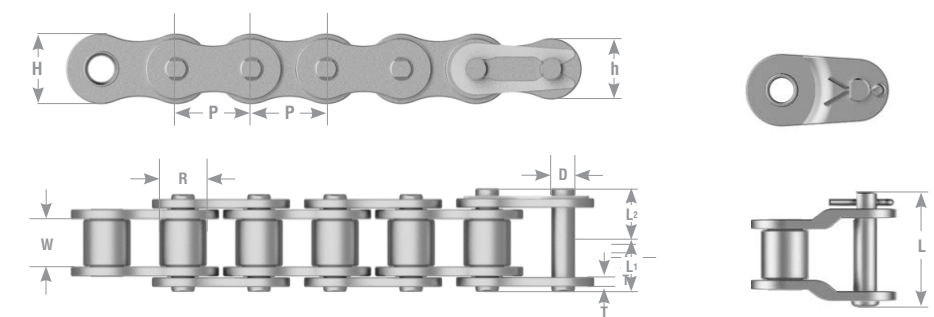
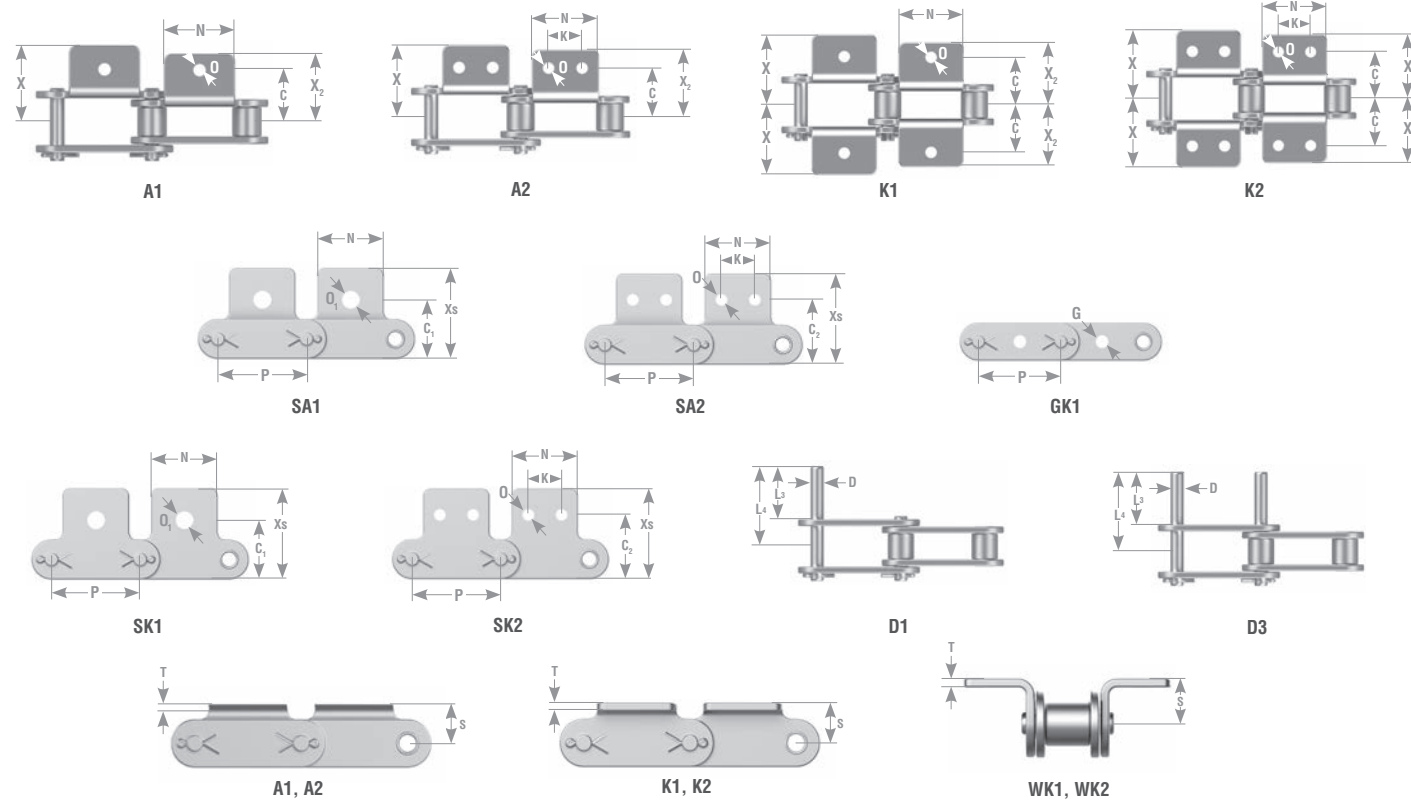
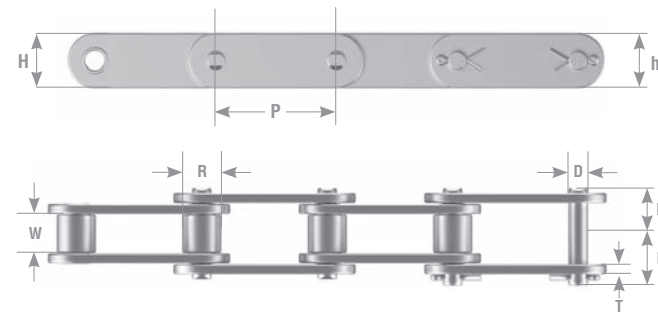


LAMBDA®

ADVANCED LUBE FREE CHAIN

- Operating Temp Range 14° - 446°F -10° - 230°C
- Exterior Includes NSF-H3 Food Grade Lube
- Bushing use NSF-H1 high temperature food-grade lubricant

NOTE: Not to be used in environments greater than 446°F as this will reduce wear life considerably. Harmful gases may be emitted at temperatures over 536°F



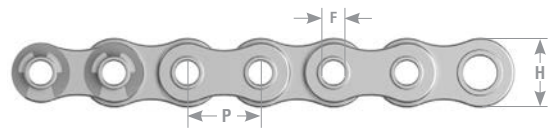
Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin			Link Plate		Xceeder Avg. Tensile Strength	Xceeder® Max. Allowable Load Tension
				D	L1	L2	T	H		
C2040CXR	1.000	0.312	0.297	0.156	0.350	0.417	0.060	0.472	4,300	816
C2050CXR	1.250	0.400	0.365	0.200	0.433	0.500	0.080	0.591	7,050	1,430
C2060CXR	1.500	0.469	0.483	0.234	0.600	0.675	0.125	0.677	9,920	1,980
C2080CXR	2.000	0.625	0.609	0.312	0.754	0.856	0.156	0.906	17,600	3,310
C2100CXR	2.500	0.750	0.736	0.375	0.840	0.996	0.187	1.126	26,500	5,070

Chain No.	C	C1	C2	K	N	O	O1	S	X	X2
C2050CXR	0.626	0.563	0.626	0.469	0.937	0.205	0.268	0.437	0.978	0.866
C2060CXR	0.844	0.689	0.752	0.563	1.126	0.205	0.343	0.579	1.276	1.110
C2080CXR	1.094	0.874	1.000	0.752	1.500	0.268	0.406	0.752	1.638	1.441
C2100CXR	1.312	1.125	1.252	0.937	1.875	0.343	0.563	0.921	2.000	1.768

KF (High-Temp) Lambda®

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin			Link Plate				Minimum Tensile Strength	Approx. Weight lbs./ft.	Allowable Speed (Ft/Min)
				D	L1	L2	T1	T2	H	h			
40LAMKF	0.500	0.312	0.297	0.156	0.344	0.411	0.060	0.080	0.472	0.409	3970	0.47	500
50LAMKF	0.625	0.400	0.365	0.200	0.423	0.490	0.080	0.094	0.591	0.512	6400	0.75	450
60LAMKF	0.750	0.469	0.483	0.234	0.541	0.618	0.094	0.125	0.713	0.614	9040	1.16	400
80LAMKF	1.000	0.625	0.609	0.312	0.675	0.797	0.125	0.156	0.949	0.819	16090	1.86	300

HOLLOW PIN LAMBDA® CHAINS

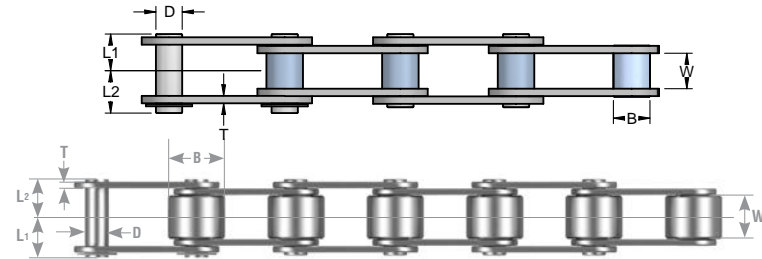
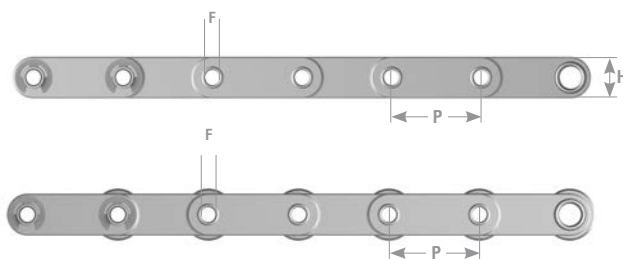


Single Pitch Hollow Pin Lambda®

Tsubaki	Pitch	Width Between Bushing Link Plates	Bushing Dimensions				Hollow Pin		Link Plate		Offset Pin Length	Average Tensile Strength	Approx. Weight lbs/ft.
Chain No.	P	W	B	R	D	F	L1	L2	H	T	L		
40LHPB	0.500	0.312	0.312	0.625	0.224	0.157	0.315	0.374	0.472	0.060	0.752	2,430	0.36
50LHPB	0.625	0.375	0.400	0.750	0.284	0.202	0.396	0.459	0.591	0.080	0.921	4,410	0.58
60LHPB	0.750	0.500	0.469	0.879	0.330	0.236	0.494	0.561	0.713	0.094	1.130	5,950	0.85
80LHPB	1.000	0.625	0.625	1.125	0.448	0.316	0.640	0.701	0.949	0.126	1.405	10,800	1.44

Note:

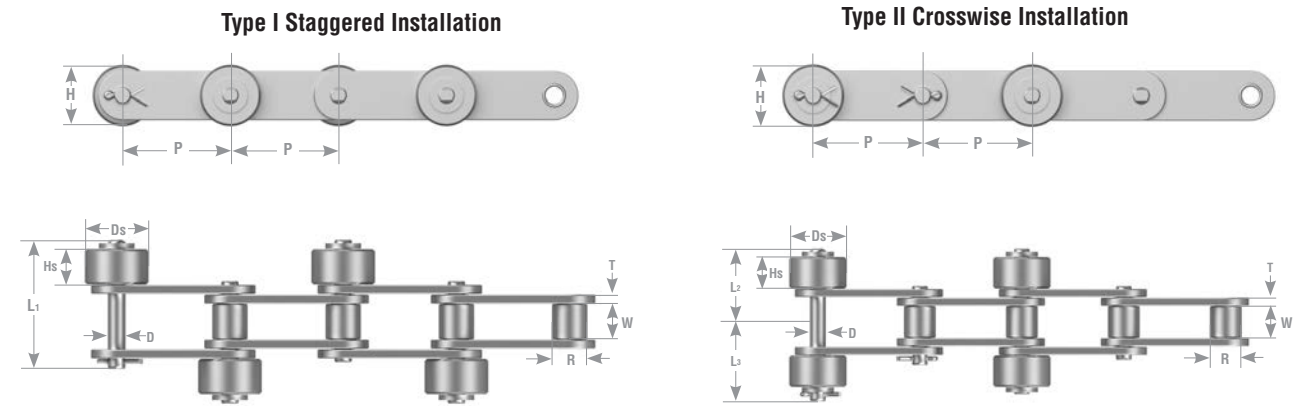
- "B" designation indicates 10' box. Cut-to-length and reel stock available upon request.
- Attachments or cross rods can be put at any pitch spacing.



Double Pitch Hollow Pin Lambda®

Tsubaki	Pitch	Width Between Bushing Link Plates	Bushing Dimensions				Hollow Pin		Link Plate		Offset Pin Length	Maximum Allowable Load	Approx. Weight lbs/ft.
Chain No.	P	W	B	R	D	F	L1	L2	H	T	L		
C2040LHPB	1.000	0.312	0.312	0.625	0.224	0.157	0.315	0.374	0.472	0.060	0.752	2,430	0.55
C2050LHPB	1.250	0.375	0.400	0.750	0.284	0.202	0.396	0.459	0.591	0.080	0.921	4,410	0.81
C2060LHPB	1.500	0.500	0.469	0.875	0.330	0.236	0.494	0.561	0.677	0.094	1.130	5,950	1.38
C2080LHPB	2.000	0.625	0.625	1.125	0.448	0.316	0.640	0.701	0.906	0.125	1.405	10,800	1.89

OUTBOARD ROLLER LAMBDA® CHAINS

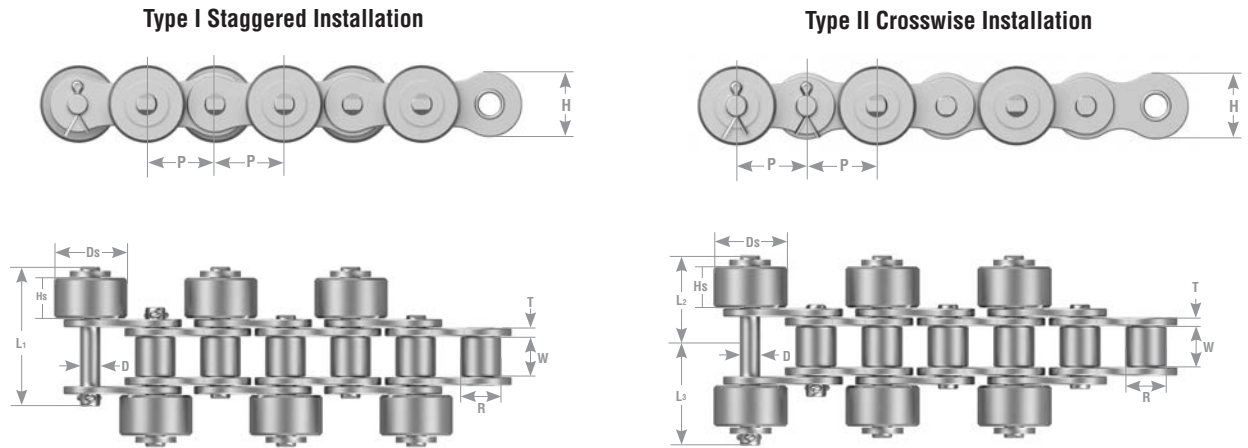


Double Pitch Chain With Outboard Rollers without brake

Chain Number		Roller Type	Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate		Pin			Outboard Roller		Approx. Weight Lbs/Ft.		
Plastic Roller	Steel Roller		P	R	W	T	H	D	L1	L2	L3	Ds	Hs	Plastic Roller	Steel Roller
C2040LPSR	C2040LSR	S	1.00	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	-	0.44
C2050LPSR	C2050LSR	S	1.25	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.917	0.750	0.370	-	0.69
C2060LPSR	C2060LSR	S	1.50	0.469	0.500	0.125	0.677	0.234	0.667	1.167	1.262	0.875	0.496	-	1.21
C2042LPSR	C2042LSR	R	1.00	0.625	0.312	0.060	0.472	0.156	0.380	0.909	0.965	0.906	0.512	0.60	0.83
C2052LPSR	C2052LSR	R	1.25	0.750	0.375	0.080	0.591	0.200	0.469	0.996	1.063	1.063	0.512	0.83	1.14
C2062LPSR	C2062LSR	R	1.50	0.875	0.500	0.125	0.677	0.234	0.667	1.167	1.262	1.181	0.496	1.30	1.77

Double Pitch Chain With Outboard Rollers with Brake

Chain Number	Roller Type	Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate		Pin			Outboard Roller		Approx. Weight	
		P	R	W	T	H	D	L1	L2	L3	Ds	Hs	
C2040LSRP	S	1.00	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.69
C2050LSRP	S	1.25	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	1.03
C2060LSRP	S	1.50	0.469	0.500	0.125	0.677	0.234	0.667	1.167	1.262	0.875	0.496	1.72
C2040LSRP	R	1.00	0.625	0.312	0.060	0.472	0.156	0.380	0.909	0.965	0.906	0.512	-
C2052LSRP	R	1.25	0.750	0.375	0.080	0.591	0.200	0.469	0.996	1.063	1.063	0.512	-
C2062LSRP	R	1.50	0.875	0.500	0.125	0.677	0.234	0.667	1.167	1.262	1.181	0.496	-



RS Chain with Steel and Plastic Outboard Rollers Chain without Brake

Chain Number		Pitch	Roller Dia.	Width Between Roller Link Plates	Link Plate		Pin			Outboard Roller		Approx. Weight	Approx. Weight	
Plastic Roller	Steel Roller	P	R	W	T	H	D	L1	L2	L3	Ds	Hs	Steel	Plastic
40LPSR	40LSR	0.500	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	1.120	0.63
50LPSR	50LSR	0.625	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	1.630	0.95
60LPSR	60LSR	0.750	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	2.440	1.42

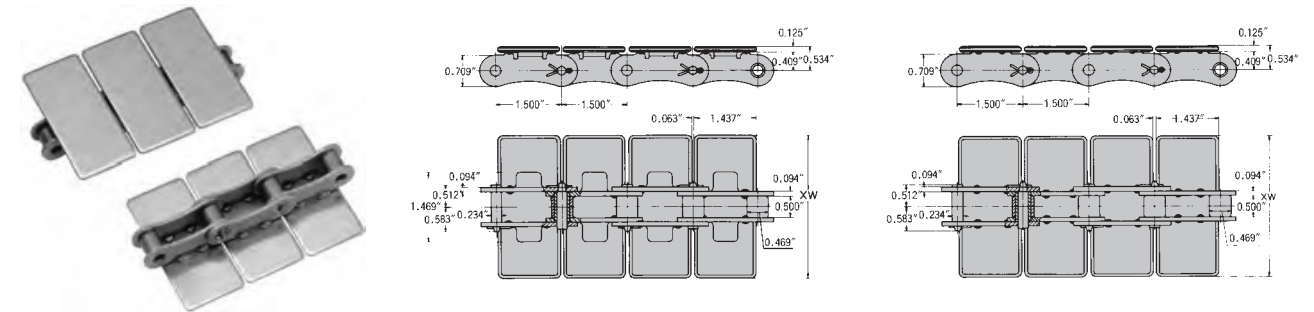
Chain with Brake

Chain Number	Pitch	Roller Dia.	Width Between Roller Link Plates	Link Plate		Pin			Outboard Roller		Approx. Weight	
P	R	W	T	H	D	L1	L2	L3	Ds	Hs		
40LSRP	0.500	0.312	0.312	0.059	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.63
50LSRP	0.625	0.400	0.375	0.079	0.591	0.200	0.469	0.850	0.913	0.750	0.370	0.95
60LSRP	0.750	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	1.42

TS Top Chain Linear Movement - Lube Free Style

Tsubaki TS Top Chain consists of top plates made of 430 stainless steel, and lube free Lambda® roller chain identical to A2060 (See Specialty Chains section for dimensional information on A2060 chain). The top plates are projection welded to the link plate of the chain. The welded strength provides reliable operation. TS Top Chain is specially designed for use in packaging, bottling, and labeling equipment.

- Installation horizontally over vertical sprockets.
- Chain can be disconnected at any joint for easy installation and maintenance
- Provides dependable trouble-free service
- Wear-resistant
- Sprockets for C2060H chain can be used.

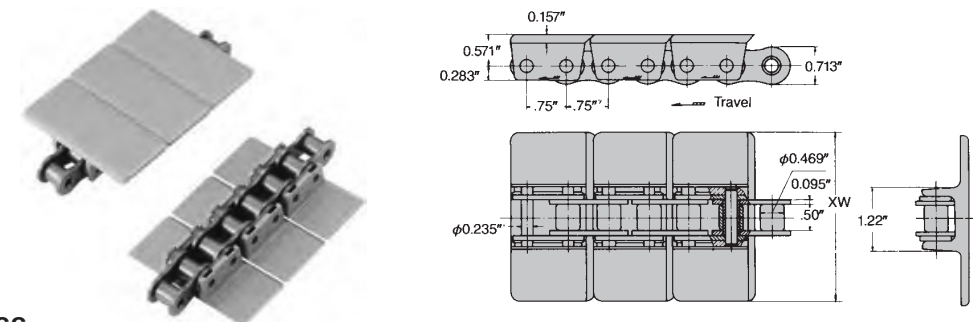


Stainless Steel Top Plate TS Series Lambda®

Chain Number		Top Plate Width	Approximate Weight Lbs/Ft		Maximum Allowable Load
P	PA	XW	P	PA	
TS550NP-P-LAMBDA	TS550NP-PA-LAMBDA	2.16	1.7	1.9	660
TS635NP-P-LAMBDA	TS635NP-PA-LAMBDA	2.50	1.8	2.0	660
TS762NP-P-LAMBDA	TS762NP-PA-LAMBDA	3.00	2.0	2.2	660
TS826NP-P-LAMBDA	TS826NP-PA-LAMBDA	3.25	2.2	2.4	660
TS950NP-P-LAMBDA	TS950NP-PA-LAMBDA	3.74	2.4	2.6	660
TS1016NP-P-LAMBDA	TS1016NP-PA-LAMBDA	4.00	2.5	2.7	660
TS1100NP-P-LAMBDA	TS1100NP-PA-LAMBDA	4.33	2.6	2.8	660
TS1143NP-P-LAMBDA	TS1143NP-PA-LAMBDA	4.50	2.7	2.9	660
TS1270NP-P-LAMBDA	TS1270NP-PA-LAMBDA	5.00	2.9	3.1	660
TS1524NP-P-LAMBDA	TS1524NP-PA-LAMBDA	6.00	3.3	3.5	660
TS1905NP-P-LAMBDA	TS1905NP-PA-LAMBDA	7.50	3.9	4.1	660

TN Top Chain Linear Movement - Lube Free Lambda® Style

Tsubaki TN Top chain consists of polyacetal resin top plates snapped onto special chain identical in size to 60 roller chain. The chain is available in lube-free Lambda® chain. The top plate can be correctly and firmly snapped on to the special pins and the chain with ease.



TN, TN-NP, TN-SS

Top plates are polyacetal, chains are lube-free Lambda®

Chain Number	Top Plate Width	Approximate Weight Lbs/Ft	Maximum Allowable Load
	XW		
TN826NP-LAMBDA	3.25	1.41	1,410
TN1016NP-LAMBDA	4.00	1.48	1,410
TN1143NP-LAMBDA	4.50	1.55	1,410
TN1270NP-LAMBDA	5.00	1.61	1,410
TN1905NP-LAMBDA	7.50	1.88	1,410

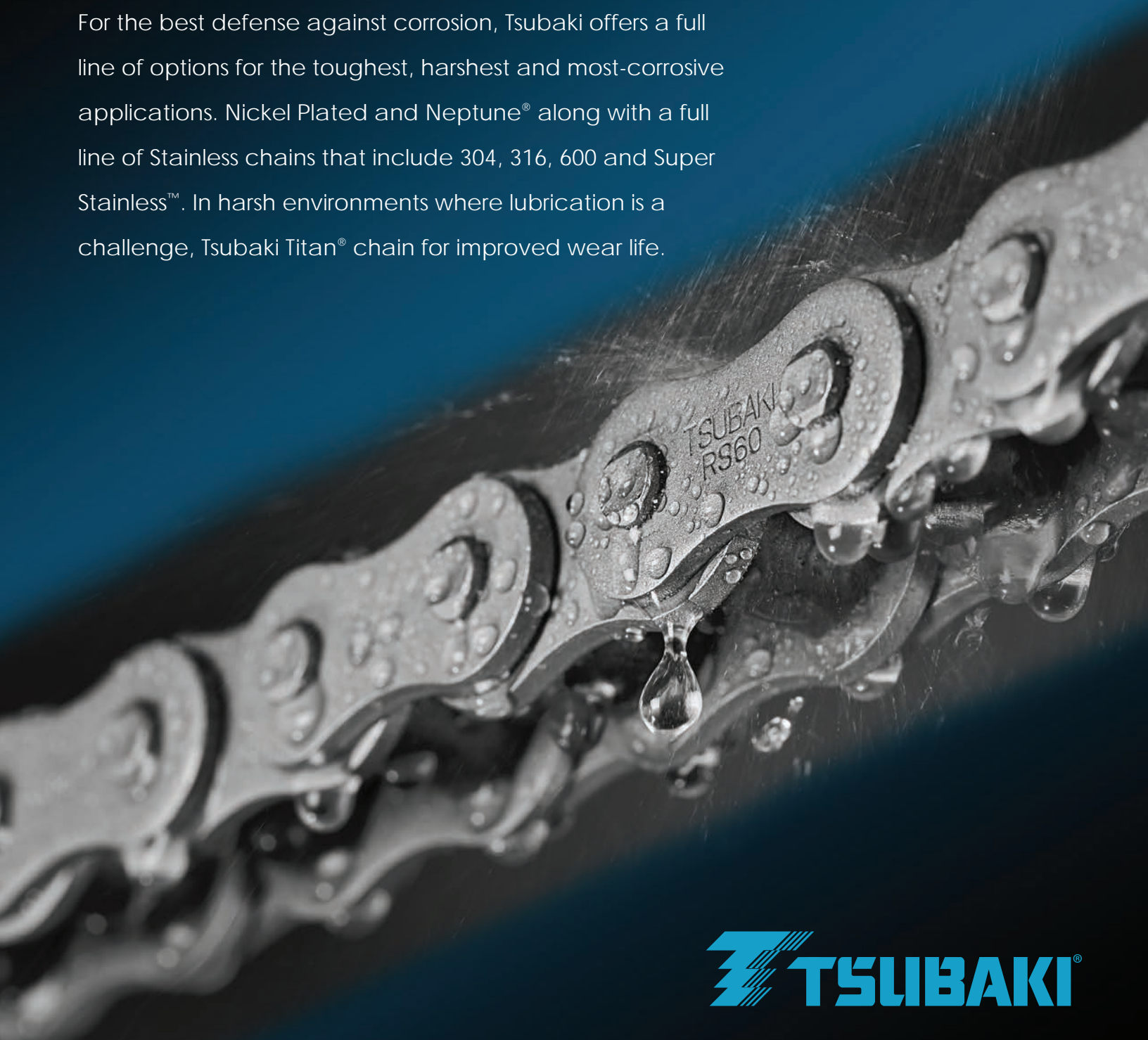
CORROSION RESISTANCE GUIDE

Corrosion resistance varies depending on application conditions. The table listed below should not be considered a guarantee of corrosion resistance and performance. Using this chart as a reference is suggested. Please check the corrosion resistance of the chain in advance according to the actual operating conditions determining chain type.

- 1 - Sufficient Corrosion Resistance
- 2 - Corrosion resistance to some applications
- 3 - No corrosion resistance

CORROSION & HEAT RESISTANT CHAINS

For the best defense against corrosion, Tsubaki offers a full line of options for the toughest, harshest and most-corrosive applications. Nickel Plated and Neptune® along with a full line of Stainless chains that include 304, 316, 600 and Super Stainless™. In harsh environments where lubrication is a challenge, Tsubaki Titan® chain for improved wear life.



Substance	Concentration	Temp (F)	SS	AS	NS	PC	Super SS
Acetic Acid	10%	68	1	1	1	1	1
Acetone		68	1	1	1	1	1
Alcohol			1	1	1	1	1
Aluminum Sulfate	Saturation	68	1	3	1	NA	3
Ammonia Water		68	1	1	1	1	1
Ammonium Chloride	50%	Boiling	2	3	1	NA	3
Ammonium Nitrate		Boiling	1	1	1	2	1
Ammonium Sulfate	Saturation	Boiling	1	2	1	NA	2
Beer		68	1	1	1	1	1
Benzene		68	1	1	1	1	1
Boric Acid	50%	Boiling	1	1	1	NA	1
Butyric Acid		68	1	1	1	1	1
Calcium Chloride	Saturation	68	2	3	1	2	3
Calcium Hydroxide	20%	Boiling	1	1	1	1	1
Calcium Hydrochlorite	11-14%	68	1	3	1	3	3
Carbolic Acid			1	1	1	3	1
Carbon Tetrachlorite (dry)		68	1	1	1	1	1
Chlorinated Water			3	3	1	3	3
Chlorine Gas (dry)		68	2	2	2	NA	2
Chlorine Gas (moist)		68	3	3	2	NA	3
Chromic Acid	5%	68	1	1	1	3	2
Citric Acid	50%	68	1	1	1	NA	1
Coffee		Boiling	1	1	1	1	1
Creosote		68	1	1	1	NA	1
Developing Solution		68	1	1	1	1	1
Ethyl Ether		68	1	1	1	1	1
Ferric Acid	50%	68	1	1	1	3	1
Ferric Chloride	5%	68	2	3	2	NA	3
Formalin	40%	68	1	1	1	NA	1
Formic Acid	50%	68	1	1	1	3	2
Fruit Juice		68	1	1	1	1	1
Gasoline		68	1	1	1	1	1
Glycerol		68	1	1	1	1	1
Honey			1	1	1	1	1
Hydrochloric Acid	2%	68	3	3	3	3	2
Hydrogen Peroxide	30%	68	2	1	1	1	2
Hydrogen Sulfide (dry)			1	1	1	1	1
Hydrogen Sulfide (wet)			3	3	3	3	3
Hydroxybenzene		68	1	1	1	3	1
Kerosene		68	1	1	1	NA	1
Ketchup		68	1	1	1	1	1
Lactic Acid	10%	68	1	2	1	1	2
Lard			1	1	1	NA	1
Linseed Oil	100%	68	1	2	1	1	2
Malic Acid	50%	Boiling	1	1	1	1	1
Mayonnaise		68	1	2	1	1	2
Milk		68	1	1	1	1	1
Nitric Acid	5%	68	1	2	1	3	2
Nitric Acid	65%	68	1	3	1	3	3

Substance	Concentration	Temp (F)	SS	AS	NS	PC	Super SS
Nitric Acid	65%	Boiling	2	3	2	3	3
Oil (Plant/Mineral)		68	1	1	1	1	1
Oleic Acid		68	1	1	1	1	1
Oxalic Acid	10%	68	1	2	1	NA	2
Paraffin		68	1	1	1	1	1
Peracetic Acid			1	1	1	NA	1
Petroleum		68	1	1	1	1	1
Phosphate			1	1	1	NA	1
Phosphoric Acid	5%	68	1	2	1	3	2
Phosphoric Acid	10%	68	2	2	2	3	2
Picric Acid	Saturation	68	1	1	1	NA	1
Potassium	Saturation	68	1	2	1	NA	2
Potassium Bichromate	10%	68	1	1	1	1	1
Potassium Chloride	Saturation	68	1	2	1	NA	2
Potassium Hydroxide	20%	68	1	1	1	1	1
Potassium Nitrate	25%	68	1	1	1	1	1
Potassium Nitrate	25%	Boiling	1	3	1	NA	3
Potassium Permanganate	Saturation	68	1	1	1	NA	1
Sal Ammoniac	50%	Boiling	2	3	1	NA	3
Sea-Water		68	2	3	1	2	3
Soap-and-Water Solution		68	1	1	1	1	1
Sodium Carbonate	Saturation	Boiling	1	1	1	NA	1
Sodium Chloride	5%	68	1	2	1	1	2
Sodium Cyanide		68	1	NA	1	NA	NA
Sodium Hydrocarbonate		68	1	1	1	1	1
Sodium Hydroxide	25%	68	1	1	1	1	1
Sodium Hypochlorite	10%	68	3	3	1	3	3
Sodium Perchlorate	10%	Boiling	1	3	1	NA	3
Sodium Sulfate	Saturation	68	1	1	1	NA	1
Sodium Thiosulfate	25%	Boiling	1	1	1	NA	1
Soft Drink		68	1	1	1	1	1
Stearic Acid	100%	Boiling	3	3	1	3	3
Sugar Solution		68	1	1	1	1	1
Sulfuric Acid	5%	68	3	3	1	3	3
Sulfur Dioxide		68	1	3	1	NA	3
Synthetic Detergent			1	1	1	1	1
Syrup			1	1	1	1	1
Tartaric Acid	10%	68	1	1	1	1	1
Turpentine		95	1	1	1	NA	1
Varnish			1	1	1	NA	1
Vegetable Juice		68	1	1	1	1	1
Vinegar		68	2	3	1	2	3
Water			1	1	1	1	1
Whiskey		68	1	1	1	1	1
Wine		68	1	1	1	1	1
Zinc Chloride	50%	68	2	3	2	2	3
Zinc Sulfate	25%	68	1	1	1	NA	1

Materials of Component Parts

	Link Plate	Pin	Bushing	Roller
304 (SS)	AISI304	AISI304	AISI304	AISI304
316 (NS)	AISI316	AISI316	AISI304	AISI316
600 (AS)	AISI304	600 Series HT*	600 Series HT*	600 Series HT*
Super SS	Proprietary	Proprietary	Proprietary	Proprietary

*PH - Precipitation Hardened
600 Series includes 17-4PH, 17-8PH, 13-7PH. Each has comparable corrosion resistance
Double pitch oversized rollers will be AISI304

Performance of Anti-Corrosive Chains

	Corrosion Resistance	Temperature Resistance	Magnetism	Wear Resistance
Nickel Plated	Acceptable for outdoor and decorative applications	(14°F) to (302°F)	Magnetic	Excellent
Neptune®	Excellent for outdoors, exposure to rain and seawater	(14°F) to (302°F)	Magnetic	Excellent
600 (AS) Series	Good for general acid, alkali and water	(-40°F) to (750°F) (Never use over 930°F)	Magnetic	Good
304 (SS) Series	Good for general acid, alkali and water	(-40°F) to (750°F) (Never use below -270°F or above 1,300°F)	Slightly magnetic due to cold forming parts	Fair
316 (NS) Series	Superior in corrosion protection to SS and AS Chains	(-40°F) to (750°F) (Never use below -420°F or above 1,500°F)	Non-Magnetic	Fair
Super Stainless™	Carbon Steel Strength with 600 Series Corrosion Resistance	(-40°F) to (750°F) (Never use above 930°F)	Magnetic	Excellent

Chain Selection

General selection is based on bearing pressure between the pin and bushing. Anti-corrosive roller chains are normally intended to be used at a slow speed without lubrication. Chain selection should be made based on the bearing pressure as shown below.

	Maximum Allowable Bearing Pressure Between Pin and Bushing	Maximum Operating Speed
304 (SS)	2,131 psi	230 ft/min
316 (NS)	1,420 psi	230 ft/min
600 (AS)	1,420 psi	230 ft/min

Chain selection can be made using the following formula
Maximum allowable load or maximum bearing pressure can be doubled only when the chain is used in group 1 of the Corrosion Resistance Guide and properly lubricated

Maximum Allowable Load

The chains maximum allowable load can be obtained by the formula:
(Maximum allowable bearing pressure) • (Bearing area between pin and bushing)

Chain	AS Series	SS Series	NS Series	Super SS
25		26	26	
35	90	60	60	
40	150	99	99	810*
50	231	154	154	1,430*
60	346	231	231	1,980*
80	596	397	397	3,300*
100		573	573	5,070*

*NOTE - If chain is not lubricated, MAL is 1/3 of published value.

Service Factor

Type of Impact	Service Factor
Smooth Transmission	1.0
Transmission with some impact	1.3
Transmission with large impact	1.5

Speed Coefficient

Chain Speed	Speed Coefficient
0-50 ft/min	1.0
50-100 ft/min	1.2
100-160 ft/min	1.4
160-230 ft/min	1.6

Temperature Factor

Temperature	AS Series	SS Series	NS Series	Super SS
(-270°F)	X	X	X	X
(-270°F to -40°F)	X	1.0	1.0	X
(-40°F to 500°F)	1.0	1.0	1.0	1.0
(500°F to 750°F)	1.0	1.0	1.0	1.5
(750°F to 930°F)	1.8	1.2	1.0	1.8
(930°F to 1,100°F)	X	1.5	1.2	X
(1,100°F to 1,300°F)	X	1.8	1.5	X
(1,300°F to 1,500°F)	X	X	2.0	X
1,500°F to *	X	X	X	X

X: Not suggested
Use in temperatures exceeding 750F requires increased clearances to accommodate thermal expansion. Consult Tsubaki prior to ordering.

RPM Factor Kn factor Kz

RPM Kn	RPM Factor Kn
Less than 27	1.00
27 or more, less than 37	1.03
37 or more, less than 50	1.07
50 or more, less than 70	1.10
70 or more, less than 100	1.14
100 or more, less than 150	1.19
150 or more, less than 300	1.27
300 or more, less than 500	1.34
500 or more, less than 1,000	1.44
1,000 or more, less than 2,000	1.54
2,000 or more, less than 4,000	1.65

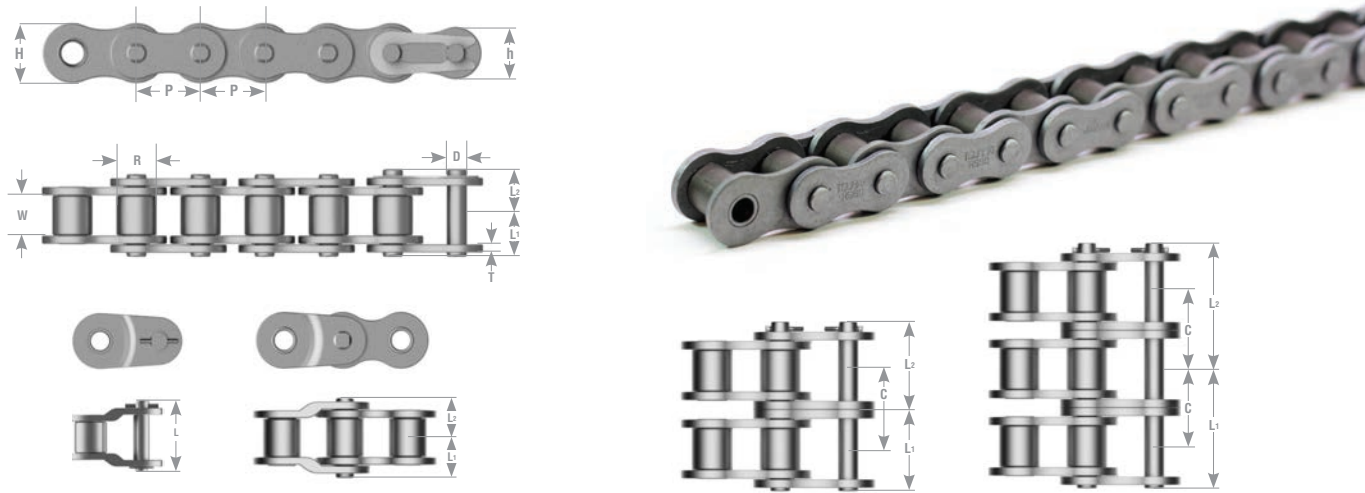
Number of Teeth Kz	Teeth factor Kz
9 or more, less than 12	1.16
12 or more, less than 15	1.14
15 or more, less than 18	1.12
18 or more, less than 24	1.10
24 or more, less than 30	1.08
30 or more, less than 38	1.06
38 or more less than 47	1.04
47 or more less than 60	1.02
60 or higher	1.00

Chain Selection Method

Chain Selection can be made using the following formula

$$\text{Maximum Chain Tension} \times \text{Service Factor} \times \text{RPM Kn} \times \text{Temperature Factor} \times \text{Tooth Factor (Kz)} \leq \text{Maximum Allowable Load}$$

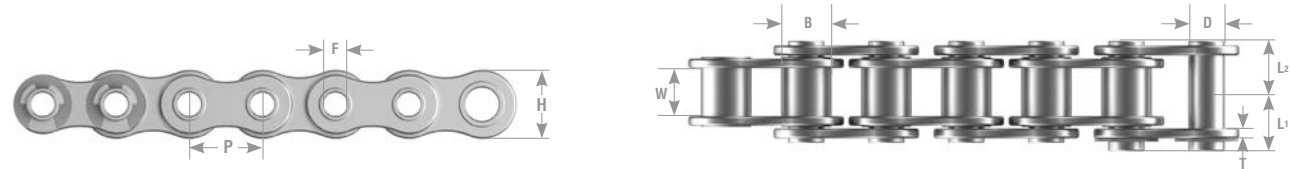
SINGLE PITCH NEPTUNE® CHAINS



Single Pitch Neptune®

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Link Plate			Pin			Transverse Pitch C	Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				T	H	h	L1	L2	D				
SINGLE STRAND													
▲35NEPRB	0.375	0.200	0.188	0.050	0.354	0.307	0.23	0.270	0.141	NA	2,530	480	0.22
40NEPRB	0.500	0.312	0.312	0.060	0.472	0.409	0.325	0.392	0.156	NA	4,290	810	0.43
50NEPRB	0.625	0.400	0.375	0.080	0.591	0.512	0.406	0.472	0.200	NA	7,050	1,430	0.70
60NEPRB	0.750	0.469	0.500	0.094	0.713	0.614	0.506	0.581	0.234	NA	9,920	1,980	1.03
80NEPRB	1.000	0.625	0.625	0.125	0.949	0.819	0.640	0.758	0.312	NA	17,640	3,300	1.79
100NEPRB	1.250	0.750	0.750	0.156	1.185	1.024	0.778	0.900	0.375	NA	26,460	5,070	2.68
120NEPRB	1.500	0.875	1.000	0.187	1.425	1.228	0.980	1.138	0.437	NA	37,480	6,830	3.98
140NEPRB	1.750	1.000	1.000	0.219	1.661	1.433	1.059	1.248	0.500	NA	48,510	9,040	5.03
160NEPRB	2.000	1.125	1.250	0.250	1.898	1.638	1.254	1.451	0.562	NA	62,830	11,900	6.79
DOUBLE STRAND													
40-2NEPRB	0.500	0.312	0.312	0.060	0.472	0.409	0.608	0.675	0.156	0.566	8,850	1,370	0.85
50-2NEPRB	0.625	0.400	0.375	0.080	0.591	0.512	0.762	0.833	0.200	0.713	14,100	2,430	1.39
60-2NEPRB	0.750	0.469	0.500	0.094	0.713	0.614	0.955	1.033	0.234	0.897	19,840	3,370	2.04
80-2NEPRB	1.000	0.625	0.625	0.125	0.949	0.819	1.217	1.355	0.312	1.153	35,300	5,620	3.54
100-2NEPRB	1.250	0.750	0.750	0.156	1.185	1.024	1.484	1.606	0.375	1.408	52,910	8,620	5.27
120-2NEPRB	1.500	0.875	1.000	0.187	1.425	1.228	1.874	2.031	0.437	1.789	74,960	11,610	7.86
140-2NEPRB	1.750	1.000	1.000	0.219	1.661	1.433	2.022	2.211	0.500	1.924	97,000	15,370	9.97
TRIPLE STRAND													
40-3NEPRB	0.500	0.312	0.312	0.060	0.472	0.409	0.892	0.951	0.156	0.566	12,870	2,020	1.28
50-3NEPRB	0.625	0.400	0.375	0.080	0.591	0.512	1.118	1.189	0.200	0.713	21,150	3,580	2.08
60-3NEPRB	0.750	0.469	0.500	0.094	0.713	0.614	1.404	1.502	0.234	0.897	29,760	4,960	3.05
80-3NEPRB	1.000	0.625	0.625	0.125	0.949	0.819	1.795	1.910	0.312	1.530	52,900	8,270	5.30
100-3NEPRB	1.250	0.750	0.750	0.156	1.185	1.024	2.191	2.313	0.375	1.408	79,370	12,680	7.91

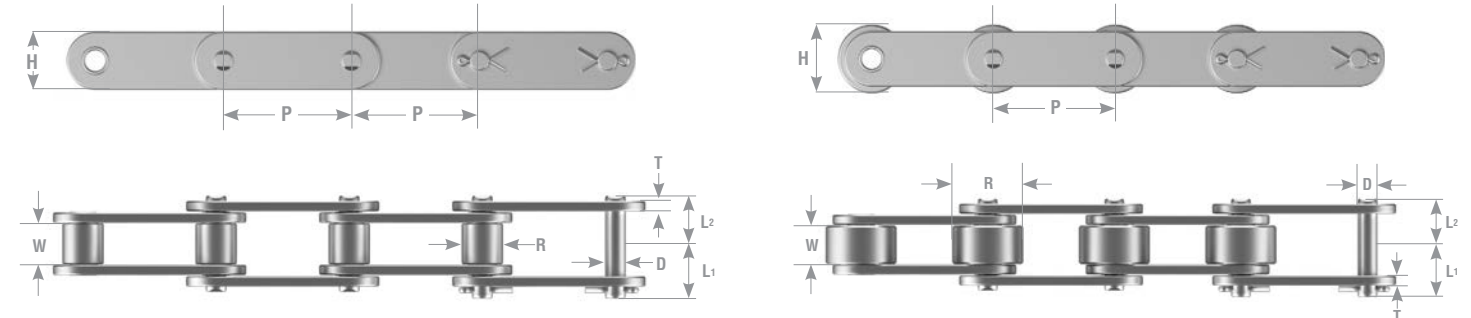
Note: 1. "RB" designation indicates 10' box riveted. Coated, cut-to-length and reel stock available upon request.
 2. Sizes 35-60 Supplied with spring clip style connecting links. 80-160 come coated style.
 ▲ 3. 35 Chain is roller less (bushing only).



Neptune® Hollow Pin

Tsubaki Chain No.	Pitch P	Width Between Bushing Link Plates W	Bushing Dimensions			Hollow Pin		Link Plate		Average Tensile Strength	Maximum Allowable Load	Approx. Weight lbs/ft.
			B	D	F	L1	L2	H	T			
40NEPHPB	0.500	0.312	0.312	0.224	0.157	0.315	0.379	0.472	0.060	2,430	397	0.36
50NEPHPB	0.625	0.375	0.400	0.284	0.202	0.396	0.459	0.591	0.080	4,410	705	0.58
60NEPHPB	0.750	0.500	0.469	0.330	0.236	0.494	0.561	0.713	0.094	5,950	948	0.85
80NEPHPB	1.000	0.625	0.625	0.448	0.316	0.640	0.701	0.949	0.125	10,800	1,720	1.60

DOUBLE PITCH NEPTUNE® CHAINS

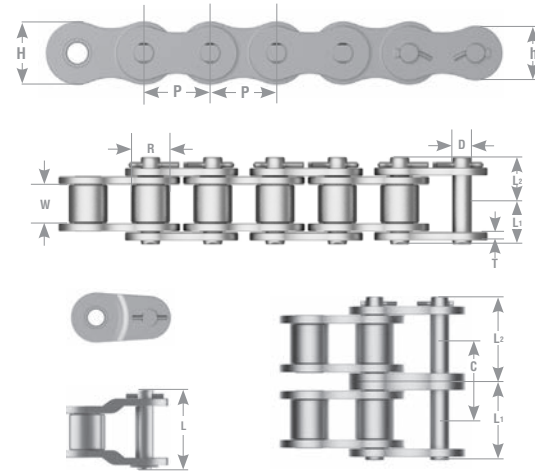


Double Pitch Neptune®

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin			Link Plate		Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				L1	L2	D	H	T			
STANDARD ROLLER											
C2040NEPRB	1.000	0.312	0.312	0.325	0.380	0.156	0.472	0.060	3,750	590	0.34
C2050NEPRB	1.250	0.400	0.375	0.406	0.469	0.200	0.591	0.080	6,170	970	0.56
C2060HNEPRB	1.500	0.469	0.500	0.575	0.646	0.234	0.677	0.125	9,040	1,410	1.01
C2080HNEPRB	2.000	0.625	0.625	0.720	0.823	0.312	0.906	0.156	15,400	2,400	1.78
OVERSIZED ROLLER											
C2042NEPRB	1.000	0.625	0.312	0.325	0.380	0.156	0.472	0.060	3,740	590	0.58
C2052NEPRB	1.250	0.750	0.375	0.406	0.469	0.200	0.591	0.080	6,170	970	0.87
C2062HNEPRB	1.500	0.875	0.500	0.573	0.646	0.234	0.677	0.125	9,040	1,410	1.47
C2082HNEPRB	2.000	1.125	0.625	0.720	0.823	0.312	0.906	0.156	15,400	2,400	2.47

Note: 1. "RB" designation indicates 10' box riveted. Coated, cut-to-length and reel stock available upon request.
 2. C2040NT-C2060HNT are provided with spring clip connecting links. C2080HNT connecting links are coated style.

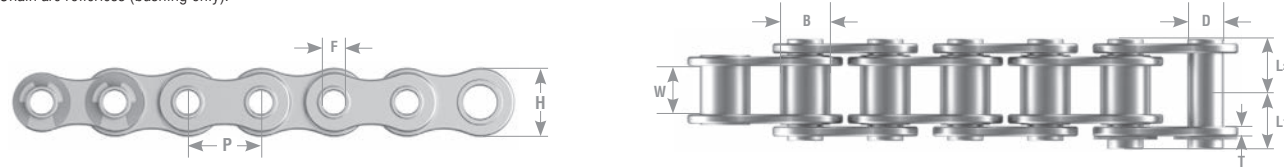
NICKEL PLATED CHAINS



Nickel-Plated Chain

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin			Link Plate			Transverse Pitch C	Average Tensile Strength	Max. Allowable LBS.	Approx. Weight lbs/ft.
				D	L1	L2	T	H	h				
SINGLE STRAND													
25NPRB	0.250	0.130	0.125	0.091	0.150	0.189	0.030	0.230	0.199	NA	1,050	140	0.094
35NPRB	0.375	0.200	0.188	0.141	0.230	0.270	0.050	0.354	0.307	NA	2,530	418	0.220
40NPRB	0.500	0.312	0.312	0.156	0.325	0.392	0.060	0.472	0.409	NA	4,290	706	0.430
41NPRB	0.500	0.306	0.251	0.141	0.266	0.312	0.050	0.382	0.331	NA	2,640	370	0.270
50NPRB	0.625	0.400	0.375	0.200	0.406	0.472	0.080	0.591	0.512	NA	7,050	1,212	0.700
60NPRB	0.750	0.469	0.500	0.234	0.506	0.581	0.094	0.713	0.614	NA	9,920	1,630	1.030
80NPRB	1.000	0.625	0.625	0.312	0.640	0.758	0.125	0.949	0.819	NA	17,640	2,855	1.790
100NPRB	1.250	0.750	0.750	0.375	0.778	0.900	0.156	1.185	1.024	NA	26,640	4,294	2.680
120NPRB	1.500	0.875	1.000	0.437	0.980	1.138	0.187	1.425	1.228	NA	37,480	5,733	3.980
DOUBLE STRAND													
25-2NPRB	0.250	0.130	0.125	0.091	0.276	0.315	0.030	0.230	0.199	0.252	2,100	238	0.181
35-2NPRB	0.375	0.200	0.188	0.141	0.429	0.469	0.050	0.354	0.307	0.399	5,060	711	0.460
40-2NPRB	0.500	0.312	0.312	0.156	0.608	0.675	0.060	0.472	0.409	0.566	8,580	1,200	0.850
50-2NPRB	0.625	0.400	0.375	0.200	0.762	0.833	0.080	0.591	0.512	0.713	14,100	2,000	1.390
60-2NPRB	0.750	0.469	0.500	0.234	0.955	1.033	0.094	0.713	0.614	0.897	19,840	2,771	2.040
80-2NPRB	1.000	0.625	0.625	0.312	1.217	1.335	0.125	0.949	0.819	1.153	35,280	4,854	3.540
100-2NPRB	1.250	0.750	0.750	0.375	1.484	1.606	0.156	1.185	1.024	1.408	53,280	7,300	5.270

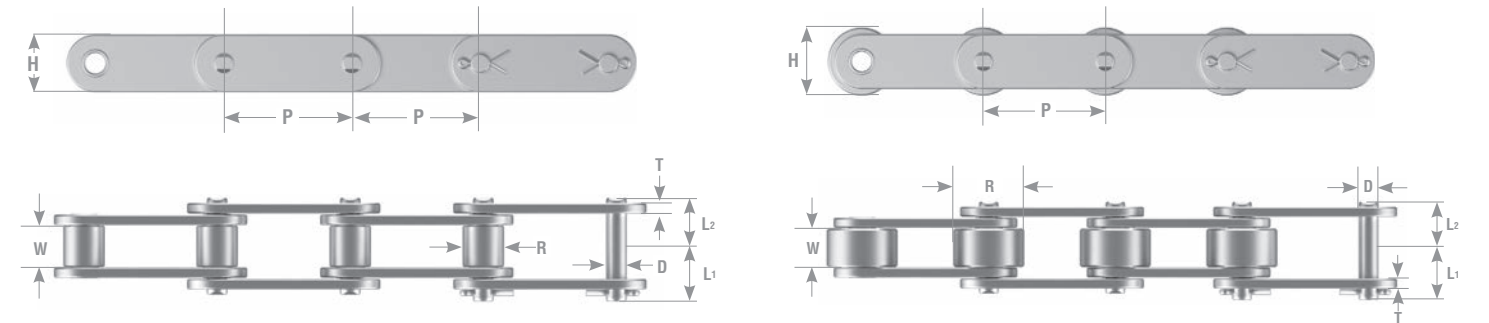
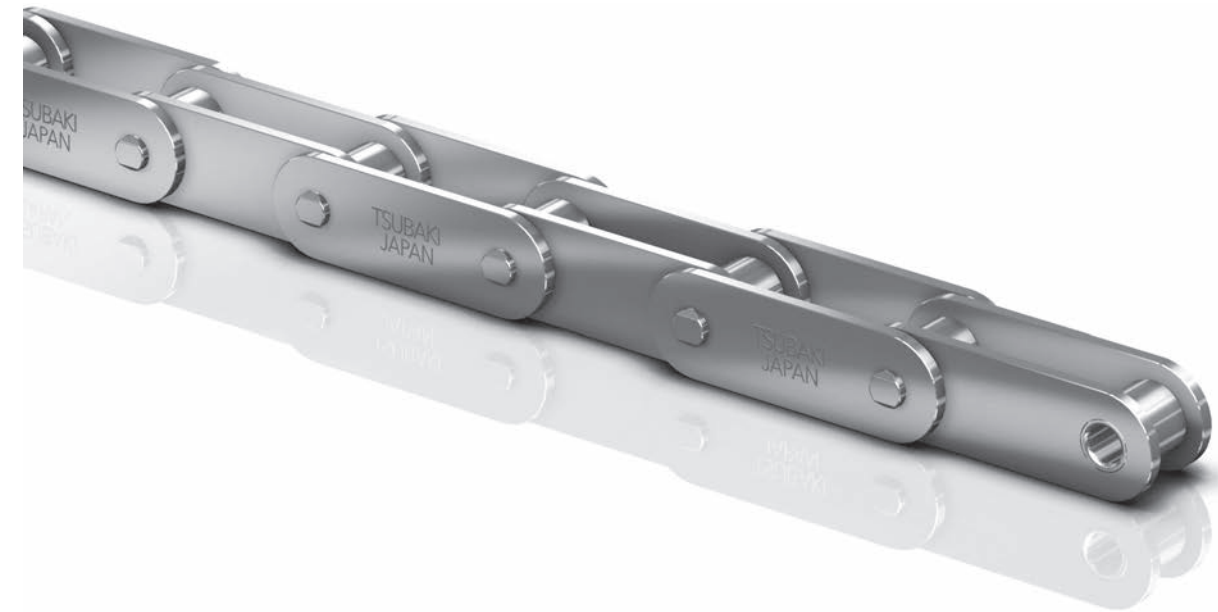
- Note:
1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Sizes 25-60 Supplied with spring clip style connecting links. 80-120 come cottered style.
 3. 25 & 35 Chain are rollerless (bushing only).



Nickel-Plated Hollow Pin Chain

Tsubaki Chain No.	Pitch P	Width Between Bushing Link Plates W	Bushing Dimensions			Hollow Pin		Link Plate		Average Tensile Strength	Maximum Allowable Load	Approx. Weight lbs/ft.
			B	D	F	L1	L2	H	T			
40NPHPB	0.500	0.312	0.312	0.224	0.157	0.315	0.374	0.472	0.060	2,430	397	0.36
50NPHPB	0.625	0.375	0.400	0.284	0.202	0.396	0.459	0.591	0.080	4,410	705	0.58
60NPHPB	0.750	0.500	0.469	0.330	0.236	0.494	0.561	0.713	0.094	5,950	948	0.85
80NPHPB	1.000	0.625	0.625	0.448	0.316	0.640	0.701	0.949	0.125	10,800	1,720	1.60

DOUBLE PITCH NICKEL PLATED CHAINS



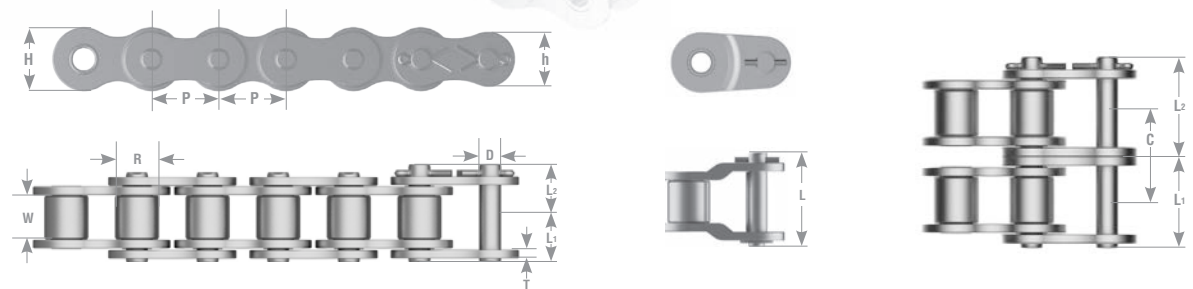
Double Pitch Nickel-Plated

Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin			Link Plate		Average Tensile Strength	Approx. Weight lbs/ft.
				D	L1	L2	T	H		
STANDARD ROLLER										
C2040NPRB	1.000	0.312	0.312	0.156	0.325	0.380	0.060	0.472	4,290	0.34
C2050NPRB	1.250	0.400	0.375	0.200	0.406	0.468	0.080	0.591	7,050	0.56
C2060HNPRB	1.500	0.469	0.500	0.234	0.573	0.652	0.125	0.677	9,920	1.01
C2080HNPRB	2.000	0.625	0.625	0.312	0.720	0.823	0.156	0.906	17,640	1.78
OVERSIZED ROLLER										
C2042NPRB	1.000	0.625	0.312	0.156	0.325	0.380	0.060	0.472	4,290	0.58
C2052NPRB	1.250	0.750	0.375	0.200	0.406	0.469	0.080	0.591	7,050	0.87
C2062HNPRB	1.500	0.875	0.500	0.234	0.573	0.652	0.125	0.677	9,920	1.47
C2082HNPRB	2.000	1.125	0.625	0.312	0.720	0.823	0.156	0.906	17,640	2.47

- Note:
1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. C2040NP-C2060HNP are provided with spring clip connecting links. C2080HNP connecting links are cottered style.

SINGLE PITCH STAINLESS STEEL CHAINS

304 SS Series, 316 NS Series & 600 AS Series

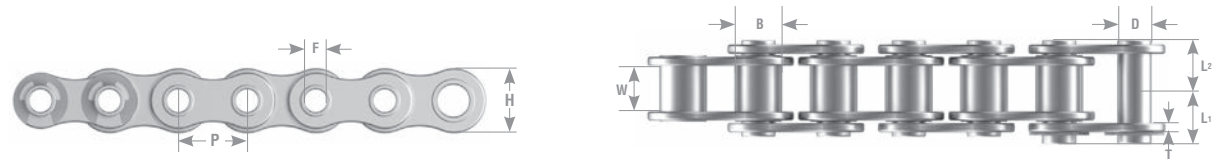


Single Pitch Stainless Steel

Tsubaki	Pitch	Roller Dia.	Width Between Roller Link Plates	Link Plate	Pin Dia.	SS - NS Pin	AS Pin	Transverse Pitch	Maximum Allowable Load	Maximum Allowable Load	Approx. Weight lbs/ft.						
SS (304)	AS (600)	NS (316)	P	R	W	T	H	D	L1	L2	L1	L2	C	SS-NS	AS		
SINGLE STRAND																	
25SSRB			0.250	0.130	0.125	0.030	0.230	0.090	0.150	0.189				NA	26		0.09
35SSRB ▲	35ASRB		0.375	0.200	0.188	0.050	0.354	0.141	0.238	0.270	0.238	0.281		NA	60	91	0.22
40SSRB ▲	40ASRB ▲	40NSRB	0.500	0.312	0.312	0.060	0.472	0.156	0.325	0.380	0.325	0.392		NA	99	150	0.43
50SSRB	50ASRB	50NSRB	0.625	0.400	0.375	0.080	0.591	0.200	0.406	0.472	0.406	0.472		NA	154	231	0.70
60SSRB	60ASRB	60NSRB	0.750	0.469	0.500	0.094	0.713	0.234	0.506	0.581	0.506	0.581		NA	231	346	1.03
80SSRB	80ASRB	80NSRB	1.000	0.625	0.625	0.125	0.949	0.312	0.640	0.766	0.640	0.766		NA	397	596	1.79
100SSRB			1.250	0.750	0.750	0.156	1.185	0.375	0.778	0.900				NA	573		2.69
120SSRB			1.500	0.875	1.000	0.197	1.425	0.437	1.014	1.173				NA	859		3.98
DOUBLE STRAND																	
25-2SSRB			0.250	0.130	0.125	0.030	0.230	0.090	0.276	0.315				0.252			0.19
35-2SSRB			0.375	0.200	0.188	0.050	0.354	0.141	0.429	0.469				0.399			0.46
40-2SSRB			0.500	0.312	0.312	0.060	0.472	0.156	0.600	0.683				0.567	198		0.85
50-2SSRB			0.625	0.400	0.375	0.080	0.591	0.200	0.754	0.837				0.713	308		1.39
60-2SSRB			0.750	0.469	0.500	0.094	0.713	0.234	0.955	1.030				0.898	463		2.04
80-2SSRB			1.000	0.625	0.625	0.125	0.949	0.312	1.217	1.335				1.154	794		3.54
100-2SSRB			1.250	0.750	0.750	0.156	1.185	0.375	1.484	1.606				1.409	1,147		5.27

▲ Indicates rollerless.

NOTE: 1. Attachment chain is available in attachment chain section.

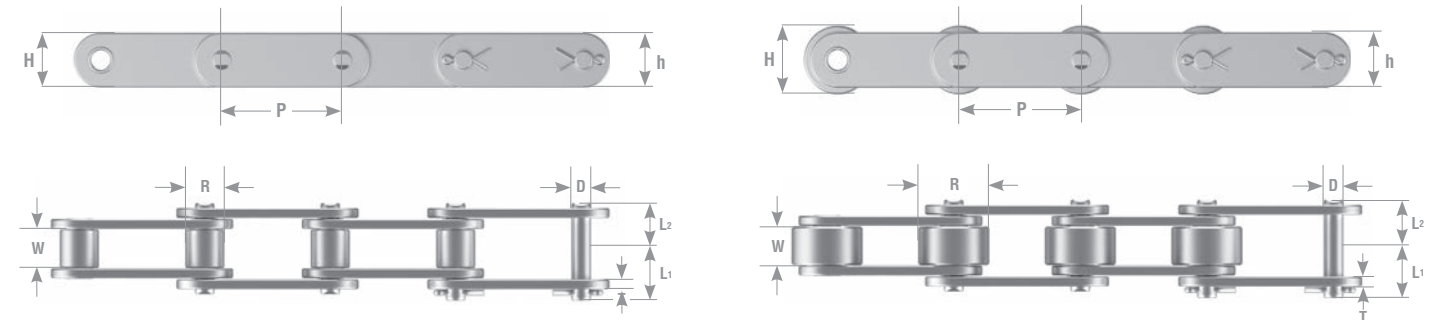


Stainless Steel Hollow Pin

Tsubaki	Pitch	Width Between Bushing Link Plates	Bushing Dimensions	Hollow Pin	Link Plate	Maximum Allowable Load	Approx. Weight lbs/ft.				
Chain No.	P	W	B	D	F	L1	L2	H	T		
40SSHPB	0.500	0.312	0.312	0.224	0.157	0.315	0.374	0.472	0.060	99	0.35
50SSHPB	0.625	0.375	0.400	0.284	0.202	0.396	0.459	0.591	0.080	155	0.56
60SSHPB	0.750	0.500	0.469	0.330	0.236	0.494	0.561	0.713	0.094	231	0.82
80SSHPB	1.000	0.625	0.625	0.448	0.316	0.640	0.701	0.949	0.125	398	1.58

DOUBLE PITCH STAINLESS STEEL CHAINS

304 SS Series, 316 NS Series & 600 AS Series



Double-Pitch Stainless Steel

Tsubaki	Pitch	Roller Dia.	Width Between Roller Link Plates	Pin	Link Plate	Maximum Allowable Load (lbs)	Maximum Allowable Load (lbs)	Approx. Weight lbs/ft.	No. of Links per 10 ft.				
SS (304)	AS (600)	P	R	W	D	L1	L2	T	H	SS (304)	AS (600)		
STANDARD ROLLER													
C2040SSRB	C2040ASRB	1.000	0.312	0.312	0.156	0.325	0.392	0.060	0.472	99	150	0.340	120
C2050SSRB	C2050ASRB	1.250	0.400	0.375	0.200	0.406	0.472	0.080	0.591	154	231	0.560	96
C2060HSSRB	C2060HASRB	1.500	0.469	0.500	0.234	0.573	0.652	0.125	0.677	231	346	1.010	80
C2080HSSRB	C2080HASRB	2.000	0.625	0.625	0.312	0.720	0.823	0.156	0.906	397	596	1.620	60
OVERSIZED ROLLER													
C2042SSRB	C2042ASRB	1.000	0.625	0.312	0.156	0.325	0.392	0.060	0.472	99	150	0.580	120
C2052SSRB	C2052ASRB	1.250	0.750	0.375	0.200	0.406	0.472	0.080	0.591	154	231	0.870	96
C2062HSSRB	C2062HASRB	1.500	0.875	0.500	0.234	0.573	0.652	0.125	0.677	231	346	1.470	80
C2082HSSRB	C2082HASRB	2.000	1.125	0.625	0.312	0.720	0.823	0.156	0.906	397	596	2.370	60

Note: Material of oversized roller is 304SS.

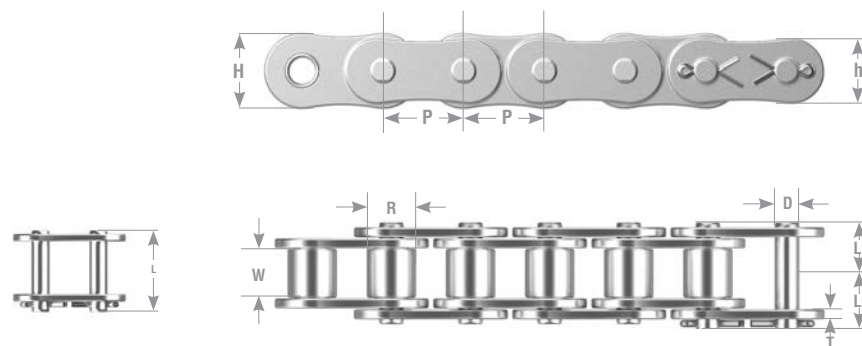
Attachment chain specifications in attachment chain section.

SUPER STAINLESS™ STEEL CHAINS



Features and Benefits Include:

1. Higher side-bar waist for improved fatigue strength
2. Comparable strength to standard ANSI carbon steel chains
3. Hardened stainless components for extended wear life and improved performance
4. Temperature range from - 40°F to 750°F



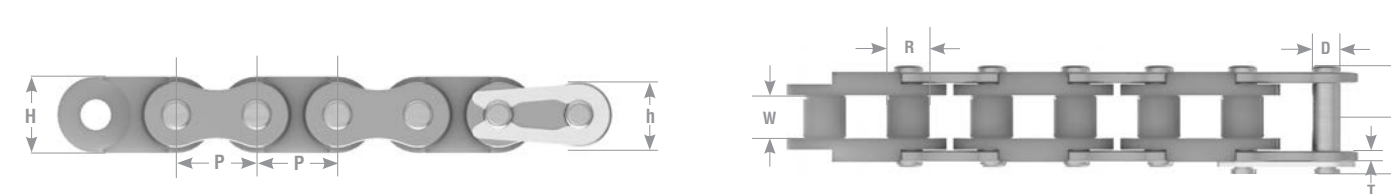
Tsubaki	Pitch	Roller Dia.	Width Between Roller Link Plates	Link Plate			Pin				Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.	No. of Links per 10 ft.
Chain No.	P	R	W	T	H	h	L1	L2	L1+L2	D				
40SUPERSRB	0.500	0.312	0.312	0.060	0.472	0.409	0.325	0.392	0.717	0.156	4,290	810	0.47	240
50SUPERSRB	0.625	0.400	0.375	0.080	0.591	0.512	0.406	0.469	0.874	0.200	7,050	1,430	0.76	192
60SUPERSRB	0.750	0.469	0.500	0.094	0.713	0.614	0.506	0.581	1.087	0.234	9,920	1,980	1.12	160
80SUPERSRB	1.000	0.625	0.625	0.125	0.949	0.819	0.640	0.758	1.398	0.312	17,640	3,300	1.95	120
100SUPERSRB	1.250	0.750	0.750	0.156	1.185	1.024	0.778	0.900	1.678	0.375	26,460	5,070	2.68	96

Note:
 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Larger pitch, conveyor and attachment chains available. Consult factory.
 3. Sizes 40-60 supplied with clip-style connecting links. Size 80 and 100 supplied in cottered style connecting links.
 *4. MAL Ratings in lubricated conditions only.



POLY-STEEL CHAINS

Tsubaki Poly-Steel chains are made to exacting specifications from polyacetal and stainless steel. The combination of polyacetal inner links and 304 stainless steel pins and outer link plates effectively incorporate the advantages of both materials into one chain. Tsubaki Poly-steel chains can be used in both driving and conveying applications.



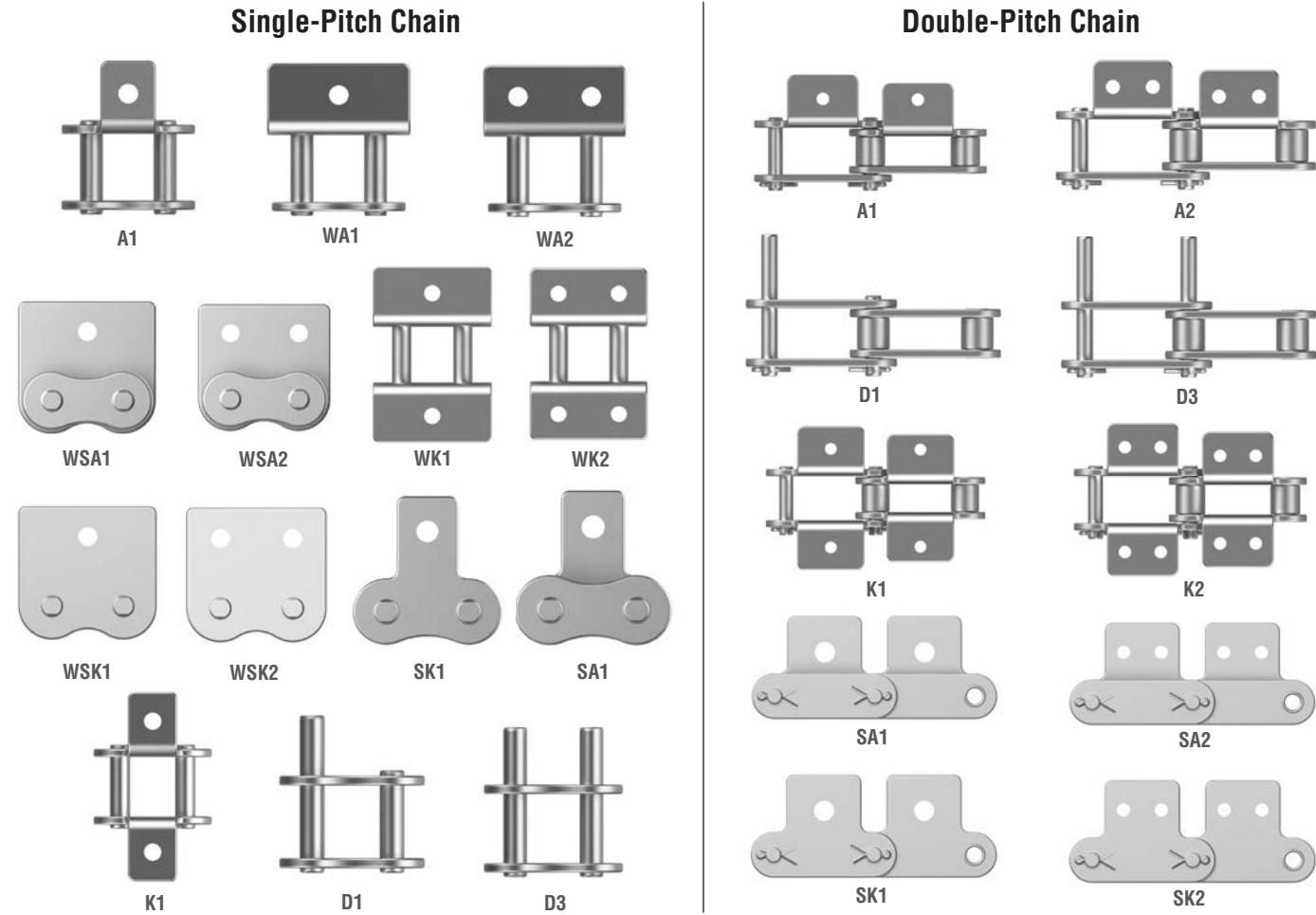
Tsubaki	Pitch	Roller Dia.	Width Between Roller Link Plates	Link Plate				Pin			Maximum Allowable Load*	Approx. Weight lbs/ft.	Color
Chain No.	P	R	W	T1	T2	H	h	D	L1	L2			
25PC	0.250	0.130	0.125	0.030	0.051	0.236	0.199	0.091	0.177	0.217	18	0.06	White
35PC	0.375	0.200	0.188	0.050	0.087	0.354	0.307	0.141	0.270	0.309	40	0.15	White
40PC	0.500	0.312	0.312	0.060	0.060	0.472	0.409	0.156	0.325	0.392	99	0.26	White
50PC	0.625	0.400	0.375	0.080	0.080	0.591	0.512	0.200	0.406	0.472	155	0.39	White
60PC	0.750	0.469	0.500	0.094	0.094	0.713	0.614	0.234	0.506	0.581	198	0.55	White

Additional Information

1. Offset links are not available for PC Chain.
2. Standard roller chain sprockets can be used with PC Chain.
3. Sizes 40 through 60 PC chain use standard "SS" series connecting links. Sizes 25 and 35 use special connecting links.
4. When replacing stainless steel chain with Poly-Steel chain, please check chain tension. Chain tension should be less than the maximum allowable load tension.
5. Ambient temperature range (-14°F - 176°F) (-10°C - 80°C).
6. Maximum chain speed: Less than 230 ft./min.
7. Coefficient of sliding friction between chain and guide rail is .25 (without lubrication).
8. The chain guide rail must support the bottom side of the links.
9. The color of the inner links is white.

CORROSION RESISTANT ATTACHMENTS

Tsubaki offers a complete line of attachments from stock to meet your conveying needs. The standard attachments Tsubaki stocks includes:



Attachments for Corrosion Resistant Applications

Tsubaki offers a complete line of attachments for the toughest Anti-Corrosion applications. From Neptune® and Nickel Plated to various types of stainless steel, Tsubaki has it all. Here is the nomenclature for ordering anti-corrosion attachment chain.

- Chain Size** 40
- Base Chain**
 - NEP = Neptune®
 - NP = Nickel Plated
 - AS = 600 Series Stainless Steel
 - SS = 304 Stainless Steel
 - NS = 316 Stainless Steel
 - SUPERSS = Super Stainless™

All dimensions for these attachments are standard as they are for carbon steel and can be found on pages 34-40 in the Attachment chain section.



Double Pitch Stainless Attachment



Single Pitch Neptune® Attachment

HARSH ENVIRONMENT CHAINS

The toughest and harshest operating conditions demand a roller chain that is built as tough as the environment it operates in. Titan® chain combines the best of Tsubaki's ANSI roller chain design with a hard-chrome plated pin and coated side plates. This combination makes Titan® chain ideal in the dirtiest and toughest applications where lubrication is difficult. Another extended-life chain solution from Tsubaki.



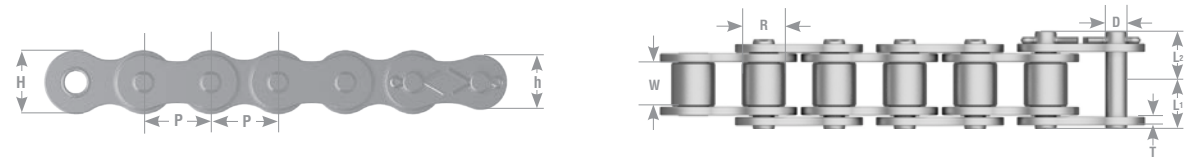
HARSH ENVIRONMENT CHAINS

Titan® Chain

Titan® Features Include:

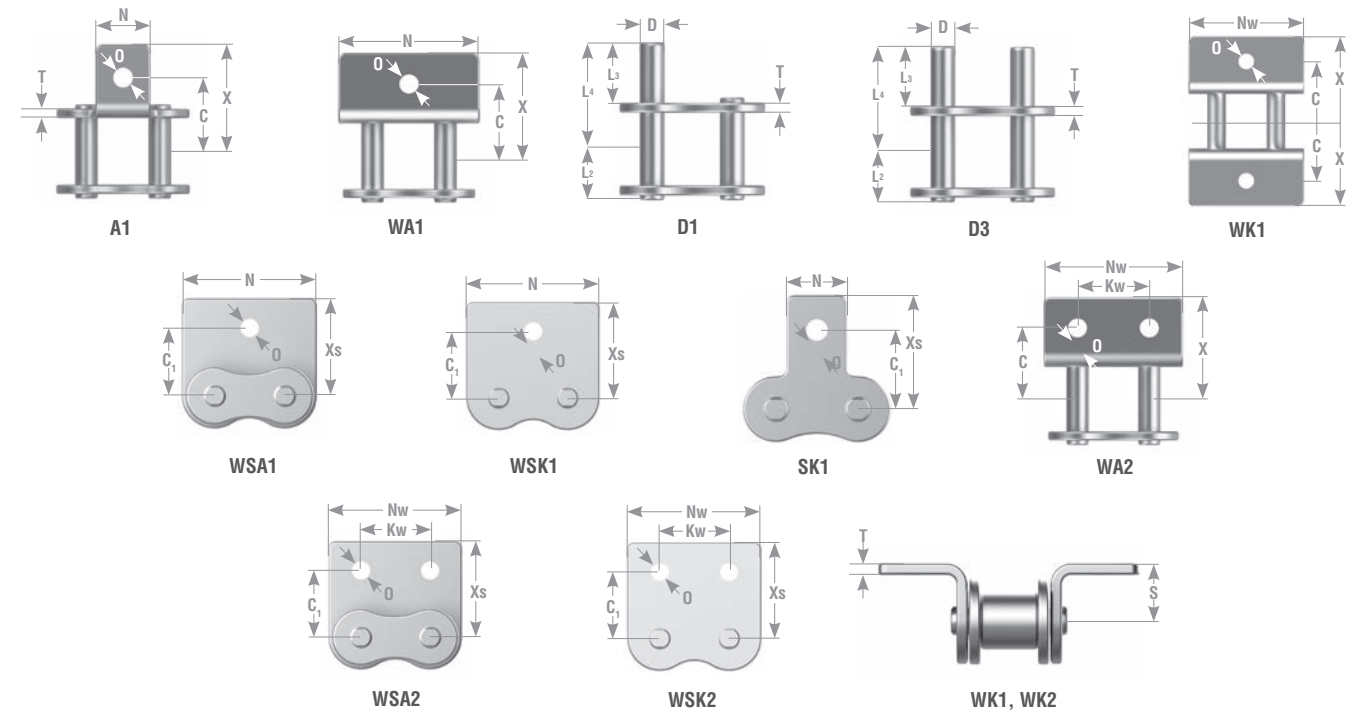
1. Custom engineered pins provide extended wear life and robust performance in high debris environments.
2. Special coated plates provide an additional layer of protection from corrosion.
3. Patented Tsubaki Performax™ lube-groove bushings — available in sizes 80-140.
4. Ring-coined connecting links to increase fatigue strength and durability in what used to be the weakest link in the chain.
5. Available in multi-strand, British Standard, and made-to-order chains as well.

TITAN®



Tsubaki Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin			Offset Pin L	Link Plate			Average Tensile Strength	Maximum Allowable Load*	Approx. Weight lbs/ft.
				D	L1	L2		T	H	h			
40TTRB	0.500	0.312	0.312	0.156	0.325	0.392	0.717	0.060	0.472	0.409	4,290	810	0.43
50TTRB	0.625	0.400	0.375	0.200	0.406	0.469	0.890	0.080	0.591	0.512	7,050	1,430	0.70
60TTRB	0.750	0.469	0.500	0.234	0.506	0.581	1.110	0.094	0.713	0.614	9,920	1,980	1.03
80TTRB	1.000	0.625	0.625	0.312	0.640	0.758	1.441	0.125	0.949	0.819	17,640	3,300	1.79
100TTRB	1.250	0.750	0.750	0.375	0.778	0.900	1.720	0.156	1.185	1.024	26,460	5,070	2.68
120TTRB	1.500	0.875	1.000	0.437	0.980	1.138	2.165	0.187	1.425	1.228	37,480	6,830	3.98
140TTRB	1.750	1.000	1.000	0.500	1.059	1.248	2.343	0.219	1.661	1.433	48,500	9,040	5.03
160TTRB	2.000	1.125	1.250	0.562	1.254	1.451	2.764	0.250	1.898	1.638	62,830	11,900	6.79
180TTRB	2.250	1.406	1.406	0.687	1.404	1.671	3.173	0.281	2.134	1.843	83,110	13,670	9.04
200TTRB	2.500	1.562	1.500	0.781	1.535	1.764	3.437	0.312	2.374	2.047	105,820	16,090	11.08
240TTRB	3.000	1.875	1.875	0.937	1.886	2.185	4.201	0.375	2.850	2.457	154,320	22,260	16.46

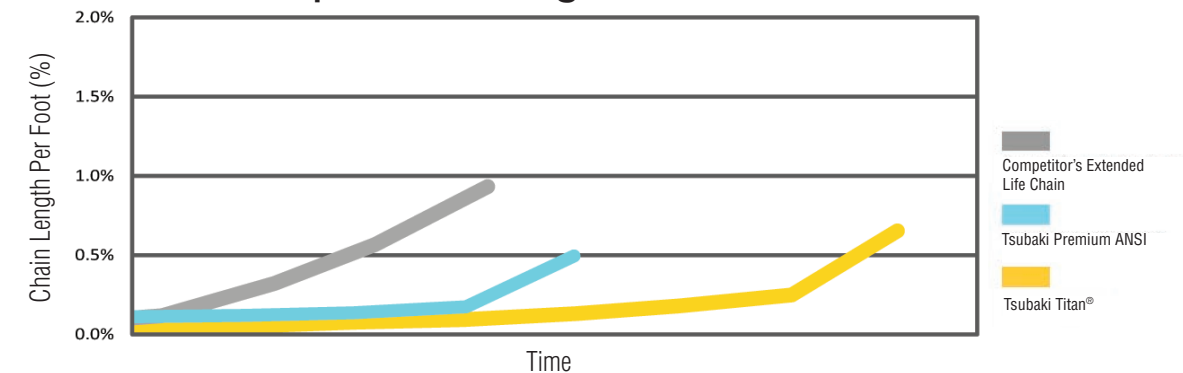
Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Sizes 40-60 Supplied with spring clip style connecting links. 80-240 come cottered style.



Tsubaki Chain No.	Attachment Dimension									Additional Weight Per Attachment		
	C	C1	N	O	S	X	Xs	L3	L4	A-SA	K-SK	D-1
35LRB▲	0.374	0.374	0.311	0.134	0.250	0.563	0.563	0.573	0.375	0.002	0.004	0.002
40LRB	0.500	0.500	0.374	0.141	0.315	0.701	0.701	0.685	0.375	0.004	0.008	0.002
50LRB	0.626	0.626	0.500	0.205	0.406	0.922	0.922	0.907	0.469	0.006	0.013	0.004
60LRB	0.750	0.720	0.626	0.205	0.469	1.110	1.110	1.057	0.563	0.015	0.030	0.006
80LRB	1.000	0.969	0.752	0.268	0.626	1.441	1.441	1.396	0.752	0.028	0.057	0.015
100LRB	1.250	1.252	1.000	0.343	0.780	1.768	1.768	1.732	0.937	0.057	0.114	0.026
120LRB	1.500	1.437	1.126	0.406	0.906	2.197	2.000	2.083	1.126	0.097	0.194	0.044
140LRB	1.752	1.752	1.374	0.469	1.126	2.484	2.252	2.500	1.311	0.156	0.313	0.066

Note: 1. "RB" designation indicates 10' box riveted. Cottered, cut-to-length and reel stock available upon request.
 2. Spring clip conn links for sizes 25-60, cotter style conn links 80-140.
 3. Rollerless.
 *4. Bushing Diameter.

Competitive Testing Wear Results

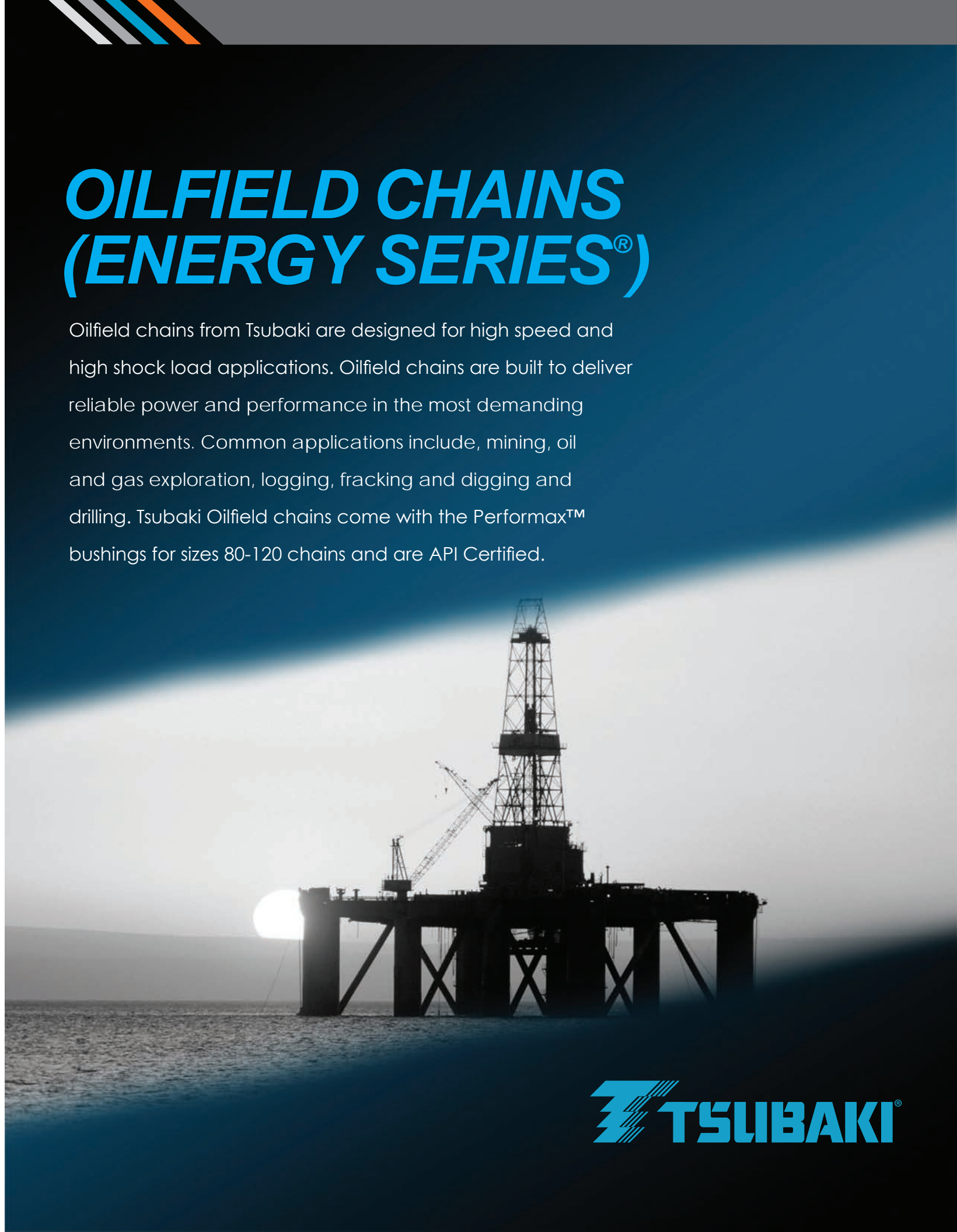


Results based on harsh environment operating conditions. For more information consult factory.

NOTES

OILFIELD CHAINS (ENERGY SERIES®)

Oilfield chains from Tsubaki are designed for high speed and high shock load applications. Oilfield chains are built to deliver reliable power and performance in the most demanding environments. Common applications include, mining, oil and gas exploration, logging, fracking and digging and drilling. Tsubaki Oilfield chains come with the Performax™ bushings for sizes 80-120 chains and are API Certified.



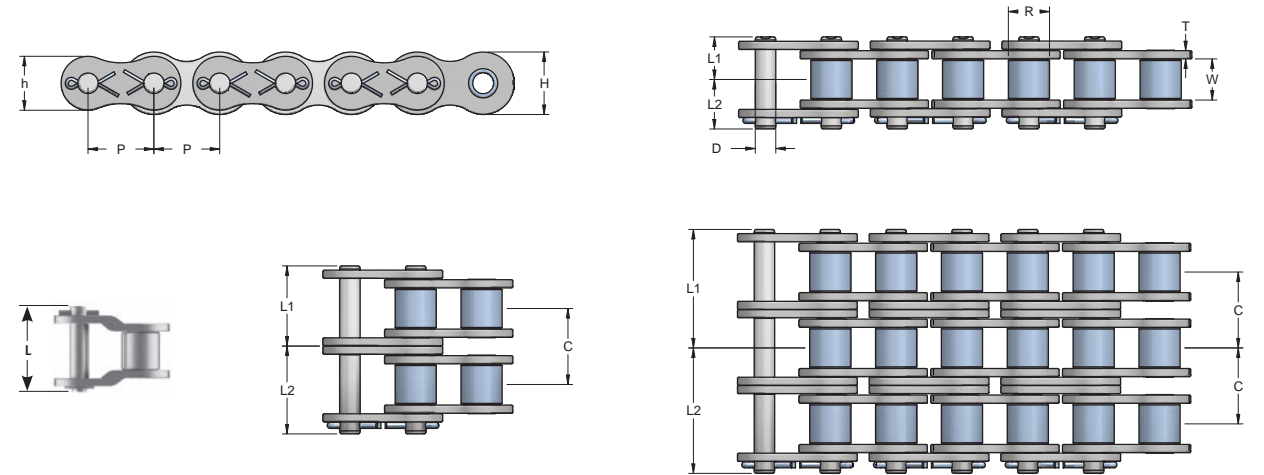
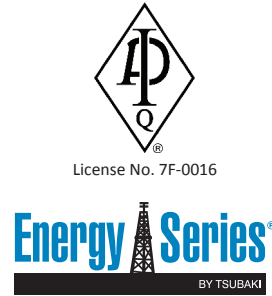
Energy Series®

BY TSUBAKI



Benefits:

- Stronger pins for longer chain life
- Ballized holes for improved fatigue strength
- Shot peened plates for maximum strength
- Performax™ bushings for sizes 80-120
- Special hot-dipping lube process to hold lube longer in the key wear areas



Single Strand Dimensions

Chain No.	Pitch	L1	L2	L	D	R	W	h	H	C	T	ATS*	WPF*
E80CB	1.00	0.640	0.758	1.398	0.312	0.625	0.625	0.819	0.949	1.153	0.125	17,600	1.79
E100CB	1.25	0.778	0.900	1.678	0.375	0.750	0.750	1.025	1.185	1.408	0.156	27,300	2.68
E120CB	1.50	0.980	1.138	2.118	0.437	0.875	1.000	1.228	1.425	1.789	0.187	39,700	3.98
E140CB	1.75	1.059	1.248	2.307	0.500	1.000	1.000	1.433	1.661	1.924	0.219	52,900	5.03
E160CB	2.00	1.254	1.451	2.705	0.562	1.125	1.250	1.638	1.898	2.305	0.250	68,300	6.79
E180CB	2.25	1.404	1.671	3.075	0.687	1.406	1.406	1.843	2.134	2.592	0.281	80,500	9.04
E200CB	2.50	1.535	1.764	3.299	0.781	1.562	1.500	2.047	2.374	2.817	0.312	105,800	11.08
E240CB	3.00	1.886	2.185	4.071	0.937	1.875	1.875	2.457	2.850	3.458	0.375	154,300	16.46
E80HCB	1.00	0.720	0.823	1.543	0.312	0.625	0.625	0.819	0.949	1.283	0.156	20,900	2.08
E100HCB	1.25	0.858	0.965	1.823	0.375	0.750	0.750	1.025	1.185	1.539	0.187	32,000	3.17
E120HCB	1.50	1.061	1.203	2.264	0.437	0.875	1.000	1.228	1.425	1.924	0.219	43,000	4.38
E140HCB	1.75	1.138	1.303	2.441	0.500	1.000	1.000	1.433	1.661	2.055	0.250	56,200	5.54
E160HCB	2.00	1.337	1.514	2.851	0.562	1.125	1.250	1.638	1.898	2.437	0.281	71,700	7.35
E180HCB	2.25	1.486	1.734	3.22	0.687	1.406	1.406	1.843	2.134	2.722	0.312	80,500	9.60
E200HCB	2.50	1.689	1.894	3.583	0.781	1.562	1.500	2.047	2.374	3.083	0.375	125,700	12.33
E240HCB	3.00	2.157	2.453	4.610	0.937	1.875	1.875	2.457	2.850	3.985	0.500	198,400	19.54

*Average Tensile Strength
*Weight Per Foot

Multi-Strand Dimensions

Double-Wide Strands					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-2CB	1.00	1.217	1.335	35,200	3.54
E100-2CB	1.25	1.482	1.604	54,600	5.27
E120-2CB	1.50	1.875	2.033	71,880	7.86
E140-2CB	1.75	2.021	2.210	94,370	9.97
E160-2CB	2.00	2.407	2.604	136,600	13.47
E180-2CB	2.25	2.700	2.967	161,000	17.82
E200-2CB	2.50	2.944	3.173	211,600	21.93
E240-2CB	3.00	3.615	3.914	308,600	32.32
E80H-2CB	1.00	1.362	1.465	41,800	4.15
E100H-2CB	1.25	1.628	1.735	64,000	6.07
E120H-2CB	1.50	2.023	2.165	71,880	8.67
E140H-2CB	1.75	2.166	2.331	94,370	11.01
E160H-2CB	2.00	2.556	2.733	143,400	14.64
E180H-2CB	2.25	2.847	3.095	161,000	19.20
E200H-2CB	2.50	3.231	3.436	207,260	24.51
E240H-2CB	3.00	4.150	4.446	304,280	38.47

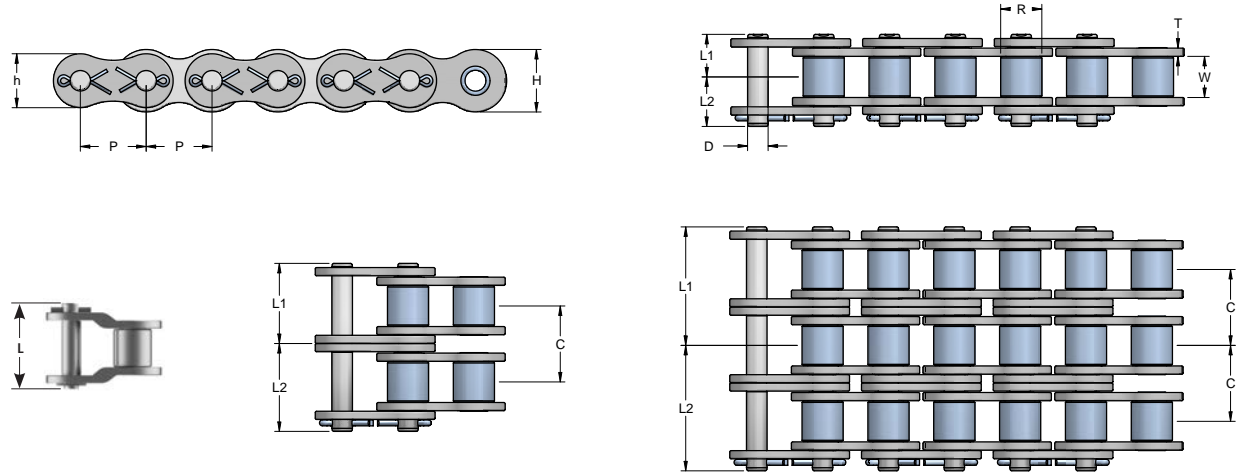
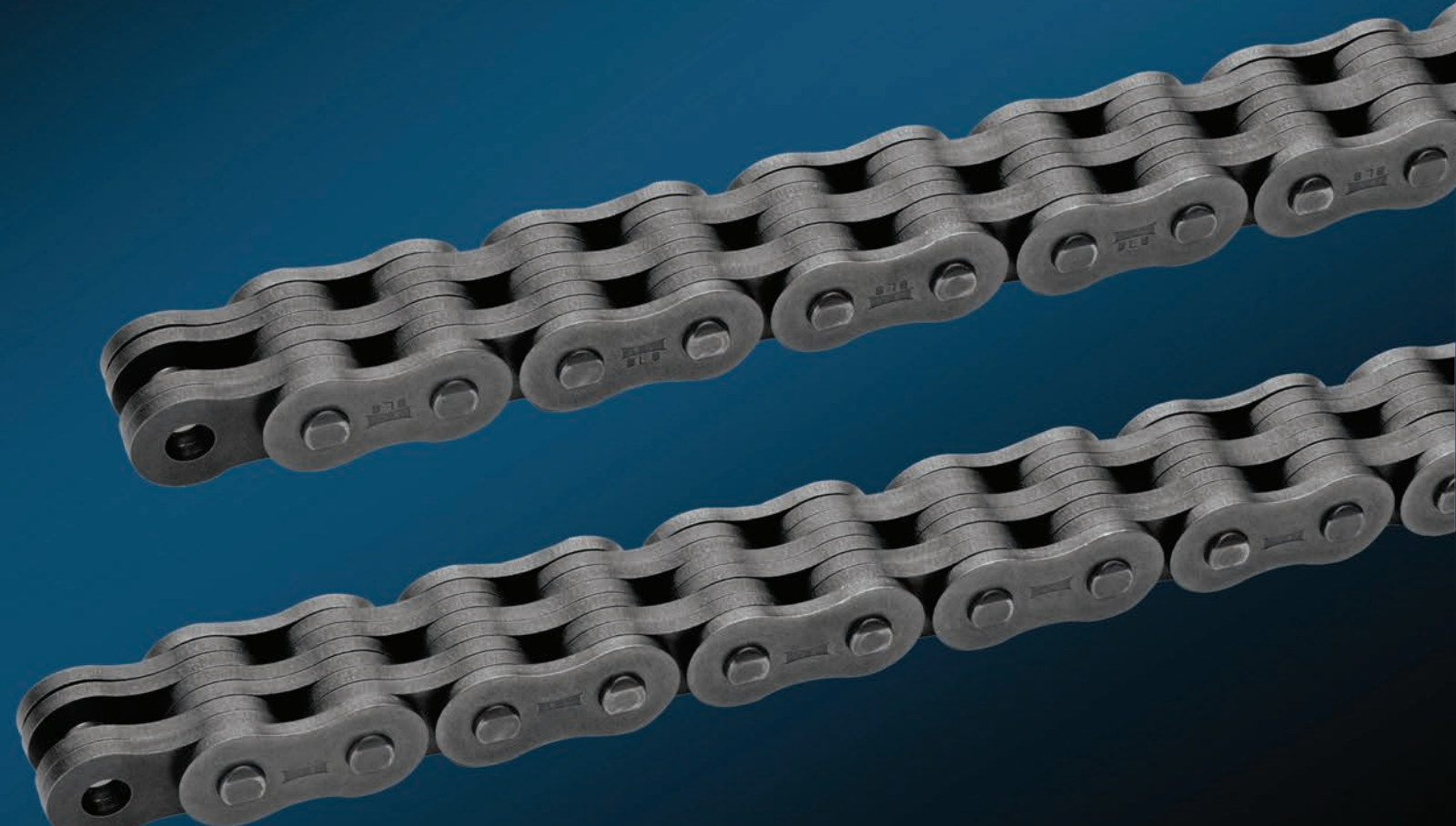
*Average Tensile Strength
*Weight Per Foot

Triple-Wide Strands					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-3CB	1.00	1.793	1.911	52,800	5.30
E100-3CB	1.25	2.186	2.308	81,900	7.91
E120-3CB	1.50	2.769	2.927	107,820	11.78
E140-3CB	1.75	2.983	3.172	141,550	14.92
E160-3CB	2.00	3.559	3.756	204,900	20.17
E180-3CB	2.25	3.996	4.263	241,500	25.68
E200-3CB	2.50	4.352	4.581	317,400	32.94
E240-3CB	3.00	5.344	5.643	462,900	48.11
E80H-3CB	1.00	2.003	2.106	62,700	6.21
E100H-3CB	1.25	2.397	2.504	96,000	9.10
E120H-3CB	1.50	2.985	3.127	107,820	12.99
E140H-3CB	1.75	3.193	3.358	141,550	16.48
E160H-3CB	2.00	3.774	3.951	215,100	21.93
E180H-3CB	2.25	4.208	4.456	241,500	28.80
E200H-3CB	2.50	4.772	4.977	310,890	36.81
E240H-3CB	3.00	6.142	6.438	456,420	57.33

OILFIELD CHAINS – MULTI-STRAND

LEAF CHAINS

Another segment of the Tsubaki chain product line is the full line of AL and BL Series leaf chains. When lifting applications require chains without rollers to carry to load, Tsubaki is there with the BL Series leaf chains. Tsubaki manufactures leaf chains from 1/2" pitch to 2-1/2" pitch in numerous lacing combinations. Please consult Tsubaki for the right Leaf Chain design needed to fit your application.



Multi-Strand Dimensions

4-Strand Wide					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-4CB	1.00	2.370	2.488	70,400	7.06
E100-4CB	1.25	2.890	3.012	109,200	10.55
E120-4CB	1.50	3.664	3.822	143,760	15.70
E140-4CB	1.75	3.945	4.134	188,740	19.16
E160-4CB	2.00	4.712	4.909	273,200	26.92
E180-4CB	2.25	5.292	5.559	322,000	34.20
E200-4CB	2.50	5.761	5.990	423,200	43.79
E240-4CB	3.00	7.073	7.372	617,200	63.90
E80H-4CB	1.00	2.645	2.748	83,600	8.27
E100H-4CB	1.25	3.167	3.274	128,000	12.13
E120H-4CB	1.50	3.947	4.089	143,760	17.31
E140H-4CB	1.75	4.221	4.386	188,730	21.95
E160H-4CB	2.00	4.993	5.170	286,800	29.22
E180H-4CB	2.25	5.569	5.817	322,000	38.40
E200H-4CB	2.50	6.314	6.519	502,800	49.11
E240H-4CB	3.00	8.135	8.431	793,600	76.19

5-Strand Wide					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-5CB	1.00	2.946	3.064	88,000	8.81
E100-5CB	1.25	3.594	3.716	136,500	13.12
E120-5CB	1.50	4.558	4.716	179,700	19.59
E140-5CB	1.75	4.907	5.096	235,920	24.84
E160-5CB	2.00	5.864	6.061	341,500	33.53
E180-5CB	2.25	6.588	6.855	402,500	42.73
E200-5CB	2.50	7.169	7.398	529,000	54.64
E240-5CB	3.00	8.802	9.101	771,500	79.70
E80H-5CB	1.00	3.286	3.389	104,500	10.33
E100H-5CB	1.25	3.936	4.043	160,000	15.16
E120H-5CB	1.50	4.909	5.051	179,700	21.63
E140H-5CB	1.75	5.248	5.413	235,910	27.42
E160H-5CB	2.00	6.211	6.388	358,500	36.51
E180H-5CB	2.25	6.930	7.178	402,500	48.00
E200H-5CB	2.50	7.855	8.06	628,500	61.41
E240H-5CB	3.00	10.127	10.423	992,000	95.05

6-Strand Wide					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-6CB	1.00	3.523	3.641	105,600	10.57
E100-6CB	1.25	4.298	4.420	163,800	15.78
E120-6CB	1.50	5.453	5.611	215,640	23.49
E140-6CB	1.75	5.869	6.058	283,110	29.77
E160-6CB	2.00	7.017	7.214	409,800	40.27
E180-6CB	2.25	7.884	8.151	483,000	51.25
E200-6CB	2.50	8.578	8.807	634,800	65.58
E240-6CB	3.00	10.531	10.830	925,800	95.49
E80H-6CB	1.00	3.928	4.031	125,400	12.39
E100H-6CB	1.25	4.706	4.813	192,000	18.19
E120H-6CB	1.50	5.871	6.013	215,640	25.95
E140H-6CB	1.75	6.276	6.441	283,090	32.89
E160H-6CB	2.00	7.430	7.607	430,200	43.80
E180H-6CB	2.25	8.291	8.539	483,000	57.60
E200H-6CB	2.50	9.397	9.602	754,200	73.71
E240H-6CB	3.00	12.12	12.416	1,190,400	113.91

8-Strand Wide					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-8CB	1.00	4.676	4.794	140,800	14.08
E100-8CB	1.25	5.706	5.828	218,400	21.01
E120-8CB	1.50	7.242	7.400	287,520	31.28
E140-8CB	1.75	7.793	7.982	377,490	40.38
E160-8CB	2.00	9.322	9.519	546,400	53.62
E180-8CB	2.25	10.476	10.743	644,000	68.30
E200-8CB	2.50	11.395	11.624	846,400	87.37
E240-8CB	3.00	13.989	14.288	1,234,400	127.08
E80H-8CB	1.00	5.211	5.314	167,200	16.51
E100H-8CB	1.25	6.245	6.352	256,000	24.25
E120H-8CB	1.50	7.795	7.937	287,520	34.59
E140H-8CB	1.75	8.331	8.496	377,450	43.83
E160H-8CB	2.00	9.867	10.044	573,600	58.38
E180H-8CB	2.25	11.013	11.261	644,000	76.80
E200H-8CB	2.50	12.480	12.685	1,005,600	98.31
E240H-8CB	3.00	16.105	16.401	1,587,200	151.63

10-Strand Wide					
Chain No.	Pitch	L1	L2	ATS*	WPF*
E80-10CB	1.00	5.829	5.947	176,000	17.59
E100-10CB	1.25	7.114	7.236	273,000	26.24
E120-10CB	1.50	9.031	9.189	359,400	39.07
E140-10CB	1.75	9.717	9.906	471,870	50.99
E160-10CB	2.00	11.627	11.824	683,000	66.97
E180-10CB	2.25	13.068	13.335	805,000	85.35
E200-10CB	2.50	14.212	14.441	1,058,000	109.16
E240-10CB	3.00	—	—	—	—
E80H-10CB	1.00	6.494	6.597	209,000	20.63
E100H-10CB	1.25	7.784	7.891	320,000	30.31
E120H-10CB	1.50	9.719	9.861	359,400	43.23
E140H-10CB	1.75	10.386	10.551	471,810	54.77
E160H-10CB	2.00	12.304	12.481	717,000	72.96
E180H-10CB	2.25	13.735	13.983	805,000	96.00
E200H-10CB	2.50	15.563	15.768	1,257,000	122.91
E240H-10CB	3.00	—	—	—	—

*Average Tensile Strength
*Weight Per Foot



BL Series chains are a heavier version of leaf chain that has, in most cases, replaced the AL series leaf chains. BL chains are manufactured with a larger pin and larger plate to comparable AL series chains. Tsubaki offers both AL and BL series leaf chains.



Step 1:

From the application table listed below, determine the chain type and service factor.

Application Table

Type of Chain	Shock	Applications	Service Factor	Chain Speed ft./Min.
AL Series	Moderate	Suspension of counterweights	1.0	Less than 100
AL & BL Series		Fork lift	1.3	
BL Series	Heavy	Mining machinery Construction equipment	1.5	

Step 2:

Multiply the required working load by the service factor and safety factor below to obtain the design tensile strength.

Safety Factor

Type of Chain	Safety Factor	Chain Speed Ft./Min.	Service Factor	Maximum Number of Reciprocations
AL Series	12	Less than 100	1.0	Less than 100 per day
BL Series	9	Less than 100	1.3	Less than 1,000 per day

Step 3:

From the chain list, select a chain having a tensile strength not less than obtained in step 2.

Working Load	X	Service Factor	X	Safety Factor	≤	Minimum Tensile Strength
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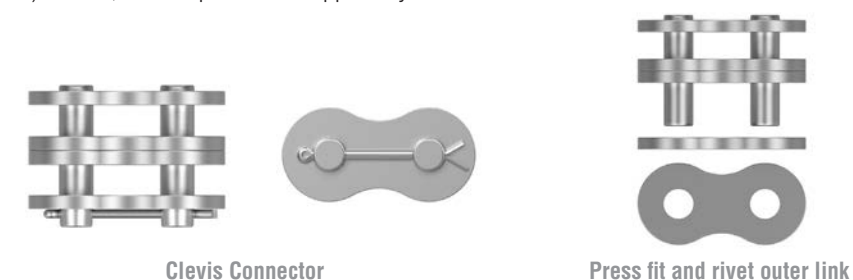
*Working Load including weights of attachments, inertia force and impact force.

When ordering, specify your requirements:

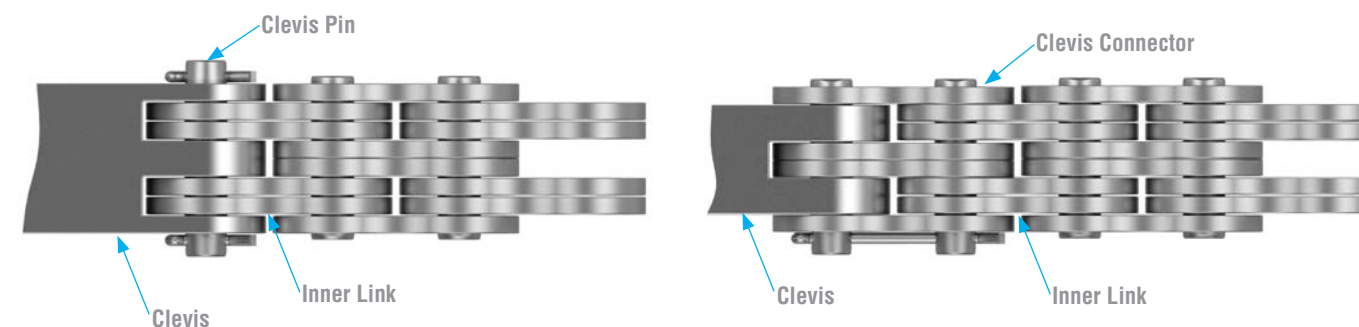
- For odd numbers of pitches, inner links (male ends) will be provided.
- Clevis connector or press fit rivet outer links are both available in popular sizes.

Connection with Clevis:

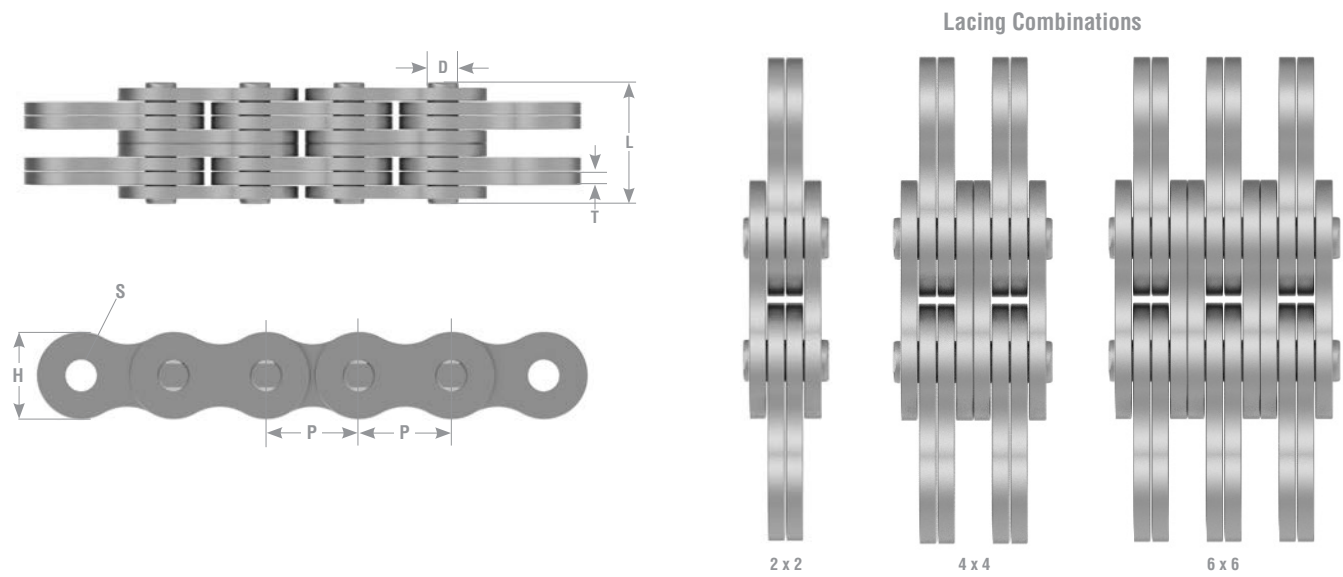
1: When an inner link (male end) is used, a clevis pin will be supplied by the clevis manufacturer.



2: When an outer link (female end) is used, the press fit outer link provides the most integrity.



AL SERIES



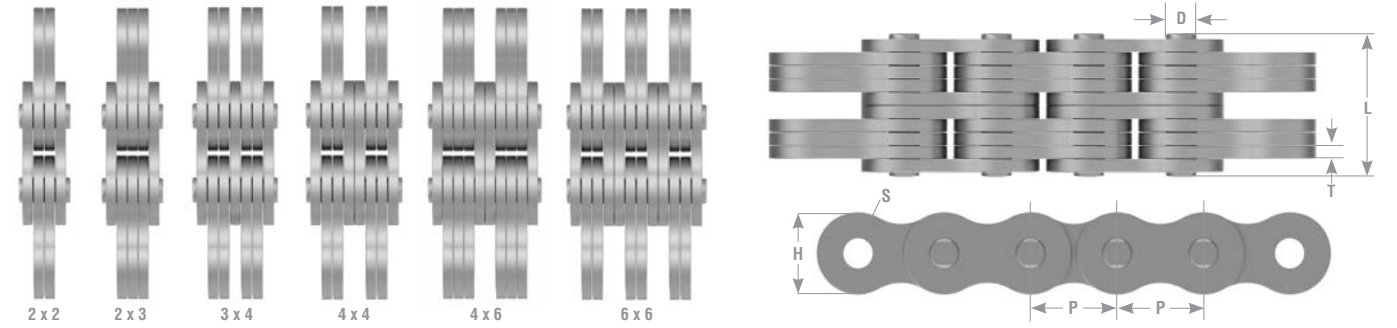
Tsubaki Chain No.	Pitch P	Lacing	Min. Tensile Strength lbs.	Pin		Link Plate		Hole Diameter (Min.) S	Approx. Weight lbs/ft.
				D	L	T	H		
AL422	0.500	2x2	3,700	0.156	0.331	0.060	0.409	0.1578	0.25
AL444	0.500	4x4	7,500	0.156	0.585	0.060	0.409		0.50
AL466	0.500	6x6	11,200	0.156	0.839	0.060	0.409		0.74
AL522	0.625	2x2	6,200	0.200	0.427	0.080	0.512	0.2019	0.42
AL544	0.625	4x4	12,300	0.200	0.762	0.080	0.512		0.82
AL566	0.625	6x6	18,500	0.200	1.094	0.080	0.512		1.21
AL622	0.750	2x2	8,600	0.234	0.498	0.094	0.614	0.2362	0.58
AL644	0.750	4x4	17,200	0.234	0.888	0.094	0.614		1.15
AL666	0.750	6x6	25,800	0.234	1.278	0.094	0.614		1.70
AL822	1.000	2x2	14,600	0.311	0.644	0.125	0.819	0.3138	1.01
AL844	1.000	4x4	29,100	0.311	1.173	0.125	0.819		2.00
AL866	1.000	6x6	43,600	0.311	1.701	0.125	0.819		2.97
AL1022	1.250	2x2	22,000	0.373	0.789	0.156	1.024	0.3768	1.80
AL1044	1.250	4x4	44,000	0.373	1.445	0.156	1.024		3.56
AL1066	1.250	6x6	66,000	0.373	2.098	0.156	1.024		5.31
AL1222	1.500	2x2	31,700	0.437	0.953	0.187	1.228	0.4386	2.39
AL1244	1.500	4x4	63,400	0.437	1.732	0.187	1.228		4.75
AL1266	1.500	6x6	95,000	0.437	2.514	0.187	1.228		7.07
AL1444	1.750	4x4	83,600	0.500	2.020	0.219	1.433	0.5016	6.95
AL1466	1.750	6x6	125,400	0.500	2.935	0.219	1.433		10.18
AL1644	2.000	4x4	105,800	0.562	2.285	0.250	1.638		0.5638
AL1666	2.000	6x6	158,000	0.562	3.325	0.250	1.638	13.00	

Non-Standard Chain

Tsubaki Chain No.	Pitch P	Lacing	Min. Tensile Strength lbs.	Pin		Link Plate		Hole Diameter (Min.) S	Approx. Weight lbs/ft.
				D	L	T	H		
BL523 (6H-5)	0.625	3x2	7,000	0.187	0.583	0.094	0.590	0.189	0.790

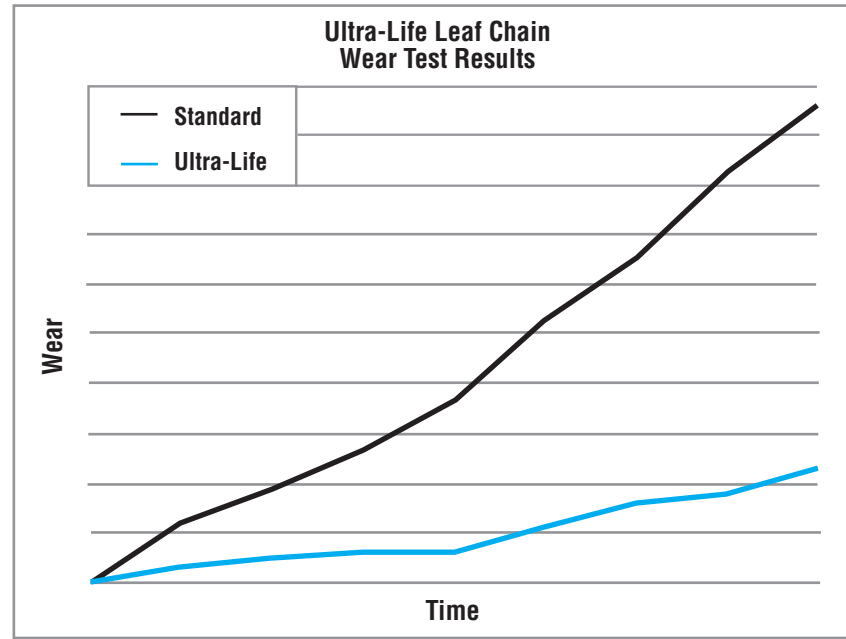
Note - BL532 is only available as a replacement chain and should not be specified for new applications or designs.

BL SERIES



Tsubaki Chain No.	Pitch P	Lacing	Min. Tensile Strength (Lbs)	ASME Min. Tensile Strength (Lbs)	Pin L	Pin D	Link Plate T	Link Plate H	Hole Dia. (Min.) S	Approx. Weight lbs/70ft.
BL422	0.500	2x2	5,300	5,000	0.427	0.200	0.080	0.472	0.202	0.46
BL423	0.500	2x3	5,300	5,000	0.510					0.56
BL434	0.500	3x4	7,900	7,500	0.677					0.76
BL444	0.500	4x4	10,600	10,000	0.764					0.86
BL446	0.500	4x6	10,600	10,000	0.929					1.11
BL466	0.500	6x6	15,600	15,000	1.094					1.32
BL522	0.625	2x2	8,800	7,500	0.498	0.234	0.094	0.591	0.236	0.72
BL523	0.625	2x3	8,800	7,500	0.594					0.85
BL534	0.625	3x4	13,200	11,000	0.791					1.14
BL544	0.625	4x4	17,600	15,000	0.888					1.27
BL546	0.625	4x6	17,600	15,000	1.083					1.61
BL566	0.625	6x6	26,400	22,500	1.278					1.88
BL622	0.750	2x2	14,300	11,000	0.645	0.312	0.125	0.713	0.314	1.13
BL623	0.750	2x3	14,300	11,000	0.778					1.37
BL634	0.750	3x4	21,500	17,000	1.041					1.90
BL644	0.750	4x4	28,500	22,000	1.173					2.14
BL646	0.750	4x6	28,500	22,000	1.437					2.69
BL666	0.750	6x6	43,000	33,000	1.701					3.18
BL822	1.000	2x2	23,100	19,000	0.794	0.375	0.156	0.949	0.377	1.74
BL823	1.000	2x3	23,100	19,000	0.953					2.15
BL834	1.000	3x4	34,800	29,000	1.281					2.98
BL844	1.000	4x4	46,200	38,000	1.453					3.39
BL846	1.000	4x6	46,200	38,000	1.772					4.25
BL866	1.000	6x6	69,500	57,000	2.098					5.07
BL1023	1.250	2x3	31,700	26,000	1.134	0.437	0.187	1.185	0.439	3.15
BL1034	1.250	3x4	48,500	41,000	1.529					4.40
BL1044	1.250	4x4	63,400	52,000	1.732					5.03
BL1046	1.250	4x6	63,400	52,000	2.114					6.24
BL1066	1.250	6x6	95,200	78,000	2.514					7.50
BL1222	1.500	2x2	41,800	34,000	1.106					0.500
BL1223	1.500	2x3	41,800	34,000	1.335	4.39				
BL1234	1.500	3x4	67,200	55,000	1.791	6.11				
BL1244	1.500	4x4	83,600	68,000	2.020	6.98				
BL1246	1.500	4x6	83,600	68,000	2.478	8.07				
BL1266	1.500	6x6	125,600	102,000	2.935	9.80				
BL1422	1.750	2x2	52,900	43,000	1.244	0.562	0.250	1.661	0.564	4.91
BL1423	1.750	2x3	52,900	43,000	1.504					6.09
BL1434	1.750	3x4	87,000	71,010	2.024					7.61
BL1444	1.750	4x4	105,800	86,000	2.285					8.71
BL1446	1.750	4x6	105,800	86,000	2.805					12.10
BL1466	1.750	6x6	158,700	130,000	3.325					15.13
BL1622	2.000	2x2	79,300	65,000	1.405	0.687	0.281	1.898	0.689	6.61
BL1623	2.000	2x3	79,300	65,000	1.703					8.17
BL1634	2.000	3x4	124,500	99,000	2.299					11.39
BL1644	2.000	4x4	158,600	130,000	2.598					12.75
BL1646	2.000	4x6	158,600	130,000	3.191					16.19
BL1666	2.000	6x6	237,900	195,000	3.785					19.31
BL1688	2.000	6x8	317,200	260,000	4.764	27.41				
BL2022	2.500	2x2	119,000	97,500	1.887	0.937	0.375	2.374	0.939	9.70
BL2023	2.500	2x3	119,000	97,500	2.280					12.06
BL2034	2.500	3x4	178,800	146,000	3.064					16.77
BL2044	2.500	4x4	238,500	195,000	3.456					19.12
BL2046	2.500	4x6	238,500	195,000	4.240					23.81
BL2066	2.500	6x6	357,800	292,500	5.044					28.23

ULTRA-LIFE SERIES LEAF CHAIN



- Premium Ultra-Life (UL) Leaf Chain
 - Up to 4X wear life vs. standard BL chain
 - Extended replacement / maintenance intervals
 - Available sizes: BL12 through BL16, all standard lacings
 - Specially hardened components for ultra wear life
- Standard BL Series dimensions
 - Part Number:
 - (BL) – BL Series Chain
 - (12 or 16) – Size and lacing
 - (UL) Ultra-Life



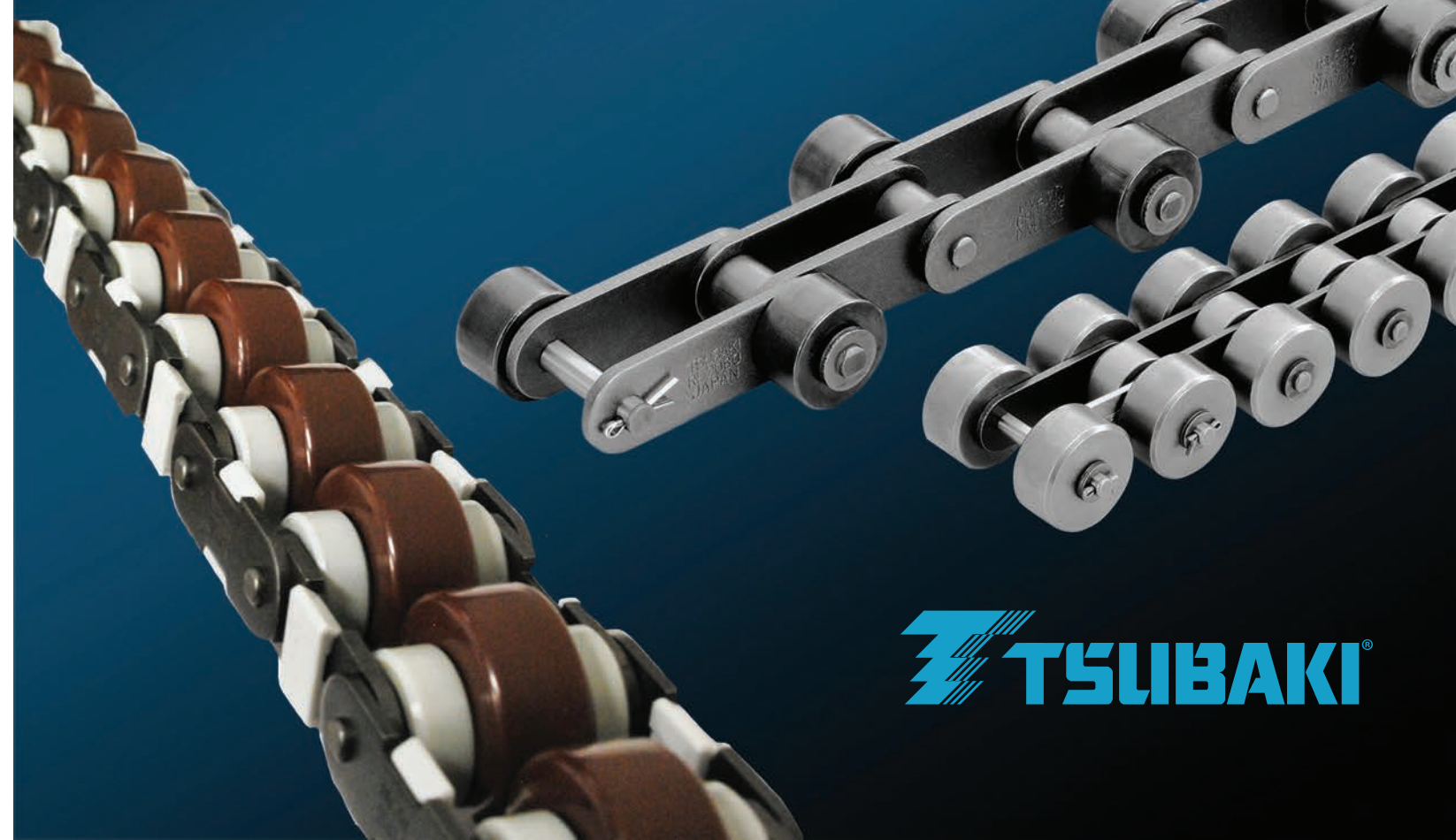
Engineered to maximize bearing area and wear life



Specially coated plates for additional corrosion resistance

FREE FLOW & TOP CHAINS

Along with a complete line of roller chains and specialty chains, Tsubaki manufactures a complete line of Free Flow and Top chains for the most demanding applications. Tsubaki Free Flow chains are maintenance free and operate quietly. Free Flow chains are designed to accumulate objects freely without indexing the conveyor. Tsubaki also offers a complete line of steel, stainless steel and plastic Top Chains as well as outboard roller, top roller, plastic chains and roller table chains.





Double Plus®



Plastic Chain



Top Plate Chain



Top Roller Chain



Outboard Roller

Tsubaki has developed the most advanced chains for Free Flow conveyors.

Tsubaki Free Flow chains have numerous advantages including:

- Maintenance-free, long life
- Economical
- Quiet operation
- Clean and anti-corrosive
- Wide selection

A Free Flow conveyor is a system where the speed of the conveyed objects can be freely controlled and stopped at any time and at any position for accumulation, or for indexing without stopping the conveyor.

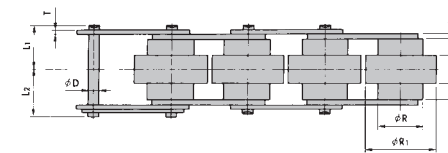
Many of the Free Flow items Tsubaki offers include:

- Double Plus® complete systems
- Outboard roller chains – with plastic and steel rollers.
- Top Roller chains – steel or plastic rollers
- Complete line of Top Chains
- Full line of plastic chains
- Cross rod, and roller table chains
- All above listed chains available in anti-corrosion and lube-free offerings.

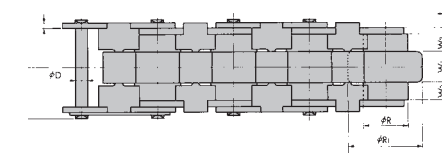
Choose the right rollers for your operation

Series	Color: Feature:	Size of Roller		Series Benefits
		Small	Large	
A	Color: Feature:	Gray Standard	Brown Standard	Maximum Allowable Tension
B	Color: Feature:	Off-White High-friction Plastic	Brown Standard	Quick Start-up
C	Color: Feature:	Gray Standard	Black Electro-conductive plastic	Volume Resistivity of $10^6 \Omega \times \text{cm}$
D	Color: Feature:	Off-white High-friction plastic	Black Electro-conductive plastic	Quick Start-up and Volume Resistivity of $10^6 \Omega \times \text{cm}$

In addition to carbon steel, Double-Plus® chain is available in Titan®, Neptune® and stainless steel.



Standard DOUBLE PLUS® CHAIN



DOUBLE PLUS® CHAIN with SNAP COVERS

Note: For Double Plus® chain with snap covers

- The base chains are specialized for snap covers
- Snap Covers cannot be attached to standard Double Plus® chain
- Offset links are not available for Double Plus® with snap covers

Double Plus Chain®

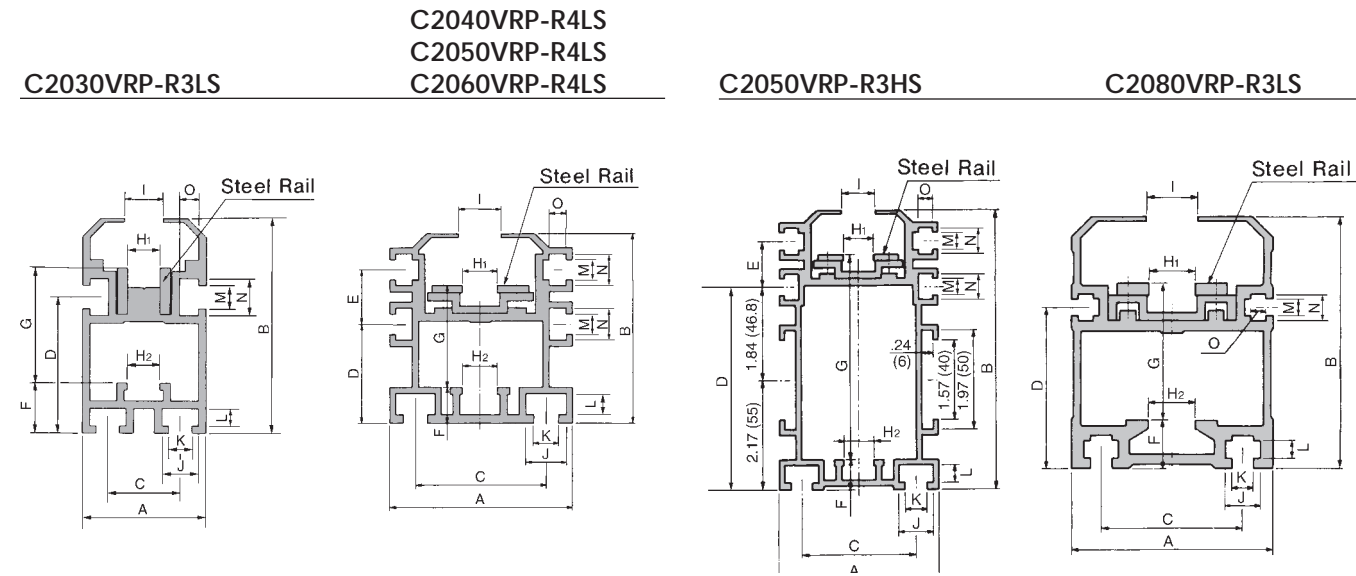
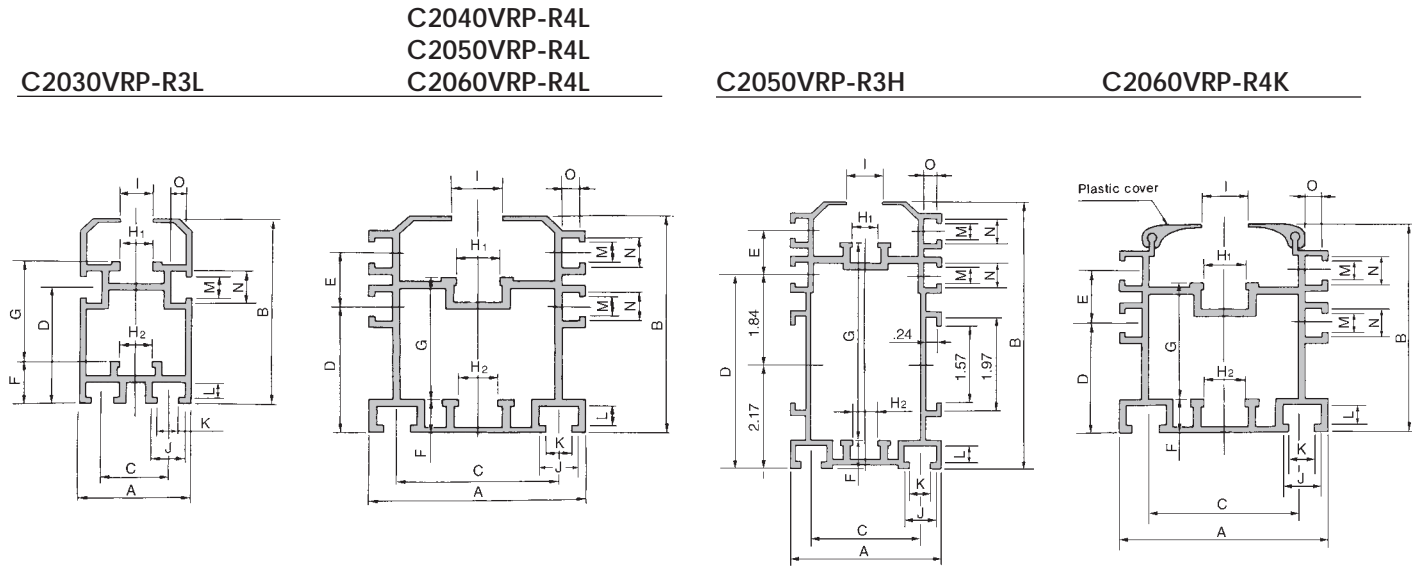
Chain No.		P	R	R1	W1	W2	t	T	H	D	L1	L2	Approx. Weight lbs/ft.
Steel Roller	Snap Covers												Steel Rollers
C2030VR	C2030VR-SC	0.750	0.469	0.720	0.315	0.157	0.060	0.060	0.354	0.141	0.474	0.522	0.94
C2040VR	C2040VR-SC	1.000	0.625	0.969	0.406	0.224	0.080	0.060	0.472	0.156	0.622	0.669	1.68
C2050VR	C2050VR-SC	1.250	0.750	1.205	0.512	0.280	0.094	0.080	0.591	0.200	0.770	0.837	2.49
C2060VR	C2060VR-SC	1.500	0.875	1.441	0.610	0.335	0.125	0.125	0.677	0.234	0.964	1.039	3.76
C2080VR	C2080VR-SC	2.000	1.125	1.890	0.787	0.591	0.156	0.156	0.906	0.312	1.409	1.496	
Plastic Roller	Snap Covers												Plastic Rollers
C2030VRP	C2030VRP-SC	0.750	0.469	0.720	0.315	0.157	0.060	0.060	0.354	0.141	0.474	0.522	0.40
C2040VRP	C2040VRP-SC	1.000	0.625	0.969	0.406	0.224	0.080	0.060	0.472	0.156	0.622	0.669	0.67
C2050VRP	C2050VRP-SC	1.250	0.750	1.205	0.512	0.280	0.094	0.080	0.591	0.200	0.770	0.837	0.94
C2060VRP	C2060VRP-SC	1.500	0.875	1.441	0.610	0.335	0.125	0.125	0.677	0.234	0.964	1.039	1.34
C2080VRP	C2080VRP-SC	2.000	1.125	1.890	0.787	0.591	0.156	0.156	0.906	0.312	1.409	1.496	2.62

- Note:
1. Steel Roller type (VR series) is available for temp range 14°F - 302°F.
 2. Plastic roller type (VRP Series) is available for temp range 14°F - 140°F.
 3. C2080VRP has a cottered connecting link.

Sprockets for Double Plus® Chain (For Double Plus® VR, VRP, VR-SC, VRP-SC)

Sprocket No.	Hub Type	No. of Teeth	Pitch Dia.	Outer Dia.	Tooth Thickness	Stock Bore	Hub Dia	Hub Length	Approx. Weight lbs/ft.
C2030VRP-10T-SC	B	10	2.427	2.480	0.118	0.500	1.457	0.984	0.602
C2040VRP-10T-SC	B	10	3.236	3.346	0.157	0.630	2.047	1.575	0.803
C2050VRP-10T-SC	B	10	4.045	4.213	0.197	0.630	2.598	1.772	1.004
C2060VRP-10T-SC	B	10	4.854	5.039	0.236	0.748	3.189	1.969	1.201
C2080VRP-10T-SC	B	10	6.472	6.772	0.472	0.906	4.331	2.638	1.870

DOUBLE PLUS® GUIDE RAILS

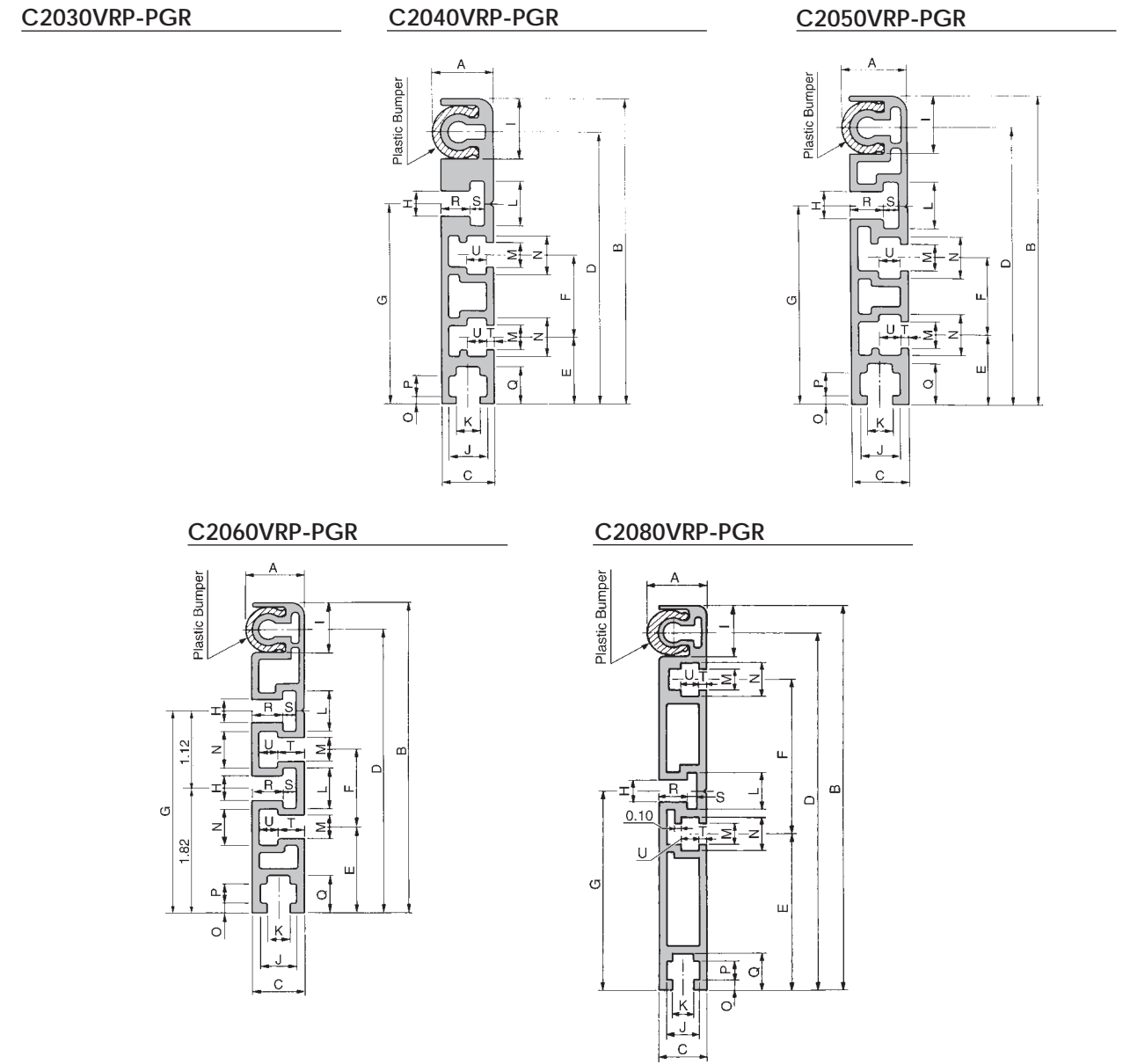


Aluminum Guide Rail Dimensional Data - standard and Steel Insert Styles (Includes VR, VRP, and Snap Cover Styles)

Guide Rail No.	A	B	C	D	E	F	G	H1	H2	I	J	K	L	M	N	O	Standard Length (FT)	Approx Weight Lbs/Ft
C2030VRP-R3L	1.38	2.36	0.807	1.494		0.550	1.268	0.350	0.366	0.390	0.413	0.256	0.197	0.256	0.413	0.197	9.84	0.94
C2030VRP-R3LS	1.38	2.36	0.807	1.494		0.550	1.268	0.350	0.366	0.390	0.413	0.256	0.197	0.256	0.413	0.197	9.84	1.48
C2040VRP-R4L	2.48	2.60	1.752	1.388	0.728	0.510	1.374	0.449	0.472	0.531	0.531	0.335	0.295	0.256	0.413	0.197	13.12	1.75
C2040VRP-R4LS	2.48	2.60	1.752	1.388	0.728	0.510	1.374	0.449	0.472	0.531	0.531	0.335	0.295	0.256	0.413	0.197	13.12	2.49
C2050VRP-R4L	3.07	3.15	2.185	1.644	0.906	0.590	1.669	0.560	0.590	0.650	0.689	0.413	0.35	0.335	0.531	0.295	13.12	2.42
C2050VRP-R4LS	3.07	3.15	2.185	1.644	0.906	0.590	1.693	0.560	0.590	0.650	0.689	0.413	0.35	0.335	0.531	0.295	13.12	3.36
C2050VRP-R3H	3.15	5.51	2.260	4.010	0.906	0.590	4.060	0.560	0.590	0.650	0.689	0.413	0.35	0.335	0.531	0.295	9.84	3.36
C2050VRP-R3HS	3.15	5.51	2.260	4.010	0.906	0.590	4.060	0.560	0.590	0.650	0.689	0.413	0.35	0.335	0.531	0.295	9.84	4.23
C2060VRP-R4L	3.74	3.58	2.854	2.018	0.925	0.590	1.988	0.677	0.709	0.768	0.689	0.413	0.354	0.335	0.531	0.295	13.12	2.82
C2060VRP-R4LS	3.74	3.58	2.854	2.018	0.925	0.590	1.988	0.677	0.709	0.768	0.689	0.413	0.354	0.335	0.531	0.295	13.12	3.96
C2060VRP-R4K	3.74	3.58	2.854	1.821	0.925	0.590	1.988	0.677	0.709	0.768	0.689	0.413	0.354	0.335	0.531	0.295	13.12	2.69
C2080VRP-R3LS	3.94	4.92	2.760	3.150	0.470	0.940	2.680	0.910	0.910	0.980	0.689	0.413	0.35	0.335	0.531	0.295	9.84	6.65

Steel inserts are fixed to the inside of the frame.

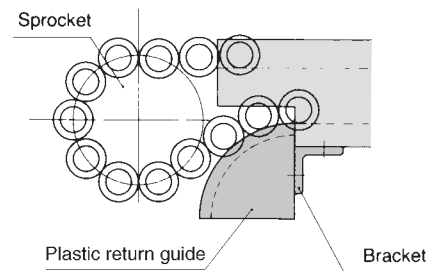
PALLET GUIDE RAILS



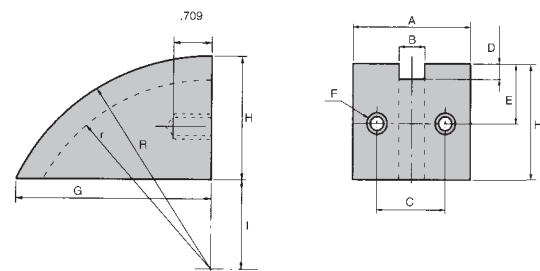
Pallet Guide Rail Dimensional Data

Guide Rail No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	S	T	U	Standard Length	Approx. Weight
C2030VRP-PGR	0.60	2.89	0.49	2.51	1.02	0.94	1.50	0.280	0.70	0.33	0.22	0.47	0.22	0.33	0.08	0.37	0.18	0.24		0.20	9.84	0.60
C2040VRP-PGR	0.68	3.27	0.57	2.88	0.71	0.87	2.12	0.280	0.71	0.41	0.26	0.47	0.26	0.41	0.08	0.39	0.26	0.22	0.08	0.22	13.12	1.00
C2050VRP-PGR	0.88	3.94	0.77	3.50	0.91	0.98	2.55	0.350	0.81	0.53	0.33	0.59	0.33	0.53	0.12	0.53	0.45	0.20	0.10	0.30	13.12	1.50
C2060VRP-PGR	0.88	4.57	0.77	4.13	1.26	1.12	2.40	0.350	0.81	0.53	0.33	0.59	0.33	0.53	0.14	0.55	0.45	0.20	0.39	0.28	13.12	1.70
C2080VRP-PGR	0.88	6.10	0.77	5.67	2.46	2.46	3.15	0.350	0.81	0.53	0.33	0.59	0.33	0.53	0.16	0.57	0.45	0.16	0.12	0.30	9.84	2.40

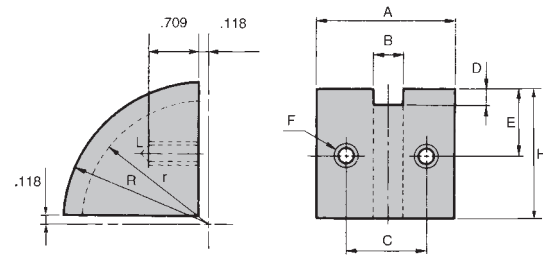
Plastic bumpers must be ordered separately.



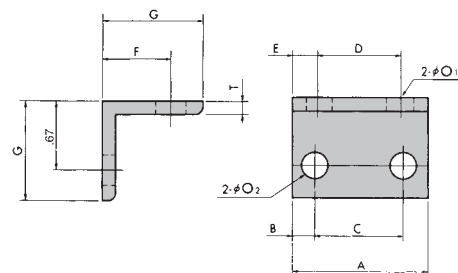
Plastic Return Guides and Brackets



Plastic Return Guides for DOUBLE PLUS® with Snap Covers



Plastic Return Guides



Bracket

Plastic Return Guide Dimensional Data

Guide No.	A	B	C	D	E	F	G	H	I	r	R
C2030VRP-RG	1.34	0.35	0.87	0.24	1.22	M6		2.24		2.13	2.6
C2040VRP-RG	1.97	0.47	1.18	0.31	1.18	M8		2.24		2.05	2.36
C2050VRP-RG	2.20	0.59	1.38	0.39	1.26	M8		2.24		1.97	2.36
C2050VRP-RG-SC	2.20	0.59	1.38	0.39	1.26	M8	3.56	2.24	1.69	3.54	3.94
C2060VRP-RG	2.36	0.71	1.54	0.49	1.26	M8		2.24		1.87	2.36
C2060VRP-RG-SC	2.36	0.71	1.54	0.49	1.26	M8	3.56	2.24	1.69	3.44	3.94
C2080VRP-RG	2.76	0.91	1.77	0.59	1.61	M8		3.03		2.56	3.15
C2080VRP-RG-SC	2.76	0.91	1.77	0.59	1.61	M8	5.5	3.03	3.46	5.91	6.5

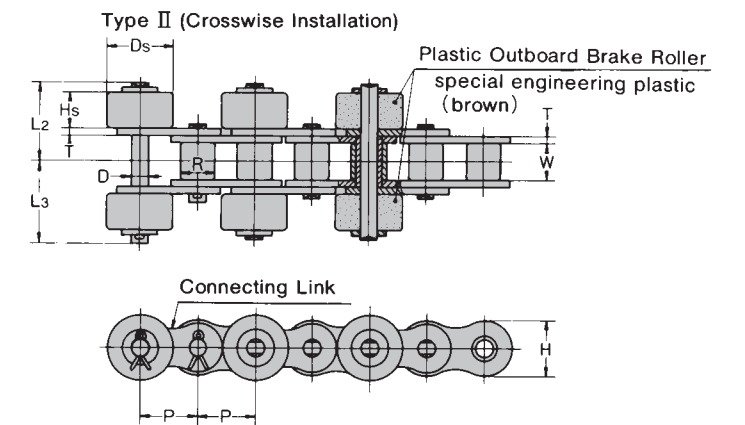
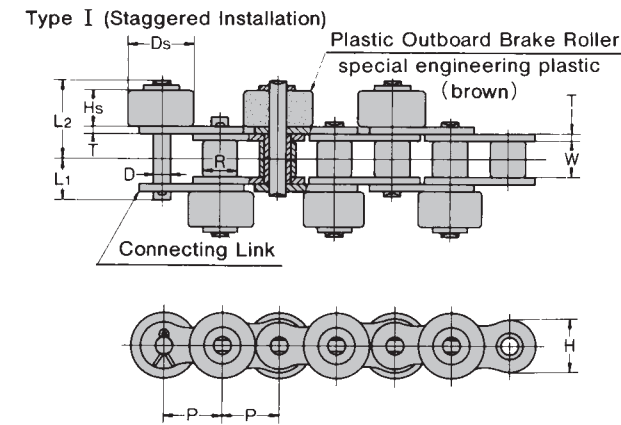
Note: Specify SC type for use with Snap Cover Double Plus®.
For chain sizes C2030VRP-SC and C2040VRP-SC, use standard plastic return guide.

Bracket Dimensional Data

Chain No.	A	B	C	D	E	F	G	Ø1	Ø2	T	Mounting Bolt Size
C2030VRP-GB	1.34	0.236	0.87	0.807	0.26	0.71	0.98	0.256	0.256	0.12	M6 X 20
C2040VRP-GB	2.36	0.591	1.18	1.752	0.30	0.79	1.18	0.335	0.335	0.12	M8 X 20
C2050VRP-GB	2.99	0.807	1.38	2.185	0.40	0.94	1.38	0.413	0.335	0.16	M8 X 20
C2060VRP-GB	3.70	1.083	1.54	2.854	0.42	0.94	1.38	0.413	0.335	0.16	M8 X 20
C2080VRP-GB	3.94	1.083	1.77	2.756	0.59	0.94	1.38	0.413	0.335	0.16	M8 X 20

Poly-Steel Series

This is a light-weight, low-noise chain. In addition, it is maintenance-free since no lubrication is required. Outboard roller construction makes for a highly compact conveyor. The ability to flex backwards adds to this by allowing easy layout on the return side to save space. All parts are made of stainless steel except the outboard rollers and inner links.



Poly Steel OBR

Tsubaki Chain No.	Pitch	Roller Diameter	Width between Roller Link Plates	Link Plate		Pin				Outboard Roller		Approx. Weight Lbs/Ft
				T	H	D	L1	L2	L3	Ds	Hs	
Regular Series	P	R	W	T	H	D	L1	L2	L3	Ds	Hs	
40PCPSR	0.500	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.46
50PCPSR	0.625	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	0.65
60PCPSR	0.750	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	0.94

Tsubaki Chain No.	Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate		Pin			Outboard Roller		Guide Attachment		Approx. Weight Lbs/Ft.	
				T	H	D	L1	L2	Ds	Hs	N	Ha	Plastic Roller	Steel Roller
Regular Series	P	R	W	T	H	D	L1	L2	Ds	Hs	N	Ha		
C2042SG	1.000	0.625	0.312	0.060	0.472	0.156	0.380	0.909	0.906	0.512	0.650	0.748	0.71	1.15
C2052SG	1.250	0.750	0.375	0.080	0.591	0.200	0.469	0.996	1.063	0.512	0.787	0.945	1.01	1.49
C2062HSG	1.500	0.875	0.500	0.094	0.713	0.234	0.600	1.167	1.181	0.496	1.000	1.063	1.62	2.12

OUTBOARD ROLLER CHAINS

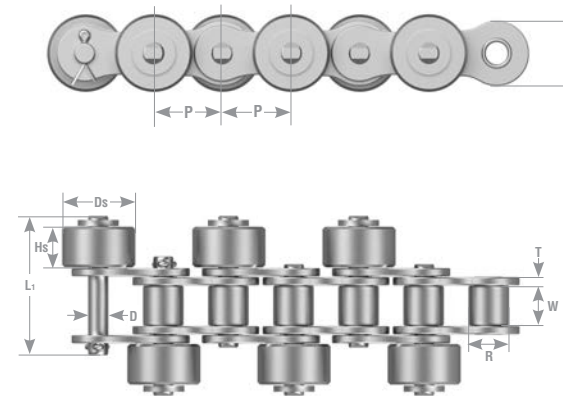
Outboard Roller Series (Side Roller) without brake roller

- Highly compact
- Wide selection
- Quick start up

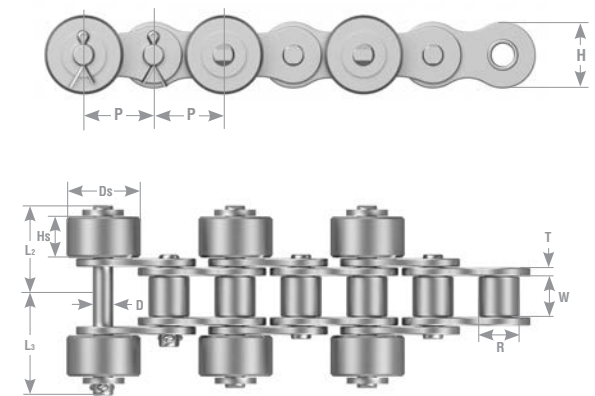


OUTBOARD ROLLER CHAINS

Type I Staggered Installation



Type II Crosswise Installation



Single Pitch Type

Tsubaki Chain No.		Pitch	Roller Dia	Width between Roller Link Plates	Link Plate		Pin			Outboard Roller		Approx. Weight Lbs/Ft.		
Regular Series	Electro-Conductive Series	P	R	W	T	H	D	L1	L2	L3	Ds	Hs	Plastic Roller	Steel Roller
40PSR	40PSRE	0.500	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.63	1.12
50PSR	50PSRE	0.625	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	0.95	1.63
60PSR	60PSRE	0.750	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	1.42	2.44
80PSR	80PSRE	1.000	0.625	0.625	0.125	0.949	0.312	0.758	1.380	1.494	1.125	0.622	2.40	3.98
100PSR		1.250	0.750	0.750	0.156	1.185	0.375	0.900	1.675	1.797	1.563	0.748	3.74	6.73

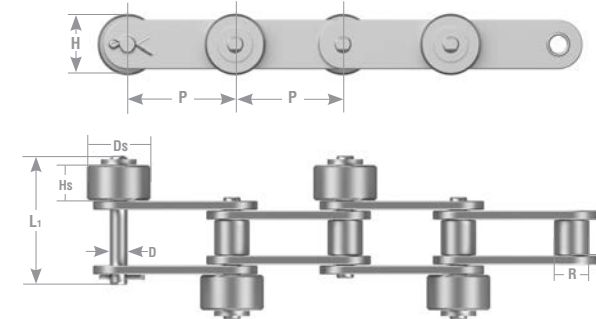
- Note:
1. Weights are for staggered outboard roller installation every link or crosswise outboard roller installation every second link.
 2. Cottered type connecting links will be provided.

Side Roller Chain Series

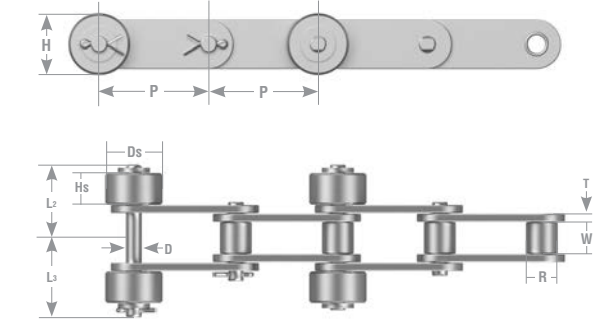
Series	Standard Specifications		Variations
	Base Chain	Side Roller	Base Chain
Regular Series	Carbon Steel Chain	Carbon Steel	Stainless Steel
	Carbon steel chain with plastic oversized rollers	Engineered plastic (white) plus special engineered plastic brake (brown)	Nickel-plated and Neptune®
Electro-Conductive Series	Carbon steel chain	Special engineered plastic (black)	Stainless Steel
	Carbon steel chain with plastic oversized rollers	Special engineered plastic (black) plus special engineered plastic brake (brown)	Nickel-plated and Neptune®
Poly-steel series	Stainless steel and engineered plastic (white)	Special engineered plastic (white)	Chemical resistant
		Engineered plastic (white) plus special engineered plastic brake (brown)	Electro-conductive
Guide Attachment Series	Carbon Steel Chain	Can be made with any of the above options	Stainless Steel
	Carbon steel chain with plastic oversized rollers		Nickel-plated and Neptune®

Note: Consult the factory when using plastic brake outboard rollers on plated chains.

Type I Staggered Installation



Type II Crosswise Installation



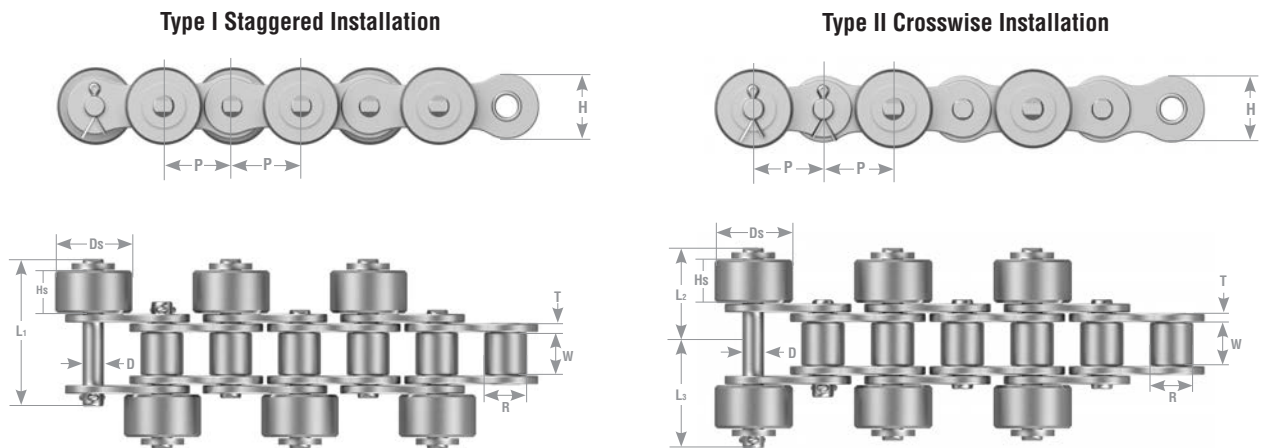
Double Pitch Type

Tsubaki Chain No.		Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate		Pin			Outboard Roller		Approx. Weight Lbs/ft.			
Regular Series	Electro-Conductive Series	P	R	W	T	H	D	L1	L2	L3	Ds	Hs	Carbon w/ plastic outboard roller	Plastic Roller Chain Plastic Outboard roller	Carbon steel chain w/steel outboard roller
Standard Roller															
C2040PSR	C2040PSRE	1.000	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.44		0.69
C2050PSR	C2050PSRE	1.250	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	0.69		1.03
C2060HPSR	C2060HPSRE	1.500	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	1.21		1.72
C2080HPSR	C2080HPSRE	2.000	0.625	0.625	0.125	0.949	0.312	0.758	1.380	1.494	1.125	0.622	2.10		2.89
C2100HPSR		2.500	0.750	0.750	0.156	1.185	0.375	0.900	1.675	1.797	1.563	0.748	3.21		4.70
Oversized Roller															
C2042PSR	C2042PSRE	1.000	0.625	0.312	0.060	0.472	0.156	0.380	0.909	0.965	0.906	0.512	0.83	0.60	
C2052PSR	C2052PSRE	1.250	0.750	0.375	0.080	0.591	0.200	0.469	0.996	1.063	1.063	0.512	1.14	0.83	
C2062HPSR	C2062HPSRE	1.500	0.875	0.500	0.125	0.677	0.234	0.667	1.167	1.262	1.181	0.496	1.77	1.30	

- Note:
1. Weights listed are for staggered outboard roller installation every pitch or crosswise outboard roller every second pitch.
 2. Cottered type connecting links will be provided.

OUTBOARD ROLLERS

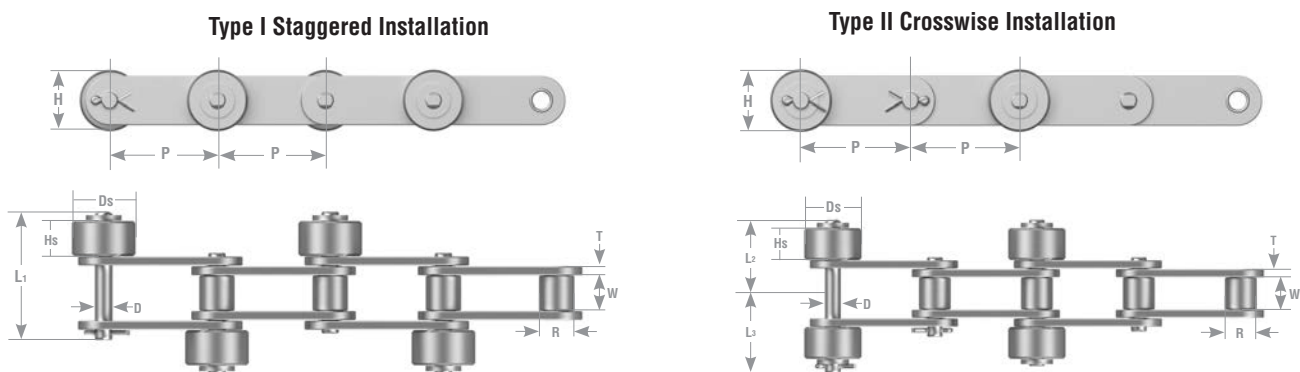
Regular and Electro-Conductive Series with brake roller



Single Pitch Type

Tsubaki Chain No.		Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate		Pin				Outboard Roller		Approx. Weight Lbs/Ft.	
Regular Series	Plastic Series	P	R	W	T	H	D	L1	L2	L3	Ds	Hs	Plastic Roller	Steel Roller
40SR	40PSR	0.500	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.63	1.12
50SR	50PSR	0.625	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	0.95	1.63
60SR	60PSR	0.750	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	1.42	2.44

Note
 1. Weights listed are for staggered construction at every link or crosswise construction at every second pitch.
 2. For staggered construction, the plastic brake rollers are spaced every third pitch alternating right side and left side. For crosswise construction, they are spaced every 6th pitch. These configurations are standard.



Double Pitch Type

Tsubaki Chain No.		Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate		Pin				Outboard Roller		Approx. Weight Lbs/Ft.		
Regular Series	Plastic Series	P	R	W	T	H	D	L1	L2	L3	Ds	Hs	Carbon with plastic outboard roller	Plastic Roller Chain Plastic Outboard roller	Carbon steel chain w/steel outboard roller
Standard Roller															
C2040SR	C2040PSR	1.000	0.312	0.312	0.060	0.472	0.156	0.380	0.705	0.760	0.625	0.307	0.44		0.69
C2050SR	C2050PSR	1.250	0.400	0.375	0.080	0.591	0.200	0.469	0.850	0.913	0.750	0.370	0.69		1.03
C2060HSR	C2060HPSR	1.500	0.469	0.500	0.094	0.713	0.234	0.600	1.100	1.195	0.875	0.496	1.21		1.72
Oversized Roller															
C2042SR	C2042PSR	1.000	0.625	0.312	0.060	0.472	0.156	0.380	0.909	0.965	0.906	0.512	0.83	0.60	
C2052SR	C2052PSR	1.250	0.750	0.375	0.080	0.591	0.200	0.469	0.996	1.063	1.063	0.512	1.14	0.83	
C2062HSR	C2062HPSR	1.500	0.875	0.500	0.125	0.677	0.234	0.667	1.167	1.262	1.181	0.496	1.77	1.30	

Note
 1. Weights listed are for staggered construction at every link or crosswise construction at every second pitch.
 2. For staggered construction, the plastic brake rollers are spaced every third pitch alternating right side and left side. For crosswise construction, they are spaced every 6th pitch. These configurations are standard.

SINGLE PITCH ROLLER CHAINS

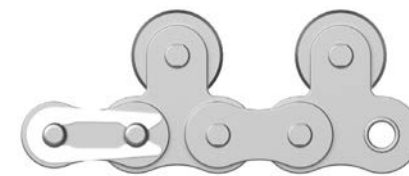


Top Roller Chain

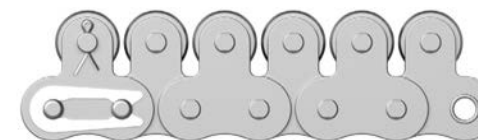
Standardized Specifications			Variations
Series	Base Chain	Top Roller	Base Chain
Regular Series	Steel	Steel	Stainless Steel Nickel-Plated Neptune®
Plastic Top Roller	Steel	Engineered Plastic	
Plastic Roller	Steel + Plastic Oversized Roller	Engineered Plastic	
Double Strand Top Roller	Steel	Steel	
Guide Attachment	Steel	Steel or Engineered Plastic	

For more information, please contact Tsubaki engineering.

When top rollers are spaced more than every second pitch:

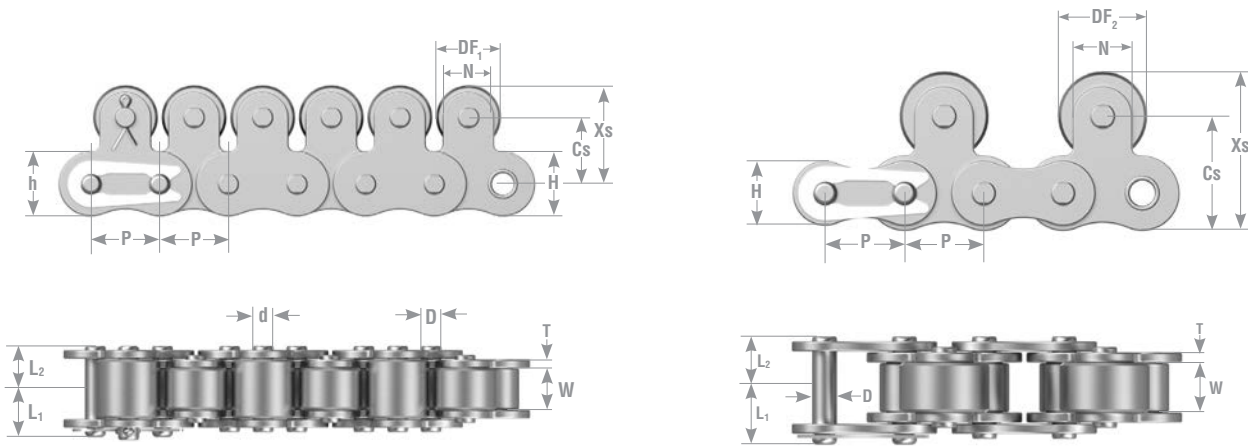


When top rollers are spaced every pitch:



- Top rollers are heat-treated
- Spring clip type connecting links for sizes 40-60 unless specified.

SINGLE PITCH TOP ROLLER CHAINS



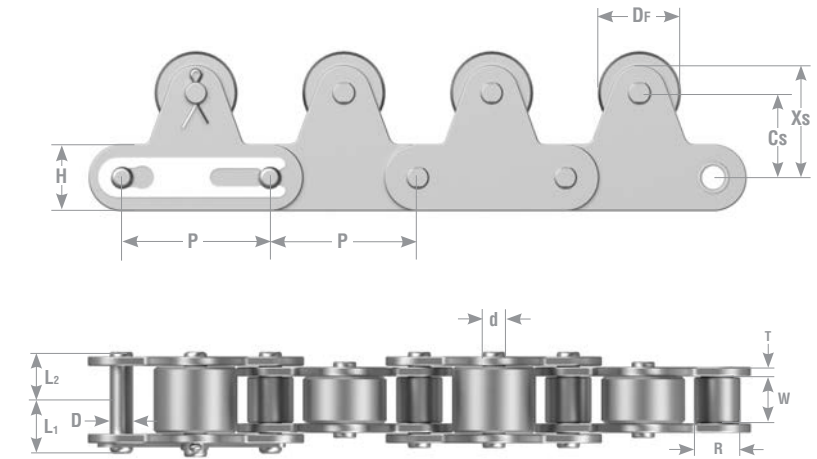
Chain Number		Pitch	Roller Dia.	Width between Roller Link Plates	Link Plate			Pin			Approximate Weight Steel Series		Approximate Weight Plastic Series	
Steel Series	Plastic Series				P	T	H	D	L1	L2	Every Pitch	Every 2nd	Every Pitch	Every 2nd
40TR	40TRP	0.500	0.312	0.312	0.060	0.472	0.156	0.325	0.392	1.23	0.95	0.62	0.57	
50TR	50TRP	0.625	0.400	0.375	0.080	0.591	0.200	0.406	0.472	1.61	1.46	1.05	0.93	
60TR	60TRP	0.750	0.469	0.500	0.090	0.713	0.234	0.506	0.581	2.42	2.14	1.55	1.36	
80TR	80TRP	1.000	0.625	0.625	0.125	0.949	0.312	0.640	0.758	4.09	3.54	2.62	2.31	
100TR	100TRP	1.250	0.750	0.750	0.156	1.185	0.375	0.778	0.900	6.25	5.95	4.07	3.64	

Chain Number		Attachment Dimensions								
Steel Series	Plastic Series	DF1	DF2	Cs	N	Xs	L	L1	L2	d
40TR	40TRP	0.433	0.625	0.500	0.374	0.687	0.520	0.325	0.380	0.156
50TR	50TRP	0.591	0.750	0.626	0.500	0.876	0.638	0.406	0.469	0.200
60TR	60TRP	0.709	0.875	0.720	0.626	1.033	0.811	0.506	0.600	0.234
80TR	80TRP	0.945	1.125	0.969	0.752	1.344	1.012	0.640	0.758	0.312
100TR	100TRP	1.181	1.563	1.252	1.000	1.752	1.220	0.778	0.900	0.376

DOUBLE PITCH TOP ROLLER CHAINS



Single Strand Double Pitch Type



Chain Number		Pitch	Roller Diameter		Width between Roller Link Plates	Link Plate			Pin		Approximate Weight Steel Series		Approximate Weight Plastic Series	
Steel Series	Plastic Series		P	"S" Roller		"R" Roller	T	H	D	L1	L2	"S" Roller	"R" Roller	"S" Roller
C2040TR	C2040TRP	1.000	0.312	0.625	0.312	0.060	0.472	0.156	0.325	0.392	0.89	1.14	0.61	0.62
C2050TR	C2050TRP	1.250	0.400	0.750	0.375	0.080	0.591	0.200	0.406	0.472	1.37	1.68	0.97	0.96
C2060HTR	C2060HTRP	1.500	0.469	0.875	0.500	0.125	0.677	0.234	0.573	0.652	2.47	2.93	1.86	1.85
C2080HTR	C2080HTRP	2.000	0.625	1.125	0.625	0.156	0.906	0.312	0.720	0.823	3.80	4.54	2.88	3.04
C2100HTR	C2100HTRP	2.500	0.750	1.563	0.750	0.187	1.126	0.375	0.858	0.965	6.12	7.64	4.37	4.44

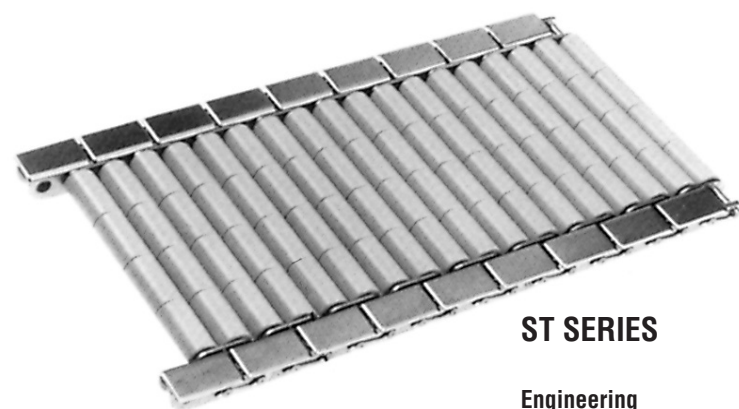
- Note: 1. "R" rollers are oversized, "S" rollers are standard.
 2. Spring clip type connecting links will be provided for C2040-C2060H.
 3. Dimensions except roller diameter, are the same for "S" and "R" roller types.
 4. For even spacing, top rollers will be fitted on roller link unless otherwise specified.

Chain Number		Attachment Dimensions						
Steel Series	Plastic Series	DF1	Cs	Xs	L1	L2	d	
C2040TR	C2040TRP	0.625	0.591	0.827	0.325	0.380	0.156	
C2050TR	C2050TRP	0.750	0.748	1.043	0.406	0.469	0.200	
C2060HTR	C2060HTRP	0.875	0.906	1.244	0.573	0.667	0.234	
C2080HTR	C2080HTRP	1.125	1.142	1.594	0.728	0.839	0.446	
C2100HTR	C2100HTRP	1.563	1.394	1.957	0.870	1.071	0.572	

Note: Weights listed apply to top rollers every pitch. For additional configuration weights consult Tsubaki engineering.

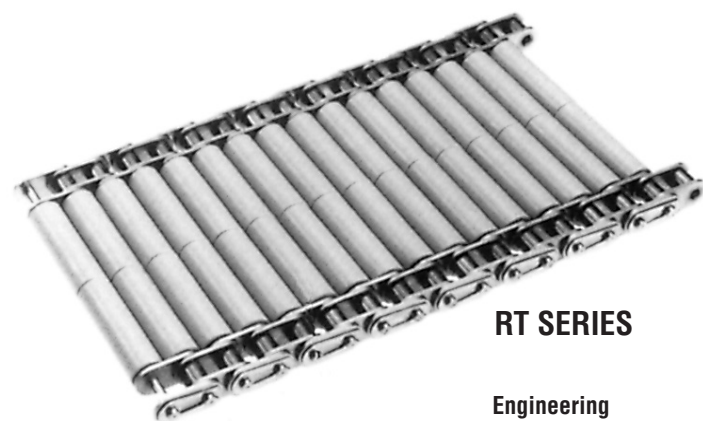
ROLLER TABLE CHAINS

- Does not damage conveyed materials
- Transfers materials smoothly to other lines
- Wide selection available
- Easy to assemble and disassemble
- RT type Roller Table chain provides a low friction alternative to table top chain
- ST type Roller Table chain allows your product to be loaded and unloaded at right angles to conveyor flow.
- Standard roller chain sprockets can be used.



ST SERIES

Engineering
Plastic Rollers



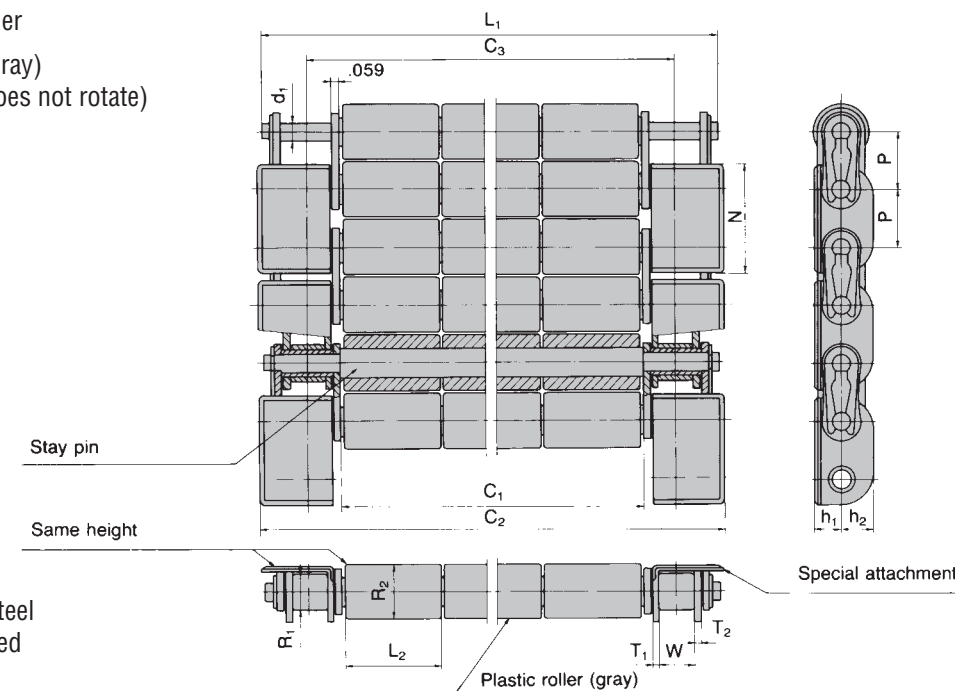
RT SERIES

Engineering
Plastic Rollers

ST ROLLER TABLE CHAINS

The special attachment is bent to height of roller

Plastic roller (gray)
Stay pin (pin does not rotate)



SS: Stainless steel
NP: Nickel-plated

Common Dimensions

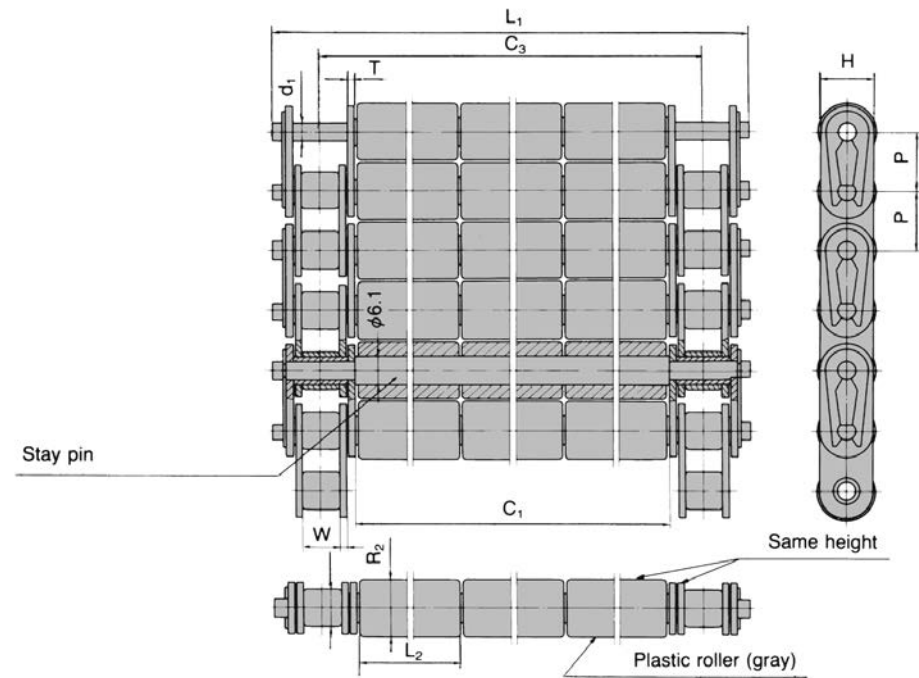
Series	P	W	R1	h1	h2	N	T1	T2	d1	R2	L2	
ST400	0.500	0.313	0.313	0.224	0.276	0.961	0.047	0.059	0.154	0.472	0.984	51
ST500	0.625	0.375	0.400	0.280	0.335	1.201	0.059	0.079	0.200	0.591	0.984	72

Note: Please use sprockets that have more than 23 teeth.

Dimensions

Series	Effective Width	Overall Width	Center Distance Between Two Chains	Pin Overall Length	Approximate Weight Lbs/Ft
Series	C1	C2	C3	L1	
400 Series					
ST404SS	3.984	5.433	4.551	5.339	2.97
ST406SS	5.953	7.402	6.520	7.307	3.88
ST408SS	7.921	9.370	8.488	9.276	4.79
ST410SS	9.890	11.339	10.457	11.244	5.70
ST412SS	11.858	13.307	12.425	13.213	6.60
ST414SS	13.827	15.276	14.393	15.181	7.51
ST416SS	15.795	17.244	16.362	17.150	8.41
500 Series					
ST504SS	3.984	5.717	4.685	5.622	4.14
ST506SS	5.953	7.658	6.654	7.591	5.43
ST508SS	7.921	9.654	8.622	9.559	6.64
ST510SS	9.890	11.622	10.591	11.528	7.89
ST512SS	11.858	13.591	12.559	13.496	9.14
ST514SS	13.827	15.559	14.528	15.465	10.39
ST516SS	15.795	17.528	16.496	17.433	11.63
ST518SS	17.764	19.496	18.465	19.402	12.89
ST520SS	19.320	21.465	20.433	21.370	14.14
ST522SS	21.701	23.433	22.402	23.339	15.39
ST524SS	23.669	25.402	24.37	25.307	16.64

RT ROLLER TABLE CHAINS



Roller Table No.	Pitch P	Width Between Roller Link Plates W	Roller Diameter R1	Link Plate		Pin		Plastic Roller		Effective Width C1	Center Distance Between Two Chains C3	Maximum Allowable Conveying Load LBS/FT	Approximate Weight LBS/FT
				H	T	d1	L1	R2	L2				
RT404SS	0.500	0.313	0.313	0.437	0.06	0.154	5.339	0.48	1.969	3.984	4.551	41	2.71
RT408SS							9.276			7.921	8.488		4.54
RT412SS							13.213			11.858	12.425		6.37
RT416SS							17.15			15.795	16.362		8.21
RT504SS	0.625	0.375	0.400	0.547	0.08	0.200	5.622	0.598	1.969	3.984	4.685	61	3.90
RT508SS							9.559			7.921	8.622		6.37
RT512SS							13.496			11.858	12.559		8.85
RT516SS							17.433			15.796	16.496		11.35
RT520SS							21.370			19.732	20.433		13.80
RT524SS							25.307			23.669	24.370		16.28
RT604SS	0.75	0.500	0.469	0.661	0.094	0.235	6.047	0.72	1.969	3.984	4.882	61	4.52
RT608SS							9.984			7.921	8.819		6.98
RT612SS							13.921			11.858	12.756		9.43
RT616SS							17.858			15.795	16.693		11.88
RT620SS							21.795			19.732	20.630		14.33
RT624SS							25.735			23.669	24.567		16.78

TOP CHAIN - TS SERIES

Tsubaki Top Chain is ideal for continuous conveying applications such as bottling, canning, packaging of beverages, food, medicines, chemicals and cosmetics, and for conveying machine parts.

Tsubaki Top Chain is available in a wide variety of material types and designs to meet the needs of your conveying applications.

TS Top Chain Linear Movement

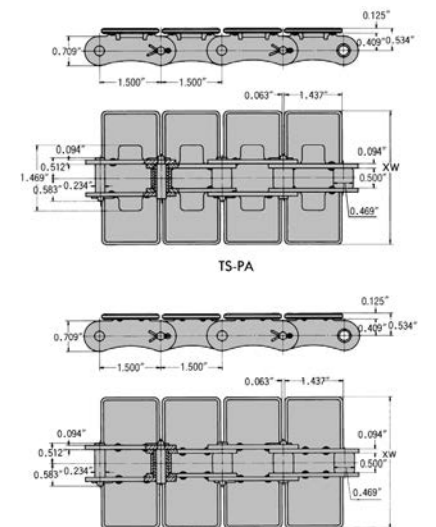
Tsubaki TS Top Chain consists of top plates made of 430 stainless steel, and steel roller chain identical to A2060. The top plates are projection welded to the link plate of the chain. The welded strength provides reliable operation.

- Installation horizontally over vertical sprockets.
- Chain can be disconnected at any joint for easy installation and maintenance
- Provides dependable trouble-free service
- Wear-resistant
- Sprockets for C2060H chain can be used.

TS-PA Type

- TS-PA-SS All Stainless steel construction
- TS-PA-CS carbon steel chain with 430 SS Top Plate

Tsubaki	Slat Width	Approx. Weight (Lbs/ft)
Chain No.	XW	
TS635-PA	2.50	2.10
TS762-PA	3.00	2.20
TS826-PA	3.25	2.40
TS950-PA	3.74	2.60
TS1016-PA	4.00	2.80
TS1100-PA	4.33	2.90
TS1143-PA	4.50	3.00
TS1270-PA	5.00	3.10
TS1524-PA	6.00	3.50
TS1905-PA	7.50	4.10



TS-P Type

- TS-P-SS All Stainless steel construction
- TS-P-CS carbon steel chain with 430 SS Top Plate

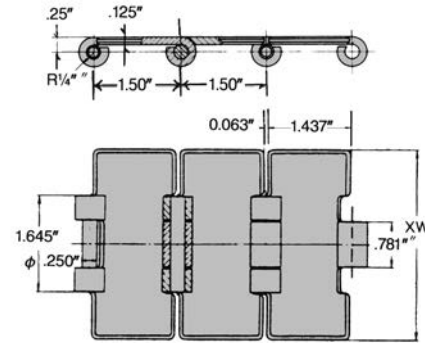
Tsubaki	Slat Width	Approx. Weight (Lbs/ft)
Chain No.	XW	
TS550-P	2.16	1.7
TS635-P	2.50	2.10
TS762-P	3.00	2.20
TS826-P	3.25	2.40
TS950-P	3.74	2.60
TS1016-P	4.00	2.80
TS1100-P	4.33	2.90
TS1143-P	4.50	3.00
TS1270-P	5.00	3.10
TS1524-P	6.00	3.50
TS1905-P	7.50	4.10



TOP CHAIN - TT & TP SERIES

TT Top Chain Linear Movement

TT Top chain is made of only two parts - stainless steel top plates with rolled hinges, and pins. This extremely simple construction ensures high strength and a long service life. In addition, the chains pick up fewer impurities and remain clean longer. The result is highly simplified handling and maintenance.



TT-N

Top plates are made of 431 stainless steel and pins are made of 304 stainless.

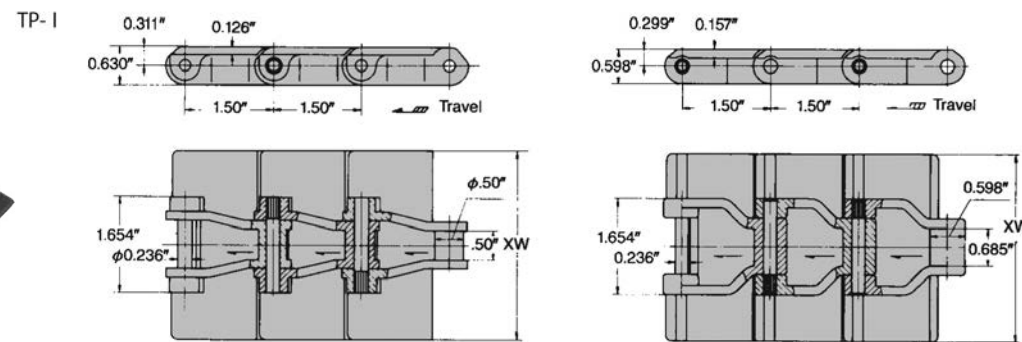
TT-SS

All parts are made of 304 stainless.

Tsubaki Chain No.	Slat Width XW	Approx. Weight (Lbs/ft)
TT635-SS	2.50	1.50
TT762-SS	3.00	1.70
TT826-SS	3.25	1.80
TT1016-SS	4.00	2.10
TT1143-SS	4.50	2.40
TT1270-SS	5.00	2.60
TT1524-SS	6.00	3.00
TT1905-SS	7.50	3.60

TP Top Chain Linear Movement

Tsubaki TP Top chain consists of polyacetal resin top plates formed with each link and 304 stainless steel pins. The uniquely shaped top plate along with Tsubaki technology ensures the high strength and maximum chain life. Tsubaki TP Top Chain can be easily assembled and disassembled thus making maintenance minimal.



TS-P Type

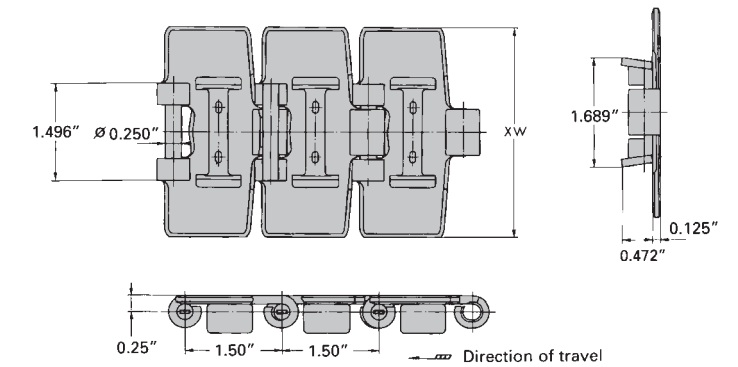
- TS-P-SS All Stainless steel construction
- TS-P-CS carbon steel chain with 430 SS Top Plate

Tsubaki Chain No.	Slat Width XW	Approx. Weight Lbs/Ft.	Type	Color
TP762	3.00	0.54	1	Gray
TP826	3.25	0.54	1	
TP1016	4.00	0.60	2	
TP1143	4.50	0.67	2	
TP1270	5.00	0.74	2	

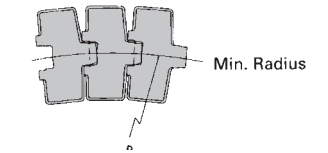
TOP PLATE - TTU & TPU SERIES

TTU Top Chain Curved Movement

Tsubaki TTU Top chain consists of top plates, connecting pins and guide-plates for float-prevention around curves. All parts are made of martensitic stainless steel which ensures strong resistance to rust and clean handling.

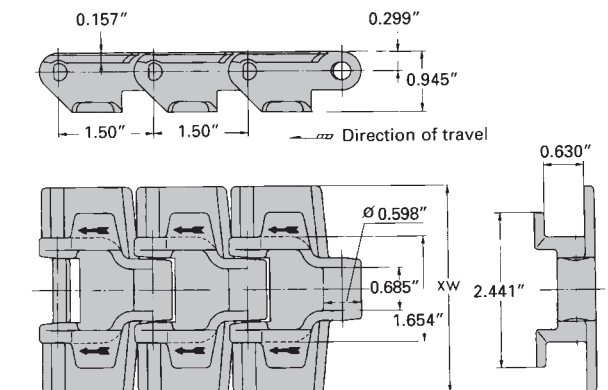
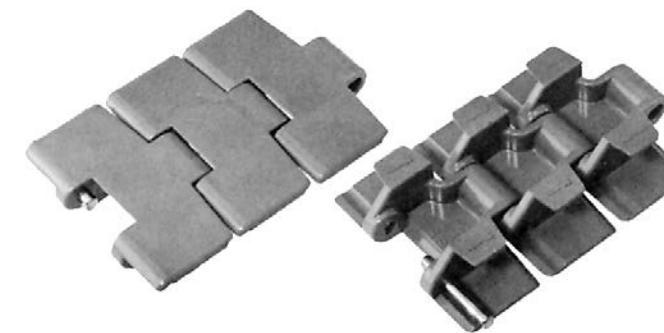


Tsubaki Chain No.	Slat Width XW	Minimum Radius R	Approx. Weight (Lbs/ft)
TTU826	3.25		2.10
TTU1143	4.50		2.20

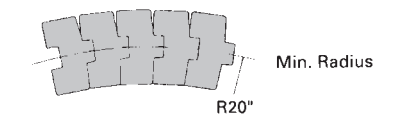


TPU Top Chain Curved Movement

Tsubaki TPU Top chain consists of polyacetal resin top plates fitted with float-prevention tabs and 304 stainless steel pins.



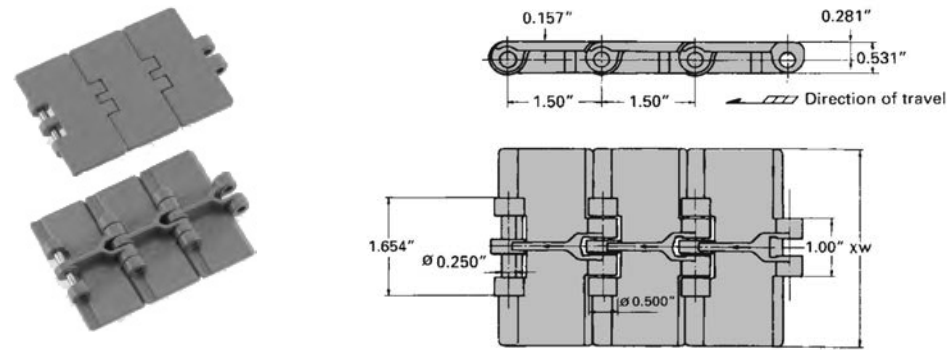
Tsubaki Chain No.	Slat Width XW	Approx. Weight Lbs/Ft	Color of Top Plate
TPU826	3.25	0.67	Gray



TOP CHAIN - TTP & TN SERIES

TTP Top Chain Linear Movement

Tsubaki TTP Top chain has a simple design of polyacetal resin top plates and 304 stainless steel pins. Maximum allowable load is lower than the TP type, but they are economical when replacement is required.



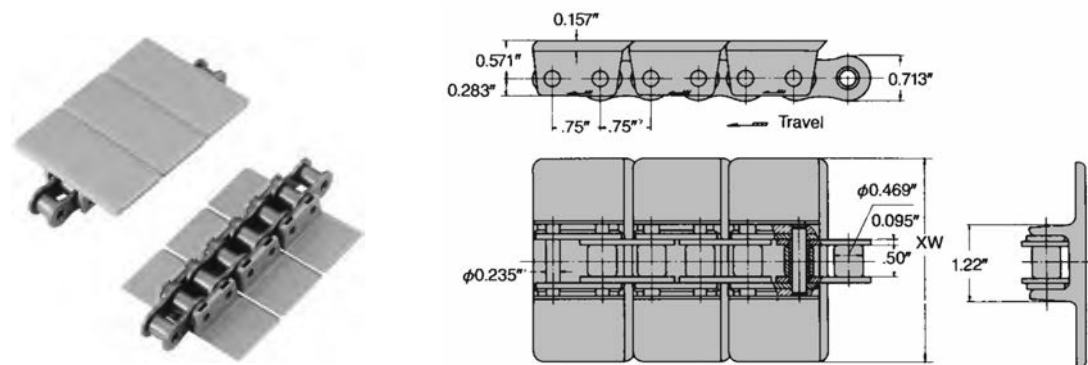
TTP and TTPF

Plates are made of polyacetal plastic. Pins are made of 304 stainless.

Tsubaki Chain No.	Slat Width XW	Approx. Weight lbs/Ft	Color
TTP826	3.25	0.60	TTP: Gray
TTPF826			
TTP1143	4.50	0.67	
TTP1270	5.00	0.74	TTPF: Brown low Friction
TTPF1270			
TTP1905	7.50	0.94	
TTPF1905			

TN Top Chain Linear Movement

Tsubaki TN Top chain consists of polyacetal resin top plates snapped onto special chain identical in size to 60 roller chain. The chain is available in three types: carbon steel, stainless and nickel-plated. The top plate can be correctly and firmly snapped on to the special pins and the chain with ease.



TN, TN-NP, TN-SS

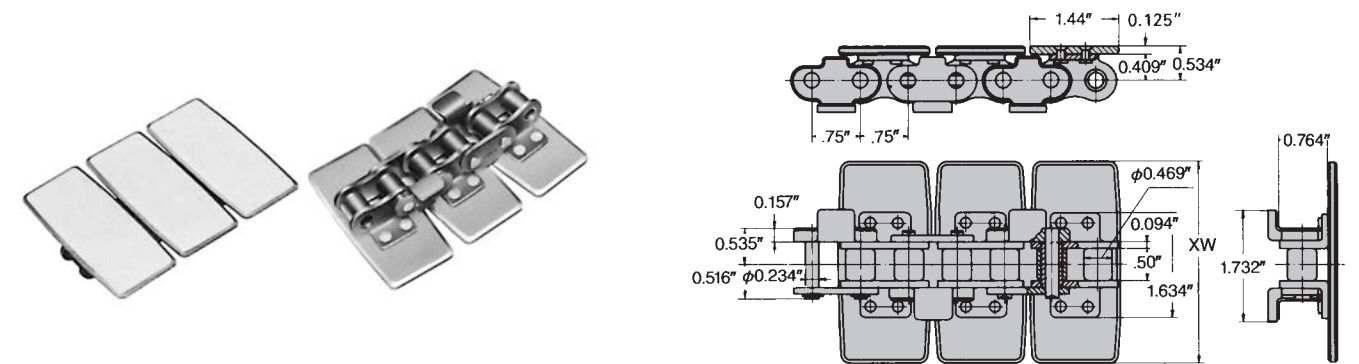
Top plates are polyacetal plastic. Chains are available in carbon steel nickel-plated or 304 stainless steel.

Tsubaki Chain No.	Slat Width XW	Approx. Weight Lbs/Ft	Color of Top Plate
TN826	3.25	1.41	Gray
TN1016	4.00	1.48	
TN1143	4.50	1.55	
TN1270	5.00	1.61	
TN1905	7.50	1.88	

TOP PLATE - TRU & TKU SERIES

TRU Top Chain Curved Movement

Tsubaki TRU Top chain uses a top-plate-riveted 60 roller chain as its base with special provisions for curving. A float-prevention tab prevents floating at corners to allow the creation of curved conveyors. The same tab may also be used for inclined conveyors to keep the chain in position.



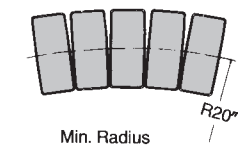
TRU

Top plates are made of 430 stainless steel. Base chain is carbon steel

TRUSS

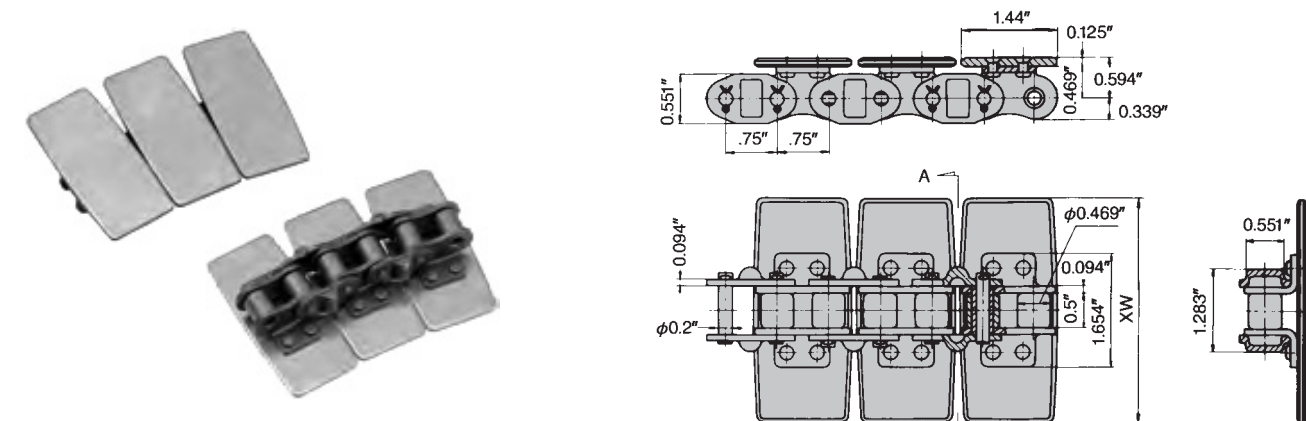
All parts are 304 stainless steel

Tsubaki Chain No.	Slat Width XW	Approx. Weight (Lbs/ft)
TRU826	3.25	2.80
TRU1143	4.50	3.30
TRU1270	5.00	3.50



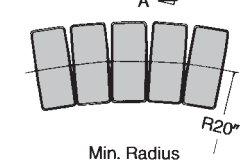
TKU Top Chain Curved Movement

Tsubaki TKU top chain uses a top-plate riveted 60 roller chain as its base with special provisions for curving. As the chain has no float-prevention tab, it is suggested that slow and simple curved running be used.



TKU

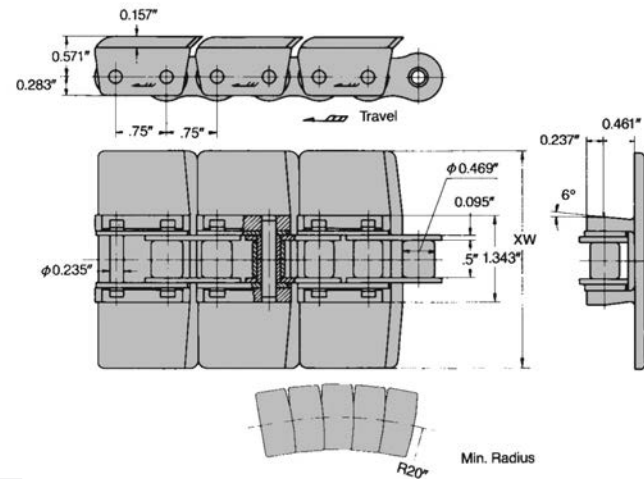
Tsubaki Chain No.	Slat Width XW	Approx. Weight (Lbs/ft/ft)
T550-P	3.25	2.60
TS635-P	4.33	3.00



TOP CHAIN - TNU & TO SERIES

TNU Top Chain Curved Movement

TNU Top chain consists of polyacetal resin top plates snapped onto a special chain the same size as 60 chain and made of carbon steel or nickel-plated. The outside surface of the snap is tapered for float prevention.



TNU and TNU-NP

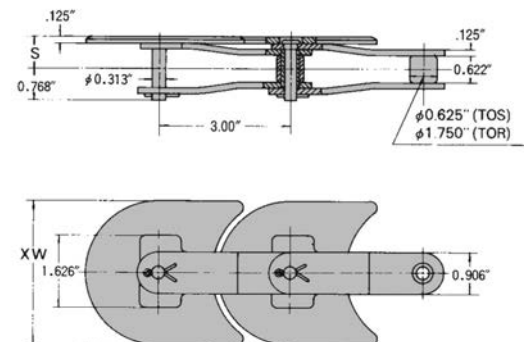
Top plates are made of polyacetal. Plastic Chains are carbon steel or nickel plated.

Tsubaki	Slat Width	Approx. Weight	Color of Top Plate
Chain No.	XW	Lbs/Ft	
TNU826	3.25	1.48	Gray
TNU1143	4.50	1.55	
TNU1270	5.00	1.68	

TO Top Chain Curved Movement

Tsubaki TO Crescent Plate chain is used to convey containers and materials in the bottling and canning industries. It is especially useful when the length of the conveyor must be long and the load factor high.

- Stronger than TS Top Plate Chain.
- Can follow any horizontal route.
- A turn-table and guide roller are unnecessary on the return side.
- Standard carbon steel chain with 430 stainless crescent shaped top plates are provided unless otherwise specified.
- Minimum radius of TO Crescent Plate chain is 4-inches.



TOS

Top plates are made of 430 stainless steel. Chain is carbon steel

Tsubaki	Slat Width		Approx. Weight (Lbs/ft)
Chain No.	XW	S	
TOS826	2.16	0.705	2.80
TOS1143	2.50	0.705	3.20
TOS1778*	3.00	0.831	4.20

Note: When ordering TOS1778 and TOR1778, please consult factory.

TOR

Top plates are made of 430 Stainless steel. Chain is carbon steel.

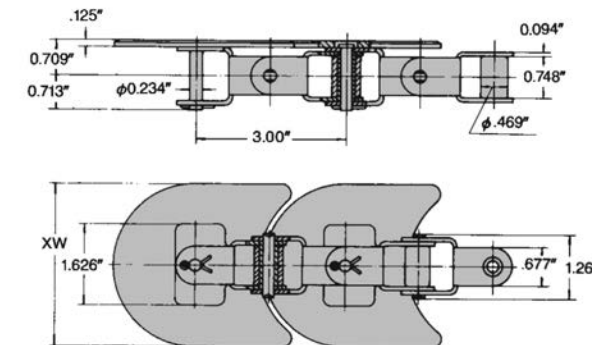
Tsubaki	Slat Width		Approx. Weight (Lbs/ft)
Chain No.	XW	S	
TOR826	3.25	0.705	4.00
TOR1143	4.50	0.705	4.60
TOR1778*	7.00	0.831	5.40

TOP CHAIN - TU SERIES

TU Top Chain Universal Movement

Tsubaki TU Crescent Plate chain is similar to other styles of Tsubaki Top chain, but it is designed for multi-plane operation. It conveys cans, bottles or packages in a straight or curved line on a horizontal plane and the return can travel in any path best suited to conditions.

- Can follow any horizontal and vertical route
- Standard carbon steel chain with 430 stainless steel crescent
- Crescent shaped top plates will be provided unless otherwise specified



Chain Number	Slat Width XW	Approx. Weight Lbs/Ft
TU826	3.25	2.60
TU1143	4.50	3.00

Standard Series ("P" Series)

Plastic chain consists of polyacetal chain links and 304 stainless steel pins. Plastic chain can operate on standard carbon steel sprockets. Plastic chain has a flat top side for power transmission or conveying purposes.

"E" Series (Electro-Conductive Series)

The special plastic used in the "E" series is electro-conductive and permits electrical charge. These chains are suitable for applications where electric noise and electric sparks exist. Also in areas where dust collects due to static electricity, Volume resistivity: 106Ω cm.

"Y" & "SY" Series (Anti-Chemical Series)

The "Y" and "SY" series utilizes an engineered plastic which permits the chain to perform well even where chloride, acid, alkaline, oxidizers, and most organic solvents are present. "SY" series is a combination of "Y" series plastic block links and titanium pins and performs well even in environments where sulfuric and hydrochloric acid exists.

"K" Series (Heat Resistant Series)

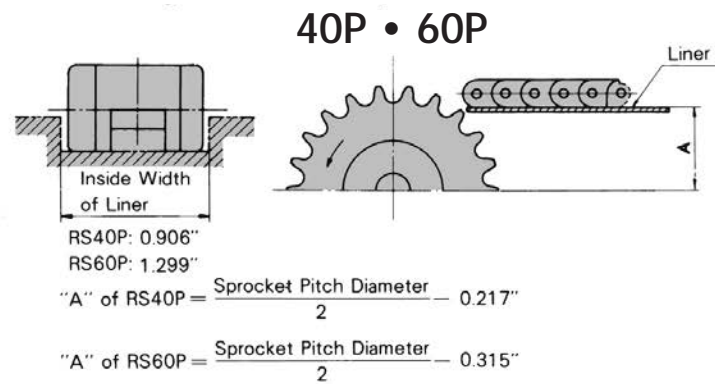
For warmer operating conditions, the "K" series is the Tsubaki offering. This plastic chain is made from engineered plastic capable of handling temperatures up to 284°F. Because of its material combination, the "K" series will not lose its properties in higher temperatures.

Chain No.	P	Maximum Allowable Tension (Lbs)				Ambient Temperature Range F		Maximum Speed	Allowable Chain Ft/Min	Coefficient of Sliding Friction
		Std.	"E"	"Y" "SY"	"K"	Std "E" "Y" "SY"	H			
35P	0.375	40	30	20	40	(-4) to 176F	(-4) to 284F	200	164	0.25
40P	0.500	100	77	55	55	(-4) to 176F	(-4) to 284F	200	164	0.25
50P	0.625	154	110	90		(-4) to 176F	(-4) to 284F	200	164	0.25
60P	0.750	200	143	110	110	(-4) to 176F	(-4) to 284F	200	164	0.25
C2040P	1.000	100	77	55	55	(-4) to 176F	(-4) to 284F	200	164	0.25

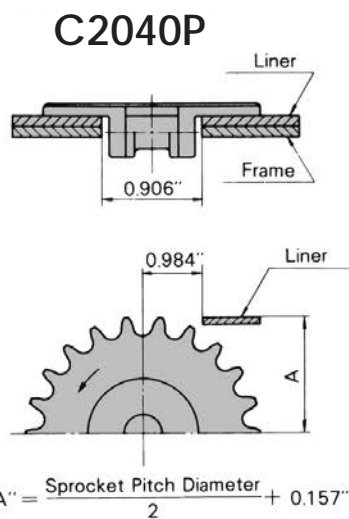
Note:

1. More detailed selections available in the Engineered Plastic Chain Catalog. Please consult the factory.
2. "K" Series chain is clip-type construction and has a slightly longer pin.

Location of guide rails and sprocket



Note: The Engineered plastic chain catalog is also available upon request. For details consult U.S. Tsubaki.



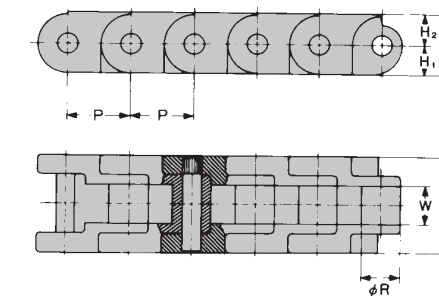
Corrosion Resistance Guide

The corrosion resistance guide given below should be referred to when selecting chains. The table presents Tsubaki laboratory tests at 68°F. Humidity and other conditions should also be considered as well as concentration of chemical and time of exposure.

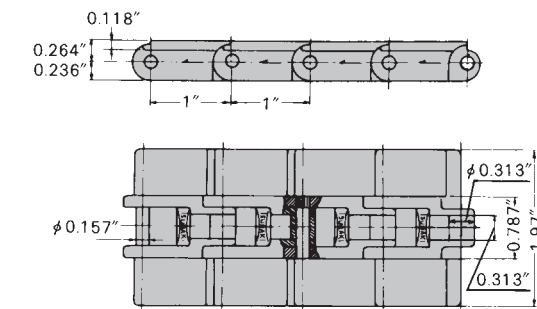
"E": Electro-Conductive series, "Y": Anti-chemical series, "K": heat resistant series, "N": Low noise series

Material	"E" "N" "K" Standard	"Y"	"SY"	Material	"E" "N" "K" Standard	"Y"	"SY"
Acetone	1	3	3	Carbon Tetrachloride	2	2	1
Oil (Vegetable)	1	1	1	Nitric Acid (5%)	3	1	1
Vegetable	1	1	1	Vinegar	2	2	2
Ammonia	1	2	2	Hypochloride	3	2	1
Sodium Chloride	2	2	1	Postassium Hydroxide	3		1
Hydrochloric Acid	3	3	1	Sodium Hydroxide (20%)	3	1	1
Sea Water	2	1	1	Soapy Water	1	1	1
Hydrogen Peroxide	3	1	1	Paraffin	1	1	1
Caustic Soda (25%)	3	1	1	Beer	1	1	1
Gasoline	1	1	1	Fruit Juice	1	1	1
Chloric Acid (10%)	3	2	2	Wine	1	1	1
Formic Acid	3	3	1	Whiskey	1	1	1
Aldehyde Formate	1	1	1	Vegetable Juice	1	1	1
Milk	1	1	1	Iodine	3	3	1
Lactic Acid	1	1	1	Sulfuric Acid	3	3	1
Citric Acid	2	1	1	Phosphoric Acid (10%)	3	2	1
Acetic Acid (5%)	3	1	1	Soda Pop	1	1	1

RS Type



RS Double Pitch Type



Double Pitch Plastic made with 304SS Pins

Chain No.	P	Stat Width	Approx. Weight Lbs/Ft	Color
C2040P	1.00	1.97	0.28	White

Single Pitch Plastic made with 304SS Pins

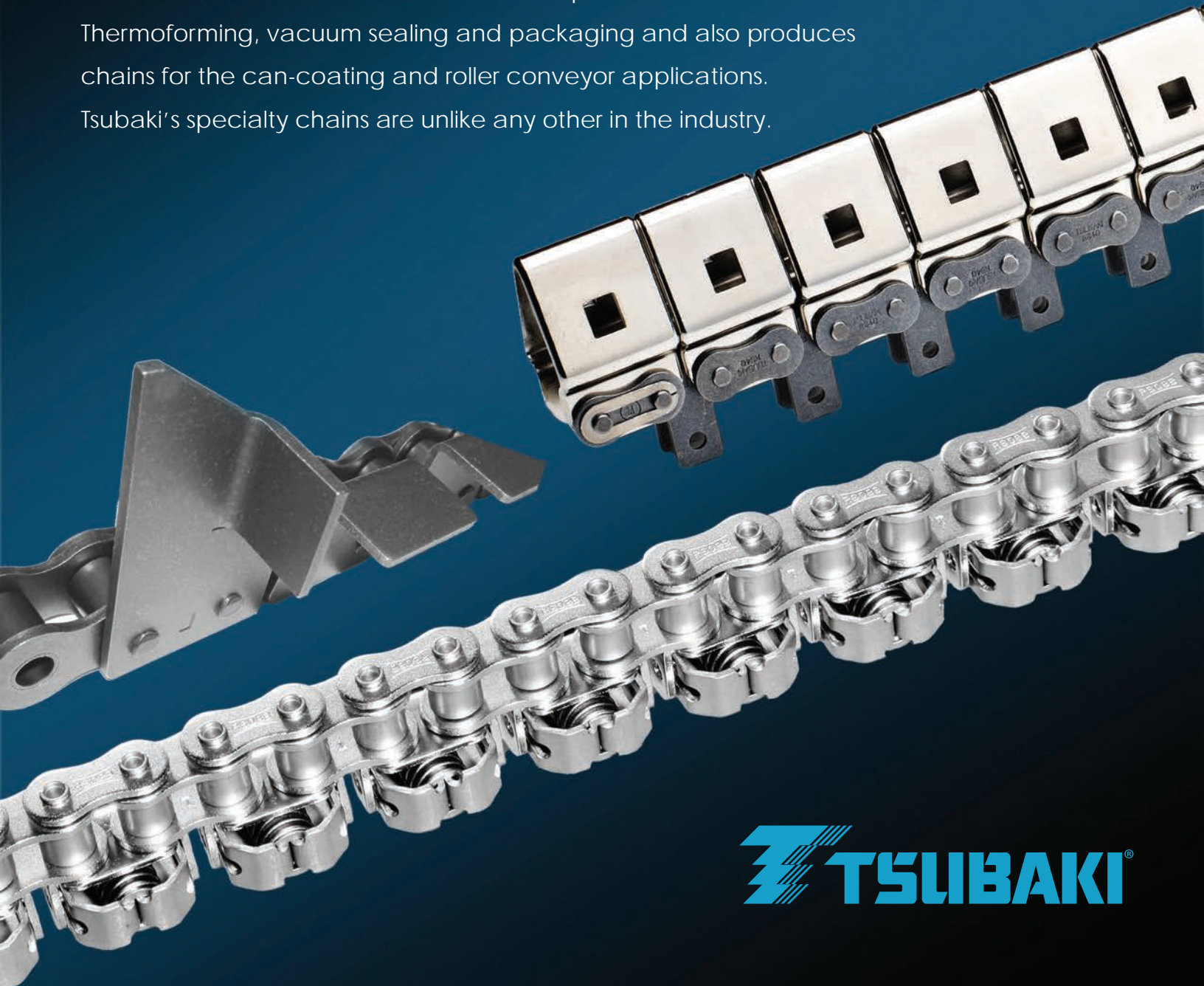
Chain No.	P	R	W	L	H1	H2	H	Approx. Weight Lbs/Ft	Color
40P	0.500	0.313	0.310	0.787	0.236	0.264	0.500	0.24	White
60P	0.750	0.469	0.500	1.181	0.335	0.346	0.681	0.48	White

SPECIALTY CHAINS

From the unique to OEM replacement chains, Tsubaki can produce even the most complex chains to fit virtually any applications.

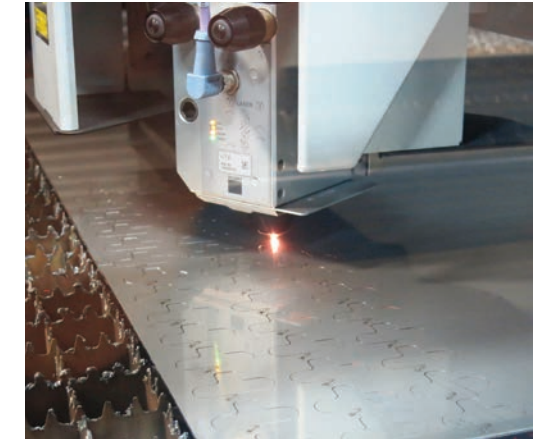
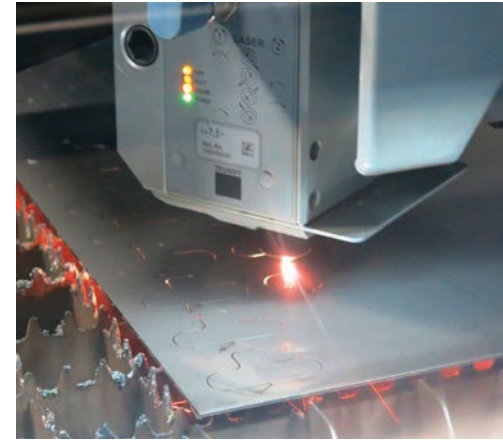
Tsubaki's Laser-Express™ provides state-of-the-art precision and custom attachment manufacturing for even the most complex attachments. Tsubaki manufactures a complete line of chains for Thermoforming, vacuum sealing and packaging and also produces chains for the can-coating and roller conveyor applications.

Tsubaki's specialty chains are unlike any other in the industry.



LASER-EXPRESS™

Specialty Attachment Chain Capabilities



Tsubaki's state-of-the-art Laser-Express™ cutting machine is designed to meet the toughest made-to-order requests. Located at the Tsubaki roller chain manufacturing plant in Holyoke, Massachusetts, the increased capabilities now allow for a quicker turn around on even the most complicated made-to-order requests.

Wider Made-to-order capabilities

- Variety of complex bent attachments
- Plate sizes up to 2x8-feet.
- Cutting range thickness range:
 - Carbon chain – 35 through 240H, C2040 - C2160
 - Stainless chain – 35 -160, C2040 - C2120H



Improved Lead-time

- No special tooling required
- Lead time improvement up to 4-weeks depending on complexity and job size.



MADE-TO-ORDER SPECIALS

Tsubaki will design and manufacture special attachment chains to meet the needs of your application. This section shows some of the specialty and industry specific roller chains Tsubaki can supply.

1. Bottle Conveying



2. Can Seamer



3. Candy Making



4. Citrus Chain



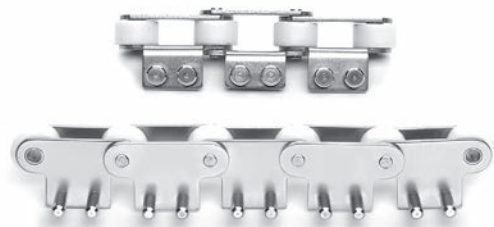
5. Forestry End-dogger chain



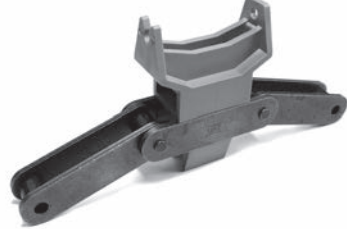
6. Electrical Resistor Manufacturing



7. Ice Cream Chains



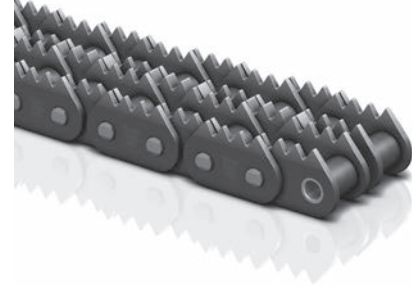
8. Produce Sizer Chains



9. Paint and Powder coating



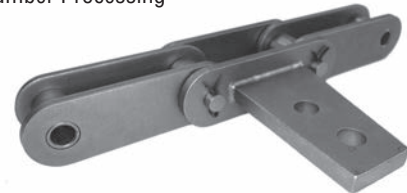
10. Forest Sharp Top



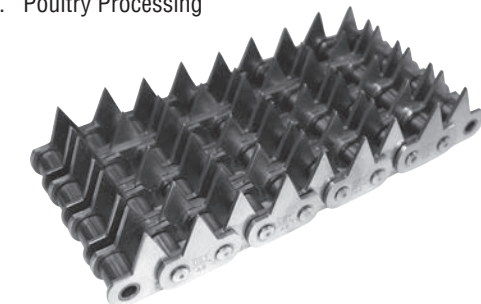
11. Refrigerator Coil Production



12. Lumber Processing



13. Poultry Processing

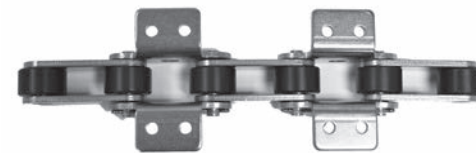


MADE-TO-ORDER SPECIALS

14. Shot Peen Drive Chain



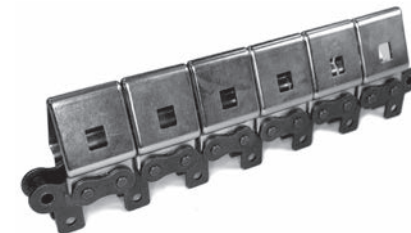
15. Smokehouse chains



16. Tobacco Processing



17. Printing/Bindery Chains



18. Pipe Cutting chains



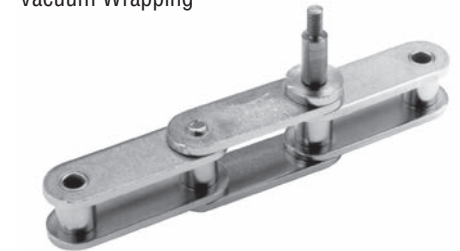
19. Pin Oven Chains



20. Vacuum Packaging



21. Vacuum Wrapping



22. Thermoforming Chains



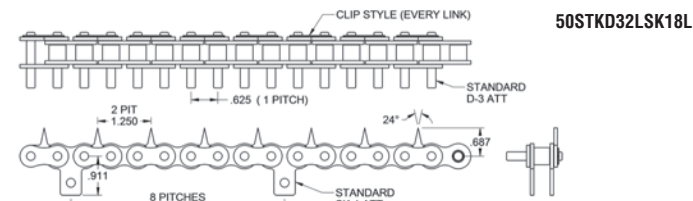
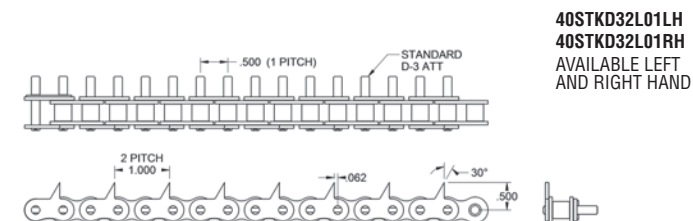
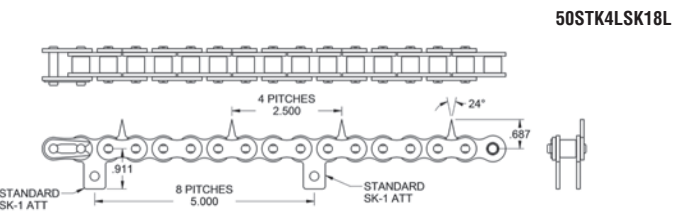
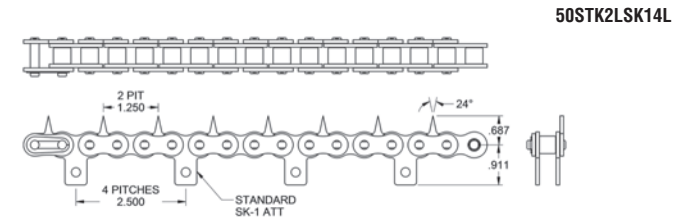
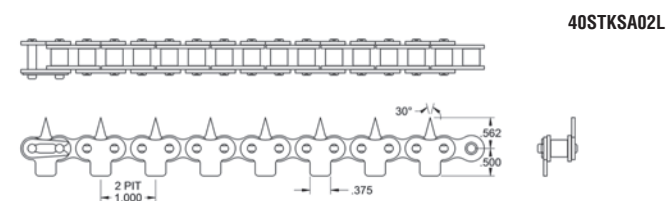
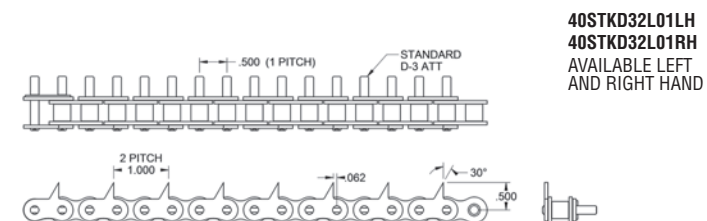
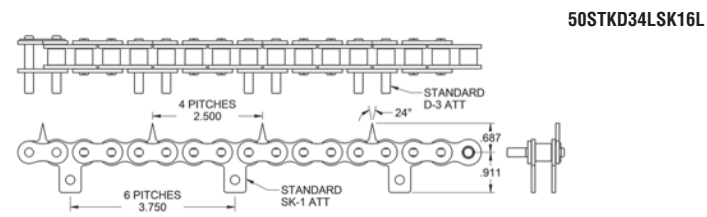
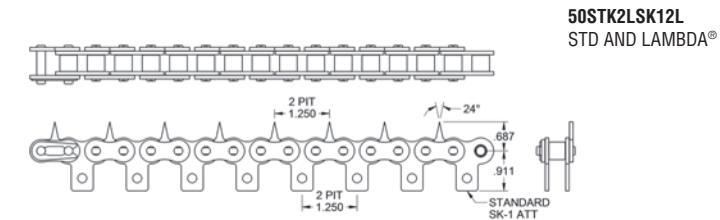
THERMOFORMING

Whether off-the-shelf or made to order, Tsubaki and its capabilities in attachment chain extend to the Thermoforming industry.

From the drawings listed below, Tsubaki stocks several of the commonly used sticker chains in a wide variety of attachment configurations.



Common Stock Sticker Chains



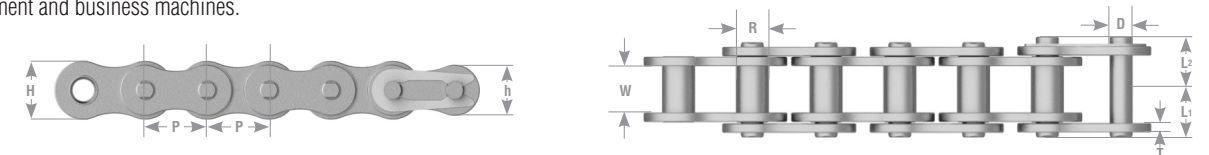
MINIATURE CHAINS

Ultra Miniature chain from Tsubaki is specially designed for applications with extremely limited space. Chains are manufactured to the most exacting specifications and are perfect for applications that require quiet, compact, lightweight chain with minimal polygon action. Ultra Miniature chains provide superior performance in a variety of demanding applications such as: business machines, check-weighing equipment, medical equipment, photographic equipment and small electro-mechanical devices. Ultra Miniature chains are available in a wide-range of sizes to meet your specific application needs.

Maximum Allowable Load			Average Tensile Strength		
180 lbs		BF25H		1,170 lbs	
140 Lbs		25RB		1,050 lbs	
70 Lbs		RS15		510 lbs	
11 Lbs		11SS		175 lbs	

11SS

Tsubaki Miniature chain 11SS is made of 304 stainless steel throughout. This provides superior corrosion resistance and high temperature resistance. The chain is specifically designed for use where space is limited such as: communication equipment, medical equipment and business machines.

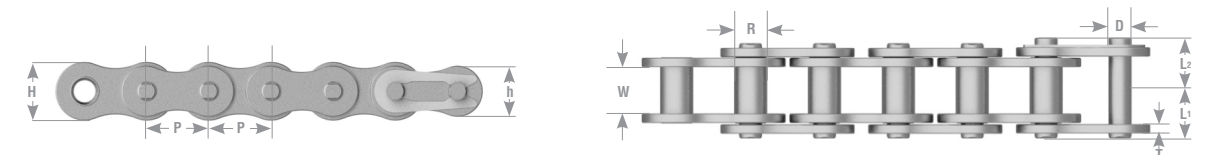


Chain No.	Pitch	Bushing Diameter	Width Between Inner Link Plates	Link Plate		Pin			Average Tensile Strength	Maximum Allowable Load	Approx. Weight Lbs/ft	Number of Links per 10 ft.	
				T	H	D	L1	L2					L1 + L2
11SS	0.148	0.09	0.072	0.015	0.138	0.062	0.090	0.125	0.214	175	11	0.035	814

Note: No offset links are available for 11SS chain.

RS15

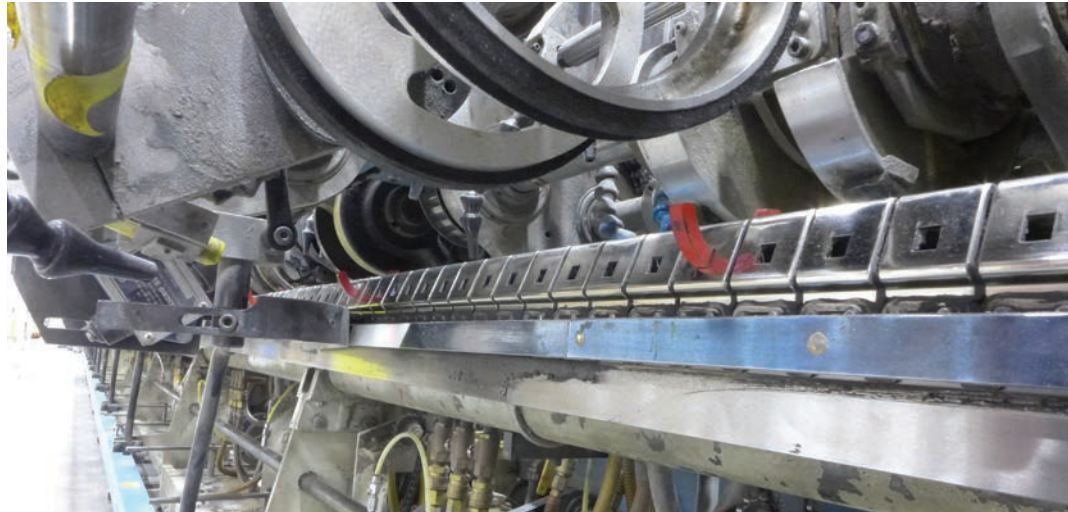
Tsubaki RS15 bushed chain is sized between 25 and 11SS in size and is economical for compact applications. Strong and precise, the chain is manufactured the same as standard roller chain. Lightweight and compact, it is only half the weight of 25 chain which is the smallest ASME/ANSI roller chain. All parts are heat-treated for better strength and wear resistance. Suitable for industrial data equipment, medical equipment, photographic equipment and many other applications.



Chain No.	Pitch	Bushing Diameter	Width Between Inner Link Plates	Link Plate		Pin			Average Tensile Strength	Maximum Allowable Load	Approx. Weight Lbs/ft	Number of Links per 10 ft.	
				T	H	D	L1	L2					L1 + L2
RS15	0.188	0.098	0.094	0.024	0.169	0.064	0.120	0.152	0.272	510	70	0.05	640

Note: No offset links are available for RS15 chain.

BINDERY CHAINS



Tsubaki has been a manufacturer of Bindery chains for over 25 years. Manufactured in our Holyoke, Massachusetts facility, Tsubaki now offers two styles of Bindery chain to fit seamlessly in many of the common bindery equipment.

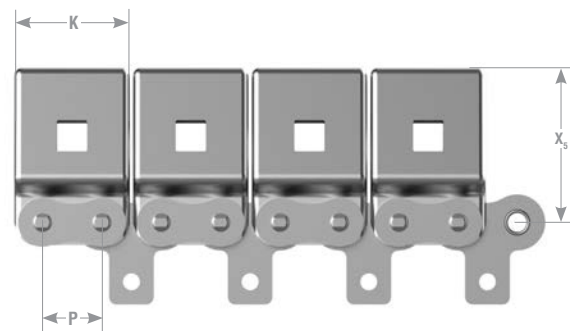
40NPENTTYPE1 - Utilized in machines made by Goss® and Heidelberg®

40NPENTTYPE2 - Utilized in machines made by Muller Martini®

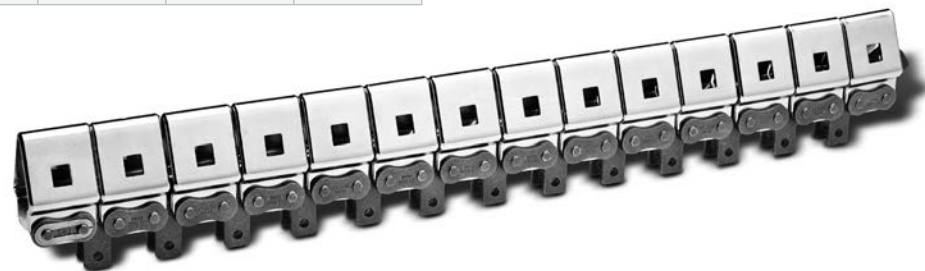
Both styles of chain are manufactured from hardened steel components with nickel plating on the tents to provide a clean, smooth surface.

Features and Benefits of Tsubaki Bindery Chains

- Available in cut-to-length sections, ready-to-install
- Heat-treated carbon steel
- Nickel-plated tents for cleanliness and smooth operating surface
- Close-ended connecting links for secure connection to adjoining sections
- Precision accuracy of bend radius allowing for clean and smooth flow through chain guide rails.



Tsubaki Part No.	Pitch P	Xs	K	N	Wt Lbs/ft
40NPENTTYPE1	0.500	1.354	0.988	0.858	1.2
40NPENTTYPE2	0.500	1.300	0.988	0.920	1.2

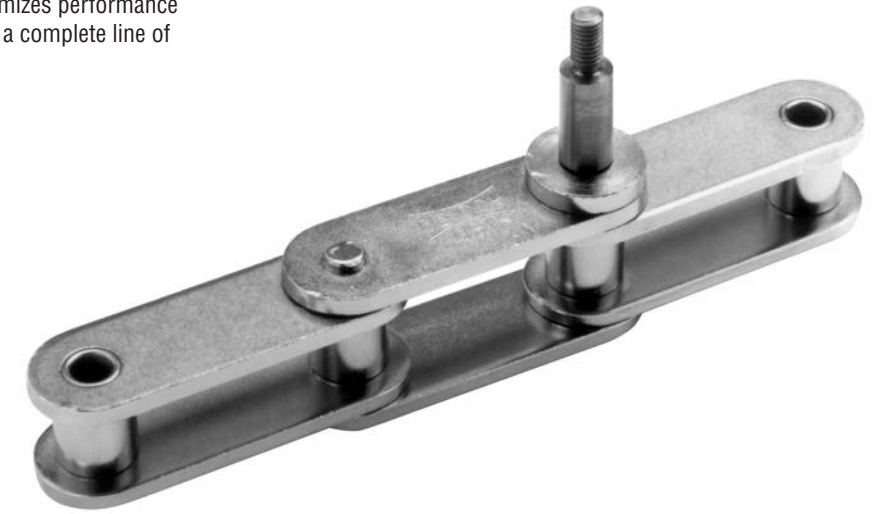


Heidelberg is a registered trade mark of Heidelberg Druckmaschinen AG.
Goss is a registered trademark of Goss International.
Muller Martini is a registered trade mark of Muller Martini Manufacturing Company.

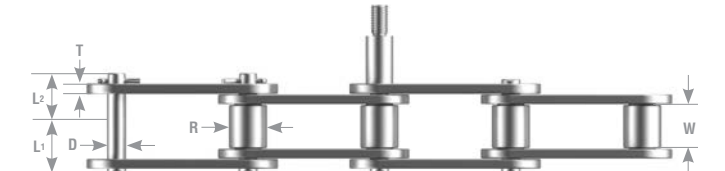
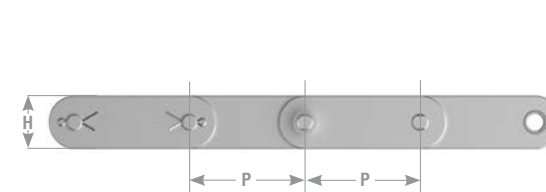
VACUUM WRAPPING CHAINS



Tsubaki again has perfected OEM replacement chains for your aftermarket needs. The vacuum wrapper chain from Tsubaki maximizes performance in your vacuum wrapping equipment. Tsubaki stocks a complete line of vacuum wrapping chains to handle immediate needs.



Base Chain Number	Chain Pitch	OEM Machine Number	Description (Pin Spacing)	Length in Pitches
C2100HNP	2.50	8600-14	Special D1 pin every 3rd and 8th pitch	154
		8600-14E	Special D1 pin every 3rd and 10th pitch	156
		8600-14EL	Special D1 pin every 3rd and 12th pitch	150
C2120HNP	3.00	8300-18	Special D1 pin every 3rd and 9th pitch	144
		8600-18	Special D1 pin every 3rd and 10th pitch	130
C2160HNP	4.00	8300-24	Special D1 pin every 3rd and 10th pitch	130



Base Chain Number	Chain Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Pin						Link Plate		Approx. Weight (lbs/Ft)	
				D	L1	Thread	Thread Length	Shaft Diameter	Shaft Length	T	H	No. of Links per 10 ft.	
C2100HNP	2.50	0.750	0.750	0.375	0.858	M8	0.630	0.506	1.000	0.187	1.126	2.38	48
C2120HNP	3.00	0.875	1.000	0.437	1.061	M10	0.700	0.629	1.090	0.219	1.354	3.41	40
C2160HNP	4.00	1.125	1.250	0.562	1.337	M10	0.750	0.787	1.060	0.281	1.898	6.02	30

How to Order:

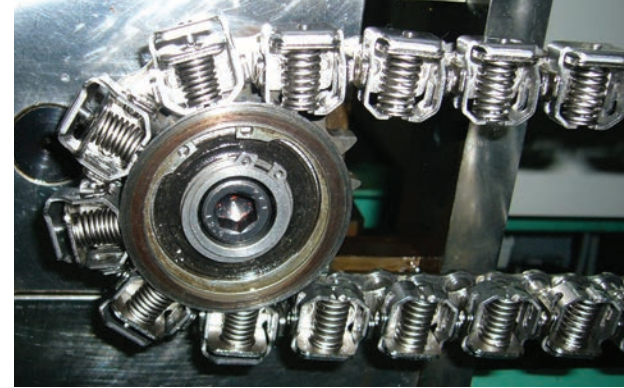
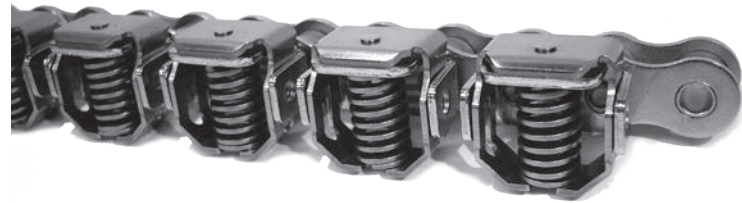
Step 1 - Identify chain size (pitch).

Step 2 - Count the number of links between the extended carrier pins. Typical configurations are every 3rd and 8th pitch, 3rd and 9th pitch, 3rd and 10th pitch or 3rd and 12th pitch.

Step 3 - Determine the overall length of the chain, including the connecting link.

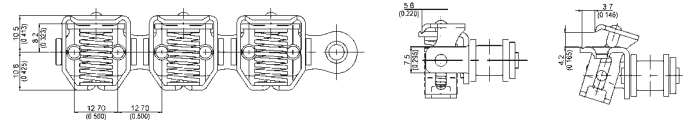
Step 4 - Contact Tsubaki to place a purchase order.

GRIPPER CHAINS™

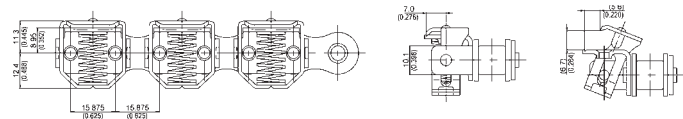


- Tsubaki high-performance roller chains combined with special “M” and “S” Type gripper heads for form, fill and vacuum seal applications
- FDA approved food-grade lubrication (H3) applied at the factory to ensure uniform coverage and protection of each key component.
- Nickel-plated and stainless steel options available in cut-to-length options from stock.

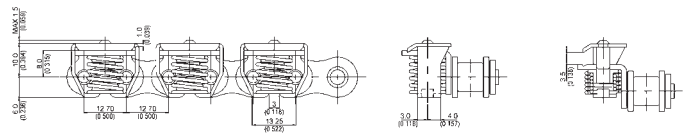
RS08BNPKUTM and RS08BLKUTM Gripper Chain™



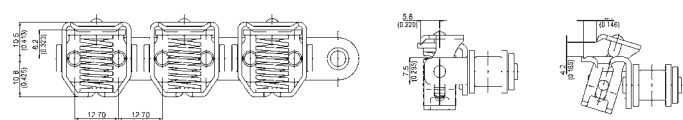
RS10BNPKUTM and RS10BLKUTM Gripper Chain™



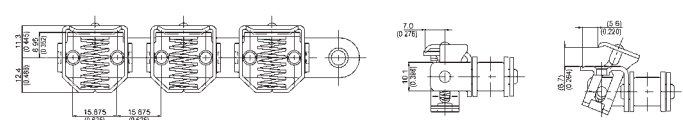
RS08BNPKUTS and RS08BLKUTS Gripper Chain™



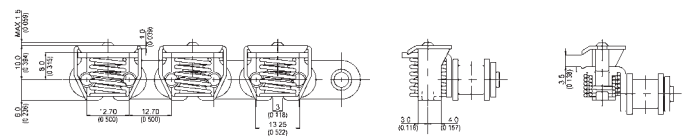
RS08BSSKUTM and RS08BASKUTM Gripper Chain™



RS10BSSKUTM and RS10BASKUTM Gripper Chain™



RS08BSSKUTS and RS08BASKUTS Gripper Chain™



Chain Number	Connecting Link	Pitch		Roller Diameter		Inside Width		Clamp Type	Clamping Force N	Materials		
		MM	Inches	MM	Inches	MM	Inches			Base Chain	Clamp	Spring
RS08BNPKUTM	RS08BNPKUTMCL	12.7	0.500	8.51	0.335	7.75	0.305	Type M	50	NP	304SS	SA
RS10BNPKUTM	RS10BNPKUTMCL	15.9	0.625	10.16	0.400	9.65	0.380	Type M	70	NP	304SS	SA
RS08BNPKUTS	RS08BNPKUTSCL	12.7	0.500	8.51	0.335	7.75	0.305	Standard	55	NP	304SS	SA
RS08BLKUTM	RS08BLKUTMCL	12.7	0.500	8.51	0.335	7.75	0.305	Type M	50	NP Lambda®	304SS	SA
RS10BLKUTM	RS10BLKUTMCL	15.9	0.625	10.16	0.400	9.65	0.380	Type M	70	NP Lambda®	304SS	SA
RS08BLKUTS	RS08BLKUTSCL	12.7	0.500	8.51	0.335	7.75	0.305	Standard	55	NP Lambda®	304SS	SA
RS08BSSKUTM	RS08BSSKUTMCL	12.7	0.500	8.51	0.335	7.75	0.305	Type M	50	SS	304SS	SA
RS10BSSKUTM	RS10BSSKUTMCL	15.9	0.625	10.16	0.400	9.65	0.380	Type M	70	SS	304SS	SA
RS08BSSKUTS	RS08BSSKUTSCL	12.7	0.500	8.51	0.335	7.75	0.305	Standard	55	SS	304SS	SA
RS08BASKUTM	RS08BASKUTMCL	12.7	0.500	8.51	0.335	7.75	0.305	Type M	50	SS	304SS	SA
RS10BASKUTM	RS10BASKUTMCL	15.9	0.625	10.16	0.400	9.65	0.380	Type M	70	SS	304SS	SA
RS08BASKUTS	RS08BASKUTSCL	12.7	0.500	8.51	0.335	7.75	0.305	Standard	55	SS	304SS	SA

Note: Chains can be supplied in cut-to-length sections. NP = Nickel Plated, SS = 304 Stainless Steel, SA = 600 Stainless Steel Do not twist chain. Use care not to damage attachment when unwinding chain from reel.

PIN OVEN CHAINS



For the last 30 years, Tsubaki has been manufacturing Pin Oven chains for industrial applications worldwide. Tsubaki has worked directly with can manufacturers to develop chain and pin designs to maximize operational excellence.

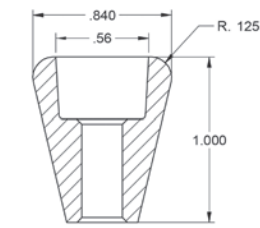
Some of the features and benefits of Tsubaki Pin Oven chain include:

FEATURES:

- All chains are pre-stressed
- Bushings for Tsubaki Pin Oven chain are of solid construction
- Extended pins are precision aligned.
- Peek material tips with .125 radius are standard

BENEFITS:

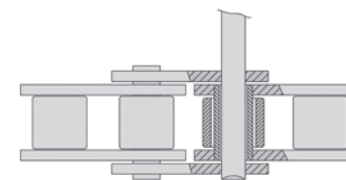
- Solid bushing provides extended life with good lubrication
- Prestressing minimizes initial chain elongation (stretch)
- Precision aligning holds cans straight during high speed production
- Peek tips for high temperature resistance



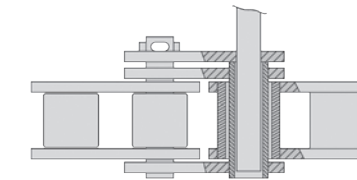
Standard Tip Dimension



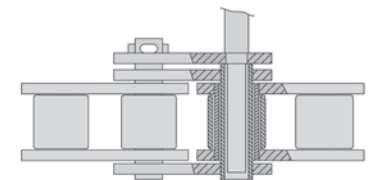
Standard Peek Tips
(Nylon tips available as MTO)



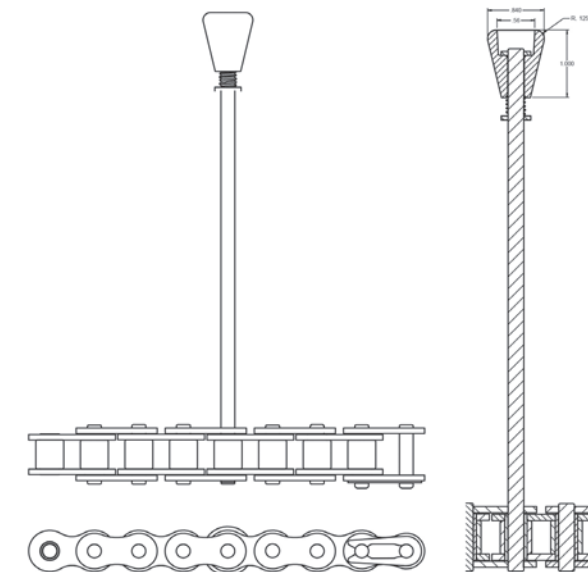
No. 60 Integral Pin
Standard Pin Oven Chain



No. 60 Plug-in Pin
Allows for easy change out of pins without having to break the chain



No. 6028 Plug-in Pin
Features an Extra large dia. pin with extra bearing area for longer life and easy tip change



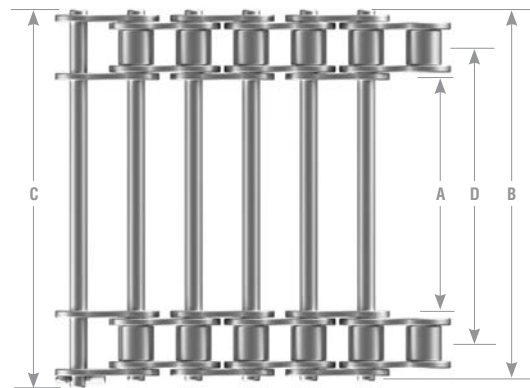
CROSSROD CHAINS

Crossrod conveyor chain consists of two parallel strands of standard 40 or 50 roller chains, joined by crossrods on every link. 40 chain is used for light loads such as conveying bread through coolers, wrappers or slicers. 50 chain is used in heavier loads. When sanitary, non-corrosive qualities are desired, stainless steel crossrods are available. Connecting pins have milled flat ends and fit into a D-shaped hole in the link plate to prevent pin rotation and to provide longer life. Chains are furnished in five-foot sections and run on standard roller chain sprockets. Removeable two-pitch link sections are available for repair and replacement needs.



How to Order:

Chains are available in carbon steel and stainless. Crossrods may be ordered in carbon steel or stainless. One connecting pin is supplied with each chain section for connection. Additional pins may be ordered separately. Specify chain number and material combination needed. All sprockets should be keyed in line in pairs to evenly distribute loads to both chains.



40 Roller chain with .500 pitch and .156 pin diameter

Chain Number	Nominal Width	Plate to Plate Width	Overall Riveted	Pin Head to end	Roller CL to CL	Average Weight Lbs/ft
		A	B	C	D	
P329-12	12	11.25	12.44	12.51	11.812	2.0
P329-15	15	14.25	15.44	15.51	14.812	2.6
P329-18	18	17.25	18.44	18.51	17.812	3.1
P329-21	21	20.25	21.44	21.51	20.812	3.4
P329-24	24	23.25	24.44	24.51	23.812	3.8
P329-30	30	29.25	30.44	30.51	29.812	4.7

Dimensions in inches

50 roller chain with .625 pitch and .200 pin diameter

Chain Number	Nominal Width	Plate to Plate Width	Overall Riveted	Pin Head to end	Roller CL to CL	Average Weight Lbs/ft
		A	B	C	D	
P800-12	12	11.10	12.60	12.67	11.812	2.2
P800-15	15	14.10	15.60	15.67	14.812	2.8
P800-18	18	17.10	18.60	18.67	17.812	3.3
P800-21	21	20.10	21.60	21.67	20.812	3.6
P800-24	24	23.10	24.60	24.67	23.812	4.1
P800-30	30	29.10	30.60	30.67	29.812	4.9

Dimensions in inches

Single Cottered Connecting Pins

40 Chain	50 Chain	Nominal Width
P329-CP12	P800-CP12	12
P329-CP15	P800-CP15	15
P329-CP18	P800-CP18	18
P329-CP21	P800-CP21	21
P329-CP24	P800-CP24	24
P329-CP30	P800-CP30	30

Dimensions in inches

Two-Pitch Connecting Links

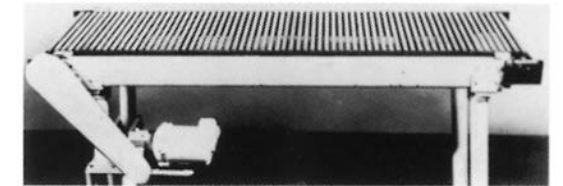
40 Chain	50 Chain	Nominal Width
P329-RS12	P800-RS12	12
P329-RS15	P800-RS15	15
P329-RS18	P800-RS18	18
P329-RS21	P800-RS21	21
P329-RS24	P800-RS24	24
P329-RS30	P800-RS30	30

Dimensions in inches

LIVE TUBULAR CHAINS

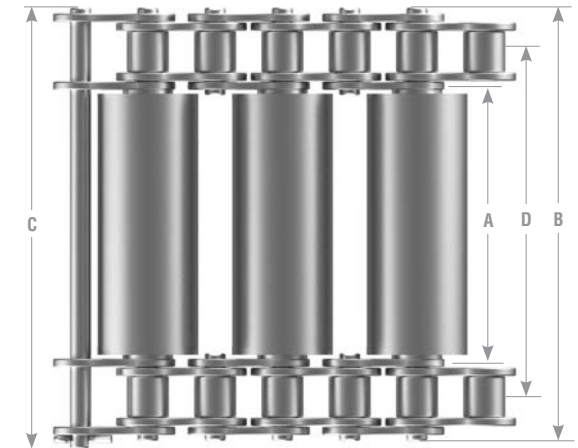
The chain consists of two parallel strands of 40 chain with 3/4" diameter live tubular rollers on 1" (every second pitch) spacing. The chains can be placed at the end of any intermediate point of a line where speed variations of conveyed goods may occur. Placed next to slicing or wrapping machines, they act as accumulators.

Each chain is assembled with connecting pins acting as tie bars every 12". The pins have milled flats and fit into a D-shaped hole in the link plate to prevent pin rotation and give longer life. Chains are furnished in 10' sections. The tubular rollers rotate on either oil impregnated iron or plastic bearings. Removeable two-pitch connecting links are available.



How to order:

Chains, connecting links and rollers are also available in nickle plated or stainless steel. Either a plastic or an oil-impregnated bearing must also be specified. Chains and connecting links are ordered separately. One connecting pin is supplied with each chain section or connecting link. Additional pins may be ordered separately. Specify chain number and the material/bearing combion desired.



RS40 chain with .500 pitch, .750" Roller Diameter

Chain No.	Nominal Width	Plate to Plate Width	Overall Riveted	Pin Head to End	Roller CL to CL	Average Weight Lbs/Ft
		A	B	C	D	
TP329-12	12	11.25	12.44	12.51	11.812	4.3
TP329-15	15	14.25	15.44	15.51	14.812	5.3
TP329-18	18	17.25	18.44	18.51	17.812	6.2
TP329-21	21	20.25	21.44	21.51	20.812	7.2
TP329-24	24	23.25	24.44	24.51	23.812	7.6
TP329-30	30	29.25	30.44	30.51	29.812	9.1

Dimensions in inches

Single Cottered Connecting Pins

Chain No.	Nominal Width
TP329-CP12	12
TP329-CP15	15
TP329-CP18	18
TP329-CP21	21
TP329-CP24	24
TP329-CP30	30

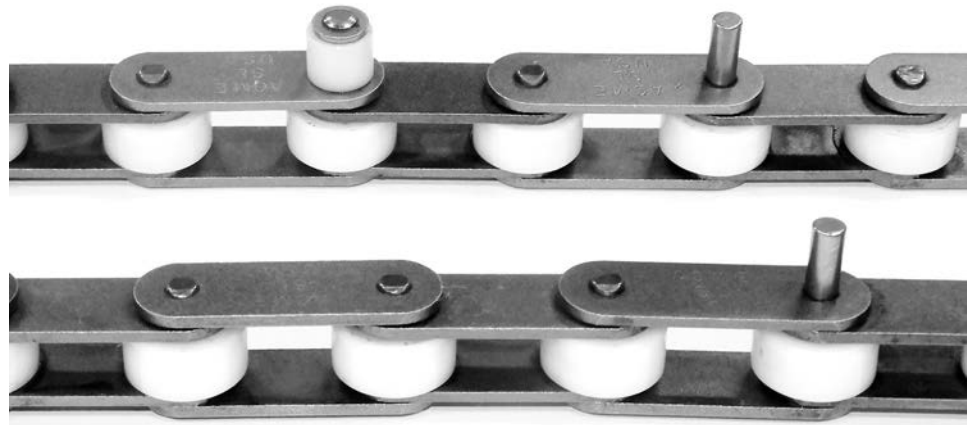
Dimensions in inches

Two-Pitch Connecting Links

Chain No.	Nominal Width
TP329-RS12	12
TP329-RS15	15
TP329-RS18	18
TP329-RS21	21
TP329-RS24	24
TP329-RS30	30

Dimensions in inches

BUCKET ELEVATOR CHAINS



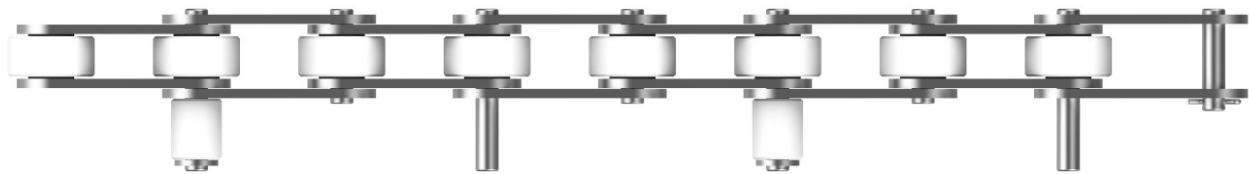
Bucket elevator chains from Tsubaki are designed for carrying bulk materials in food and light weight material handling applications. The features and benefits of Tsubaki bucket elevator chains include:

- Lube-free construction
- Hardened carbon steel pins, plates, and bushings
- Delrin rollers for greater durability
- Prestressed chains to allow for proper set-up and alignment

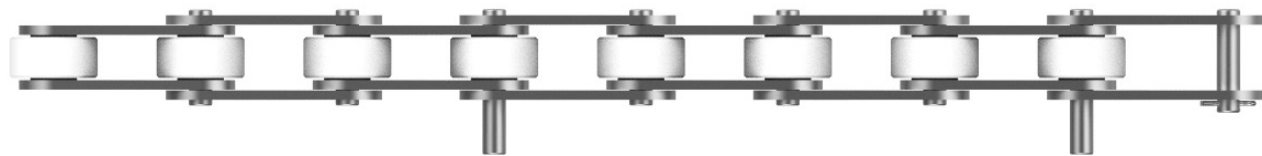
Chain information:

- C2052 – Delrin roller chain (1.25" pitch)
- Pin projection - .468"
- Pin Diameter - .199"
- Pin spacing – Every 5"
- Outboard roller diameter - .438"

B100-9035 Bucket Support Chain



B100-9036 Bucket Pin Chain

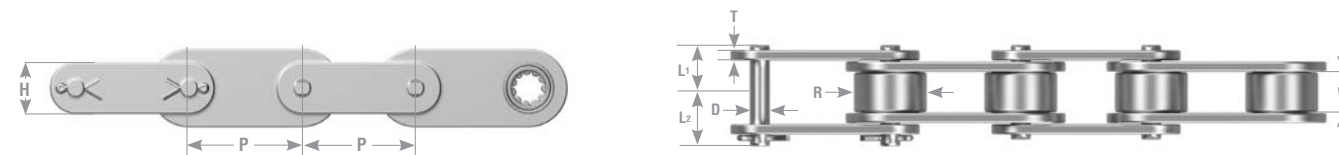


BEARING BUSHED CHAINS



Tsubaki Bearing Bushed chain virtually eliminates initial stretch by placing a needle bearing in between the pin and bushing area. Bearing Bushed chain offers excellent wear without the need for additional lubrication.

Major dimensions of the chain are the same as standard ANSI double-pitch chains. Tsubaki Bearing Bushed chains work perfectly with standard over-sized roller sprockets. Bearing Bushed chains are suggested for applications where precision accuracy positioning of the conveyed material is required.



Chain No.	Pitch	Roller Diameter	Width Between Roller Plates	Link Plate			Pin			Maximum Allowable Load	Allowable Roller Load LBS/Roller	Approx. Weight lbs/Ft
	P	R	w	T	H	h	D	L1	L2			
CN2042	1.000	0.625	0.312	0.060	0.689	0.473	0.156	0.325	0.380	176	33	0.660
CN2052	1.250	0.750	0.375	0.080	0.827	0.591	0.200	0.406	0.472	287	44	1.160
CN2062H	1.500	0.875	0.500	0.125	1.024	0.677	0.234	0.573	0.667	396	66	1.720
CN2082H	2.000	1.125	0.625	0.156	1.378	0.906	0.312	0.720	0.823	660	121	2.600

Chain No.	Attachment							Additional Weight per Attachment	
	S	C	X	N	K	T	O	A-2 Att.	K-2 Att.
CN2042	1.000	0.625	0.312	0.060	0.689	0.473	0.156	33	0.660
CN2052	1.250	0.750	0.375	0.080	0.827	0.591	0.200	44	1.160
CN2062H	1.500	0.875	0.500	0.125	1.024	0.677	0.234	66	1.720
CN2082H	2.000	1.125	0.625	0.156	1.378	0.906	0.312	121	2.600

- Note:
1. Spring clip type connecting links for CN2042-CN2062H.
 2. Offset links are not available.
 3. Chain available in 304SS.
 4. Link plates can be nickel-plated.

SPROCKETS

Tsubaki produces a broad range of sprockets to satisfy all your application requirements. Stock product offerings are readily available and can be supplied in a multitude of pitch ranges and configurations. Extensive design, engineering and manufacturing capabilities allow Tsubaki to produce a wide variety of made-to-order sprocket products for a multitude of applications. From one-off customer designs to high volume OEM and Smart Tooth[®] sprocket requirements, Tsubaki has you covered.



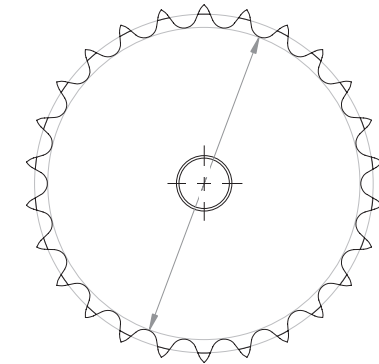
SPROCKETS 101

The following defines terminology and provides guidance to help select the best sprocket for a given application. In the event that further assistance is required, please call Tsubaki customer service at (800) 323-7790.

Basics of Sprockets

1. Caliper Diameter:

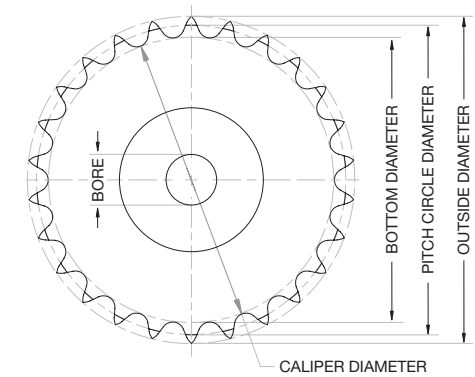
Caliper Diameter refers to the dimension measured from sprocket tooth valley to sprocket tooth valley on the opposite side (180°) of the sprocket. This dimension is used to measure the diameter of the sprocket plate (not including sprocket teeth). On sprockets that have an odd number of teeth, the measurement would be taken from the valley of one tooth to the valley as close to 180° on the opposite side of the sprocket.



Measuring caliper diameter

2. Sprocket Outside Diameter:

Sprocket outside diameter is the measurement from sprocket tooth peak to sprocket tooth peak on the opposite (180°) side of the sprocket. For sprockets with an odd number of teeth, the measurement would be taken from the peak of one sprocket tooth to the peak of a tooth as close to 180° as possible.



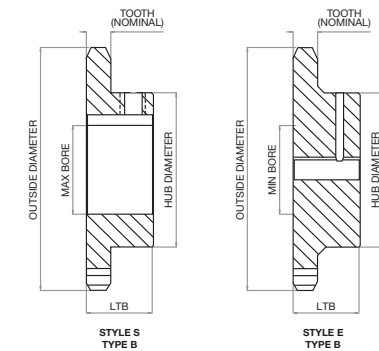
Measuring sprocket outside diameter

3. Maximum Bore Diameter:

Refers to the maximum bore size diameter a sprocket can be machined to without compromising structural integrity. This term is associated with both "B" and "C" style sprockets.

4. Length Thru Bore:

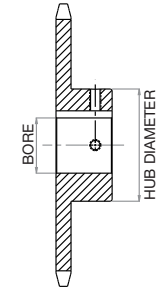
"LTB" Refers to the inside hub diameter and the length to which it was machined. This machined length must be long enough to accommodate the proper size keyway to withstand shear and torque stress induced by the rotating shaft.



Maximum bore diameter and thru bore

5. Plain Bore:

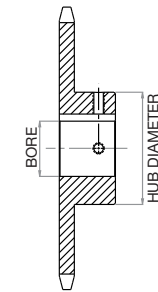
Associated with "A," "B" and "C" style sprockets where there is no special machining performed to accommodate keyways or set screws, only a hole to accommodate shaft diameter.



Plain bore sprocket

6. Finished Bore:

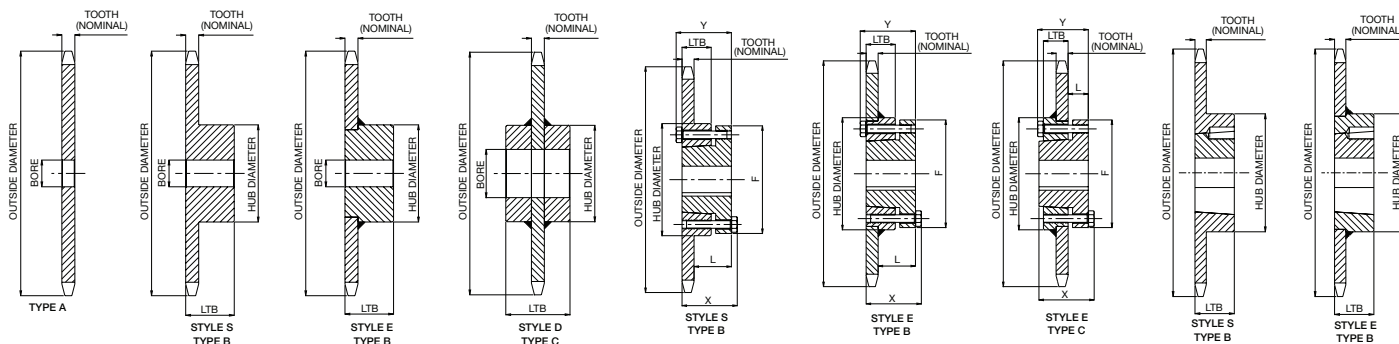
Associated with "B" and "C" style sprockets where the inside diameter of the hub is machined with a standard keyway and two set screws. Finished bore hubs can also be machined to specific requirements depending on the needs of the application.



Finished bore sprocket

7. Sprocket Hub Style:

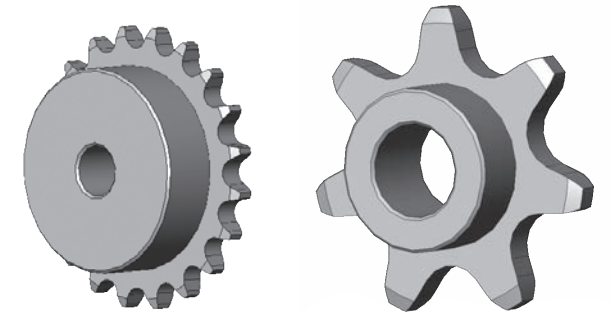
Tsubaki manufactures various sprocket hub styles to meet the application requirements of our customers.



Stock sprocket hub styles

8. Small and Large Roller Double Pitch Sprockets:

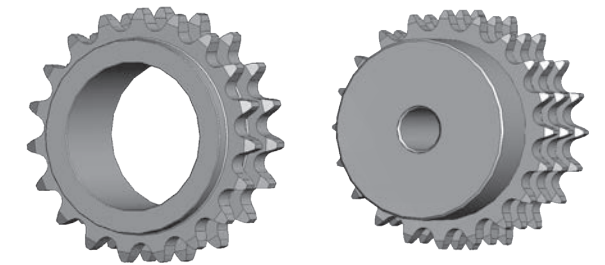
Used with double pitch conveyor series roller chains. These chains are available with either the standard small roller diameter (i.e.: 2040, 2050, 2060, 2080, 2100) or a larger diameter chain roller style (i.e.: 2042, 2052, 2062, 2082, 2102). Sprockets are available from stock to accommodate either style. This type of sprocket is primarily used in conveying applications where torque requirements are lower, and long service life is critical.



Small and large roller double pitch sprockets

9. Multiple-Strand Sprockets:

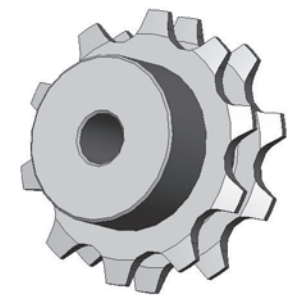
This type of sprocket is commonly used in applications where higher torque and power requirements are needed. The spacing between the rows of teeth corresponds with the center-line of chain strands. Due to the added width of chain, the "LTB" of multiple strand sprockets is correspondingly longer. This style of sprocket is available in 40 through 160 chain pitch with plain, finished or TAPER-LOCK®/QD® style hubs.



Multiple-Strand sprockets

10. DOUBLE PLUS® Sprockets:

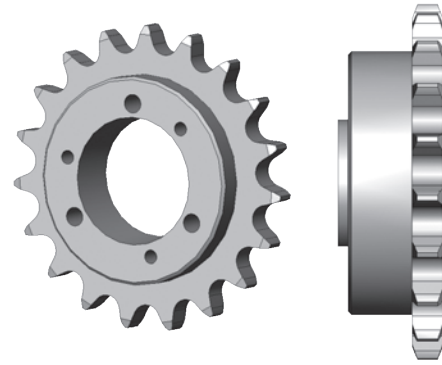
This type of sprocket is specifically designed to work with DOUBLE PLUS® chain. This style of sprocket is used in conveyor applications where product on the conveyor is propelled at twice speed of the drive system powering the conveyor. The main benefit of incorporating DOUBLE PLUS® chain and sprockets is less noise and longer chain life.



DOUBLE PLUS® sprockets

11. QD® Sprockets:

This type of sprocket is used in applications where higher working loads are prevalent, and high clamp loading on the drive shaft is desirable. Sprockets with tapered bushings will fall into the QD®, Split-Taper or TAPER-LOCK® family. QD® bushings are flanged, and most commonly utilize large anchor bolts around the circumference of the flange to retain itself to the sprocket. However, this style of bushing is also available in a weld on hub configuration. One of the primary advantages the QD® bushing offers is its ease of installation and removal. It also provides superior clamp force, and aligns the sprocket 90° to the drive shaft to assure proper alignment.



QD® sprocket

12. TAPER-LOCK® Sprockets:

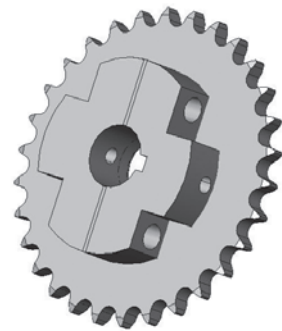
TAPER-LOCK® bushings are similar to QD® style bushings in that they both utilize a split through the taper and flange to provide a true clamp on the shaft that is equivalent to a shrink fit. This type of bushing is retained to the sprocket with a series of set screws on the outside diameter of the bushing running parallel to the shaft, or can be welded to the sprocket itself. With TAPER-LOCK® bushings, there is no need for a set screw over the drive shaft key. TAPER-LOCK® bushings offer flexibility in that they allow multiple sized bores for a single bushing size.



TAPER-LOCK® sprocket

13. Steel Split Sprockets:

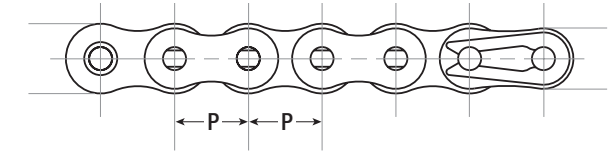
Split sprockets are slit through the entire diameter of the sprocket to allow ease of installation and removal. The sprocket halves are held together by bolts located on either side of the hub. This particular style is available in chain pitch sizes of 40 through 240, and bore diameters of 3/4" through 6" depending on chain pitch selected.



Steel Split sprocket

14. British Standard Sprockets:

This style of sprocket is similar to an ANSI style sprocket with the exception of the fact that it is designed to propel British Standard Chain. British Standard Chain has slightly different dimensions with regard to chain pitch and roller diameter. ANSI Standard chain pitch is measured in 1/8" increments (pin to pin), whereas British Standard follows a 1/16" pin to pin spacing.



Measuring British Standard Chain

15. Double Single Sprockets:

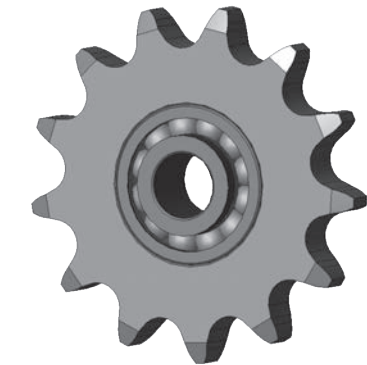
This type of sprocket is commonly used in applications where two or more items are powered by a common drive shaft. The space between the sprocket plates is wider than a multi-strand sprocket, and allows two separate strands of chain to engage without contacting each other. With this type of sprocket, one strand of chain may exit in a different direction than the other. For example, one strand exiting towards the ceiling and the other running parallel to the floor.



Double Single Sprocket

16. Idler Sprockets:

This type of sprocket is used in applications where the drive chain may experience slack due to long lengths, non-adjustability of the driven shaft, or where the chain has to be guided around an obstruction. Use of Idler Sprockets prevents chain whipping and uneven distribution of load. This type of sprocket can also be used in applications where the drive chain may experience direction reversal, or in applications where the chain may experience whipping. Having idler sprockets touching the outside of the chain would be beneficial.



Idler Sprocket

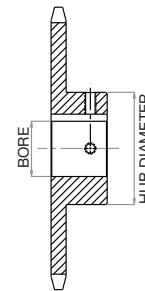
17. How to Order Code:

The following decodes the model number for a given Tsubaki Stock Sprocket product. The following example should be used to decipher the characteristics and features associated with a given sprocket.

A	35	B	TL	18		
Altered ¹¹	Chain Pitch in Inches	Hub Type	TAPER-LOCK [®]	Number of Teeth		
A: Alteration Required	35: 3/8" Pitch	B: Hub Extension One Side	TAPER-LOCK [®] hub	18	22	26
				19	23	28
				20	24	30
				21	25	32

18. Altered Sprockets:

Altered sprockets require a minor modification to the standard configuration to fulfill the requirements of the application at hand. Some examples of common alterations include: rebore to a different size than standard, different set screw location than standard, drilling of holes into sprocket plate for accessory mounting, non-standard keyway size, etc. A complete list of common alterations is available in the engineering section of this catalog. It should be noted that adding the prefix "A" is used only when an alteration is required. It is not necessary for standard products and only applies when a non-standard feature is required.



Altered Bore Sprocket

19. Fraction Legend for Hub Bore Size:

The following table should be used to define the hub bore size associated with "Finished Bore" stock sprocket product. Note that a letter designator is used to represent a fractional dimension. For example: a 1B hub bore equates to a sprocket bore of 1.125" inside diameter.

Letter Designator	Fractional Size	Decimal Size
A	1/16"	0.0625"
B	1/8"	0.1250"
C	3/16"	0.1875"
D	1/4"	0.2500"
E	5/16"	0.3125"
F	3/8"	0.3750"
G	7/16"	0.4375"
H	1/2"	0.5000"
I	9/16"	0.5625"
J	5/8"	0.6250"
K	11/16"	0.6875"
L	3/4"	0.7500"
M	13/16"	0.8125"
P	7/8"	0.8750"
R	15/16"	0.9375"

PLAIN BORE

Chain Data	
Size	25
Pitch	1/4"
Inside Width	1/8"
Roller Diameter	0.130"
Nominal Tooth Width:	0.110"

All dimensions in inches unless noted.

No. Teeth	25 Plain Bore Sprocket Diameters			Type "A" Plain Bore		Type "B" Plain Bore					
	Outside Diameter	Pitch Diameter	Caliper Diameter	Plain Bore	Wt. Lbs.	Plain Bore	MAX Bore*	Hub Diameter	LTB	Style	Wt. Lbs.
9	0.837	0.731	0.591	NS	NS	0.250	0.250	0.438	0.500	S	0.03
10	0.919	0.809	0.679	NS	NS	0.250	0.250	0.500	0.500	S	0.03
11	1.002	0.870	0.748	NS	NS	0.250	0.313	0.563	0.500	S	0.04
12	1.083	0.966	0.836	NS	NS	0.250	0.375	0.625	0.500	S	0.06
13	1.167	1.045	0.907	NS	NS	0.250	0.438	0.781	0.500	S	0.07
14	1.246	1.124	0.994	NS	NS	0.250	0.563	0.813	0.500	S	0.08
15	1.326	1.203	1.066	0.250	0.040	0.250	0.563	0.891	0.500	S	0.10
16	1.407	1.282	1.152	0.250	0.040	0.250	0.563	0.969	0.500	S	0.12
17	1.487	1.361	1.225	0.250	0.040	0.250	0.625	1.031	0.500	S	0.14
18	1.568	1.440	1.310	0.250	0.040	0.250	0.750	1.125	0.500	S	0.16
19	1.648	1.519	1.383	0.250	0.040	0.250	0.813	1.219	0.500	S	0.19
20	1.729	1.598	1.468	0.250	0.040	0.250	0.875	1.281	0.625	S	0.25
21	1.809	1.678	1.543	0.375	0.040	0.250	0.875	1.375	0.625	S	0.28
22	1.889	1.757	1.627	0.375	0.060	0.250	0.938	1.438	0.625	S	0.31
23	1.969	1.836	1.702	0.375	0.060	0.250	1.000	1.500	0.625	S	0.32
24	2.049	1.915	1.785	0.375	0.080	0.375	1.000	1.500	0.625	S	0.33
25	2.129	1.995	1.861	0.375	0.080	0.375	1.000	1.500	0.625	S	0.34
26	2.209	2.074	1.944	0.375	0.090	0.375	1.000	1.500	0.625	S	0.35
28	2.369	2.233	2.103	0.375	0.100	0.375	1.000	1.500	0.625	S	0.36
30	2.529	2.392	2.262	0.375	0.120	0.375	1.000	1.500	0.625	S	0.38
32	2.688	2.551	2.421	0.375	0.140	0.375	1.000	1.500	0.625	S	0.40
35	2.928	2.789	2.656	0.375	0.160	0.375	1.000	1.500	0.625	S	0.46
36	3.008	2.869	2.739	0.375	0.180	0.375	1.000	1.500	0.750	S	0.50
40	3.327	3.187	3.057	0.500	0.200	0.500	1.375	2.000	0.750	E	0.53
45	3.725	3.584	3.452	0.500	0.250	0.500	1.375	2.000	0.750	E	0.56
48	3.964	3.823	3.693	0.500	0.320	0.500	1.375	2.000	0.750	E	0.56
54	4.442	4.300	4.170	0.500	0.380	0.500	1.375	2.000	0.750	E	1.00
60	4.920	4.777	4.647	0.500	0.540	0.500	1.375	2.000	0.750	E	1.10
72	5.876	5.732	5.602	0.500	0.740	0.500	1.375	2.000	0.750	E	1.30

* Dimensions shown allow for standard keyway with set screw at 90 degrees NS = Non Stock

STAINLESS STEEL PLAIN BORE

Chain Data	
Size	25SS
Pitch	1/4"
Inside Width	1/8"
Roller Diameter	0.130"
Nominal Tooth Width:	0.110"

All dimensions in inches unless noted.

No. Teeth	25 Stainless Steel Sprocket Diameters			Type "B" Plain Bore				
	Outside Diameter	Pitch Diameter	Caliper Diameter	Plain Bore	MAX Bore*	Hub Diameter	LTB	Wt. Lbs.
9	0.837	0.731	0.591	0.250	0.250	0.438	0.500	0.03
10	0.919	0.809	0.679	0.250	0.250	0.500	0.500	0.03
11	1.002	0.870	0.748	0.250	0.313	0.563	0.500	0.03
12	1.083	0.966	0.836	0.250	0.375	0.625	0.500	0.06
13	1.167	1.045	0.907	0.250	0.438	0.719	0.500	0.07
14	1.246	1.124	0.994	0.250	0.563	0.813	0.500	0.08
15	1.326	1.203	1.066	0.250	0.563	0.891	0.500	0.10
16	1.407	1.282	1.152	0.250	0.563	0.969	0.500	0.12
17	1.487	1.361	1.225	0.250	0.625	1.031	0.500	0.14
18	1.568	1.440	1.310	0.250	0.750	1.125	0.500	0.16
19	1.648	1.519	1.383	0.250	0.813	1.219	0.500	0.19
20	1.729	1.598	1.468	0.250	0.875	1.281	0.625	0.25
21	1.809	1.678	1.543	0.250	0.875	1.375	0.625	0.28
22	1.889	1.757	1.627	0.250	0.938	1.438	0.625	0.31
23	1.969	1.836	1.702	0.250	1.000	1.500	0.625	0.32
24	2.049	1.915	1.785	0.375	1.000	1.500	0.625	0.33
25	2.129	1.995	1.861	0.375	1.000	1.500	0.625	0.34
26	2.209	2.074	1.944	0.375	1.000	1.500	0.625	0.35
28	2.369	2.233	2.103	0.375	1.000	1.500	0.625	0.36
30	2.529	2.392	2.262	0.375	1.000	1.500	0.625	0.38
36	3.008	2.869	2.739	0.375	1.000	1.500	0.750	0.50
40	3.327	3.187	3.057	0.500	1.375	2.000	0.750	0.53
45	3.725	3.584	3.452	0.500	1.375	2.000	0.750	0.56
60	4.920	4.777	4.647	0.500	1.375	2.000	0.750	1.10

* Dimensions shown allow for standard keyway with set screw at 90 degrees For more information on Sprockets see pages 132-137.

PLAIN BORE



All dimensions in inches unless noted.

Table with columns: No. Teeth, Outside Dia., Pitch Dia., Caliper Dia., Plain Bore, Wt. Lbs., MAX Bore*, Hub Dia., LTB, Style, Wt. Lbs.

* Dimensions shown allow for standard keyway with set screw at 90 degrees. □ Has recessed groove in hub for chain clearance. NS = Non Stock

Chain Data table with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

FINISHED BORE

All dimensions in inches unless noted.

Table with columns: No. Teeth, Outside Dia., Pitch Dia., Caliper Dia., 1/2", .625", .750", 1.000", 1.125", 1.1888", 1.250", 1.375", 1.438", 1.500", Hub Style, Wt. Lbs.

• Denotes stocking item ** Furnished without keyway For more information on Sprockets see pages 132-137.

Chain Data table with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

TAPER-LOCK®



All dimensions in inches unless noted.

Table with columns: No. Teeth, Outside Dia., Bushing #, MAX Bore*, LTB, Hub Diameter, Hub Style, Weight Lbs.

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data. †† Has recessed groove in hub for chain clearance.

TAPER-LOCK® Bushings table with columns: Bushing #, Bore Range.

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

QD® Bushings table with columns: Bushing #, Bore Range.

QD® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 199. QD® is a registered trademark of, and is used under license agreement from Emerson Electric Co.

QD®

All dimensions in inches unless noted.

Table with columns: No. Teeth, Outside Diameter, Bushing #, MAX Bore*, Hub Diameter, LTB, X, Y, L, F, Hub Style, Weight Lbs.

* Please reference QD® bushing dimension table on page 200 for specific information on MAX Bore and keyway data. For more information on Sprockets see pages 132-137.

Chain Data table with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

Chain Data table with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

PLAIN BORE

Chain Data table with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

All dimensions in inches unless noted.

Main table for Plain Bore sprockets with columns: No. Teeth, Outside Dia., Pitch Dia., Caliper Dia., Plain Bore, Wt. Lbs., Plain Bore, MAX Bore *, Hub Dia., LTB, Hub Style, Wt. Lbs.

* Dimensions shown allow for standard keyway with set screw at 90 degrees □ Has recessed groove in hub for chain clearance NS = Non Stock

STAINLESS STEEL PLAIN BORE

Chain Data table for stainless steel sprockets with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

All dimensions in inches unless noted.

Main table for Stainless Steel Plain Bore sprockets with columns: No. Teeth, Outside Dia., Pitch Dia., Caliper Dia., Plain Bore, Wt. Lbs., Plain Bore, MAX Bore *, Hub Dia., LTB, Hub Style, Wt. Lbs.

* Dimension depicted allows for standard keyway with set screw at 90 degrees □ Has recessed groove in hub for chain clearance N/A = Not Available For more information on Sprockets see pages 132-137.

FINISHED BORE

Chain Data table for finished bore sprockets with columns: Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width.

All dimensions in inches unless noted.

Main table for Finished Bore sprockets with columns: No. Teeth, Outside Diameter, Pitch Diameter, Caliper Diameter, and various keyway sizes (.500", .625", .750", .875", 1.000", 1.125", 1.187", 1.250", 1.375", 1.438", 1.500"), Hub Style, Wt. Lbs.

• Denotes stocked item ■ Indicates ser screw at 90 degrees and 180 degrees from keyway ** Furnished without keyway

For more information on Sprockets see pages 132-137.

SPROCKETS

SPROCKETS

MULTI-STRAND

Chain Data	
Size	40-2, 40-3
Pitch	1/2"
Inside Width	5/16"
Roller Diameter	0.312"
Nominal Tooth Width:	0.275"

All dimensions in inches unless noted.

40 Multi Strand Sprocket Dia.			Dimensional Data: Double Strand Sprockets				
No. Teeth	Outside Diameter	Plain Bore	Hub Diameter	LTB	MAX Bore +	Hub Style	Weight Lbs.
11	2.003	0.500	1.438 □	1.500	0.750	S	0.62
12	2.166	0.500	1.563 □	1.500	0.938	S	0.76
13	2.328	0.500	1.500	1.500	1.000	S	0.86
14	2.490	0.500	1.688	1.500	1.125	S	1.08
15	2.652	0.500	1.813	1.500	1.250	S	1.24
16	2.814	0.625	2.000	1.500	1.375	S	1.42
17	2.974	0.625	2.125	1.500	1.438	S	1.64
18	3.136	0.625	2.313	1.500	1.500	S	1.92
19	3.292	0.625	2.500	1.500	1.750	S	2.22
20	3.457	0.625	2.625	1.625	1.875	S	2.64
21	3.618	0.625	2.750	1.625	1.875	S	2.94
22	3.778	0.625	2.875	1.625	1.875	S	3.18
23	3.938	0.625	3.000	1.625	2.000	S	3.52
24	4.098	0.625	3.250	1.625	2.250	S	4.04
25	4.258	0.625	3.250	1.625	2.250	S	4.26
26	4.418	0.625	3.250	1.625	2.250	S	4.48
30	5.057	0.875	3.250	1.625	2.250	S	5.34
35	5.856	0.875	3.250	1.625	2.250	S	6.80
36	6.015	0.938	3.750	1.625	2.500	S	7.20
40	6.653	0.938	3.750	1.750	2.500	S	9.40
42	6.972	0.938	3.750	1.750	2.500	S	10.20
45	7.450	0.938	3.750	1.750	2.500	S	11.36
48	7.930	0.938	3.750	1.750	2.500	S	12.66
52	8.570	0.938	3.750	1.750	2.500	S	14.46
54	8.890	0.938	3.750	1.750	2.500	S	15.48
60	9.840	0.938	3.750	1.750	2.500	S	18.60

+ Dimension depicted allows for standard keyway with set screw at 90 degrees.
 □ Has recessed groove in hub for chain clearance.

40 Multi Strand Sprocket Dia.			Dimensional Data: Triple Strand Sprockets				
No. Teeth	Outside Diameter	Plain Bore	Hub Diameter	LTB	MAX Bore +	Hub Style	Weight Lbs.
11	2.003	0.500	1.438 □	2.125	0.750	S	0.80
12	2.166	0.500	1.563 □	2.125	0.938	S	1.10
13	2.328	0.500	1.500	2.125	1.000	S	1.24
14	2.490	0.500	1.688	2.125	1.125	S	1.50
15	2.652	0.500	1.813	2.125	1.250	S	1.76
16	2.814	0.625	2.000	2.125	1.375	S	2.04
17	2.974	0.625	2.125	2.125	1.438	S	2.34
18	3.136	0.625	2.313	2.125	1.500	S	2.72
19	3.292	0.625	2.500	2.125	1.750	S	3.10
20	3.457	0.625	2.625	2.250	1.875	S	3.72
21	3.618	0.625	2.750	2.250	1.875	S	4.06
22	3.778	0.625	2.875	2.250	1.875	S	4.52
23	3.938	0.625	3.000	2.250	2.000	S	4.96
24	4.098	0.625	3.250	2.250	2.250	S	5.64
25	4.258	0.625	3.250	2.250	2.250	S	6.02
26	4.418	0.625	3.250	2.250	2.250	S	6.36
30	5.057	0.875	3.250	2.250	2.250	S	7.84
35	5.856	0.875	3.250	2.250	2.250	S	10.30
36	6.015	0.938	3.750	2.375	2.500	S	11.72

+ Dimension depicted allows for standard keyway with set screw at 90 degrees.
 □ Has recessed groove in hub for chain clearance.

DOUBLE SINGLE

Chain Data	
Size	40
Pitch	1/2"
Inside Width	5/16"
Roller Diameter	0.312"
Nominal Tooth Width:	0.284"

All dimensions in inches unless noted.

40 Double Single Sprocket Dia.			Dimensional Data				
No. Teeth	Outside Diameter	Plain Bore	LTB	C	D	MAX Bore +	Weight Lbs.
15	2.650	0.500	1.406	1.125	1.813	1.250	1.20
16	2.810	0.500	1.406	1.125	2.000	1.250	1.40
17	2.980	0.500	1.406	1.125	2.125	1.313	1.60
18	3.140	0.500	1.406	1.125	2.313	1.500	1.80
19	3.300	0.625	1.406	1.125	2.500	1.688	2.20
20	3.460	0.625	1.406	1.125	2.625	1.750	2.60
21	3.620	0.625	1.406	1.125	2.781	1.750	2.90
22	3.780	0.625	1.406	1.125	2.938	1.938	3.00
23	3.940	0.625	1.406	1.125	3.094	2.063	3.50
24	4.100	0.625	1.406	1.125	3.266	2.250	4.00

+ Dimension depicted allows for standard keyway with set screw at 90 degrees.

DOUBLE SINGLE

Chain Data	
Size	40
Pitch	1/2"
Inside Width	5/16"
Roller Diameter	0.312"
Nominal Tooth Width:	0.284"

TAPER-LOCK® Bushings	
Bushing #	Bore Range
1215	0.500 - 1.250"
1615	0.500 - 1.688"

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

All dimensions in inches unless noted.

40 Double Single TAPER-LOCK® Sprocket Diameters			Dimensional Data				
No. Teeth	Outside Diameter	Plain Bore	LTB	C	Bushing #	MAX Bore*	Weight Lbs.
19	3.300	0.500	1.406	1.125	1215	1.250	1.10
20	3.460	0.500	1.406	1.125	1215	1.250	1.30
21	3.620	0.500	1.406	1.125	1615	1.688	1.30
23	3.940	0.500	1.406	1.125	1615	1.688	1.50
24	4.100	0.500	1.406	1.125	1615	1.688	1.70

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

TAPER-LOCK®

All dimensions in inches unless noted.

Table with 8 columns: No. Teeth, Outside Diameter, Bushing #, MAX Bore*, LTB, Hub Diameter, Hub Style, Weight Lbs. Rows include sprocket sizes from 14 to 96.

Chain Data table with 2 columns: Attribute (Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width) and Value (40, 1/2", 5/16", 0.312", 0.284").

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data. □ Has recessed groove in hub for chain clearance.

TAPER-LOCK® Bushings table with 2 columns: Bushing #, Bore Range. Rows include bushing sizes 1008, 1210, 1610, 2012.

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

QD® Bushings table with 2 columns: Bushing #, Bore Range. Rows include bushing sizes JA, SH, SDS, SK.

QD® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 199.

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QD®

All dimensions in inches unless noted.

Table with 12 columns: No. Teeth, Outside Diameter, Bushing #, MAX Bore*, Hub Diameter, LTB, X, Y, L, F, Hub Style, Weight Lbs. Rows include sprocket sizes from 15 to 112.

Chain Data table with 2 columns: Attribute (Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width) and Value (40, 1/2", 5/16", 0.312", 0.284").

* Please reference QD® bushing dimension table on page 200 for specific information on MAX Bore and keyway data. □ Has recessed groove in hub for chain clearance. For more information on Sprockets see pages 132-137.

MULTI-STRAND TAPER-LOCK®

All dimensions in inches unless noted.

Table with 9 columns: No. Teeth, Outside Diameter, Bushing #, MAX Bore*, LTB, Hub Diameter, Hub Type, Hub Style, Weight Lbs. Rows include sprocket sizes from 15 to 84.

Chain Data table with 2 columns: Attribute (Size, Pitch, Inside Width, Roller Diameter, Nominal Tooth Width) and Value (40 - 2, 1/2", 5/16", 0.312", 0.275").

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

TAPER-LOCK® Bushings table with 2 columns: Bushing #, Bore Range. Rows include bushing sizes 1008, 1210, 1610, 2012, 2517.

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

For more information on Sprockets see pages 132-137.

STAINLESS STEEL PLAIN BORE

Chain Data	
Size	50SS
Pitch	5/8"
Inside Width	3/8"
Roller Diameter	0.400"
Nominal Tooth Width:	0.343"

All dimensions in inches unless noted.

50 Stainless Steel Sprocket Diameters				Type "B" Plain Bore					
No. Teeth	Outside Diameter	Pitch Diameter	Caliper Diameter	Plain Bore	MAX Bore *	Hub Diameter	LTB	Hub Style	Wt. Lbs.
10	2.300	2.023	1.623	0.625	0.875	1.563 □	1.000	S	0.50
11	2.500	2.219	1.796	0.625	1.000	1.750 □	1.000	S	0.60
12	2.710	2.415	2.015	0.625	1.250	1.984 □	1.000	S	0.70
13	2.910	2.612	2.193	0.625	1.313	1.875	1.000	S	0.80
14	3.110	2.809	2.409	0.625	1.438	2.125	1.000	S	1.00
15	3.320	3.006	2.590	0.625	1.500	2.375	1.000	S	1.30
16	3.520	3.204	2.804	0.625	1.750	2.500	1.000	S	1.50
17	3.720	3.401	2.987	0.625	1.875	2.688	1.000	S	1.80
18	3.920	3.599	3.199	0.625	1.875	2.875	1.000	S	2.00
19	4.120	3.798	3.384	0.625	1.750	2.500	1.000	S	2.30
20	4.320	3.995	3.595	0.750	1.750	2.500	1.000	S	2.50
21	4.520	4.194	3.782	0.750	2.000	3.000	1.000	D	2.70
22	4.720	4.392	3.992	0.750	2.000	3.000	1.000	D	3.30
23	4.920	4.590	4.179	0.750	2.000	3.000	1.000	D	3.80
24	5.120	4.788	4.388	0.750	2.000	3.000	1.250	D	4.10
25	5.320	4.987	4.577	0.750	2.000	3.000	1.250	D	4.30
26	5.520	5.185	4.785	0.750	2.000	3.000	1.250	D	4.60
28	5.920	5.582	5.182	0.750	2.000	3.000	1.250	D	5.00
30	6.320	5.979	5.579	0.750	2.250	3.250	1.250	D	5.20
35	7.320	6.973	6.565	0.750	2.250	3.250	1.250	D	6.50
40	8.320	7.966	7.566	0.750	2.250	3.250	1.250	D	7.80
45	9.310	8.960	8.554	0.750	2.500	3.750	1.250	D	8.50
60	12.300	11.942	11.542	1.000	2.500	3.750	1.250	D	14.00

* Dimensions shown allow for standard keyway with set screw at 90 degrees. □ Has recessed groove in hub for chain clearance.

MULTI-STRAND

Chain Data	
Size	50-2, 50-3
Pitch	5/8"
Inside Width	3/8"
Roller Diameter	0.400"
Nominal Tooth Width:	0.332"

All dimensions in inches unless noted.

50 Multi-Strand Sprocket Dia.			Dimensional Data: Double Strand Sprockets				
No. Teeth	Outside Dia.	Plain Bore	Hub Diameter	LTB	MAX Bore *	Hub Style	Wt. Lbs.
11	2.500	0.625	1.469	1.750	0.938	S	0.96
12	2.710	0.625	1.688	1.750	1.125	S	1.25
13	2.910	0.625	1.875	1.750	1.313	S	1.56
14	3.110	0.625	2.063	1.750	1.375	S	1.86
15	3.320	0.750	2.313	1.750	1.500	S	2.22
16	3.520	0.750	2.500	1.750	1.750	S	2.62
17	3.720	0.750	2.688	1.750	1.875	S	3.04
18	3.920	0.750	2.938	1.750	1.938	S	3.58
19	4.120	1.000	3.125	1.750	2.125	S	3.90
20	4.320	1.000	3.250	1.750	2.250	S	4.25
21	4.520	1.000	3.500	1.750	2.375	S	4.90
22	4.720	1.000	3.563	1.875	2.375	S	5.58
23	4.920	1.000	3.625	1.875	2.500	S	6.10
24	5.120	1.000	3.625	1.875	2.500	S	6.50
25	5.320	1.000	3.625	1.875	2.500	S	6.94
26	5.520	1.000	3.750	1.875	2.500	S	7.54
30	6.320	1.000	3.750	1.875	2.500	S	9.40
32	6.720	1.000	3.750	1.875	2.500	S	10.46
35	7.320	1.000	3.750	1.875	2.500	S	12.28
36	7.520	1.188	4.000	2.125	2.750	S	13.94
40	8.320	1.188	4.000	2.125	2.750	S	16.54
42	8.720	1.188	4.000	2.125	2.750	S	17.92
45	9.310	1.188	4.000	2.125	2.750	S	20.30
48	9.910	1.188	4.250	2.375	2.750	S	24.08
52	10.710	1.188	4.250	2.375	2.750	D	27.42
54	11.110	1.188	4.250	2.375	2.750	D	29.16
60	12.300	1.313	4.500	2.375	3.000	D	35.88
72	14.690	1.313	4.500	2.375	3.000	D	50.22
84	17.080	1.313	4.500	2.375	3.000	D	51.64
96	19.470	1.313	4.500	2.375	3.000	D	67.42
112	22.650	1.313	5.250	2.375	3.313	D	90.22

50 Multi-Strand Sprocket Dia.			Dimensional Data: Triple Strand Sprockets				
No. Teeth	Outside Dia.	Plain Bore	Hub Diameter	LTB	MAX Bore *	Hub Style	Wt. Lbs.
11	2.500	0.625	1.469	2.500	0.938	S	1.42
12	2.710	0.625	1.688	2.500	1.125	S	1.84
13	2.910	0.625	1.875	2.500	1.313	S	2.28
14	3.110	0.625	2.063	2.500	1.375	S	2.72
15	3.320	0.750	2.313	2.500	1.500	S	3.24
16	3.520	0.750	2.500	2.500	1.750	S	3.75
17	3.720	0.750	2.688	2.500	1.875	S	4.38
18	3.920	0.750	2.938	2.500	1.938	S	5.10
19	4.120	1.000	3.125	2.500	2.125	S	5.60
20	4.320	1.000	3.250	2.625	2.250	S	6.42
21	4.520	1.000	3.500	2.625	2.375	S	7.42
22	4.720	1.000	3.563	2.625	2.375	S	7.92
23	4.920	1.000	3.625	2.625	2.500	S	8.80
24	5.120	1.000	3.625	2.625	2.500	S	9.42
25	5.320	1.000	3.625	2.625	2.500	S	10.16
26	5.520	1.000	3.750	2.625	2.500	S	11.02
30	6.320	1.000	3.750	2.625	2.500	S	14.24
35	7.320	1.000	3.750	2.625	2.500	S	18.96
36	7.520	1.188	4.000	2.750	2.750	S	20.60

* Dimensions shown allow for standard keyway with set screw at 90 degrees. For more information on Sprockets see pages 132-137.

For more information on Sprockets see pages 132-137.

DOUBLE SINGLE

Chain Data	
Size	50
Pitch	5/8"
Inside Width	3/8"
Roller Diameter	0.400"
Nominal Tooth Width:	0.343"

All dimensions in inches unless noted.

50 Double Single Sprocket Dia.			Dimensional Data: Double Single Sprockets				
No. Teeth	Outside Diameters	Plain Bore	LTB	C	D	MAX Bore *	Weight Lbs.
15	3.320	0.625	1.656	1.313	2.375	1.500	2.10
16	3.520	0.625	1.656	1.313	2.500	1.688	2.40
17	3.720	0.625	1.656	1.313	2.688	1.750	2.90
18	3.920	0.625	1.656	1.313	2.891	1.875	3.30
19	4.120	0.625	1.656	1.313	3.078	2.063	3.70
20	4.320	0.625	1.656	1.313	3.281	2.250	4.20
21	4.520	0.625	1.656	1.313	3.484	2.250	4.80
22	4.720	0.625	1.656	1.313	3.688	2.438	5.30
23	4.920	0.625	1.656	1.313	3.891	2.625	5.80
24	5.120	0.625	1.656	1.313	4.078	2.750	6.30

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

DOUBLE SINGLE

Chain Data	
Size	50
Pitch	5/8"
Inside Width	3/8"
Roller Diameter	0.400"
Nominal Tooth Width:	0.343"

TAPER-LOCK® Bushings	
Bushing #	Bore Range
1610	0.500 - 1.688"
2012	0.500 - 2.125"

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

All dimensions in inches unless noted.

50 Double Single TAPER-LOCK® Sprocket Dia.			Dimensional Data: Double Single TAPER-LOCK® Sprockets				
No. Teeth	Outside Diameters	Bushing #	LTB	C	D	MAX Bore *	Weight Lbs.
17	3.720	1610	1.656	1.313	2.688	1.688	1.80
18	3.920	1610	1.656	1.313	2.891	1.688	2.20
19	4.120	1610	1.656	1.313	3.078	1.688	2.70
21	4.520	2012	1.656	1.313	3.469	2.125	3.30
23	4.920	2012	1.656	1.313	3.891	2.125	3.70
24	5.120	2012	1.656	1.313	4.078	2.125	4.10

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

For more information on Sprockets see pages 132-137.

TAPER-LOCK®

Chain Data	
Size	50
Pitch	5/8"
Inside Width	3/8"
Roller Diameter	0.400"
Nominal Tooth Width:	0.343"

All dimensions in inches unless noted.

50 TAPER-LOCK® Sprocket Dia.			Dimensional Data TAPER-LOCK® Sprockets				
No. Teeth	Outside Diameter	Bushing #	MAX Bore *	LTB	Hub Diameter	Hub Style	Weight Lbs.
12	2.710	1008	1.000	0.875	1.938 □	S	0.50
13	2.910	1008	1.000	0.875	1.813	S	0.50
14	3.110	1008	1.000	0.875	1.938	S	0.60
15	3.320	1210	1.250	1.000	2.469 □	S	0.70
16	3.520	1610	1.688	1.000	2.781 □	S	0.70
17	3.720	1610	1.688	1.000	2.781 □	S	0.80
18	3.920	1610	1.688	1.000	2.781	S	0.90
19	4.120	1610	1.688	1.000	3.000	S	1.30
20	4.320	1610	1.688	1.000	3.250	S	1.60
21	4.520	1610	1.688	1.000	3.500	S	1.60
22	4.720	1610	1.688	1.000	3.500	S	1.60
23	4.920	2012	2.125	1.250	3.875	S	2.00
24	5.120	2012	2.125	1.250	4.000	S	2.20
25	5.320	2012	2.125	1.250	4.000	S	2.40
26	5.520	2012	2.125	1.250	4.000	E	2.50
27	5.720	2012	2.125	1.250	4.000	E	2.60
28	5.920	2012	2.125	1.250	4.000	E	2.80
30	6.320	2012	2.125	1.250	3.563	E	3.20
32	6.720	2012	2.125	1.250	3.563	E	3.60
35	7.320	2012	2.125	1.250	3.563	E	4.20
36	7.520	2012	2.125	1.250	3.563	E	4.30
40	8.320	2012	2.125	1.250	3.563	E	5.20
42	8.720	2012	2.125	1.250	3.563	E	5.90
45	9.310	2012	2.125	1.250	3.563	E	6.50
48	9.910	2012	2.125	1.250	3.563	E	7.30
54	11.110	2012	2.125	1.250	3.563	E	9.00
60	12.300	2012	2.125	1.250	3.563	E	10.80
70	14.290	2517	2.688	1.750	4.250	E	14.00
72	14.690	2517	2.688	1.750	4.250	E	15.50
80	16.280	2517	2.688	1.750	4.250	E	19.50
84	17.080	2517	2.688	1.750	4.250	E	22.50
96	19.470	2517	2.688	1.750	4.250	E	29.00
112	22.650	2517	2.688	1.750	4.250	E	38.70

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data. □ Has recessed groove in hub for chain clearance.

TAPER-LOCK® Bushings	
Bushing #	Bore Range
1008	0.500 - 1.000"
1210	0.500 - 1.250"
1610	0.500 - 1.688"
2012	0.500 - 2.125"
2517	0.500 - 2.688"

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

MULTI-STRAND TAPER-LOCK®

Chain Data	
Size	50-2
Pitch	5/8"
Inside Width	3/8"
Roller Diameter	0.400"
Nominal Tooth Width:	0.332"

All dimensions in inches unless noted.

50 Multi-Strand TAPER-LOCK® Sprocket Dia.			Dimensional Data Double Strand TAPER-LOCK® Sprockets					
No. Teeth	Outside Diameter	Bushing #	MAX Bore *	LTB	Hub Diameter	Hub Type	Hub Style	Weight Lbs.
14	3.110	1008	1.000	0.875	N/A	A	S	0.80
15	3.320	1210	1.250	1.000	N/A	A	S	0.90
16	3.520	1210	1.250	1.000	N/A	A	S	1.10
17	3.720	1610	1.688	1.000	N/A	A	S	1.10
18	3.920	1610	1.688	1.000	N/A	A	S	1.30
19	4.120	1610	1.688	1.000	N/A	A	S	1.60
20	4.320	2012	2.125	1.250	3.250	B	S	1.50
21	4.520	2012	2.125	1.250	3.500	B	S	1.90
25	5.320	2012	2.125	1.250	4.281	B	S	3.80
30	6.320	2517	2.688	1.750	5.281	B	S	7.50
36	7.520	2517	2.688	1.750	4.250	C	S	9.40
42	8.720	2517	2.688	1.750	4.250	C	S	13.40
48	9.910	2517	2.688	1.750	4.250	C	S	18.60
52	10.710	2517	2.688	1.750	4.375	C	S	22.20
60	12.300	2517	2.688	1.750	4.375	C	S	30.30
84	17.080	2517	2.688	1.750	4.375	C	S	45.30

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

For more information on Sprockets see pages 132-137.

MULTI-STRAND

Chain Data	
Size	60-2, 60-3
Pitch	3/4"
Inside Width	1/2"
Roller Diameter	0.469"
Nominal Tooth Width:	0.444"

All dimensions in inches unless noted.

60 Multi-Strand Sprocket Diameters			Dimensional Data: Double Strand Sprockets					
No. Teeth	Outside Diameter	Plain Bore	Hub Diameter	LTB	MAX Bore *	Hub Type	Hub Style	Weight Lbs.
11	3.000	1.000	1.813	2.125	1.250	B	S	1.62
12	3.250	1.000	2.125	2.125	1.438	B	S	2.20
13	3.490	1.000	2.250	2.125	1.500	B	S	2.60
14	3.740	1.000	2.500	2.125	1.750	B	S	3.24
15	3.980	1.000	2.813	2.125	1.875	B	S	3.96
16	4.220	1.000	3.000	2.125	2.000	B	S	4.62
17	4.460	1.000	3.250	2.125	2.250	B	S	5.40
18	4.700	1.000	3.500	2.125	2.375	B	S	6.24
19	4.950	1.000	3.688	2.125	2.500	B	S	7.00
20	5.190	1.000	3.750	2.125	2.500	B	S	7.72
21	5.430	1.000	4.125	2.125	2.750	B	S	8.82
22	5.670	1.000	4.250	2.125	2.750	B	S	9.68
23	5.910	1.000	4.250	2.125	2.750	B	S	10.30
24	6.150	1.000	4.250	2.125	2.750	B	S	11.14
25	6.390	1.000	4.250	2.125	2.750	B	S	11.96
26	6.630	1.000	4.250	2.125	2.750	B	S	12.70
30	7.590	1.000	4.250	2.125	2.750	B	S	16.36
32	8.070	1.250	4.500	2.375	3.000	B	S	19.52
35	8.780	1.250	4.500	2.375	3.000	B	S	22.80
36	9.020	1.250	4.500	2.375	3.000	B	S	23.82
40	9.980	1.250	4.750	2.750	3.250	B	S	30.84
45	11.180	1.250	4.750	2.750	3.250	B	S	37.08
48	11.890	1.250	4.750	2.750	3.250	B	D	44.90
60	14.760	1.250	4.750	2.750	3.250	B	D	63.10

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

60 Multi-Strand Sprocket Diameters			Dimensional Data: Triple Strand Sprockets					
No. Teeth	Outside Diameter	Plain Bore	Hub Diameter	LTB	MAX Bore *	Hub Type	Hub Style	Weight Lbs.
11	3.000	1.000	1.813	3.000	1.250	B	S	2.50
12	3.250	1.000	2.125	3.000	1.438	B	S	3.30
13	3.490	1.000	2.250	3.000	1.500	B	S	3.90
14	3.740	1.000	2.500	3.000	1.750	B	S	4.50
15	3.980	1.000	2.688	3.000	1.875	B	S	5.40
16	4.220	1.000	3.000	3.000	2.000	B	S	6.50
17	4.460	1.000	3.250	3.000	2.250	B	S	7.70
18	4.700	1.000	3.500	3.000	2.375	B	S	8.50
19	4.950	1.000	3.688	3.000	2.500	B	S	10.00
20	5.190	1.000	3.750	3.000	2.500	B	S	11.20
21	5.430	1.000	4.125	3.000	2.750	B	S	12.50
22	5.670	1.000	4.250	3.000	2.750	B	S	13.20
23	5.910	1.000	4.250	3.000	2.750	B	S	14.60
24	6.150	1.000	4.250	3.000	2.750	B	S	15.80
25	6.390	1.000	4.250	3.000	2.750	B	S	17.00
26	6.630	1.000	4.250	3.000	2.750	B	S	18.60
30	7.590	1.000	4.250	3.000	2.750	B	S	23.20
35	8.780	1.250	4.500	3.250	3.000	B	S	34.50
36	9.020	1.250	4.500	3.250	3.000	B	S	37.00

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

For more information on Sprockets see pages 132-137.

DOUBLE SINGLE

Chain Data	
Size	60
Pitch	3/4"
Inside Width	1/2"
Roller Diameter	0.469"
Nominal Tooth Width:	0.459"

All dimensions in inches unless noted.

60 Double Single Sprocket Diameters			Dimensional Data: Double Single Sprockets				
No. Teeth	Outside Dia.	Plain Bore	LTB	C	D	MAX Bore *	Weight Lbs.
13	3.490	0.750	1.938	1.484	2.344	1.500	2.60
14	3.740	0.750	1.938	1.484	2.563	1.750	3.20
15	3.980	0.750	1.938	1.484	2.875	1.875	3.80
16	4.220	0.750	1.938	1.484	3.047	2.000	4.50
17	4.460	0.750	1.938	1.484	3.250	2.250	5.30
18	4.700	0.750	1.938	1.484	3.500	2.375	6.50
19	4.950	0.750	1.938	1.484	3.703	2.500	6.80
20	5.190	0.750	1.938	1.484	3.953	2.750	7.00
21	5.430	0.750	1.938	1.484	4.188	2.875	7.50

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

DOUBLE SINGLE

Chain Data	
Size	60
Pitch	3/4"
Inside Width	1/2"
Roller Diameter	0.469"
Nominal Tooth Width:	0.459"

All dimensions in inches unless noted.

60 Double Single TAPER-LOCK® Sprocket Diameters			Dimensional Data: Double Single TAPER-LOCK® Sprockets				
No. Teeth	Outside Dia.	Bushing #	LTB	C	D	MAX Bore *	Weight Lbs.
17	4.460	1615	1.938	1.484	3.218	1.688	4.50
18	4.700	2012	1.938	1.484	3.469	2.125	5.00
19	4.950	2012	1.938	1.484	3.703	2.125	5.80
20	5.190	2517	1.938	1.484	3.953	2.688	5.60
21	5.430	2517	1.938	1.484	4.188	2.688	6.40
23	5.910	2517	1.938	1.484	4.672	2.688	7.30
24	6.150	2517	1.938	1.484	4.906	2.688	8.20

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

TAPER-LOCK® Bushings	
Bushing #	Bore Range
1615	0.500 - 1.688"
2012	0.500 - 2.125"
2517	0.500 - 2.688"

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

For more information on Sprockets see pages 132-137.

QD®

All dimensions in inches unless noted.

60 QD® Sprockets Dimensional Data QD® Sprockets. Table with columns: No. Teeth, Outside Dia., QD® Bushing #, MAX Bore *, Hub Dia., LTB, X, Y, L, F, Hub Type, Hub Style, Weight Lbs.

* Please reference QD® bushing dimension table on page 200 for specific information on MAX Bore and keyway data.

QD® Bushings table with columns: Bushing #, Bore Range. Rows include JA, SH, SDS, SK, SF.

QD® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 199.

QD® is a registered trademark of, and is used under license agreement from Emerson Electric Co.

Chain Data table for No. 60: Size (60), Pitch (3/4"), Inside Width (1/2"), Roller Diameter (0.469"), Nominal Tooth Width (0.459").

DOUBLE SINGLE

All dimensions in inches unless noted.

60 TAPER-LOCK® Sprockets Dimensional Data TAPER-LOCK® Sprockets. Table with columns: No. Teeth, Outside Dia., Bushing #, MAX Bore *, LTB, Hub Dia., Hub Type, Hub Style, Weight Lbs.

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

□ Has recessed groove in hub for chain clearance.

TAPER-LOCK® Bushings table with columns: Bushing #, Bore Range. Rows include 1008, 1210, 1610, 2012, 2517.

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

TAPER-LOCK® Bushings table with columns: Bushing #, Bore Range. Rows include 1215, 1615, 2012, 2517.

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

MULTI-STRAND TAPER-LOCK®

Chain Data table for Multi-Strand TAPER-LOCK®: Size (60-2), Pitch (3/4"), Inside Width (1/2"), Roller Diameter (0.469"), Nominal Tooth Width (0.444").

All dimensions in inches unless noted.

Double Strand 60 TAPER-LOCK® Sprockets Dimensional Data Multi-Strand TAPER-LOCK® Sprockets. Table with columns: No. Teeth, Outside Diameter, Bushing #, MAX Bore *, LTB, Hub Diameter, Hub Type, Hub Style, Weight Lbs.

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

For more information on Sprockets see pages 132-137.

For more information on Sprockets see pages 132-137.

MULTI-STRAND

Chain Data	
Size	100-2, 100-3
Pitch	1 1/4"
Inside Width	3/4"
Roller Diameter	0.750"
Nominal Tooth Width:	0.669"

All dimensions in inches unless noted.

100 Multi-Strand Sprocket Dia.			Dimensional Data: Double Strand Sprockets					
No. Teeth	Outside Dia.	Plain Bore	Hub Dia.	LTB	MAX Bore *	Hub Type	Hub Style	Weight Lbs.
9	4.180	1.000	2.375	2.875	1.625	B	S	4.60
10	4.600	1.000	2.375	2.875	1.875	B	S	6.20
11	5.010	1.000	3.125	2.875	2.125	B	S	7.90
12	5.420	1.125	3.375	2.875	2.250	B	S	9.30
13	5.820	1.125	3.813	2.875	2.500	B	S	11.40
14	6.230	1.125	4.188	2.875	2.750	B	S	13.60
15	6.630	1.250	4.625	3.125	3.125	B	S	17.10
16	7.030	1.250	5.000	3.125	3.313	B	S	20.10
17	7.440	1.250	5.250	3.125	3.500	B	S	23.10
18	7.840	1.250	5.250	3.125	3.500	B	S	25.40
19	8.240	1.250	5.500	3.375	3.750	B	S	29.60
20	8.640	1.250	5.500	3.375	3.750	B	S	32.40
21	9.040	1.250	5.500	3.375	3.750	B	S	35.30
22	9.440	1.250	5.500	3.375	3.750	B	D	38.40
23	9.840	1.250	5.500	3.375	3.750	B	D	41.30
24	10.250	1.250	5.750	3.375	3.750	B	D	45.10
25	10.660	1.250	5.750	3.375	3.750	B	D	48.50
26	11.050	1.500	5.750	3.375	3.750	B	D	51.50
30	12.640	1.500	5.750	3.375	3.750	B	D	65.00
32	13.440	1.500	5.750	3.375	3.750	B	D	69.00
35	14.640	1.500	6.000	4.250	3.813	B	D	75.00
36	15.038	1.500	6.000	4.500	4.000	B	D	90.80

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

100 Multi-Strand Sprocket Dia.			Dimensional Data: Triple Strand Sprockets					
No. Teeth	Outside Dia.	Plain Bore	Hub Dia.	LTB	MAX Bore *	Hub Type	Hub Style	Weight Lbs.
12	5.420	1.125	3.375	4.250	2.250	B	S	13.70
13	5.820	1.125	3.813	4.250	2.500	B	S	16.90
14	6.230	1.125	4.188	4.250	2.750	B	S	20.20
15	6.630	1.250	4.625	4.500	3.125	B	S	25.00
16	7.030	1.250	5.000	4.500	3.313	B	S	29.30
17	7.440	1.250	5.250	4.500	3.500	B	S	33.80
18	7.840	1.250	5.250	4.750	3.500	B	S	38.60
19	8.240	1.250	5.500	4.750	3.750	B	D	43.30
20	8.640	1.250	5.500	4.750	3.750	B	D	47.90
21	9.040	1.250	5.500	4.750	3.750	B	D	52.30
22	9.440	1.250	5.500	4.750	3.750	B	D	57.50
23	9.840	1.250	5.500	4.750	3.750	B	D	62.50
24	10.250	1.250	5.750	4.750	3.750	B	D	69.00
25	10.660	1.250	5.750	4.750	3.750	B	D	73.00
26	11.050	1.500	5.750	4.750	3.813	B	D	79.00
30	12.640	1.500	5.750	4.750	3.813	B	D	103.00

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

For more information on Sprockets see pages 132-137.

DOUBLE SINGLE

Chain Data	
Size	100
Pitch	1 1/4"
Inside Width	3/4"
Roller Diameter	0.750"
Nominal Tooth Width:	0.692"

All dimensions in inches unless noted.

100 Double Single Sprocket Diameters			Dimensional Data: Double Single Sprockets				
No. Teeth	Outside Dia.	Plain Bore	LTB	C	D	MAX Bore *	Weight Lbs.
13	5.820	1.000	2.688	2.000	3.781	2.500	11.20
14	6.230	1.250	2.688	2.000	4.188	2.750	13.50
15	6.630	1.250	2.688	2.000	4.594	3.063	16.80
16	7.030	1.250	2.688	2.000	4.500	3.250	19.30
17	7.440	1.250	2.688	2.000	4.906	3.625	21.50
18	7.840	1.250	2.688	2.000	5.281	3.750	23.00
19	8.240	1.250	2.688	2.000	6.203	4.188	25.00
20	8.640	1.250	2.688	2.000	6.609	4.813	26.50
21	9.040	1.250	2.688	2.000	7.000	5.250	29.00

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

DOUBLE SINGLE

Chain Data	
Size	100
Pitch	1 1/4"
Inside Width	3/4"
Roller Diameter	0.750"
Nominal Tooth Width:	0.692"

TAPER-LOCK® Bushings	
Bushing #	Bore Range
2517	0.500 - 2.688"
3020	0.875 - 3.250"

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

All dimensions in inches unless noted.

100 Double Single TAPER-LOCK® Sprocket Diameters			Dimensional Data: Double Single TAPER-LOCK® Sprockets				
No. Teeth	Outside Dia.	Bushing #	LTB	C	D	MAX Bore *	Weight Lbs.
16	7.030	2517	2.688	2.000	5.000	2.688	13.00
17	7.440	3020	2.688	2.000	5.469	3.250	14.00
18	7.840	3020	2.688	2.000	5.797	3.250	16.00
19	8.240	3020	2.688	2.000	6.203	3.250	20.00
20	8.640	3020	2.688	2.000	6.906	3.250	24.00
21	9.040	3020	2.688	2.000	7.000	3.250	27.50

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data.

For more information on Sprockets see pages 132-137.

PLAIN BORE

Chain Data table with 2 columns: Property and Value. Properties include Size, Pitch, Inside Width, Roller Diameter, and Nominal Tooth Width.

All dimensions in inches unless noted.

140 Plain Bore Sprocket Dia. table with 13 columns: No. Teeth, Outside Dia., Pitch Dia., Caliper Dia., Plain Bore, Wt. Lbs., Plain Bore, MAX Bore *, Hub Dia., LTB, Hub Type, Hub Style, Wt. Lbs.

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

MULTI-STRAND

Chain Data table with 2 columns: Property and Value. Properties include Size, Pitch, Inside Width, Roller Diameter, and Nominal Tooth Width.

All dimensions in inches unless noted.

140 Multi-Strand Sprocket Dia. table with 9 columns: No. Teeth, Outside Diameter, Plain Bore, Hub Diameter, LTB, MAX Bore *, Hub Type, Hub Style, Weight Lbs.

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

140 Multi-Strand Sprocket Dia. table with 9 columns: No. Teeth, Outside Diameter, Plain Bore, Hub Diameter, LTB, MAX Bore *, Hub Type, Hub Style, Weight Lbs.

* Dimensions shown allow for standard keyway with set screw at 90 degrees.

TAPER-LOCK®

Chain Data table with 2 columns: Property and Value. Properties include Size, Pitch, Inside Width, Roller Diameter, and Nominal Tooth Width.

TAPER-LOCK® Bushings table with 2 columns: Bushing # and Bore Range.

TAPER-LOCK® bushing is not included with the sprocket. They are to be ordered separately. Please refer to the table below for general guidelines. Specific details are found in the Bushing Section of this catalog beginning on page 194.

All dimensions in inches unless noted.

140 TAPER-LOCK® Sprockets table with 9 columns: No. Teeth, Outside Diameter, Bushing #, Hub Diameter, LTB, MAX Bore *, Hub Type, Hub Style, Weight Lbs.

* Please reference TAPER-LOCK® bushing dimension table on page 194 for specific information on MAX Bore and keyway data. For more information on Sprockets see pages 132-137.

DOUBLE PLUS® SPROCKETS

Dimensional data in inches unless noted.

No. Teeth	Chain Pitch	Outside Diameter (Do)	Pitch Diameter (Dp)	Plain Bore (d)	Hub Diameter (DH)	Hub Length (L)	Hub Type	Tooth Thickness (T)	M	Wt. Lbs.
10	C2030	2.480	2.427	0.500	1.457	0.984	B	0.118	0.602	0.44
10	C2040	3.346	3.326	0.630	2.047	1.575	B	0.157	0.803	1.76
10	C2050	4.213	4.045	0.630	2.598	1.772	B	0.197	1.004	3.31
10	C2060	5.039	4.854	0.748	3.189	1.969	B	0.236	1.201	5.52
10	C2080	6.772	6.472	0.906	4.331	2.638	B	0.472	1.870	15.40

SPROCKETS

TAPER-LOCK® BUSHINGS

All dimensions in inches unless noted.

Bushing No.	Bore Range				Torque Capacity (lb-in)	A	B	C	Wt. Lbs*
	Minimum	Max w/Standard Keyway	Max w/Shallow Keyway	Max w/No Keyway					
1008	0.500	0.875	1.000	1.000	1,200	1.386	0.875	1.328	0.20
1108	0.500	1.000	1.125	1.125	1,300	1.511	0.875	1.453	0.25
1210	0.500	1.250	1.250	1.250	3,600	1.875	1.000	1.750	0.55
1215	0.500	1.250	1.250	1.250	3,550	1.875	1.500	1.750	0.70
1310	0.500	1.375	1.438	1.438	3,850	2.000	1.000	1.875	0.70
1610	0.500	1.625	1.688	1.688	4,300	2.250	1.000	2.125	0.75
1615	0.500	1.625	1.688	1.688	4,300	2.250	1.500	2.125	1.00
2012	0.500	2.000	2.125	2.125	7,150	2.750	1.250	2.625	1.40
2517	0.500	2.438	2.688	2.688	11,600	3.375	1.750	3.250	3.20
2525	0.750	2.375	2.688	2.688	11,300	3.375	2.500	3.250	4.30
3020	0.875	3.000	3.250	3.250	24,000	4.250	2.000	4.000	5.80
3030	0.938	3.000	3.250	3.250	24,000	4.250	3.000	4.000	8.00
3535	1.188	3.500	3.938	3.938	44,800	5.000	3.500	4.830	11.00
4040	1.438	4.000	4.438	4.438	77,300	5.750	4.000	5.540	17.00
4545	1.938	4.500	4.938	4.938	110,000	6.375	4.500	6.130	24.00
5050	2.438	5.000	5.313	5.313	126,000	7.000	5.000	6.720	32.00

* Bushing weight changes with bore size. Weight depicted reflects approximate weight.

NOTE: Torque Capacity shown is for light starting and steady running. For more severe applications apply Service Factor as needed.

All dimensions in inches unless noted.

Bushing No.	Locking Screws (F)		Clearance L*		Clearance M#		Hex Key Torque in./lbs
	Size	Qt.	Std. Hey Key	Short Hex Key	Std. Hey Key	Short Hex Key	
1008	.250 X .500	2	1.125	0.625	1.250	0.750	55
1108	.250 X .500	2	1.125	0.625	1.250	0.750	55
1210	.375 X .625	2	1.375	0.813	1.625	1.063	175
1215	.375 X .625	2	1.375	0.813	1.625	1.063	175
1310	.375 X .625	2	1.375	0.813	1.625	1.063	175
1610	.375 X .625	2	1.375	0.813	1.625	1.063	175
1615	.375 X .625	2	1.375	0.813	1.625	1.063	175
2012	.438 X .875	2	1.563	0.938	2.000	1.375	280
2517	.500 X 1.000	2	1.625	1.000	2.250	1.625	430
2525	.500 X 1.000	2	1.625	1.000	2.250	1.625	430
3020	.625 X 1.250	2	1.813	1.188	2.688	2.063	800
3030	.625 X 1.250	2	1.813	1.188	2.688	2.063	800
3535	.500 X 1.500	3	2.000	1.313	3.375	2.688	1000
4040	.625 X 1.750	3	2.375	1.625	4.125	3.375	1700
4545	.750 X 2.000	3	2.625	1.938	4.750	4.063	2450
5050	.875 X 2.250	3	2.813	2.313	5.250	4.813	3100

* Space required to tighten bushing. Also space required to loosen screws to permit removal of hub by puller.

Space required to remove bushing using jackscrews - no puller required.

Short Hex Key = Standard hex key cut to minimum usable length.

TAPER-LOCK® WELD-ON HUBS

Tsubaki offers the most complete line of TAPER-LOCK® weld-on hubs for insertion and welding to produce “B” type sprockets, sheaves, and other applications without hub protrusion. To provide greater strength for this type of shaft locking mechanism and to reduce heat distortion caused by welding, these hubs are dimensionally interchangeable with our sprocket items.

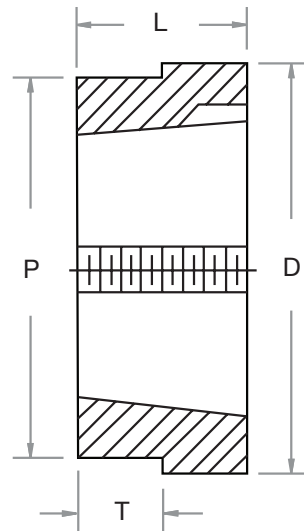
Special dimension hubs are available per your application requirements on a Made-To-Order basis. All stock Tsubaki hubs are made from 1045 steel bar stock. No powdered or sintered metal is used. The TAPER-LOCK® weld-on hubs listed below include the appropriate tapered bores and mounting holes to mate with Tsubaki sprockets and other U.S. sprocket manufacturers that conform to ANSI specifications.

TAPER-LOCK® WELD-ON HUBS

All dimensions in inches unless noted.

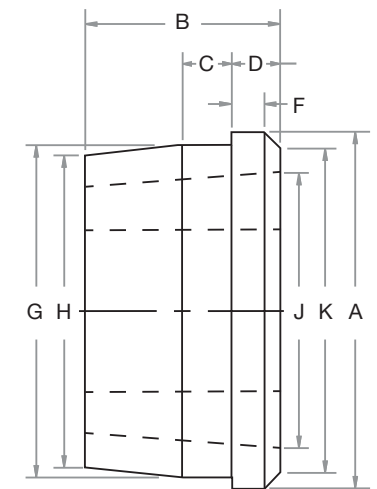
Model #	Use with Bushing #	D	P	L	T	Wt. Lbs
35TL1	1610	3.000	2.875	1.000	0.141	0.80
41TL1	1610	3.000	2.875	1.000	0.219	0.80
40TL1	1610	3.000	2.875	1.000	0.250	0.80
40TL2	2012	3.625	3.438	1.250	0.250	1.50
40TL3	2517	4.250	4.125	1.750	0.250	2.70
50TL1	2012	3.625	3.438	1.250	0.313	1.50
50TL2	2517	4.250	4.125	1.750	0.313	2.70
60TL1	2012	3.625	3.438	1.250	0.438	1.50
60TL2	2517	4.250	4.125	1.750	0.438	2.70
80TL1	2012	3.625	3.438	1.250	0.563	1.50
80TL2	2517	4.250	4.125	1.750	0.563	2.70
80TL3	3020	5.250	5.000	2.000	0.563	4.30
100TL1	2517	4.500	4.125	1.750	0.688	2.70
100TL2	3020	5.250	5.000	2.000	0.688	4.30
120TL1	2517	4.250	4.000	1.750	0.875	2.60
120TL2	3020	5.250	5.000	2.000	0.875	4.20
120TL3	3535	6.500	6.500 *	3.500	-	13.00
140TL1	4040	7.750	7.750 *	4.000	-	25.00
160TL1	3020	5.250	5.000	2.000	1.125	4.00
160TL2	3535	6.500	6.250	3.500	1.125	12.60
160TL3	4545	8.750	8.750 *	4.500	-	42.00

* These items have no step on the hubs.



TAPER-LOCK® Type W Weld-On Hubs

TAPER-LOCK® type W weld-on hubs are designed for use in applications such as welding to plate sprockets, pulleys, and agitators. Each is made of steel, drilled, tapped, and taper bored for TAPER-LOCK® bushings. The W-series Weld-On Hubs are generally used for severe duty applications.



All dimensions in inches unless noted.

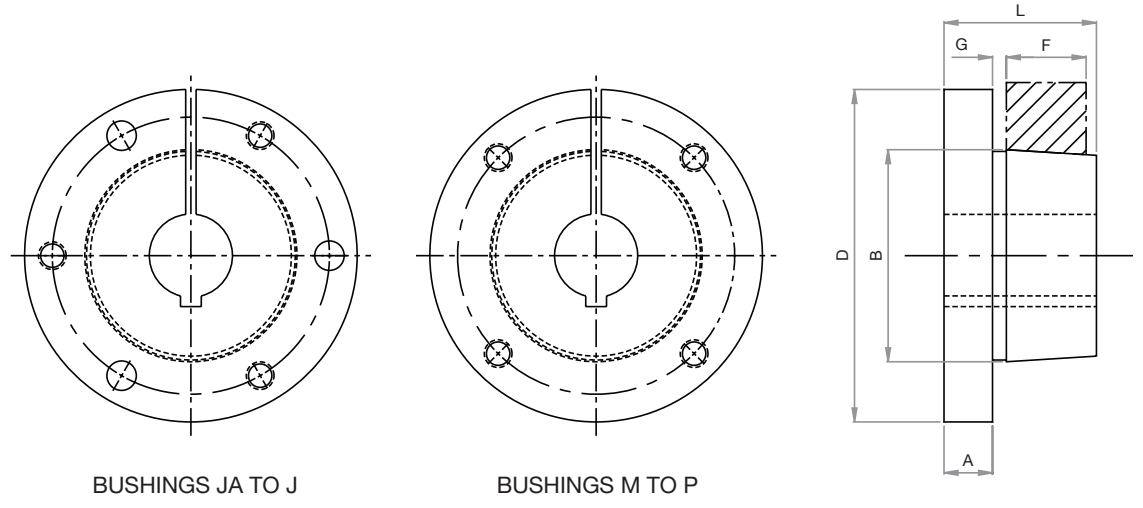
Hub Number	Use with Bushing #	A	B	C	D	F	G	H	J	K	Wt. Lbs
W12	1215	2.875	1.500	0.375	0.625	0.375	2.500	2.375	1.875	2.625	1.30
W16	1615	3.250	1.500	0.375	0.625	0.375	2.875	2.750	2.375	3.000	1.50
W25	2517	4.875	1.750	0.500	0.750	0.375	4.375	4.250	3.375	4.625	4.00
W30	3030	5.500	3.000	0.750	0.750	0.250	5.125	4.813	4.125	5.000	8.60
W35	3535	6.750	3.500	1.250	1.000	0.375	6.250	5.938	5.000	6.000	15.00
W40	4040	7.750	4.000	1.500	1.000	0.375	7.250	6.875	5.750	7.000	29.00
W45	4545	8.750	4.500	1.750	1.000	0.375	8.000	7.625	6.375	8.000	42.00

QD® BUSHINGS

A	SDS	-1B		
Altered ¹⁾	QD® Bushing	Bore Size		
A: Alteration Required	JA	Blank = stock plain bore		
	SH	H	1/2"	(0.500")
	SDS	I	9/16"	(0.563")
	SDS	J	5/8"	(0.625")
	SK	K	11/16"	(0.688")
	SF	L	3/4"	(0.750")
	E	M	13/16"	(0.813")
	F	P	7/8"	(0.875")
	J	R	15/16"	(0.938")
	M	1	1"	(1.000")
	N	1A	1-1/16"	(1.063")
	P	1B	1-1/8"	(1.125")

Above are examples. There are more sizes available. Please see QD® Bushing selection chart on pages 201 and 202.

¹⁾ Alteration field only to be denoted if a deviation from standard is required.



QD® BUSHING
Dimensional Information

All dimensions in inches unless noted.

QD® Bushing	Bore Range				Torque Capacity (lb-in)	A	B	D	F	G	L	Wt. Lbs
	Min.	Max w/ Standard Keyway	Max w/ Shallow Keyway	Max w/No Keyway								
JA	0.500	1.000	1.188	1.250	1,000	0.375	1.375	2.000	0.563	0.125	1.063	0.80
SH	0.500	1.375	1.625	1.688	3,500	0.438	1.871	2.625	0.813	0.125	1.313	0.70
SDS	0.500	1.625	1.938	2.000	5,000	0.438	2.187	3.188	0.760	0.125	1.313	1.00
SD	0.500	1.625	1.938	2.000	5,000	0.438	2.187	3.188	1.250	0.125	1.813	1.20
SK	0.500	2.125	2.500	2.625	7,000	0.563	2.812	3.875	1.250	0.125	1.938	2.10
SF	0.500	2.313	2.938	2.938	11,000	0.625	3.125	4.625	1.250	0.125	2.063	3.10
E	0.875	2.875	3.500	-	20,000	0.873	3.834	6.000	1.625	0.250	2.750	7.10
F	1.000	3.250	3.938	4.000	30,000	0.938	4.437	6.625	2.500	0.344	3.750	8.70
J	1.500	3.750	4.500	-	45,000	1.125	5.148	7.250	3.188	0.375	4.625	16.80
M	2.000	4.750	5.500	-	85,000	1.250	6.500	9.000	5.188	0.400	6.750	56.00
N	2.438	5.000	6.000	-	150,000	1.500	7.000	10.000	6.250	0.563	8.125	68.00
P	2.938	5.938	7.000	-	250,000	1.750	8.250	11.750	7.250	0.625	9.375	120.00

All dimensions in inches unless noted.

QD® Bushing	Cap Screws			Bolt Torque (FT. LBS.)
	Size	Quantity Req.	Bolt Circle*	
JA	10 - 24 x 1	3	1.656	5
SH	1/4 x 1 3/8	3	2.250	9
SDS	1/4 x 1 3/8	3	2.688	9
SD	1/4 x 1 7/8	3	2.688	9
SK	5/16 x 2	3	3.313	15
SF	3/8 x 2	3	3.875	30
E	1/2 x 2 3/4	3	5.000	60
F	9/16 x 3 5/8	3	5.625	75
J	5/8 x 4 1/2	3	6.250	135
M	3/4 x 6 3/4	4	7.875	225
N	7/8 x 8	4	8.500	300
P	1 x 9 1/2	4	10.000	450

QD® is a registered trademark of, and is used under license agreement from Emerson Electric Co.

QD® WELD-ON HUBS

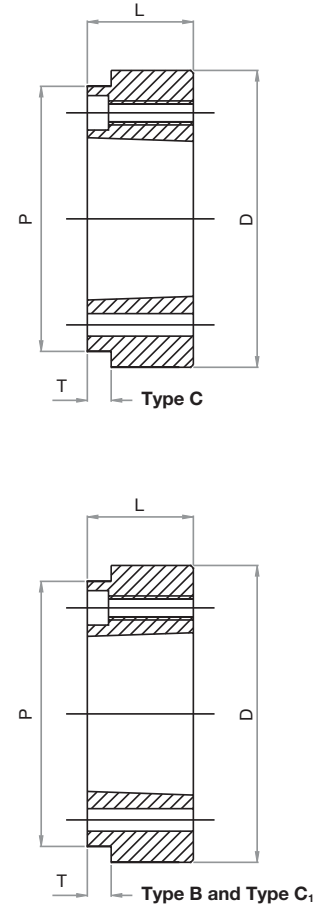


3/8" PITCH

Tsubaki offers the most complete line of "QD®" Style weld-on hubs for insertion and welding to produce "B" style sprockets, sheaves, and other applications. To provide greater strength for this type of shaft locking mechanism and reduce heat distortion caused by welding, these hubs are dimensionally the same as our sprocket items. Special dimensional hubs are available per your specifications on a made-to-order basis. All Tsubaki hubs are made from steel bar stock (not powdered or sintered metal). The "QD®" Style Weld-On hubs listed below include appropriate tapered bores and mounting holes. QD® Weld-On hubs are manufactured with a step for assistance in locating the attached plate. This is shown as the "T" dimension and depending on the width of the plate, the result is either a B-style or C-style sprocket.

All dimensions in inches unless noted.

Catalog Number	Use with Bushing #	Dim. D	Dim. P	Dim. L	Dim. T	Hub Type	Wt. Lbs.
35SHW	SH	3.00	2.875	0.813	0.141	B	.90
40SDSW	SDS	3.500	3.125	0.750	0.250	B	1.00
40SKW	SK	4.250	3.875	1.250	0.250	B	2.40
50SDSW	SDS	3.625	3.438	0.750	0.313	B	1.00
50SKW	SK	4.250	4.125	1.250	0.313	B	2.40
50SFW	SF	5.000	4.625	1.250	0.313	B	3.70
60SDSW	SDS	3.500	3.125	0.750	0.438	B	1.00
60SKW	SK	4.250	3.875	1.250	0.438	B	2.40
60SFW	SF	5.000	4.625	1.250	0.438	B	3.60
60EW	E	6.250	5.875	1.625	0.438	B	7.80
80SFW	SF	5.000	4.625	1.250	0.563	B	3.50
80EW	E	6.250	5.875	1.625	0.563	C	7.70
80FW	F	7.000	6.625	2.500	0.563	C	14.70
100EWB	E	6.250	5.875	1.625	0.688	B	7.50
100EWC	E	6.250	5.875	1.625	0.688	C	7.50
100FW	F	7.000	6.625	2.500	0.688	C	14.60
120EW	E	6.250	5.875	1.625	0.875	B	7.40
120FW	F	7.000	6.625	2.500	0.875	C	14.30
120JW	J	8.000	7.500	3.188	0.875	C	23.70
160FW	F	7.000	6.625	2.500	1.094	B	14.00
160JW	J	8.000	7.500	3.188	1.125	C	23.30
160MW	M	10.000	9.500	5.188	2.250	C1	59.30



No. 35 SINGLE SPLIT TAPER

Chain Data	
Chain Size	35
Pitch	.375"
Inside Width	.188"
Roller Diameter	.2"
Nominal Tooth Width:	0.168"

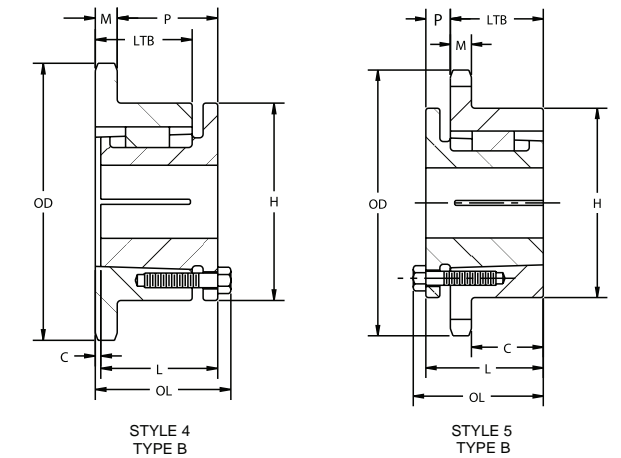
All dimensions in inches unless otherwise stated.

No. 35 Single Split Taper - 3/8" Pitch							Type B							
No. of Teeth	Outside Diameter	Pitch Diameter	Caliper Diameter	Catalog Number	Style	Bushing	LTB	LTB Bushing (L)	OL	P	M	C	H	Wt. LBS
15	1.989	1.804	1.594	35G15	3	G1	0.750	1.000	1.348	1.000	0.168	0.156	2.000	0.3
16	2.110	1.922	1.722	35G16	3	G1	0.750	1.000	1.348	1.000	0.168	0.156	2.000	0.3
17	2.231	2.041	1.832	35G17	3	G1	0.750	1.000	1.348	1.000	0.168	0.156	2.000	0.3
18	2.352	2.160	1.960	35G18	3	G1	0.750	1.000	1.348	1.000	0.168	0.156	2.000	0.3
19	2.472	2.279	2.071	35G19	3	G1	0.625	1.250	1.348	1.000	0.168	0.063	2.500	0.3
19	2.472	2.279	2.071	35H19	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.5
20	2.593	2.397	2.197	35H20	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.5
21	2.713	2.516	2.039	35H21	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.6
22	2.833	2.635	2.435	35H22	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.8
23	2.953	2.754	2.548	35H23	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.7
24	3.073	2.873	2.673	35H24	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.8
25	3.193	2.992	2.786	35H25	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.8
26	3.313	3.111	2.911	35H26	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.8
28	3.553	3.349	3.149	35H28	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.9
30	3.793	3.588	3.388	35H30	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.9
32	4.032	3.826	3.626	35H32	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	0.9
35	4.392	4.184	3.979	35H35	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.0
36	4.511	4.303	4.103	35H36	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.0
40	4.990	4.780	4.580	35H40	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.2
42	5.229	5.018	4.818	35H42	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.2
45	5.588	5.375	5.173	35H45	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.4
48	5.946	5.734	5.534	35H48	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.5
54	6.664	6.449	6.249	35H54	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	1.8
60	7.380	7.165	6.965	35H60	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	2.3
70	8.575	8.358	8.158	35H70	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	2.8
72	8.881	8.597	8.397	35H72	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	3.0
80	9.769	9.552	9.352	35H80	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	3.8
84	10.247	10.029	9.829	35H84	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	4.0
96	11.680	11.461	11.261	35H96	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	5.3
112	13.591	13.371	13.171	35H112	3	H1	0.875	1.250	1.500	1.156	0.168	0.063	2.500	6.8

Construction may not be exactly as shown. Solid or welded construction for sprockets may be substituted. Minor envelope variations may occur. Other bushing sizes and mounting directions are available. Specify bushing size and mounting direction (hub or plate side) when ordering. For Split Taper Bushings see page 217.

If the sprocket needed is not listed above, please contact Tsubaki for made-to-order custom sprockets.

All Tsubaki stock sprockets have hardened teeth (Rockwell C35 minimum).



No. 80 SINGLE SPLIT TAPER



All dimensions in inches unless otherwise stated.

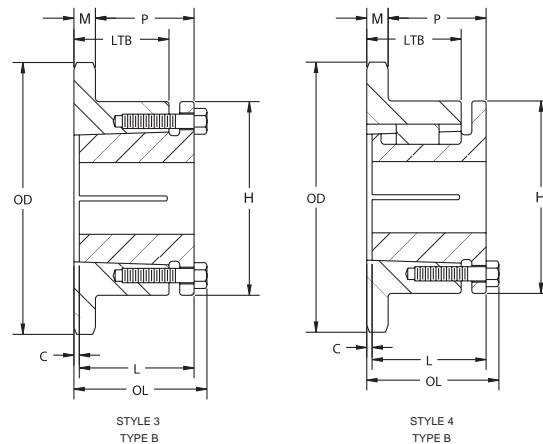
Table with columns: No. of Teeth, Outside Diameter, Pitch Diameter, Caliper Diameter, Catalog Number, Style, Bushing, LTB, LTB Bushing (L), OL, P, M, C, H, Wt. LBS. Rows include various sprocket types from 10 to 112 teeth.

Chain Data table: Chain Size: 80, Pitch: 1.00", Inside Width: .625", Roller Diameter: .625", Nominal Tooth Width: 0.575"

Construction may not be exactly as shown. Solid or welded construction for sprockets may be substituted. Minor envelope variations may occur. Other bushing sizes and mounting directions are available. Specify bushing size and mounting direction (hub or plate side) when ordering. For Split Taper Bushings see page 217

If the sprocket needed is not listed above, please contact Tsubaki for made-to-order custom sprockets.

All Tsubaki stock sprockets have hardened teeth (Rockwell C35 minimum).



No. 80 DOUBLE SPLIT TAPER



All dimensions in inches unless otherwise stated.

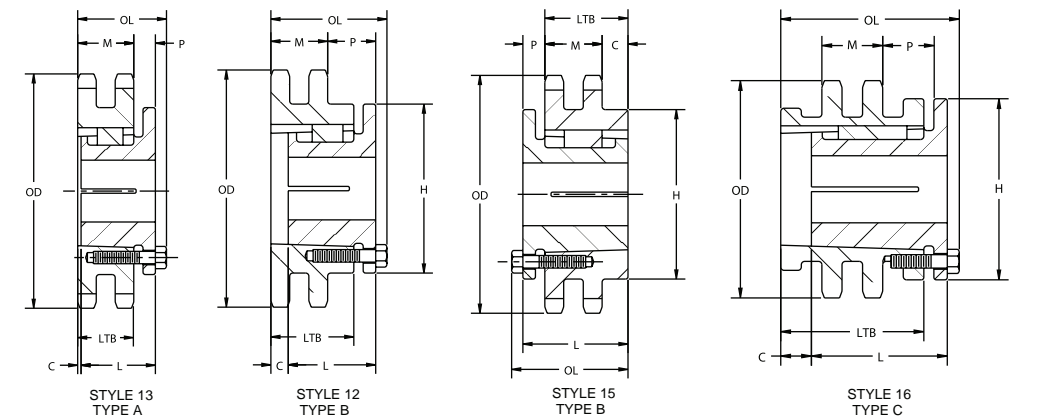
Table with columns: No. of Teeth, Outside Diameter, Pitch Diameter, Caliper Diameter, Catalog Number, Type, Bushing, Style, LTB, LTB Bushing (L), OL, P, M, C, H, Wt. LBS. Rows include various sprocket types from 13 to 72 teeth.

Chain Data table: Chain Size: 80, Pitch: .625", Inside Width: .625", Roller Diameter: .625", Nominal Tooth Width: 0.557", Plate Thickness: 1.710"

Construction may not be exactly as shown. Solid or welded construction for sprockets may be substituted. Minor envelope variations may occur. Other bushing sizes and mounting directions are available. Specify bushing size and mounting direction (hub or plate side) when ordering. For Split Taper Bushings see page 217.

If the sprocket needed is not listed above, please contact Tsubaki for made-to-order custom sprockets.

All Tsubaki stock sprockets have hardened teeth (Rockwell C35 minimum).



SPROCKETS

SPROCKETS

ANSI SPLIT TAPER BUSHINGS

All dimensions in inches unless otherwise stated.

Bushing No.	Dimensions										Bore Range				Cap Screws		Approx. Weight (Lbs)	Wrench Torque In. Lbs
	L	U	T	D		H	V	W	X	R	Type 1		Type 2		No.	Size		
				Large End	Small End						Min Bore	Max Bore	Min Bore	Max Bore				
G1	1.000	0.250	0.750	1.172	1.133	2.000	1.563		0.675	0.125	0.375	0.938	1.000	1.000	2	1/4 x 5/8	0.5	95
H1	1.250	0.250	1.000	1.625	1.570	2.500	2.000		0.875	0.125	0.375	1.375	1.438	1.500	2	1/4 x 3/4	0.8	95
P1	1.938	0.406	1.531	1.938	1.856	3.000	2.438	0.375	1.313	0.219	0.500	1.438	1.500	1.750	3	5/16 x 1	1.3	192
P2	2.938	0.406	2.531	1.938	1.793	3.000	2.438	0.375	2.313	0.219	0.750	1.438	1.500	1.750	3	5/16 x 1	1.5	192
B	1.938	0.500	1.439	2.625	2.557	3.688	3.125	0.500	1.188	0.250	0.500	1.938	2.000	2.438	3	5/16 x 1-1/4	1.8	192
Q1	2.500	0.531	1.969	2.875	1.796	4.125	3.375	0.500	1.750	0.219	0.750	2.063	2.125	2.688	3	3/8 x 1-1/4	3.5	348
Q2	3.500	0.531	2.969	2.875	1.704	4.125	3.375	0.500	2.750	0.219	1.000	2.063	2.125	2.625	3	3/8 x 1-1/4	4.5	348
R1	2.875	0.675	2.250	4.000	3.875	5.375	4.625	0.750	2.000	0.250	1.185	2.813	2.875	3.750	3	3/8 x 1-1/4	7.5	348
R2	4.875	0.675	4.250	4.000	3.750	5.375	4.625	0.750	4.000	0.313	1.375	2.813	2.875	3.625	3	3/8 x 1-1/4	11	348
S1	4.375	0.750	3.675	4.625	4.418	6.375	5.375	0.750	3.313	0.313	1.688	3.188	3.250	4.250	3	1/2 x 2-1/4	14	840
S2	6.750	0.750	6.000	4.625	4.270	6.375	5.375	0.750	5.688	0.438	1.875	3.188	3.250	4.188	3	1/2 x 2-1/4	19	840
U0	5.250	1.063	4.188	6.000	5.770	8.375	7.000	1.250	3.750	0.438	2.375	3.063			3	5/8 x 2-3/4	30	1680
U0	4.938	0.750	4.188	6.000	2.766	8.375	7.000	1.250	3.750	0.438	3.250	4.250	4.375	5.500	3	5/8 x 2-3/4	27	1680
U1	7.125	1.063	6.063	6.000	5.649	8.375	7.000	1.250	5.625	0.438	2.375	4.250	4.375	5.000	3	5/8 x 2-3/4	40	1680
U2	10.125	1.063	9.063	6.000	5.461	8.375	7.000	1.250	5.625	0.438	2.438	4.250	4.375	5.000	3	5/8 x 2-3/4	50	1680
W1	8.250	1.438	6.813	8.500	6.102	12.500	10.000	1.250	6.375	0.438	3.375	6.188	6.250	7.438	4	3/4 x 3	104	3000
W2	11.250	1.438	9.813	8.500	7.914	12.500	10.000	1.250	9.375	0.438	3.375	6.188	6.250	7.438	4	3/4 x 3	133	3000

METRIC SPLIT TAPER BUSHINGS

All dimensions in inches unless otherwise stated.

Bore Range	14	15	16	18	19	20	22	24	25	28	30	32	35	36	38
Keyway (mm)	5 x 5	5 x 5	5 x 5	6 x 6	6 x 6	6 x 6	6 x 6	8 x 7	8 x 7	8 x 7	8 x 7	10 x 8	10 x 8	10 x 8	10 x 8
Bushing No.	5 x 5	5 x 5	5 x 5	6 x 6	6 x 6	6 x 6	6 x 6	8 x 7	8 x 7	8 x 7	8 x 7	10 x 8	10 x 8	10 x 8	10 x 8
G	X		X	X	X	X	X	X	X						
H	X		X	X	X	X	X	X	X	X	X	X	X	X	X
P1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
B				X	X	X	X	X	X	X	X	X	X	X	X
Q1				X	X	X	X	X	X	X	X	X	X	X	X
R1										X	X	X	X	X	X
R2													X	X	X

Note:
 "X" denotes that the Split Taper Bushing is also available in metric bore size and keyway.
 All metric bores are supplied with imperial threads.
 All bushings can be supplied in steel, stainless steel and other materials. Consult Tsubaki factory for more details.

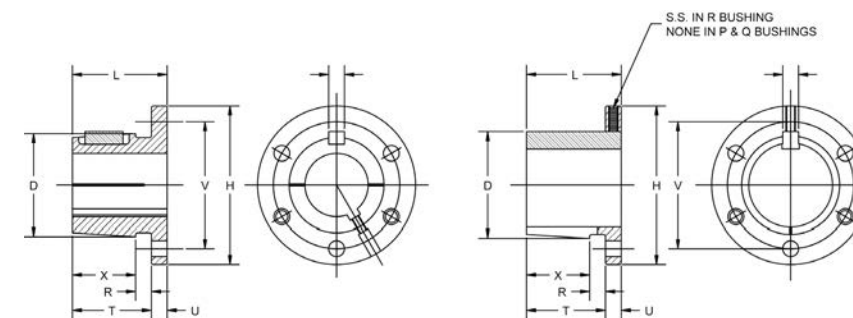
METRIC SPLIT TAPER BUSHINGS

All dimensions in inches unless otherwise stated.

Bore Range	39	40	42	45	48	50	55	60	65	70	75	80	85	90	95
Keyway (mm)	12 x 8	12 x 8	12 x 8	14 x 9	14 x 9	14 x 9	16 x 10	18 x 11	18 x 11	20 x 12	20 x 12	22 x 14	22 x 14	25 x 14	25 x 14
Bushing No.	12 x 8	12 x 8	12 x 8	14 x 9	14 x 9	14 x 9	16 x 10	18 x 11	18 x 11	20 x 12	20 x 12	22 x 14	22 x 14	25 x 14	25 x 14
G															
H															
P1	X	X	X												
B	X	X	X	X	X	X	X	X	X						
Q1	X	X	X	X	X	X	X	X	X	X					
R1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
R2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S1			X	X	X	X	X	X	X	X	X	X	X	X	X

Note:
 "X" denotes that the Split Taper Bushing is also available in metric bore size and keyway.
 All metric bores are supplied with imperial threads.
 All bushings can be supplied in steel, stainless steel and other materials. Consult Tsubaki factory for more details.

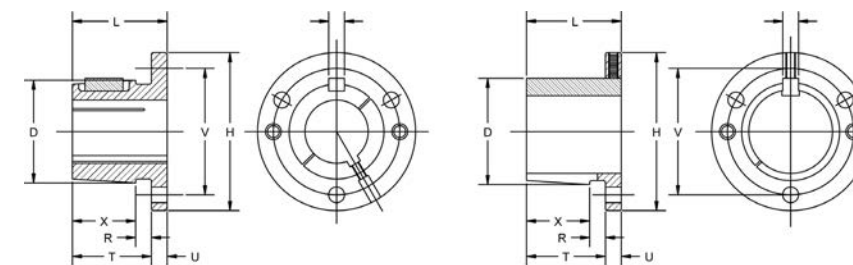
B, P, Q & R Bushings



TYPE 1

TYPE 2

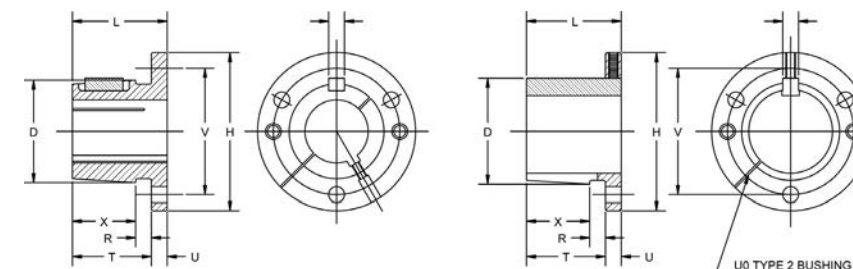
S Bushings



TYPE 1

TYPE 2

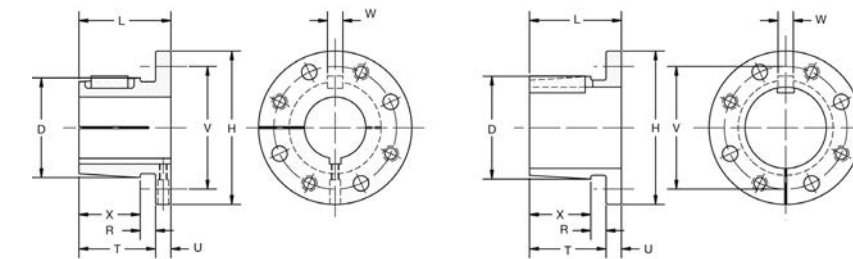
U Bushings



TYPE 1

TYPE 2

W Bushings



TYPE 1

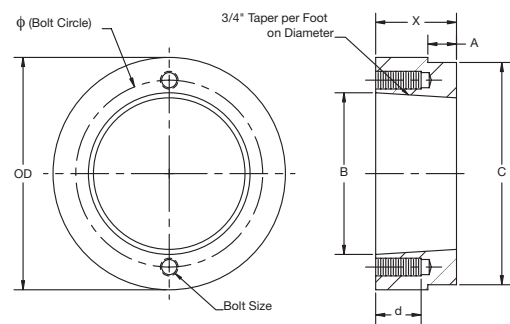
TYPE 2

SPLIT TAPER HUBS

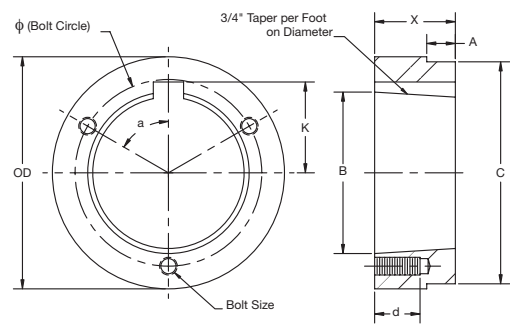
Tsubaki offers a complete line of Split Taper style weld-on hubs for insertion and welding to produce “B:” style sprockets, sheaves and other applications without hub protrusion. To provide greater strength for this type of shaft locking mechanism and reduce heat distortion caused by welding, these hubs are dimensionally the same as our sprocket items. Special dimension hubs are available on a made-to-order basis. All Tsubaki hubs are made from steel bar stock (not powdered or sintered metal). The Split Taper style weld-on hubs listed below include appropriate tapered bores and mounting holes.

All dimensions in inches unless otherwise stated.

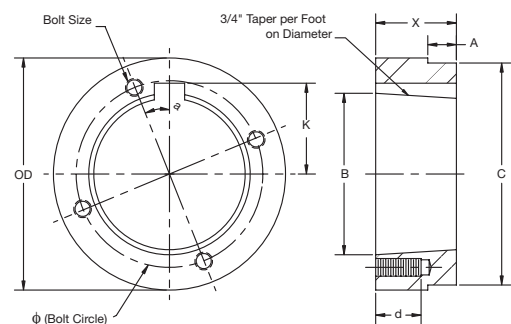
Hub	Bushing	Dimensions									Tapped Holes			Weight (Lbs.)
		OD	A	B	C	K	V	W	X	a(0)	d	No.	Size	
G1W	G	2.00	0.174	1.168	1.875		1.563		0.625		0.625	2	1/4 20	0.4
H1W	H	2.50	0.174	1.621	2.375		2.000		0.875		0.875	2	1/4 20	0.6
P1W	P1	3.00	0.292	1.938	2.875	1.094	2.438	0.375	1.313	60	0.625	3	5/16 18	1.4
P2W	P2	3.00	1.100	1.938	2.875	1.094	2.438	0.375	2.313	60	0.625	3	5/16 18	2.5
B1W	B	3.88	0.292	2.623	3.750	1.438	3.125	0.500	1.313	60	0.813	3	5/16 18	2.3
B2W	B	4.50	0.709	2.623	4.375	1.438	3.125	0.500	1.750	60	0.813	3	5/16 18	4.7
Q1W	Q1	4.50	0.709	2.875	4.375	1.563	3.375	0.500	1.750	60	0.875	3	3/8 16	4.4
Q2W	Q2	4.50	1.606	2.875	4.375	1.563	3.375	0.500	2.750	60	0.875	3	3/8 16	6.9
R1W	R1	5.75	0.709	4.000	5.625	2.188	4.625	0.750	2.000	60	1.125	3	3/8 16	7.3
R2W	R2	5.75	1.606	4.000	5.625	2.188	4.625	0.750	4.000	60	1.125	3	3/8 16	15
S1W	S1	6.75	0.946	4.625	6.500	2.563	5.375	0.750	3.313	60	1.625	3	1/2 13	17
S2W	S2	6.75	2.963	4.625	6.500	2.563	5.375	0.750	5.688	60	1.625	3	1/2 13	30
U0W	U0	8.50	2.000	6.000	8.250	3.250	7.000	1.250	3.750	60	2.000	3	5/8 11	32
U1W	U1	8.50	2.963	6.000	8.250	3.250	7.000	1.250	5.625	60	1.750	3	5/8 11	45
U2W	U2	8.50	6.016	6.000	8.250	3.250	7.000	1.250	8.625	60	1.750	3	5/8 11	69
W1W	W1	12.50	2.963	8.500	12.250	4.563	10.000	1.250	6.375	22.50	1.750	4	3/4 10	130



For Bushings G and H



For Bushings P, B, Q, R, S, and U



For Bushing W

SMART TOOTH® SPROCKETS



Tsubaki Smart Tooth® offers users visual indication that a sprocket is still within allowable wear tolerance. The patented wear indicator pins on one or more teeth around the sprocket along with highly-visible blue painted finish, allow the operator to get a clear look at the wear of the sprocket without taking costly downtime to shut down the system. Tsubaki wear indicator technology makes sense in applications wear down time is critical. Sprockets are available with Smart Tooth® technology on a made to order basis.



New Smart Tooth® Sprocket

- Availability
- ANSI Sizes 80-240 pitch sprockets
- Hardened teeth
- Bored to size and bushed sprockets



Worn sprocket with Smart Tooth®

- Value
- Extended chain life through predictable maintenance
- Reduction in overall ownership cost
- Life cycle predictability.



POWER TRANSMISSION UNITS & COMPONENTS

The Tsubaki Power Transmission Units & Components product line utilizes more than 100 years of engineering and manufacturing excellence to offer a wide range of power transmission units and components. Whether it's Tsubaki's full line of overrunning, indexing and backstopping cam clutches, or the new and innovative Zip Chain Actuators®, Tsubaki's engineering creativity and experience shine through to create premium industrial components.



INTRODUCTION

Everything you need to get the best results out of your Tsubaki roller chain and sprockets!

Clutches and Backstops

Full range of overrunning, backstopping and indexing cam clutches. With 50 years of experience, Tsubaki can offer the right cam clutch for any application.



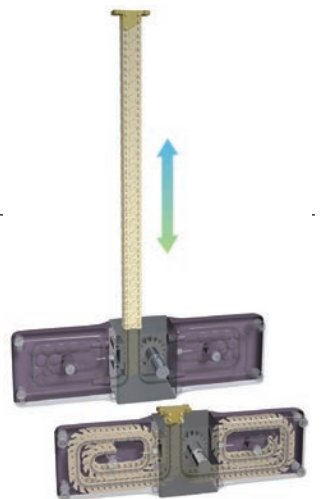
POWER-LOCK®

Easy-to-install keyless shaft-hub locking device that offers a backlash free method of hub locking that eliminates the costly machining of keyways.



Shock Relays

Simple to install overload protection device that monitors motor amperage and cuts power should a blockage or equipment malfunction put excessive loads on machinery. Shock relays are a cost effective method of protecting critical machinery.



Zip Chain Actuators®

An innovative and unique method of linear actuation, the Zip Chain Actuators® utilize modified segmented roller chain and purpose-designed sprockets to create a rigid chain actuator with an extremely small footprint.

Roller Chain Couplings

Leveraging Tsubaki's extensive roller chain expertise, the Roller Chain Couplings offer a robust and flexible shaft coupling solution.



Overload Protection Devices

Tsubaki offers a wide range of mechanical overload protection devices that will help protect critical machinery.



For a full listing of all Tsubaki PT Components, visit www.ustsubaki.com

CLUTCHES & BACKSTOPS



TSUBAKI BACKSTOP CAM CLUTCH PRODUCTS



BS & BS-F

BS Series is designed for lower speed conveyor applications. The unique non-rollover cam design provides higher torque capacity, assuring full engagement.

Bore Range:
0.750" to 5.315" (20 to 135 mm)
Torque Range:
217 to 11,580 lbs. ft.

BS-F Series is designed for simple, drop-in installations to all major competitive backstop products. Uses unique seal design for maximum life, minimal maintenance.

Bore Range:
2.360" to 18.310" (60 to 465 mm)
Torque Range:
4,980 to 722,000 lbs. ft.



BR-HT

BR-HT Series is designed for backstop applications where high-speed overrunning is required. Lift off cam design assures minimal heat generation and longest life.

Bore Range:
0.787" to 5.118" (20 to 320 mm)
Torque Range:
77 to 269,950 lbs. ft.
COMPETITOR MODELS:
Formsprag RSCI; Ringspann FXM



BSEU

BSEU Cam Clutches are a European variation popular on many bucket elevators in North and South America.

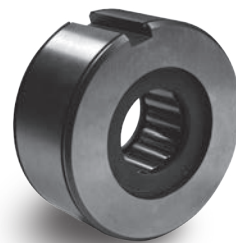
Bore Range:
0.787" to 3.543" (20 to 90 mm)
Torque Range:
159 to 3,467 lbs. ft.
COMPETITOR MODELS:
Formsprag RSBW
Morse CR/BW
Stieber RSBW



BREU

BREU Series is designed for backstop applications where bearing support and modular construction is desirable.

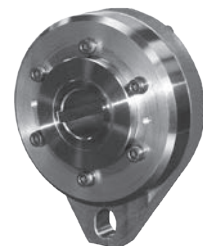
Bore Range:
1.181" to 5.906" (30 to 150 mm)
Torque Range:
447 to 25,009 lbs. ft.
COMPETITOR MODELS:
Formsprag RIZ; Stieber RIZ



CA

CA line of backstops are an integral part of the reducer. The unique non-rollover cam design is key and prevents damage to the gears, shafts and drive train. This is a drop-in replacement for DodgeTXT® reducers.

Bore Range:
0.738" to 1.750" (18.75 to 44.45 mm)
Torque Range:
45 to 901 lbs. ft.
COMPETITOR MODELS:
Dodge 24 Series



BRUS

BRUS series of high-speed external backstops utilize non-rollover and lift-off design cams. This is a drop-in replacement for Falk® BIF backstops.

Bore Range:
1.125" to 3.750" (28.58 to 95.25 mm)
Torque Range:
700 to 4,420 lbs. ft.
COMPETITOR MODELS:
Falk BIF; Formsprag FHB; Ringspann FRXF

TSUBAKI INDEXING



MIUS

MIUS Series is for mid-speed indexing applications up to 300 cycles a minute.

Bore Range:
0.500" to 6.250" (12.7 to 160 mm)
Torque Range:
280 to 27,290 lbs. ft.
COMPETITOR MODELS:
Formsprag HPI
Morse MI
Marland RMS



TSS

TSS Series clutch is designed for press fit installation. Outside dimensions are the same as series 62 ball bearings.

Bore Range:
0.314" to 2.362" (8 mm to 60 mm)
Torque Range:
4 to 479 lb. ft. (6 to 649 Nm)
COMPETITOR MODELS:
Formsprag AS
Morse NSS
Ringspann FCN

CLUTCHES & BACKSTOPS



OVERRUNNING AND GENERAL CAM CLUTCH PRODUCTS



MGUS/MGUS-R

MGUS Series is suitable for applications which require low to high speed inner race. MGUS-R Series contains a built-in oil reservoir and can be used for backstopping applications.

Bore Range:
0.500" to 6.250" (12.7 to 160 mm)
Torque Range:
280 to 27,290 lb. ft. (380 to 37,000 Nm)
COMPETITOR MODELS:
Formsprag FSO; Morse MG;
Ringspann FB



TFS

TFS Series has two vertical keyways on the outer race to assist with positioning. Outside dimensions are the same as series 63 ball bearings. Ideal for general overrunning applications.

Bore Range:
0.472" to 3.150" (12 to 80 mm)
Torque Range:
13 to 2,894 lbs. ft. Competitor Models:
Formsprag ASNU; Morse NFS;
Ringspann FC/FDN



MZEU

MZEU Series is designed for overrunning applications. These units come pre-lubricated, and can be adapted with flanges and torque arms to suit a wide variety of applications.

Bore Range:
0.472" to 5.906" (12 to 150 mm)
Torque Range:
44 to 24,930 lbs. ft.
COMPETITOR MODELS:
Formsprag GFR/GFRN
Stieber GFR



PBUS

PBUS Series clutch is packed with a special grease for general applications. The outer race has provision for mounting gears, pulleys, and sprockets.

Bore Range:
0.375" to 1.750" (10 to 45 mm)
Torque Range:
41 to 1,623 lb. ft. (56 to 2,200 Nm)
COMPETITOR MODELS:
Formsprag FSR; Morse PB-A;
Renold SB



MZ

MZ Series is designed for low speed indexing applications that require inner or outer race overrunning. These units come pre-lubricated for easy installation and long service life.

Bore Range:
0.591" to 2.756" (15 to 70 mm)
Torque Range:
137 to 2,242 lb. ft. (186 Nm-m to 3,040 Nm)
COMPETITOR MODELS:
Stieber SMZ



BUS200

BUS Series is specifically designed for shaft mounting applications that require high speed inner race overrunning or low to mid speed outer race overrunning.

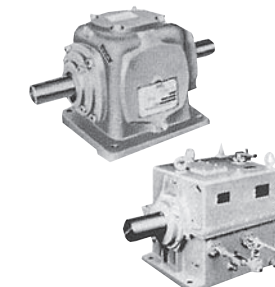
Bore Range:
0.650" to 3.122" (16.5 to 79.3 mm)
Torque Range:
39 to 1,025 lbs. ft.
Competitor Models:
Formsprag FS50; Morse B200;
Renold SD



BB

BB Series Cam Clutch has the bearing dimensions and characteristics of a 62 Series type ball bearing. This design provides easy installation and is ideal for general overrunning applications

Bore Range:
0.590" to 1.575" (15 to 40 mm)
Torque Range:
21 to 192 lb. ft. (29 to 260 Nm)
COMPETITOR MODELS:
Formsprag CSK; Morse KK; Ringspann ZZ; Stieber KK



OB-ON/OF & OB-SF

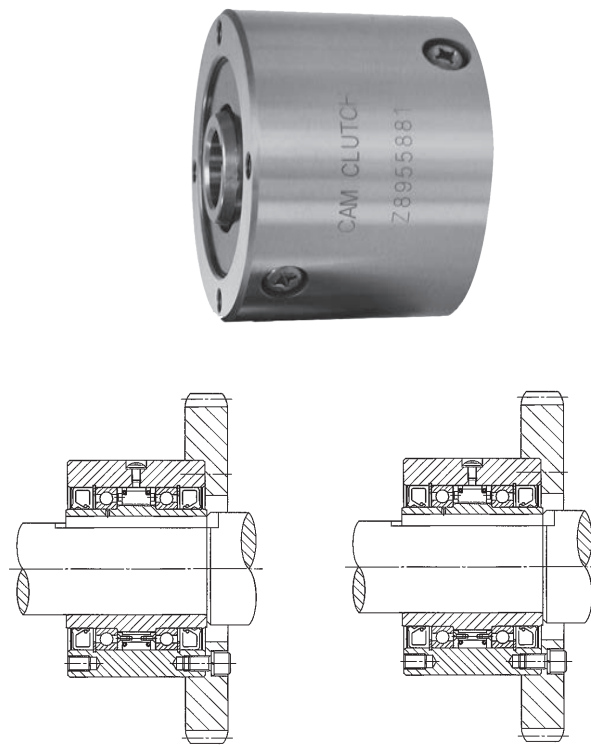
OB-ON/OF Series is an enclosed unit housing cam clutch units and a common shaft. These units are used for high speed overrunning applications.

Torque Range:
2,318 to 59,270 lbs. ft.
OB-SF Series is an enclosed unit housing cam clutch units that allow for continuous high speed overrunning and engagement and high torque capacities.
Torque Range:
231 to 4,337 lbs. ft.

MGUS SERIES

MGUS Series Cam Clutch products are designed to satisfy inner or outer race overrunning/general application requirements. Depending on application requirements, the MGUS Series can be used in overrunning, indexing, or backstopping applications. This series is offered in both metric and inch based inner race configurations. MGUS Series units can easily be mated to pulleys, gears, or sprockets.

Available Bore Range		
MGUS Series Cam Clutches are stocked in many bore sizes. Requested bore size and keyway combination are possible on a made-to-order basis. Chart below provides the available range of bore sizes per a given model.		
Model	Inner Diameter Range (in)	Torque Capacity (lbs-ft)
MGUS300	0.500 - 0.750	280
MGUS400	0.437 - 0.866	398
MGUS500	0.750 - 1.312	1195
MGUS600	0.937 - 2.000	2316
MGUS700	1.875 - 2.938	5163
MGUS750	2.250 - 3.437	7007
MGUS800	2.625 - 4.438	13276
MGUS900	3.625 - 5.438	18070
MGUS1000	4.938 - 7.000	27290

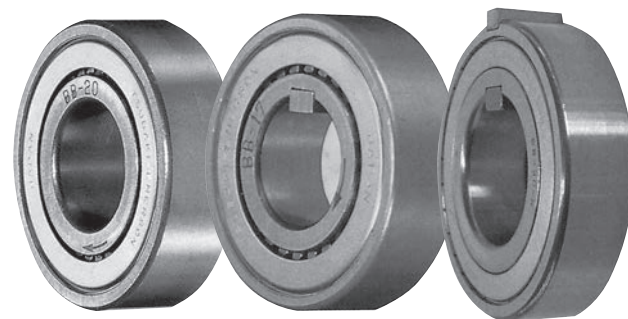


MGUS Installation Example

BB SERIES

BB Series Cam Clutches are a combination of a 62 Series ball bearing and a cam style clutch. These units are designed for press fit applications and are available in five variations, combinations of metal shield or dust protective sealed type and with or without keyways on the inner and/or outer race to allow design and application flexibility. BB Series units come grease lubricated but metal shielded style can be adapted for oil bath lubrication.

Specifications			
Model	Inner Diameter (mm)	Bearing Series	Torque Capacity (lbs-ft)
BB15	15	6202	21
BB17	17	6203	32
BB20	20	6204	45
BB25	25	6205	58
BB30	30	6206	103
BB35	35	6207	128
BB40	40	6208	192



BB Series

BB-K Series

BB-KK Series

TSS SERIES

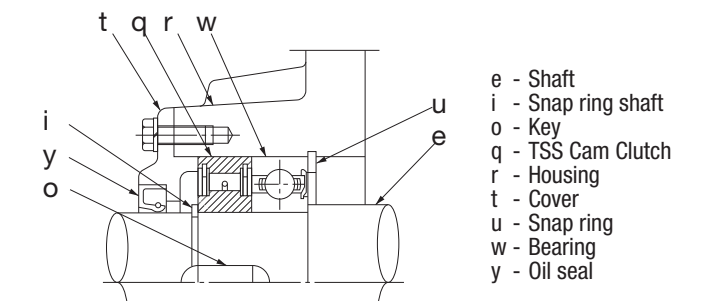
TSS Series Cam Clutch is designed for press fit installation with outside dimensions the same as the 62 Series ball bearing. As a sprag clutch, torque capacities are often higher than a similar ramp & roller design. This design provides easy handling and installation, most often with a Series 62 ball bearing located next to the TSS Cam Clutch. The TSS Series is ideal for applications that require high speed inner race overrunning in a very compact package.

Specifications			
Model	Inner Diameter (mm)	Bearing Series	Torque Capacity (lbs-ft)
TSS8	8	628	5
TSS10	10	6200	9
TSS12	12	6201	13
TSS15	15	6202	16
TSS20	20	6204	30
TSS25	25	6205	41
TSS30	30	6206	77
TSS35	35	6207	100
TSS40	40	6208	218
TSS45	45	6209	256
TSS50	50	6210	297
TSS60	60	6212	479



TSS Series Cam Clutch

TSS installation example



TFS SERIES

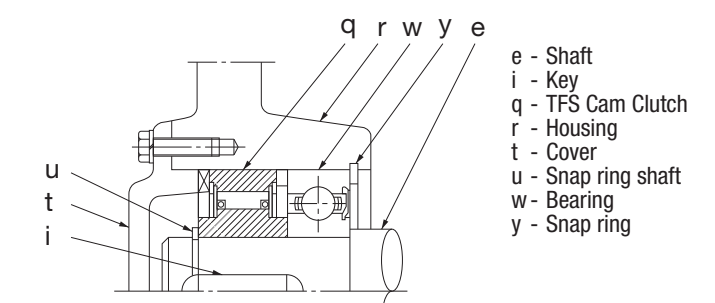
TFS Series Cam Clutch is a sprag type clutch designed for press fit installation. Sprag type designs typically have a higher torque capacity than a similarly sized ramp & roller type clutch. TFS has two vertical keyways on the outer race to assist with locating. Outside dimensions are the same as Series 63 ball bearings. This design is ideal for general inner or outer race overrunning applications. Since the TFS Series does not include an integral bearing, installing the TFS Cam Clutch next to a bearing which handles both the axial and radial loads is the typical application.

Specifications			
Model	Inner Diameter (mm)	Bearing Series	Torque Capacity (lbs-ft)
TFS12	12	6301	13.3
TFS15	15	6302	20.7
TFS17	17	6303	36.9
TFS20	20	6304	62
TFS25	25	6305	94.4
TFS30	30	6306	148
TFS35	35	6307	350
TFS40	40	6308	448
TFS45	45	6309	558
TFS50	50	6310	829
TFS60	60	6312	1457
TFS70	80	6314	1854
TFS80	80	6316	2894



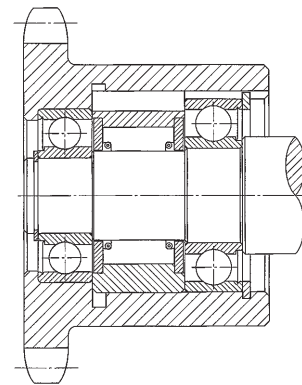
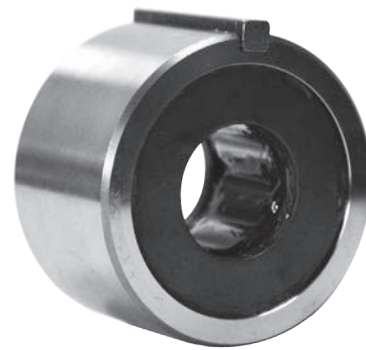
TFS Series Cam Clutch

TFS installation example



BUS200 SERIES

BUS200 Series Cam Clutch is a general purpose Cam Clutch used in backstop, overrunning, and indexing applications. Generally, the customer supplies the inner race as a component of their machinery, but if desired, Tsubaki can also provide an inner race. A second very convenient feature is that the BUS200 Series outside diameter matches with 6200 Series ball bearings. Because of the common popular dimensions, BUS200 Series Cam Clutches are found as integral components in many pieces of machinery; these include backstops within gear boxes and as components within timing gear applications. BUS200 Series ships pre-lubricated with grease. Oil lubrication is generally recommended for indexing applications.

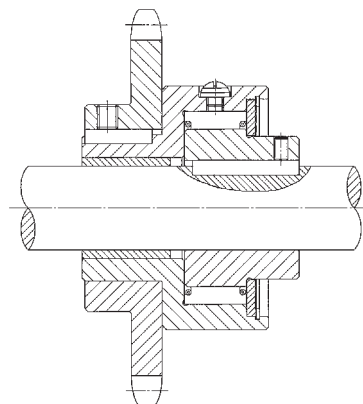
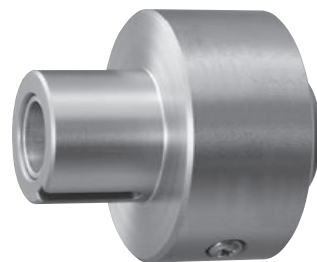


BUS Installation Example

Specifications				
Model	Bearing Series	Torque Capacity (lbs-ft)	Max Overrunning (RPM)	
			Shaft	Outer Race
203	6203	40	2400	500
204	6204	52	2400	500
205	6205	81	1800	400
206	6206	177	1800	350
207	6207	280	1800	300
208	6208	405	1800	200
209	6209	405	1800	200
210	6210	578	1200	200
211	6211	578	1200	200
212	6212	907	1200	180
213	6213	907	1200	180
214	6214	1025	1200	180

PBUS SERIES

PBUS Series Cam Clutches are intended for use in general overrunning or indexing applications. The PBUS Series comes pre-lubricated with synthetic grease for easy installation and long service life. The outer race has provision for mounting gears, pulleys, and sprockets. Specify direction of rotation when ordering.

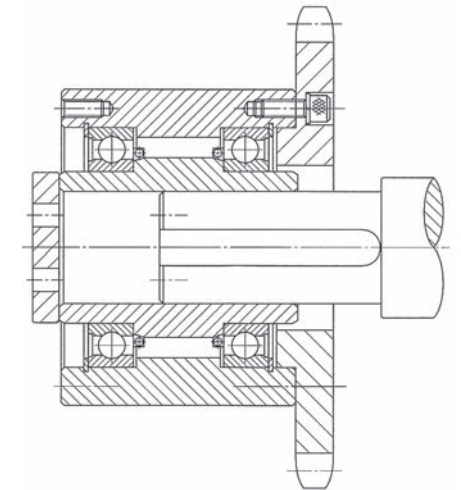


PBUS Installation Example

Specifications		
Model	Inner Diameter Range (in)	Torque Capacity (lbs-ft)
PBUS3	0.375 - 0.500	41.3
PBUS5	0.500 - 0.630	114
PBUS6	0.750 - 0.787	301
PBUS8	0.875 - 1.000	454
PBUS10	1.125 - 1.250	679
PBUS12	1.375 - 1.575	1365
PBUS14	1.625 - 1.772	1623

MZ SERIES

MZ Series Cam Clutch products are designed for general overrunning applications. The MZ Series can be used in applications which require the inner or outer race to have overrunning capability. The MZ Series comes pre-lubricated with grease and is ready to install. No lubrication maintenance is required. This series is ideal for gears, pulleys and clutch assemblies.

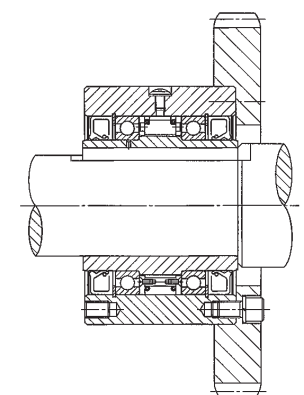


MZ Installation Example

Specifications		
Model	Inner Diameter Range (in)	Torque Capacity (lbs-ft)
MZ15	0.500 - 0.591	137
MZ17	0.625 - 0.669	159
MZ20	0.750 - 0.787	238
MZ30	0.866 - 1.181	542
MZ35	1.250 - 1.378	797
MZ45	1.500 - 1.772	1195
MZ60	1.969 - 2.362	1556
MZ70	2.559 - 2.756	2242

MIUS SERIES

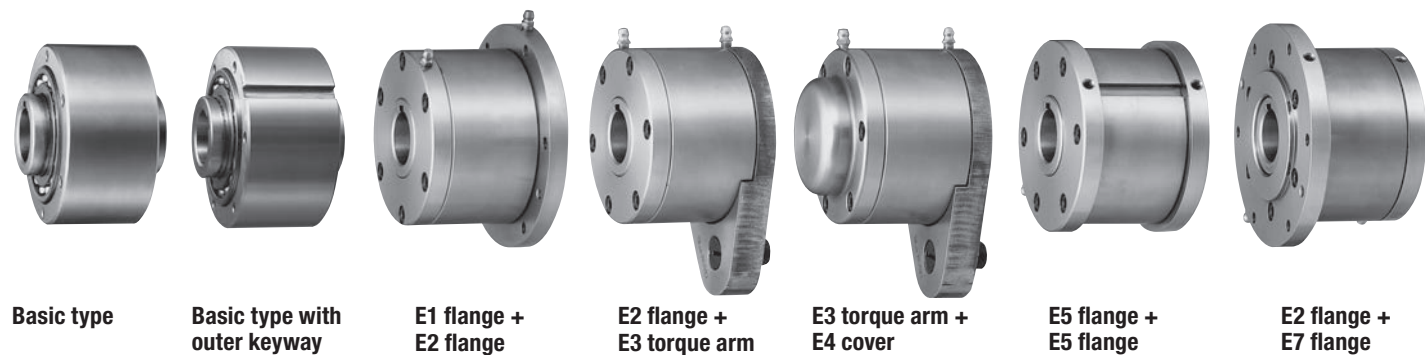
MIUS Series Cam Clutch units are designed for indexing applications. In this mode of operation, reciprocating motion applied to the driving race of the clutch is transformed into uni-directional intermittent motion, at the driven race. The clutch drives in the forward stroke (index) and overruns on the return stroke. In addition to torque capacity, consider the number of indexing cycles per minute.



MIUS Installation Example

Specifications		
Model	Inner Diameter Range (in)	Torque Capacity (lbs-ft)
MIUS300	0.500 - 0.750	280
MIUS400	0.437 - 0.866	398
MIUS500	0.750 - 1.312	1195
MIUS600	0.937 - 2.000	2316
MIUS700	1.875 - 2.938	5163
MIUS750	2.250 - 3.437	7007
MIUS800	2.625 - 4.438	13276
MIUS900	3.625 - 5.438	18070
MIUS1000	4.938 - 7.000	27290

MZEU/BREU CAM CLUTCH AVAILABLE MODULAR COMPONENTS



MZEU SERIES

MZEU Series is a general purpose Cam Clutch suitable for a wide variety of applications. A selection of add-on flanges and torque arms are available enabling this Cam Clutch to easily fit where custom designed products were previously required. MZEU12 to MZEU80 are pre-greased, requiring no Lubrication.

Specifications					
Model	Bore Size (mm)	Torque Capacity (lbs-ft)	Model	Bore Size (mm)	Torque Capacity (lbs-ft)
MZEU12	12	44	MZEU55	55	1770
MZEU15	15	74	MZEU60	60	2176
MZEU20	20	181	MZEU70	70	3105
MZEU25	25	313	MZEU80	80	3813
MZEU30	30	542	MZEU90	90	8851
MZEU35	35	749	MZEU100	100	12981
MZEU40	40	996	MZEU130	130	18070
MZEU45	45	1195	MZEU150	150	24930
MZEU50	50	1527			



BREU SERIES

The BREU Series Cam Clutch is commonly used in backstopping applications that require higher speed inner race overrunning, and low to medium speed engagement speed capability. The BREU Series Cam Clutch is popular amongst both OEM's and end users, utilizing a broad array of mounting accessories and the ability to select keyway positions on the inner and outer race to offer mounting flexibility. BREU Series incorporates a "lift off" style cam which provides increased Cam Clutch life.

Specifications					
Model	Bore Size (mm)	Torque Capacity (lbs-ft)	Inner Race Overrunning		Engagement
			Min RPM	Max RPM	Max RPM
BREU30	30	448	880	3600	350
BREU35	35	506	780	3600	300
BREU40	40	723	720	3600	300
BREU45	45	795	670	3600	280
BREU50	50	1265	610	3600	240
BREU55	55	1446	580	3600	220
BREU60	60	2566	490	3600	200
BREU70	70	3492	480	3600	200
BREU80	80	4807	450	3600	190
BREU90	90	6288	420	3000	180
BREU100	100	10481	460	2500	180
BREU130	130	15034	420	2200	180
BREU150	150	25009	370	1300	180

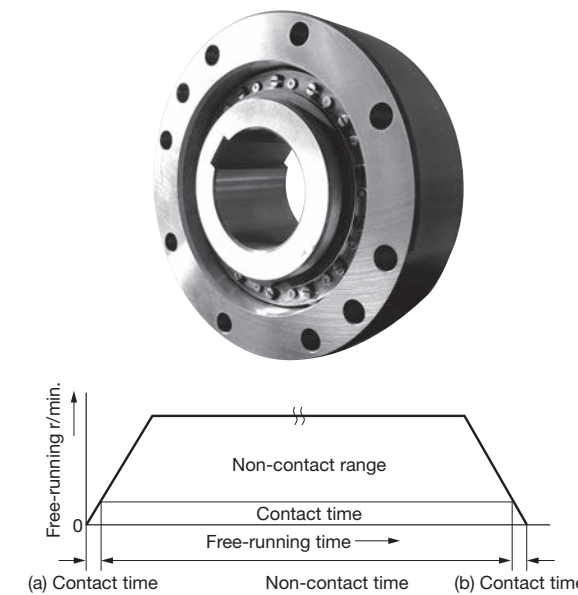
BR-HT SERIES

BR-HT is mainly used in backstop applications as an integral part of a gear reducer. Prevention of reverse rotation for inclined conveyors and bucket elevators are typical application examples. BR-HT assures not only the immediate backstop function under high torque, but also long service life by the "lift-off" design. In addition, installation on the high speed shaft with low torque enables selection of more compact models with resulting lower cost.

Please refer to Tsubaki's Cam Clutch Catalog for more information on BR-HT part numbering. Available for download at www.ustsubaki.com/technical-resources.html

Service Life of BR-HT Series

The service life of previous Tsubaki Cam Clutch models was determined as the frictional service life during free-running (when the clutch was disengaged) and the fatigue service life of the engaged clutch. However, with BR-HT Series, frictional service life is not a factor because there is no mechanical contact when the clutch is disengaged. As a result, service life is determined solely by the fatigue life of the engaged clutch.

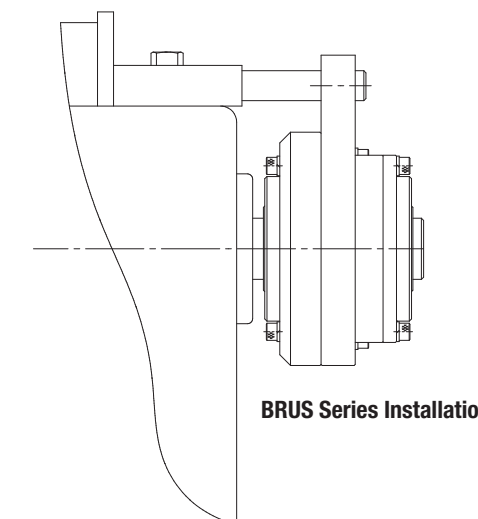
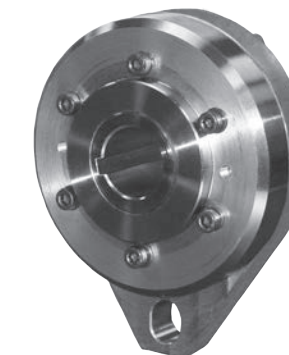


Friction in the clutch mechanism only occurs during a very short period of time denoted by "a" and "b". "a" is the time during which the cam is engaged until the acceleration of inner race causes it to disengage. "b" is the time during which the cam engages when the inner race decelerates.

BRUS SERIES BACKSTOPS

The BRUS Series backstops are designed for use in external high-speed backstopping applications. The BRUS is drop-in-ready and has a unique torque arm design that allows for backstop or torque arm replacement only during maintenance. BRUS series backstops ship pre-lubricated with grease.

Specifications					
Model	Torque Capacity		Inner Diameter Range (in)	Inner Race Overrunning (r/min)	
	lb. ft.	(Nm)		Min.	Max.
BRUS45	700	(950)	6.5 - 0.98	400	3600
BRUS60	1770	(2400)	8.58 - 1.26	400	2400
BRUS90	4420	(6000)	11.65 - 1.50	400	1800

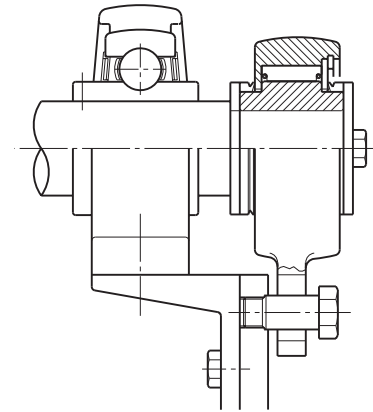


BRUS Series Installation

CLUTCHES & BACKSTOPS

BSEU SERIES

BSEU Series Cam Clutch was developed as a user-friendly backstopping Cam Clutch. It has cam and roller construction which is the same as the smaller size BS Series Cam Clutch. The outer race has a special shape which combines the torque arm providing easy installation. These Cam Clutches are shipped pre-lubricated with grease and ready for installation. Most often used as a backstop in applications where limited space is available.



BSEU Installation Example

Specifications			
Model	Inner Diameter Range (in)	Torque Capacity (lbs-ft)	Overrunning Max Speed (RPM)
BSEU25	20-25	159	500
BSEU40	20-40	1062	450
BSEU70	45-70	2316	350
BSEU90	75-90	3467	250

CA SERIES

The CA series backstops are designed to be an integral part of the reducer. The unique non-rollover style cams prevent damage to gears, shafts, and drive train. This extends the life of the reducer and other system components while also ensuring proper performance. The CA series backstops are drop-in replacements for Dodge® reducers. CA series backstops ship pre-lubricated.



Cross-Reference Chart									
Tsubaki CA Series Part Number	DODGE® Part Number	Current TXT Series Housing Redesign 2005		Obsolete TXT Series		TDT Series		TD Series	
211CA-0.738	243106	TXT309B, TXT315B, TXT325B		TXT309A, TXT315A, TXT325A		—		—	
212CA-0.889	244106	TXT409B, TXT415B, TXT425B		TXT409A, TXT415A, TXT425A		—		—	
214CA-1.052	244148	—		TXT405 TXT419	TXT415 TXT425	—		—	
216CA-1.215	245154	TXT509C TXT515C TXT525C		TXT509 TXT509A TXT509B TXT515	TXT515A TXT515B TXT525 TXT525A TXT525B	—		—	
217CA-1.296	246101	—		TXT505 TXT505A		T15		—	
F227CA-1.500A	246092	TXT609A, TXT615A, TXT625A		TXT605 TXT609	TXT615 TXT625	TDT615A, TDT625A, T16		TDT615 TDT625	TDT615A TDT625A
F227CA-1.500B	247260 (247092)	TXT709A, TXT715A, TXT725A		TXT705 TXT709	TXT715 TXT725	TDT715, TDT725, T17		TDT715 TDT725	TDT715A TDT725A
F233CA-1.750A	249260 (248101) (250101)	TXT815A TXT825A	TXT115A TXT926A	TXT815 TXT825	TXT915 TXT926	TXT815 TXT825 TXT915	TXT926 TDT1115 TDT1125	TD815 TD825 TD815A TD825A	TD915 TD1115 TD1125
F233CA-1.750B	250260	TXT1015A TXT1024A		TXT805 TXT1015 TXT1024	TXT1215 TXT1225	TD1015 TDT1024 T18	TDT1215 TDT1225	TD1015 TD1024	TDT1215 TDT1225

Dodge® is a registered trademark of Baldor Electric Company Corporation.

CLUTCHES & BACKSTOPS

BS SERIES

BS Series Cam Clutch products are designed to provide inner race overrunning capability in one direction of operation, and engage the outer race when reverse rotation is experienced. BS Series units are often found on incline conveyor systems or pump systems that may experience reverse rotation due to excessive loading on the discharge side of the pump. BS Series Cam Clutches are a cam and roller design incorporating the low friction bearing into the cam cage.



A complete Cam Clutch assembly typically includes the Cam Clutch, torque arm, shaft key, shaft end plate, and safety cover or oil reservoir. The shaft key is included with the Cam Clutch but please select each additional item individually as needed. These Cam Clutches are shipped pre-lubricated with grease and ready for installation.

Specifications				
Model	Inner Diameter Range (in)	Torque Capacity (lbs-ft)	Overrunning Max RPM	Torque Arm Part #
BS30	0.750 - 1.181	217	350	BS30TA
BS50	1.125 - 2.000	578	300	BS50TA
BS65	1.500 - 2.559	1158	340	BS65TA
BS75	1.938 - 2.953	1807	300	BS75TA

BS/BS-F SERIES SAFETY COVER

This safety cover is specifically designed to fit the BS and BS-F Series Cam Clutch. The safety cover is intended to protect and cover the rotating portion of the Cam Clutch from debris and foreign objects entering the rotating portion of the unit.

Cover Installed



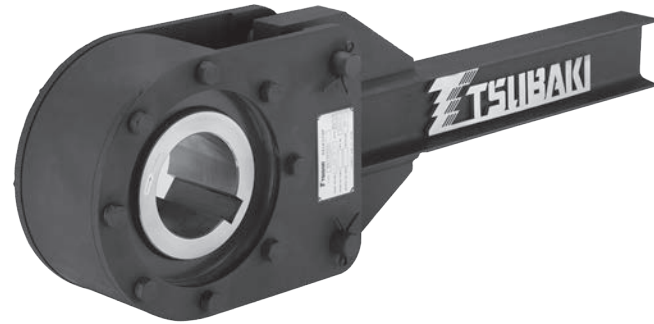
Contents Delivered



BS-F SERIES BACKSTOPS

Tsubaki's new BS-F Series backstops are designed for simple, drop-in installations to all major competitive backstop products. These backstops use a unique seal design for maximum life with minimal maintenance. With Tsubaki's innovative design features, our backstops ensure efficient and dependable operation in the harshest environments.

BS-F series backstop units are all manufactured on a made-to-order basis. When ordering, please specify bore size, keyway dimensions, overrunning rotation, and torque arm orientation. Tsubaki includes a shaft key with your BS-F backstop. If tolerances are not known, Tsubaki will produce per our standards. BS-F Series backstops are pre-lubricated with grease prior to shipping.



Specifications				
Model	Torque Capacity		Inner Diameter Range (in)	Overrunning Max. RPM
	lb. ft.	(Nm)		
BS85F	4980	(6760)	4.21 - 2.52	300
BS95F	6590	(8940)	4.21 - 2.80	300
BS115F	12000	(16300)	5.00 - 2.80	300
BS140F	18000	(24400)	5.00 - 2.99	300
BS165F	32500	(44100)	5.55 - 3.58	300
BS200F	45500	(61700)	5.91 - 4.17	180
BS225F	75200	(102000)	10.12 - 4.65	150
BS250F	108000	(147000)	9.72 - 5.00	135
BS270F	141000	(192000)	10.51 - 5.51	125
BS300F	254000	(345000)	10.94 - 5.63	115
BS360F	360000	(489000)	11.50 - 5.98	100
BS425F	542000	(735000)	14.96 - 6.38	85
BS465F	722000	(980000)	16.14 - 7.24	80

ENTER THE “KEYLESS” SOCIETY

Our POWER-LOCK® solves your problems.

Eliminate backlash damage to keyways from heavy loads... the Tsubaki POWER-LOCK® fits tightly around the shaft/hub and is not affected by load reversals.

End your high machining expenses for long shaft keyways, splined shafts, threads, grooves and steps... the Tsubaki POWER-LOCK® offers exacting, slip-free location. Erase the headaches of shrink and press fits. The Tsubaki POWER-LOCK® simplifies installation and removal.

This easy-to-install unit slides into position and offers a keyless shaft-hub lock that will simultaneously handle both high torque and thrust while increasing your shaft strength.

The POWER-LOCK® is easy to assemble... you only need one tool. It is ideal for locking in large or small sprockets, gears, pulleys, timing cams and rollers. Best of all, the POWER-LOCK® is in stock for immediate shipment.

Features & Applications

High Durability Against Reversing or Impacting Loads

The POWER-LOCK® connection is not affected by torsional load reversal or impact, which damages the key and keyway connection. Tsubaki POWER-LOCKS® fit tightly around the shaft/hub and is free of backlash.

Easy and Precise Positioning

The POWER-LOCK® offers 360-degree angular adjustment and is excellent for indexing tables, cam mechanisms, gear drives and double-strand conveyor sprockets.

Thrust Capability

The Tsubaki POWER-LOCK® can hold axial forces, too. Typical applications with these forces include indexing tables and bevel gears.

Easy Assembly and Disassembly

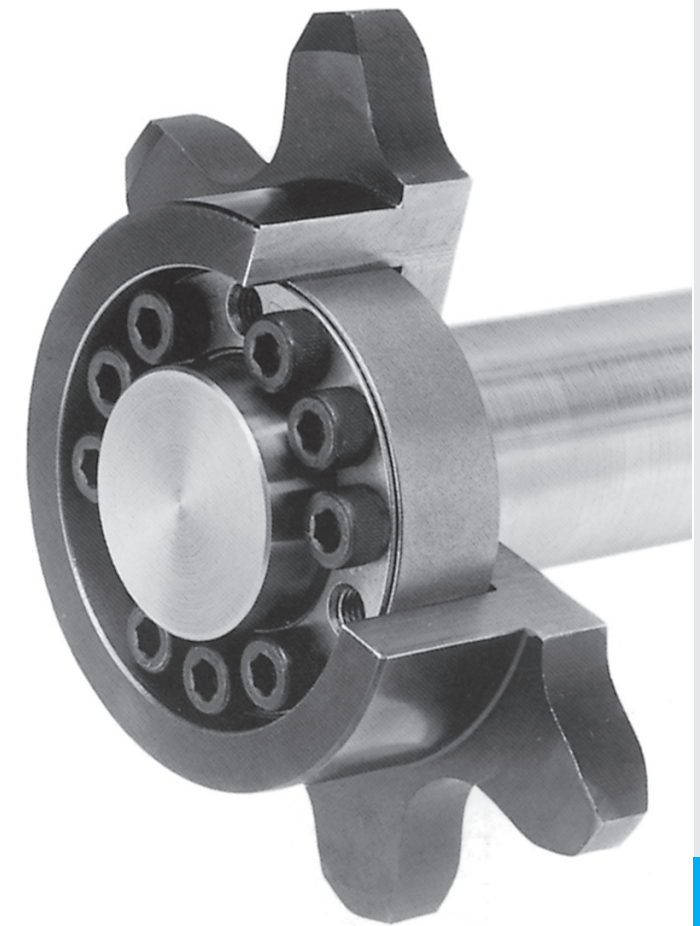
The POWER-LOCK® can be assembled and disassembled frequently, so maintenance or replacement of worn parts is simple and easy as compared to other methods (key and keyway, spline, shrink or press fits and welding).

Increased Shaft Strength

By using the POWER-LOCK®, no metal needs to be removed from the shaft (such as the cutting of a keyway). The strength of the shaft can be kept at its original diameter. This savings can be especially noted on hollow-shaft applications.

Eliminates Costly Machining

There is no need for time-consuming machining of keyways. The POWER-LOCK® offers substantial savings on long, heavy shafts.



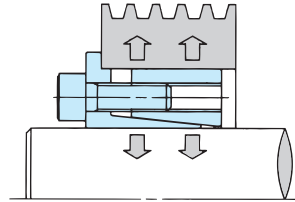
Tsubaki POWER-LOCKS® offer a Whole New Approach to Replacing Keyways

For a complete listing of all Tsubaki POWER-LOCK® locking devices, please download the Tsubaki POWER-LOCK® catalog at: www.ustsubaki.com

KE SERIES



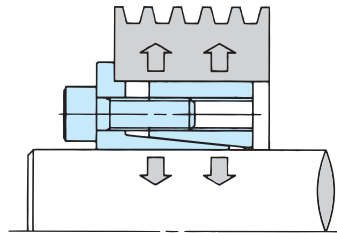
1. Designed to suit a wide range of shaft tolerances.
2. Compact with only a small difference between the inner and outer diameters.
3. Self-centering.
4. Excellent for locking small shafts.



AE SERIES



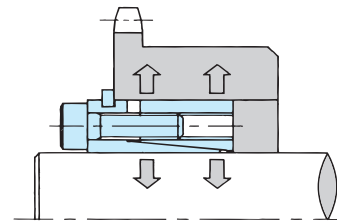
1. Self-centering.
2. Generally the same inner and outer diameters as an AS Series POWER-LOCK®.



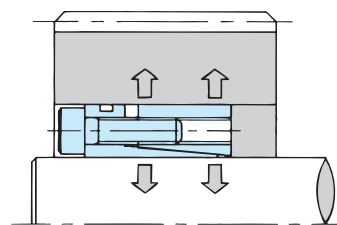
**RE SERIES
STAINLESS STEEL**



1. RE Series can be installed without snap ring.
2. Offers corrosion protection.



FLANGE TYPE



STRAIGHT TYPE

AD SERIES



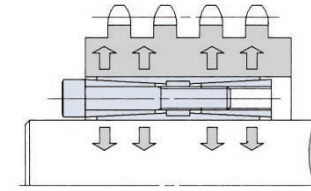
**AS SERIES
MULTIPURPOSE**



FL SERIES



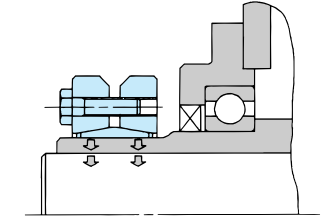
1. Offers 1.5 to 3 times the rated torque capacity of the AS Series.
2. Self-centering.
3. Designed with the same inner and outer diameters as an AS Series POWER-LOCK®.



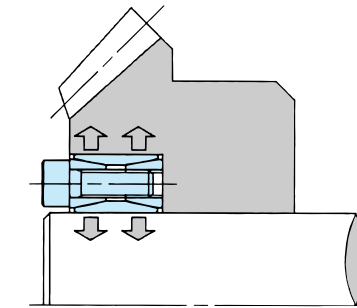
SL SERIES



1. Installs over outer hub diameters.
2. Excellent for locking hollow shafts.
3. Low profile for applications with space restrictions.



1. Easy-handling and multipurpose.
2. Compatible with large shafts.



Environment resistant models in stainless steel (AS-SS Series) and electroless nickel-plated finish (AS-KP Series) available.

EXTERNAL LOCKS

LOCKING ELEMENTS

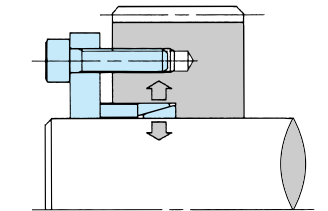
LOW PROFILE

SMALL HUB DIAMETERS

EL SERIES



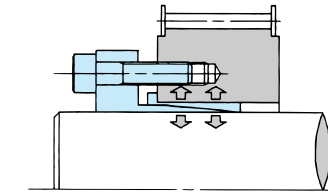
1. Offers flexible design configurations.
2. Designed for applications requiring space restrictions.
3. Excellent cost performance.



EF SERIES



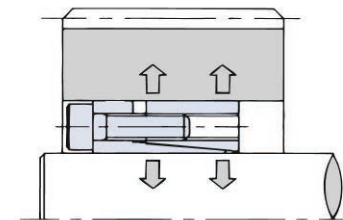
1. Pressure flange type locking elements.
2. Offers 2 to 3 times the rated torque capacity of the EL Series.
3. Self-centering.



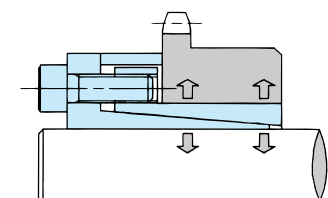
TF SERIES



1. Self-Centering Function
2. Same size inside diameter and outside diameter as AS Series POWER-LOCK® in most cases.
3. Simple Construction



1. Excellent for locking small hubs.
2. Minimum number of bolts used.
3. Self-centering.



AS INCH & METRIC SERIES

MOST POPULAR STYLE

Features & Applications

Multipurpose

Ideally structured and highly reliable locking device

Easy and Precise Positioning

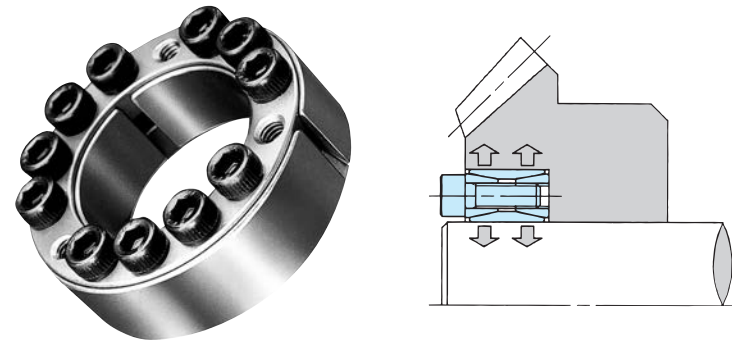
Keyway, splines, presses and thermal fittings are not required. Optimum performance is achieved with low shaft and hub tolerances minimizing the total machining costs.

Thrust Capability

Install or removes just by tightening or loosening of bolts. No need to hassle with adjusting keyways and thermal fittings.

Easy Assembly and Disassembly

Stainless Steel and electroless nickel plating options are offered for standard models. Both are highly durable in corrosive or clean room environments.



MODEL NUMBER



AE INCH & METRIC SERIES

SELF CENTERING SERIES

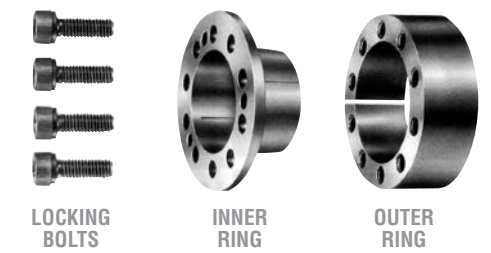
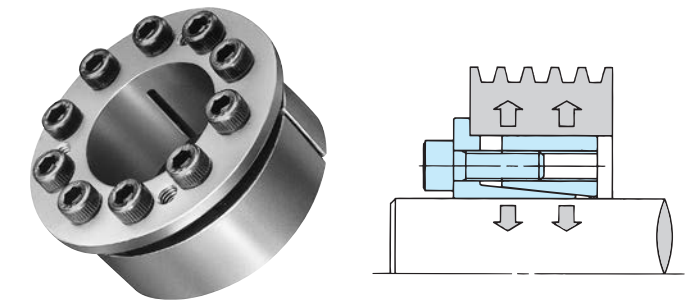
Features & Applications

Multipurpose

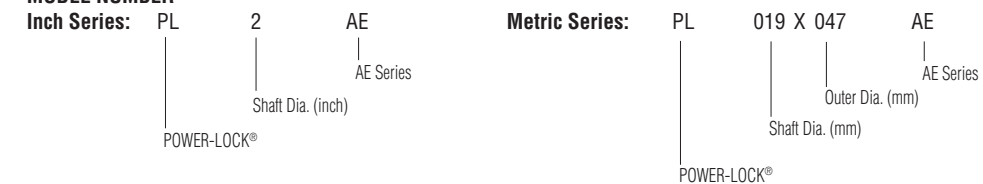
Ideally structured and highly reliable locking device

Easy and Precise Positioning

Keyway, splines, presses and thermal fittings are not required. Optimum performance is achieved with low shaft and hub tolerances minimizing the total machining costs.



MODEL NUMBER



AD INCH & METRIC SERIES

DOUBLE TORQUE SERIES

Features & Applications

Over 2 Times Larger Transmissible Torque than that of AS Series

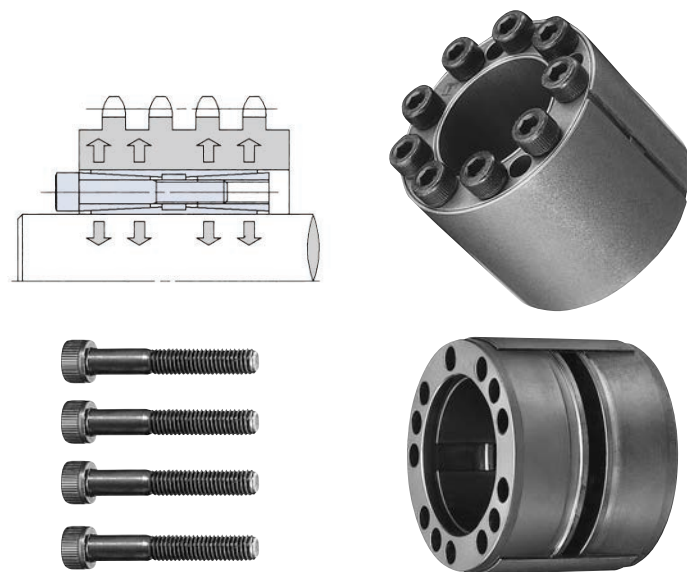
Interchangeable with POWER-LOCK® AS Series

Has the same size inside and outside diameter as AS Series POWER-LOCK® in most cases.

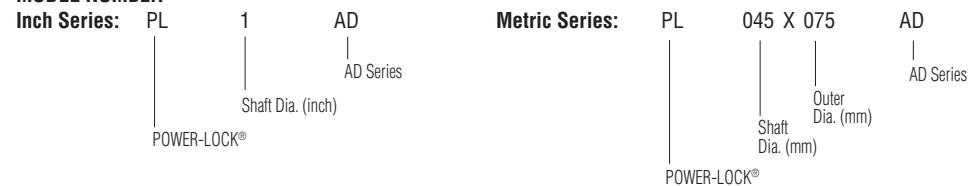
Self-Centering Function

Straight and narrow hubs can be used with AD Series POWER-LOCK®

Easy and Precise Positioning



MODEL NUMBER



Note: AD Series is referred to as AND and AD-N in other parts of the world. All three describe an identical product.

FL INCH & METRIC SERIES

FLUSH-MOUNT SELF-CENTERING STYLE

Features & Applications

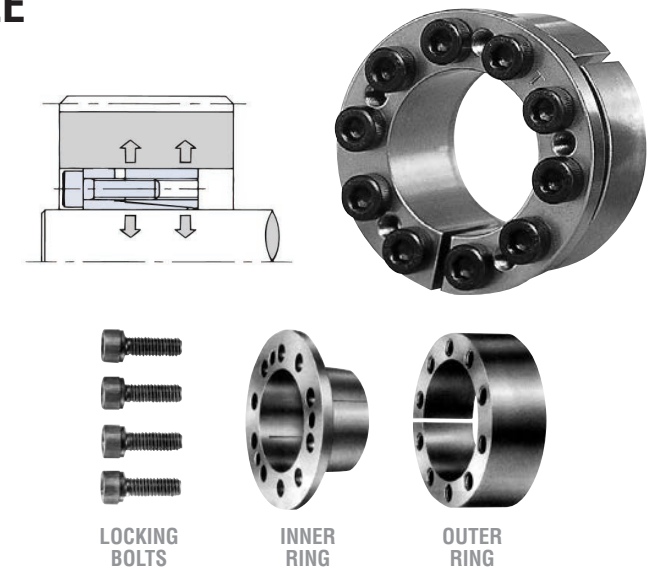
Self-Centering Function

Straight and narrow hubs can be used with FL Series POWER-LOCK®

Interchangeable POWER-LOCK® AS Series to FL Series

Easy and Precise Positioning

Simple Construction



MODEL NUMBER



RE INCH & METRIC SERIES

STAINLESS STEEL FLANGED/STRAIGHT OPTION

Features & Applications

Installation Options

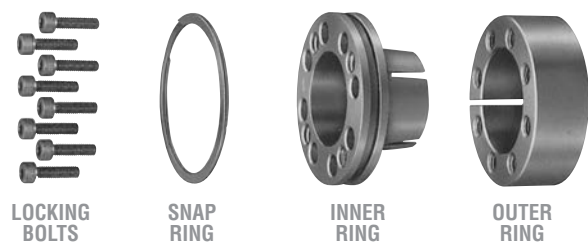
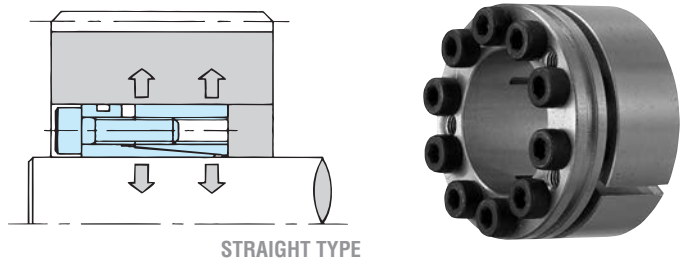
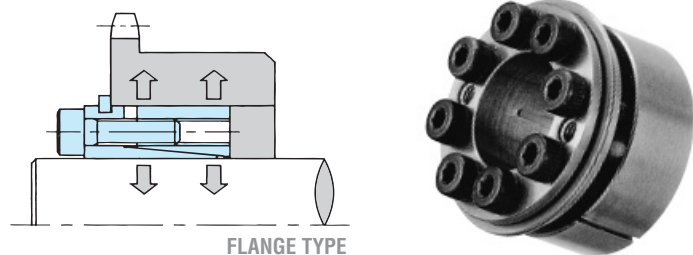
Comes with removable snap ring allowing either flange type or straight-type mounting.

Austenite Stainless Steel

The main unit is made of highly anti-corrosive austenite stainless steel, which makes the entire product excellent for clean-room operation.

No Lubrication Required

Locking bolts are lubricated so that no additional lubrication is necessary during assembly.



MODEL NUMBER
PL 010 X 026 RE-SS
POWER-LOCK®
Shaft Dia. (mm)
Outer Dia. (mm)
Stainless Steel
RE Series

KE INCH & METRIC SERIES

SELF-CENTERING KEYLESS LOCKING POWER

Features & Applications

Self-Centering

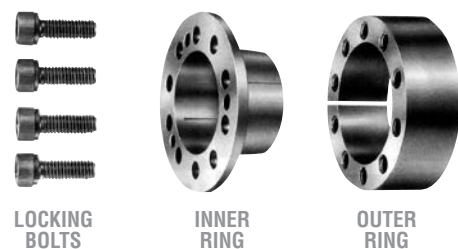
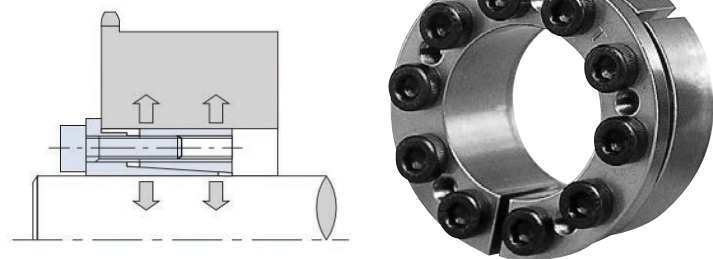
Ideal for A-type sprockets and narrow gears. The POWER-LOCK® KE Series actually strengthens the shaft. Pre-centering is not required.

Strong, Long-Lasting Performance

The POWER-LOCK® KE Series has been tested in hundreds of applications. It offers high durability against reversing or impacting loads.

Range of Sizes Available

Available in a variety of sizes, including fractional inch sizes for smaller motors or sensors. No costly machining.



MODEL NUMBER
Inch Series: PL 1 KE
POWER-LOCK®
Shaft Dia. (inch)
KE Series

Metric Series: PL 005 X 016 KE
POWER-LOCK®
Shaft Dia. (mm)
Outer Dia. (mm)
Series
KE: Standard
KE-SS: Stainless Steel
KE-KP: Electroless Nickel-Plated

TF METRIC SERIES

SELF-CONTAINED THIN PROFILE

Features & Applications

Designed to Fit Small Hub Diameters

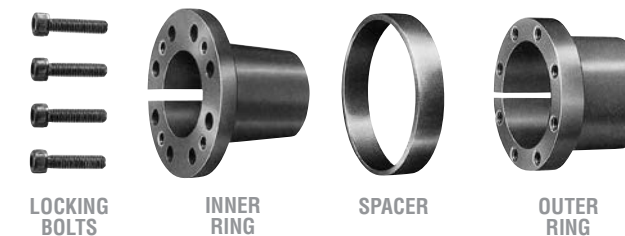
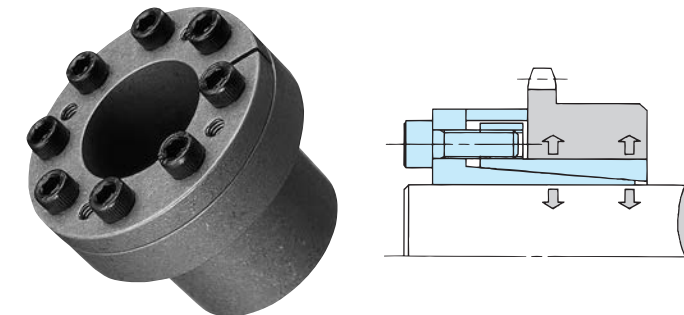
The small difference between inner and outer diameters reduces contact pressure and makes mounting to small hubs possible.

Self-Centering

These units provide accurate shaft-hub alignment and concentricity, allowing straight bore mounting.

Simple Construction

Constructed with only an inner and an outer ring and locking bolts. Simply tighten these bolts to achieve a completely secure connection.



MODEL NUMBER
PL 010 X 018 TF
POWER-LOCK®
Shaft Dia. (mm)
Outer Dia. (mm)
TF Series: Standard
TF-KP: Electroless Nickel-Plated

SL SERIES

SHRINK DISK STYLE

Features & Applications

External Lock

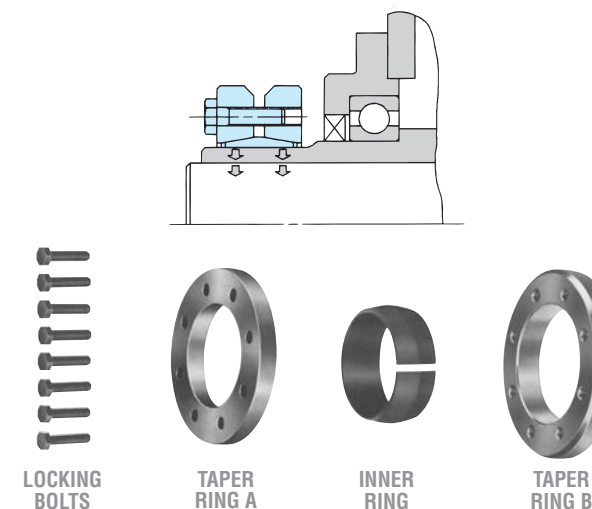
Excellent for hollow shaft or space restricted installation.

Easy to Install and Remove

Installs or removes just by the tightening or loosening of bolts. No need to hassle with adjusting keyways and thermal fittings.

Simple Construction

Simply constructed with only an inner ring and taper rings A and B. Simply tighten the locking bolts to achieve a completely secure connection.



MODEL NUMBER
PL 024 X 050 SL
POWER-LOCK®
Shaft Dia. (mm)
Outer Dia. (mm)
SL Series

EL SERIES

LOCKING ELEMENT STYLE

Features & Applications

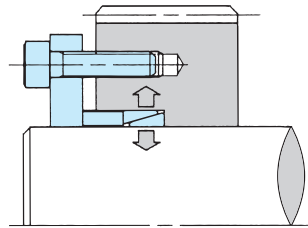
External Lock

Excellent for hollow shaft or space restricted installation.

Easy to Install and Remove

Installs or removes just by the tightening or loosening of bolts. No need to hassle with adjusting keyways and thermal fittings.

MODEL NUMBER
 PL 010 X 013 E
 Shaft Dia. (mm) Outer Dia. (mm) EL Series
 POWER-LOCK®



OUTER RING
INNER RING

EF METRIC SERIES

THIN PROFILE SERIES

Features & Applications

Same Inner and Outer Diameters as the EL Series

Designed with the same inner and outer diameters as an EL Series POWER-LOCK®

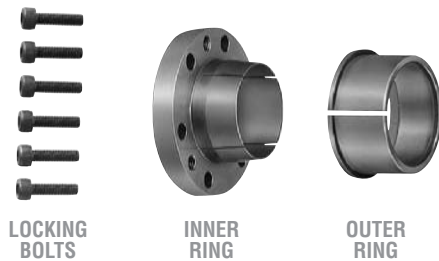
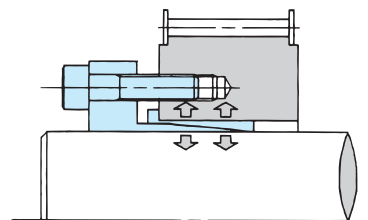
Self-Centering

These units provide accurate shaft-hub alignment and concentricity, allowing straight bore mounting.

Simple Construction

Constructed with only an inner and an outer ring and locking bolts. Simply tighten the bolts to achieve a completely secure connection.

MODEL NUMBER
 PL 018 X 022 EF
 Shaft Dia. (mm) Outer Dia. (mm) EF Series
 POWER-LOCK®



LOCKING BOLTS
INNER RING
OUTER RING

SHOCK RELAYS

THE ELECTRONIC SHEAR PIN

Pioneered by Tsubaki, the Shock Relay protects your equipment against unexpected shock loads, overloads, and underloads before damage occurs. The Shock Relay protects the mechanical parts of your equipment by monitoring the current draw on your electric drive motor, and shutting it down when the motor works too hard for too long.

Advantages:

- Back to work with the press of a button
- No moving parts, CPU design ensures repeatability
- Precise set-points retain accuracy day-after-day
- Permits problem notification by alarm or warning lights
- Protect equipment that is up to 1000 feet away



The Shock Relay adapts to virtually any kind of equipment that's driven by an electric motor and is used in applications in a broad variety of industries. Some of the common industries and applications are listed below:

Industry	Application
Material handling	Conveyors, turntables, elevators
Water treatment plants	Pumps, scrapers, water screens
Food machinery	Screw and belt conveyors, bucket elevators
Machine tool	Tapping machines, drill presses
Chemical	Pumps, agitators, filters

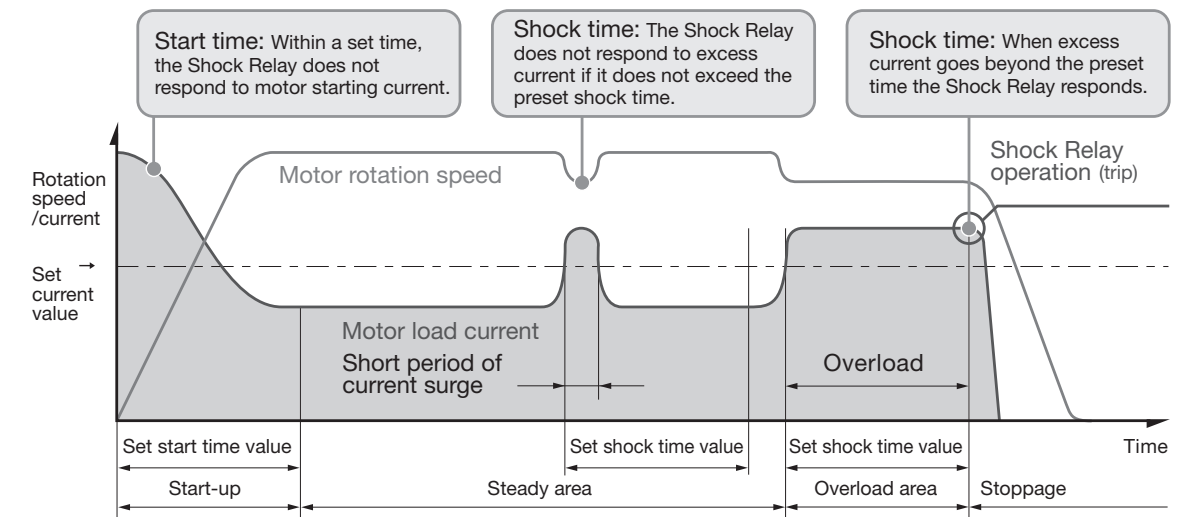
Reacts only when there is a problem

- At installation, two set-points are made to the Shock Relay:
- How hard is the equipment allowed to work as measured by motor amperage
 - Once the motor starts to work too hard, how soon in seconds must we stop production

Balancing these two settings allows for protection when the unexpected happens, limiting damage and downtime.

THEORY OF OPERATION

HOW DOES IT WORK?



SHOCK RELAYS

PRODUCT OVERVIEW

TSBSB SERIES

Dimensional Envelope
2.6"H X 2.2"W X 3"D

Provides overload protection. Select manual or automatic reset output. Monitor AC motors up to 600 volts and 300 Amps. Shock Relay power supply can be AC or 24VDC. 35 mm DIN rail or panel mount. Economically priced, OEM style. UL Listed.



TSBED SERIES

Dimensional Envelope
2.8"H X 2.2"W X 3.1"D

Designed to work with inverters. Product features include: digital display, built-in tamper-proof cover, and built-in test button. Choose between self-holding output relay and automatic reset. UL listed.



TSBSC SERIES

Dimensional Envelope
2.9"H X 2.8"W X 3.3"D

Product features include: overload or underload, pre-alarm notification, thermal energy protection, communication function (4 to 20 mA) to allow central monitoring, and works with 20Hz to 200Hz inverters. Panel mount option available.



TSBSB SERIES

Features:

- User adjustable for manual or automatic reset
- Contacts open when an overload is detected and remain until the reset button is pushed
- Fail-safe relay de-energizes when over current detected
- Economically priced
- Wide current setting range
- High degree of repeatability with low hysteresis
- Includes TEST and RESET buttons
- All-in-one unit with built-in current transformer
- 35 mm DIN rail mount or panel mount
- Can be used with single-phased motors
- UL listed
- Permits trip notification by alarm or warning lights



Model	Amperage Range
TSBSB5	0.5 - 6 A
TSBSB10	1 - 12 A
TSBSB30	3 - 30 A
TSBSB60	5 - 60 A
TSBSB100	10 - 100 A
TSBSB200	20 - 200 A
TSBSB300	30 - 300 A

TSBED SERIES

Features:

- Works with inverter 20 to 200 Hz
- User adjustable for manual or automatic reset
- Digital display
- Adjustable Start Time, Shock Time, and Current setting
- Built-in tamper-resistant cover over controls
- Built-in Test Function
- Includes motor locked rotor protection
- DIN rail or panel mount
- UL listed
- Permits trip notification by alarm or warning lights



Model	Amperage Range
TSBED020	0.2 - 2.4 A
TSBED075	1.2 - 5.8 A
TSBED220	3 - 14 A
TSBED550	6 - 34 A

For a complete listing of all Tsubaki Shock Relay devices, please download the Tsubaki Shock Relay catalog at: www.ustsubaki.com

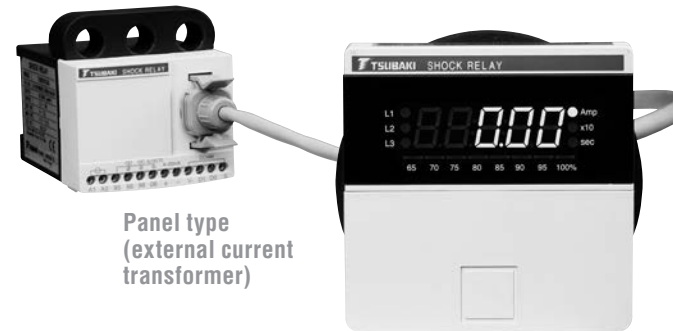
For a complete listing of all Tsubaki Shock Relay devices, please download the Tsubaki Shock Relay catalog at: www.ustsubaki.com

Features:

- The 4 to 20 mA output allows communication to a central control, or as input to controls that operators monitor and adjust to maintain production
- Panel mounting with remote display option
- Both Under current and Over current monitoring
- Inverter compatible from 20 to 200 Hz
- Locked rotor protection
- Phase imbalance protection
- Phase loss protection
- Thermal overload protection
- Can be used with single-phased motors
- Multiple operations can be linked together and monitored from one location.



All-in-one type
(built-in current transformer)



Panel type
(external current transformer)

Model	Amperage Range
TSBSC06	0.15 - 6.40 A
TSBSC34	3 - 34 A
TSBSC60	10 - 60 A
TSBSC100	12 - 100 A
TSBSC200	24 - 200 A
TSBSC300	36 - 300 A

OVERLOAD PROTECTION DEVICES



Torque Guard TGB Series

An economical choice for general use. The TGB series can be used with about any machine. Offers automatic resetting, easy-to-read torque indicator and no backlash.



Torque Guard TGM Series

The gasket and O-ring sealed construction in the TGM series is unique. Excels in wet, dusty, and oily applications. Designed for long life, tough environments.



Torque Guard TGX Series

A high-precision option, the TGX series features no backlash and unsurpassed operation rigidity. Ideal for machines that require accurate positioning.

OVERLOAD PROTECTION DEVICES



Torque Limiter TL Series

A friction system, mechanical device that limits damage to equipment when an unexpected increase in torque occurs because of a jam or overload by slipping and absorbing the brunt of the force, preventing the increased power from damaging your equipment.



Torque Limiter Coupling

A flexible coupling that uses a Torque Limiter and special type sprocket and is connected by two rows of roller chains. It acts as an automatic safety device, protecting machinery from damage due to overload.



Torque Keeper TFK Series

A mechanical device for industrial equipment brake mechanisms has been designed with abrasion resistance, the use of a torque indicator, weight savings and other aspects that make it easy to use.



Mini-Keeper MK Series

A super-compact slipping clutch and brake, constructed from fine chemicals and engineering plastic. The MINI-KEEPER has a supreme level of lightness, compactness and accuracy and is ideal for braking, accumulating and dragging applications.

For a complete listing of all Tsubaki Overload Protection Devices, please download the Tsubaki Overload Protection Devices brochure at: www.ustsubaki.com

For a complete listing of all Tsubaki Overload Protection Devices, please download the Tsubaki Overload Protection Devices brochure at: www.ustsubaki.com

CHAIN TOOLS & TECHNICAL RESOURCES

Tsubaki has the path to the right roller chain in the Technical Resource section. In this section you will find details on how to size a roller chain, select a chain for even the most difficult applications, and sizing up the right roller chain. All the details for designing and selecting the right Double Plus® and Top Chain for your accumulating applications is right here. Need the right chain tool for breaking or measuring your chain? Get it all here.

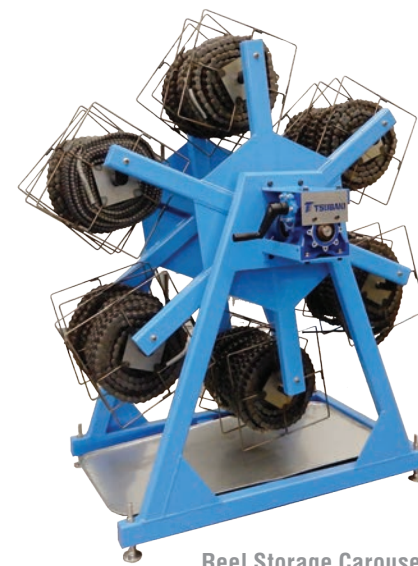
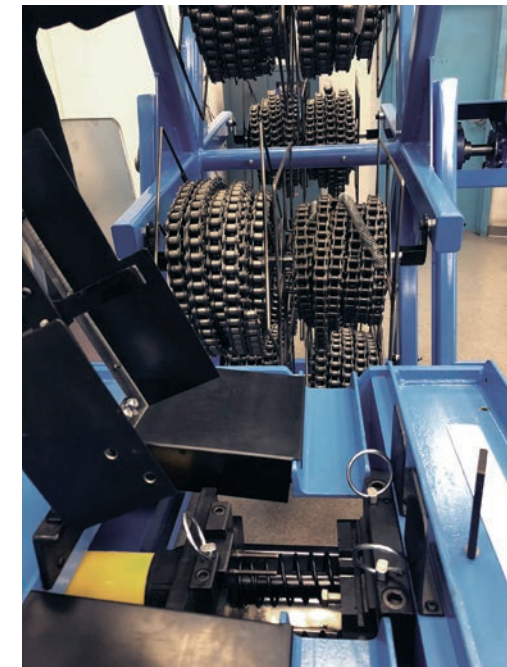


CHAIN MANAGEMENT SYSTEM™

With Storeroom and Warehouse space at a premium, and no room to stack boxes of chain, Tsubaki has the solution. The Tsubaki Chain Management System™ (CMS) is a combination cutting table and reel storage carousel.

Features and benefits of the CMS include:

- Reel storage capacity for up to 12 reels of chain
- Cutting table can cut sizes 40-120 and Multi-Wide chains to size 80.
- British standard chains can also be cut from 06B-20B.
- Cutting table comes with electric or hydraulic pump options.



Reel Storage Carousel



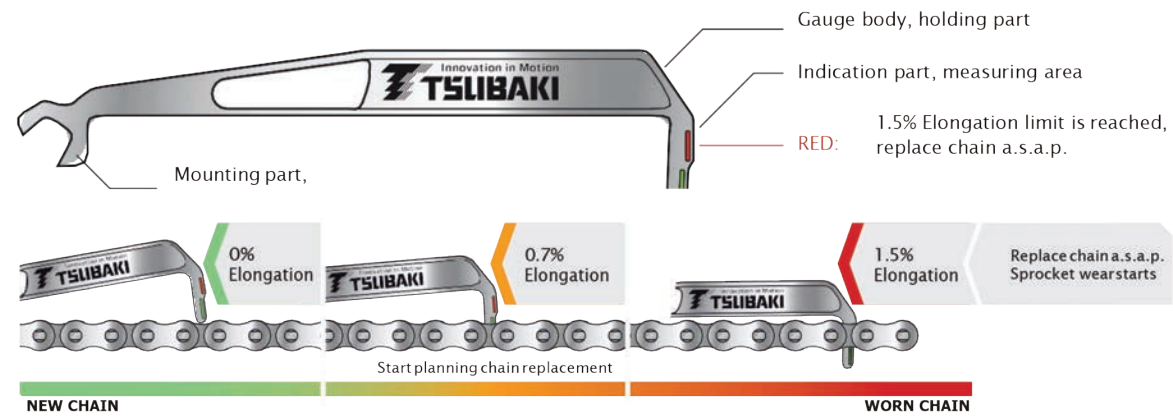
Hydraulic Cutting Table

CHAIN WEAR INDICATOR KIT

Chain Wear Indicator Kit

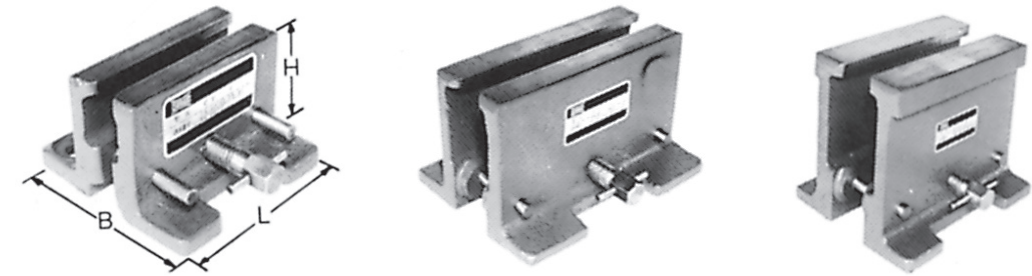
- ANSI Chain Wear Kit - Measuring tools sizes 35-80
Part #ANSICHAINWERINDIC
- British Standard Chain Wear Kit - Measuring tools sizes 06B-16B
Part #BSCHAINWEARINDICA

Additional sizes available please consult factory.



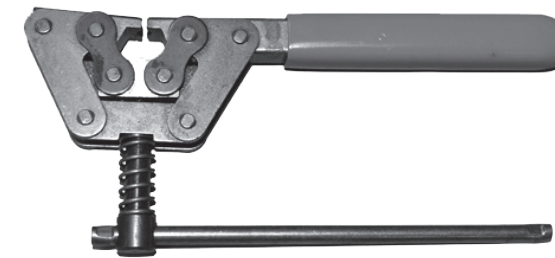
Punches

Chain No.	Primary Punch	Secondary Punch	Chain No.	Riveting Punch
40-60	S-1	D-1	40	RV-1
80-120	S-2	D-2	50	RV-2
140-240	S-3	D-3	60	RV-3
			80	RV-4



Chain Vices

No. of Strands	40	50	60	80	100	120	140	160	180	200	240
1	CV1	CV1	CV1	CV1	CV2	CV2	CV2	CV2	CV3	CV3	CV3
2	CV1	CV2	CV2	CV2	CV2	CV3	CV3	CV3	CV3	CV3	CV3
3	CV2	CV2	CV2	CV2	CV2	CV3	CV3	Made To Order			



Chain Breakers

Model No.	D-35	D-60	D-120	CS - C3
Chain No.	25-60	60-100	120-160	160-240



Chain Pullers

Model No.	P-35	P-60	P-80
Chain No.	35-60	40-80	80-240

Tsubaki Roller Chain Drive Selection Process

Horsepower Rating

The horsepower rating in Table 4 on page 253 is based on the following conditions:

- The chains are operated under ordinary conditions. The ambient temperature range must be between 15°F and 140°F. They should not be used in an atmosphere in which abrasive dust or corrosive gas is present or where high humidity is present.
- The two transmission shafts are in a horizontal position, and the chains are properly installed.
- The suggested lubrication system and oil are used.
- The load does not change significantly during transmission. The service factor given in Table 1 should be taken into account when the chains are used under various operating conditions. The load conditions will affect the life of the chain.
- The increase in horsepower rating of multiple strand roller chain cannot be calculated simply by multiplying the horsepower rating of one strand by the number of strands, since the load on each strand is not exactly the same. In order to estimate the service life of the multiple strand chain, the multiple strand service factor given in Table 2 must be used. When the chain length is 100 pitches and the above conditions are met, a service life of approximately 15,000 hours can be expected.

Procedures for Selecting Roller Chain

- The following must be considered when selecting roller chain:
 - Source of Power
 - Driven machine
 - HP to be transmitted
 - RPM of drive and driven shafts
 - Diameter of shafts
 - Center distance of shafts
- Use Table 1 to obtain the service factor.
- Multiply the horsepower value by the service factor to obtain the design horsepower value.
- Use Table 4 on page 253 and the HP ratings tables on pages 8-21 to obtain the chain number and the number of teeth for small sprockets. Refer to the number of revolutions of the high speed shaft (the driving shaft when the speed is reduced; the driven shaft when the speed is increased) and the design horsepower value. For smoother chain drive, a smaller pitch chain is suggested. If a single strand chain does not satisfy the requirements, use a multi-strand chain. If space is limited, a smaller pitch, multi-strand roller chain can be used.
- After determining the number of teeth for the small sprocket, refer to the sprocket dimension table on pageto check if the sprocket diameter satisfies the space limitations.
- The number of teeth for the large sprocket is determined by multiplying the number of teeth for the small sprocket by the speed ratio. More than 15 teeth on the small sprocket is suggested. The number of teeth for the small sprocket should be less than 120. By reducing the number of teeth for the small sprocket, the number of teeth for the large sprocket can be reduced.
- For temperatures below 15°F, see the environmental temperatures and points of concern table on page 262.

Table 1 – Service Factor

Type of Impact	Machines	Source of Power		
		Electric Motor or Turbine	Internal Combustion Engine	
			With Hydraulic Drive	Without Hydraulic Drive
Smooth	Belt conveyors with small load fluctuation, chain conveyors, centrifugal blowers, general textile machines, machines with small load fluctuation.	1.0	1.0	1.2
Some Impact	Centrifugal compressors, marine engines, conveyors with some load fluctuation, automatic furnaces, dryers, pulverizers, general machine tools, compressors, general work machines, general paper mills.	1.3	1.2	1.4
Large Impact	Press, construction or mining machines, vibration machines, oil well rigs, rubber mixers, rolls, general machines with reverse or large impact loads.	1.5	1.4	1.7

Basic Formula for Chain Drives

- Chain Speed: S

$$S = \frac{P \times N \times n}{12} = (\text{ft/min})$$

P = Chain Pitch
N = Sprocket tooth count
n = RPM

- Chain tension: T

$$T = \frac{33,000 \times \text{HP}}{S} = (\text{lbs})$$

S = Chain Speed (ft/min)
HP = Horsepower transmitted

- Number of chain pitches: L

$$*L = \frac{N_1 + N_2}{2} + 2C + \frac{\left(\frac{N_2 - N_1}{6.28}\right)^2}{C}$$

N₁ = Small sprocket teeth
N₂ = Large sprocket teeth
C = Center distance in pitches
*Any fraction of L is counted as one pitch

- Center distance in Pitches: C

$$C = \frac{1}{8} \left\{ 2L - N_1 - N_2 + \sqrt{(2L - N_1 - N_2)^2 - \frac{8}{9.86}(N_2 - N_1)^2} \right\}$$

Table 2 – Multi-Strand Factor

Number of Chain Strands	Multi-Strand Factor
2	1.7
3	2.5
4	3.3
5	3.9
6	4.6

Example

STEP – 1 Data Required:

- Type of Application: Centrifugal Blower
- Shock Load: Small load fluctuation
- Source of Power: Motor
- HP to be transmitted: 40HP
- Drive shaft: Diameter – 2", 750 RPM
Driven Shaft: Diameter – 3", 250 RPM
- Center distance: Less than 9 inches
- Space limitation: Less than 20 inches

STEP 2 – Use Table 1 to determine the service factor

Service Factor SF = 1.0

STEP 3 – Obtain Design HP

Design HP = (HP to be transmitted) x SF
= 40hp x 1
= 40hp

STEP 4 – Obtain the chain number and the number of teeth on the small sprocket from the roller chain selection table page 240 referring to the above 40 hp and 750 rpm.

Then check it by referring to the Horsepower Rating Tables (Pages 8-21)

- According to the horsepower rating, the best choice would be a single strand 80 – 17 teeth. Since the speed ratio is 1/3 (250/750 rpm), the necessary number of sprocket teeth would be 17 for the small sprocket and 51 for the large sprocket. But, as outside diameters are 5.94 inches for 17T and 16.81 inches for 51T. This exceeds the limitation of 20 inches (5.67 + 16.81 > 20 inches).
- As a single strand chain is not suitable, a multi-strand chain of 60-2 with sprockets of 22 and 66 teeth also would not fit this working envelope.
- A triple strand, 60-3 with 15 and 45 teeth would fit the working envelope. The sprocket diameters are 3.90 and 11.18 inches respectively and the sum is less than 20 inches. The HP rating of the 15T is 15.1 at 700 rpm and 17 hp at 800 rpm. A single strand chain rates at 16 hp and thus must be multiplied by a strand factor of 2.5 for a triple strand. Therefore, the horsepower rating of 60-3 15-teeth at 750 rpm is 40 hp.

STEP 5 – Refer to the sprocket section to check the diameter of the bore.

A 45-tooth sprocket meets the necessary requirement, but since the maximum bore diameter is 1.87 inches of a 15-tooth sprocket is smaller than the drive shaft, diameter of 2 inches, it cannot be used.

A 16-tooth sprocket with a maximum bore of 2 inches must be used. Check again that the O.D. of 4.21 inches for 16 teeth and 11.89 inches for 48 teeth is less than the space limitation. A combination of 60-3, 16 and 48 teeth must be used to fulfill the necessary application requirements.

Selection for slow speed

When the chain speed (S) is less than 160 ft/min, select the roller chain that is one size smaller than the chain chose from the horsepower rating method mentioned above.

- Tentatively select the chain and sprocket from Table 4 and proceed by using the on-size-smaller chain and its sprocket with the number of teeth close to the sprocket selected above. Be sure to confirm the sprocket meets the application requirements such as bore diameter and space limitations.

- Calculate the chain speed from the number of teeth on the drive sprocket using the equation (A). Also, check that the speed is less than 160 ft/min.
- Calculate the tension for the above from equation (B).
- Select the service factor and the chain speed coefficient from Table 1 and Table 3.
- Verify that the chain has maximum allowable load which satisfies equation (C).

$$S = \frac{P \times N \times n}{12} \text{ ft/min... (A)}$$

$$T = \frac{33,000 \times \text{HP}}{S} (\text{lbs}) \dots\dots (B)$$

T • Service factor • chain speed coefficient ≤ Maximum allowable load(C)

S: Chain speed (ft/min)
P: chain pitch
N: No. of sprocket teeth
n: RPM
T: chain tension (lbs.)
HP: Transmitted horsepower

There are two different ways to do the next step: to increase the number of teeth, or to use the same procedure for Super Chains of the same size.

NOTE: Please use press-fit connecting links for slow speed chain selection.

Table 3

Chain Speed	Speed Coefficient
Less than 50ft/min	1.0
50 to 100 ft/min	1.2
100 to 160 ft./min	1.4

Selection for High Temperatures

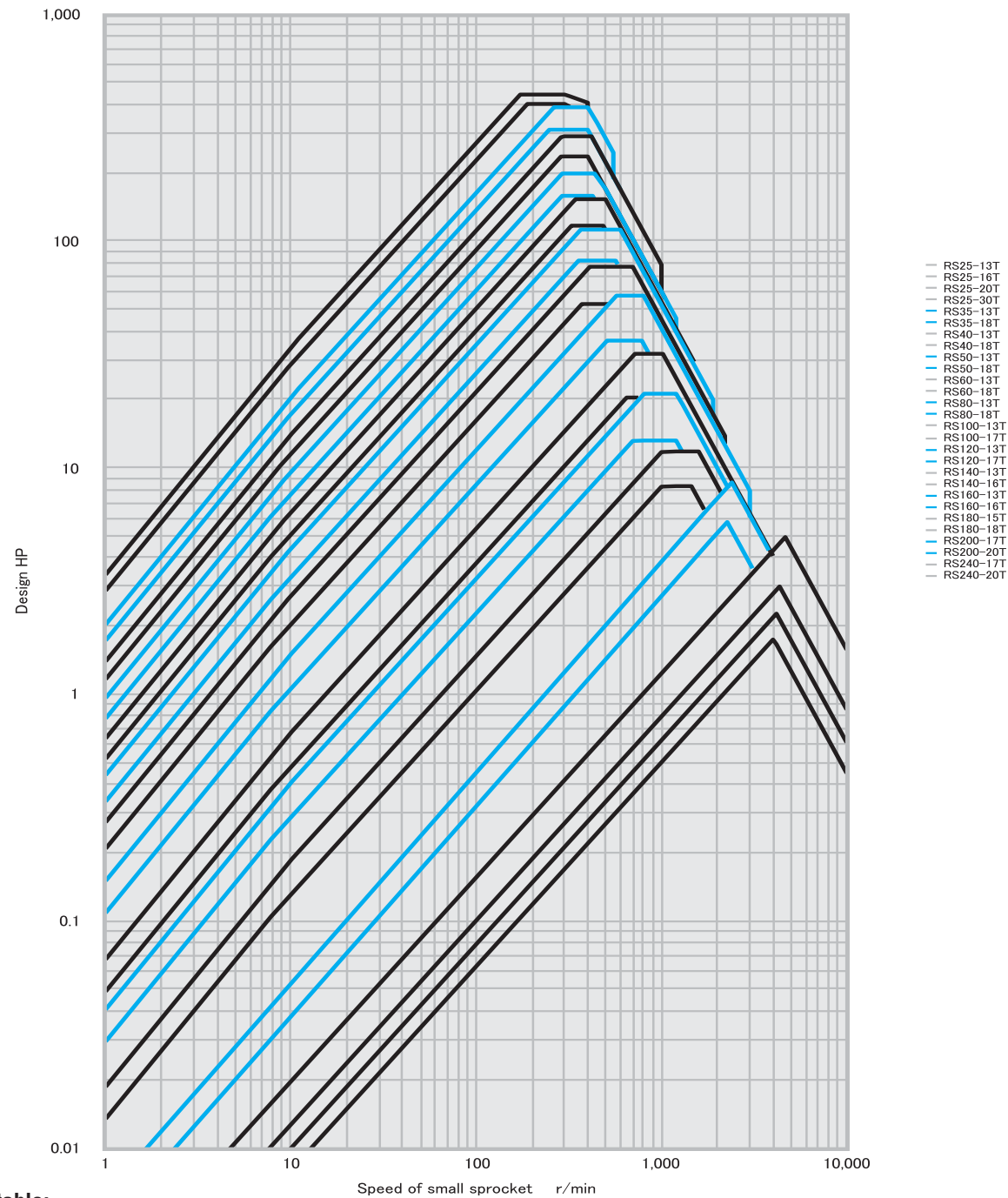
Tsubaki drive chains are made of heat treated carbon steel. When exposed to high temperatures, the mechanical properties of the heat treated chain components are lost.

- The hardness, and therefore the wear resistance of the pins and bushings is reduced.
- At temperatures of 390°F, the rollers and plates lose their hardness and strength.

Standard roller chains can be used in temperatures up to 500°F with the following adjustments.

Temperature	% of Catalog Capacity Rating
Up to 340° F	100%
390° F	75%
500° F	50%

Table 4: ANSI Roller Chain Selection Table



How to use this table:

- 1 – Example – Design horsepower 7hp
 - a) Assume that the RPM of the small sprocket is 100. Judging from the intersection point of the design horsepower's value of 7 hp and the RPM value of 100, size 80 roller chain and a subsequent sprocket with 17 or 18 teeth can be selected. Sprockets with 17 teeth are more economical than those with 18 teeth.
 - b) Assume that the RPM of the small sprocket is 300. A size 60, 15-tooth sprocket is appropriate from the intersection point in the same manner as above. The line for a size 50 chain, 24-tooth sprocket can also be seen as near the intersection of 7 hp and 300 RPM. Therefore, either a size 60 chain, 15-tooth or a size 50 chain, 24-tooth sprocket can be selected. This table is used to make a tentative selection. The Horsepower Rating Tables should be used to determine the most appropriate chain and sprocket.
- 2 – Horsepower lines of 20, 24, and 30-tooth sprockets are shown only in the high speed range on the right hand side of the above chart. When checking with the horsepower line of these sprockets, make a line parallel to the other lines on the left hand side of the dotted line for a size 50, 24-tooth sprocket.
- 3 – When the chain speed is less than 160 ft./min, it is more economical to select the right roller chain by the selection method for slow speed drives (page 252).

CHAIN DRIVE SELECTION

Heavy Series Chains

Generally Super Series chains are suggested when the chain speed is less than 160 ft./min and where the roller chain or the ASME/ANSI Heavy Series chains are not strong enough to meet application requirements.

- 1) Tentatively select the chain and sprocket with the same size and number of teeth as used in the "Selection for Slow Speed."
- 2) Calculate the chain speed from the number of teeth of the driving sprocket using equation (A) and check whether the speed is less than 160 ft./min.
- 3) Calculate the chain tension necessary for the above drive from equation (B).
- 4) Select the same service factor and the chain speed coefficient from Tables 1 and 2.
- 5) Select the suitable chain and verify that the chain satisfies equation (C).

$$S = \frac{P \times N \times n}{12} \text{ (Ft/min)}$$

$$T = \frac{33,000 \times HP}{S} = \text{(LBS)}$$

T x Service Factor x Chain Speed Coefficient ≤ or = to MAL(C)

- S:** Chain speed (ft/min)
- P:** Chain pitch (inches)
- N:** Drive sprocket teeth No.
- n:** RPM of drive sprocket
- T:** Chain tensions (lbs)

Table 1: Service Factor

Type of Impact	Service Factor
Smooth	1.0
Some Impact	1.3
Large Impact	1.5

Table 2: Service Factor

Chain Speed	Speed Coefficient
Less than 50 ft/min	1.0
50-100 ft/min	1.2
100-160 ft/min	1.4

BRITISH STANDARD CHAIN DRIVE SELECTION

1. The following must be considered when selecting roller chain:
 - a. Source of Power
 - b. Driven machine
 - c. HP to be transmitted
 - d. RPM of drive and driven shafts
 - e. Diameter of shafts
 - f. Center distance of shafts
2. Use Table 1 to obtain the service factor.
3. Multiply the horsepower value by the service factor to obtain the design horsepower value.
4. Use Table 4 on page 255 to obtain the chain number and the number of teeth for small sprockets. Refer to the number of revolutions of the high speed shaft (the driving shaft when the speed is reduced; the driven shaft when the speed is increased) and the design horsepower value. For smoother chain drive, a smaller pitch chain is suggested. If a single strand chain does not satisfy the requirements, use a multi-strand chain. If space is limited, a smaller pitch, multi-strand roller chain can be used.
5. After determining the number of teeth for the small sprocket, refer to the sprocket section to check if the sprocket diameter satisfies the space limitations.
6. The number of teeth for the large sprocket is determined by multiplying the number of teeth for the small sprocket by the speed ratio. More than 15 teeth on the small sprocket is suggested. The number of teeth for the small sprocket should be less than 120. By reducing the number of teeth for the small sprocket, the number of teeth for the large sprocket can be reduced.
7. For temperatures below 15°F, see the environmental temperatures and points of concern table on page 262.

Table 1: Service Factor

Type of Impact	Machines	Source of Power		
		Electric Motor or Turbine	With Hydraulic Drive	Without Hydraulic Drive
Smooth	Belt conveyors with small load fluctuation, chain conveyors, centrifugal blowers, general textile machines, machines with small load fluctuation.	1.0	1.0	1.2
Some Impact	Centrifugal compressors, marine engines, conveyors with some load fluctuation, automatic furnaces, dryers, pulverizers, general machine tools, compressors, general work machines, general paper mills.	1.3	1.2	1.4
Large Impact	Press, construction or mining machines, vibration machines, oil well rigs, rubber mixers, rolls, general machines with reverse or large impact loads.	1.5	1.4	1.7

Table 2 – Multi-Strand Factor

Number of Chain Strands	Multi-Strand Factor
Double Strand	1.7
Triple Strand	2.5

Number of Pitches of Chain

$$L = \frac{N_1 + N_2}{2} + 2C + \frac{\left(\frac{N_2 - N_1}{6.28}\right)^2}{C}$$

Any fraction of L is counted as one pitch.

Center Distance in Pitches

$$C = \frac{1}{8} \left\{ 2L - N_1 - N_2 + \sqrt{(2L - N_1 - N_2)^2 - \frac{8}{9.86}(N_2 - N_1)^2} \right\}$$

- L: Number of pitches
- N₁: Number of teeth (small Sprocket)
- N₂: Number of teeth (large sprocket)
- C: Center distance in pitches

Chain Speed

$$S = \frac{P \times N \times n}{12} = (\text{ft./min.})$$

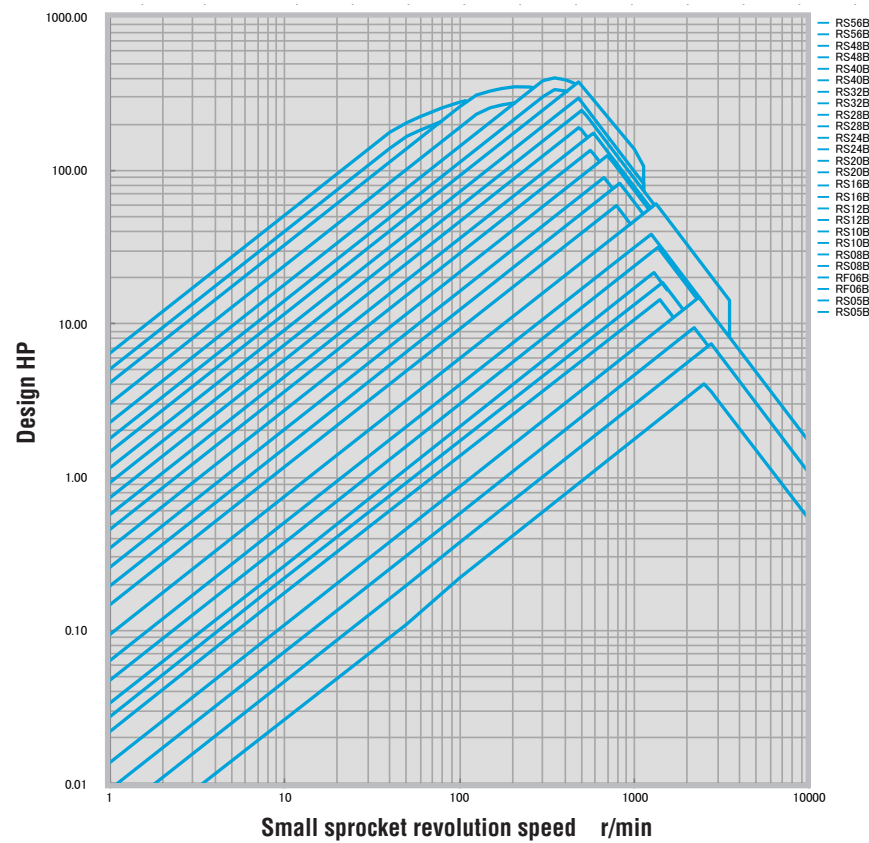
- S: Chain Speed (ft./min.)
- P: Chain Pitch (Inch)
- N: Number of sprocket teeth
- n: RPM of sprocket

Chain Tension from HP

$$T = \frac{30,000 \times \text{HP}}{S} = (\text{lbs.})$$

T: Chain Tension (lbs.)

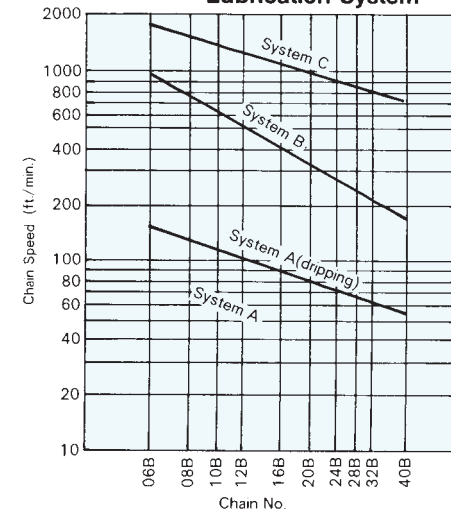
Table 3: British Standard Roller Chain Selection Table



The selection table is based on the following conditions:

- The chains are operated under ordinary conditions. The ambient temperature range is between 15°F and 140°F. They are not to be in an environment where abrasive dust or corrosive gas is present or when the humidity is high.
- The two transmission shafts are in a horizontal position and the chains are properly installed.
- The load does not change significantly during transmission. The "Service Factors" given in Table 1 are used under various operating conditions. The load conditions will affect the chain life. The increase in horsepower rating of the multi-strand chains cannot be calculated by multiplying the horsepower rating of one strand by the total number of strands since the load on each strand is not the same. In order to estimate the service life of a multi-strand chain, the "Multiple-Strand Factor" given in Table 2 must be used.
- Refer to chain lubrication styles and details in Technical Data sections.

Table IV: Chain Speed and Lubrication System



Example:

- Data:
- Type of application: Centrifugal Blowers
 - Source of Power: Electric Motor
 - HP to be transmitted: 40 hp
 - Drive shaft: 600 rpm
 - Driven shaft: 200 rpm
 - Center distance: 19 inches
 - Space Limit: Maximum 24 inches

STEP 1 – Service Factor per Table 1 – 1.0

STEP 2 – Calculate HP
 Design HP = HP transmitted SF
 = 40 HP 1.0
 = 40 HP

STEP 3 – Obtain chain size and the small sprocket teeth count from the selection table for 40 hp and 600 rpm.

According to the selection table, the selected chain and sprocket RPM's are:

- (a) RS12B-3 chain and 25 tooth sprocket
- (b) RS16B-2 chain and 17-tooth sprocket
- (c) RS16B chain and 25-tooth sprocket

* For (a), the necessary number of teeth for both small and large sprockets are 25 teeth and 75 teeth respectively, since the speed ratio is 1/3 (200/600 rpm). But the outside diameter of the sprockets

* For (c), the necessary number of teeth for small and large sprockets is 25 (O.D. 8.4 inches) and 75 teeth (O.D. 24.4 inches) respectively. It exceeds the space limitation again (8.4 inches + 24.4 inches > 24 inches).

* For (b), the necessary number of teeth for the small and large sprockets is 17 (O.D. 5.9 inches) and 51 (O.D. 16.8 inches). It satisfies the space limitation (5.9 inches + 16.8 inches < 24 inches). A combination of RS16B-2, and 17 teeth and 51 teeth must be used to fulfill all the necessary requirements.

STEP 4 – Use Table IV to determine the lubrication method

$$\text{Chain Speed (S): } \frac{P \times N \times n}{12}$$

$$= \frac{1 \times 600 \times 17}{12} = 850 \text{ ft/min}$$

System B is suggested

STEP 5 – Obtain the number of pitches of chain (L).

$$= \frac{N_1 + N_2}{2} + 2C + \frac{\left(\frac{N_2 - N_1}{6.28}\right)^2}{C}$$

$$= \frac{17 + 51}{2} + 2 \cdot \frac{19}{1} + \frac{\left(\frac{51 - 17}{6.28}\right)^2}{1}$$

$$= 73.35 = 74 \text{ Links of chain}$$

Installation and Arrangement

Speed Ratio and Chain Wrap

The speed ratio of the roller chain can range up to 7:1 under normal operating conditions. However, a speed ratio of 10:1 is possible if the speed is very low. Chain wrap on a small sprocket must be at least 120 degrees.

Distance Between Shafts

Sprockets can be separated by any distance as long as their teeth do not touch. Optimum distance is 30 to 50 times the pitch of the chain used except when there is a pulsating load. In such cases, the distance should be up to 20 times the pitch of the chain used.

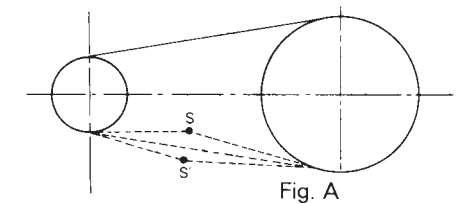
Position

Roller chains are ideally installed horizontally. When chains are installed at angles approaching the vertical, they stretch quickly and may slip off the sprockets. In such cases, the sprockets should be adjusted properly.

Slack

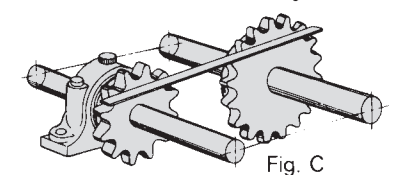
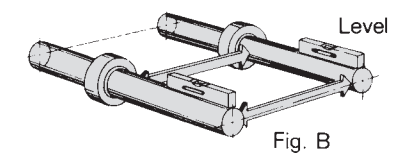
Generally, the slack of a roller chain should be on the lower side (Figure A). Adequate slack is 4% of the span for normal drives. In the following cases, the slack should be about 2% of the span:

- Vertical Drive or close to vertical drive.
- Center distance between two shafts is greater than 3ft.
- Chain is operated under heavy load and high frequency of an on and off drive.
- Direction of the drive is often changed.



Position of Sprocket

The two shafts should be parallel and preferably in a horizontal position. Sprockets should be firmly installed (Figs B & C). Use a straight edge to check that the two sprockets are installed along the same horizontal plane.



Arrangement

When designing roller chain drives, the centerline of both sprockets should be close to the horizontal (Figs D & E). The angle of the incline can be up to 60 degrees (Figs F & G). If installation is close to vertical, it is desirable to install an idler or a guide stopper to maintain smooth engagement of the chain and sprocket.

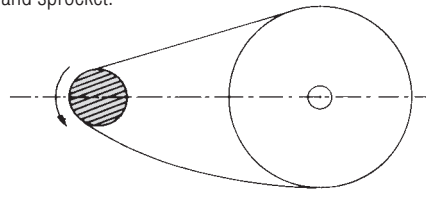


Fig. D

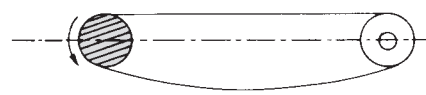


Fig. E

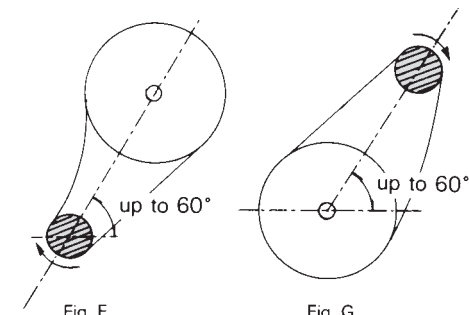


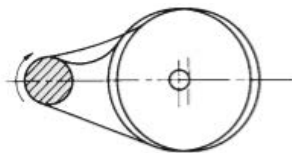
Fig. F

Fig. G

Attention should be paid to the following arrangements:

If the slack side is on the top, it is necessary to eliminate excessive chain slack.

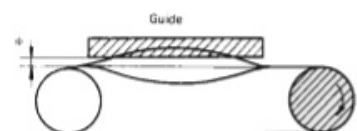
A-1 When the center distance is short, chain slack should be adjusted by increasing the center distance.



A-2 When the center distance is long, the chain slack should be adjusted by installing an idler.

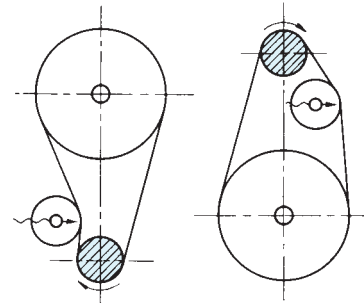


B If vibration occurs due to high chain speed, install a guide.



* Clearance between chain and guide should be 5/64" to 5/32"

C If the centerline is vertical, install an idler which functions automatically to eliminate extra chain slack. If the driving shaft is on the lower side, an idler must be installed.



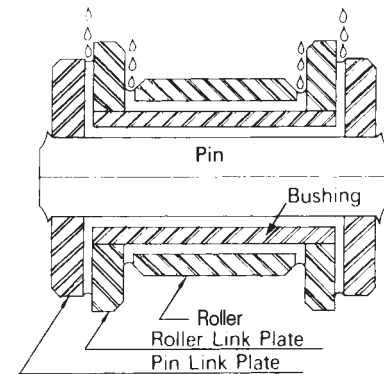
Lubrication

Lubrication increases the Service Life

One of the most important factors in getting the best possible performance out of your roller chain is proper lubrication. No matter how well a transmission system is designed, if it is not properly lubricated, it will not meet its full service life potential.

Lubrication

Wear between the pin and bushing causes the roller chain to elongate. These parts should, therefore, be well lubricated. The gap between the pin link plate and the roller link plate on the slack side of the chain should be filled with oil as much as possible. This oil forms a film which minimizes wear on the pin and bushing thus increases the chains service life. It also reduces noise and acts as a coolant when the chain runs at high speeds.



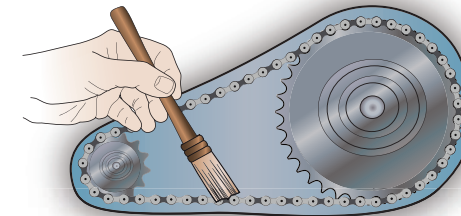
Suggested Lubricants

Only high quality oil should be used to lube roller chain. Neither heavy oil nor grease is suitable. The viscosity of the oil used will depend on the chain size, speed and temperature. See table below for more information.

Lubricating System	A, B Ambient Temperature Range				C Ambient Temperature Range			
	14°-32°F	32°-104°F	104°-122°F	122°-140°F	14°-32°F	32°-104°F	104°-122°F	122°-140°F
Chain No.	14°-32°F	32°-104°F	104°-122°F	122°-140°F	14°-32°F	32°-104°F	104°-122°F	122°-140°F
50 or less	SAE 10	SAE 20	SAE 30	SAE 40				
60 and 80		SAE 20	SAE 30	SAE 40	SAE10	SAE20	SAE30	SAE40
100				SAE 50				
120 or more	SAE 30	SAE 40	SAE 50		SAE 20	SAE 30	SAE 40	SAE 50

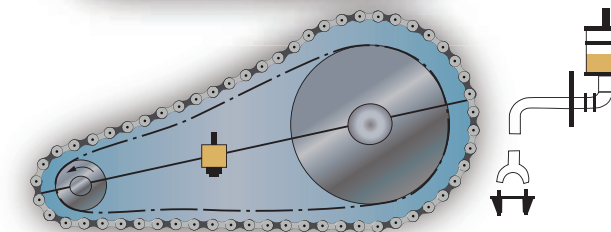
The following lubrication systems are suggested:

SYSTEM A



Manual Lubrication

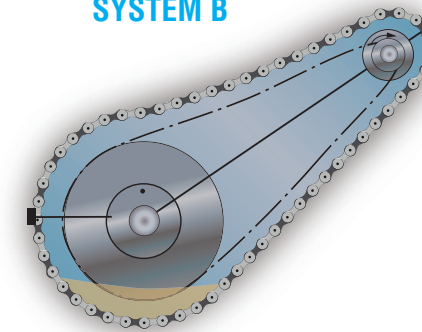
Oil is applied with an oil filler or brush in the gap between the pin link and roller link on the slack side of the chain. It should be applied about every eight hours or so as often as necessary to prevent the bearing area of the chain from becoming dry. Always turn off and lockout the power switch before lubricating or servicing a chain system.



Drip Lubrication

A simple casing can be used. The oil is supplied by a drip feed. Each strand of chain should ordinarily receive 50 to 20 drops of oil per minute depending on chain speed.

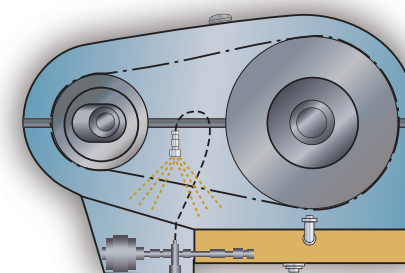
SYSTEM B



Oil Bath Lubrication

The chain is installed in a leak-free casing. The oil depth should be 1/4 to 1/2 inch deep. In the oil is too deep, the oil will be adversely affected by the heat generated.

SYSTEM C



Lubrication Using a Pump

Use a leak-free casing. A pump is used to circulate the oil which is cooled. The number of supply holes should equal the number of strands plus 1. The amount of oil supplied to each hole should be constant.

Chain Speed (ft/min)	Chain Number			
	60 and under	80-100	120-140	160 and over
1600-2600	.26gal/min	.40gal/min	.53gal/min	.66gal/min
2600-3600	.53gal/min	.66gal/min	.79gal/min	.92gal/min
3600-4600	.79gal/min	.92gal/min	1.06gal/min	1.19gal/min

Regardless of lubricating system, the roller chain must be washed periodically with solvent. Examine the pin and bushing after removing the chain. Any damage or reddish-brown color on the surfaces may indicate that the system is not being lubed correctly.

Troubleshooting Guide

Problem	Possible Cause	What to Do
Excessive Noise	Misalignment of sprockets	Realign sprockets and shafts
	Loose casings or bearings	Tighten set-bolts
	Too little or too much slack	Adjust centers or idler take-up
	Chain and/or sprocket wear	Replace chain and/or sprocket
	Inadequate lubrication or no lubrication	Proper lubrication
Chain Vibration	Resonance to the vibration cycle of machine to be installed	Chain vibration cycle of chain or machine
	High load fluctuation	Use torque converter or fluid coupling
Wear on inside of link plate and one side of sprocket teeth	Misalignment	Realign sprockets and shafts
Chain climbs sprockets	Excessive chain wear	Replace chain and/or sprocket
	Excessive chain slack	Adjust centers or idler take-up
	Heavy overload	Reduce load or install stronger chain
Broken pins, bushings or rollers	Chain speed too high for pitch and sprocket size	Shorter pitch chain or larger dia. Sprockets
	Heavy shock or suddenly applied loads	Reduce shock load or install larger chain.
	Material build-up in sprocket tooth pockets	Remove material build up or install mud-relief sprockets
	Inadequate lubrication or no lubrication	Proper lubrication
	Chain or sprocket corrosion	Install corrosion resistant chain and sprockets
Chain clings to sprocket	Center distance too big or high load fluctuation	Adjust the center distance or idler take-up
	Excessive chain slack	Same as above
	Excessive chain wear	Replace chain
Chain gets stiff	Misalignment	Realign sprockets and shafts
	Inadequate lubrication or no lubrication	Proper lubrication
	Corrosion	Replace with corrosion resistant chains
	Excessive load	Reduce load or replace with larger chain
	Material build-up in chain joints	Shield drive from foreign matter
Breaking of link plate	Peening or deformed sideplates	Check for chain interference/impact
	Subjected to shock load	Reduce shock (install shock damper)
	Vibration	Install a device to absorb vibration (tensioner)
	Moment of load inertia is too big	Increase chain pitch or no. of strands
	Load/speed too high	Check for proper chain selection
	Corrosion	Corrosion resistant chains

ATTACHMENT CHAIN SELECTION GUIDE

Tsubaki ANSI single and double pitch roller chain is widely used for conveyor service. The following procedure is useful for economical and quick chain selection.

- Step 1 – Confirm operating conditions
- Step 2 – Tentatively select chain size
- Step 3 – Calculate the design tension (Actual chain tension)
- Step 4 – Verify the chain selection
- Step 5 – Verify the allowable roller load

STEP 1 - Confirm the operating conditions of the conveyor

The following information is needed to design the chain conveyor

1. Type of conveyor
2. Method of chain travel
3. Type, weight, and size of materials to be conveyed
4. Weight of materials being transported.
5. Conveyor speed
6. Conveyor length
7. Lubrication
8. Environment

STEP 2 – Tentatively select chain size

To tentatively select the chain size, estimate the tension (T) by the following formula. A chain with an allowable load equal to or over the above calculated chain tension may be tentatively selected.

$$T (\text{lbs.}) = M_T \cdot f \cdot k_1 \text{-----}(1)$$

M_T : Total weight of material conveyed (lbs)

f : Coefficient of friction, sliding and/or rolling (f_1 and or f_2 of Table 1 and Table 2)

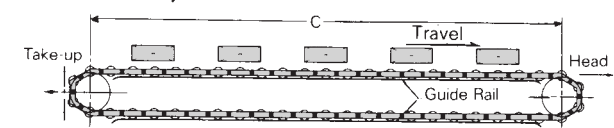
k_1 : Chain speed coefficient (Table 3)

STEP 3 – Calculate chain tension

Next, the chain tension should be calculated using the actual weight of the conveyor chain and material conveyed, as shown below.

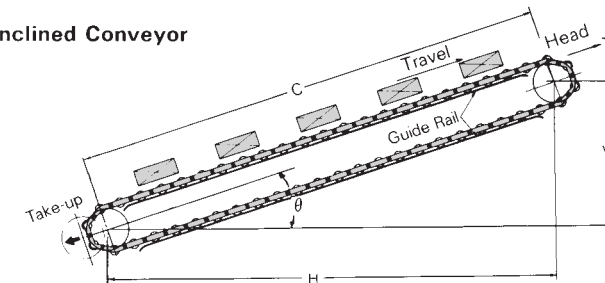
1. Chain rolling

■ Horizontal Conveyor



$$T = (M + 2.1w)f_1C \text{-----}(2)$$

■ Inclined Conveyor



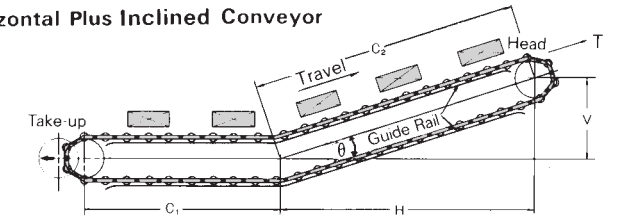
$$T = (M + w)(f_1C\cos\theta + C\sin\theta) + 1.1w(f_1C\cos\theta - C\sin\theta) \text{-----}(3)$$

$$\text{When}(f_1C\cos\theta - C\sin\theta) < 0, 1.1w(f_1C\cos\theta - C\sin\theta) = 0$$

$$\text{or } T = (M + w)(V + f_1H) + 1.1w(f_1H - V) \text{-----}(4)$$

$$\text{When}(f_1H - V) < 0, 1.1w(f_1H - V) = 0$$

■ Horizontal Plus Inclined Conveyor



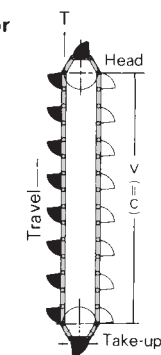
$$T = (M + 2.1w)f_1C_1 + (M + w)(f_1C_2\cos\theta + C_2\sin\theta) + 1.1w(f_1C_2\cos\theta - C_2\sin\theta) \text{-----}(5)$$

$$\text{When}(f_1C_2\cos\theta - C_2\sin\theta) < 0, 1.1w(f_1C_2\cos\theta - C_2\sin\theta) = 0$$

$$\text{or } T = (M + 2.1w)f_1C_1 + (M + w)(V + f_1H) + 1.1w(f_1H - V)$$

$$\text{When}(f_1H - V) < 0, 1.1w(f_1H - V) = 0 \text{-----}(6)$$

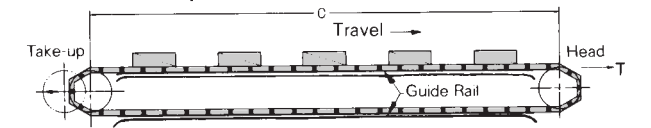
■ Vertical Conveyor



$$T = (M + w)V \text{-----}(7)$$

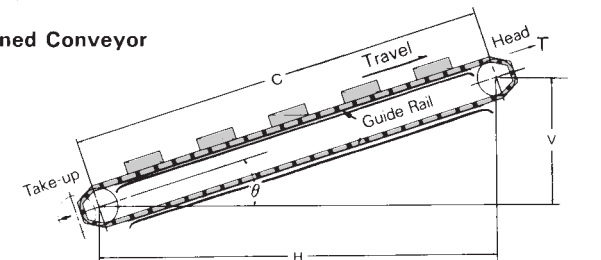
2. Chain sliding

■ Horizontal Conveyor



$$T = (M + 2.1w)f_2C \text{-----}(8)$$

■ Inclined Conveyor



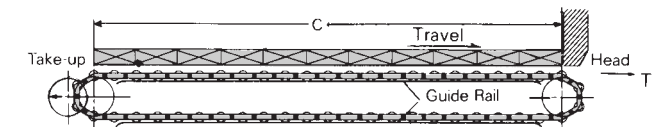
$$T = (M + w)(f_2C\cos\theta + C\sin\theta) + 1.1w(f_2C\cos\theta - C\sin\theta) \text{-----}(9)$$

$$\text{When}(f_2C\cos\theta - C\sin\theta) < 0, 1.1w(f_2C\cos\theta - C\sin\theta) = 0$$

$$\text{or } T = (M + w)(V + f_2H) + 1.1w(f_2H - V) \text{-----}(10)$$

$$\text{When}(f_2H - V) < 0, 1.1w(f_2H - V) = 0$$

■ Horizontal Conveyor for Top Roller Chain and Plastic Outboard Roller Chain



$$T = \left\{ M(f_1 + f_2) + 2.1w \frac{f_1 + f_2}{2} \right\} C \text{-----}(11)$$

3. Calculate the required power

Calculate the required power to drive the conveyor from the following formula.

■ Horizontal and/or Inclined Conveyor

$$HP = \frac{T \cdot S}{33,000 \times \eta} \dots\dots\dots(12)$$

■ Vertical Conveyor

$$HP = \frac{M \cdot V \cdot S}{33,000 \times \eta} \dots\dots\dots(13)$$

Where:

- T = Chain Tension (lbs)
- w = Weight of chain and attachments per foot (lbs/ft)
- M = Weight of material conveyed per foot (lbs/ft)
- V = Vertical center distance of conveyor (ft.)
- H = Horizontal center distance of conveyor (ft.)
- C = Center distance between sprockets (ft.)

f_1 = Coefficient of rolling friction between chain and guide rail (Table 1)

f_2 = Coefficient of sliding friction between chain and guide rail (Table 2)

η = Transmission efficiency

$$S = \text{Speed} = P \times N \times \frac{\pi}{12} = (\text{ft/min})$$

P = Chain pitch

N = Number of teeth

n = Sprocket speed (rpm)

Table 1: Coefficient of Rolling Friction (f_1)

Type of Roller	Dry	Lubricated
Oversized "R" roller type	0.12	0.08
Standard "S" roller type	0.21	0.14
Top roller type	0.09	0.06

Table 2: Coefficient of Sliding Friction (f_2)

Dry	Lubricated
0.3	0.2

4. Verify chain selection

Multiply the chain tension (T) by the chain coefficient (K_1) listed in Table 3 and verify the following formula.

$$T \cdot K_1 \leq \text{Max. Allowable load of the chain} \dots\dots\dots(14)$$

Table 3: Chain Speed Coefficient (K_1)

Chain Speed (Ft/Min)	Speed Factor (K_1)
0 - 50	1.0
50 - 100	1.2
100 - 160	1.4
160 - 230	1.6
230 - 300	2.2
300 - 360	2.8
360 - 400	3.2

When the design chain tension ($T \cdot K_1$) is over the allowable load or much less than it, try the same steps again for the next bigger or smaller chain size to select a more suitable chain.

5. Verify the allowable roller load

When the load is carried on the rollers, the total weight of the chain and load per roller should not exceed the allowable roller load shown in Table 4.

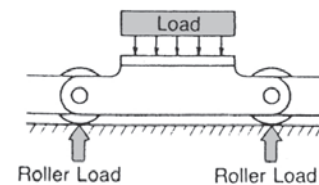


Table 4: Allowable Roller Load

Chain No.		Allowable Roller Load lbs/roller		
		Oversized Roller	Plastic Oversized Roller	Standard Roller
C2040	40	143	44	33
C2050	50	220	66	44
C2060H	60	350	110	66
C2080H	80	590	198	120
C2100H	100	880	286	180
C2120H	120	1,320		260
C2140H	140			300
C2160H	160	2,160		430

Note - Oversized rollers available only for double pitch chains.

GENERAL ENGINEERING INFORMATION - ATTACHMENT CHAIN SELECTION GUIDE

Environmental Temperatures and Points of Concern

Temperatures	Chain Selection	Caution
(-60°F) to (-20°F)	Under (-20°F) or lower, ANSI 304 stainless, super stainless and 600 stainless chains are suggested	1 - Low-temperature embrittlement may occur on link plates of carbon chain. 2 - Freezing of lubricant 3 - Rust due to condensation. 4 - Seizure due to freezing.
	Carbon chains are not suggested	
(-20°F) to 15°F	The chain should be selected on the basis of the corrected working load below.	
140°F to 300°F	Special lube required	
300°F to 480°F	The chain should be selected on the basis of the corrected working load below. Selection of the next larger pitch chain over the originally selected chain is suggested.	1 - Excessive wear due to decrease of hardness of pin and bushing. 2 - Poor Lubrication due to deterioration of lube.
480° F and Greater	ANSI 304, 316 and 600 stainless steel chains are suggested.	

Table 5: Corrected Working Load

Temperature	Corrected Working Load
(-20° F - -4° F)	(Max. allowable load in catalog) x 0.25
(-4° F - 15° F)	(Max. allowable load in catalog) x 0.30
(15° F - 300° F)	(Max. allowable load in catalog) x 1.00
(300° F - 390° F)	(Max. allowable load in catalog) x 0.75
(390° F - 480° F)	(Max. allowable load in catalog) x 0.50

2 - Wet Conditions:

When the chain is exposed to water in a sterilizer or in a water screen, excessive wear due to insufficient lubrication and rust may shorten life. In these cases, a larger chain size provides less bearing pressure and stainless steel or coated chains will provide rust prevention.

3 - Corrosive Environments:

When the chain is exposed to acidic or alkaline solution or operates in a corrosive atmosphere, excessive wear may occur due to chemical corrosion on the chain parts in addition to mechanical wear. Hydrogen embrittlement may also occur in an acidic atmosphere. Roller chain is more easily affected by acid than alkali. In special cases, electro-chemical corrosion may occur on the chain due to sea or mine water. Refer to the "Corrosion Resistance" guide on page 270 for the proper chain selection.

4 - Dusty conditions:

When conveyor chain operates in dusty conditions, (in coke, foundry's, sand, metal powder) the chain wears very quickly because foreign material penetrates the pin and bushing area. In such cases, consult Tsubaki engineering for the best roller chain option. Options include, Titan®, Lambda® and, potentially, larger pitch chains for higher wear resistance.

I - Selection Procedure for Double Plus®, Outboard Roller and Top Roller Chain

1 - Confirmation of operating conditions for free flow conveyors

The Following information is needed in order to select an appropriate chain for free flow conveyors:

- 1 - Material weight, dimension and quantity of the conveyed object (including pallet).
- 2 - Conveyor speed
- 3 - Conveyor length (the length for accumulating and transferring portion respectively).
- 4 - Lubrication requirements and environment.

2 - Tentative selection of chain size

$$T = W_T \cdot f \cdot K$$

W_T = Total weight of conveyed object except chain (lbs)

f = Coefficient of friction $f = f_2 + f_3$ (See page 264, Tables 4 and 5 or Table 8)

K = Chain speed coefficient (See page 264, Table 6)

Note: In the case where two matched strands are to be operated, the chain's maximum allowable tension (shown in Table 7, page 264) should be compared with $T \cdot 0.6$ to decide the chain type and size.

3 - Confirmation of the maximum allowable roller load

The maximum allowable roller load for conveyed objects should not exceed the figures shown in Table 1 below. However, maximum allowable roller load for the base chain should be checked using Table 2.

Table 1 - Maximum Allowable Roller Load For Conveyed Objects

Chain Type	Type of Guide Rail	C2030VRP	C2040VRP	C2050VRP	C2060VRP	C2080VRP
Double Plus Chain	Aluminum	26	40	53	67	
	Aluminum with Steel Rail	53	80	107	134	201

This is the load for two strands of Double-Plus chain

Note - When using aluminum frame with steel rail, the maximum allowable for VR series is twice that of VRP series

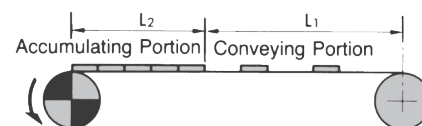
Chain	Type of Roller for transfer	Lbs/Roller				
		40 C2040	50 C2050	60 C2060	80 C2080	100 C2100
Outboard Roller Chain	Plastic Outboard Roller	11	15	30	55	66
	Steel Outboard Roller	33	44	66	121	176
Top Roller Chain (Single Strand)	Plastic Top Roller	11	15	30	55	66
	Steel Top Roller	33	44	66	121	176

Table 2 - Maximum Allowable Roller Load of Base Chain

Chain	Type of Roller for transfer	40 C2040	50 C2050	60 C2060	80 C2080	100 C2100
Steel Roller	Standard Roller "S"	33	44	66	121	176
	Oversized Roller "R"	143	220	352	594	880
Top Roller Chain (Single Strand)	Standard Roller "S"	4	7	11		
	Oversized Roller "R"	44	66	110	198	286
Poly Steel		4	9	13		

Note - The above figures for Poly-Steel show the maximum allowable load per plastic inner link.

4 - Calculation of maximum chain tension (T)



$$T = (W_1 + M) L_1 \cdot f_1 + W_2 \cdot L_2 \cdot f_2 + (W_2 + M) L_2 \cdot f_3 + 1.1 M (L_1 + L_2) f_1$$

5 - Calculation of required power (HP)

- P: Maximum number of pallets on conveyor
- T: Maximum chain tension (lbs)
- L_2 : Length of accumulating portion (ft)
- W_2 : Weight of conveyed objects in accumulating portion (Lbs/ft)
- L_1 : Length of conveying portion (ft)
- W_1 : Weight of conveyed objects in conveying portion
- f_1 : Coefficient of friction between chain and rail when conveying
- f_2 : Coefficient of friction between chain and conveyed object when accumulating
- f_3 : Coefficient of friction between chain and rail when accumulating
- M: Weight of chain and slat, etc. (lbs/ft)
- Hp: Required power (Hp)
- V: Chain speed (ft/min)
- η : Transmission efficiency of drive unit
- L: Length of pallet

Calculate the maximum chain tension (T) with the following formula referring to Table 3 and Tables 4 and 5 (or Table 8) on page XXX

$$T = (W_1 + M) L_1 \cdot f_1 + W_2 \cdot L_2 \cdot f_2 + (W_2 + M) L_2 \cdot f_3 + 1.1 M (L_1 + L_2) f_1$$

In general, free flow conveyors should have two matched strands of chain and in this case, the chain weight should be for two strands of chain. T, calculated above is the maximum chain tension for two strands of chain.

Table 3 f_1 - Coefficient of Friction between chain and rail when conveying

Chain Type	Type of Roller on Base Chain	Dry	Lubricated
Double Plus Chain	Regular and high friction type	0.08	
Outboard Roller Chain	Steel Roller	"S" Roller	0.21
		"R" Roller	0.12
	Plastic roller	"S" Roller	0.12
		"R" Roller	0.08
Top Roller Chain	Poly-Steel		0.25
	Steel Roller	"S" Roller	0.21
		"R" Roller	0.12

Table 4 f_2 - Coefficient of Friction between chain and Conveyed Object when Accumulating

Chain Type	Type of Roller on Base Chain	Dry	Lubricated
Double Plus Chain	Regular Type	0.10	
	High Friction Type	0.15	
Outboard Roller Chain	Plastic Outboard Roller	0.06	
	Plastic brake outboard roller	0.10	
	Steel outboard roller	0.09	0.06
Top Roller Chain	Plastic top roller	0.06	
	Steel top roller	0.09	0.06

Note: These factors are for reference only.

Table 5 f_3 - Coefficient of Friction between Chain and Rail when Accumulating

Chain Type	Type of Roller on Base Chain	Dry	Lubricated
Double Plus® Chain	Regular Type	0.20	
	High friction type	0.25	

Note: For all chains except Double Plus® chain, f_3 equals f_1 . These factors are for reference only.

Table 6 - Chain Speed Coefficient

Chain Speed ft/min	Chain Speed Coefficient (K)
0 - 50	1.0
50 - 100	1.2
100 - 160	1.4
160 - 230	1.6
230 - 300	2.2
300 - 360	2.8
360 - 400	3.2

Note: These factors are for reference only.

Suggested chain speed is as follows:

Double Plus® - 50ft/min or less

Plastic Roller Chain - 230ft/min or less

Poly-Steel Chain - 230ft/min or less

When chain speed exceeds the above, consult Tsubaki engineering

6 - Determination of Chain Size

Multiply the maximum chain tension (T) by the speed coefficient (K) listed in Table 6 and verify with the following formula

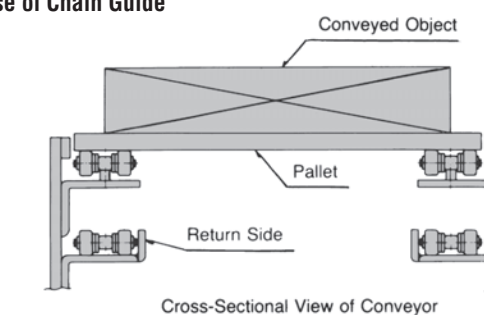
$T \cdot K \leq$ Maximum allowable chain tension

Note - When there are two strands, the maximum chain tension should be $T \cdot 0.6 \leq$ Maximum allowable chain tension

Ambient Temperature Range

Suggested ambient temperature range is between 14°F and 140°F, for which standard lubrication is suggested. Special lubrication is required for temperatures between 140°F and 300°F. For temperatures above 300°F please consult Tsubaki engineering.

Use of Chain Guide



Note:

1 - When using plastic brake outboard roller chain, the rollers of the base chain on the return side should be supported by the rail in the same way as the conveying side.

2 - When using Poly-Steel chain with the outboard rollers, the guide should support the bottom surface of the links.

Table 7 - Maximum Allowable Chain Tension (Lbs)

Chain Type	Type of Roller on Base Chain	C2030	40 C2040	50 C2050	60 C2060	80 C2080	100 C2100
Double Plus® Chain	Regular	120	200	310	460	1190	
	High Friction	60	100	155	230	595	
	Stainless Steel	60	100	155	230	595	
	Steel Roller	220	350	550	840		
Outboard Roller Chain	Steel Roller		595	970	1410	2400	3835
	Plastic Roller		100	155	230	400	575
	Poly-Steel		100	155	200		
Top Roller Chain	Steel Roller		595	970	1410	2400	3835
	Plastic Roller		100	155	230	400	575

Table 8 - Coefficient of Friction Double Plus® "VR" Steel Roller

	Coefficient of Friction	Double Pitch Double Plus® Steel Roller	Large Size Double Plus®
f1	Coefficient of friction between chain and rail when conveying	0.05	0.05
f2	Coefficient of friction between chain and conveyed object when accumulating	0.10	0.15
f3	Coefficient of friction between chain and rail when accumulating	0.10	0.25

Note - Tsubaki suggests lubricating steel roller and "VR" type chains

7 - Selection Procedure Example for Double Plus® Chain

I – Confirm operating conditions for conveyor

Conveyor Length 30 Feet
 Dimensions of conveyed object: 53lbs/piece
 53lbs/piece ÷ 1.5 ft. = 35.3 lbs./ft.
 Conveyed product speed 30ft/min
 Chain speed: 12 ft./min

Full conveyor accumulating

Quantity of conveyed object: 20 pieces
 Dry, in-plant use, normal operating temperatures (up to 77°F)

II – Select initial chain size

Use the calculation method in Step 2 on page 263.

$$T_t = W_t \times (f_2 + f_3) \times K$$

$$T_t = (35.3 \text{ (lbs.ft.)} \times 30 \text{ ft.}) \times (0.1 + 0.2) \times 1.0 = 318 \text{ lbs}$$

$$T_s = 318 \times 0.6 = 190.8 \text{ lbs}$$

Note – Presume two strands of chain, each loaded by 0.6 of the total.

Based on these calculations, C2040VRP-A chain is the preliminary choice but this selection must be confirmed.

Note: C2040VRP-A weight/ft. = .67 lbs./ft. per strand (1.34 lbs./ft. for two strands)

III – Confirm the maximum allowable roller load

By consulting Table 1 on page 263, you find that for C2040VRP-A, the maximum allowable load is 40 lbs./ft. for the aluminum rail.

In this example, the weight of the conveyed object is 35.3 lbs./ft. Therefore, C2040VRP-A can cover the load.

IV – Confirm total chain tension

Using the calculation method of total chain tension (T_t):

$$T_t = (0 \times 1.34) \times 0 \times .08 + 35.3 \times 30 \times .10 + (35.5 + 1.34) \times 30 \times .20 + 1.1 \times 1.34 \times (0+30) \times .08$$

$$T_t = 329 \text{ lbs.}$$

$$T_s = T_t \times .6 = 1967 \text{ pounds per strand.}$$

Now determine chain size:

Multiply the chain tension (T_s) by the chain speed coefficient (K) in Table 6 on page 264, confirm with the following formula:

$$T_s \times K \leq \text{Maximum allowable chain tension (Table 7).}$$

$$197 \times 1.0 \leq 200 \text{ (C2040VRP regular plastic)}$$

V – Calculate required power

*Presume gear motor efficiency (η) = 0.8

$$\text{HP} = 329 \text{ lbs.} \times 12 \text{ ft./min} \times 1.1 \div 33,000 \times 0.8 = .17 \text{ or } \frac{1}{4} \text{ HP}$$

II Design guidelines for Double Plus® Chain

I – Dimensions for both ends of the conveyor

A typical arrangement of Double Plus® components is illustrated in Figure 1. The bracket is used to mount the plastic return guide to the aluminum guide rail, allowing the chain to flow smoothly between the sprocket and guide rail. See Table 9a for dimensions.

Figure 1 – Typical arrangement of Double Plus® components

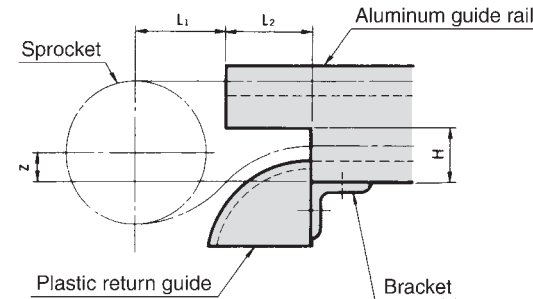


Table 9a - Conveyor End Dimensions

Chain Number	Z	L ₁	L ₂		H
			Driver Side	Driven Side	
C2030CRP-R3L & R3LS	0.839	1.57	8.27	3.15	0.98
C2040VRP-R4L & R4LS	0.579	1.97	11.81	3.94	0.98
C2050VRP-R4L & R4LS	0.634	2.36	13.39	4.72	1.18
C2050VRP-R3H & R3HS	3.000	2.36	13.39	4.72	1.18
C2060VRP-R4K & R4LS	0.587	2.76	16.93	5.12	1.57
C2080VRP-R3LS	0.945	3.94	21.65	7.87	2.36

ii – Screws, bolts, height of conveyor

The values for L shown in Table 9b and Fig 2 vary because of the plastic bumper wall thickness tolerance.

Connecting the aluminum guide rail

Connect the aluminum guide rails by aligning the V groove shown by arrow A in Fig 2.

Installing the pallet guide rail

Drill holes using the V groove as a guide, shown by arrow B in Fig 2, and install the pallet guide rail using socket head cap screws from Table 9b.

Figure 2 – Location of screws and bolts

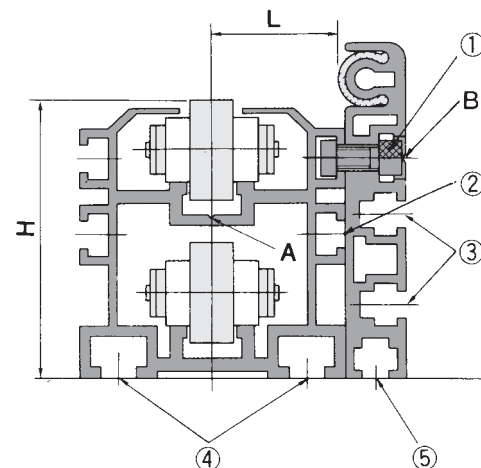


Table 9b - Screws, Bolts, Height of Conveyor

Rail Number	1	2	3	4	5	H	L
C2030CRP-R3L & R3LS	M6 X 10	M6	M5	M6	M5	2.42	0.57
C2040VRP-R4L & R4LS	M6 X 12	M6	M6	M8	M6	2.68	1.12
C2050VRP-R4L & R4LS	M8 X 20	M8	M8	M10	M8	3.25	1.42
C2050VRP-R3H & R3HS	M8 X 20	M8	M8	M10	M8	5.61	1.46
C2060VRP-R4K & R4LS	M8 X 20	M8	M8	M10	M8	3.74	1.75
C2080VRP-R3LS	M8 X 25	M8	M8	M10	M8	5.12	1.85

iii – Nominal Spacing of Conveyor Supports

Proper operation of Double Plus® chain is maintained by controlling the amount of deflection of the aluminum guide rail. This deflection is determined from the weight of the conveyed goods and the second moment of area, shown in Table 9c. To control deflection, supports should be spaced as shown in Figure 3, in accordance with the following equation:

$$l = (\text{in}) [384 \times E \times L \times d \div 5 \times 0.6 \times W]^{1/4}$$

l = Spacing support (inches)

E = Young's Modulus = 9.956 x 106 lbs./in

L = Second movement area = in⁴ (See table 9c)

d = Deflection = 0.079 in.

W = Total conveyed weight = lbs./ft.

Figure 3 – Nominal spacing of conveyor supports (l)

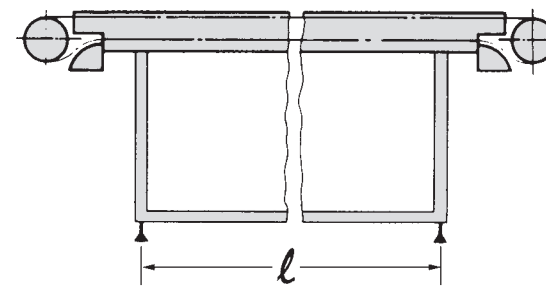


Table 9c - Second Moment of Area

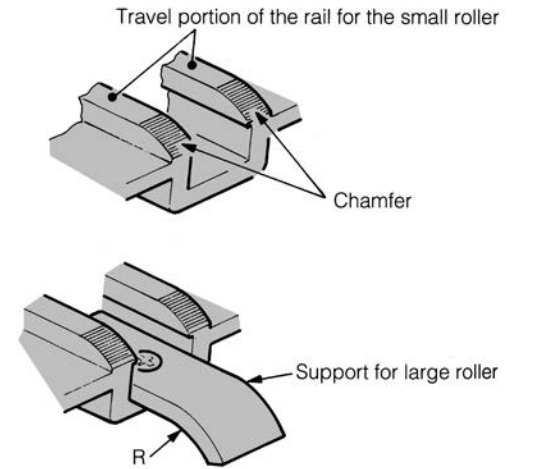
	Rail No.	Second moment of area (L) in ⁴
Aluminum Guide Rail	C2030VRP-R3L	0.411
	C2040VRP-R4L	0.965
	C2050VRP-R4L	2.019
	C2050VRP-R3H	9.809
	C2060VRP-R4L	3.247
	C2060VRP-R4K	2.607
Aluminum Frame with Steel Rail	C2030VRP-R3LS	0.428
	C2040VRP-R4LS	1.065
	C2050VRP-R4LS	2.297
	C2050VRP-R3HS	10.621
	C2060VRP-R4LS	4.127
C2080VRP-R3LS	8.666	

iv - Finishing the ends of the conveying side.

Put a chamfer on the ends of the upper rail that the chain's small rollers travel on Fig. 4.

Figure 4 – Location of Chamfer

Travel portion of the rail for the smaller roller.

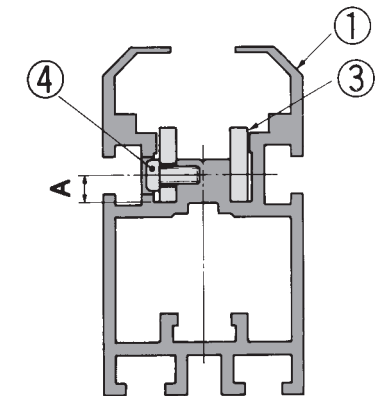


It is possible to prevent the chain's large roller from dipping at the chamfered portion by installing a support for the large roller on the ends of the rail on the driven side.

v – Aluminum frame with steel rail.

Two basic constructions are used when building guide rail with aluminum frame and steel rail.

For C2030VRP-R3LS, a steel rail (No. 3) is arranged in the vertical position and lock screws (No. 4) are secured into the frame (no. 1) from both sides (See Fig 5a). See Table 9d for dimensions and hardware.



For C2040 – C2080 Double Plus® Guide Rails with steel inserts – Lock screws (no. 4) are secured through the inner rail (no. 2), which anchors the steel rail (no. 3) to the frame (no. 1) (see Fig 5b). See table 9d for dimensions and hardware.

Fig 5b – Cross Section of C2040VRP-C2080VRP frame with steel rail

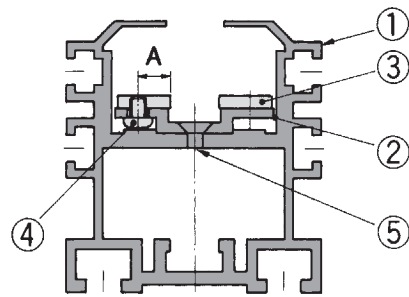


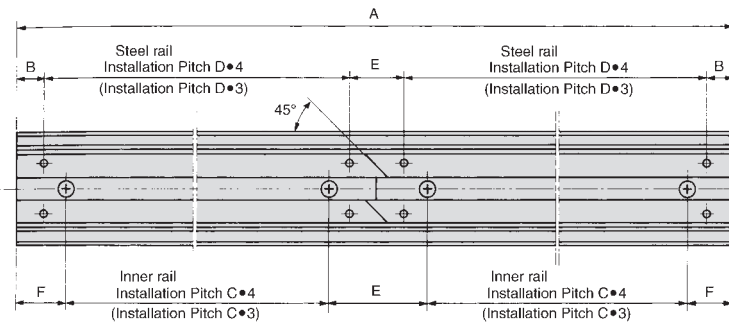
Table 9d - Aluminum Frame with Steel Rail

Rail No.	Steel Rail (Part No. 3)		Installation screws for steel rail (Part No. 4) phillips pan head machine screws	Installation screws for steel rail (Part No. 5) phillips flat head machine screws
	Dim. (Plate Thickness x width) Inches	"A" Dim. Inches		
C2030VRP-R3LS	.12 X .51	0.187	M3 X 7	
C2040VRP-R4LS	.12 X .51	0.315	M4 X 5	M4 X 6
C2050VRP-R4LS	.12 X .51	0.315	M4 X 6	M4 X 6
C2050VRP-R3HS	.12 X .51	0.315	M4 X 6	M4 X 6
C2060VRP-R4LS	.12 X .51	0.315	M4 X 6	M4 X 6
C2080VRP-R3LS	.24 X .63	0.413	M5 X 8	M6 X 10

(2) – Assembly Drawing

When joining rail sections to form a longer conveyor, please refer to Fig 6.

Figure 6 – Assembly Drawing



- 1 – The steel rail is cut at an angle of 45° at the center portion of the main rail.
- 2 – The installation spacing for C2030VRP-R3LS steel rail is the same as that for C2050VRP-R3HS and C2080VRP-R3LS.
- 3 – Dimensions in parenthesis refer to C2050 – C2080-R3LS

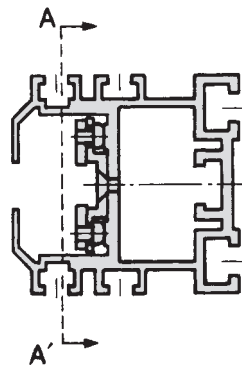


Table 9e - Steel Rail Assembly Dimensions

Rail No.	A	B	C	D	E	F
C2040VRP-R4LS	157.5	1.18	19.09	19.09	2.36	1.18
C2050VRP-R4LS	157.5	1.18	19.09	19.09	2.36	1.18
C2060VRP-R4LS	157.5	1.18	19.09	19.09	2.36	1.18
C2050VRP-R3LS	118.1	0.59	18.9	19.09	2.36	1.18
C2080VRP-R3LS	118.1	0.59	18.9	19.09	2.36	1.18

(3) – Important points when handling steel guide rails – When cutting the guide rail with steel rail

- 1 – Cut anywhere other than the central portion or screwed portions of the conveyor.
- 2 – Insert lock screws into the steel rail and inner rail along with the inner rail and main rail at 0.6 - 1.2 inches from the cut end.
- 3 – Machine all parts individually.
- 4 – Completely remove all burrs before reassembly.

Note - Use screws according to Table 9d when reassembling the conveyor.

When connecting the rail

After connecting the rail, put small chamfers on the mating faces of the steel rail in both directions where steps occur. These prevent the chain rollers from getting caught.

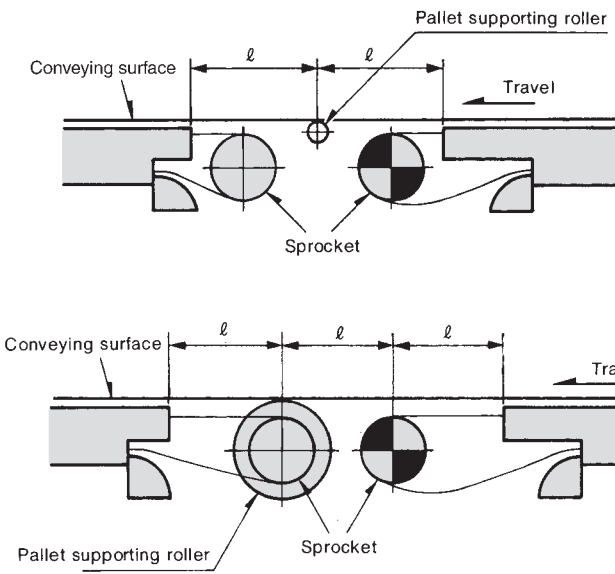
vi – Transferring objects between conveyors.

To convey pallets in a stable condition at the transfer portion of the conveyor, install a roller between the two conveyors or the shafts of the sprockets (fig. 7). Be sure that the distance (l) from the ends of the rail to the roller that supports the pallets is less than 1/25 times the pallet length in the conveying direction.

Table 9f - Chain Slack for Double Plus®

Chain Size	Normal Slack Inches	Maximum Slack Inches
C2030	0.1	2.95
C2040	1.38	4.13
C2050	1.57	4.72
C2060	1.97	5.9
C2080	2.56	7.48

Figure 7 – Install a roller as shown for a straight line transfer



vii – Take-up

The amount of take-up $l = (L \cdot 0.02) + \text{marginal length}$ (0.02 = allowable chain wear elongation 2%).

Allow for some sagging (up to 10% of the span) in the chain on the bottom of the driver sprocket. Adjust the take-up so that the slack does not exceed the values in Table 9f (see Fig. 8). The total arc of contact between the chain and the sprocket should be more than 130°. If the take-up cannot be set up as shown in Fig. 9 due to space limitations, refer to Fig. 10.

Figure 8 – Slack Tolerance

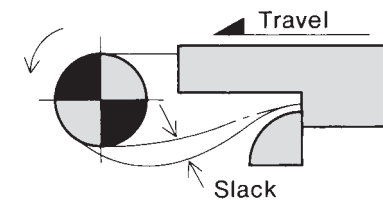


Figure 9 – Take-up Arrangement

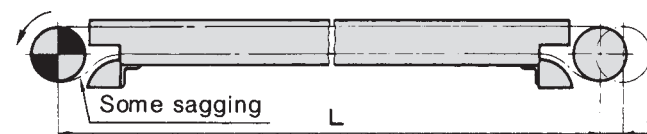
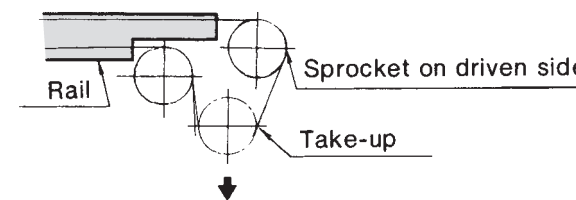


Figure 10 – Take-up Arrangement for limited space.



viii – Maximum conveyor length

Double Plus® chain operates well on conveyors with lengths not exceeding 50 feet, make several shorter conveyors in line. If you require one continuous system longer than 50 feet, consult Tsubaki Engineering.

ix – For Double Plus® Chain with Snap Covers

When using this arrangement, as shown in Fig. 11, be aware that the sprocket cannot engage the chain from the top surface of the snap covers. When bending the chain toward the snap cover side, do not bend beyond the R dimension of the plastic return guide. Snap covers and installation are shown in Figs 12 and 13.

Figure 11 – Take-up arrangement for limited space for Double Plus® with snap covers.

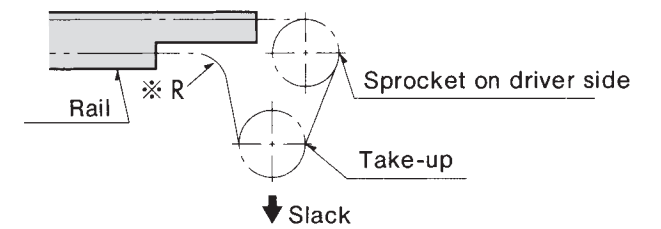


Figure 12 – Snap covers for outer and inner links

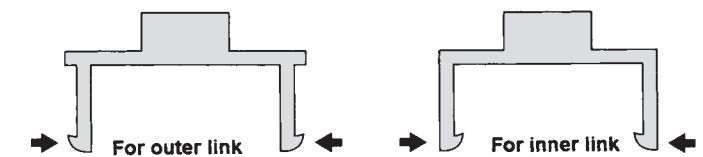


Figure 13 – Proper installation of snap covers.



TOP CHAIN

Selection and Engineering Information

Chain Type	Materials		Specifications				Feature	Applications
	Chain/Pin	Top Plate	Suggested Max. Speed (ft./Min)					
			Max. Allowable Load (Lbs.)	Lubricated	Dry	Ambient Temp.		
Linear Movement								
TS-P	Carbon Steel	430 Stainless Steel	660	390	200	15 30	Type P: Suitable for single strand	Assembly line for bottling or canning, and conveying tons or parts
TS-SS	304 Stainless Steel	304 Stainless Steel	231	23	150	4 750	Type SS: Suitable for multi-strand operation and corrosive environment	
TS-CS	Hardened Carbon Steel	430 Stainless Steel	1,100	390	200	15 350	Type CS: Suitable for heavy load operation	
TT-N	304 Stainless Steel	430 Stainless Steel	330	330	200	15 500	Simple construction, washable, clean-handling, and anti-corrosive	
TT-SS	304 Stainless Steel		484			4 750		
TP	304 Stainless Steel	Polyacetal Resin	264	330	160	4 170	Self-lubrication, quiet operation. Anti-corrosive, suitable for transportation of small size goods due to small clearance between top plates.	Conveying steel, cans, finished parts, paper packages, etc.
TTP			187					
TN	Carbon Steel	Polyacetal Resin	1,410	390	200	15 170	Damage-free, quiet operation. Smooth transportation, easy removal of top plate. Easy repair.	
TN-NP	Nickel-Plated							
TN-S	304 Stainless Steel							231
P	304 Stainless Steel		40P, 2040P: 100 60P: 200	200	200	4 170	Quiet and trouble-free operation with anti-corrosive protection. Also available in "E", "K", "Y", and "SY" Series.	Conveying electronic parts and small items.
Curved Movement								
TRU	Carbon Steel	430 Stainless Steel	902	330	200	15 350	Float-prevention tab allows high speed, complex, and curved transportation	Curved operation for type TS and TT.
TRU-SS	304 Stainless Steel		231	230	150	4 750		
TKU	Carbon Steel	430 Stainless Steel	638	150		15 350	Easy removal of chain. Used for low speed and simple curved operation.	
TTU	304 Stainless Steel		484	260	160	4 750	Same features as TT - used for curved operation.	Curved operation for TT
TPU	304 Stainless Steel	Polyacetal Resin	220			4 170	Same features as TP and TRU.	Curved operation for TP
TNU	Carbon Steel		Polyacetal Resin	902	330	200	15 170	Used for simple curved operation. TN type side bow feature.
TNU-NP	Nickel-Plated							
TO	Carbon Steel	430 Stainless Steel	660	200	200	15 350	Any horizontal curved operation is possible. Min radius: 4". Complex curved operation is available.	Suitable for horizontal curved operations.
TU			220				Any return such as straight/curved line on horizontal or vertical route is available. Complex curved operation available.	

Table 1 must be referred to when selecting chain and the liner materials to be used with top chain. The table shows the results of lab tests at 68 F. It is to be used for reference only and does

Table 1 - Corrosion Resistance to Various Fluids

Fluid	Steel	Polyacetal	Stainless Steel		Ultra-High Polymer Polyethylene
			304	430	
Acetone	3	1	1	1	1
Oils (Vegetable and Mineral)	1	1	1	1	1
Alcohol	1	1	1	1	1
Aqueous ammonia	2	1	1	1	1
Sodium Chloride	3	1	2	2	1
Hydrochloric Acid (2%)	3	3	3	3	3
Sea Water	3	2	2	3	1
Hydrogen Peroxide	3	3	1	1	1
Caustic Soda (25%)	3	3	1	1	1
Gasoline	1	1	1	1	2
Formic Acid	3	3	3	3	1
Formic Acid Aldehyde	1	1	1	1	1
Milk	1	1	1	1	1
Lactic Acid	3	1	1	3	1
Citric Acid	3	2	1	2	1
Acetic Acid (5%)	3	3	1	1	1
Carbon Tetrachloride	2	1	2	2	2
Nitric Acid (5%)	3	3	1	1	2
Rice vinegar (5%)	3	1	2	2	1
Hypochlorite Soda	3	3	3	3	1
Soapy Water	2	1	1	1	1
Paraffin	1	1	1	1	1
Beer	1	1	1	1	1
Fruit Juice	3	1	1	2	1
Wine	1	1	1	1	1
Whiskey	1	1	1	1	1
Benzene	1	1	1	1	2
Water	3	1	1	1	1
Vegetable Juice	2	1	1	1	1
Iodine	3	3	3	3	3
Sulfuric Acid	3	3	3	3	3
Phosphoric Acid	3	3	2	3	1
Soft Drinks	1	1	1	1	1

1 = Totally Resistant 2 = Partially resistant 3 = Not suggested

Top Plate Selection Process

Follow the procedure below to select top chain and liner that are most economical and suitable for the application

- Step 1** Establish general conveyor conditions.
- Step 2** Select top plate material
- Step 3** Select liner material
- Step 4** Determine factors and coefficients
- Step 5** Select top plate width
- Step 6** Calculate tension
- Step 7** Determine chain size.

Step 1 Establish general conveyor conditions

- A** Materials conveyed
 - 1 - Container material
 - 2 - Weight
 - 3 - Dimensions
- B** Conveyor Arrangement
 - 1 - Straight or curved movement
 - 2 - Conveyor length
 - 3 - Layout
 - 4 - Space limitations
- C** Other conditions
 - 1 - Conveyor capacity
 - 2 - Interval
 - 3 - Conveyor Speed
 - 4 - Lubrication requirements
 - 5 - Material conveyance regularity
- D** Environment
 - 1 - Temperature
 - 2 - Presence of chemical substances
 - 3 - Existence of wear-causing agents such as class, paint, metal, powder or sand.

Step 2 - Select Top Plate Material

Top plate must be selected according to the type of goods to be moved.

Table II: Plate Material Selection Guide

Material Conveyed	Top Plate Material	Dry		Lubricated	
		Abrasive Atmosphere			
		No	Yes	No	Yes
Tin cans, aluminum cans, metal containers,	Polyacetal	0	X	0	
Industrial parts, machine parts, dies, castings, forgings, bolts, nuts, etc.	Stainless Steel		0		0
Plastics and plastic covered containers and paper products. Milk products, paper containers, paper boards.	Polyacetal		X		
	Stainless Steel	0	0	0	0
Glass jars, glass products, ceramics	Polyacetal		X		X
	Stainless Steel	0	0	0	0

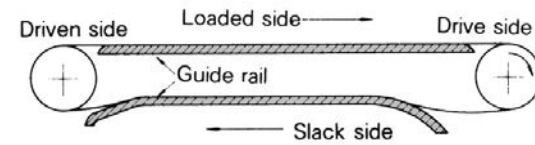
0 = Suggested X = Suggested

Good

Limited Use

2 - 1 Guide Rail

The guide rail consists of the conveyor frame and liner. The liner sider with the top chain to minimize frictional resistance and wear so the chains are protected and driving power can be minimized.

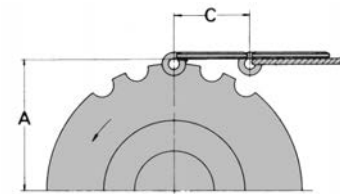


2 - 2 Location of guide rails and sprocket

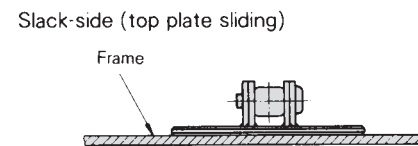
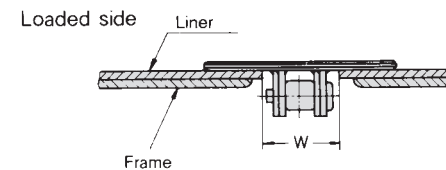
When the chain engages the sprocket, the chain itself moves up and down slightly due to the polygonal of the sprocket. Therefore, the guide rail on the loaded side must be positioned so that the chain is horizontal when at the highest level. Guide rail installation dimension "A" is determined from the following equation.

$$A = (\text{Pitch diameter of sprocket}/2) + B \text{ (inch)}$$

Chain Type	B	C
TS, TRU, TKU, TN, TNU	0.433	1.496
TT, TTU	0.157	
TP-I	0.197	
TP-11, TPU, TTP, TTPF	0.157	



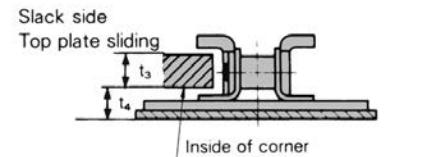
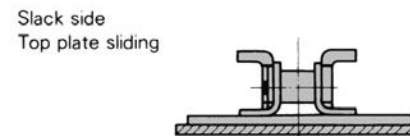
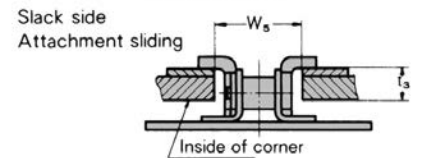
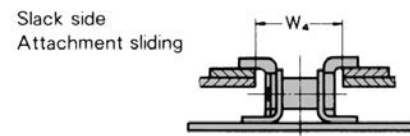
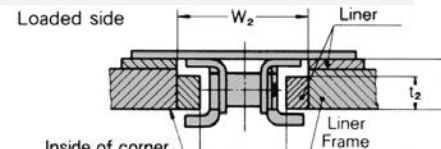
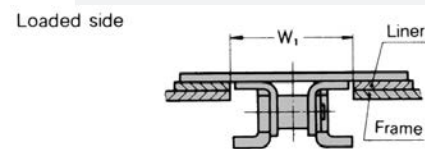
Note: Please refer to page B-69 for the RS Plastic chain.



Guide Rail Inside Width

Chain Type	W
TS-P	1.300
TS-SS, TS-CS	1.594
TT	1.772

Chain Type	W
TP	1.772
TTP	1.772
TN	1.496

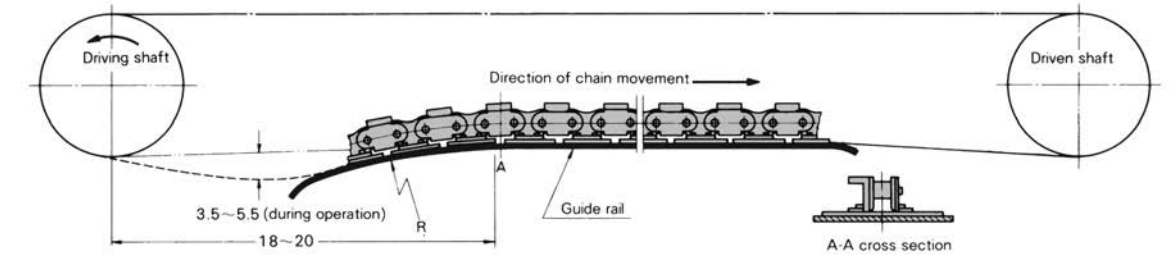


Curved Movement Chain

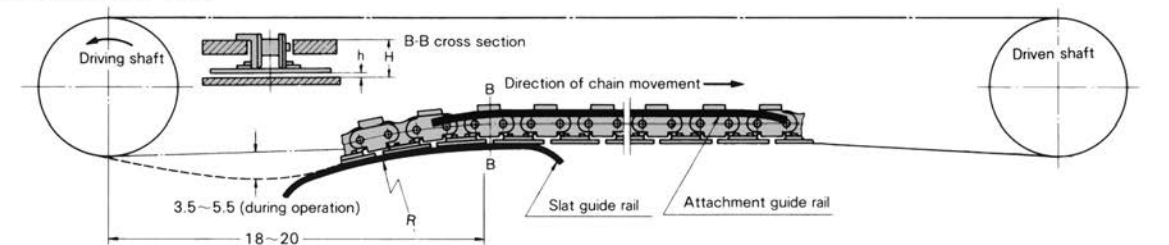
Chain Type	W1	W2	W3	t1	t2	W4	W5	t3
TRU	1.752	1.890	1.220	0.689	0.472	1.220	1.220	0.472
TPU	1.772	1.772	1.772	0.472	0.472	1.890	1.890	0.472
TNU	1.496	1.496	1.496	0.709	0.709			
TO	1.752							
TU	1.752							
TKU	1.772	1.890	1.417	0.748	0.531			
TTU	1.654					1.654		

2 - 3 Slack side guide rail arrangement

Top plate sliding (applicable for all top chains)



Attachment sliding (TRU type)



Chain Type	h	H
TRU	0.260	1.181
TPU	0.236	1.024

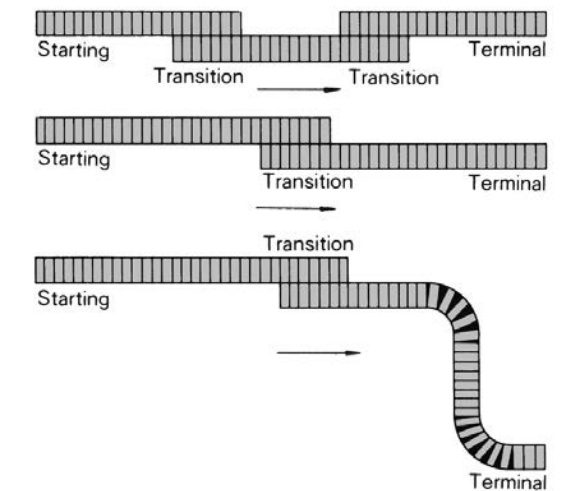
- Slack of 3.5 - 5.5 inches during operation is needed under the drive sprocket.
- Engagement angle must be more than 150° between the drive sprocket and chain.
- The radius R (inches) of the guide rail must be larger than the radius of chain back-bend given in the table below.

Type	Back-bend radius	Type	Back-bend radius
TS	13	2040P	18
TRU, TKU	12	TP, TTP, TPU	2
TT	7	TN, TNU	4
40P	5	TTU	2
60P	18		

- Guide rails must have sloped ends to prevent interference with the chain.

2 - 4 Connection of additional conveyors

If a conveyor is too long, the chain tension will increase and chain strength will not be sufficient. In such cases, additional conveyors should be used.



Locations of the chain and the guide rail are very important for a smooth transition between conveyors. Two parallel chains must be positioned at the same height, or the output chain must be positioned slightly higher than the receiving chain. The guide rail must be shaped such that transition of goods can be accomplished smoothly.



Step 3 - Select Liner material

The appropriate liner material must be selected from the top plate materials listed in Step 2.

Top Plate Material (Chain Type)	Liner Material	Dry		Lubricated	
		Abrasive Atmosphere			
		No	Yes	No	Yes
Stainless Steel TS and TT for straight running TRU, TKU, TO and TU, for curved.	Stainless Steel				
	Steel		0		0
	Super-High Polymer Polyethylene	0	X	0	0
Polyacetal (TP, TTP, TN and P for linear movement, TPU and TNU for curved).	Stainless Steel			0	0
	Steel	0	0		
	Super-High Polymer Polyethylene		X		

0 = Suggested X = Suggested

Good Limited Use

Step 4 - Determine factors of coefficients (f2, f3, k2, k3)

Table IV: Coefficient of Friction (f2) between Top Plate and liner.

Top Plate Material	Lubrication	Coefficient of Dynamic Friction of Liner Material		
		Stainless Steel	Steel	Ultra High Polymer Polyethylene
Stainless Steel	Dry	0.35	0.35	0.25
	Lubrication by soapy water	0.20	0.20	0.15
	Oil Lubrication	0.20	0.20	0.15
Polyacetal	Stainless Steel	0.25	0.25	0.25
	Steel	0.15	0.15	0.15

Table V: Coefficient of Friction (f2) between Material Conveyed and Top Plate

Top Plate Material	Lubrication	Coefficient of Dynamic Friction of Top Plate Material	
		Stainless Steel	Polyacetal
Plastic and paper containers and film packages	Dry	0.30	0.25
	Lubrication by soapy water	0.20	0.10
Cans (with metal tops and bottoms)	Dry	0.35	0.25
	Lubrication by soapy water	0.20	0.15
Bottles and Ceramics	Dry	0.30	0.40
	Lubrication by soapy water	0.20	0.20
Industrial parts (metal)	Dry	0.35	0.25
	Lubrication by soapy water	0.20	0.15

Table VI: Angle Factor (k2) and Length Factor (k3)

Turning Angle	Length Factor (k2)	Angle Factor (k2)			
		TPU and TNU Chains		TRU and TKU Chains	
		Dry	Lubricated	Dry	Lubricated
30°	0.50	1.15	1.10	1.20	1.10
60°	1.00	1.30	1.15	1.45	1.25
90°	1.60	1.50	1.25	1.75	1.35
120°	2.10	1.70	1.35	2.10	1.50
150°	2.60	1.90	1.50	2.50	1.70
180°	3.10	2.20	1.60	3.00	1.85

k2 and k3 factors are to be used for curved movement except for TO and TU types.

k3 = $\frac{\text{Turning Angle}}{180^\circ}$

Step 5 - Top Plate width

Generally, the top plate must be wider than the material conveyed. When materials are very wide, and none of the top plate widths are satisfactory, top plates of the same width may be used in multi-strand arrangement. Top plates of different widths can be used together, but this is not desirable since the tension on the chains will be uneven.

Step 6 - Calculate Chain tension (T)

1 - Linear movement.

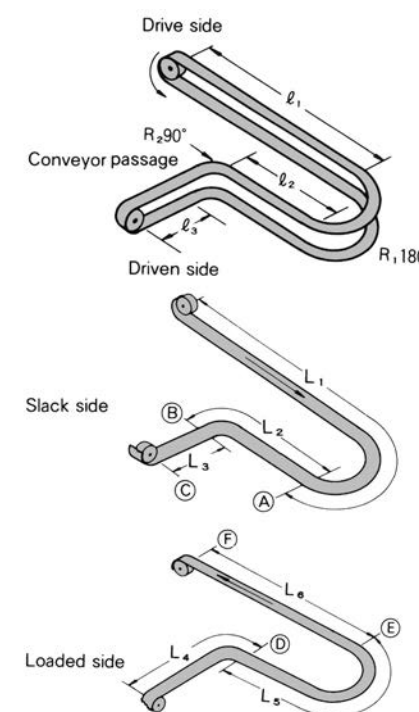
(TS, TT, TP, TN, TTP and P chains)

$$T = (M + 2.1w) Lf2 + ML'f3 \dots \dots \dots \text{Formula 1}$$

2 - Curved Movement

(TRU, TKU, TPU, TNU and TTU Chains)

The chain tension for curved movement is calculated similarly to that for linear movement. The tension at corners, however, is compensated for by the angle factor (K2) and length factor (K3).



Slack Side

Chain tension at A: Ta

$$Ta = L1wf2k2, L1 = l1 + R1k3 \text{ (k2 and k3 at } 180^\circ)$$

Chain tension at B: Tb

$$Tb = (Ta + L2wf2) k2, L2 = l2 + R2k3 \text{ (k2 and k3 at } 90^\circ)$$

Chain tension at C: Tc

$$Tc = Tb + L3wf2, L3 = l3$$

Loaded Side

Chain tension at d: Td

$$Td = (Tc + (M+w) L5f2 + ML'4f3) K2, L4 = l3 + R2k3$$

Chain tension at e: Te

$$Te = (Td + (M + w) L4f2 + ML'4f3) K2, L5 = l2 + R1k3$$

Chain tension at f: Tf

$$Tf = Te + (M+w) L5f2 + ML'6f3$$

3 - TO and TU Chains

Calculations for chain selection vary according to their usage and arrangement. A sample calculation is given for the arrangement shown to the right.

$$T = (M + w) Lf2 + wlf2 + ML'f3 \dots \dots \dots \text{Formula 3}$$

4 - Calculation of power required.

$$HP = \frac{(TS/33,000 \cdot \eta)}{\dots} \dots \dots \text{Formula 4}$$

Step 7 - Determine Chain Size

Multiply maximum chain tension (T) by the speed coefficient (k1) taken from the Table VII and verify that the following equation is satisfied.

$$T \times k1 \leq \text{Chain maximum allowable load} \dots \dots \dots \text{Formula 5}$$

When the maximum allowable load is insufficient, it can be corrected by using top plates with narrower width and increasing the number of chain strands, or splitting into many short conveyors.

Table VII - Speed Coefficient (k1)

Chain Speed (ft./min)	Speed Factor (k1)
0 - 50	1.0
50 - 100	1.2
100 - 160	1.4
160 - 230	1.6
230 - 300	2.2
300 - 360	2.8
360 - 400	3.2

T = Chain tension (lbs.)

M = Weight of material conveyed per foot (lbs./ft.)

w = Chain weight (lbs./ft.)

L = Center distance between sprockets (ft.)

l = Distance not loaded (ft.)

L' = Distance of material sliding on the chain for storage

(L' = 0 when items and chain are not slipping)

f2 = Coefficient of friction between the top plate and liner

f3 = Coefficient of friction between goods moved and top plate

k1 = Speed coefficient

k2 = Angle factor

k3 = Length factor

R = Radius at corner (ft.)

S = Chain speed (ft./min)

η = Mechanical transmission efficiency for drive unit

HP = Power required

Conveyor Design

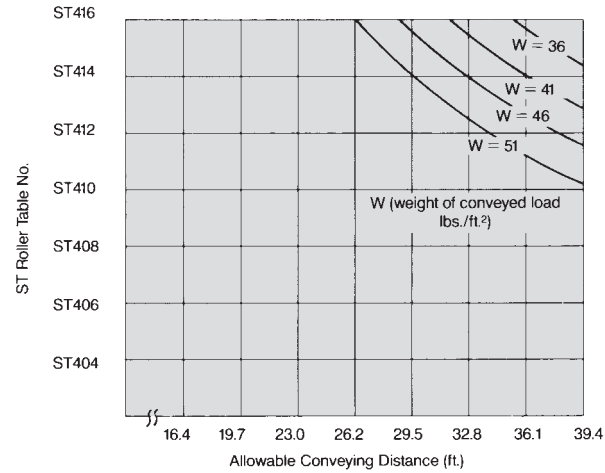
The layout of a conveyor varies with the type of chain used. A typical layout is shown below. Goods should be conveyed on the tension side of the chain, and the slack (return) side should be supported by guide rails with sloped ends to prevent chain vibration and conveyor pulsation.

III – Selection Procedure for Roller Table

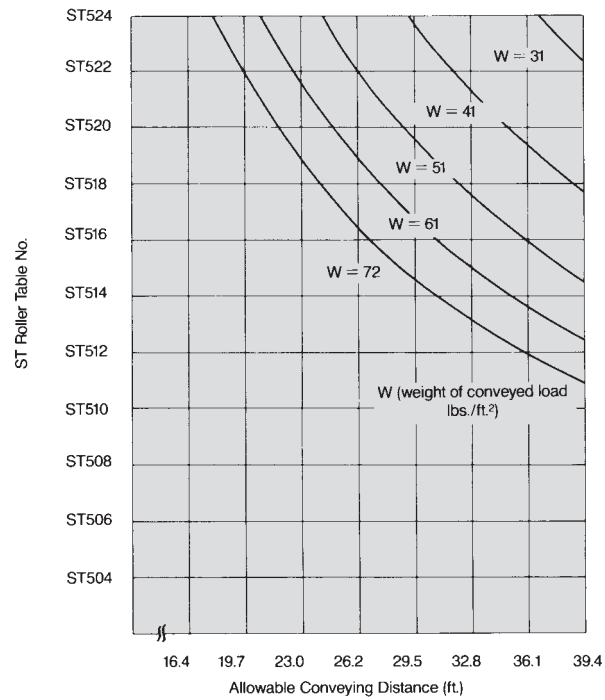
Determine the Roller Table Size with the following capability graphs:

ST – Roller Table Capability Graph

ST400



ST500

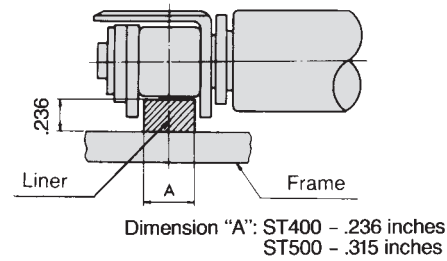


How to use the graph:
 If W equals 61 lbs./ft.² and the conveyor length equals 32.8 ft., Roller Table numbers ST514 to ST504 can be used.

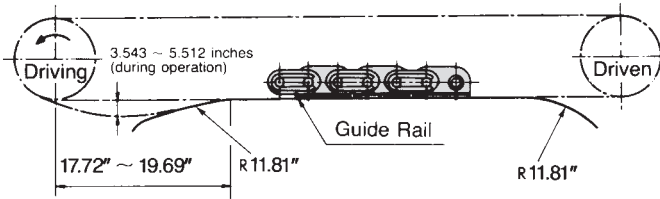
$$W \text{ [Weight of conveyed load (lbs./ft.}^2\text{)]} = \frac{\text{Weight of conveyed object (lbs.)}}{\text{Base area of conveyed object (ft.}^2\text{)}}$$

Guide for ST Roller Table

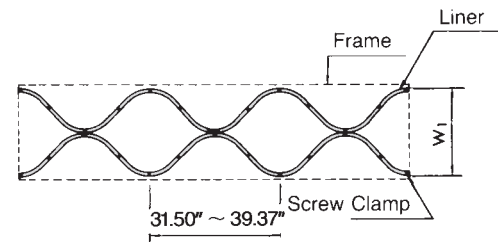
Conveying Side (reference only)



Return Side



1) Top View of Return Side



2) Cross -Sectional View

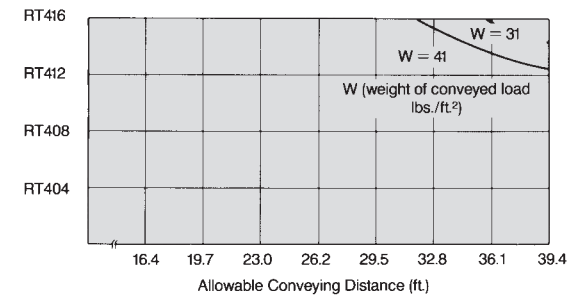


- Liner should be shaped to avoid plastic roller wear.
- Liner width (W₁) should be C₁ (effective width) minus (0.394 inches).
- Material of liner should be high polymer polyethylene.

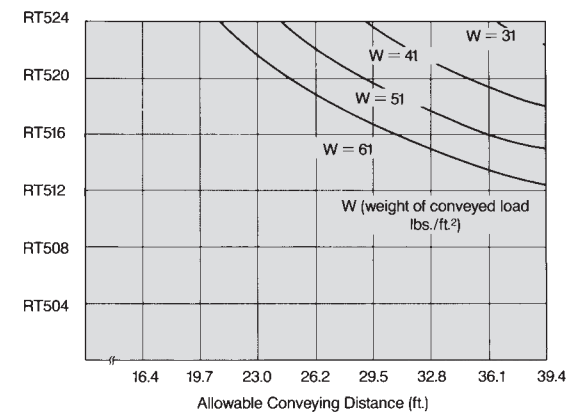
Roller Table Speed should not exceed 160 ft./min.

Roller Table Conveyor Capability Graph

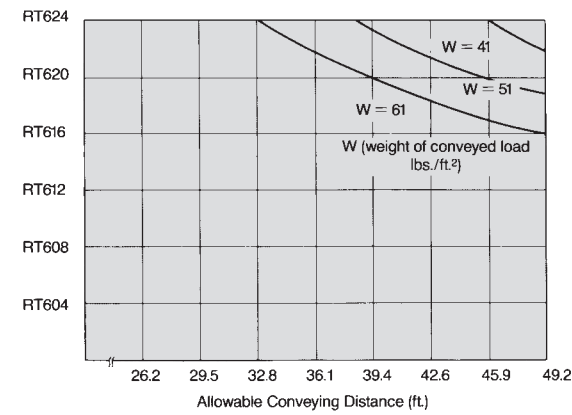
RT400



RT500



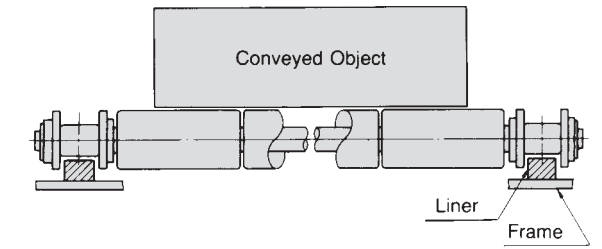
RT600



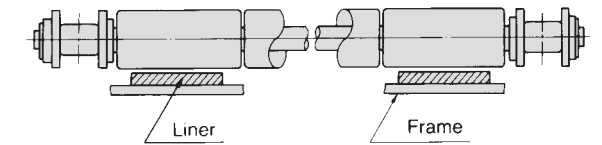
Use these graphs in the same way as for ST Roller Table.

Guide for RT Roller Table

■ Conveying Side



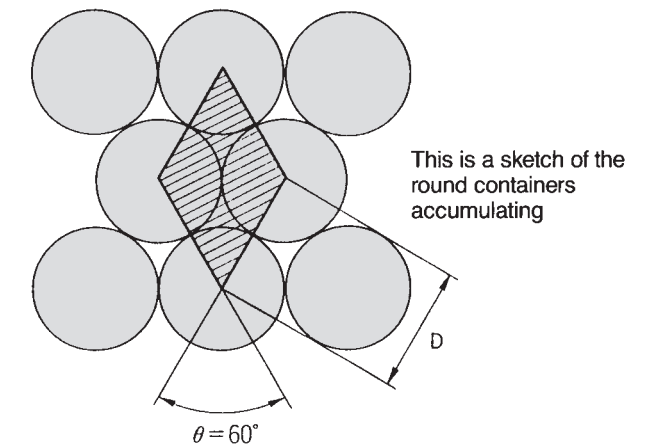
■ Return Side



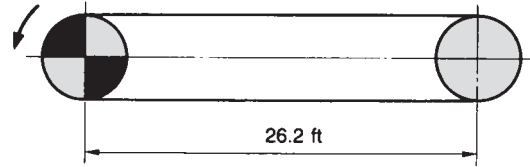
Note: Material of liner should be high polymer polyethylene.

Roller Table speed should not exceed 160 ft./min

How to calculate the carrying capacity (For round containers)



Selection Procedure Example

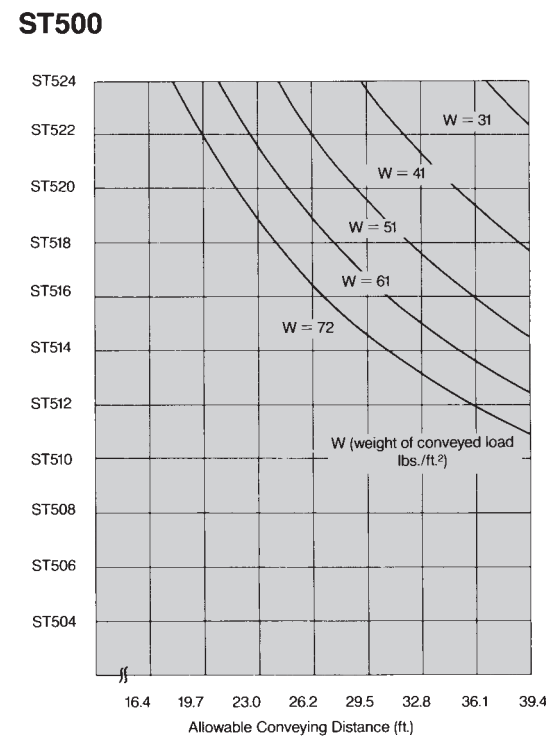
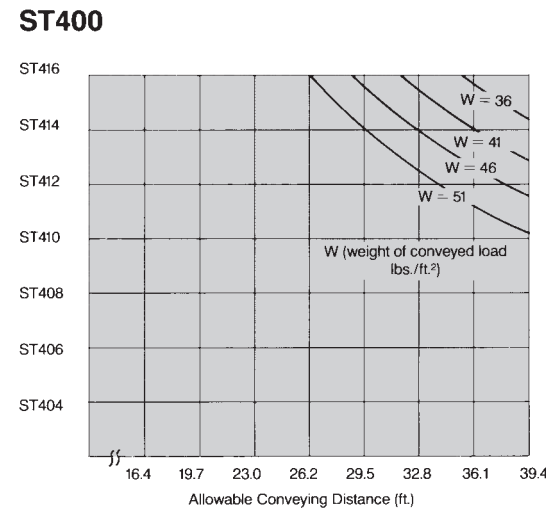


Conveyor Length – 26.2 feet
 Weight of conveyed object – 44 pounds
 Dimensions of conveyed object – 0.98 ft. x 0.66 ft. x 0.33 ft.

From the ST Roller Table conveyor capability graph:

$$W = 44 \div (.98 \times .66) = 68 \text{ lbs./ft}^2$$

If $W = 68 \text{ lbs./ft}^2$ and the conveyor length is 26.2 ft., ST504 – ST516 Roller Table is the appropriate choice according to the following table:



How to use the graph:
 If W equals 61 lbs./ft.² and the conveyor length equals 32.8 ft., Roller Table numbers ST514 to ST504 can be used.
 W [Weight of conveyed load (lbs./ft.²)]
 $= \frac{\text{Weight of conveyed object (lbs.)}}{\text{Base area of conveyed object (ft.²)}}$

Determine the chain width (C1) using the dimension diagram.
 In this example, ST510SS (NP) Roller table chain with chain-width.

PITCH CONVERSION GUIDE

No. of Pitches	Chain Number												Length of Pitches
	25 - 1/4"	35 - 3/8"	40/ 41 - 1/2"	50 - 5/8"	60 - 3/4"	80 - 1"	100 - 1-1/4"	120 - 1-1/2"	140 - 1-3/4"	160 - 2"	200 - 2-1/2"	240 - 3"	
	Chain Length (ft.)												
1	0.021	0.031	0.042	0.052	0.063	0.083	0.104	0.125	0.146	0.167	0.208	0.250	1
2	0.042	0.063	0.083	0.104	0.125	0.167	0.208	0.250	0.313	0.375	0.415	0.500	2
3	0.063	0.094	0.125	0.156	0.188	0.250	0.313	0.375	0.438	0.500	0.625	0.750	3
4	0.083	0.125	0.167	0.208	0.250	0.333	0.417	0.500	0.588	0.667	0.833	1.000	4
5	0.104	0.156	0.208	0.260	0.313	0.417	0.521	0.625	0.722	0.833	1.042	1.250	5
6	0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750	0.875	1.000	1.250	1.500	6
7	0.146	0.219	0.292	0.365	0.438	0.583	0.719	0.875	1.021	1.167	1.458	1.750	7
8	0.167	0.205	0.333	0.417	0.500	0.667	0.833	1.000	1.167	1.333	1.667	2.000	8
9	0.188	0.281	0.375	0.469	0.563	0.750	0.938	1.126	1.313	1.500	1.875	2.250	9
10	0.208	0.313	0.417	0.521	0.625	0.833	1.042	1.250	1.458	1.667	2.083	2.500	10
11	0.229	0.344	0.459	0.573	0.688	0.917	1.146	1.375	1.604	1.833	2.292	2.750	11
12	0.250	0.375	0.500	0.625	0.750	1.000	1.250	1.500	1.750	2.000	2.500	3.000	12
13	0.271	0.406	0.542	0.677	0.813	1.083	1.354	1.625	1.896	2.167	2.708	3.250	13
14	0.292	0.438	0.583	0.729	0.875	1.167	1.458	1.750	2.042	2.333	2.917	3.500	14
15	0.313	0.469	0.625	0.781	0.938	1.250	1.563	1.875	2.188	2.500	3.125	3.750	15
16	0.333	0.500	0.667	0.833	1.000	1.333	1.667	2.000	2.333	2.667	3.333	4.000	16
17	0.354	0.531	0.708	0.885	1.063	1.417	1.771	2.125	2.479	2.833	3.542	4.250	17
18	0.375	0.563	0.750	0.938	1.125	1.500	1.875	2.250	2.725	3.000	3.750	4.500	18
19	0.396	0.594	0.792	0.990	1.188	1.583	1.979	2.375	2.771	3.167	3.958	4.750	19
20	0.417	0.625	0.833	1.042	1.250	1.667	2.083	2.500	2.917	3.333	4.167	5.000	20
21	0.438	0.656	0.875	1.094	1.313	1.750	2.188	2.625	3.063	3.500	4.375	5.250	21
22	0.458	0.688	0.917	1.146	1.375	1.833	2.292	2.750	3.208	3.667	4.583	5.500	22
23	0.479	0.719	0.958	1.197	1.438	1.917	2.396	2.875	3.354	3.833	4.792	5.750	23
24	0.500	0.750	1.000	1.250	1.500	2.000	2.500	3.000	3.500	4.000	5.000	6.000	24
25	0.521	0.781	1.042	1.302	1.563	2.083	2.664	3.125	3.646	4.167	5.208	6.250	25
26	0.542	0.813	1.083	1.354	1.625	2.167	2.708	3.250	3.792	4.333	5.417	6.500	26
27	0.563	0.844	1.125	1.406	1.688	2.250	2.813	3.375	3.938	4.500	5.625	6.750	27
28	0.583	0.875	1.167	1.458	1.760	2.333	2.917	3.500	4.083	4.667	5.833	7.000	28
29	0.602	0.906	1.208	1.510	1.813	2.417	3.021	3.625	4.229	4.833	6.042	7.250	29
30	0.625	0.938	1.250	1.563	1.875	2.500	3.125	3.750	4.375	5.000	6.250	7.500	30
31	0.646	0.969	1.292	1.616	1.938	2.583	3.229	3.875	4.521	5.167	6.458	7.750	31
32	0.667	1.000	1.333	1.667	2.000	2.667	3.333	4.000	4.667	5.333	6.667	8.000	32
33	0.688	1.031	1.375	1.719	2.063	2.750	3.438	4.125	4.813	5.500	6.879	8.250	33
34	0.708	1.063	1.417	1.771	2.125	2.833	3.542	4.250	4.958	5.667	7.083	8.500	34
35	0.729	1.094	1.458	1.823	2.188	2.917	3.646	4.375	5.104	5.833	7.292	8.750	35
36	0.750	1.125	1.500	1.875	2.250	3.000	3.750	4.500	5.250	6.000	7.500	9.000	36
37	0.771	1.156	1.542	1.927	2.313	3.083	3.854	4.625	5.396	6.167	7.708	9.250	37
38	0.792	1.188	1.583	1.979	2.375	3.167	3.958	4.750	5.542	6.333	7.917	9.500	38
39	0.813	1.219	1.625	2.031	2.438	3.250	4.063	4.875	5.688	6.500	8.125	9.750	39
40	0.833	1.250	1.667	2.083	2.500	3.333	4.167	5.000	5.833	6.667	8.333	10.000	40
41	0.854	1.281	1.708	2.135	2.563	3.417	4.271	5.125	5.979	6.833	8.542	10.250	41
42	0.875	1.313	1.750	2.188	2.625	3.500	4.375	5.250	6.125	7.000	8.750	10.500	42
43	0.896	1.344	1.792	2.240	2.688	3.583	4.479	5.375	6.271	7.167	8.958	10.750	43
44	0.917	1.375	1.833	2.292	2.750	3.667	4.583	5.500	6.417	7.333	9.167	11.000	44
45	0.938	1.406	1.875	2.344	2.813	3.750	4.688	5.625	6.563	7.500	9.375	11.250	45
46	0.958	1.438	1.917	2.396	2.875	3.833	4.792	5.750	6.708	7.667	9.583	11.500	46
47	0.979	1.469	1.958	2.448	2.938	3.917	4.896	5.875	6.854	7.833	9.792	11.750	47
48	1.000	1.500	2.000	2.500	3.000	4.000	5.000	6.000	7.000	8.000	10.000	12.000	48
49	1.021	1.531	2.042	2.552	3.063	4.083	5.104	6.125	7.146	8.167	10.208	12.250	49
50	1.042	1.563	2.083	2.604	3.125	4.167	5.208	6.250	7.292	8.333	10.417	12.500	50
51	1.063	1.594	2.125	2.656	3.188	4.250	5.313	6.375	7.438	8.500	10.625	12.750	51
52	1.083	1.625	2.167	2.708	3.250	4.333	5.417	6.500	7.583	8.667	10.833	13.000	52
53	1.104	1.656	2.208	2.760	3.125	4.417	5.521	6.625	7.729	8.833	11.042	13.250	53
54	1.125	1.688	2.250	2.813	3.375	4.500	5.625	6.750	7.875	9.000	11.250	13.500	54
55	1.146	1.719	2.292	2.865	3.438	4.583	5.729	6.875	8.021	9.167	11.458	13.750	55
56	1.167	1.750	2.333	2.917	3.500	4.667	5.833	7.000	8.167	8.333	11.667	14.000	56
57	1.138	1.781	2.375	2.969	3.563	4.750	5.938	7.125	8.313	9.500	11.875	14.250	57
58	1.208	1.813	2.417	3.021	3.625	4.833	6.042	7.250	8.458	9.667	12.083	14.500	58
59	1.228	1.844	2.458	3.073	3.687	4.917	6.146	7.375	8.604	9.833	12.192	14.750	59
60	1.250	1.875	2.500	3.125	3.750	5.000	6.250	7.500	8.750	10.000	12.500	15.000	60
61	1.271	1.906	2.542	3.177	3.813	5.083	6.354	7.625	8.896	10.167	12.708	15.250	61
62	1.292	1.938	2.583	3.229	3.875	5.167	6.458	7.750	9.042	10.333	12.917	15.500	62
63	1.313	1.969	2.625	3.281	3.938	5.250	6.563	7.875	9.188	10.500	13.125	15.750	63
64	1.333	2.000	2.667	3.333	4.000	5.333	6.667	8.000	9.333	10.667	13.333	16.000	64
65	1.354	2.031	2.708	3.385	4.063	5.417	6.813	8.125	9.479	10.833	13.542	16.250	65
66	1.375	2.063	2.750	3.438	4.125	5.500	6.917	8.250	9.625	11.000	13.750	16.500	66
67	1.396	2.094	2.792	3.490	4.188	5.583	7.019	8.375	9.771	11.167	13.958	16.750	67
68	1.417	2.125	2.833	3.542	4.250	5.667	7.183	8.500	9.917	11.333	14.167	17.000	68
69	1.438	2.156	2.875	3.594	4.313	5.750	7.288	8.625	10.063	11.500	14.375	17.250	69
70	1.458	2.188	2.917	3.646	4.375	5.833	7.392	8.750	10.208	11.667	14.583	17.500	70
71	1.479	2.219	2.958	3.698	4.438	5.917	7.496	8.875	10.354	11.833	14.792	17.750	71
72	1.500	2.250	3.000	3.750	4.500	6.000	7.500	9.000	10.500	12.000	15.000	18.000	72
73	1.521	2.281	3.042	3.802	4.563	6.083	7.604	9.125	10.646	12.167	15.208	18.250	73
74	1.542	2.313	3.083	3.854	4.625	6.167	7.708	9.250	10.792	12.333	15.417	18.500	74
75	1.553	2.344	3.125	3.906	4.688	6.250	7.813	9.375	10.938	12.500	15.625	18.750	75
76	1.583	2.375	3.167	3.958	4.750	6.333	7.917	9.500	11.083	12.667	15.833	19.000	76
77	1.604	2.406	3.208	4.010	4.813	6.417	8.021	9.625	11.229	12.833	16.042	19.250	77
78	1.625	2.438	3.250</										

Horsepower Ratings

40 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	10	25	50	100	200	300	400	500	700	900	1000	1200
9	0.06	0.15	0.28	0.52	0.97	1.39	1.81	2.21	2.99	3.74	4.12	4.85
10	0.06	0.16	0.31	0.58	1.09	1.55	2.02	2.47	3.35	4.20	4.61	
11	0.08	0.19	0.35	0.64	1.21	1.73	2.24	2.73	3.71	4.65	5.11	
12	0.09	0.20	0.38	0.71	1.31	1.90	2.47	3.00	4.08	5.11		
13	0.09	0.23	0.42	0.76	1.43	2.08	2.68	3.28	4.44	5.56		
14	0.11	0.24	0.44	0.83	1.55	2.24	2.91	3.55	4.81			
15	0.11	0.25	0.48	0.90	1.68	2.41	3.14	3.83	5.19			
16	0.12	0.28	0.52	0.97	1.80	2.59	3.37	4.10	5.56			
17	0.13	0.29	0.55	1.03	1.92	2.76	3.58	4.38				
18	0.13	0.31	0.59	1.10	2.04	2.95	3.81	4.67				
19	0.15	0.34	0.62	1.17	2.17	3.12	4.05	4.95				
20	0.16	0.35	0.66	1.23	2.29	3.30	4.28	5.23				
21	0.16	0.38	0.70	1.30	2.41	3.47	4.51	5.51				
22	0.17	0.39	0.72	1.35	2.53	3.66	4.73	5.79				
23	0.17	0.42	0.76	1.42	2.67	3.83	4.97	6.07				
24	0.19	0.43	0.80	1.49	2.79	4.02	5.20					
25	0.20	0.44	0.83	1.55	2.91	4.20	5.44					
26	0.20	0.47	0.87	1.64	3.04	4.38	5.67					
28	0.23	0.51	0.95	1.77	3.30	4.75	6.14					
30	0.24	0.55	1.02	1.90	3.55	5.11						
32	0.25	0.59	1.10	2.04	3.81	5.48						
35	0.28	0.64	1.21	2.25	4.20	6.03						
40	0.32	0.75	1.39	2.60	4.84							
45	0.38	0.84	1.58	2.95	5.50							

50 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	10	25	50	100	200	300	400	500	600	700	800	900
9	0.13	0.31	0.58	1.07	2.00	2.88	3.73	4.56	5.38	6.18	6.96	7.74
10	0.15	0.35	0.64	1.21	2.24	3.23	4.18	5.11	6.02	6.92	7.80	
11	0.16	0.39	0.71	1.33	2.48	3.58	4.64	5.67	6.68	7.67		
12	0.19	0.42	0.78	1.46	2.72	3.93	5.10	6.22	7.34	8.42		
13	0.20	0.46	0.86	1.59	2.98	4.29	5.55	6.79	7.99			
14	0.21	0.50	0.92	1.73	3.22	4.64	6.02	7.35	8.66			
15	0.23	0.54	0.99	1.86	3.47	5.00	6.48	7.93				
16	0.25	0.58	1.07	2.00	3.73	5.36	6.95	8.49				
17	0.27	0.62	1.14	2.13	3.97	5.73	7.42	9.07				
18	0.28	0.66	1.22	2.27	4.22	6.09	7.89					
19	0.31	0.68	1.29	2.40	4.48	6.45	8.37					
20	0.32	0.72	1.35	2.53	4.73	6.83	8.84					
21	0.34	0.76	1.43	2.68	4.99	7.19	9.32					
22	0.35	0.80	1.50	2.82	5.26	7.56						
23	0.38	0.84	1.58	2.95	5.51	7.94						
24	0.39	0.88	1.66	3.10	5.77	8.31						
25	0.40	0.92	1.73	3.23	6.03	8.69						
26	0.43	0.97	1.81	3.37	6.29	9.07						
28	0.46	1.05	1.96	3.65	6.81	9.82						
30	0.50	1.13	2.10	3.93	7.34							
32	0.54	1.21	2.27	4.22	7.87							
35	0.59	1.34	2.49	4.64	8.68							
40	0.67	1.54	2.87	5.36	10.0							
45	0.76	1.76	3.27	6.10								

Horsepower Ratings

60 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	10	25	50	100	150	200	250	300	400	500	600	700
9	0.24	0.55	1.02	1.89	2.72	3.54	4.32	5.10	6.60	8.06	9.5	10.9
10	0.27	0.60	1.14	2.12	3.06	3.96	4.84	5.70	7.39	9.04	10.6	
11	0.29	0.67	1.26	2.35	3.39	4.38	5.36	6.32	8.19	10.0		
12	0.32	0.74	1.38	2.59	3.73	4.83	5.90	6.95	8.99	11.0		
13	0.35	0.80	1.52	2.82	4.06	5.26	6.42	7.58	9.82			
14	0.39	0.87	1.64	3.06	4.40	5.70	6.96	8.21	10.6			
15	0.42	0.94	1.76	3.29	4.73	6.14	7.50	8.84	11.4			
16	0.44	1.01	1.89	3.53	5.08	6.58	8.05	9.48				
17	0.47	1.09	2.01	3.77	5.42	7.03	8.58	10.1				
18	0.51	1.15	2.15	4.01	5.77	7.47	9.13	10.7				
19	0.54	1.22	2.28	4.24	6.11	7.93	9.68	11.4				
20	0.56	1.29	2.40	4.49	6.46	8.37	10.2	12.5				
21	0.59	1.35	2.53	4.73	6.81	8.82	10.8	12.7				
22	0.63	1.42	2.67	4.97	7.16	9.28	10.3					
23	0.66	1.50	2.79	5.22	7.51	9.74	11.9					
24	0.68	1.57	2.92	5.46	7.87	10.2	12.5					
25	0.72	1.64	3.06	5.71	8.22	10.6	13.0					
26	0.75	1.72	3.19	5.95	8.58	11.1						
28	0.82	1.85	3.46	6.45	9.29	12.0						
30	0.87	2.00	3.73	6.95	10.0	13.0						
32	0.94	2.15	3.99	7.46	10.7							
35	1.03	2.36	4.40	8.21	11.8							
40	1.19	2.72	5.08	9.48	13.7							
45	1.35	3.10	5.77	10.8								

80 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	10	25	50	75	100	125	150	200	250	300	350	
9	0.54	1.22	2.27	3.27	4.24	5.18	6.10	7.91	9.67	11.4	13.1	
10	0.60	1.37	2.55	3.66	4.75	5.81	6.84	8.86	10.84	12.8	14.6	
11	0.66	1.51	2.82	4.06	5.27	6.44	7.59	9.83	12.0	14.2		
12	0.72	1.66	3.10	4.46	5.78	7.07	8.33	10.8	13.2			
13	0.79	1.81	3.38	4.87	6.30	7.71	9.08	11.8	14.3			
14	0.86	1.96	3.66	5.27	6.84	8.35	9.84	12.7	15.5			
15	0.92	2.12	3.94	5.69	7.36	8.99	10.6	13.7				
16	0.99	2.27	4.22	6.09	7.89	9.64	11.4	14.7				
17	1.06	2.41	4.52	6.50	8.42	10.3	12.1	15.7				
18	1.13	2.57	4.80	6.92	8.96	11.0	12.9					
19	1.19	2.72	5.10	7.34	9.51	11.6	13.7					
20	1.26	2.88	5.38	7.75	10.0	12.3	14.5					
21	1.33	3.04	5.67	8.17	10.6	12.9	15.3					
22	1.41	3.19	5.97	8.60	11.1	13.5	16.1					
23	1.47	3.35	6.26	9.01	11.7	14.2	16.8					
24	1.54	3.51	6.56	9.44	12.2	14.9						
25	1.61	3.67	6.85	9.87	12.8	15.7						
26	1.68	3.83	7.15	10.3	13.3	16.4						
28	1.82	4.14	7.74	11.1	14.5	17.7						
30	1.96	4.47	8.34	12.0	15.5							
32	2.10	4.79	8.94	12.9	16.6							
35	2.32	5.28	9.86	14.2	18.4							
40	2.67	6.10	11.4	16.4								
45	3.03	6.92	12.9	18.6								

Horsepower Ratings

100 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	10	25	50	75	100	125	150	175	200	225	250	275
9	0.88	2.02	3.78	5.46	7.07	8.64	10.2	11.7	13.2	14.6	16.1	17.6
10	0.99	2.28	4.24	6.11	7.91	9.68	11.4	13.1	14.7	16.5	18.1	
11	1.10	2.52	4.70	6.77	8.77	10.7	12.6	14.5	16.4	18.0		
12	1.22	2.76	5.16	7.44	9.64	11.8	13.9	15.9	18.0			
13	1.33	3.02	5.63	8.11	10.5	12.8	15.1	17.4				
14	1.43	3.27	6.10	8.79	11.4	13.9	16.4	18.9				
15	1.54	3.53	6.57	9.47	12.3	15.0	17.7					
16	1.65	3.78	7.05	10.1	13.1	16.1	18.9					
17	1.77	4.04	7.52	10.8	14.1	17.2						
18	1.88	4.29	8.00	11.5	14.9	18.2						
19	2.00	4.55	8.49	12.2	15.8	19.3						
20	2.10	4.80	8.97	12.9	16.8	20.5						
21	2.23	5.07	9.45	13.7	17.7							
22	2.33	5.32	9.94	14.3	18.5							
23	2.45	5.59	10.4	15.0	19.4							
24	2.56	5.85	10.9	15.7	20.4							
25	2.68	6.11	11.4	16.5	21.3							
26	2.80	6.38	11.9	17.2								
28	3.03	6.92	12.9	18.6								
30	3.26	7.44	13.9	20.0								
32	3.50	7.99	14.9	21.4								
35	3.86	8.79	16.4									
40	4.45	10.2	18.9									
45	5.05	11.5	21.6									

120 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	5	10	15	20	25	30	40	50	60	80	100	125
9	0.87	1.64	2.35	3.04	3.72	4.39	5.67	6.93	8.18	10.6	12.9	15.8
10	0.98	1.82	2.63	3.41	4.17	4.91	6.36	7.78	9.16	11.9	14.5	17.7
11	1.09	2.03	2.91	3.78	4.61	5.45	7.04	8.62	10.1	13.1	16.1	
12	1.19	2.23	3.21	4.14	5.07	5.98	7.74	9.47	11.1	14.5	17.7	
13	1.30	2.43	3.49	4.52	5.53	6.52	8.44	10.3	12.2	15.7	19.3	
14	1.41	2.63	3.78	4.90	5.99	7.05	9.15	11.2	13.2	17.0		
15	1.52	2.83	4.08	5.28	6.45	7.60	9.86	12.0	14.2	18.4		
16	1.62	3.03	4.37	5.66	6.92	8.15	10.6	12.9	15.1	19.7		
17	1.73	3.25	4.67	6.05	7.39	8.70	11.3	13.8	16.2			
18	1.85	3.45	4.96	6.42	7.86	9.27	12.0	14.6	17.3			
19	1.96	3.65	5.26	6.81	8.33	9.82	12.7	15.5	18.4			
20	2.07	3.86	5.57	7.20	8.81	10.4	13.4	16.5	19.3			
21	2.19	4.06	5.86	7.59	9.28	10.9	14.2	17.3	20.4			
22	2.29	4.28	6.17	7.98	9.76	11.5	14.9	18.2				
23	2.40	4.49	6.46	8.38	10.2	12.1	15.7	19.2				
24	2.52	4.71	6.77	8.77	10.7	12.6	16.4	20.0				
25	2.63	4.91	7.08	9.17	11.2	13.2	17.2	20.9				
26	2.75	5.12	7.39	9.56	11.7	13.8	17.8	21.8				
28	2.98	5.55	7.99	10.3	12.7	14.9	19.3					
30	3.21	5.98	8.62	11.2	13.7	16.1	20.8					
32	3.43	6.41	9.24	12.0	14.6	17.3	22.4					
35	3.78	7.07	10.2	13.2	16.1	19.0						
40	4.37	8.17	11.7	15.3	18.6	22.0						
45	4.96	9.27	13.3	17.3	21.2							

Horsepower Ratings

140 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	5	10	15	20	25	30	40	50	60	80	100	125
9	1.37	2.55	3.67	4.76	5.82	6.87	8.89	10.8	12.8	16.6	20.3	24.8
10	1.53	2.86	4.12	5.34	6.53	7.68	9.96	12.2	14.3	18.6	22.7	
11	1.70	3.17	4.57	5.91	7.23	8.53	11.0	13.5	15.9	20.6	25.2	
12	1.86	3.49	5.02	6.50	7.95	9.36	12.1	14.9	17.4	22.7		
13	2.04	3.80	5.47	7.09	8.66	10.2	13.2	16.2	19.0	24.7		
14	2.20	4.12	5.93	7.68	9.39	11.1	14.3	17.6	20.6	26.7		
15	2.37	4.44	6.38	8.27	10.1	11.9	15.4	18.9	22.2			
16	2.55	4.75	6.85	8.87	10.8	12.8	16.5	20.2	23.9			
17	2.72	5.07	7.31	9.47	11.6	13.7	17.7	21.6	25.5			
18	2.90	5.40	7.78	10.1	12.3	14.5	18.8	22.9	27.1			
19	3.07	5.73	8.25	10.7	13.0	15.4	20.0	24.4				
20	3.25	6.05	8.72	11.3	13.8	16.2	21.0	25.7				
21	3.42	6.37	9.19	11.9	14.5	17.2	22.2	27.1				
22	3.59	6.71	9.66	12.5	15.3	18.0	23.3	28.5				
23	3.77	7.04	10.1	13.1	16.1	18.9	24.5					
24	3.94	7.36	10.6	13.7	16.8	19.8	25.6					
25	4.13	7.70	11.1	14.3	17.6	20.6	26.8					
26	4.31	8.03	11.6	15.0	18.4	21.6	27.9					
28	4.67	8.70	12.5	16.2	19.8	23.3	30.3					
30	5.02	9.37	13.5	17.4	21.3	25.2						
32	5.39	10.0	14.5	18.8	22.9	26.9						
35	5.93	11.1	15.9	20.6	25.2	29.8						
40	6.85	12.8	18.4	23.9	29.1							

160 Lambda® Horsepower Ratings (Single Strand Chain)

Small Sprocket Teeth No.	Small Sprocket Max. rpm											
	5	10	15	20	25	30	40	50	60	80	100	
9	2.07	3.85	5.54	7.18	8.77	10.3	13.4	16.4	19.3	24.9	30.6	
10	2.31	4.31	6.21	8.03	9.83	11.6	15.0	18.4	21.6	28.0		
11	2.56	4.77	6.88	8.91	10.9	12.8	16.6	20.4	24.0	31.0		
12	2.82	5.24	7.55	9.79	11.9	14.1	18.2	22.3	26.3	34.1		
13	3.06	5.71	8.23	10.7	13.0	15.4	19.8	24.3	28.7			
14	3.33	6.20	8.92	11.5	14.1	16.6	21.6	26.4	31.1			
15	3.58	6.68	9.62	12.4	15.3	18.0	23.2	28.4	33.5			
16	3.84	7.16	10.3	13.3	16.4	19.2	24.9	30.4	35.9			
17	4.09	7.64	11.0	14.2	17.4	20.5	26.6	32.5				
18	4.36	8.13	11.7	15.2	18.5	21.9	28.3	34.6				
19	4.61	8.61	12.4	16.1	19.7	23.2	30.0	36.6				
20	4.88	9.11	13.1	17.0	20.8	24.4	31.7					
21	5.14	9.6	13.8	18.0	21.9	25.8	33.4					
22	5.40	10.1	14.5	18.8	23.1	27.1	35.1					
23	5.67	10.6	15.3	19.7	24.1	28.4	36.9					
24	5.94	11.1	16.0	20.7	25.3	29.8	38.6					
25	6.21	11.6	16.6	21.6	26.4	31.1						
26	6.48	12.1	17.4	22.5	27.6	32.5						
28	7.01	13.1	18.9	24.4	29.9	35.1						
30	7.56	14.1	20.4	26.3	32.2	38.0						
32	8.10	15.2	21.7	28.2	34.5	40.6						
35	8.93	16.6	24.0	31.1	38.0							
40	10.3	19.3	27.8	35.9								

Horsepower Ratings

40 Drive Xceeder®

No. of Teeth Small Sprocket	Horsepower Ratings - Maximum Speed - Small Sprocket (RPM)											
	10	25	50	100	200	300	400	500	700	900	1000	1200
9	0.07	0.15	0.28	0.52	0.97	1.39	1.81	2.20	2.99	3.74	4.11	4.85
10	0.07	0.16	0.31	0.58	1.09	1.55	2.02	2.47	3.34	4.20	4.61	
11	0.08	0.19	0.35	0.64	1.21	1.73	2.24	2.73	3.70	4.65	5.11	
12	0.09	0.20	0.38	0.71	1.31	1.90	2.47	3.00	4.07	5.11		
13	0.09	0.23	0.42	0.76	1.43	2.06	2.68	3.28	4.44	5.56		
14	0.11	0.24	0.44	0.83	1.55	2.24	2.91	3.55	4.81			
15	0.11	0.25	0.48	0.90	1.68	2.41	3.14	3.83	5.19			
16	0.12	0.28	0.52	0.97	1.80	2.59	3.35	4.10	5.55			
17	0.13	0.29	0.55	1.03	1.92	2.76	3.58	4.38				
18	0.13	0.31	0.59	1.10	2.04	2.95	3.81	4.66				
19	0.15	0.34	0.62	1.17	2.17	3.12	4.05	4.95				
20	0.16	0.35	0.66	1.23	2.29	3.30	4.28	5.23				
21	0.16	0.38	0.70	1.29	2.41	3.47	4.50	5.51				
22	0.17	0.39	0.72	1.35	2.53	3.66	4.73	5.79				
23	0.17	0.42	0.76	1.42	2.67	3.83	4.97	6.07				
24	0.19	0.43	0.80	1.49	2.79	4.02	5.20					
25	0.20	0.44	0.83	1.55	2.91	4.20	5.44					
26	0.20	0.47	0.87	1.62	3.04	4.38	5.67					
28	0.23	0.51	0.95	1.77	3.30	4.74	6.14					
30	0.24	0.55	1.02	1.90	3.55	5.11						
32	0.25	0.59	1.09	2.04	3.81	5.48						
35	0.28	0.64	1.21	2.24	4.20	6.03						
40	0.32	0.75	1.39	2.59	4.84							
45	0.38	0.84	1.58	2.95	5.50							

50 Drive Xceeder®

No. of Teeth Small Sprocket	Horsepower Ratings - Maximum Speed - Small Sprocket (RPM)											
	10	25	50	100	200	300	400	500	600	700	8000	900
9	0.13	0.31	0.58	0.52	0.97	1.39	1.81	2.20	5.37	6.17	6.96	7.73
10	0.15	0.31	0.64	0.58	1.09	1.55	2.02	2.47	3.34	4.20	7.80	
11	1.50	0.38	0.71	0.64	1.21	1.73	2.24	2.73	3.70	4.65		
12	0.19	0.42	0.78	0.71	1.31	1.90	2.47	3.00	4.07	5.11		
13	0.02	0.46	0.86	0.76	1.43	2.06	2.68	3.28	4.44	5.56		
14	0.21	0.50	0.92	0.83	1.55	2.24	2.91	3.55	4.81			
15	0.23	0.54	0.99	0.90	1.68	2.41	3.14	3.83	5.19			
16	0.25	0.58	1.07	0.97	1.80	2.59	3.35	4.10	5.55			
17	0.27	0.62	1.14	1.03	1.92	2.76	3.58	4.38				
18	0.28	0.66	1.22	1.10	2.04	2.95	3.81	4.66				
19	0.31	0.68	1.29	1.17	2.17	3.12	4.05	4.95				
20	0.32	0.72	1.35	1.23	2.29	3.30	4.28	5.23				
21	0.34	0.76	1.43	1.29	2.41	3.47	4.50	5.51				
22	0.35	0.80	1.50	1.35	2.53	3.66	4.73	5.79				
23	0.38	0.84	1.58	1.42	2.67	3.83	4.97	6.07				
24	0.39	0.88	1.66	1.49	2.79	4.02	5.20					
25	0.40	0.92	1.73	1.55	2.91	4.20	5.44					
26	0.43	0.97	1.81	1.62	3.04	4.38	5.67					
28	0.46	1.05	1.96	1.77	3.30	4.74	6.14					
30	0.50	1.13	2.10	1.90	3.55	5.11						
32	0.54	1.21	2.27	2.04	3.81	5.48						
35	0.59	1.33	2.49	2.24	4.20	6.03						
40	0.67	1.54	2.87	2.59	4.84							
45	0.76	1.74	3.27	2.95	5.50							

Horsepower Ratings

60 Drive Xceeder®

No. of Teeth Small Sprocket	Horsepower Ratings - Maximum Speed - Small Sprocket (RPM)											
	10	25	50	100	150	200	250	300	400	500	600	700
9	0.24	0.55	1.02	1.89	2.72	3.52	4.32	5.08	6.59	8.06	9.49	10.91
10	0.27	0.60	1.14	2.12	3.06	3.95	4.84	5.70	7.39	9.02	10.64	
11	0.29	0.67	1.26	2.35	3.39	4.38	5.36	6.31	8.19	10.00		
12	0.32	0.74	1.38	2.59	3.71	4.81	5.88	6.94	8.99	10.99		
13	0.35	0.80	1.51	2.81	4.06	5.25	6.42	7.57	9.80			
14	0.39	0.87	1.64	3.06	4.40	5.70	6.96	8.20	10.62			
15	0.42	0.94	1.76	3.28	4.73	6.13	7.49	8.83	11.45			
16	0.44	1.01	1.89	3.52	5.08	6.57	8.04	9.46				
17	0.47	1.09	2.01	3.77	5.41	7.02	8.58	10.11				
18	0.51	1.15	2.14	3.99	5.76	7.47	9.13	10.75				
19	0.54	1.22	2.28	4.24	6.11	7.91	9.68	11.41				
20	0.56	1.29	2.40	4.48	6.46	8.36	10.23	12.05				
21	0.59	1.35	2.53	4.73	6.81	8.82	10.78					
22	0.63	1.42	2.67	4.97	7.16	9.27	11.34					
23	0.66	1.50	2.79	5.21	7.51	9.73	11.89					
24	0.68	1.57	2.92	5.46	7.87	10.19	12.45					
25	0.72	1.64	3.06	5.71	8.22	10.64	13.01					
26	0.75	1.72	3.19	5.95	8.58	11.11						
28	0.82	1.85	3.46	6.45	9.29	12.04						
30	0.87	2.00	3.73	6.94	10.00	12.96						
32	0.94	2.14	3.99	7.45	10.72							
35	1.03	2.36	4.40	8.20	11.82							
40	1.19	2.72	5.08	9.48	13.67							
45	1.35	3.10	5.76	10.76								

80 Drive Xceeder®

No. of Teeth Small Sprocket	Horsepower Ratings - Maximum Speed - Small Sprocket (RPM)										
	10	25	50	75	100	125	150	200	250	300	350
9	0.54	1.22	2.27	3.27	4.24	5.17	6.10	7.91	9.66	11.39	13.08
10	0.60	1.37	2.55	3.66	4.74	5.80	6.84	8.86	10.83	12.76	14.61
11	0.66	1.51	2.81	4.06	5.27	6.43	7.57	9.82	12.01	14.21	
12	0.72	1.66	3.10	4.46	5.78	7.06	8.32	10.79	13.19		
13	0.79	1.81	3.38	4.87	6.30	7.71	9.07	11.75	14.34		
14	0.86	1.96	3.66	5.27	6.82	8.35	9.84	12.75	15.55		
15	0.92	2.12	3.94	5.68	7.36	8.99	10.59	13.67			
16	0.99	2.27	4.22	6.08	7.88	9.64	11.37	14.74			
17	1.06	2.41	4.52	6.50	8.42	10.26	12.13	15.68			
18	1.13	2.57	4.80	6.92	8.95	10.95	12.91				
19	1.19	2.72	5.09	7.33	9.49	11.61	13.67				
20	1.26	2.88	5.37	7.75	10.04	12.26	14.48				
21	1.33	3.04	5.67	8.16	10.57	12.93	15.28				
22	1.39	3.19	5.96	8.59	11.12	13.54	16.08				
23	1.47	3.35	6.26	9.01	11.67	14.21	16.75				
24	1.54	3.51	6.55	9.44	12.22	14.88					
25	1.61	3.67	6.85	9.85	12.77	15.55					
26	1.68	3.82	7.14	10.28	13.32	16.35					
28	1.82	4.14	7.73	11.14	14.48	17.69					
30	1.96	4.46	8.34	12.01	15.55						
32	2.10	4.78	8.94	12.87	16.62						
35	2.31	5.28	9.84	14.21	18.36						
40	2.67	6.10	11.37	16.35							
45	3.03	6.92	12.94	18.63							

Horsepower Ratings

100 Drive Xceeder®

No. of Teeth Small Sprocket	Horsepower Ratings - Maximum Speed - Small Sprocket (RPM)											
	10	25	50	75	100	125	150	175	200	225	250	275
9	0.88	2.02	3.78	5.46	7.06	8.63	10.17	11.69	13.18	14.61	16.08	17.56
10	0.99	2.28	4.24	6.11	7.91	9.68	11.39	13.09	14.74	16.35	18.09	
11	1.10	2.52	4.70	6.77	8.77	10.72	12.63	14.48	16.35	18.23		
12	1.21	2.76	5.16	7.44	9.64	11.78	13.94	15.95	17.96			
13	1.33	3.02	5.63	8.11	10.51	12.84	15.15	17.42				
14	1.43	3.27	6.10	8.79	11.38	13.94	16.35	18.76				
15	1.54	3.52	6.57	9.46	12.26	15.01	17.69					
16	1.65	3.78	7.05	10.15	13.15	16.08	18.90					
17	1.77	4.03	7.52	10.83	14.07	17.16						
18	1.88	4.29	8.00	11.53	14.88	18.23						
19	2.00	5.21	8.48	12.21	15.82	19.30						
20	2.10	4.80	8.97	12.91	16.75	20.51						
21	2.22	5.07	9.45	13.67	17.69							
22	2.33	5.32	9.93	14.34	18.50							
23	2.45	5.59	10.43	15.01	19.43							
24	2.56	5.84	10.91	15.68	20.37							
25	2.68	6.11	11.41	16.49	21.31							
26	2.80	6.38	11.90	17.16								
28	3.03	6.90	12.89	18.63								
30	3.26	7.44	13.94	19.97								
32	3.50	7.97	14.88	21.44								
35	3.86	8.79	16.38									
40	4.45	10.16	18.90									
45	5.05	11.53	21.58									

TERMS AND CONDITIONS OF SALE

PRICE-PAYMENT

The prices stated are those in effect on the date hereof and are subject to change based on prices in effect on the date of shipment. Interest at the rate of 18% per annum shall be charged on overdue payments. Prices are for Seller's standard packaging only, and F.O.B. Seller's plant or warehouse. All orders are subject to credit approval. Terms of payment are net, 30 days. In the event of non-payment by Buyer, Buyer shall pay all of Seller's costs of collection, including reasonable attorneys' fees. Up to 5% over or under the specified quantity for made-to-order products may be shipped at Seller's option.

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- (a) Any time for delivery stated herein is approximate. Delivery shall be deemed complete by tender of the products to a common carrier. Partial shipments are permitted.
- (b) Orders are not subject to cancellation or revision, in whole or in part, without written approval of Seller.
- (c) Should Buyer cause changes to be made in the design or construction of said products, or otherwise delay or interrupt the progress of the work hereunder, Buyer will reimburse Seller for any additional expenses arising therefrom.
- (d) Seller shall not be liable for any delay caused by acts of God, riot or civil commotion, government orders, rules, regulations, suspensions or requisitions of any kind, strikes or other stoppages of labor or shortage in the supply of labor or material, fire casualties or accidents, or any cause, whether of the same or a different character, beyond Seller's control. Any such delay shall extend the time for delivery of the products. Delay in delivery of any installment shall not relieve Buyer of its obligation to accept remaining deliveries.
- (e) If delays due to Buyer's fault exceed 60 days in the aggregate, the entire purchase price shall be due and payable to Seller on demand.

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After delivery to the carrier, Buyer assumes the risk of all loss or damage to the products resulting from any cause whatever.

LIMITED WARRANTY

Products manufactured by Seller: (a) conform to the design and specifications, if any, expressly agreed to in writing by Seller; and (b) are free of defects in workmanship and materials at the time of shipment. The warranties set forth in the preceding sentence are exclusive of all other warranties, express or implied, and extend only to Buyer and to no other person. ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED.

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Buyer is not relying upon any advice, representations or warranties (except the warranties expressly set forth above) of Seller, or upon Seller's skill or judgment regarding the Seller's products. Buyer is solely responsible for the design and specifications of the products, including without limitation, the determination of suitability for Buyer's application of the products.

CLAIMS

- (a) Any claim relating to quantity or type shall be made to Seller in writing within 7 days after receipt of the products; any such claim made thereafter shall be barred.
- (b) Any claim under the above-stated Limited Warranty shall be made to Seller in writing within three (3) months after receipt of the products; any such claim made thereafter shall be barred.
- (c) Seller's liability for breach of warranty or otherwise is limited to repair or replacement, at Seller's option, of non-conforming or defective products. Buyer waives all other remedies, including, but not limited to, all rights to consequential, special or incidental damages, including, but not limited to, damages resulting from personal injury, death or damage to or loss of use of property.
- (d) Repair, alteration, neglect or misuse of the products shall void all applicable warranties.

INDEMNIFICATION

Buyer will indemnify, defend and hold Seller harmless from all loss, liability, damage and expense, including attorneys' fees, arising out of any claim (a) for infringement of any patent, trademark, copyright, misappropriation of trade secrets, unfair competition or similar charge by any products supplied by Seller in accordance with the design or specifications furnished by Buyer, or (b) arising out of or connected with the products or any items into which the products are incorporated, including, but not limited to, any claim for product liability (whether or not based on negligence or strict liability of Seller), breach of warranty, breach of contract or otherwise.

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In addition to the specified purchase price, Buyer will pay any and all federal, state or local taxes, duties, excises, license fees and other charges leveled, assessed or imposed upon Seller due to the manufacture, sale, purchase or delivery of the products. Buyer shall also pay the cost by which such manufacture is increased by reason of any law, ordinance or regulation adopted or promulgated by any government or governmental subdivision, department or agency, or other source, after the date hereof, but prior to the completion and delivery hereunder.

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Seller's specifications, drawings, patterns and tooling shall be the sole and exclusive property of Seller unless otherwise agreed in writing.

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No goods will be accepted for return without prior written authorization by Seller. Freight must be prepaid on all such returns, and each return is subject to inspection and acceptance by Seller to assure the goods are in a "resalable" condition. A minimum 10% handling and restocking charge will be applied to all authorized returns. Special or made-to-order goods are NOT returnable. Attachment chains returned are at the manufacturer's discretion.



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