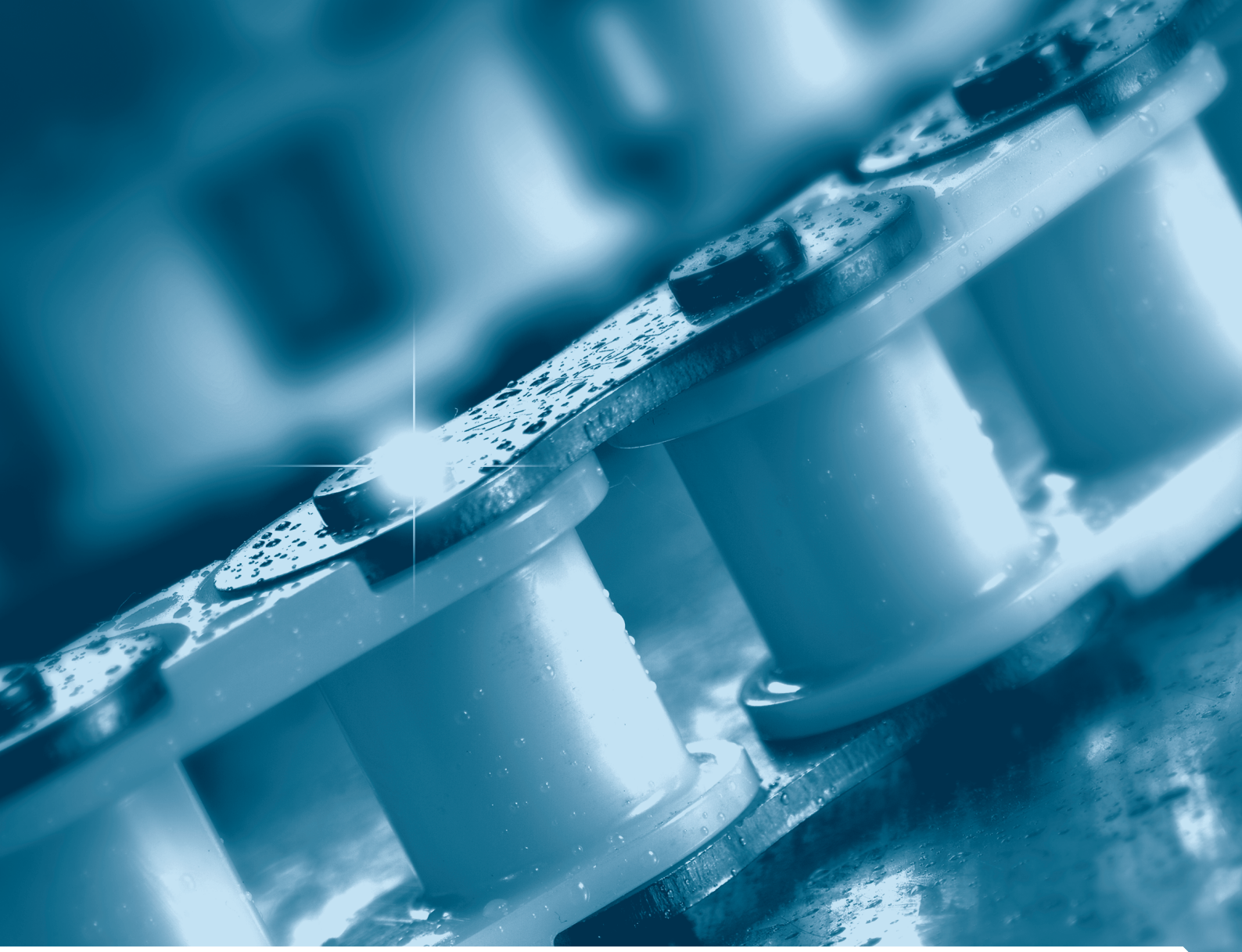
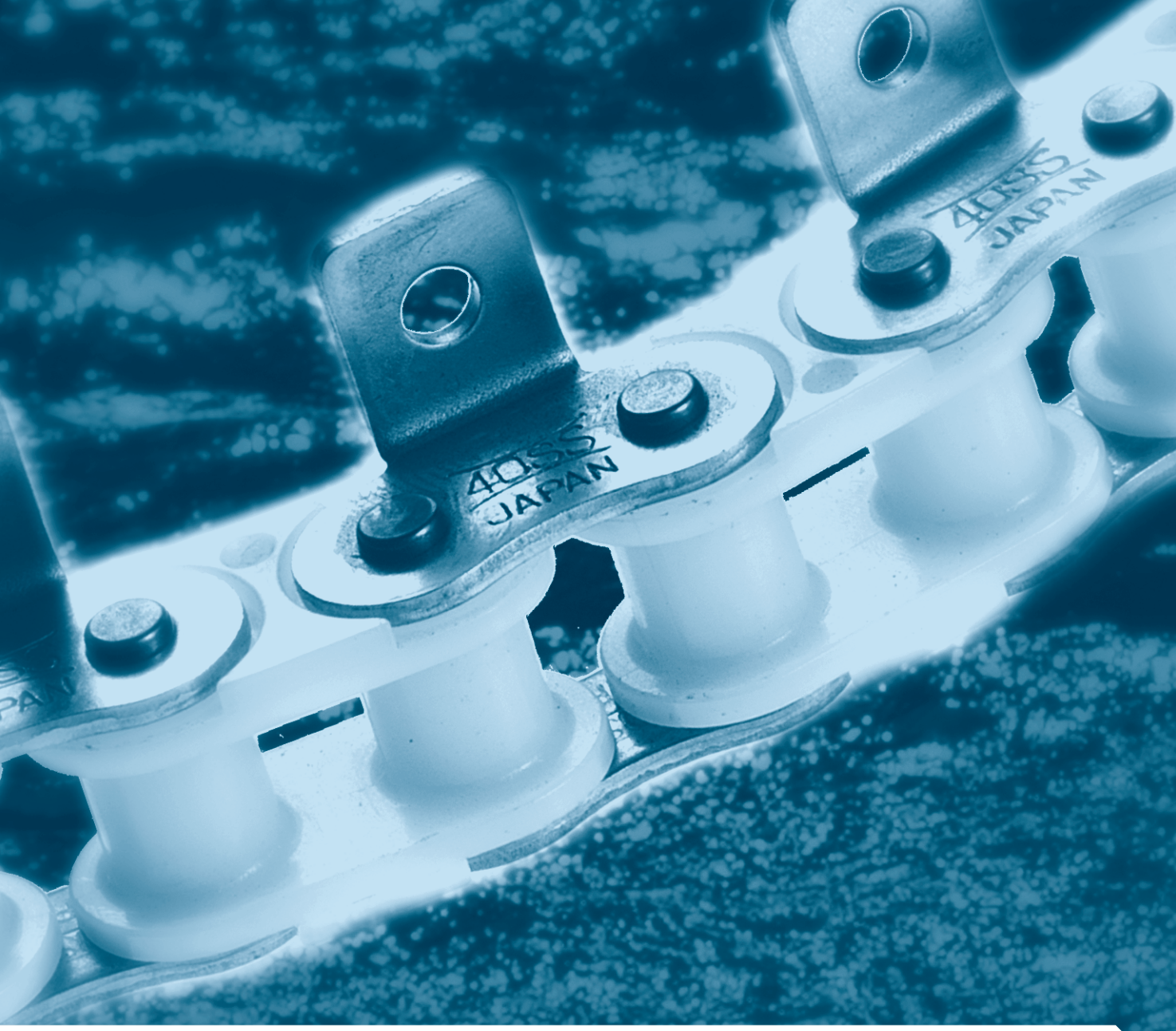


Innovation in Motion
TSUBAKI

DRIVE CHAIN
ATTACHMENT CHAIN

CATALOGUE 1-2 | 2015



Innovation in Motion
TSUBAKI

CATALOGUE 1-2 DRIVE CHAIN

Classification			Chain Series	Tsubaki Chain Type	Features
General			Standard Roller Chain Series	BS GT4 Winner	Superior Performance Chain in
				ANSI G7	both BS/DIN and ANSI
Lube-Free			LAMBDA Series	BS LAMBDA	Self Lube Chain;
				ANSI LAMBDA	Maintenance Free
			X-LAMBDA Series	BS X-LAMBDA	Self Lube under Severe Dust Conditions
Heavy Duty			Heavy Duty Series	ANSI H	Higher Fatigue Strength
				ANSI HT	Anti-Shock Performance
			SUPER Series	ANSI SUPER	Better Fatigue Strength
				ANSI SUPER-H	Better Fatigue Strength and Anti-Shock Performance
				ANSI ULTRA SUPER	Ultimate Strength
Anti Corrosion	Corrosion Protected	Carbon Steel Base	NP Series	BS (LAMBDA) NP	Shining Nickel Plated Parts
				ANSI (LAMBDA) NP	
			N.E.P. Series	BS N.E.P. BS LAMBDA N.E.P. ANSI N.E.P. ANSI LAMBDA N.E.P.	Environmental Friendly Corrosion Protection
	Corrosion Resistant	Stainless Steel Base	SS Series	BS SS	Stainless Steel SUS304
				ANSI SS	Excellent Corrosion Resistant
			AS Series	ANSI AS	Higher Maximum Allowable Load
			PC Series	BS PC	SUS304+Engineering Plastic Inner Link;
				ANSI PC	Lube Free
Specialty Chain			Leaf Chain Series	ANSI AL	Ideally Suited for Lifting Applications
				ANSI BL	
			Low Noise Series	ANSI SNS	Unique Spring Roller for Noise Reduction

CATALOGUE 1-2 ATTACHMENT CHAIN

Classification			Chain Series	Tsubaki Chain Type	Features
General			BS Standard Attachment Chain Series	BS Single Pitch Standard	All Major Chain Attachments Available
				BS Single Pitch RF	Straight Side Plate for Direct Conveying
			ANSI Standard Attachment Chain Series	ANSI Single Pitch Standard	All Major Chain Attachments Available
				ANSI Single Pitch HP	Hollow Pin Chain
				ANSI Single Pitch CU	Curved Chain (Side Bow Chain)
				ANSI Double Pitch Standard	For Longer Conveyor Lines
				ANSI Double Pitch HP	Hollow Pin Chain
Lube-Free			BS LAMBDA Attachment Chain Series	BS Single Pitch LAMBDA	Self Lube, Maintenance Free
				BS Single Pitch LAMBDA RF	Self Lube, Maintenance Free
			ANSI LAMBDA Attachment Chain Series	ANSI Single Pitch LAMBDA	Self Lube, Maintenance Free
				ANSI Single Pitch LAMBDA HP	Self Lube, Hollow Pin Chain
				ANSI Double Pitch LAMBDA	Self Lube, Maintenance Free
Anti Corrosion	Corrosion Protected	Carbon Steel Base	N.E.P. Attachment Chain Series	BS Single Pitch N.E.P.	Environmental Friendly Corrosion Protection
	Corrosion Resistant	Stainless Steel Base	SS Attachment Chain Series	BS Single Pitch SS	Stainless Steel SUS304
				ANSI Single Pitch SS	Stainless Steel SUS304
				ANSI Single Pitch SS HP	SUS304, Hollow Pin
				ANSI Double Pitch SS	SUS304, Double Pitch
				ANSI Double Pitch SS HP	SUS304, Double Pitch, Hollow Pin
			PC Attachment Chain Series	BS Single Pitch PC	SUS304+Engineering Plastic Inner Link
				ANSI Single Pitch PC	SUS304+Engineering Plastic Inner Link
		Plastic Base	P Attachment Chain Series	ANSI Single Pitch P	Engineering Plastic Block+SUS304 Pins

CATALOGUE 3 CUSTOM MADE CHAIN

Classification			Chain Series		Tsubaki Chain Type	Features
ANSI Drive Chain			Lube-Free Series		ANSI LAMBDA Heavy Duty	Self Lube, Increased Tensile Strength
					ANSI X-LAMBDA	Self Lube under Severe Dust Conditions
					ANSI LAMBDA DKF	High Temperature up to 230°C
						Food Grade
			Corrosion Resistant Series		ANSI TI	All Titanium
					ANSI PC-SY	Superior Chemical Resistance
					ANSI NS	Ultimate Corrosion Protection, Heat Application
			Cold Resistant Series		ANSI KT	Low Temperature Freezing Application down to -60°C
ANSI Attachment Chain			Standard Series		ANSI Single Pitch Standard	Flexible Design Capability
					ANSI Double Pitch Standard	
			Lube-Free Series	Standard	ANSI Single Pitch LAMBDA	Self Lube Chain
					ANSI Single Pitch LAMBDA CU	Curved Chain
					ANSI Double Pitch LAMBDA	Self Lube Chain
				Special Environments	ANSI Single Pitch LAMBDA CKF	High Temperature up to 230°C
						Food Grade
					ANSI Double Pitch LAMBDA CKF	High Temperature up to 230°C
						Food Grade
			Corrosion Resistant Series		ANSI Single Pitch SS	SUS304, Excellent Corrosion Resistant
					ANSI Single Pitch SS CU	SUS304, Curved Chain
					ANSI Double Pitch SS	SUS304, Excellent Corrosion Resistant
Conveyor Chain	Tsubaki Standard		Standard Series		RF	Wide Variation
			Low Maintenance Series		RF LAMBDA	Self Lube, Direct Conveying
					BR Bearing Roller	Low Friction of Roller, Save Energy
			Deep Link Series		RFD	Ideal for Direct Conveying
			Free Flow Series		VR Double Plus	Chain Speed can be Reduced 2,5 Times, Save Energy
	DIN Standard		Standard Series		M	Wide Variation
					FV	
			Hollow Pin Series		MC	Hollow Pin
					FVC	
			Deep Link Series		MT	Ideal for Direct Conveying
					FVT	
			Scraper Series		TFM	Scraping Attachments
					TF	

LEADING PRODUCTS AND EXCELLENT SERVICE

At TSUBAKI we know that customers want the best. We are also aware that each and every one of our customers has unique requirements. Therefore, we take pride in our ability to deliver an extensive product line-up that satisfies these high expectations. We believe that in coming years there will be an increase in demand for quality in products as well as in services. With an eye on these future trends, we are committed to take on the challenge of technical innovation.

Our main products, along with automotive timing-drive systems, are industrial drive chains, attachment chains and large size conveyor chains. Related products such as cam clutches, sprockets, shaft couplings, safety devices, toothed belts & pulleys compliment the program. In the new and modern workshop in Dordrecht, standard attachment chains can be assembled as ready-to-use items, thus saving customers time and achieving highest quality. In case of special needs it is possible to manufacture chains completely to order.

For optimum performance and reliability, a chain has to be selected carefully. In respect of this customers can rely on our specialised sales people and our experienced field engineers for technical advice (including maintenance and chain inspection on site). To ensure a close customer contact and excellent service an extensive network of distribution points is strategically placed throughout Europe and other designated markets.

Tsubakimoto Europe B.V. serves the Pan-European market, Africa and the Middle East. Our headquarters are located in Dordrecht, the Netherlands, serving Power Transmission customers. From the subsidiary office in Nottingham, Tsubaki UK serves the United Kingdom, Ireland and Iceland and from the office in Gilching, Germany customers in Germany, Austria and Switzerland are served. The TSUBAKI Group includes 46 production locations and 63 group companies worldwide. Our production and sales networks are now more developed than ever.

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Note:
Chains which are included in this catalogue are available from stock, with the exception of the chains of which the Tsubaki chain number is indicated with gray characters.

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Glossary

1. Minimum Tensile Strength as per ISO Standardisation

This is the Minimum Tensile Strength determined by ISO. If a roller chain fails a tensile load below this value, it does not surpass the standards.

2. Minimum Tensile Strength as per TSUBAKI Standardisation

This is a minimum value determined by statistical processes at TSUBAKI. If a roller chain fractures at a tensile load below this value, it does not surpass TSUBAKI standards. TSUBAKI standards are higher than ISO standards.

3. Average Tensile Strength as per TSUBAKI Standardisation

This is a fracture load reading obtained after a long period of actual tensile strength testing of a large number of chain strands. Of course, when any given strand of roller chain fractures, this value may be higher or lower, so it does not represent a guaranteed value.

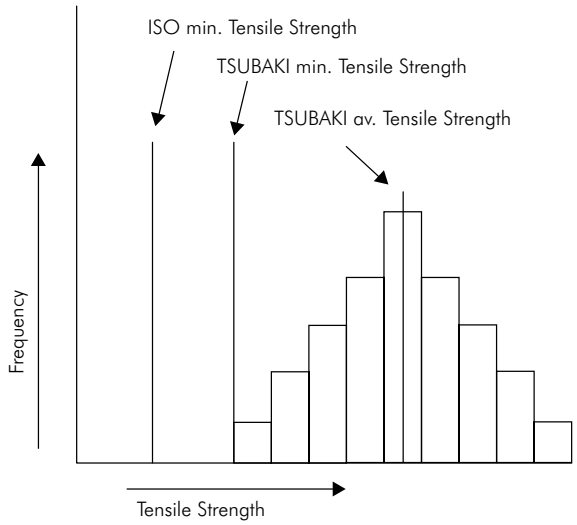


Fig. 1 Relationship between the three tensile strengths mentioned above.

4. Tensile Strength Testing Method

As shown in Fig. 2, a roller chain with minimum of five links is fixed at both ends by clevises and tensioned until fracture occurs. The type of fracture can be used to determine the cause of the breakage of the chain (Fig. 3).

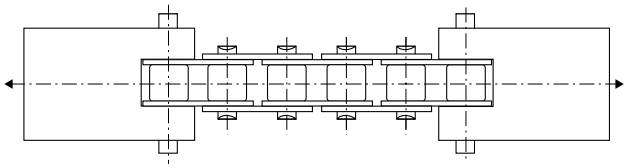


Fig. 2 Tensile Strength test

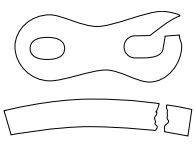


Fig. 3 Shape of fracture

5. Maximum Allowable Load

The Maximum Allowable Load (M.A.L.) of a roller chain (excluding Stainless Steel Chain and Engineering Plastic Chain) is the value derived from the lowest fatigue limit. When a load lower than this value is repetitively applied to the roller chain, fatigue failure will never occur.

The TSUBAKI M.A.L. is determined after 10 million repetitive loads instead of 3 million repetitive loads which is the European Standard.

The Maximum Allowable Load of Stainless Steel Chain and Engineering Plastic Chain is determined by the surface pressure between the pins and bushes.

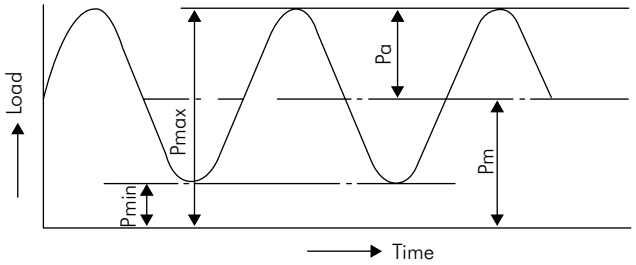


Fig. 4 Summary chart for repetitive loads

6. Ring Coining Process

For easy assembling the pin and link plate of a connecting link are slip fit. In general, this type of connecting link has a 20% lower fatigue strength than the chain itself. However, TSUBAKI developed a special process to eliminate that loss of fatigue strength and still satisfy the customers demand for easy assembling: the Ring Coining process. By applying the Ring Coining process, TSUBAKI generates a cold deformation around the pin hole of the connecting link plate. This results in residual stress around the pin hole and thereby adds strength. By using this process, transmission capacity is increased back to 100%.

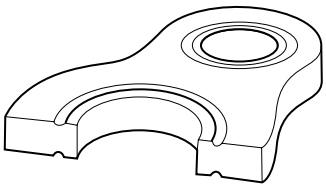


Fig. 5 Ring Coin

For severe conditions, TSUBAKI has developed the Heavy Duty Chain series. These chains are standard equipped with press fit connecting links. The installation is more difficult than in case of standard connecting links.

7. Ball Drifting Process

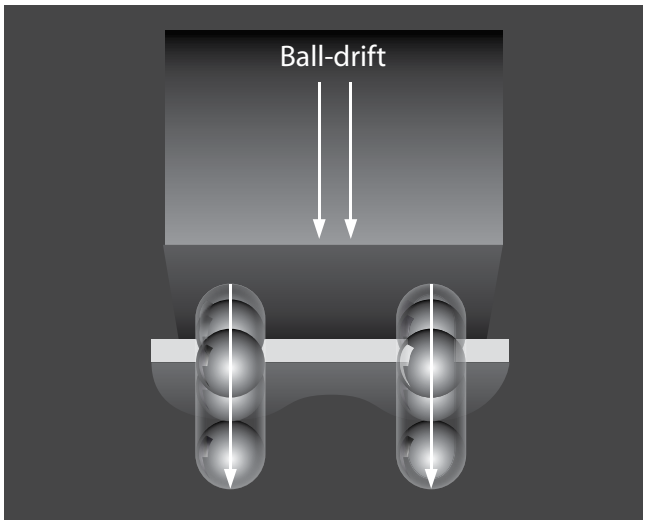


Fig. 6 Ball Drifting

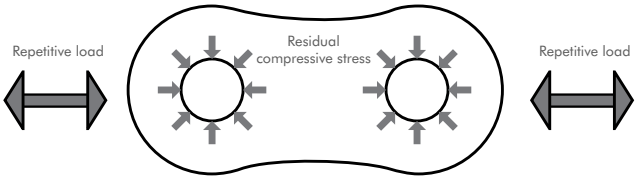


Fig. 7 Residual Compressive Stress

Ball drifting is the process of pressing a hardened steel ball through a hole in an already hardened steel plate (Fig. 6). The goal of this process is to create local plastic deformation and effectively add compressive stress (Fig. 7) to the walls of the hole. Besides this, the process generates precisely controlled holes for an optimum press fit. Together, this leads to significantly improved fatigue life (up to 30%).

8. Shot Peening Process

Shot peening is a process used to produce a compressive residual stress layer and modify mechanical properties of metals. It means impacting a surface with shot (round metallic or ceramic particles) with force sufficient to create plastic deformation.
At TSUBAKI, all basic chain parts (except pins and bushes) are shot peened.

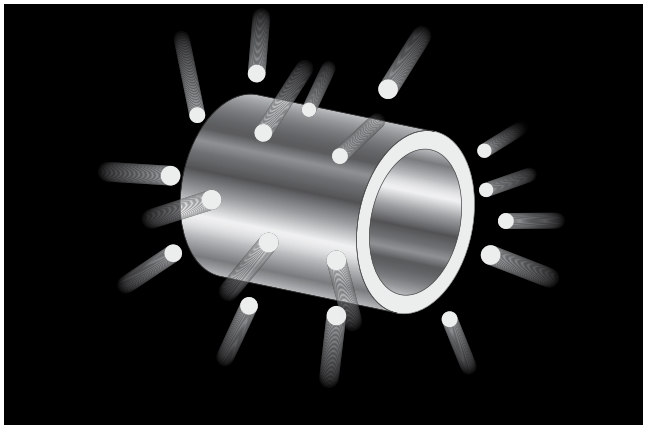


Fig. 8 Shot Peening

Shot Peening increases resistance to:

- fatigue failure
- corrosion fatigue
- hydrogen assisted cracking
- cavitation erosion
- stress corrosion cracking
- galling
- fretting

9. Pre-Loading Process

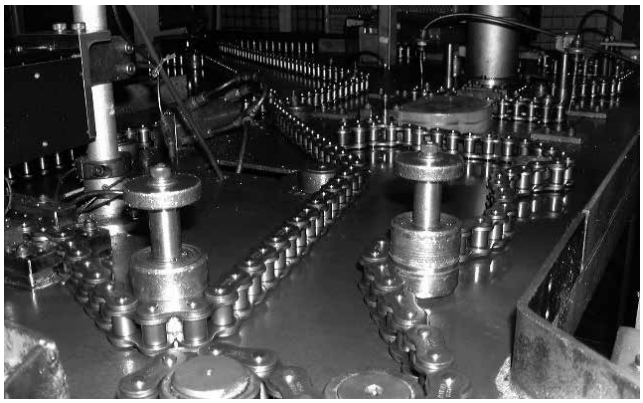


Fig. 9 Pre-Loading

After the assembly of a chain, TSUBAKI applies an initial load, which is called a pre-load. The pre-load force approximates the recommended Maximum Allowable Load and is applied to seat the various chain components such as pins, bushes and link plates. The benefit of pre-loading is that it minimizes the initial elongation. Minimization of this initial elongation increases the chains service life therefore pre-loading is very important.

10. Super Long Length

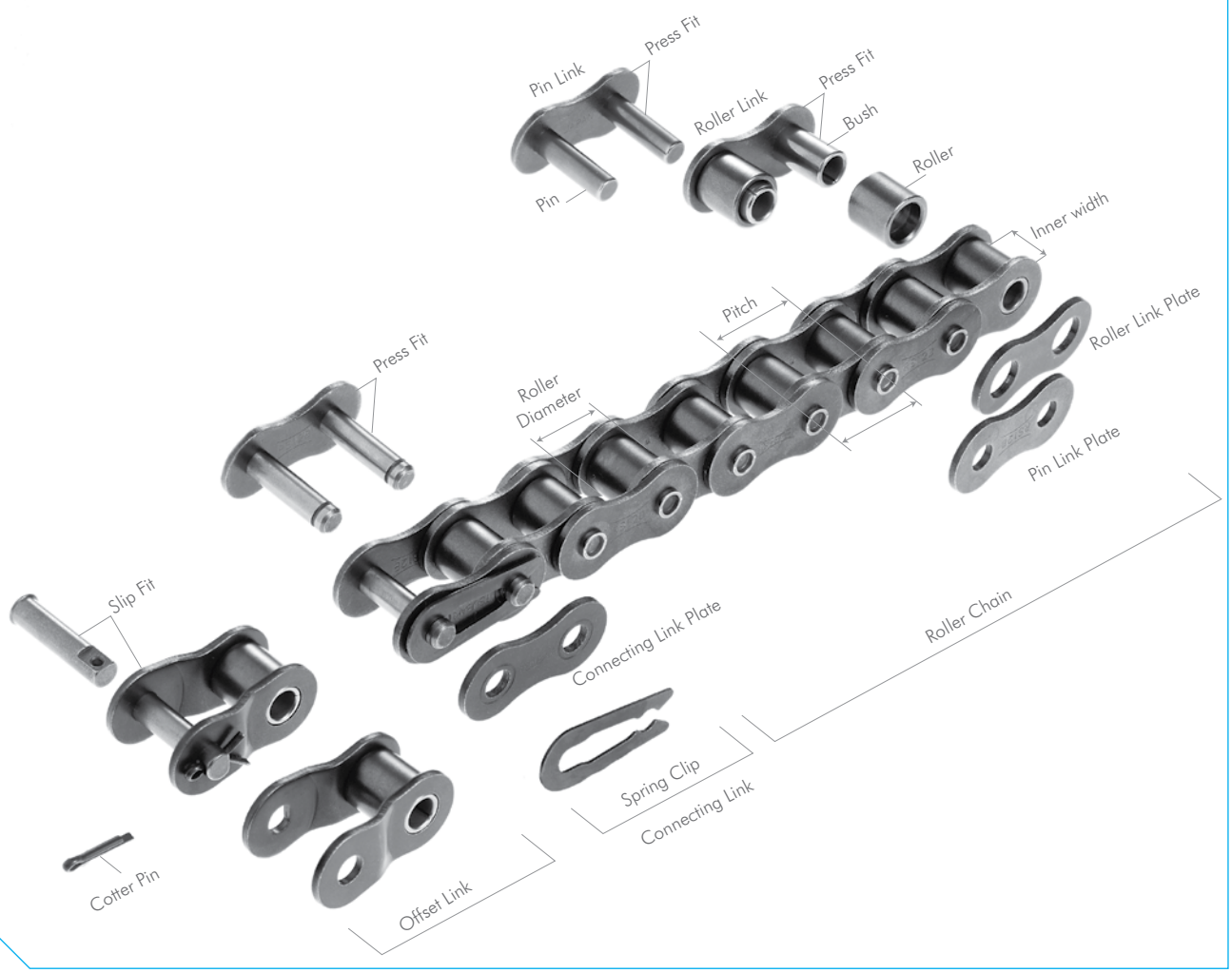
As chain size increases, so does the burden of connecting it for the user. TSUBAKI can connect the chain at the desired length prior to delivery increasing our customer's work productivity and helps maintain a safe working environment.

11. Match & Tag

The "Matchy" is an in-house facility which allows TSUBAKI Europe to supply customers with drive or attachment chain in pairs or multiples that require a specific overall chain length tolerance.

INTRODUCTION TO TSUBAKI ROLLER CHAIN

Roller Chain Structure



Roller Chain Structure

1. Three Basic Dimensions

Pitch, Roller Diameter and Inner Width are known as the "Three Basic Dimensions of Roller Chain." When these three dimensions are identical, roller chains and sprockets are dimensionally compatible.

2. Basic Parts

Link Plate

The plate is the component that bears the tension placed on the chain. Usually this is a repeated loading, sometimes accompanied by shock. Therefore, the plate must not only have great static tensile strength, it must also hold up to the dynamic forces of load and shock.

Pin

The pin is subject to shearing and bending forces transmitted by the plate. At the same time, it forms a load-bearing part (together with the bush) when the chain flexes during sprocket engagement. Therefore, the pin needs high tensile and shear strength, resistance to bending, and must also have sufficient endurance against shock and wear.

Bush

The bush is subject to complex forces from all parts, especially from the repetition of shock loads when the chain engages the sprocket. Therefore, the bush needs extremely high shock resistance. In addition, the bush forms a load-bearing part together with the pin and as such requires great wear resistance.

Roller

The roller is subject to impact load as it mates with the sprocket teeth during engagement of the chain with the sprocket. After engagement, the roller changes its point of contact and balance. It is held between the sprocket teeth and bush, and moves on the tooth face while receiving a compression load. Therefore, it must be resistant to wear and still have strength against shock, fatigue and compression. (RS25 and RS35 are bush chains and do not have rollers).

Roller Link

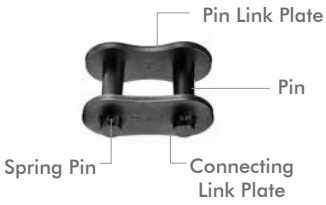
Two bushes are press fit into two roller link plates and rollers are

Connecting Links

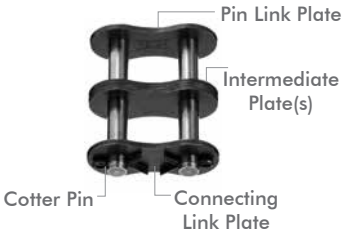
Spring Clip Connecting Link

Cotter Pin Connecting Link

Spring Pin Connecting Link



Cotter Pin Connecting Link Multi-Strand (2-strand shown)



ONE Pitch Offset Links (OL)

Single Strand

Multi-strand (2-strand shown)

TWO Pitch Offset Links (2POL)

Single Strand

Multi-strand (2-strand shown)

inserted to allow rotation around the outside of the bushes during operation. This is the same for single and for multi strand chains.

Pin Link and Intermediate Plate

The pin link consists of two pins that have been press fit into two pin link plates. In case of multi-strand roller chain up till size 08B, an intermediate plate is added to the pin link. In case of multi-strand roller chain above size 08B, two intermediate plates are added to the pin link. The intermediate plates are slip fit for standard roller chain and press fit for SUPER roller chain.

3. Assembly Parts

Roller chains are usually made up of a number of inner and outer links in an endless formation. Although offset links can be used when there is an odd number of links in the roller chain, it is better to use a design that requires an even number of links. If an odd number of links cannot be avoided, it is recommended to use a two-pitch offset link in stead of a one-pitch offset link. As it is riveted into the chain, a two-pitch offset link has a 100% (applicable to ANSI chain) Maximum Allowable Load, where as the one-pitch offset link has a Maximum Allowable Load of 65% (applicable to ANSI chain).

Connecting Links

There are three types of connecting links: spring clip connecting link, cotter pin connecting link and spring pin connecting link.

It's common to use slip fit spring clip connecting links for small size roller chains. Cotter pin and spring pin connecting links are used for large size roller chains and on customer request.

Offset Links

An offset link is used when an odd number of chain links is required. Different types are available:

One pitch offset link (OL).
The pin and two plates are slip fit. The fatigue strength is 35% (applicable to ANSI chain) lower than the chain itself.

Two pitch offset link (2POL).
Two pitch offset links are the combination of a roller link and an offset link connected with a rivet pin. Please refer to the dimension tables for roller chain types and sizes suitable for offset links.

BS LAMBDA LUBE FREE ROLLER CHAIN

TSUBAKI's LAMBDA Chains were the first in the industry to use a special oil impregnated bush. Since their launch in 1988, they have been adopted for diverse industries and applications, and their performance has been highly rated. TSUBAKI has a wide line-up of lube-free, long life products that help customers reduce costs.

Technical Evolution

As a pioneer in the lube-free chain market, TSUBAKI will reveal some of the key elements behind BS LAMBDA's outstanding performance:

Sintered Oil Impregnated Bush

The microscopic pores in the seamless sintered bush are vacuum filled with high performance lubricant. The upgraded bush design provides a 50% increase in wear-life performance.

* Average increase compared to the previous generation of Lambda chain.

Special Coated Pin

The special coating on the pin surface enhances the long term internal lubrication.

Centre Sink Rivet

The unique centre sink pin design offers easy chain disassembly and the markings on the rivet head will identify pin rotation.

Ring Coin

The patented Ring Coin connecting link ensures that the chain can be specified up to its full chain capacity.

Special Environments

TSUBAKI BS LAMBDA has outstanding performance in temperatures up to +150°C.

For temperatures above +150°C: Due to the special NSF-H1 certified lubrication impregnated bushes, TSUBAKI BS LAMBDA KF Series is usable in a wide temperature range (from -10°C to +230°C), and for food product applications while at the same time being kind to the environment.
Please consult TSUBAKI for more detailed information.

Advantages

TSUBAKI has enhanced the BS LAMBDA with the following advantages:

Save Maintenance Costs

No expensive labour costs as it is not required to manually lubricate this chain.

Save Purchasing Costs

Lower frequency of purchasing due to the high quality of the chain and its long economic life. No purchasing of lubricants or lubrication systems necessary.

Higher Productivity

No unforeseen downtime due to chain breakdown.
Less time required for maintenance and therefore more time for production.

Environmental Friendly

Applications run clean thus reducing the risk of contaminating products, machines, floor etc.

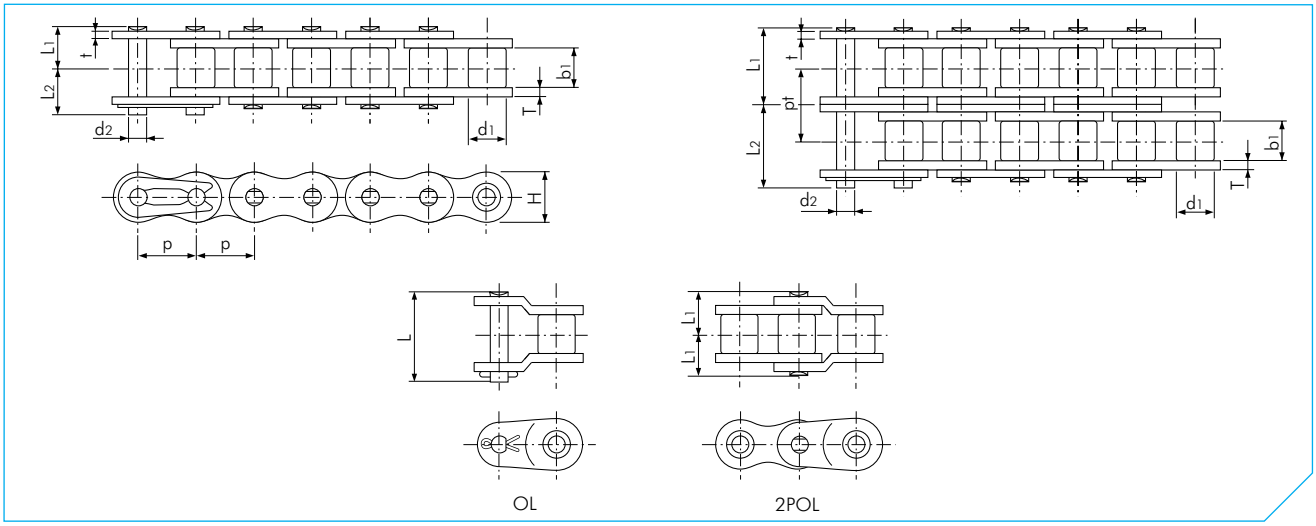
Inter-Changeability

Chains:
BS LAMBDA Chains are fully interchangeable with standard BS roller chains.

Sprockets:
Standard BS roller chain sprockets can be used. However, due to the extended lifetime of BS LAMBDA chain, TSUBAKI recommends to install sprockets with hardened teeth in every LAMBDA application.

Fig. 10 Basic Construction

BS LAMBDA LUBE FREE ROLLER CHAIN



BS LAMBDA Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch		Roller Diameter	Inner Width	Pin				Link Plate			Transverse Pitch	Min. Tensile Strength acc. to ISO 606	Approx. Mass
					Diameter	Length	Length	Length	Thickness	Thickness	Height			
	p		d1	b1	d2	L1	L2	L	T	t	H (max)	pt	kN	kg/m
RF06B-LM-1	9.525	(3/8")	6.35	5.72	3.28	6.10	7.70	15.10	1.30	1.00	8.20	-	8.9	0.39
RF06B-LM-2						11.20	12.80	25.90				10.24	16.9	0.75
RS08B-LM-1	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	18.60	1.60	1.60	11.80	-	17.8	0.70
RS08B-LM-2						15.30	16.90	34.50				13.92	31.1	1.35
RS10B-LM-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	20.80	1.50	1.50	14.70	-	22.2	0.95
RS10B-LM-2						17.85	19.55	39.40				16.59	44.5	1.85
RS12B-LM-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	24.40	1.80	1.80	16.10	-	28.9	1.25
RS12B-LM-2						20.85	22.75	45.90				19.46	57.8	2.50
RS16B-LM-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	41.10	4.00	3.20	21.00	-	60.0	2.70
RS16B-LM-2						33.55	35.75	75.20				31.88	106.0	5.40
RS20B-LM-1	31.75	(1 1/4")	19.05	19.56	10.19	19.90	23.10	46.60	4.40	3.40	26.40	-	95.0	3.85
RS20B-LM-2						38.25	41.45	84.60				36.45	170.0	7.65
RS24B-LM-1	38.10	(1 1/2")	25.40	25.40	14.63	26.65	31.85	61.70	6.00	5.60	33.40	-	160.0	7.45
RS24B-LM-2						50.80	56.00	112.80				48.36	280.0	14.65

Note:

1. Connecting links are clip type for sizes up to RS16B-LM, and cotter type for sizes RS20B-LM to RS24B-LM.
2. RF06B-LM chain has flat shaped link plates.
3. Intermediate plate of RF06B-LM-2 and RS08B-LM-2 is a solid plate.
4. Centre sink riveting is applied for RS08B-LM-1 to RS16B-LM-1. Double stake riveting is applied to all other sizes including multi-strand chain.
5. Warning: previous generations of Lambda chain can not be connected with the above chains due to different dimensions.
6. When a single pitch offset link is used, please calculate a 40% reduction of the fatigue strength.
7. Also available in N.E.P. specification.
8. The improved bush design is applicable on RF06B until RS16B.

BS X-LAMBDA LUBE FREE ROLLER CHAIN

Ten years after introducing the number-one LAMBDA Chain to the market in 1988, TSUBAKI has developed innovative technology that sets the bar even higher for lube-free chain performance. To the user the benefits that X-LAMBDA provides mean increased productivity, reduced maintenance and a cleaner working environment.

Technical Evolution of BS LAMBDA

BS X-LAMBDA chain is a quantum leap for power transmission technology. The basic BS LAMBDA components (a special coated pin and an oil-impregnated sintered bush) come completed with special felt seals (patent pending) between inner and outer link plate that lock in lubrication while keeping dirt and abrasives out.

Because of this evolution BS X-LAMBDA chain greatly increases the performance of the BS LAMBDA chains. When your operation needs to run clean, when machines and conveyed materials must be free from contact with oil, or when lubrication is difficult, BS X-LAMBDA chain can extend the life of your operation drastically.

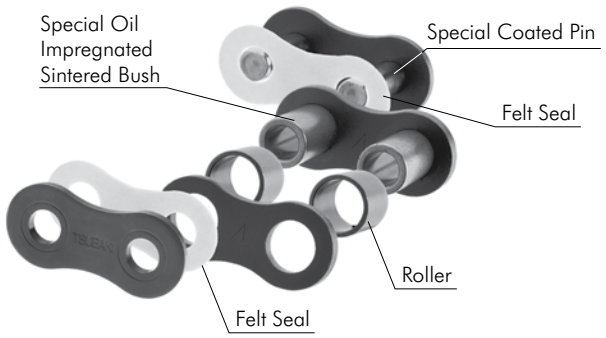


Fig. 11 Basic Construction

Advantages

Additional to all BS LAMBDA advantages, TSUBAKI has enhanced the BS X-LAMBDA with the following additional advantages:

Extended Wear Life

Even longer wear life than BS LAMBDA chain (over 5 times longer).

Applicable in Dusty Environments

Extra protection of critical areas due to the specially developed felt seal.

Connecting Method

When connecting the chain, use a BS X-LAMBDA chain connecting link (with a felt seal). As shown in Fig. 12 insert felt seals between the outer plate and the connecting link plate, then attach the link.

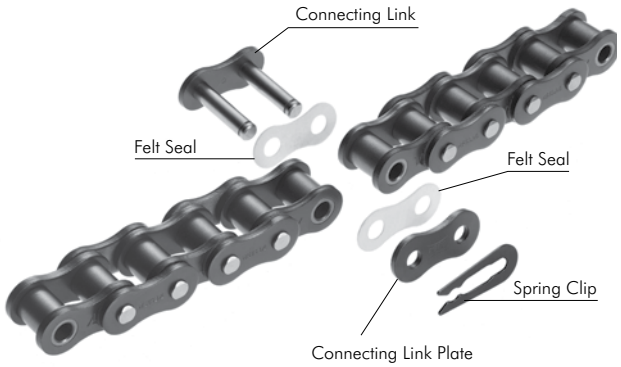
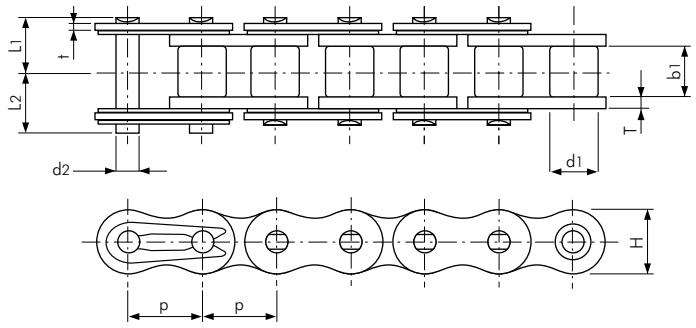


Fig. 12 Connecting Method BS X-LAMBDA

Inter-Changeability

Chains:
BS X-LAMBDA chain is interchangeable with standard BS roller chain. However, as the pins are longer than those of the standard BS roller chain, please make sure that there is no interference with the machine.

Sprockets:
Standard BS roller chain sprockets can be used. However, due to the extended lifetime of BS X-LAMBDA chain, TSUBAKI advises to install sprockets with hardened teeth in every LAMBDA application.



BS X-LAMBDA Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Min. Tensile Strength acc. to ISO 606 kN	Approx. Mass kg/m
RS08B-LMX-1	12.70 (1/2")	8.51	7.75	4.45	9.00	10.60	1.60	1.60	11.80	17.8	0.70
RS10B-LMX-1	15.875 (5/8")	10.16	9.65	5.08	10.30	12.00	1.50	1.50	14.70	22.2	0.95
RS12B-LMX-1	19.05 (3/4")	12.07	11.68	5.72	11.90	13.80	1.80	1.80	16.10	28.9	1.25
RS16B-LMX-1	25.40 (1")	15.88	17.02	8.28	18.55	21.75	4.00	3.20	21.00	60.0	2.70

Note:

1. Connecting links are clip type for sizes up to RS12B-LMX, and cotter type for size RS16B-LMX.
2. Due to the use of the felt seal, the pins are longer. Check for machine interference.
3. X-LAMBDA offset links are not available.
4. X-LAMBDA double strand chain is not available.
5. Due to the oil in the felt seal, more oil adheres to the surface of X-LAMBDA chain than regular LAMBDA chain.

RS ROLLER CHAIN GT4 WINNER

TSUBAKI GT4 Winner is the most advanced BS/DIN standard roller chain in the European market. Since 1917 Tsubakimoto Chain Company has maintained a line-up of cutting-edge chain products with exceptional quality and performance. TSUBAKI is proud of the 4th generation, enhanced European premium BS/DIN chain.

Advantages

TSUBAKI RS roller chain GT4 Winner is enhanced with the following advantages:

Wear resistance

TSUBAKI's patented LG (Lube Groove) seamless bushes are precision components and perfectly cylindrical. Our special lube grooves hold oil at the point of contact, where the chain needs it most. The result is a chain that lasts longer with lower maintenance costs over the lifetime of the chain. The Lube Groove is applied to RS16B, RS20B and RS24B.

Easy disassembling with centre sink pin design

The chains can be easily and safely disassembled with a standard screw type cutter without damaging bushes. Center sink riveting is applied to RS08B up to RS16B single strand chain.

Increased kW Rating

The TSUBAKI Ring Coining process on the connecting link plate allows the chain to be specified up to its full kW rating.

Fig. 13 Ring Coined Connecting Link Plate

In general, connecting links have a 20% lower fatigue strength than the chain itself. However, TSUBAKI developed a special process to eliminate that loss of fatigue strength and still satisfy the customers demand for easy assembly: the Ring Coining process. Generating a cold deformation around the pin hole of the connecting link plate results in residual stress around this region, thereby adding strength. By using this process we can achieve 100% transmission capacity of the base chain.

Constant Quality Level

In pursuit of outstanding quality, every TSUBAKI chain is made of a special steel alloy, the specification of which has been developed by the TSUBAKI engineering department for selected steel mills to work with. TSUBAKI produces the GT4 Winner under highly controlled conditions in its advanced heat treatment facilities. This, in combination with TSUBAKI fatigue strength tests, ensures that our customers can always rely on a constant level of quality whenever using TSUBAKI products.

Customized Pre-Lubrication Service

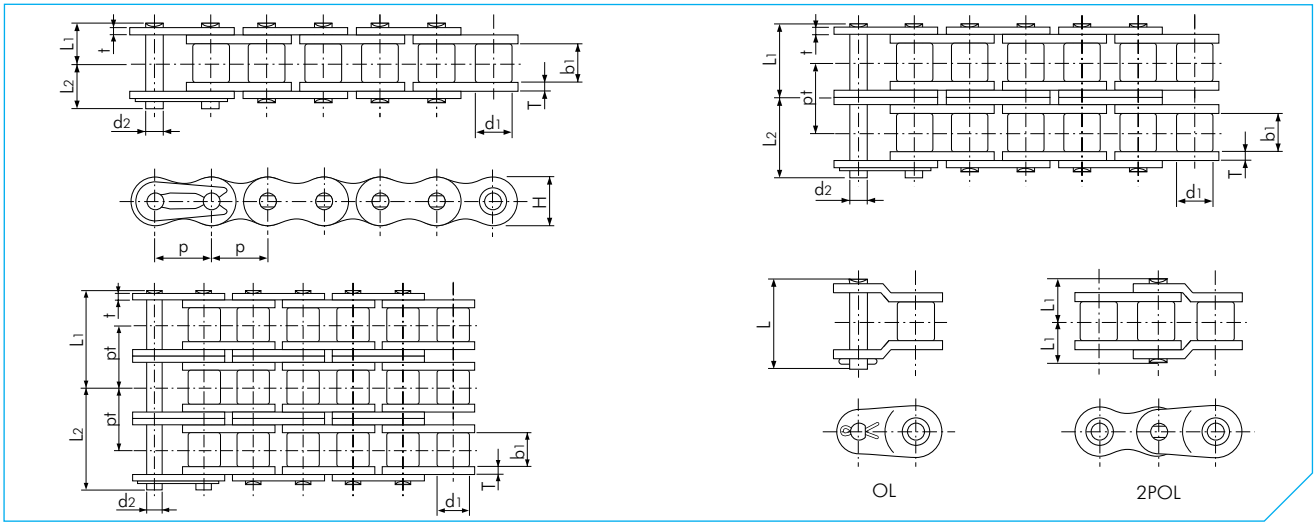
Proper lubrication is the key to extending the life and improving the performance of a chain. In order to get the best performance in general applications (-10°C to +60°C), all GT4 Winner drive chains are pre-lubricated.

For special applications, TSUBAKI can provide chains which are pre-lubricated with a special lubricant on customer demand:

- High temperature
- Low temperature
- Food safe
- Outdoor exposure
- Dusty environment

Please consult TSUBAKI for more detailed information.

RS ROLLER CHAIN GT4 WINNER



BS GT4 WINNER

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to ISO 606 kN	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS05B-1	8.00 (0.315″)	5.00	3.00	2.30	3.80	4.70	-	0.75	0.75	7.10	-	4.4	4.4	0.18
RS05B-2					6.65	7.55	-				5.64	7.8	7.8	0.35
RS05B-3					9.45	10.35	-				5.64	11.1	11.1	0.53
RF06B-1	9.525 (3/8″)	6.35	5.72	3.28	6.10	7.70	15.10	1.30	1.00	8.20	-	8.9	9.0	0.39
RF06B-2					11.20	12.80	25.90				10.24	16.9	17.0	0.75
RF06B-3					16.40	17.90	-				10.24	24.9	24.9	1.11
RS08B-1	12.70 (1/2″)	8.51	7.75	4.45	8.40	10.00	18.60	1.60	1.60	11.80	-	17.8	19.0	0.70
RS08B-2					15.30	16.90	34.50				13.92	31.1	32.0	1.35
RS08B-3					22.25	23.85	48.40				13.92	44.5	47.5	2.00
RS10B-1	15.875 (5/8″)	10.16	9.65	5.08	9.55	11.25	20.80	1.50	1.50	14.70	-	22.2	23.0	0.95
RS10B-2					17.85	19.55	39.40				16.59	44.5	44.5	1.85
RS10B-3					26.15	27.85	56.00				16.59	66.7	66.8	2.80
RS12B-1	19.05 (3/4″)	12.07	11.68	5.72	11.10	13.00	24.40	1.80	1.80	16.10	-	28.9	31.0	1.25
RS12B-2					20.85	22.75	45.90				19.46	57.8	61.0	2.50
RS12B-3					30.60	32.50	65.40				19.46	86.7	92.0	3.80
RS16B-1	25.40 (1″)	15.88	17.02	8.28	17.75	19.95	41.10	4.00	3.20	21.00	-	60.0	70.0	2.70
RS16B-2					33.55	35.75	75.20				31.88	106.0	128.0	5.40
RS16B-3					49.50	51.70	107.10				31.88	160.0	192.0	8.00
RS20B-1	31.75 (1 1/4″)	19.05	19.56	10.19	19.90	23.10	46.60	4.40	3.40	26.00	-	95.0	98.1	3.85
RS20B-2					38.25	41.45	84.60				36.45	170.0	197.0	7.65
RS20B-3					56.50	59.70	121.00				36.45	250.0	295.0	11.45
RS24B-1	38.10 (1 1/2″)	25.40	25.40	14.63	26.65	31.85	61.70	6.00	5.60	33.40	-	160.0	167.0	7.45
RS24B-H-1					29.30	34.20	-	7.50	6.00	36.20	-	-	234.0	8.20
RS24B-2					50.80	56.00	112.80	6.00	5.60	33.40	48.36	280.0	335.0	14.65
RS24B-3					75.10	80.20	161.10				48.36	425.0	500.0	21.75
RS28B-1	44.45 (1 3/4″)	27.94	30.99	15.90	32.45	37.45	74.40	7.50	6.30	36.40	-	200.0	200.0	9.45
RS28B-2					62.15	67.15	136.00				59.56	360.0	374.0	18.80
RS28B-3					91.95	96.95	195.90				59.56	530.0	560.0	28.20
RS32B-1	50.80 (2″)	29.21	30.99	17.81	32.10	37.70	73.30	7.00	6.30	42.20	-	250.0	255.0	10.25
RS32B-2					61.25	66.85	134.50				58.55	450.0	485.0	20.10
RS32B-3					90.50	96.10	192.60				58.55	670.0	729.0	29.90
RS40B-1	63.50 (2 1/2″)	39.37	38.10	22.89	39.25	45.05	88.60	8.50	8.00	52.90	-	355.0	373.0	16.35
RS40B-2					75.40	81.20	163.20				72.29	630.0	716.0	32.00
RS40B-3					111.50	117.30	235.30				72.29	950.0	1080.0	47.75
RS48B-1	76.20 (3″)	48.26	45.72	29.23	49.30	58.80	117.70	12.10	10.00	63.80	-	565.0	565.0	25.00
RS48B-2					95.00	104.40	209.00				91.21	1000.0	1000.0	50.00
RS48B-3					140.60	150.00	-				91.21	1500.0	1520.0	75.00

Note:

1. For sizes RS16B - RS24B the Lube Groove(LG) is applied
2. Connecting links are clip type for sizes up to RS16B, and cotter type for sizes RS20B to RS48B.
3. RF06B chain has flat-shaped link plates.
4. Intermediate plate of multi strand RF06B-2 and RS08B-2 chain is a solid plate.
5. Center sink riveting is applied to RS08B-1 to RS16B-1 single strand chain.
6. Double stake riveting is applied to all other sizes including multi-strand chain.
7. When a single pitch offset link is used, please calculate a 40% reduction of the fatigue strength.
8. RS24B-H-1 chain is a reinforced RS24B-1 chain.

BS CHAIN FOR CORROSIVE ENVIRONMENTS

Whether your operation requires a sanitary environment, is exposed to corrosive chemicals, is heated to extreme temperatures, runs through a freezer, is exposed to the outdoors or is affected by excessive moisture: our specially designed and tested chains will outlast your current chains and contribute to a cost effective application.

Corrosion Resistant Chain (Stainless Steel base)

BS PC Engineering Plastic Combination Chain

The pins and pin link plates of these chains are made of SUS304 equivalent (spring clips SUS301). Engineering plastic (white) is used for the inner link. This combination makes it a lube-free, low noise (5 dB lower than BS standard roller chain) and light-weight chain (50% lighter than BS standard roller chain).
Working temperature range: -20°C to +80°C. For details on corrosion resistance, please check out the table in the back of this catalogue.

BS SS Stainless Steel Chain

All basic components of this chain are made of SUS304 equivalent Stainless Steel (except the spring clips, which are made of SUS301).
This chain can be used in special environments such as underwater, acidic and alkaline applications. It can also be used in high and low temperatures (-20°C to +400°C). SUS304 equivalent is only marginally magnetic, which is the result of the cold-forging process. For details on corrosion resistance, please check out the table in the back of this catalogue.

Corrosion Protected Chain (Carbon Steel base)

BS N.E.P. New Environmental Plating Chain

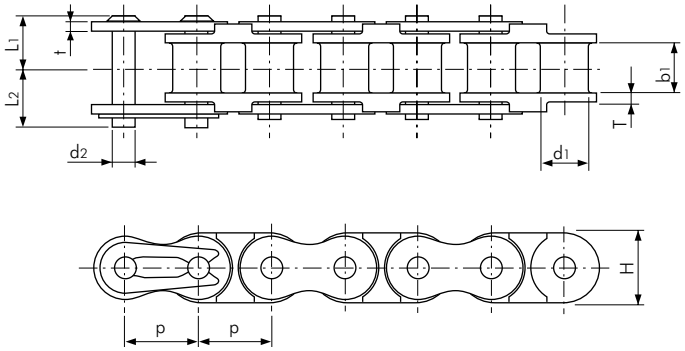
BS N.E.P. Chain is a TSUBAKI BS chain that has undergone a special surface treatment.
The link plates, bushes and bearing pins have a special three stage layer applied in order to provide the maximum protection from the operating or environmental conditions. (Spring clips are SUS301). N.E.P. Rollers have a special coating designed to resist the corrosive conditions as well as the severe dynamic contact between roller and sprocket.

This chain is suitable for use in environments exposed to sea-water, acid-rain and other adverse weather conditions. This chain does not contain any chemically hazardous substances such as Hexavalent Chromium, Lead, Cadmium and Mercury as regulated by RoHS√. The kilowatt ratings are the same as those of the corresponding BS chain with a working temperature range: -10°C to +150°C. Above +60°C a special high-temperature lubrication is required. Of course, BS LAMBDA N.E.P. chain is also available.

BS NP Nickel Plated Chain

BS NP Chain is a TSUBAKI BS chain that has been plated with Nickel. NP Chain has a light corrosion resistance and an attractive appearance. NP Chain is suitable for outdoor conditions exposed to water. There is a 15% reduction in Maximum Allowable Load compared to the corresponding BS chain, so please take this into account when making your chain selection. It has a working temperature range of: -10°C to +60°C. Of course, BS LAMBDA NP chain is also available.

√ RoHS = Restriction of Hazardous Substances



BS PC Chain

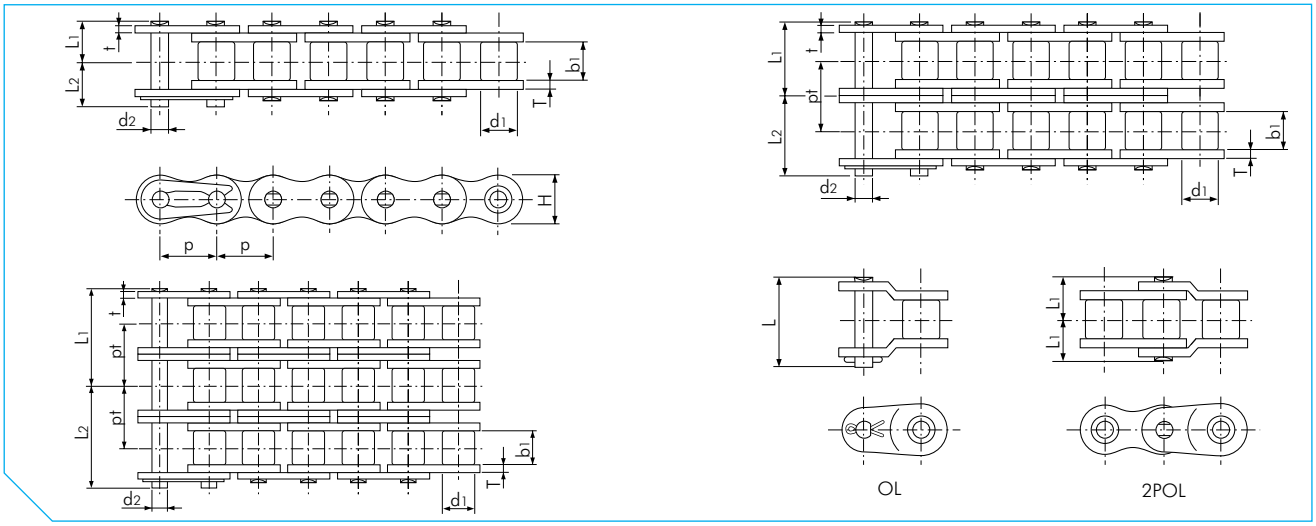
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin			Link Plate			Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
					Diameter d2	Length L1	Length L2	Thickness T	Thickness t	Height H (max)		
RF06B-PC-1	9.525	(3/8")	6.35	5.72	3.28	6.50	7.25	1.30	1.00	8.20	0.20	0.23
RS08B-PC-1	12.70	(1/2")	8.51	7.75	4.45	8.35	10.05	1.60	1.50	12.00	0.46	0.40
RS10B-PC-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	1.50	1.50	14.70	0.53	0.51
RS12B-PC-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	1.80	1.80	16.10	0.70	0.67

Note:

1. Make sure to check the chain load again when replacing Stainless Steel Chain with PC Chain.
2. Offset links are not available.
3. Use a chain tensioner with an idler sprocket to adjust chain tension.
4. Guide rails should support the underside of the inner links.
5. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

BS CHAIN FOR CORROSIVE ENVIRONMENTS



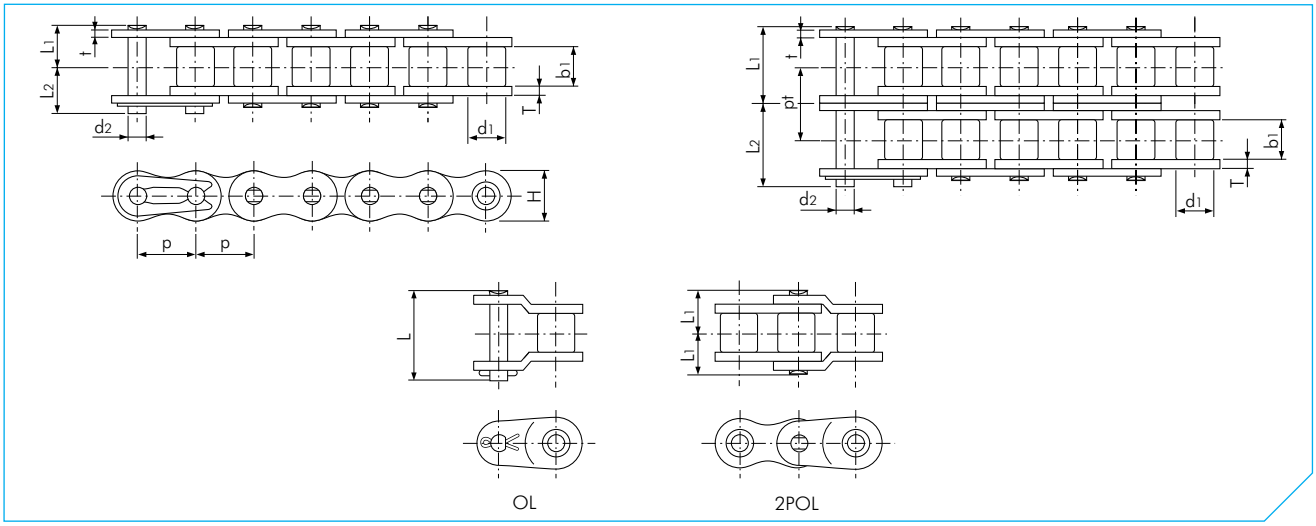
BS SS Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Transverse Pitch pt	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
RF06B-SS-1	9.525	(3/8")	6.35	5.72	3.28	6.50	7.25	15.45	1.30	1.00	8.20	-	0.27	0.39
RF06B-SS-2						11.60	12.30	25.85				10.24	0.53	0.75
RS08B-SS-1	12.70	(1/2")	8.51	7.75	4.45	8.35	10.05	20.05	1.50	1.50	11.80	-	0.48	0.70
RS08B-SS-2						15.30	17.00	34.60				13.92	0.96	1.35
RS08B-SS-3						22.25	23.95	48.60				13.92	1.44	2.00
RS10B-SS-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	22.90	1.50	1.50	14.70	-	0.66	0.95
RS10B-SS-2						17.85	19.55	39.40				16.59	1.32	1.85
RS10B-SS-3						26.20	27.80	56.00				16.59	1.97	2.80
RS12B-SS-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	26.70	1.80	1.80	16.10	-	0.87	1.25
RS12B-SS-2						20.90	22.70	46.10				19.46	1.74	2.50
RS12B-SS-3						30.65	32.55	65.60				19.46	2.61	3.80
RS16B-SS-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	43.70	4.00	3.20	21.00	-	2.06	2.70
RS16B-SS-2						33.55	35.75	75.50				31.88	4.12	5.40
RS20B-SS-1	31.75	(1 1/4")	19.05	19.56	10.19	20.10	23.10	48.40	4.50	3.50	26.00	-	2.90	3.85

Note:

1. Connecting links are clip type for sizes up to RS16B-SS, and cotter type for sizes RS12B-SS to RS20B-SS.
2. RF06B-SS chain has flat shaped link plates.
3. Center sink pins are not available. Double stake riveting is applied.
4. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.



BS LAMBDA N.E.P. Chain

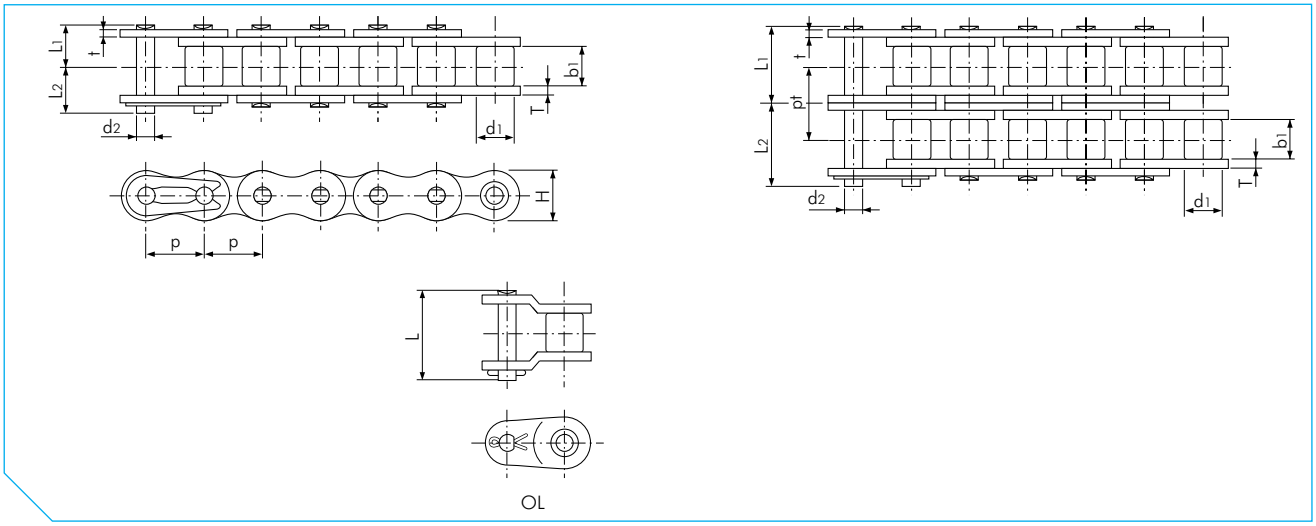
Dimensions in mm

TSUBAKI Chain No.	Pitch		Roller Diameter	Inner Width	Pin				Link Plate			Transverse Pitch	Min. Tensile Strength acc. to ISO 606	Approx. Mass
					Diameter	Length	Length	Length	Thickness	Thickness	Height			
	p		d1	b1	d2	L1	L2	L	T	t	H (max)	pt	kN	kg/m
RS08B-LM-NEP-1	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	18.60	1.60	1.60	11.80	-	17.8	0.70
RS08B-LM-NEP-2						15.30	16.90	34.50				13.92	31.1	1.35
RS10B-LM-NEP-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	20.80	1.50	1.50	14.70	-	22.2	0.95
RS10B-LM-NEP-2						17.85	19.55	39.40				16.59	44.5	1.85
RS12B-LM-NEP-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	24.40	1.80	1.80	16.10	-	28.9	1.25
RS12B-LM-NEP-2						20.85	22.75	45.90				19.46	57.8	2.50
RS16B-LM-NEP-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	41.10	4.00	3.20	21.00	-	60.0	2.70
RS16B-LM-NEP-2						33.55	35.75	75.20				31.88	106.0	5.40
RS20B-LM-NEP-1	31.75	(1 1/4")	19.05	19.56	10.19	19.90	23.10	46.60	4.40	3.40	26.40	-	95.0	3.85
RS24B-LM-NEP-1	38.10	(1 1/2")	25.40	25.40	14.63	26.65	31.85	61.70	6.00	5.60	33.40	-	160.0	7.45

Note:

1. Connecting links are clip type for sizes up to RS16B-LM-NEP, and cotter type for sizes RS20B-LM-NEP to RS24B-LM-NEP.
2. RF06B-LM-NEP chain has flat shaped link plates.
3. Intermediate plate of RF06B-LM-NEP-2 and RS08B-LM-NEP-2 is a solid plate.
4. Centre sink riveting is applied for RS08B-LM-NEP-1 to RS16B-LM-NEP-1. Double stake riveting is applied to all other sizes including multi-strand chain.
5. Warning: previous generations of Lambda chain can not be connected with the above chains due to different dimensions.
6. When a single pitch offset link is used, please calculate a 40% reduction of the fatigue strength.

BS CHAIN FOR CORROSIVE ENVIRONMENTS



BS N.E.P. Chain

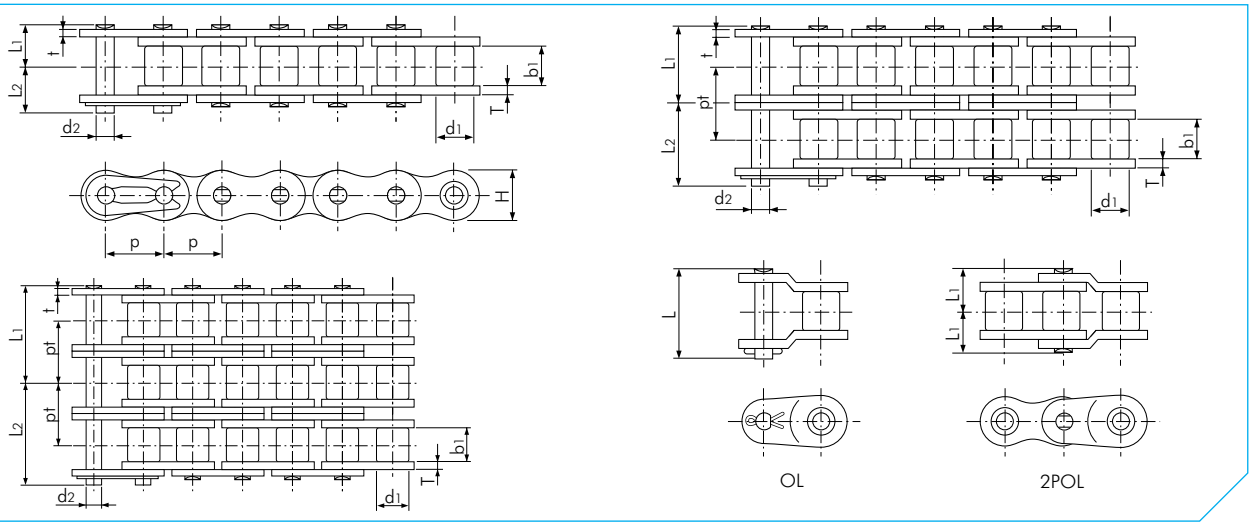
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to ISO 606 kN	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RF06B-NEP-1	9.525	(3/8")	6.35	5.72	3.27	6.10	7.70	15.10	1.30	1.00	8.20	-	8.9	9.0	0.39
RF06B-NEP-2						11.20	12.80	25.90				10.24	16.9	17.0	0.75
RS08B-NEP-1	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	18.60	1.60	1.60	11.80	-	17.8	19.0	0.70
RS08B-NEP-2						15.30	16.90	34.50				13.92	31.1	32.0	1.35
RS10B-NEP-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	20.80	1.50	1.50	14.70	-	22.2	23.0	0.95
RS10B-NEP-2						17.85	19.55	39.40				16.59	44.5	44.5	1.85
RS12B-NEP-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	24.40	1.80	1.80	16.10	-	28.9	31.0	1.25
RS12B-NEP-2						20.85	22.75	45.90				19.46	57.8	61.0	2.50
RS16B-NEP-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	43.30	4.00	3.20	21.00	-	60.0	70.0	2.70
RS16B-NEP-2						33.55	35.75	75.20				31.88	106.0	128.0	5.40
RS20B-NEP-1	31.75	(1 1/4")	19.05	19.56	10.19	19.90	23.10	48.20	4.40	3.40	26.00	-	95.0	98.1	3.85
RS20B-NEP-2						38.25	41.45	84.60				36.45	170.0	197.0	7.65
RS24B-NEP-1	38.10	(1 1/2")	25.40	25.40	14.63	26.65	31.85	64.30	6.00	5.60	33.40	-	160.0	167.0	7.45

Note:

1. Connecting links are clip type for sizes up to RS16B-NEP, and cotter type for sizes RS20B-NEP to RS24B-NEP.
2. RF06B-NEP chain has flat-shaped link plates.
3. Intermediate plate of multi strand RF06B-NEP-2 and RS08B-NEP-2 chain is a solid plate.
4. Center sink riveting is applied to RS08B-NEP-1 to RS16B-NEP-1 single strand chain.
5. Double stake riveting is applied to all other sizes including multi-strand chain.
6. When a single pitch offset link is used, please calculate a 40% reduction of the fatigue strength.

BS CHAIN FOR CORROSIVE ENVIRONMENTS



BS NP Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to ISO 606 kN	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mas kg/m
RF06B-NP-1	9.525	(3/8")	6.35	5.72	3.27	6.10	7.70	15.10	1.30	1.00	8.20	-	8.9	9.0	0.39
RF06B-NP-2						11.20	12.80	-				10.24	16.9	17.0	0.75
RF06B-NP-3						16.40	17.90	-				10.24	24.9	24.9	1.11
RS08B-NP-1	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	18.60	1.60	1.60	11.80	-	17.8	19.0	0.70
RS08B-NP-2						15.30	16.90	34.50				13.92	31.1	32.0	1.35
RS08B-NP-3						22.25	23.85	48.40				13.92	44.5	47.5	2.00
RS10B-NP-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	20.80	1.50	1.50	14.70	-	22.2	23.0	0.95
RS10B-NP-2						17.85	19.55	39.40				16.59	44.5	44.5	1.85
RS10B-NP-3						26.15	27.85	56.00				16.59	66.7	66.8	2.80
RS12B-NP-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	24.40	1.80	1.80	16.10	-	28.9	31.0	1.25
RS12B-NP-2						20.85	22.75	45.90				19.46	57.8	61.0	2.50
RS12B-NP-3						30.60	32.50	65.40				19.46	86.7	92.0	3.80
RS16B-NP-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	41.10	4.00	3.20	21.00	-	60.0	70.0	2.70
RS16B-NP-2						33.55	35.75	75.20				31.88	106.0	128.0	5.40
RS20B-NP-1	31.75	(1 1/4")	19.05	19.56	10.19	19.90	23.10	46.60	4.40	3.40	26.00	-	95.0	98.1	3.85
RS20B-NP-2						38.25	41.45	84.60				36.45	170.0	197.0	7.65
RS24B-NP-1	38.10	(1 1/2")	25.40	25.40	14.63	26.65	31.85	61.70	6.00	5.60	33.40	-	160.0	167.0	7.45
RS24B-NP-2						50.80	56.00	112.80				48.36	280.0	335.0	14.65
RS28B-NP-1	44.45	(1 3/4")	27.94	30.99	15.90	32.45	37.45	74.40	7.50	6.30	36.40	-	200.0	200.0	9.45
RS28B-NP-2						62.15	67.15	136.60				59.56	360.0	374.0	18.80
RS32B-NP-1	50.80	(2")	29.21	30.99	17.81	32.10	37.70	73.30	7.00	6.30	42.20	-	250.0	255.0	10.25
RS32B-NP-2						61.25	66.85	134.50				58.55	450.0	485.0	20.10

Note:

1. Connecting links are clip type for sizes up to RS16B-NP, and cotter type for sizes RS16B-NP to RS32B-NP.
2. RF06B-NP chain has flat-shaped link plates.
3. Intermediate plate of multi strand RF06B-NP-2 and RS08B-NP-2 chain is a solid plate.
4. Center sink riveting is applied to RS08B-NP-1 to RS16B-NP-1 single strand chain.
5. Double stake riveting is applied to all other sizes including multi-strand chain.
6. When a single pitch offset link is used, please calculate a 40% reduction of the fatigue strength.

ANSI LAMBDA LUBE FREE ROLLER CHAIN

TSUBAKI's LAMBDA Chains were the first in the industry to use a special oil impregnated bush. Since their launch in 1988, they have been adopted for diverse industries and applications, and their performance has been highly rated. TSUBAKI has a wide line-up of lube-free, long life products that help customers reduce costs.

Technical Evolution

As a pioneer in the lube-free chain market, TSUBAKI will reveal some of the key elements behind ANSI LAMBDA's outstanding performance:

Sintered Bush

A special oil impregnated sintered bush in combination with a special coated pin for long-term internal lubrication is the secret of TSUBAKI ANSI LAMBDA's long economic life and wear resistance.

Patented Ring Coining Process

Breakage of the chains connecting link is no issue at TSUBAKI thanks to this unique feature. By applying the patented Ring Coining process, TSUBAKI generates a cold deformation around the pin hole of the connecting link plate. This results in residual stress around the pin hole and thereby adds strength. By using this process transmission capacity is increased to 100% of the base chain.

Special Environments

TSUBAKI ANSI LAMBDA has outstanding performance in temperatures up to +150°C.

For temperatures above +150°C: Due to the special NSF-H1 certified lubrication impregnated bushes, TSUBAKI ANSI LAMBDA KF Series is usable in a wide temperature range (from -10°C to +230°C), and for food product applications while at the same time being kind to the environment.
Please consult TSUBAKI for more detailed information.

Advantages

TSUBAKI has enhanced the ANSI LAMBDA with the following advantages:

Save Maintenance Costs

No expensive labour costs as it is not required to manually lubricate this chain.

Save Purchasing Costs

Lower frequency of purchasing due to the high quality of the chain and its long economic life. No purchasing of lubricants or lubrication systems necessary.

Higher Productivity

No unforeseen downtime due to chain breakdown.
Less time required for maintenance and therefore more time for production.

Environmental Friendly

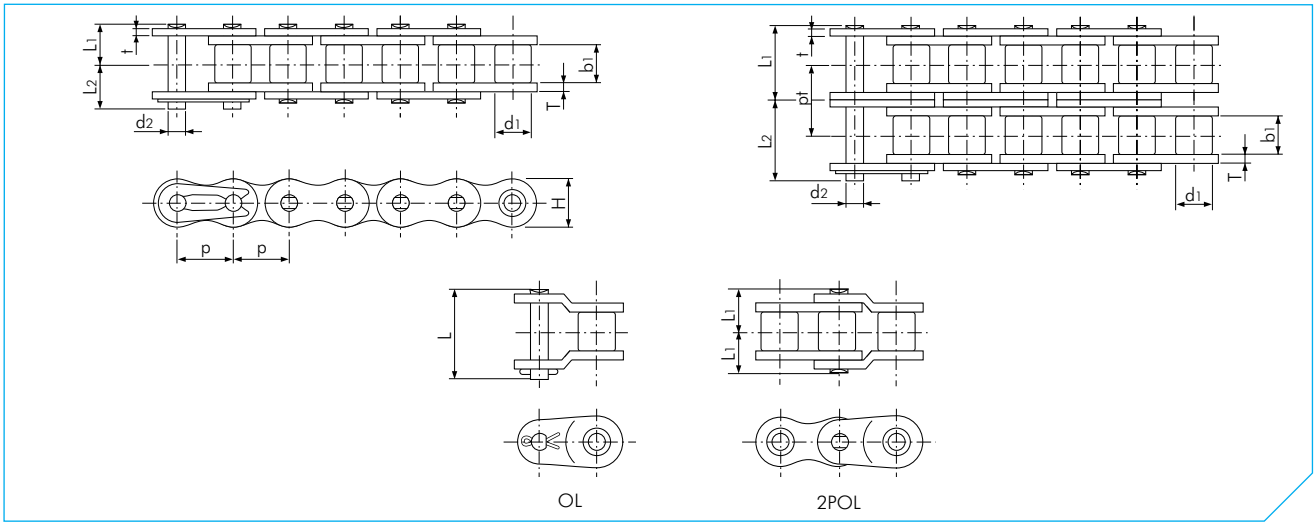
Applications run clean thus reducing the risk of contaminating products, machines, floor etc.

Inter-Changeability

Sprockets:
Only simplex ANSI roller chain sprockets are interchangeable. Multi strand sprockets need to be customised due to the thickness of the roller link plates.
Due to the extended lifetime of ANSI LAMBDA chain, TSUBAKI advises to install sprockets with hardened teeth in every LAMBDA application.

Fig. 14 Basic Construction

ANSI LAMBDA LUBE FREE ROLLER CHAIN



ANSI LAMBDA Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS40-LMD-1	12.70	(1/2")	7.95	7.55	3.97	8.75	10.45	20.00	2.00	1.50	12.00	-	17.7	0.70
RS40-LMD-2						16.50	18.10	-				15.40	35.4	1.40
RS50-LMD-1	15.875	(5/8")	10.16	9.26	5.09	10.75	12.45	24.00	2.40	2.00	15.00	-	28.4	1.11
RS50-LMD-2						20.20	22.00	-				19.00	56.8	2.20
RS60-LMD-1	19.05	(3/4")	11.91	12.28	5.96	13.75	15.70	32.00	3.20	2.40	18.10	-	40.2	1.72
RS60-LMD-2						26.05	28.05	-				24.52	80.4	3.40
RS80-LMD-1	25.40	(1")	15.88	15.48	7.94	17.15	20.25	39.90	4.00	3.20	24.10	-	71.6	2.77
RS80-LMD-2						32.70	35.90	-				31.10	143.0	5.50
RS100-LMD-1	31.75	(1 1/4")	19.05	18.70	9.54	20.65	23.85	47.50	4.80	4.00	30.10	-	107.0	4.30
RS100-LMD-2						39.50	42.50	-				37.60	214.0	8.60
RS120-LMD-1	38.10	(1 1/2")	22.23	24.75	11.11	25.75	29.95	59.00	5.60	4.80	36.20	-	148.0	6.40
RS140-LMD-1	44.45	(1 3/4")	25.40	24.75	12.71	27.70	32.20	63.70	6.40	5.60	42.20	-	193.0	8.10

Note:

1. Connecting links are clip type for sizes RS40-LMD to RS60-LMD, and cotter type for sizes RS80-LMD to RS140-LMD.
2. Drive and Conveyor series LAMBDA chain cannot be intercoupled or interchanged.
3. Due to increased roller link plate thickness, Drive LAMBDA connecting links are required.
4. Due to increased roller link plate thickness, LAMBDA double strand chains require special sprockets.
5. Due to increased roller link plate thickness, the pins are longer. Check for machine interference.
6. Offset links for LAMBDA double strand chains are not available.
7. When a single pitch offset link is used, please calculate a 35% reduction in fatigue strength.
8. Also available in N.E.P. specification.

ANSI G7 STANDARD ROLLER CHAIN

TSUBAKI's 7th model upgrade, celebrating 90 years of quality. Pursuing the ultimate in quality, TSUBAKI has created the world's highest standard of roller chain.

Technical Evolution

All ANSI Chains Are Not Created Equal

ANSI defines minimum threshold standards: acceptable, but they won't improve your bottom line. TSUBAKI ANSI G7 Chains set the bar higher with design innovations that deliver solid results!

Solid Lube Groove Bush - Our Latest Innovation

Unlike curled bush, TSUBAKI SOLID Lube Groove Bush does not have a split. This means that oil cannot leak from the bearing area as a result of that type of manufacturing process. Additional to that innovation TSUBAKI developed a unique process to add grooves to the inner surface of the solid bush. This lube groove process ensures longer and better lubrication which results in an extended chain life.

The Lube Groove Bush is available in ANSI sizes RS80 through RS140, perfectly sized for the most demanding applications.

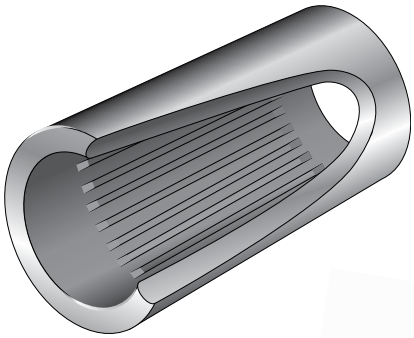


Fig. 15 Solid Lube Groove Bush

Advantages

TSUBAKI has enhanced the ANSI G7 with the following advantages:

Save Operating Costs and Reduce Downtime

Normally, ANSI chains are removed or replaced due to elongation caused by wear in the pin-bush joint. The patented Lube Groove retains lubricant right where it's needed: in the pin-bush joint. In many applications you'll notice a significant difference in maintenance, operating, and replacement costs due to the increased reliability of the ANSI G7 chains.

Increased kW Rating

Transmission capacity has been increased by applying the patented TSUBAKI Ring Coining process on the connecting link plate.

For easy assembling the pin and link plate of a connecting link are slip fit. In general, this type of connecting link has a 20% lower fatigue strength than the chain itself. However, TSUBAKI developed a special process to eliminate that loss of Fatigue Strength and still satisfy the customers demand for easy assembly: the patented Ring Coining process. By applying the patented Ring Coining process, TSUBAKI generates a cold deformation around the pin hole of the connecting link plate. This results in residual stress around the pin hole and thereby adds strength. By using this process transmission capacity is increased to 100% of that of the base chain.

Constant Quality Level

In pursuit of outstanding quality, every TSUBAKI chain is made of a special steel alloy developed by the TSUBAKI Engineering Department.
Besides that, TSUBAKI produces the ANSI G7 under highly controlled conditions in its advanced heat treatment facilities. This, in combination with the TSUBAKI fatigue strength confirmation tests, ensures that our customers can always rely on a constant level of TSUBAKI quality.

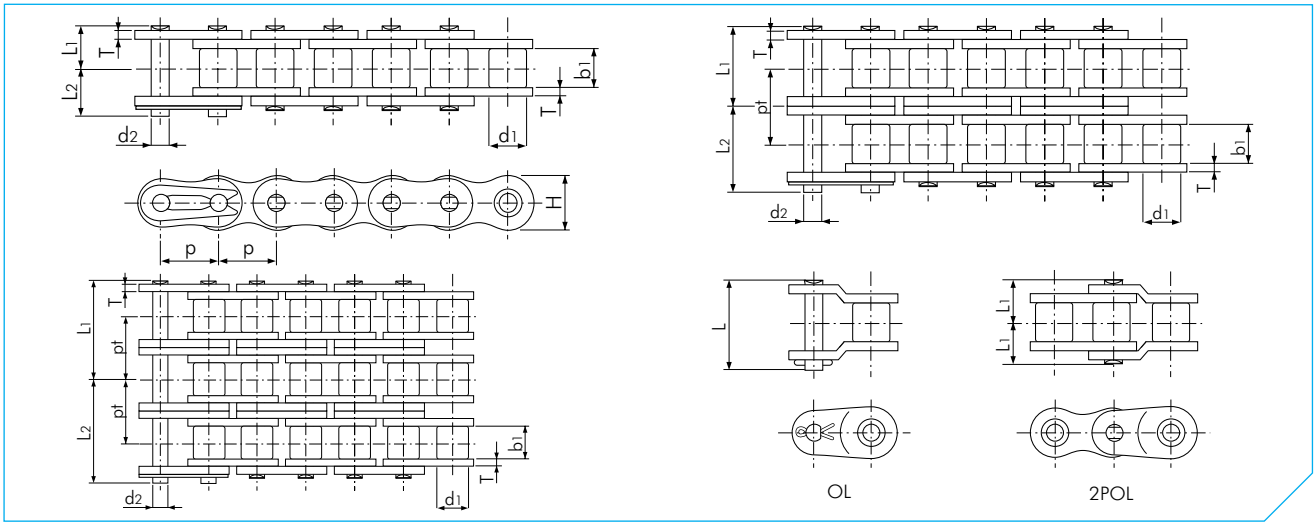
Customised Pre-Lubrication Service

Proper lubrication is the key to extend the life and improve the performance of a chain. In order to get the best performance in general applications (-10 to +60°C), all ANSI G7 drive chains are pre-lubricated.
For special applications, TSUBAKI can provide chains which are pre-lubricated with a special lubricant on customer demand:

- High temperature
- Low temperature
- Food safe
- Outdoor exposure
- Dusty environment

Please consult TSUBAKI for more detailed information.

ANSI G7 STANDARD ROLLER CHAIN



ANSI G7

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Tickness T	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to ANSI kN	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS25-1	6.35	(1/4")	3.30	3.18	2.31	3.80	4.50	-	0.75	5.84	-	3.5	4.12	0.14
RS25-2						6.95	7.75	-			6.40	7.0	8.24	0.27
RS25-3						10.15	10.95	-			6.40	10.5	12.4	0.42
RS35-1	9.525	(3/8")	5.08	4.78	3.59	5.85	6.85	13.50	1.25	9.00	-	7.9	9.81	0.33
RS35-2						10.90	11.90	24.50			10.10	15.8	19.6	0.69
RS35-3						16.00	16.90	34.60			10.10	23.7	29.4	1.05
RS35-4						21.05	21.95	44.70			10.10	-	39.2	1.41
RS37-1	12.70	(1/2")	7.80	3.40	3.63	5.10	5.90	12.45	1.00	9.80	-	-	8.14	0.29
RS38-1	12.70	(1/2")	7.80	4.80	3.63	6.00	7.10	14.10	1.10	9.80	-	-	8.14	0.35
RS41-1	12.70	(1/2")	7.77	6.38	3.59	6.75	7.95	15.10	1.25	9.80	-	6.7	10.3	0.41
RS40-1	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	18.20	1.50	12.00	-	13.9	17.7	0.64
RS40-2						15.45	17.15	33.50			14.40	27.8	35.3	1.27
RS40-3						22.65	24.15	47.90			14.40	41.7	53.0	1.90
RS40-4						29.90	31.30	62.30			14.40	-	70.6	2.53
RS50-1	15.875	(5/8")	10.16	9.53	5.09	10.30	11.90	22.60	2.00	15.00	-	21.8	28.4	1.04
RS50-2						19.35	21.15	41.80			18.10	43.6	56.9	2.07
RS50-3						28.40	30.20	59.90			18.10	65.4	85.3	3.09
RS50-4						37.45	39.25	78.10			18.10	-	114.0	4.11
RS60-1	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	28.20	2.40	18.10	-	31.3	40.2	1.53
RS60-2						24.25	26.25	52.60			22.80	62.6	80.4	3.04
RS60-3						35.65	38.15	75.50			22.80	93.9	121.0	4.54
RS60-4						47.05	49.55	98.30			22.80	-	161.0	6.04
RS80-1	25.40	(1")	15.88	15.88	7.94	16.25	19.25	36.60	3.20	24.10	-	55.6	71.6	2.66
RS80-2						30.90	33.90	67.50			29.30	111.2	143.0	5.27
RS80-3						45.60	48.50	96.90			29.30	166.8	215.0	7.89
RS80-4						60.25	63.25	126.30			29.30	-	286.0	10.50
RS100-1	31.75	(1 1/4")	19.05	19.05	9.54	19.75	22.85	43.70	4.00	30.10	-	87.0	107.0	3.99
RS100-2						37.70	40.80	81.50			35.80	174.0	214.0	7.85
RS100-3						55.65	58.75	117.30			35.80	261.0	321.0	11.77
RS100-4						73.55	76.65	153.10			35.80	-	428.0	15.70
RS120-1	38.10	(1 1/2")	22.23	25.40	11.11	24.90	28.90	55.00	4.80	36.20	-	125.0	148.0	5.93
RS120-2						47.60	51.60	103.20			45.40	250.0	296.0	11.70
RS120-3						70.40	74.40	148.60			45.40	375.0	444.0	17.53
RS120-4						93.10	97.10	194.00			45.40	-	592.0	23.36
RS140-1	44.45	(1 3/4")	25.40	25.40	12.71	26.90	31.70	59.50	5.60	42.20	-	170.0	193.0	7.49
RS140-2						51.35	56.15	112.30			48.90	340.0	386.0	14.83
RS140-3						75.85	80.75	161.30			48.90	510.0	580.0	22.20
RS160-1	50.80	(2")	28.58	31.75	14.29	31.85	36.85	70.20	6.40	48.20	-	223.0	255.0	10.10
RS160-2						61.15	66.15	132.20			58.50	446.0	510.0	20.04
RS160-3						90.45	95.45	190.70			58.50	669.0	765.0	30.02
RS180-1	57.15	(2 1/4")	35.71	35.72	17.46	35.65	42.45	80.60	7.15	54.20	-	281.0	336.0	13.45
RS180-2						68.75	75.35	151.10			65.80	562.0	673.0	26.52
RS180-3						101.70	108.50	216.90			65.80	843.0	1010.0	38.22
RS200-1	63.50	(2 1/2")	39.68	38.10	19.85	39.00	44.80	87.30	8.00	60.30	-	347.0	427.0	16.49
RS200-2						74.85	80.65	161.20			71.60	694.0	853.0	32.63
RS200-3						110.75	116.45	233.00			71.60	1041.0	1280.0	49.02
RS240-1	76.20	(3")	47.63	47.63	23.81	47.90	55.50	106.70	9.50	72.40	-	500.0	623.0	24.50
RS240-2						91.90	99.40	198.40			87.80	1000.0	1250.0	48.10

Note:

1. RS25 - RS35 are rollerless chain (only bush). The figure shown is the bush diameter.
2. Connecting links are clip type for sizes up to RS60, and cotter type for sizes RS80 to RS200. RS240 connecting links are spring pin type.
3. When a single pitch offset link is used, please calculate a 35% reduction of the fatigue strength.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS

Whether your operation requires a sanitary environment, is exposed to corrosive chemicals, is heated to extreme temperatures, runs through a freezer, is exposed to the outdoors or is affected by excessive moisture: our specially designed and tested chains will outlast your current chains and contribute to a cost effective application.

Corrosion Resistant Chain (Stainless Steel base)

ANSI PC Engineering Plastic Combination Chain

The pins and pin link plates of these chains are made of SUS304 equivalent (spring clips SUS301). Engineering Plastic (white) is used for the inner link. This combination makes it a lube-free, low noise (5 dB lower than ANSI standard roller chain) and lightweight chain (50% lighter than ANSI standard roller chain). Working temperature range: -20°C to +80°C. For details on corrosion resistance, please check out the table in the back of this catalogue as a basic guide.

ANSI SS Stainless Steel Chain

All basic components of this chain are made of SUS304 equivalent Stainless Steel (except the spring clips, which are made of SUS301). This chain can be used in special environments such as underwater, acidic and alkaline applications. It can also be used in high and low temperatures (-20°C to +400°C). SUS304 equivalent is only marginally magnetic, due to the cold-forging process. For details on corrosion resistance, please check out the table in the back of this catalogue as a basic guide.

ANSI AS Stainless Steel Chain

The pins and rollers of this roller chain are made of precipitation-hardened, tempered stainless steel. The link plates and the bushes are made of SUS304 equivalent stainless steel (spring clips are SUS301). The Maximum Allowable Load is 1.5 times that of ANSI SS chain. Corrosion resistance is slightly lower than standard SS chain. This chain is suitable where corrosion and heat resistance is required in a heavy duty drive application and where a smaller ANSI SS chain is preferred. Magnetism exists due to the use of precipitation-hardened stainless steel. The working temperature range: -20°C to +400°C.

Corrosion Protected Chain (Carbon Steel base)

ANSI N.E.P. New Environmental Plating Chain

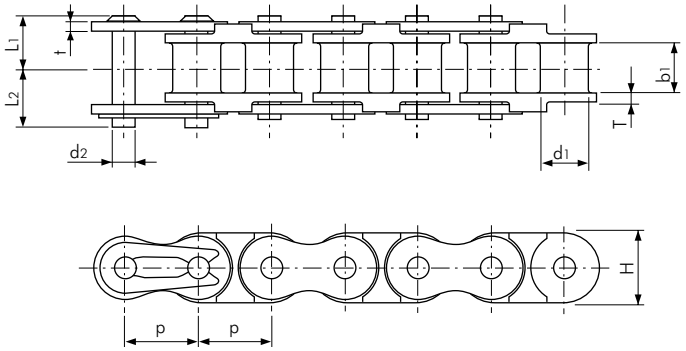
ANSI N.E.P. Chain is a TSUBAKI ANSI G7 chain that has undergone a special surface treatment. The link plates, bushes and pins have a special three stage layer applied in order to provide the maximum protection from the operating or environmental conditions. (Spring clips are SUS301). N.E.P. Rollers have a special coating designed to resist the corrosive conditions as well as the severe dynamic contact between roller and sprocket.

This chain is suitable for use in environments exposed to seawater, acid-rain and other adverse weather conditions. This chain does not contain any chemically hazardous substances such as Hexavalent Chromium, Lead, Cadmium and Mercury as regulated by RoHS√. The kilowatt ratings are the same as those of the corresponding ANSI G7 chain. Working temperature range is: -10°C to +150°C. Above +60°C a special high-temperature lubrication is required. Of course, ANSI LAMBDA N.E.P. chain is also available.

ANSI NP Nickel Plated Chain

ANSI NP Chain is a TSUBAKI ANSI G7 chain that has been plated with Nickel. NP chain has a light corrosion resistance and an attractive appearance. NP chain is suitable for outdoor conditions exposed to water. There is a 15% reduction in Maximum Allowable Load compared to the corresponding ANSI G7 chain, so please take this into account when making your chain selection. The working temperature range is: -10°C to +60°C. Of course, ANSI LAMBDA NP chain is also available.

√RoHS = Restriction of Hazardous Substances



ANSI PC Chain

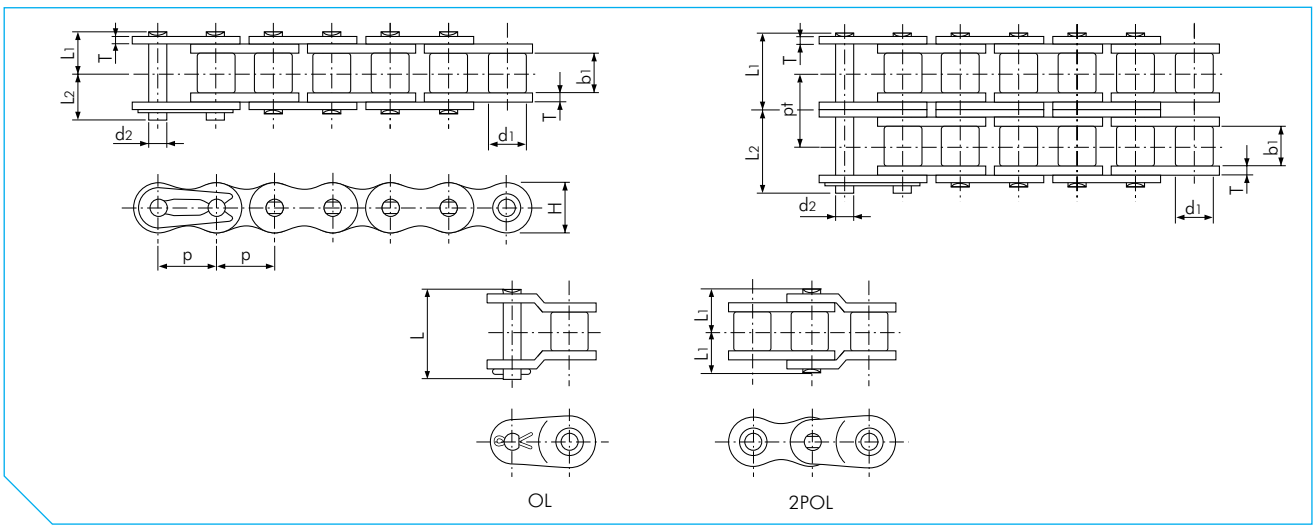
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max)	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
RS25-PC-1	6.35	(1/4")	3.30	3.18	2.31	4.50	5.50	1.30	0.75	6.00	0.08	0.10
RS35-PC-1	9.525	(3/8")	5.08	4.78	3.59	6.85	7.85	2.20	1.25	9.00	0.18	0.22
RS40-PC-1	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	1.50	1.50	12.00	0.44	0.39
RS50-PC-1	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	2.00	2.00	15.00	0.69	0.58
RS60-PC-1	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	2.40	2.40	18.10	0.88	0.82

Note:

1. Make sure to check the chain load again when replacing Stainless Steel Chain with PC Chain.
2. Offset links are not available.
3. Use a chain tensioner with an idler sprocket to adjust chain tension.
4. Guide rails should support the underside of the inner links.
5. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI SS Chain

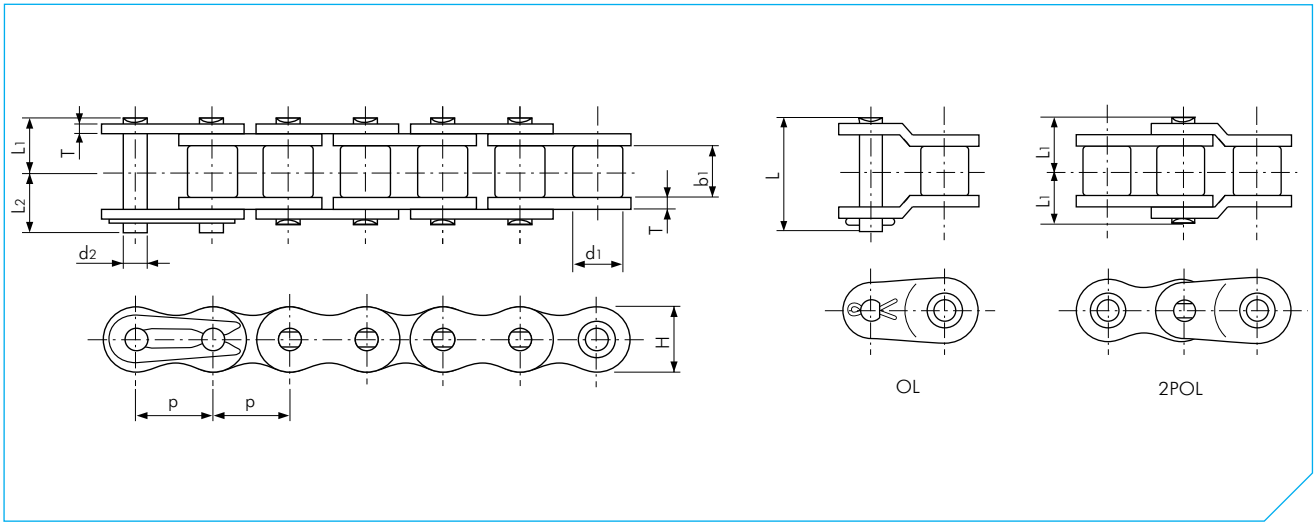
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H (max)	Transverse Pitch pt	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
RS11-SS-1	3.7465	(-)	2.285	1.83	1.57	2.275	3.165	-	0.38	3.50	-	0.05	0.052
RS25-SS-1	6.35	(1/4")	3.30	3.18	2.31	3.80	4.80	-	0.75	5.84	-	0.12	0.14
RS35-SS-1	9.525	(3/8")	5.08	4.78	3.59	6.05	6.85	14.70	1.25	9.00	-	0.26	0.33
RS35-SS-2						11.15	11.85	24.60			10.10	0.53	0.69
RS40-SS-1	12.70	(1/2")	7.92	7.95	3.97	8.25	9.65	18.60	1.50	12.00	-	0.44	0.64
RS40-SS-2						15.25	17.35	33.50			14.40	0.88	1.27
RS50-SS-1	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	23.90	2.00	15.00	-	0.69	1.04
RS50-SS-2						19.15	21.15	41.80			18.10	1.37	2.07
RS60-SS-1	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	29.40	2.40	18.10	-	1.03	1.53
RS60-SS-2						24.25	26.15	52.60			22.80	2.06	3.04
RS80-SS-1	25.40	(1")	15.88	15.88	7.94	16.25	19.25	39.00	3.20	24.10	-	1.77	2.66
RS80-SS-2						30.90	33.90	68.05			29.30	3.53	5.30
RS100-SS-1	31.75	(1 1/4")	19.05	19.05	9.54	19.75	22.85	45.70	4.00	30.10	-	2.55	4.01
RS100-SS-2						37.70	40.80	81.60			35.80	5.10	7.99

Note:

1. RS11-SS to RS35-SS are rollerless chain (only bush). The figure shown is the bush diameter.
2. Connecting links are clip type for sizes RS11-SS to RS60-SS, and cotter type for sizes RS80-SS to RS100-SS.
3. The rivet-type for single-strand and multi-strand chain above RS80-SS is quad-rivet.
4. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI AS Chain

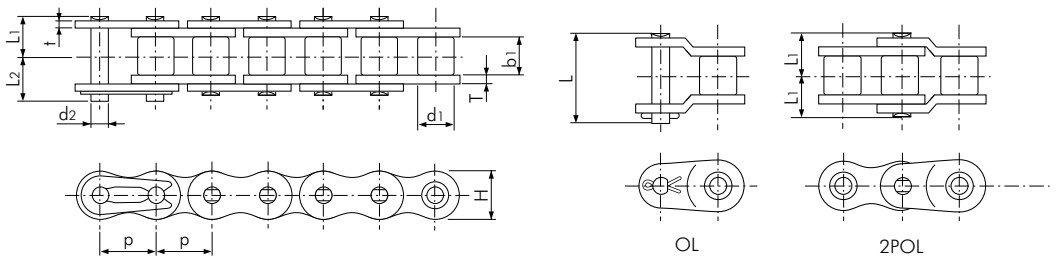
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H (max)	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
RS35-AS-1	9.525	(3/8")	5.08	4.78	3.59	5.85	6.85	14.70	1.25	9.00	0.39	0.33
RS40-AS-1	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	18.60	1.50	12.00	0.69	0.64
RS50-AS-1	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	23.90	2.00	15.00	1.03	1.04
RS60-AS-1	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	29.40	2.40	18.10	1.57	1.53
RS80-AS-1	25.40	(1")	15.88	15.88	7.94	16.25	19.25	39.00	3.20	24.10	2.65	2.66

Note:

1. Connecting links are clip type for sizes RS35-AS to RS60-AS, and cotter type for size RS80-AS.
2. RS35-AS is rollerless chain (only bush). The figure shown is the bush diameter.
3. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



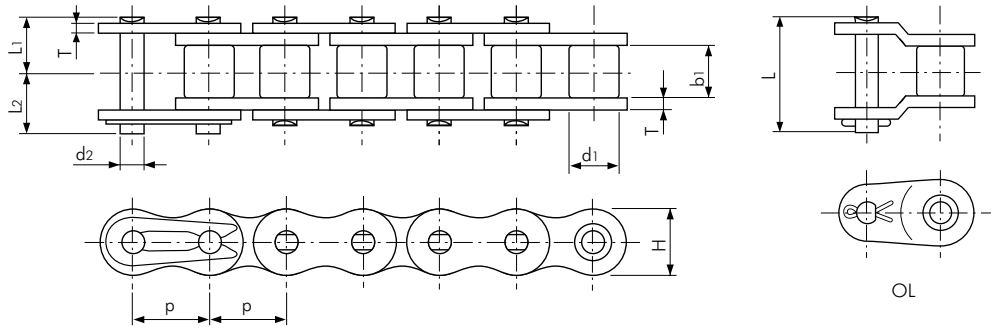
ANSI LAMBDA N.E.P. Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin				Link Plate			Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
					Diameter d2	Length L1	Length L2	Length L	Thickness T	Thickness t	Height H (max)		
RS40-LMD-NEP-1	12.70	(1/2")	7.95	7.55	3.97	8.75	10.45	20.00	2.00	1.50	12.00	17.7	0.70
RS50-LMD-NEP-1	15.875	(5/8")	10.16	9.26	5.09	10.75	12.45	24.00	2.40	2.00	15.00	28.4	1.11
RS60-LMD-NEP-1	19.05	(3/4")	11.91	12.28	5.96	13.70	15.70	32.00	3.20	2.40	18.10	40.2	1.72
RS80-LMD-NEP-1	25.40	(1")	15.88	15.48	7.94	17.15	20.25	39.90	4.00	3.20	24.10	71.6	2.77
RS100-LMD-NEP-1	31.75	(1 1/4")	19.05	18.70	9.54	20.65	23.85	47.50	4.80	4.00	30.10	107.0	4.30
RS120-LMD-NEP-1	38.10	(1 1/2")	22.23	24.75	11.11	25.75	29.95	59.00	5.60	4.80	36.20	148.0	6.40
RS140-LMD-NEP-1	44.45	(1 3/4")	25.40	24.75	12.71	27.70	32.20	63.70	6.40	5.60	42.20	193.0	8.10

Note:

1. Connecting links are clip type for sizes RS40-LMD-NEP to RS60-LMD-NEP, and cotter type for sizes RS80-LMD-NEP to RS140-LMD-NEP.
2. Drive and Conveyor series LAMBDA chain cannot be intercoupled or interchanged.
3. Due to increased roller link plate thickness, Drive LAMBDA connecting links are required.
4. Due to increased roller link plate thickness, the pins are longer. Check for machine interference.
5. When a single pitch offset link is used, please calculate a 35% reduction in fatigue strength.



ANSI N.E.P. Chain

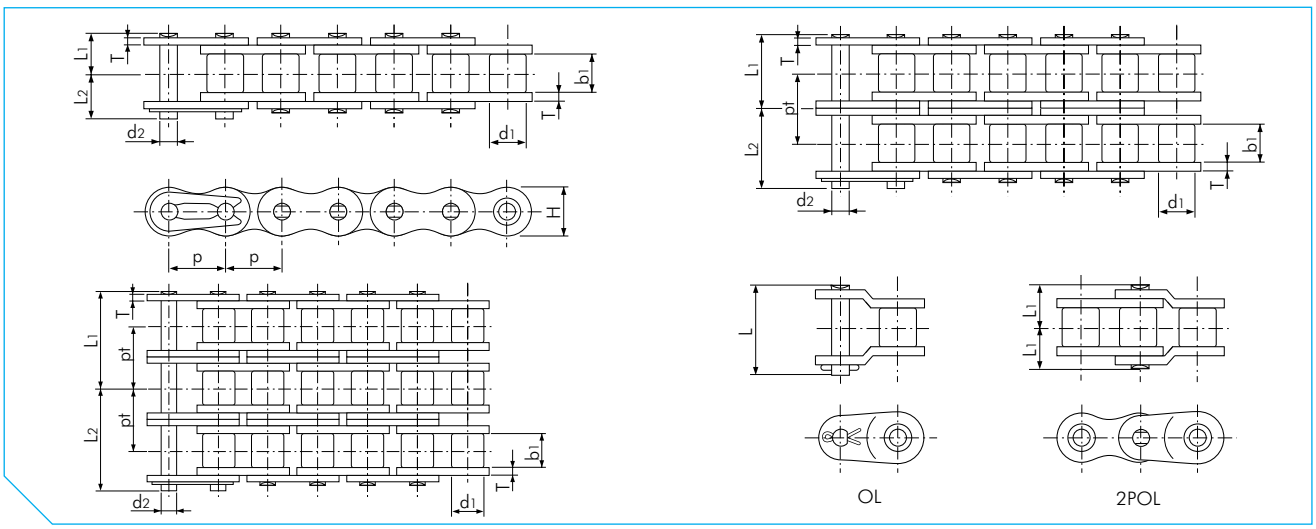
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H (max)	Min. Tensile Strength acc. to ANSI kN	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS35-NEP-1	9.525	(3/8")	5.08	4.78	3.59	5.85	6.85	13.50	1.25	9.00	7.9	9.81	0.33
RS40-NEP-1	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	18.20	1.50	12.00	13.9	17.7	0.64
RS50-NEP-1	15.875	(5/8")	10.16	9.53	5.09	10.30	11.90	22.60	2.00	15.00	21.8	28.4	1.04
RS60-NEP-1	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	28.20	2.40	18.10	31.3	40.2	1.53
RS80-NEP-1	25.40	(1")	15.88	15.88	7.94	16.25	19.25	38.20	3.20	24.10	55.6	71.6	2.66

Note:

1. Connecting links are clip type for sizes RS35-NEP to RS60-NEP, and cotter type for size RS80-NEP.
2. When a single pitch offset link is used, please calculate a 35% reduction of the fatigue strength.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI NP Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS25-NP-1	6.35	(1/4")	3.30	3.18	2.31	3.80	4.50	7.60	0.75	5.84	-	4.12	0.14
RS35-NP-1						5.85	6.85	13.50			-	9.81	0.33
RS35-NP-2	9.525	(3/8")	5.08	4.78	3.59	10.90	11.90	24.50	1.25	9.00	10.10	19.6	0.69
RS35-NP-3						16.00	16.90	34.60			10.10	29.4	1.05
RS40-NP-1						8.25	9.95	18.20			-	17.7	0.64
RS40-NP-2	12.70	(1/2")	7.92	7.95	3.97	15.45	17.15	33.50	1.50	12.00	14.40	35.3	1.27
RS40-NP-3						22.65	24.15	47.90			14.40	53.0	1.90
RS50-NP-1						10.30	11.90	22.60			-	28.4	1.04
RS50-NP-2	15.875	(5/8")	10.16	9.53	5.09	19.35	21.15	41.80	2.00	15.00	18.10	56.9	2.07
RS50-NP-3						28.40	30.20	59.90			18.10	85.3	3.09
RS60-NP-1						12.85	14.75	28.20			-	40.2	1.53
RS60-NP-2	19.05	(3/4")	11.91	12.70	5.96	24.25	26.25	52.60	2.40	18.10	22.80	80.4	3.04
RS60-NP-3						35.65	38.15	75.50			22.80	121.0	4.54
RS80-NP-1						16.25	19.25	36.60			-	71.6	2.66
RS80-NP-2	25.40	(1")	15.88	15.88	7.94	30.90	33.90	67.50	3.20	24.10	29.30	143.0	5.27
RS80-NP-3						45.60	48.50	96.90			29.30	215.0	7.89
RS100-NP-1	31.75	(1 1/4")	19.05	19.05	9.54	19.75	22.85	43.70	4.00	30.10	-	107.0	3.99

Note:

1. RS25-NP to RS35-NP are rollerless chains (only bush). The figure shown is the bush diameter.
2. Connecting links are clip type for sizes RS25-NP to RS60-NP, and cotter type for size RS80-NP to RS100-NP.
3. When a single pitch offset link is used, please calculate a 35% reduction of the fatigue strength.

The superior performance of TSUBAKI Heavy Duty chains is the result of a comprehensive quality control network that begins with selection of the world's finest steel materials. It continues with inspection and analysis of quality and performance in 20 different work areas. At TSUBAKI quality control is not just a one time check; it is a total dedication. It is your assurance of long lasting and dependable performance.

TSUBAKI offers Heavy Duty chains for applications that exceed the capabilities of TSUBAKI ANSI G7 standard roller chain. Heavy Duty chain should be considered in the following situations:

1. Harsh environments where the chain will be subjected to heavy impact.
2. Compact drives for equipment or machines that must work in tight spaces.
3. When higher transmission power, allowable load or tensile strength is required.
4. When a lower rate of elastic elongation is required.

H Series

H Series chain differs only from the ANSI G7 Series chain in the thickness of the link plates. The link plates have the same thickness as the link plates of the next larger pitch size in ANSI G7 Series. The increased thickness of the link plates provides a 10% greater capacity for fatigue strength. In short, H Series chains are especially suitable for situations where the load is heavy and operating speed is low (up to 50 m/min) or where operating conditions are severe.

HT Series

HT Series chain provides a (10% to 20%) higher Tensile Strength than ANSI G7 Series chain by using through-hardened pins and link plates of the next larger pitch size in ANSI G7 series. HT Series chain also provides a higher fatigue strength and is best suited for low operating speeds - up to 50 m/min Dimensions of the chain are identical to the H Series chain.

SUPER Series

The dimensions of these series are identical to those of ANSI G7 Series chain. The special design of the SUPER Series link plate delivers exceptional performance. The pin holes are critically formed and ball drifted and the pins are through-hardened for greater fatigue strength (25% to 30%). SUPER Series chains offer 10% higher tensile strength than the equivalent size ANSI G7 Series chain. SUPER Series chains can be used to replace the next larger pitch size of ANSI G7 Series, making them ideal for applications where chain space is limited. Best suited for low speed operating conditions - up to 50 m/min.

SUPER-H Series

The thickness of the SUPER-H Series link plates is the same as the next larger pitch size of SUPER Series chain. The pins are also through-hardened which provides a higher tensile strength and a higher fatigue strength than SUPER Series chain. The pin holes are critically formed and ball drifted. SUPER-H Series chains can be used to replace the next larger size of ANSI standard chain, making them ideal for applications where space is limited. Best suited for low speed operating conditions - up to 50 m/min.

ULTRA SUPER Series

ULTRA SUPER Series offer longer wear life, greater fatigue strength (170%) and higher tensile strength (150%) than any other TSUBAKI roller chain. The pins are through-hardened and the pin holes are critically formed and ball drifted. The diameter of the pins has been increased. This chain is well suited for applications where there are space limitations. The heavy duty construction of the ULTRA SUPER Series chain allows it to replace chains up to two pitch sizes larger ANSI G7 Series chain. It is best suited for low speed operating conditions up to 50 m/min.

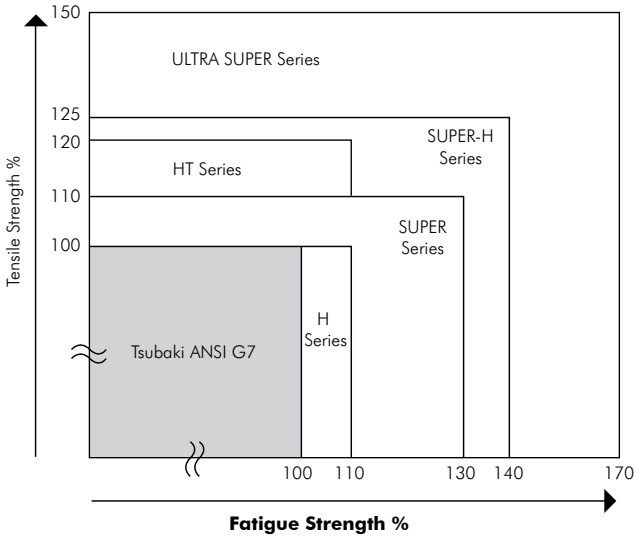
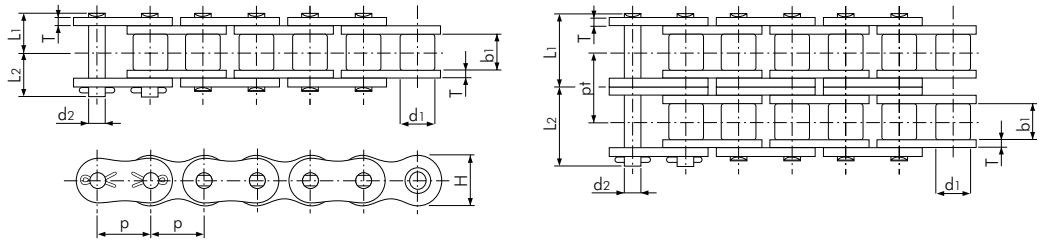


Fig. 16 Comparison of Tensile Strength / Fatigue Strength

ANSI HEAVY DUTY ROLLER CHAIN



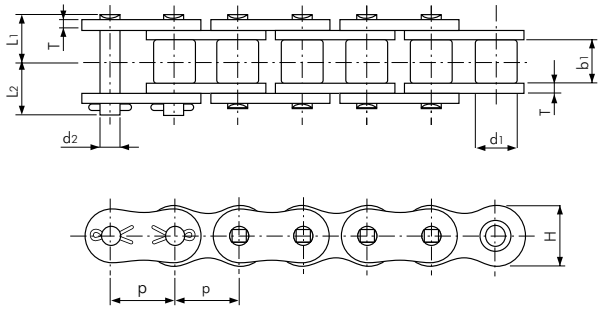
H Series

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS60-H-1	19.05	(3/4")	11.91	12.70	5.96	14.80	17.00	3.20	18.10	-	40.2	1.80
RS60-H-2						27.80	29.90			26.10	80.4	3.59
RS80-H-1	25.40	(1")	15.88	15.88	7.94	18.30	20.90	4.00	24.10	-	71.6	3.11
RS80-H-2						34.60	37.20			32.60	143.0	6.18
RS100-H-1	31.75	(1 1/4")	19.05	19.05	9.54	21.80	24.50	4.80	30.10	-	107.0	4.58
RS100-H-2						41.40	44.10			39.10	214.0	9.03
RS120-H-1	38.10	(1 1/2")	22.23	25.40	11.11	26.95	30.55	5.60	36.20	-	148.0	6.53
RS120-H-2						51.40	55.00			48.90	296.0	12.90
RS140-H-1	44.45	(1 3/4")	25.40	25.40	12.71	28.90	33.10	6.40	42.20	-	193.0	8.27
RS140-H-2						55.00	59.50			52.20	386.0	16.38
RS160-H-1	50.80	(2")	28.58	31.75	14.29	33.95	38.45	7.15	48.20	-	255.0	10.97
RS160-H-2						64.90	69.60			61.90	510.0	21.78
RS200-H-1	63.50	(2 1/2")	39.68	38.10	19.85	42.90	48.10	9.50	60.30	-	427.0	18.41

Note:

1. Standard ANSI sprockets can be used for single strand chain.
2. Multi strand chains need special sprockets, contact Tsubaki for more detailed information.
3. Sprockets with a low teeth number must have hardened teeth.
4. Steel grade of sprockets must be C45 or higher.



HT Series

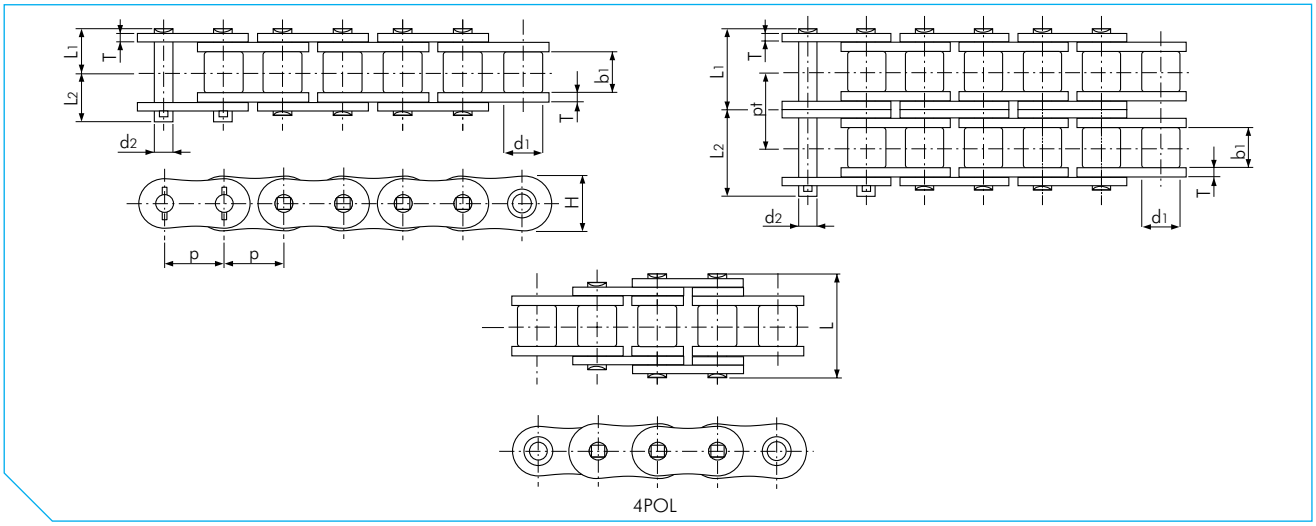
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Height H (max)	Min. Tensile Strength acc. to Tsubaki kN	Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS60-HT-1	19.05	(3/4")	11.91	12.70	5.96	14.80	17.00	3.20	18.10	48.1	55.9	1.80
RS80-HT-1	25.40	(1")	15.88	15.88	7.94	18.30	20.90	4.00	24.10	81.4	93.2	3.11
RS100-HT-1	31.75	(1 1/4")	19.05	19.05	9.54	21.80	24.50	4.80	30.10	124.0	142.0	4.58
RS120-HT-1	38.10	(1 1/2")	22.23	25.40	11.11	26.95	30.55	5.60	36.20	167.0	191.0	6.53
RS140-HT-1	44.45	(1 3/4")	25.40	25.40	12.71	28.90	33.10	6.40	42.20	218.0	250.0	8.27
RS160-HT-1	50.80	(2")	28.58	31.75	14.29	33.95	38.45	7.15	48.20	278.0	319.0	10.97
RS200-HT-1	63.50	(2 1/2")	39.68	38.10	19.85	42.90	48.10	9.50	60.30	486.0	559.0	18.41
RS240-HT-1	76.20	(3")	47.63	47.63	23.81	54.80	62.30	12.70	72.40	768.0	883.0	29.13

Note:

1. Semi press-fit type connecting links are supplied.
2. Standard ANSI sprockets can be used for single strand chain.
3. Sprockets with a low teeth number must have hardened teeth.
4. Steel grade of sprockets must be C45 or higher.
5. Multi strand chains are available on request.
6. Pins are quad riveted.
7. RS240-HT uses a spring pin for the connecting link.

ANSI HEAVY DUTY ROLLER CHAIN



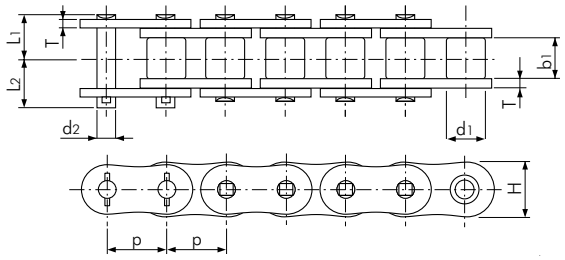
SUPER Series

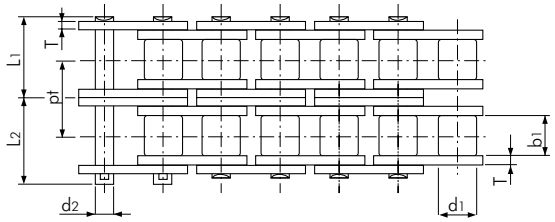
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to Tsubaki kN	Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS80-SUP-1	25.40	(1″)	15.88	15.88	7.94	16.25	19.25	39.30	3.20	24.10	-	74.2	85.3	2.81
RS80-SUP-2						30.90	33.90	-			29.30	148.0	171.0	5.62
RS100-SUP-1	31.75	(1 1/4″)	19.05	19.05	9.54	19.75	22.85	48.00	4.00	30.10	-	111.0	127.0	4.25
RS100-SUP-2						37.70	40.80	-			35.80	222.0	255.0	8.38
RS120-SUP-1	38.10	(1 1/2″)	22.23	25.40	11.11	24.90	28.90	59.90	4.80	36.20	-	162.0	186.0	6.30
RS120-SUP-2						47.60	51.60	-			45.40	324.0	373.0	12.44
RS140-SUP-1	44.45	(1 3/4″)	25.40	25.40	12.71	26.90	31.70	65.70	5.60	42.20	-	213.0	245.0	8.04
RS160-SUP-1	50.80	(2″)	28.58	31.75	14.29	31.85	36.85	77.20	6.40	48.20	-	273.0	314.0	10.79
RS200-SUP-1	63.50	(2 1/2″)	39.68	38.10	19.85	39.00	44.80	94.90	8.00	60.30	-	439.0	505.0	17.63
RS240-SUP-1	76.20	(3″)	47.63	47.63	23.81	47.90	55.50	116.00	9.50	72.40	-	639.0	735.0	25.63

Note:

1. When a 4POL is used, please calculate a 10% reduction of the fatigue strength.
2. Standard ANSI sprockets can be used.
3. Pins are quad riveted.





SUPER-H Series

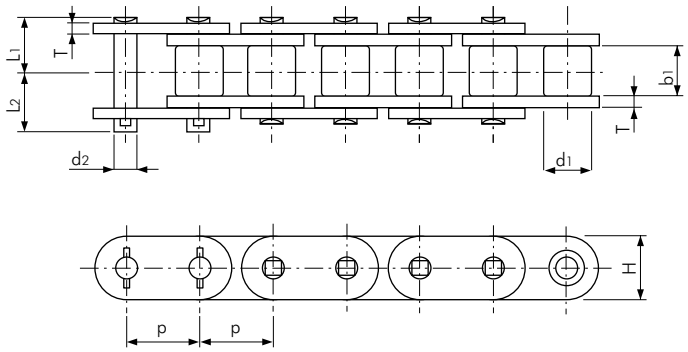
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Height H (max)	Transverse Pitch pt	Min. Tensile Strength acc. to Tsubaki kN	Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS80-SUP-H-1	25.40	(1")	15.88	15.88	7.94	18.30	20.90	4.00	24.10	-	85.3	98.1	3.29
RS80-SUP-H-2						34.60	37.20			32.60	171.0	196.0	6.52
RS100-SUP-H-1	31.75	(1 1/4")	19.05	19.05	9.54	21.80	24.50	4.80	30.10	-	127.0	145.0	4.88
RS100-SUP-H-2						41.40	44.10			39.10	253.0	290.0	9.51
RS120-SUP-H-1	38.10	(1 1/2")	22.23	25.40	11.11	26.95	30.55	5.60	36.20	-	171.0	196.0	6.94
RS140-SUP-H-1	44.45	(1 3/4")	25.40	25.40	12.71	28.90	33.10	6.40	42.20	-	222.0	255.0	8.88
RS160-SUP-H-1	50.80	(2")	28.58	31.75	14.29	33.95	38.45	7.15	48.20	-	281.0	324.0	11.72
RS200-SUP-H-1	63.50	(2 1/2")	39.68	38.10	19.85	42.90	48.10	9.50	60.30	-	520.0	598.0	19.68
RS240-SUP-H-1	76.20	(3")	47.63	47.63	23.81	54.80	62.30	12.70	72.40	-	802.0	922.0	30.47

Note:

1. Offset links are not available.
2. Press-fit type connecting links are supplied.
3. Standard ANSI sprockets can be used with single strand chain only.
4. Sprockets with a low teeth number must have hardened teeth.
5. Steel grade of sprockets must be C45 or higher.
6. Multi strand chains need special sprockets, contact Tsubaki for more detailed information.
7. Pins are quad riveted.

ANSI HEAVY DUTY ROLLER CHAIN



ULTRA SUPER Series

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Height H (max)	Min. Tensile Strength acc. to Tsubaki kN	Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RF100-US-1	31.75	(1 1/4")	19.05	19.05	10.32	22.35	25.35	4.80	30.10	149.0	172.0	5.07
RF120-US-1	38.10	(1 1/2")	22.23	25.40	12.28	27.55	31.55	5.60	36.20	213.0	245.0	7.22
RF140-US-1	44.45	(1 3/4")	25.40	25.40	13.97	29.50	34.20	6.40	42.20	273.0	314.0	9.24
RF160-US-1	50.80	(2")	28.58	31.75	15.62	34.50	40.20	7.15	48.20	341.0	392.0	12.19

Note:

1. Standard ANSI sprockets can be used if the sprocket teeth have been hardened.
2. Steel grade of sprockets must be C45 or higher.
3. Offset links are not available.
4. Multi-strand chains are not available.
5. Press-fit type connecting links are supplied.
6. Pins are quad riveted.

Low Noise Drive Chain - a TSUBAKI innovation - creates a worker-friendly, environmentally friendly plant. It reduces equipment noise, and it eliminates the need for expensive, hard-to-work-around soundproof enclosures.

Technical Evolution

TSUBAKI's uniquely structured spring rollers are used for chain rollers. When TSUBAKI's Low Noise roller chain engages the sprocket, the spring roller deforms and absorbs the force of impact, reducing impact noise between chain and sprocket. Compared with TSUBAKI's standard roller chain, noise levels of Low Noise Roller Chain are 6 - 8 dB lower. Working temperature range: -10°C to +60°C. Allowable chain speed: 200 m/min.

Advantages

Noise Reduction

Lower noise levels increase comfort levels in the workplace. Besides, lower noise levels also eliminate the need for costly, soundproof enclosures.

Stronger than Belts

In some applications, belts are considered as a countermeasure to noise. However, there are many limitations in terms of strength when considering belts. The TSUBAKI Low Noise roller chain is perfect for applications where the strength of a roller chain is needed without the accompanying noise.

Inter-Changeability

Chains:
TSUBAKI Low Noise roller chain is directly interchangeable with ANSI standard roller chain.

Sprockets:
Standard ANSI roller chain sprockets can be used. However, if the chain cannot be sufficiently lubricated, TSUBAKI recommends installing sprockets with hardened teeth.

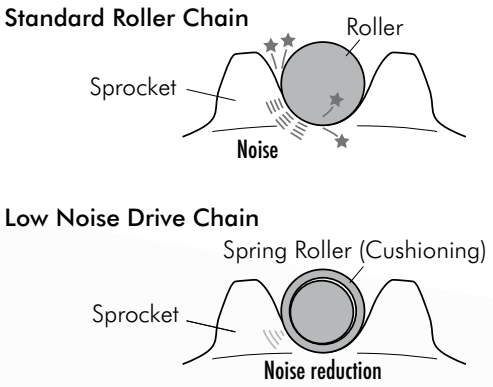
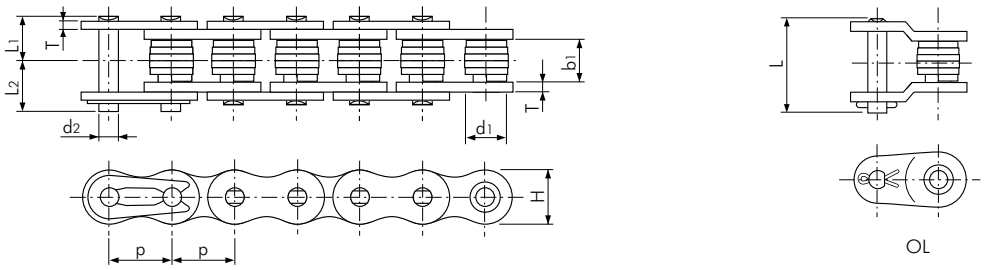


Fig. 17 Cushioning Effect

ANSI LOW NOISE ROLLER CHAIN



ANSI SNS Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H (max)	Min. Tensile Strength acc. to ANSI kN	Min. Tensile Strength acc. to Tsubaki kN	Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
RS40-SNS-1	12.70	(1/2")	8.50	7.95	3.97	8.25	9.95	18.00	1.50	12.00	13.9	17.7	19.1	0.64
RS50-SNS-1	15.875	(5/8")	10.80	9.53	5.09	10.30	12.00	22.50	2.00	15.00	21.8	28.4	31.4	1.04
RS60-SNS-1	19.05	(3/4")	12.60	12.70	5.96	12.85	14.75	28.20	2.40	18.10	31.3	40.2	44.1	1.53
RS80-SNS-1	25.40	(1")	16.80	15.88	7.94	16.25	19.25	36.00	3.20	24.10	55.6	71.6	78.5	2.66

Note:

1. Connecting links are clip type for sizes RS40-SNS to RS60-SNS, and cotter type for size RS80-SNS.
2. When a single pitch offset link is used, please calculate a 35% reduction of the Fatigue Strength.
3. Standard ANSI sprockets can be used.

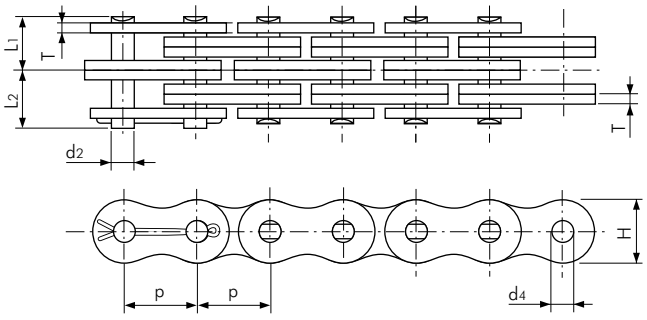
Leaf Chain is the most simple of steel chains, consisting only of link plates and pins. This chain generally has greater tensile strength than roller chains and runs over sheaves rather than sprockets. They are suitable for hanging, balancing or motion transmitting applications. Leaf chains are often used as counterweight chains for machine tools, elevator and oven doors, forklift truck masts, spinning frames and similar lifting or balancing applications.

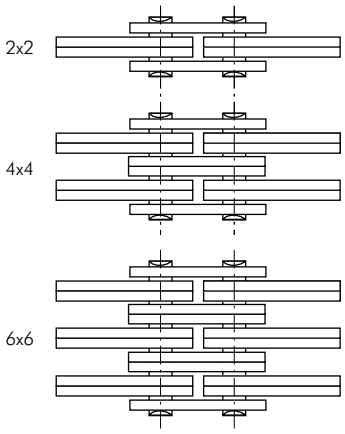
Plates are connected by pins and hold the tension loaded on the chain.

AL Type
Plate configuration and thickness are the same as ANSI G7 roller chain. Pin diameter is almost the same as ANSI G7 roller chain.

BL Type
BL Series leaf chains consist of link plates which are thicker and larger in contour than the AL Series link plates of the same pitch. The link plates have the same thickness as the link plates of the next larger pitch size in ANSI G7 roller chains. The pins have the same diameter as those of ANSI G7 roller chains of the next larger pitch.

ANSI LEAF CHAIN





Lacing Combination

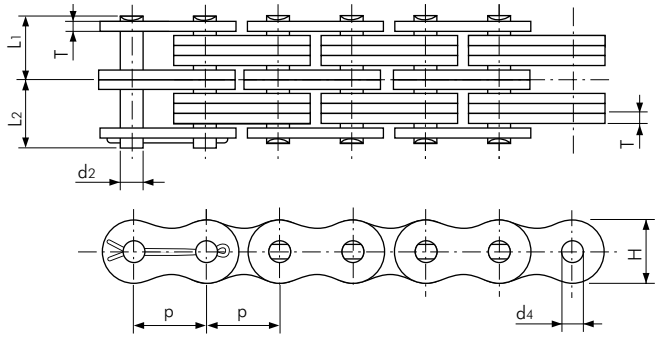
AL Type

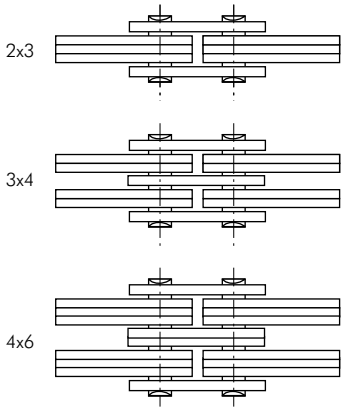
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Lacing Combination LC	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Height H (max)	Link Plate Hole Diameter d4	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
AL 422	12.70	(1/2")	2 x 2	3.96	4.20	5.30	1.50	10.40	4.02	16.7	0.38
AL 444			4 x 4		7.43	8.52				33.3	0.74
AL 466			6 x 6		10.65	11.75				50.5	1.10
AL 522	15.875	(5/8")	2 x 2	5.08	5.43	6.97	2.00	13.00	5.13	27.5	0.62
AL 544			4 x 4		9.68	11.22				54.9	1.22
AL 566			6 x 6		13.90	15.45				82.4	1.81
AL 622	19.05	(3/4")	2 x 2	5.94	6.33	8.22	2.40	15.60	6.00	38.2	0.87
AL 644			4 x 4		11.28	13.17				76.5	1.71
AL 666			6 x 6		16.23	18.12				115.0	2.54
AL 822	25.40	(1")	2 x 2	7.90	8.18	10.97	3.20	20.80	7.97	64.7	1.51
AL 844			4 x 4		14.90	17.70				129.0	2.98
AL 866			6 x 6		21.60	24.40				194.0	4.44
AL 1022	31.75	(1 1/4")	2 x 2	9.48	10.03	13.22	4.00	26.00	9.57	98.1	2.69
AL 1044			4 x 4		18.35	21.55				196.0	5.31
AL 1066			6 x 6		26.65	29.85				294.0	7.93
AL 1222	38.10	(1 1/2")	2 x 2	11.04	12.10	15.80	4.80	31.20	11.14	141.0	3.57
AL 1244			4 x 4		22.00	25.70				282.0	7.07
AL 1266			6 x 6		31.93	35.62				424.0	10.56
AL 1444	44.45	(1 3/4")	4 x 4	12.64	25.65	30.15	5.60	36.40	12.74	373.0	10.34
AL 1466			6 x 6		37.28	41.77				559.0	15.16
AL 1644	50.80	(2")	4 x 4	14.21	29.03	34.02	6.40	41.60	14.32	471.0	12.98
AL 1666			6 x 6		42.23	47.22				706.0	19.41

Note:

1. For more detailed information regarding clevises and sheaves, please contact Tsubaki.





Lacing Combination

BL Type

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Lacing Combination LC	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Height H (max)	Link Plate Hole Diameter d4	Min. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
BL 422	12.70	(1/2")	2 x 2	5.08	5.44	6.99	2.00	12.00	5.13	23.5	0.68
BL 423			2 x 3		6.48	8.02				23.5	0.84
BL 434			3 x 4		8.61	10.15				35.3	1.13
BL 444			4 x 4		9.70	11.25				47.1	1.28
BL 446			4 x 6		11.80	13.35				47.1	1.65
BL 466			6 x 6		13.89	15.44				70.6	1.96
BL 522	15.875	(5/8")	2 x 2	5.95	6.32	8.23	2.40	15.00	6.00	39.2	1.07
BL 523			2 x 3		7.55	9.45				39.2	1.27
BL 534			3 x 4		10.05	11.95				58.8	1.69
BL 544			4 x 4		11.28	13.18				78.5	1.89
BL 546			4 x 6		13.75	15.65				78.5	2.40
BL 566			6 x 6		16.23	18.14				118.0	2.80
BL 622	19.05	(3/4")	2 x 2	7.93	8.20	11.02	3.20	18.10	7.97	63.7	1.68
BL 623			2 x 3		9.88	12.67				63.7	2.04
BL 634			3 x 4		13.23	16.02				95.6	2.83
BL 644			4 x 4		14.91	17.70				127.0	3.18
BL 646			4 x 6		18.25	21.05				127.0	4.01
BL 666			6 x 6		21.62	24.41				191.0	4.73
BL 822	25.40	(1")	2 x 2	9.48	10.08	13.28	4.00	24.10	9.57	103.0	2.59
BL 823			2 x 3		12.10	15.30				103.0	3.20
BL 834			3 x 4		16.28	19.47				155.0	4.44
BL 844			4 x 4		18.47	21.67				206.0	5.04
BL 846			4 x 6		22.50	25.70				206.0	6.32
BL 866			6 x 6		26.64	29.85				309.0	7.54
BL 1022	31.75	(1 1/4")	2 x 2	11.04	11.99	15.67	4.80	30.10	11.14	141.0	3.76
BL 1023			2 x 3		14.45	18.15				141.0	4.69
BL 1034			3 x 4		19.43	23.12				216.0	6.55
BL 1044			4 x 4		21.69	25.37				282.0	7.48
BL 1046			4 x 6		26.85	30.55				282.0	9.29
BL 1066			6 x 6		31.93	35.61				424.0	11.16
BL 1222	38.10	(1 1/2")	2 x 2	12.64	14.02	18.54	5.60	36.20	12.74	186.0	4.83
BL 1223			2 x 3		16.95	21.45				186.0	6.54
BL 1234			3 x 4		22.75	27.25				299.0	9.10
BL 1244			4 x 4		25.65	30.18				373.0	10.39
BL 1246			4 x 6		31.48	35.97				373.0	12.01
BL 1266			6 x 6		37.29	41.81				559.0	14.58
BL 1422	44.45	(1 3/4")	2 x 2	14.21	15.82	20.83	6.40	42.20	14.32	235.0	7.31
BL 1423			2 x 3		19.10	24.10				235.0	9.06
BL 1434			3 x 4		25.70	30.70				387.0	11.32
BL 1444			4 x 4		29.03	34.04				471.0	12.96
BL 1446			4 x 6		35.63	40.62				471.0	18.00
BL 1466			6 x 6		42.24	47.24				706.0	22.51
BL 1622	50.80	(2")	2 x 2	17.38	17.81	24.41	7.20	48.20	17.49	353.0	9.84
BL 1623			2 x 3		21.63	28.22				353.0	12.16
BL 1634			3 x 4		29.20	35.80				554.0	16.95
BL 1644			4 x 4		32.94	39.55				706.0	18.97
BL 1646			4 x 6		40.53	47.12				706.0	24.09
BL 1666			6 x 6		48.08	54.69				1060.0	28.73

Note:

1. For more detailed information regarding clevises and sheaves, please contact Tsubaki.

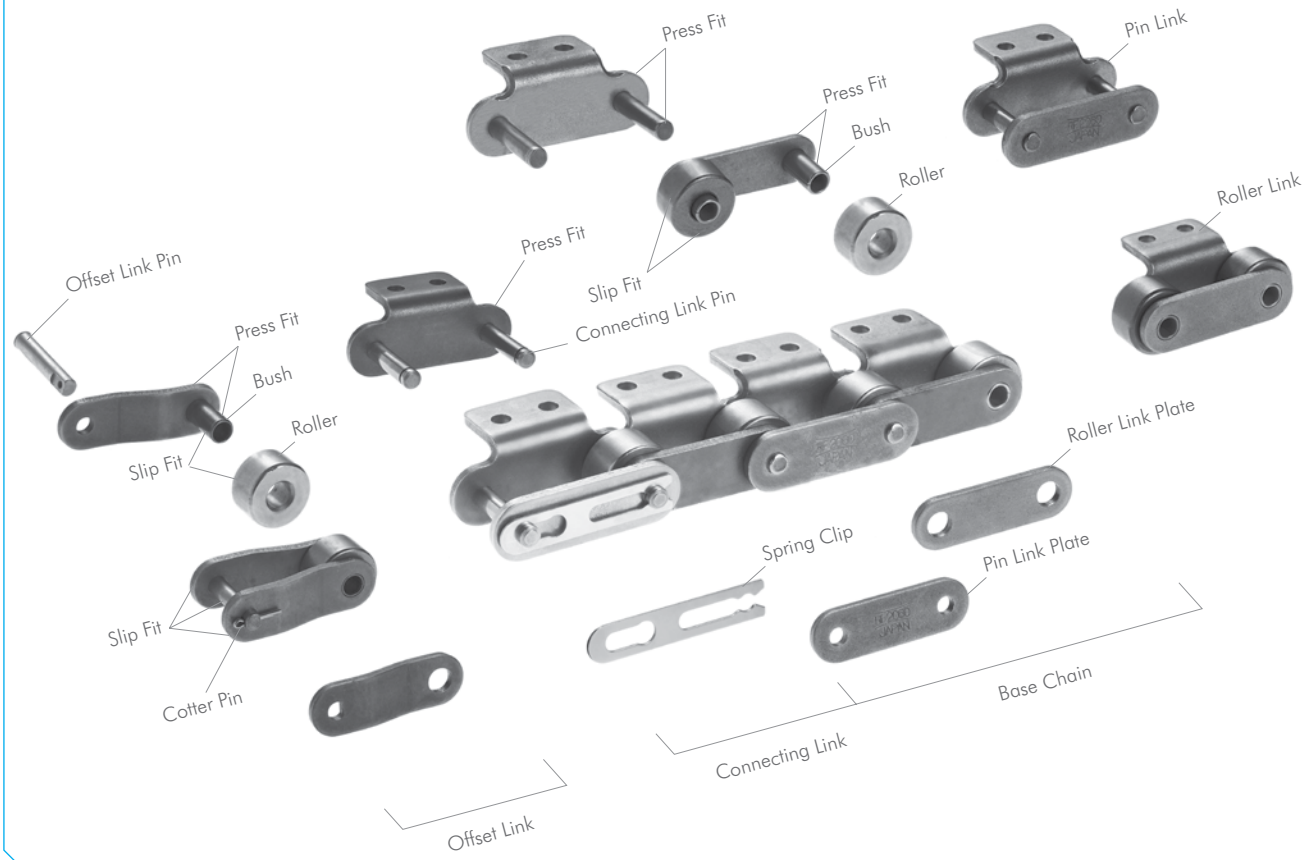
TSUBAKI DRIVE CHAIN APPLICATION CHECK SHEET

Company name:		Tel. no.		
Contact person:		Fax no.		
1) Description of machine				
2) Requirement		❑ New design	❑ Replacement	❑ Investigation
3) Current drive (for replacement & investigation)				
Chain size:				
No. of links:				
No. of drive sprocket teeth:				
No. of driven sprocket teeth:				
4) Operation time _____ hours per day _____ days per week _____ weeks per year				
5) Please complete either A or B				
A		B		
Torque of motor output shaft (Rated) (N/m)		Type of motor:		
(lay-out)		Rated output:(kW)		
		Output of reducer:		(N/m)
		Reduction ratio:		
		RPM of driver shaft:		(1/min.)
		RPM of driven shaft:		(1/min.)
6) Does the drive use a fluid coupling or other soft-start/stop feature?			❑ Yes	❑ No
7) Shaft centre distance:				
8) Load fluctuations		❑ smooth	❑ some impact	❑ large impact
9) Frequency of starting (stopping) or forward (reverse) operation _____ Times/day(8h)				
Note - for wrapping transmission drives, suspension drive, bogie traction or pin gear drives with > 5 times per day, please complete 10-13				
10) Moment of inertia of the motor (GD^2):				(kg/m^2)
11) Converted moment of inertia for the driven shaft (GD^2):				(kg/m^2)
12) Starting torque:				(N/m)
13) Stalling torque:				(N/m)
14) Acceleration and deceleration:				(m/sec^2)
15) Lubrication condition:		❑ With lubrication	❑ Without lubrication	
16) Ambient temperature:				
17) Atmosphere (corrosiveness, humidity, acid/alkaline etc.):				
18) Diameter of drive and driven shaft:		Drive shaft	(mm), Driven shaft	(mm)

Please complete and return to Tsubakimoto Europe B.V. on fax: +31-(0)78 6204001

In the world of attachment chain TSUBAKI is the manufacturer you require to assure smooth operation. Whether your application requires attachments or extended pins in Carbon Steel, N.E.P., Nickel Plating or Stainless Steel, TSUBAKI is your partner. TSUBAKI's maintenance free solution, LAMBDA, is also available with a wide range of attachments. When starting with a completely new design, TSUBAKI can tailor make an attachment chain for you in any specification.

Attachment Chain Structure



Attachment Chain Structure

There are mainly two types of Attachment Chain: Single Pitch and Double Pitch.

1. Single Pitch Attachment Chain

Single pitch attachment chains are based on roller chains with attachments added to make them suitable for conveying use. Due to the smaller chain pitch, this type of chain is ideal for short centre distances, and the conveying of small and light goods. Single pitch attachment chain has smooth transfer and low noise characteristics and can be used at relatively medium conveying speeds. Standard roller chain sprockets can be used in most cases.

Fig. 1 Single Pitch Attachment Chain

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN

2. Double Pitch Attachment Chain

This is the most commonly used attachment chain and is utilised widely in the automotive parts, electric, electronic, and precision machinery industries. Double pitch roller chain has the same basic construction as single pitch roller chain, but has twice the pitch length. A major benefit is that whilst larger conveyor lengths are possible, a double pitch chain uses only half the components of a single pitch chain in the same application, resulting in less components to wear.

The choice of sprockets depends on the roller type applied to the chain. Chain with S-type rollers can be driven by standard roller chain sprockets (> 30 teeth). The chain engages every second tooth. Special sprockets are needed when R-type rollers are used.

Fig. 2 Double Pitch Attachment Chain

3. Three Basic Dimensions

Pitch, Roller Diameter and Inner Width are known as the "Three Basic Dimensions of Roller Chain." When these three dimensions are identical to the existing chain being replaced, then the roller chain and sprockets are dimensionally compatible. With attachment chain a lot of additional dimensions are important to ensure a safe replacement and carefree installation of the chain. Please refer to our dimension tables for the appropriate dimensions.

4. Basic Parts

Link Plate

The link plate is the component that bears the tension placed on the chain. Usually this is a repeated load, sometimes accompanied by shock. Therefore, the plate must not only have great static tensile strength, it must also hold up to the dynamic forces of load and shock.

Pin

The pin is subject to shearing and bending forces transmitted by the plate. At the same time, it forms a load-bearing part (together with the bush) when the chain flexes during sprocket engagement. Therefore, the pin needs high tensile and shear strength, resistance to bending, and must also have sufficient endurance against shock and wear.

Bush

The bush is subject to complex forces from all parts, especially from the repetition of shock loads when the chain engages with the sprocket. Therefore, the bush needs extremely high shock resistance. In addition, the bush forms a load-bearing part together with the pin and as such requires great wear resistance.

Roller

The roller is subject to impact load as it mates with the sprocket tooth during engagement of the chain with the sprocket. After engagement, the roller changes its point of contact and balance. It is held between the sprocket tooth and bush, and moves on the tooth face whilst receiving a compression load. Therefore, it must be resistant to wear and still have strength against shock, fatigue and compression.

There are two types of rollers for Double Pitch Attachment chain: S-roller (standard) and R-roller (oversized). The S-rollers are used in short-length and slow-speed conveying. The R-rollers are most commonly used for longer conveying applications.
(RS35 is a bush chain and does not have rollers).

Roller Link

Two bushes are press fit into two roller link plates and rollers are inserted to allow rotation around the outside of the bushes during operation. This is the same for single and for multi strand chains.

Pin Link

The pin link consists of two pins that have been press fit into two pin link plates.

Spring Clip and Cotter Pin

The spring clip prevent the link plate from becoming detached, with the cotter pin type being as an added security measure where there is as possibly of the clip being removed due to interference from chain guides or some other aspect of the application.

5. Assembly Parts

Roller chains are usually made up of a number of inner and outer links in an endless formation. Although offset links can be used when there is an odd number of links in the roller chain, it is better to use a design that requires an even number of links, thus eliminating the use of offset links.

Connecting Links

There are two types of connecting link: spring clip connecting link and cotter pin connecting link. It's common to use slip fit spring clip connecting links for small size attachment chains. Cotter pin connecting links are used for large size attachment chains and on customer request.

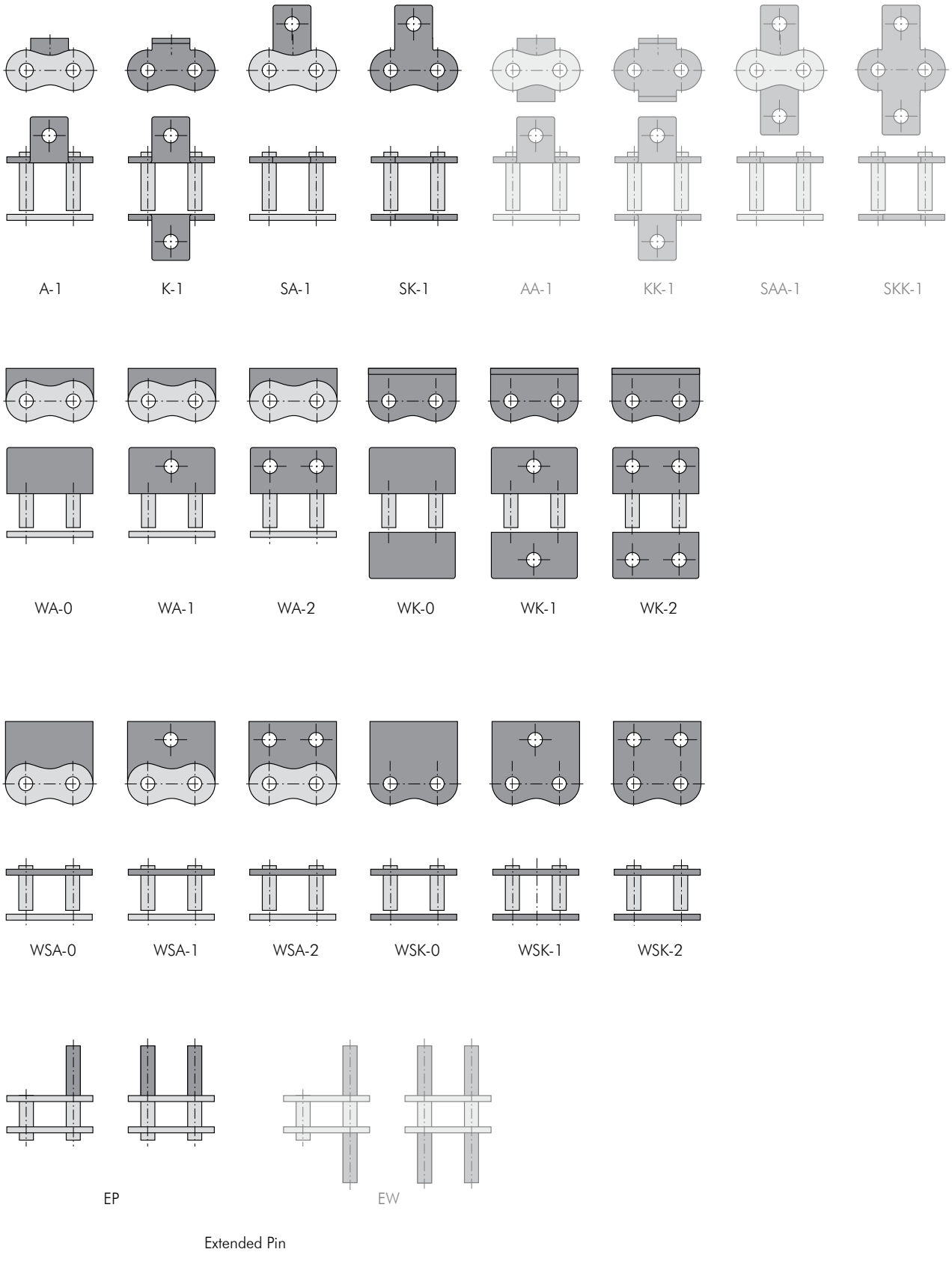
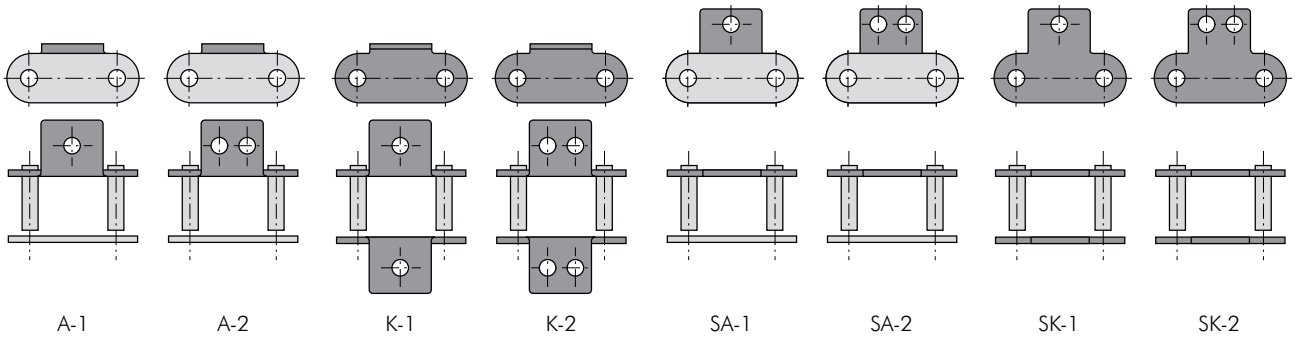
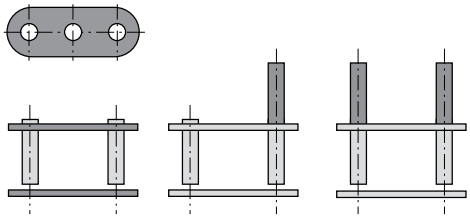


Fig. 3 Overview Single Pitch Attachment Types

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN



A-1 A-2 K-1 K-2 SA-1 SA-2 SK-1 SK-2



GK-1 Extended Pin

Chain Types

In addition to standard single and double pitch attachment chain, two other chain types are commonly used for conveyance purposes:

Hollow Pin Chain (HP)

This particular design of chain has a hollow bearing pin allowing for the installation of various attachments. Usually these chains are used for conveyors. The advantages of installing attachments into the hollow pin include the following:

- The hollow pin is at the centre of articulation, and always keeps the pitch length. Regardless of whether the chain is straight or wrapping around the sprocket, the centre distance of attachments is always the same.
- With a cross rod over two chains, the load from the attachments is distributed equally between the link plates. The chain can fully utilise its strength and will not twist.
- It is easy to change, maintain, and adjust attachments.
- Standard sprockets are used for the single pitch series. For double pitch series, standard sprockets for double pitch roller chain are used.

Fig. 5 Hollow Pin Chain

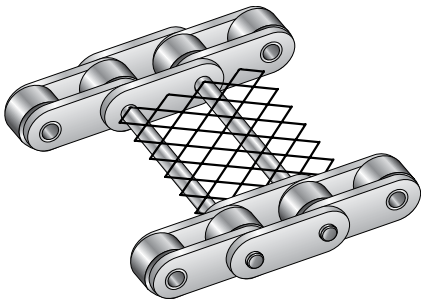


Fig. 6 Cross Rods with Mesh

Curved Chain (CU)

Due to TSUBAKI's exclusive pin and bush structure and the wide plate to plate clearance, this roller chain has a large side flex radius. The basic dimensions of this chain are the same as ANSI standard roller chain. The ability to use ANSI standard sprockets makes curved transmission simple. Guides are required for all curved areas.

Attachments

The characteristics of the conveyed materials and the working environment are different for each application. Many types of attachments are available with or without jigs.
Our standard attachments are available based upon the long history of attachment chain usage and demand. Being high quality, economical with a quick delivery to meet customers' requirements.

- For Single Pitch attachment chain, standard attachments include: A, WA, K, WK, SA, WSA, SK, WSK and Extended Pin types.
- For Double Pitch attachment chain, standard attachments include: A, K, SA, SK, GK-1 and Extended Pin types.

In figures 3 and 4 you can find an overview of the most common attachment types.

Standard attachments are available for a wide variety of chains:

- With special surface treatments (N.E.P. or Nickel-Plated).
- Made of 304 stainless steel or other materials.
- For lube-free operations (LAMBDA and PC series, etc.).

W-Designation

Attachments with W-designation only differ in the width of the bent or extended part of the link plate. The width of W-attachments is equal to the width of the link plate.
The W-type option is only applicable on the four standard attachments: A, K, SA and SK (referenced WA, WK, WSA and WSK respectively).
There are no W-type attachments available for double pitch attachment chains.

A Attachment

An A attachment is the most commonly used. It has a bent link plate that extends out on one side of the chain, forming an L-shape. It comes with one or two bolt holes, referred to as A-1 or A-2. The attachment interval can vary (for example, on each chain link, every five links, or two attachments in a series with intervals every four links, etc.). Generally two strands of chain are used in parallel with slats (Figure 8).

Fig. 7 A-1 Attachment

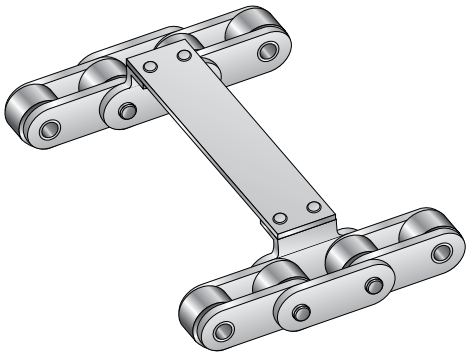


Fig. 8 A-2 Attachment with Slat

The attachments are subject to bending force. If they convey heavy objects, have long jigs installed, or receive side loads,

twisting force is added to the bending force. Depending on the application, please ensure you consider these forces in your calculations.
The shape of the attachment influences the design of the equipment. If slats do not cover the chain rollers, guide rails may be used to support the chain rollers on the return side.

K Attachment

This is an attachment made by installing A attachments on both sides of the chain. The attachment is called K-1 or K-2 based on the number of bolt holes on each individual attachment. The attachment interval can vary, same as the A attachment (Figure 9).

Fig. 9 K-1 Attachment

The top of the attachment is higher than the R-rollers, so slats or jigs can be installed over the chains (Figure 10). Objects can also be conveyed directly on the K attachments.
When a wide slat is installed on two A attachment chains, the slats may not be able to support the weight. A chain with K attachments is installed between the A attachment chains to help support the load.

When the slats are rigid enough and are fastened well to the attachments, there is almost no effect from bending force to the strength of the attachment. But if the slat is not fastened well, make sure to consider the bending force in your calculation.

If long jigs are installed, or the attachment receives side loads, it will be exposed to twisting forces.
The return side of the K attachment chain cannot be supported with guide rails on the rollers. The return may be slack or supported in some other way.

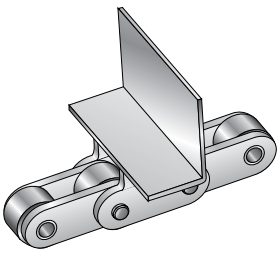


Fig. 10 K Attachment with L-angle

SA Attachment

For the SA attachment, the link plate is extended on one side of the chain, and one or two bolt holes are installed. These are called SA-1 or SA-2 depending on the number of the bolt holes (Figure 11). The attachment interval can vary the same as the A attachment. These attachments may be adapted for use with hooks or slats (Figure 12).
The SA attachment is simpler and stronger than the A attachment, and may receive bending and twisting force depending on the direction of the loads.

The return side of the chains can be supported by guide rails on the rollers unless bolts extend into the attachment.

Fig. 11 SA-1 Attachment

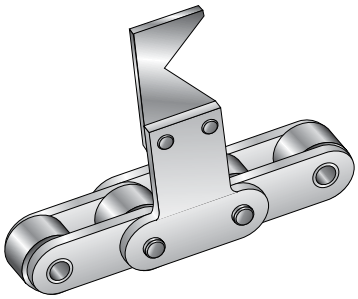


Fig. 12 SA-2 Attachments with Hook

SK Attachment

SK attachments are made by installing SA attachments on both sides of the chain. They are called SK-1 or SK-2, depending on the number of bolt holes on each individual attachment. The attachment interval can vary the same as the A attachment (Figure 13).

Usually SK attachments are used with dogs or jigs (Figure 14). SK attachments are strong enough to withstand bending or twisting forces.
The return side of SK attachment chains cannot be supported by guide rails on the rollers as can A or SA attachment chains. The return must be slack or supported in some other manner.

Fig. 13 SK-1 Attachments

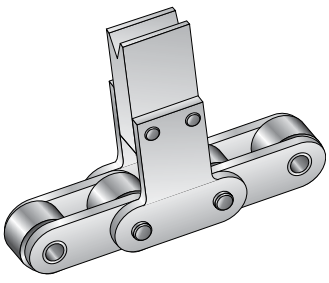


Fig. 14 SK-2 Attachments with V-block

Extended Pin Attachment

In this form, one end of the pin is extended. The attachment interval can vary the same as the A attachment (Figure 15).
As shown in Figure 16, two sets of D attachment chains can be connected to cross rods, or jigs (such as blocks).
The extended pins are subjected to bending and shearing forces. The return side of the D attachment chain can be supported by guide rails on the rollers.

Fig. 15 Extended Pin Attachment

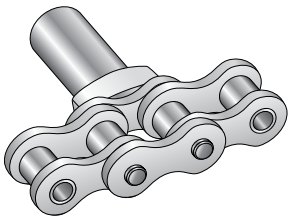


Fig. 16 D Attachments with Jigs

GK-1 Attachment

A hole is added to the centre of both link plates, to be able to attach cross rods between two (or more) parallel running chains. The attachment interval can vary the same as the A attachment (Figure 17). This type of attachment is often used when cross rods with larger diameters than the maximum applicable diameters of hollow pin chains are used. This type of attachment is only available as a double pitch attachment chain, Type R-rollers can not be used in combination with GK-1 attachments due to the interference between the roller and the hole in the link plates.

Fig. 17 GK-1 Attachment

Chain Length Tolerance

Maintaining an accurate overall length tolerance in attachment chain is essential for conveying and index drive equipment used in such applications as inserting components, product assembly lines, integrated circuit boards and board/paper & packaging amongst many others.
The tolerance of the overall chain length is depending on the chain type and the appropriate international standard:

Single Pitch Chain

- BS Single Pitch Roller Chain
  According to ISO 606: 0% to +0.15%
- BS Single Pitch Attachment Chain
  According to ISO 606: 0% to +0.30%
- ANSI Single Pitch Roller Chain
  According to ANSI: 0% to +0.15%
- ANSI Single Pitch Attachment Chain
  According to ANSI: 0% to +0.30%

Double Pitch Chain

- ANSI Double Pitch Roller Chain
  According to ANSI: 0% to +0.13%
- ANSI Double Pitch Attachment Chain
  According to ANSI: 0% to +0.25%

TSUBAKI chain length tolerances are very narrow by nature, however some markets require narrow tolerance chain; in the market often referred to, and marketed as 1/3 DIN or 1/6 DIN length tolerance chain. TSUBAKI chain coming from the same production lot is generally complying with these tolerances as a standard; once again our constant high quality.
Figure 18 shows the amount of variation for several types of chain chosen at random from the same production run.

Chain Length [mm]	Matched Tolerance [mm]
< 14 m	< 3 mm
14~30 m	< 4 mm
30~44 m	< 5 mm

Fig. 18 Attachment Chains Chosen at Random from Same Production Lot

When even more accurate tolerances are required, TSUBAKI can offer an effective solution with the Match & Tag Service. This can be useful for attachment chains which have to run parallel in pairs and where a minimum of chain length tolerance is required.

Match & Tag Service: High Accuracy, Narrow Tolerance Service

For TSUBAKI quality is second nature- and so for customers with specific application requirements, we are able to supply chains with a specific length tolerance, or even pairs & multiple chains length matched and tagged in the same way for easy identification and installation. This is as a result of the sophisticated chain length measurement equipment (the "Matchy") kept in house within the European headquarters with supply times for such chains kept to a minimum-ideal for distributors, final consumers and OEM customers alike.

Sizes

The Matchy at our European Headquarters is equipped for:

- BS Single Pitch sizes RS08B to RS32B
- ANSI Single Pitch sizes RS40 to RS100 (including Heavy Duty Series)
- ANSI Double Pitch sizes RF2040 to RF2100

For other sizes and specific demands please contact TSUBAKI, our Engineering Department will explain all options available.

Tolerances

When chains have to run in parallel for conveying purposes in for instance packaging machines or when a minimum of difference

in chain length is required in lifting applications (accumulator towers in the steel and carpet industry) TSUBAKI excels in quality performance. We can guarantee a maximum chain length difference of 0.50 mm independent of the total chain length demanded by our customers!

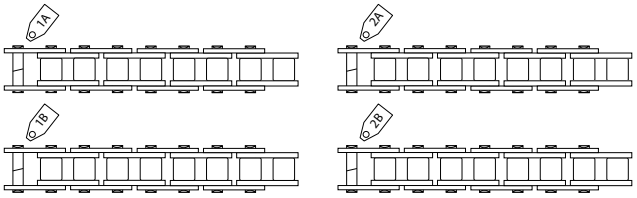


Fig. 19 Tagging of Matched Chain Strands

Local Assembly Service

TSUBAKI offers a huge range of attachment chains to suit virtually any application.

An extended range of stock components covering the majority of standard applications, and a Built To Order service using more specialised attachments also held in stock within Tsubakimoto Europe-swift deliveries can be both achieved...and maintained. Along with the Made To Order service when very unusual or highly specialist solutions can be delivered on accurate lead times from TSUBAKI's dedicated state of the art factory results in a comprehensive supply chain capability.

As our customers increase production capacity and reduce maintenance windows, we believe that this high level of product availability and swift delivery can make a difference. This policy represents TSUBAKI's core values.

If a standard attachment chain is required (for volumes typically under 50 meters) it can be assembled from stock lengths and/or components. If an attachment is required with a specific dimension requirement such as a non standard assembly hole then the attachment can be produced within Europe.

Fig. 20 Matching Chain Strands

Fig. 21 Local Assembly Service

BS LAMBDA LUBE FREE ATTACHMENT CHAIN

TSUBAKI's LAMBDA chains were the first in the industry to use a special oil-impregnated bush. Since their launch in 1988, they have been adopted for diverse industries and applications, and their performance has been highly rated. TSUBAKI has a wide line-up of lube-free, long life products that help customers reduce costs.

Technical Evolution

As a pioneer in the lube-free chain market, TSUBAKI will reveal some of the key elements behind BS LAMBDA's outstanding performance:

Sintered Bush

A special oil-impregnated sintered bush in combination with a special coated pin for long-term internal lubrication is the secret of TSUBAKI BS LAMBDA's long economic life and wear resistance.

Temperature and Lubrication

TSUBAKI BS LAMBDA has outstanding performance in temperatures up to +150°C.

For temperatures above +150°C: Due to the special NSF-H1 certified lubrication impregnated bushes, TSUBAKI BS LAMBDA KF Series is usable in a wide temperature range (from -10°C to +230°C), and for food product applications while at the same time being kind to the environment.
Please consult TSUBAKI for more detailed information.

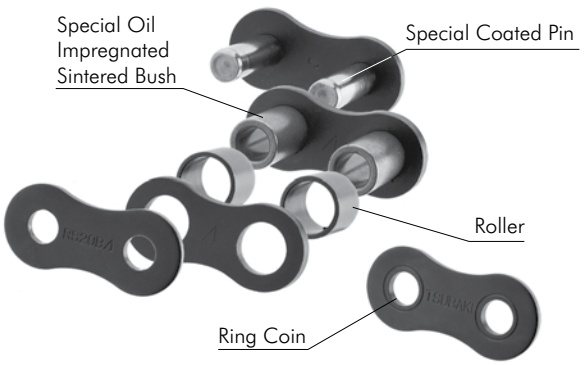


Fig. 22 Basic Construction

Advantages

TSUBAKI has enhanced the BS LAMBDA with the following advantages:

Save Maintenance Costs

No expensive labour costs as it is not required to manually lubricate this chain.

Save Purchasing Costs

Lower frequency of purchasing due to the high quality of the chain and its long economic life. No purchasing of lubricants or lubrication systems necessary.

Higher Productivity

No unforeseen downtime due to chain breakage. Less time required for maintenance and therefore more time for production.

Environmental Friendly

Applications run clean thus reducing the risk of contaminating products, machines, floor, etc.

Inter-Changeability

BS LAMBDA attachment chains are fully interchangeable with standard BS roller chains.

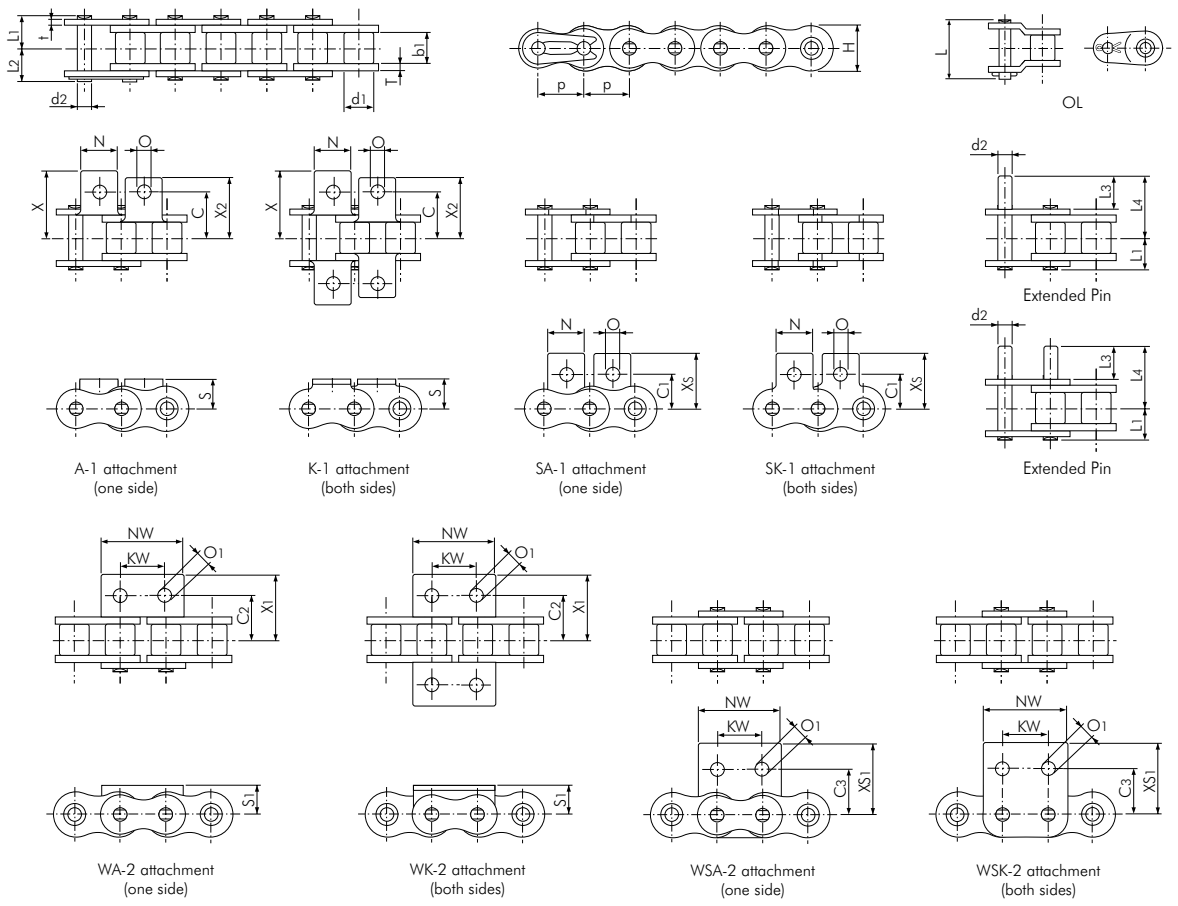
Standard Product Range

The product range for our standard LAMBDA attachment chains is:

- BS Single Pitch LAMBDA chain + standard attachments
- BS Single Pitch LAMBDA RF chain with flat shaped link plates
- ANSI Single Pitch LAMBDA chain + standard attachments
- ANSI Single Pitch LAMBDA HP Hollow Pin chain
- ANSI Double Pitch LAMBDA chain

Special attachments can be designed and manufactured to meet your specific requirements.

BS LAMBDA LUBE FREE ATTACHMENT CHAIN



BS Single Pitch LAMBDA Chain

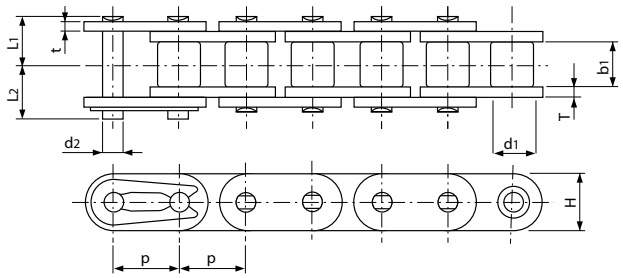
Dimensions in mm

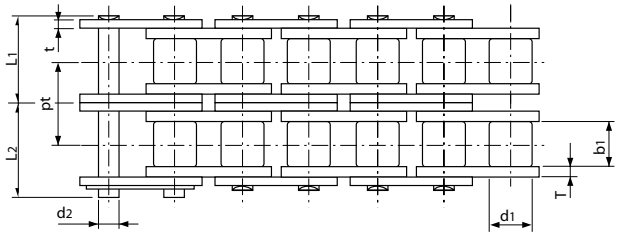
TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max.)	Approx. Mass kg/m
RS08B-LM	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	14.70	22.20	18.60	1.60	1.60	11.80	0.70
RS10B-LM	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	17.80	26.15	20.80	1.50	1.50	14.70	0.95
RS12B-LM	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	20.80	30.60	24.40	1.80	1.80	16.10	1.25
RS16B-LM	25.40	(1")	15.88	17.02	8.28	17.75	19.95	33.20	49.35	41.10	4.00	3.20	21.00	2.70

TSUBAKI Chain No.	Attachment Dimensions C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	Attachment Mass A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RS08B-LM	11.90	12.70	12.70	13.10	12.70	11.40	24.60	4.20	4.90	8.90	8.90	19.05	20.30	17.15	19.30	20.70	0.002	0.004	0.005	0.010	0.001
RS10B-LM	15.90	15.90	15.90	16.60	15.90	12.70	30.00	5.00	5.00	10.20	10.20	22.25	22.85	20.60	22.90	23.60	0.003	0.006	0.006	0.012	0.002
RS12B-LM	19.05	22.20	17.45	17.60	19.10	16.50	34.80	7.10	5.50	13.50	11.40	29.85	25.65	27.80	32.05	25.75	0.006	0.012	0.009	0.018	0.003
RS16B-LM	23.80	23.90	28.60	26.00	25.40	24.30	46.00	6.70	8.10	15.20	15.90	37.35	39.25	34.40	34.10	36.70	0.014	0.028	0.030	0.060	0.008

Note:

1. Connecting links are clip type.
2. Warning: previous generations of Lambda chain cannot be connected with the above chains due to different dimensions.





BS Single Pitch LAMBDA RF Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H	Transverse Pitch pt	Approx. Mass kg/m
RF08B-LM-1	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	1.60	1.60	12.00	-	0.70
RF08B-LM-2						15.30	16.90				13.92	1.40
RF10B-LM-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	1.50	1.50	14.70	-	0.95
RF10B-LM-2						17.85	19.55				16.59	1.90
RF12B-LM-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	1.80	1.70	16.10	-	1.25
RF12B-LM-2						20.85	22.75				19.46	2.60
RF16B-LM-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	4.00	3.20	24.00	-	2.70
RF16B-LM-2						33.55	35.75				31.88	5.60

Note:

1. Connecting links are clip type.
2. Intermediate plate of RF08B-LM-2 chain is a solid plate.

BS STANDARD ATTACHMENT CHAIN

For common applications, TSUBAKI can provide you with an outstanding range of Attachment Chain. The chain is manufactured according to the appropriate European Standards.

Construction

This chain is based on standard BS roller chain and assembled with attachments for conveying.

Key Features

- Due to the small pitch of these chains, the drive design is more compact.
- Usually sprockets with a large number of teeth are used. The chain speed does not vary significantly as the chain engages with sprockets. With less impact, there is also less noise generated as a result of the impact between the roller and sprocket tooth.
- These chains may be used for high speed conveyor applications.
- A wide variety of standard and special attachments are available for this chain series.

Customised Pre-Lubrication Service

Proper lubrication is the key to extend the life and improve the performance of a chain. In order to get the best performance in general applications (-10°C to +60°C), all BS drive chains are pre-lubricated. BS attachment chains however are NOT pre-lubricated, but have been treated with rust preventive oil for protection and therefore need to be lubricated before the chain is installed. The reason TSUBAKI does not pre-lubricate BS attachment chains is due to the fact that attachment chains often have to function in various environments where standard lubrication cannot be used.

For special applications and on customer's requirement, TSUBAKI can provide attachment chains which are pre-lubricated with a special lubricant which include:

- High temperature
- Low temperature
- Food safe
- Outdoor exposure
- Dusty environment

Please consult TSUBAKI for more detailed information.

Application Example

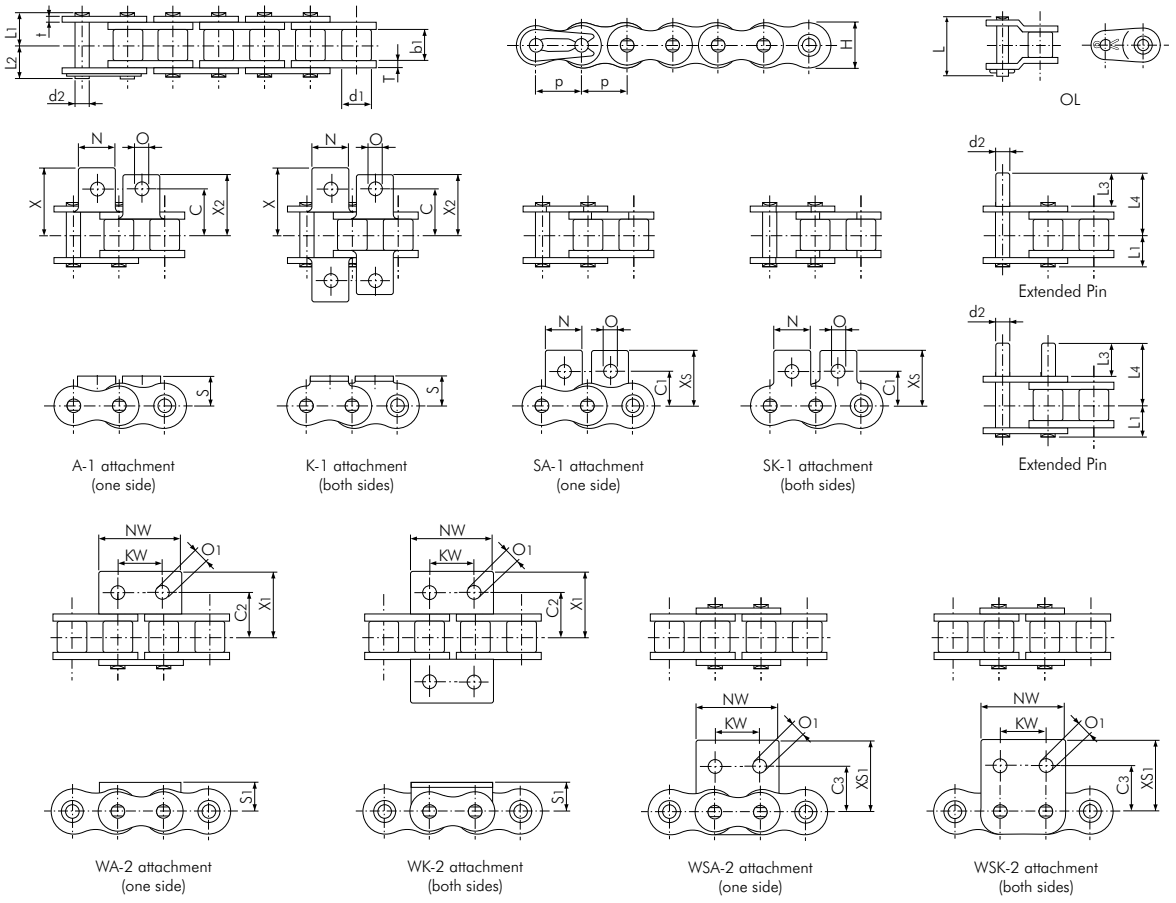
BS Standard attachment chain is used for short conveyor runs (usually less than 10 metres) and for conveying small and reasonably lightweight products. This chain is also suitable for conditions where noise levels need to be kept to a minimum.

Standard Product Range

The product range for our standard attachment chains is:

- BS Single Pitch Standard chain + standard attachments
- BS Single Pitch RF chain with flat shaped link plates
- ANSI Single Pitch Standard chain + standard attachments
- ANSI Single Pitch HP Hollow Pin chain
- ANSI Single Pitch CU Curved chain
- ANSI Double Pitch Standard chain + standard attachments
- ANSI Double Pitch HP Hollow Pin chain

Special attachments can be designed and manufactured to meet your specific requirements.



BS Single Pitch Standard Chain

Dimensions in mm

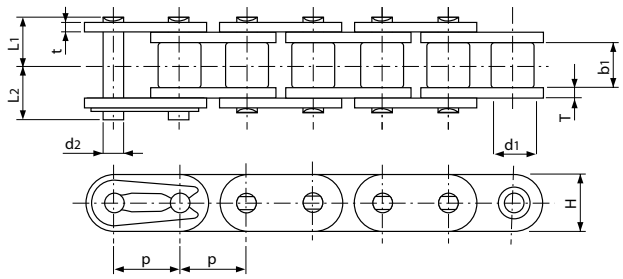
TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max.)	Approx. Mass kg/m
RF06B	9.525 (3/8")	6.35	5.72	3.27	6.10	7.70	10.90	16.30	15.10	1.30	1.00	8.20	0.39
RS08B	12.70 (1/2")	8.51	7.75	4.45	8.40	10.00	14.70	22.20	18.60	1.60	1.60	11.80	0.70
RS10B	15.875 (5/8")	10.16	9.65	5.08	9.55	11.25	17.80	26.15	20.80	1.50	1.50	14.70	0.95
RS12B	19.05 (3/4")	12.07	11.68	5.72	11.10	13.00	20.80	30.60	24.40	1.80	1.80	16.10	1.25
RS16B	25.40 (1")	15.88	17.02	8.28	17.75	19.95	33.20	49.35	41.10	4.00	3.20	21.00	2.70
RS20B	31.75 (1 1/4")	19.05	19.56	10.19	19.90	23.10	38.40	56.90	46.60	4.40	3.40	26.00	3.85

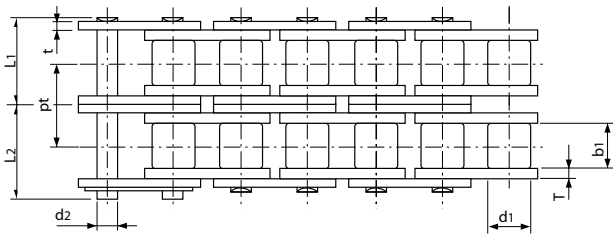
TSUBAKI Chain No.	Attachment Dimensions C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	Attachment Mass A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RF06B	9.50	9.50	-	-	-	8.50	-	3.50	-	6.5	-	14.10	-	-	14.30	-	0.002	0.004	-	-	0.001
RS08B	11.90	12.70	12.70	13.10	12.70	11.40	24.60	4.20	4.90	8.90	8.90	19.05	20.30	17.15	19.30	20.70	0.002	0.004	0.005	0.010	0.001
RS10B	15.90	15.90	15.90	16.60	15.90	12.70	30.00	5.00	5.00	10.20	10.20	22.25	22.85	20.60	22.90	23.60	0.003	0.006	0.006	0.012	0.002
RS12B	19.05	22.20	17.45	17.60	19.10	16.50	34.80	7.10	5.50	13.50	11.40	29.85	25.65	27.80	32.05	25.75	0.006	0.012	0.009	0.018	0.003
RS16B	23.80	23.90	28.60	26.00	25.40	24.30	46.00	6.70	8.10	15.20	15.90	37.35	39.25	34.40	34.10	36.70	0.014	0.028	0.030	0.060	0.008
RS20B	31.75	31.80	-	-	-	25.40	-	8.70	-	19.80	-	44.85	-	-	44.00	-	0.027	0.054	-	-	0.014

Note:

1. RF06B chain has flat-shaped link plates.

BS STANDARD ATTACHMENT CHAIN





BS Single Pitch RF Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H	Transverse Pitch pt	Approx. Mass kg/m
RF08B-1	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	1.60	1.60	12.00	-	0.75
RF08B-2						15.30	16.90				13.92	1.40
RF10B-1	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	1.50	1.50	14.70	-	1.00
RF10B-2						17.85	19.55				16.59	1.90
RF12B-1	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	1.80	1.80	16.10	-	1.30
RF12B-2						20.85	22.75				19.46	2.60
RF16B-1	25.40	(1")	15.88	17.02	8.28	17.75	19.95	4.00	3.20	24.00	-	2.80
RF16B-2						33.55	35.75				31.88	5.60

Note:

1. Connecting links are clip type.
2. Intermediate plate of RF08B-2 chain is a solid plate.

BS ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS

Whether your operation requires a sanitary environment, is exposed to corrosive chemicals, is heated to extreme temperatures, runs through a freezer, is exposed to the outdoors or is affected by excessive moisture: our specially designed and tested chains will outlast your current chains and contribute to a cost effective application.

Corrosion Resistant Chain (Stainless Steel base)

BS PC Engineering Plastic Combination Chain

The pins, outer plates and attachments of these chains are made of SUS304 equivalent (spring clips SUS301). White Engineering Plastic is used for the inner link. This combination makes it lube-free, low noise (5 dB lower than BS standard roller chain) and lightweight (50% lighter than BS standard roller chain). The working temperature range is: -20°C to +80°C. For details on corrosion resistance, please refer to the table in the back of this catalogue.

BS SS Stainless Steel Chain

All basic components of this chain are made of SUS304 equivalent Stainless Steel (except the spring clips, which are made of SUS301). This chain can be used in special environments such as underwater, acidic and in alkaline applications. It can also be used in high and low temperatures (-20°C to +400°C). SUS304 equivalent is only marginally magnetic, which is a result of the cold-forging process. For details on corrosion resistance, please refer to the table in the back of this catalogue.

Corrosion Protected Chain (Carbon Steel base)

BS N.E.P. New Environmental Plating Chain

BS N.E.P. Chain is a TSUBAKI BS chain that has undergone a special surface treatment process.
The link plates, attachments, bushes and bearing pins have a special three stage layer applied in order to provide the maximum protection from the operating or environmental conditions. (Spring clips are SUS301).
N.E.P. Rollers have a special coating designed to resist the corrosive conditions as well as the severe dynamic contact between roller and sprocket.
This chain is suitable for use in environments exposed to seawater, acid-rain and other adverse weather conditions. This chain does not contain any chemically hazardous substances such as Hexavalent Chromium, Lead, Cadmium and Mercury as regulated by RoHS√. It has a working temperature range of: -10°C to +150°C. Above +60°C a special high-temperature lubrication is required.
Of course, BS LAMBDA N.E.P. chain is also available for this purpose.

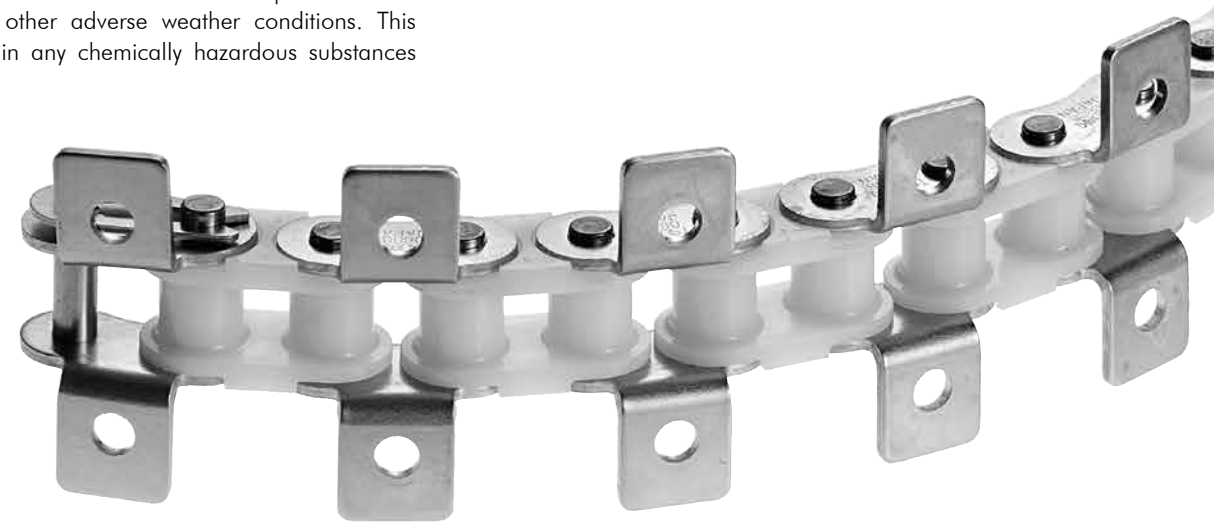
√ RoHS = Restriction of Hazardous Substances

Standard Product Range

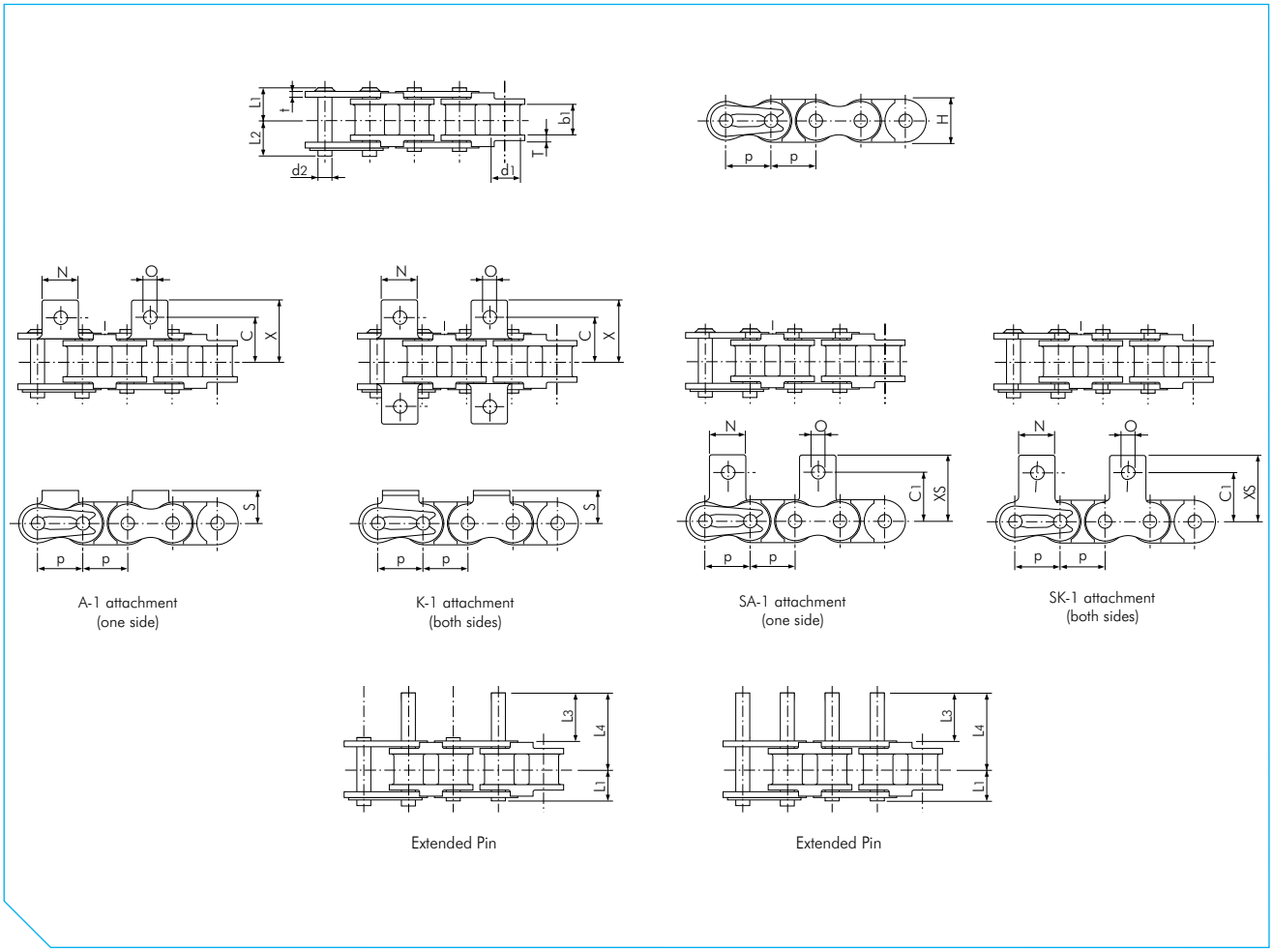
TSUBAKI has a wide variety of chains for corrosive environments; our standard product range is as follows:

- BS Single pitch PC chain + standard attachments
- BS Single pitch SS chain + standard attachments
- BS Single pitch N.E.P. chain + standard attachments
- ANSI Single pitch PC chain + standard attachments
- ANSI Single pitch P Plastic chain
- ANSI Single pitch SS chain + standard attachments
- ANSI Single pitch SS HP Hollow Pin chain
- ANSI Double Pitch SS chain + standard attachments
- ANSI Double Pitch SS HP Hollow Pin chain

Special attachments can be designed and manufactured to meet your specific requirements.



BS ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS



BS Single Pitch PC Chain

Dimensions in mm

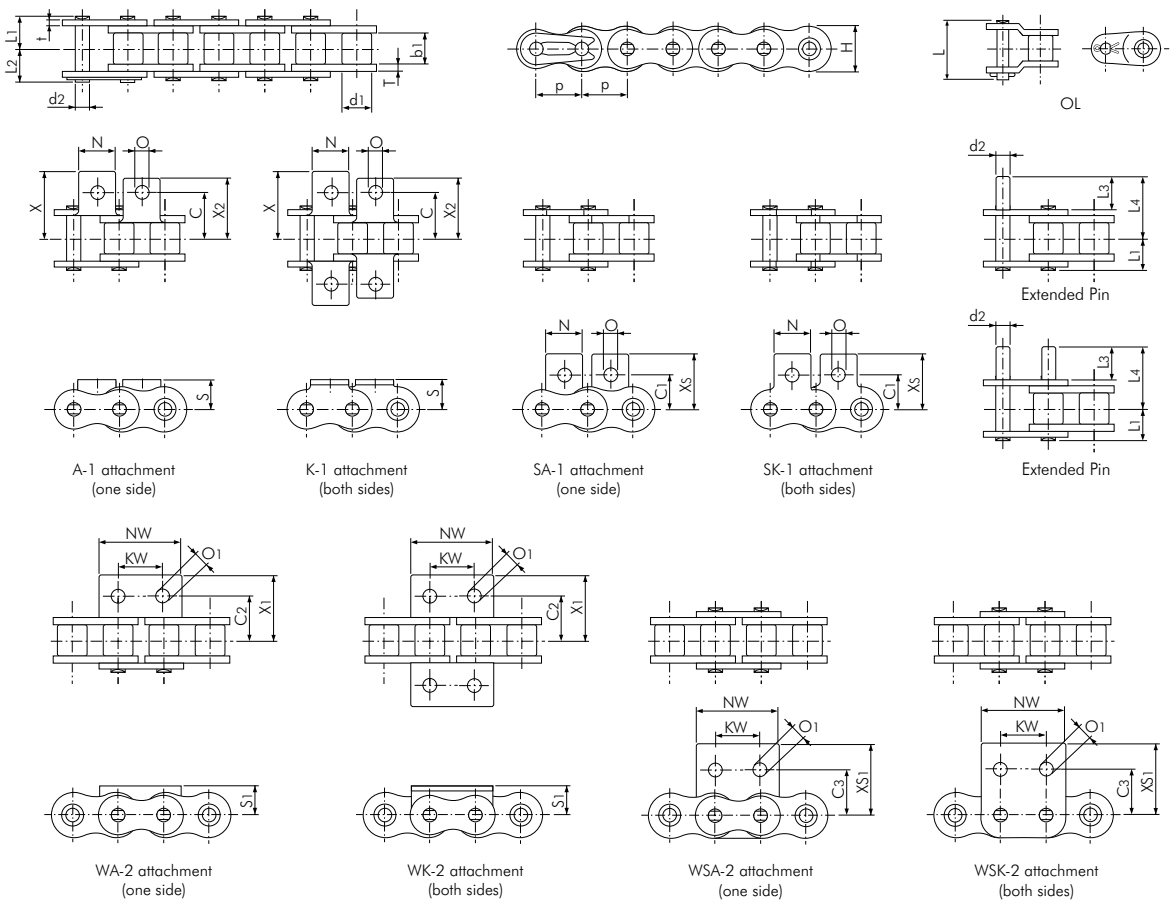
TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max.)	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
RF06B-PC	9.525	(3/8")	6.35	5.72	3.28	6.50	7.25	11.30	16.65	1.30	1.00	8.20	0.20	0.23
RS08B-PC	12.70	(1/2")	8.51	7.75	4.45	8.35	10.05	14.90	22.25	1.60	1.50	12.00	0.46	0.40
RS10B-PC	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	17.80	26.15	1.50	1.50	14.70	0.53	0.51
RS12B-PC	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	20.90	30.70	1.80	1.80	16.10	0.70	0.67

TSUBAKI Chain No.	Attachment Dimensions C	C1	N	O	S	X	XS	Attachment Mass A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RF06B-PC	9.50	9.50	8.50	3.50	6.50	14.10	14.30	0.002	0.004	0.001
RS08B-PC	11.90	12.70	11.40	4.20	8.90	19.05	19.30	0.002	0.004	0.001
RS10B-PC	15.90	15.90	12.70	5.00	10.20	22.25	22.95	0.003	0.006	0.002
RS12B-PC	19.05	22.20	16.50	7.10	13.50	29.85	32.30	0.006	0.012	0.003

Note:

1. Make sure to check the chain load again when replacing Stainless Steel Chain with PC Chain.
2. Offset links are not available.
3. Use a chain tensioner with an idler sprocket to adjust chain tension.
4. Guide rails should support the underside of the inner links.
5. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

BS ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS



BS Single Pitch SS Chain

Dimensions in mm

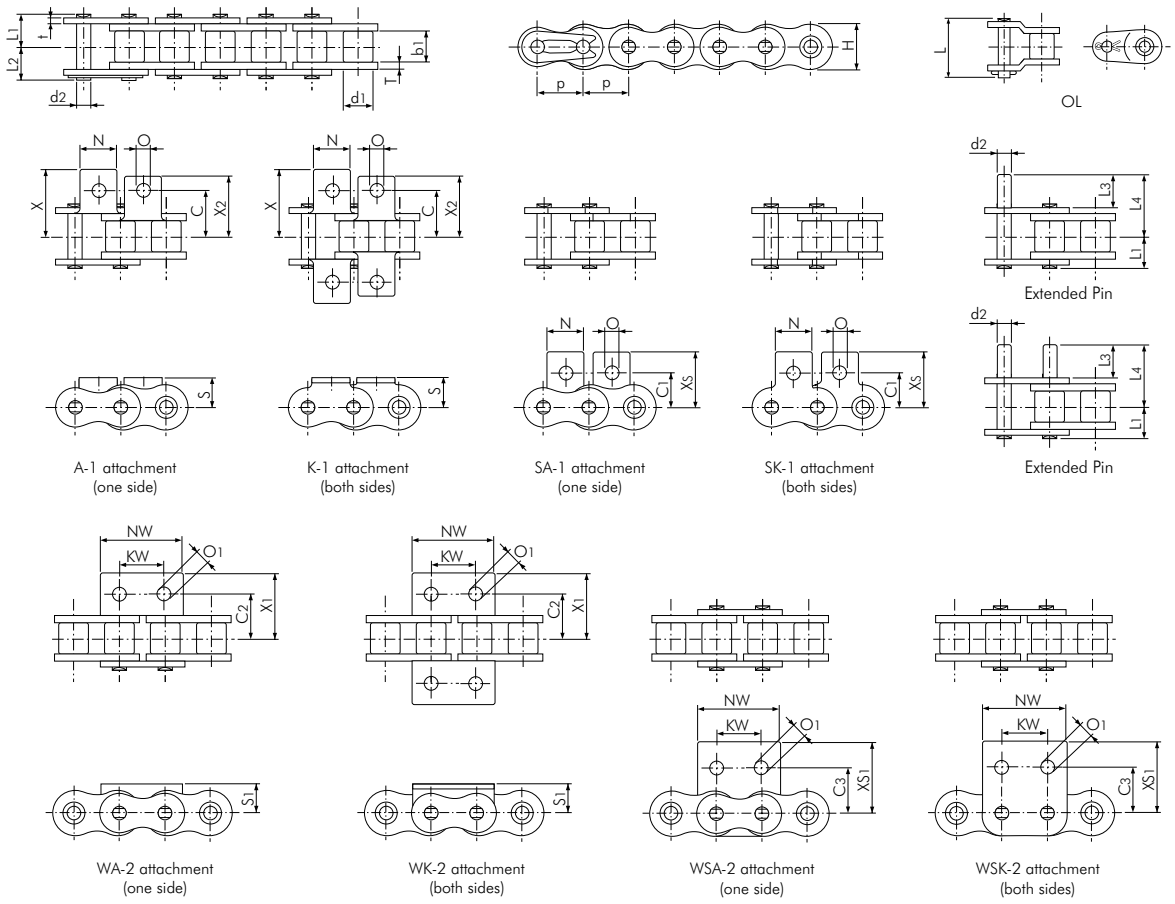
TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max.)	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass kg/m
RF06B-SS	9.525	(3/8")	6.35	5.72	3.28	6.10	7.70	10.90	16.30	15.10	1.30	1.00	8.20	0.27	0.39
RS08B-SS	12.70	(1/2")	8.51	7.75	4.45	8.35	10.05	14.70	22.20	20.05	1.50	1.50	12.00	0.48	0.70
RS10B-SS	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	17.80	26.15	22.90	1.50	1.50	14.70	0.66	0.95
RS12B-SS	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	20.90	30.70	26.70	1.80	1.80	16.10	0.87	1.25
RS16B-SS	25.40	(1")	15.88	17.02	8.28	17.75	19.95	33.20	49.35	43.70	4.00	3.20	21.00	2.10	2.70

TSUBAKI Chain No.	Attachment Dimensions C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	Attachment Mass A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RF06B-SS	9.50	9.50	-	-	-	8.50	-	3.50	-	6.50	-	14.10	-	-	14.30	-	0.002	0.004	-	-	0.001
RS08B-SS	11.90	12.70	12.70	13.10	12.70	11.40	24.60	4.20	4.90	8.90	8.90	19.05	20.30	17.15	19.30	20.70	0.002	0.004	0.005	0.010	0.001
RS10B-SS	15.90	15.90	15.90	16.60	15.90	12.70	30.00	5.00	5.00	10.20	10.20	22.25	22.85	20.60	22.90	23.60	0.003	0.006	0.006	0.012	0.002
RS12B-SS	19.05	22.20	17.45	17.60	19.10	16.50	34.80	7.10	5.50	13.50	11.40	29.85	25.65	27.80	32.05	25.75	0.006	0.012	0.009	0.018	0.003
RS16B-SS	23.80	23.90	28.60	26.00	25.40	24.30	46.00	6.70	8.10	15.20	15.90	37.35	39.25	34.40	34.10	36.70	0.014	0.028	0.030	0.060	0.008

Note:

1. RF06B-SS chain has flat-shaped link plates.
2. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

BS ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS



BS Single Pitch N.E.P. Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max.)	Approx. Mass kg/m
RF06B-NEP	9.525	(3/8")	6.35	5.72	3.27	6.10	7.70	10.90	16.30	15.10	1.30	1.00	8.20	0.39
RS08B-NEP	12.70	(1/2")	8.51	7.75	4.45	8.40	10.00	14.70	22.20	18.60	1.60	1.60	11.80	0.70
RS10B-NEP	15.875	(5/8")	10.16	9.65	5.08	9.55	11.25	17.80	26.15	20.80	1.50	1.50	14.70	0.95
RS12B-NEP	19.05	(3/4")	12.07	11.68	5.72	11.10	13.00	20.80	30.60	24.40	1.80	1.80	16.10	1.25
RS16B-NEP	25.40	(1")	15.88	17.02	8.28	17.75	19.95	33.20	49.35	41.10	4.00	3.20	21.00	2.70
RS20B-NEP	31.75	(1 1/4")	19.05	19.56	10.19	19.90	23.10	38.40	56.90	46.60	4.40	3.40	26.00	3.85

TSUBAKI Chain No.	Attachment Dimensions C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	Attachment Mass A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RF06B-NEP	9.50	9.50	-	-	-	8.50	-	3.50	-	6.50	-	14.10	-	-	14.30	-	0.002	0.004	-	-	0.001
RS08B-NEP	11.90	12.70	12.70	13.10	12.70	11.40	24.60	4.20	4.90	8.90	8.90	19.05	20.30	17.15	19.30	20.70	0.002	0.004	0.005	0.010	0.001
RS10B-NEP	15.90	15.90	15.90	16.60	15.90	12.70	30.00	5.00	5.00	10.20	10.20	22.25	22.85	20.60	22.90	23.60	0.003	0.006	0.006	0.012	0.002
RS12B-NEP	19.05	22.20	17.45	17.60	19.10	16.50	34.80	7.10	5.50	13.50	11.40	29.85	25.65	27.80	32.05	25.75	0.006	0.012	0.009	0.018	0.003
RS16B-NEP	23.80	23.90	28.60	26.00	25.40	24.30	46.00	6.70	8.10	15.20	15.90	37.35	39.25	34.40	34.10	36.70	0.014	0.028	0.030	0.060	0.008
RS20B-NEP	31.75	31.80	-	-	-	25.40	-	8.70	-	19.80	-	44.85	-	-	44.00	-	0.027	0.054	-	-	0.014

Note:

1. RF06B-NEP chain has flat shaped link plates.
2. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

ANSI LAMBDA LUBE FREE ATTACHMENT CHAIN

TSUBAKI's LAMBDA Chains were the first in the industry to use a special oil- impregnated bush. Since their launch in 1988, they have been adopted for diverse industries and applications, and their performance has been highly rated. TSUBAKI has a wide line-up of lube-free, long life products that help customers reduce costs.

Technical Evolution

As a pioneer in the lube-free chain market, TSUBAKI will reveal some of the key elements behind ANSI LAMBDA's outstanding performance:

Sintered Bush

A special oil-impregnated sintered bush in combination with a special coated pin for long-term internal lubrication is the secret of TSUBAKI ANSI LAMBDA's long economic life and wear resistance.

Temperature and Lubrication

TSUBAKI ANSI LAMBDA has outstanding performance in temperatures up to +150°C.

For temperatures above +150°C: Due to the special NSF-H1 certified lubrication impregnated bushes, TSUBAKI ANSI LAMBDA KF Series is usable in a wide temperature range (from -10°C to +230°C), and for food product applications while at the same time being kind to the environment.
Please consult TSUBAKI for more detailed information.

Save Maintenance Costs

No expensive labour costs as it is not required to manually lubricate this chain.

Save Purchasing Costs

Lower frequency of purchasing due to the high quality of the chain and its long economic life. No purchasing of lubricants or lubrication systems necessary.

Higher Productivity

No unforeseen downtime due to chain breakage.
Less time required for maintenance and therefore more time for production.

Environmental Friendly

Applications run clean thus reducing the risk of contaminating products, machines, floor etc.

Inter-Changeability

ANSI LAMBDA Attachment chain is interchangeable with standard ANSI roller chains. However, as the pins are longer than those of the standard ANSI roller chain, please make sure that there is no interference with the machine.

Standard Product Range

The product range for our standard LAMBDA attachment chains is:

- ANSI Single Pitch LAMBDA chain + standard attachments
- ANSI Single Pitch LAMBDA HP Hollow Pin chain
- ANSI Double Pitch LAMBDA chain
- BS Single Pitch LAMBDA chain + standard attachments
- BS Single Pitch LAMBDA RF chain with flat shaped link plates

Special attachments can be designed and manufactured to meet your specific requirements.

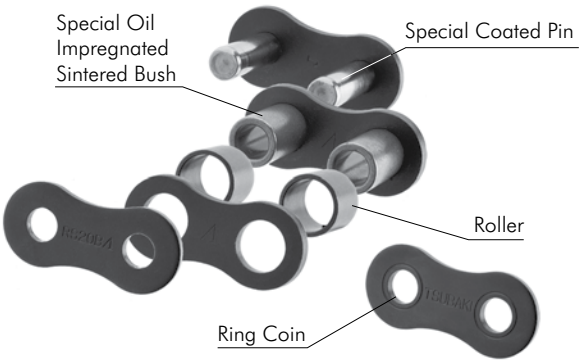
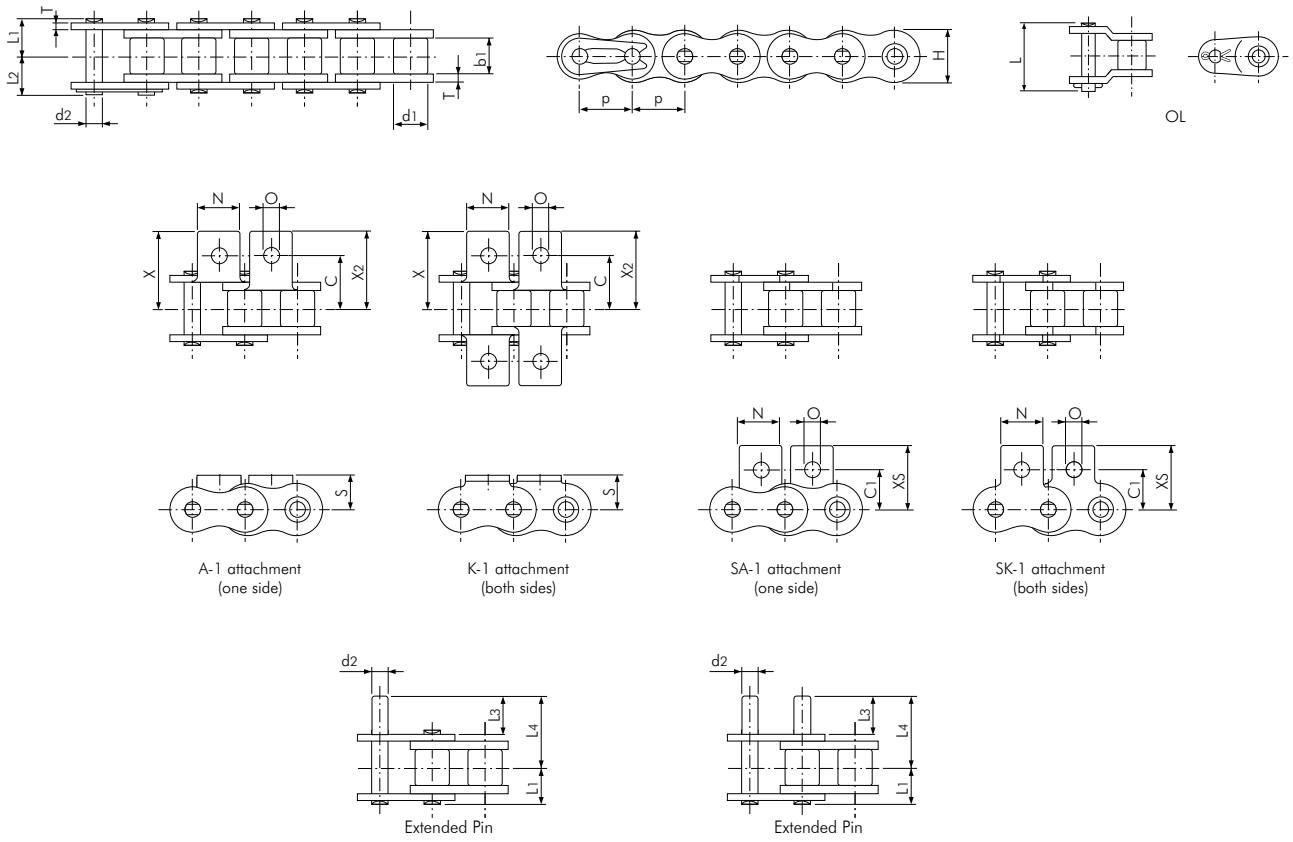


Fig. 23 Basic Construction

Advantages

TSUBAKI has enhanced the ANSI LAMBDA with the following advantages:

ANSI LAMBDA LUBE FREE ATTACHMENT CHAIN



ANSI Single Pitch LAMBDA Chain

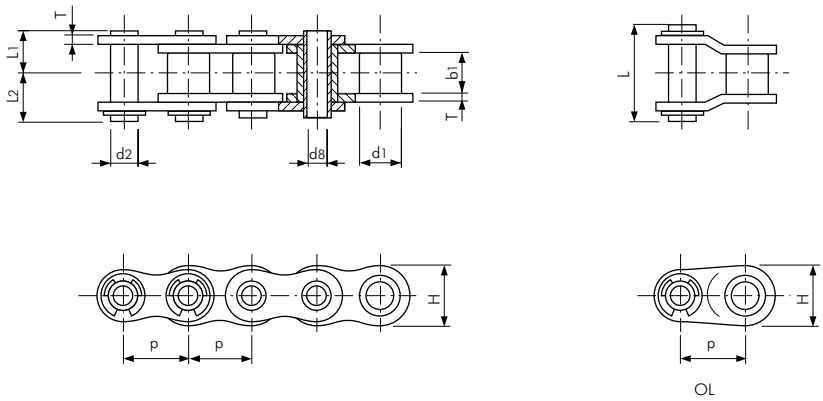
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Height H (max.)	Approx. Mass kg/m
RS40-LMC	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	9.50	16.75	18.20	1.50	12.00	0.64
RS50-LMC	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	11.90	21.00	22.60	2.00	15.00	1.04
RS60-LMC	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	14.30	25.75	28.20	2.40	18.10	1.53
RS80-LMC	25.40	(1")	15.88	15.88	7.94	16.25	19.25	19.10	33.85	36.60	3.20	24.10	2.66

TSUBAKI Chain No.	Attachment Dimensions C	C1	N	O	S	X	X2	XS	Attachment Mass A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RS40-LMC	12.70	12.70	9.50	3.60	8.00	17.80	17.80	17.40	0.002	0.004	0.001
RS50-LMC	15.90	15.90	12.70	5.20	10.30	23.40	23.40	23.05	0.003	0.006	0.002
RS60-LMC	19.05	18.30	15.90	5.20	11.90	28.20	28.20	26.85	0.007	0.014	0.003
RS80-LMC	25.40	24.60	19.10	6.80	15.90	36.60	36.60	35.45	0.013	0.026	0.007

Note:

1. Connecting links are clip type for sizes up to RS60-LMC, and cotter type for size RS80-LMC.
2. Drive and Conveyor series LAMBDA chains cannot be intercoupled or interchanged.
3. Standard ANSI sprockets can be used.
4. LAMBDA Conveyor Chain cannot be used as a drive chain. This chain is designed for conveyor applications where speeds are lower and center distances are larger than drive chain applications.
5. Special attachments are available on request.



ANSI Single Pitch LAMBDA Hollow Pin (HP) Chain

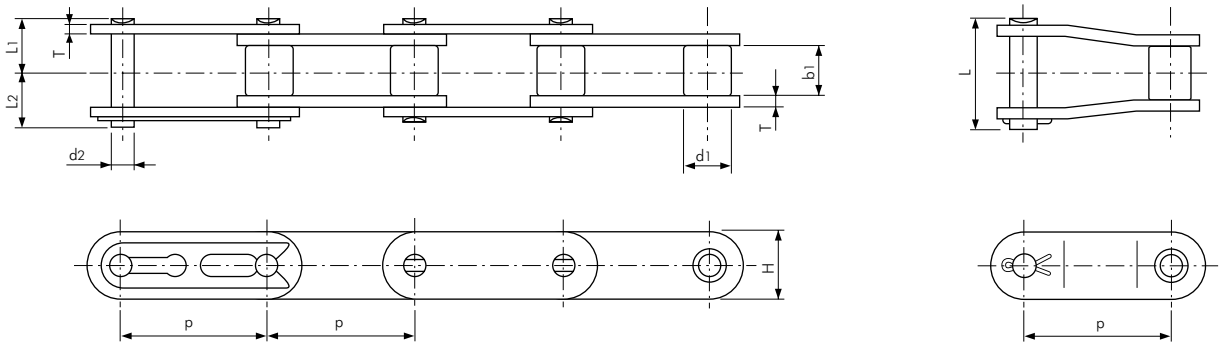
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin					Link Plate		Approx. Mass kg/m
					Diameter d2	Hollow Pin d8	Length L1	Length L2	Length L	Thickness T	Height H (max.)	
RS40-LMC-HP	12.70	(1/2")	7.92	7.95	5.68	4.00	8.00	9.50	19.10	1.50	12.00	0.53
RS50-LMC-HP	15.875	(5/8")	10.16	9.53	7.22	5.12	10.05	11.65	23.40	2.00	15.00	0.86
RS60-LMC-HP	19.05	(3/4")	11.91	12.70	8.38	5.99	12.55	14.25	28.70	2.40	18.10	1.27

Note:

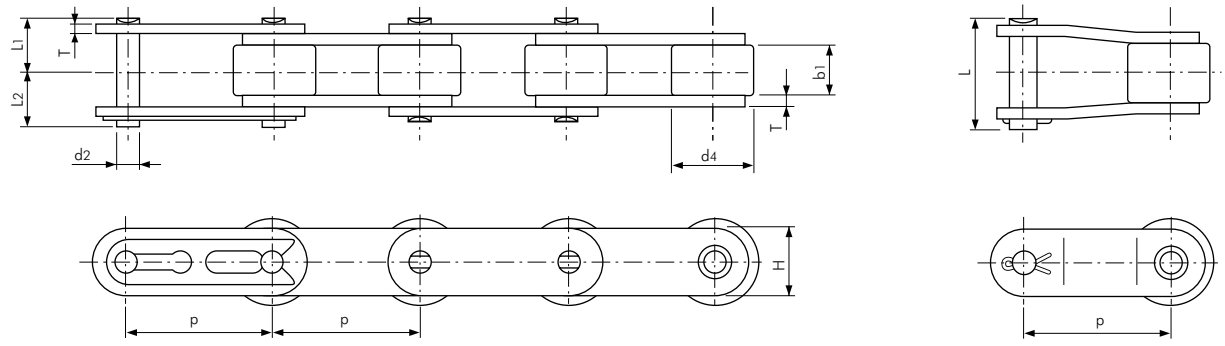
1. ANSI LMC-HP chain is rollerless chain (only bush).

ANSI LAMBDA LUBE FREE ATTACHMENT CHAIN



S type roller

OL



R type roller

OL

ANSI Double Pitch LAMBDA Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Inner Width b1	Roller S Roller d1	Roller R Roller d4	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H	Approx. Mass S Roller kg/m	Approx. Mass R Roller kg/m
RF2040-LMC	25.40	(1″)	7.95	7.92	15.88	3.97	8.25	9.95	18.20	1.50	12.00	0.51	0.87
RF2050-LMC	31.75	(1 1/4″)	9.53	10.16	19.05	5.09	10.30	12.00	22.60	2.00	15.00	0.84	1.30
RF2060-LMC	38.10	(1 1/2″)	12.70	11.91	22.23	5.96	14.55	16.55	31.50	3.20	17.20	1.51	2.19

Note:

1. Connecting links are clip type.
2. LAMBDA Conveyor Chain cannot be used as a drive chain. This chain is designed for conveyor applications where speeds are lower and center distances are larger than drive chain applications.
3. Special attachments are available on request.
4. Chain with S type roller is indicated as RF2040S-LMC.
5. Chain with R type roller is indicated as RF2040R-LMC.

ANSI STANDARD ATTACHMENT CHAIN

For standard applications, TSUBAKI can provide you with an outstanding Attachment Chain. This chain is manufactured in accordance with the American Standards.

Fig. 24 K-1 Attachment

Construction

This chain is based on standard ANSI roller chain with attachments added for conveying.

Key Features

- Due to the small pitch of these chains, the drive design is smaller.
- Usually sprockets with a large number of teeth are used. The chain speed does not vary significantly as the chain engages with sprockets. With less impact, there is also less noise generated as a result of the impact between the roller and sprocket tooth.
- These chains may be used for high-speed conveyors.
- A wide variety of standard attachments and special attachments is available for this chain series.

Customised Pre-Lubrication Service

Proper lubrication is the key to extend the life and improve the performance of a chain. In order to get the best performance in general applications (-10°C to +60°C), all ANSI drive chains are pre-lubricated. ANSI attachment chains however are NOT pre-lubricated, but have been treated with rust preventive oil and therefore need to be lubricated before the installation of the chain. The reason for TSUBAKI not to lubricate the ANSI attachment chains is due to the fact that attachment chains often have to function in various environments where standard lubrication cannot be used.

For special applications, TSUBAKI can provide attachment chains, pre-lubricated with a special lubricant at the customer's request.

- High temperature
- Low temperature
- Food safe
- Outdoor exposure
- Dusty environment

Please consult TSUBAKI for more detailed information.

Application Example

ANSI Standard attachment chain is used for short conveyors of usually less than 10 metres for small and light products. This chain is also suitable for conditions under which noise should be avoided.

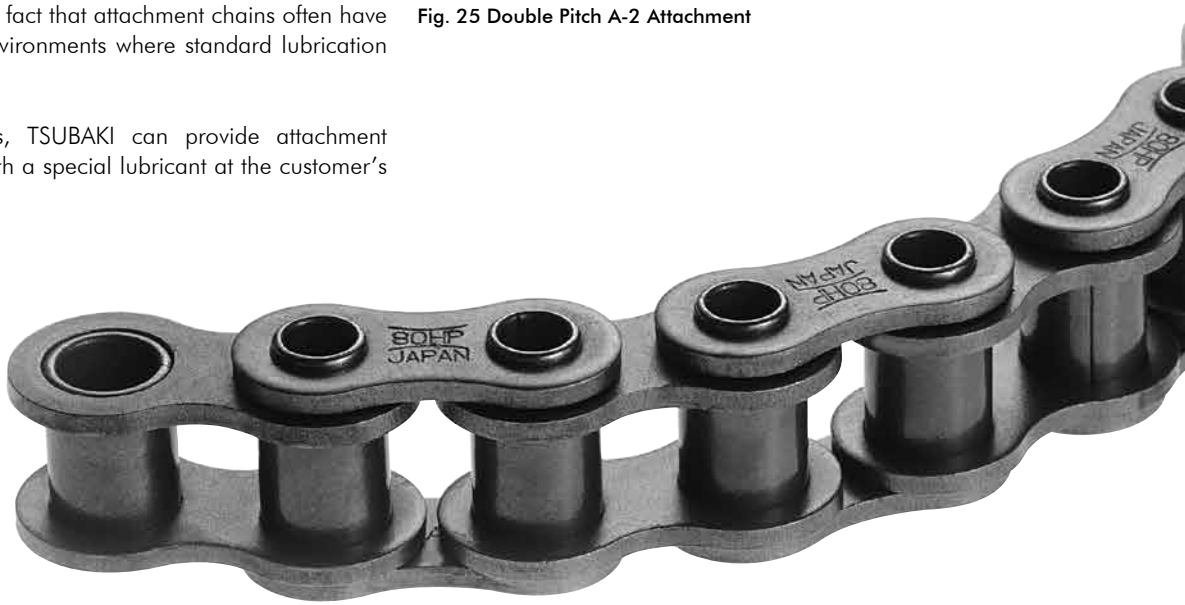
Standard Product Range

The product range for our standard attachment chains is:

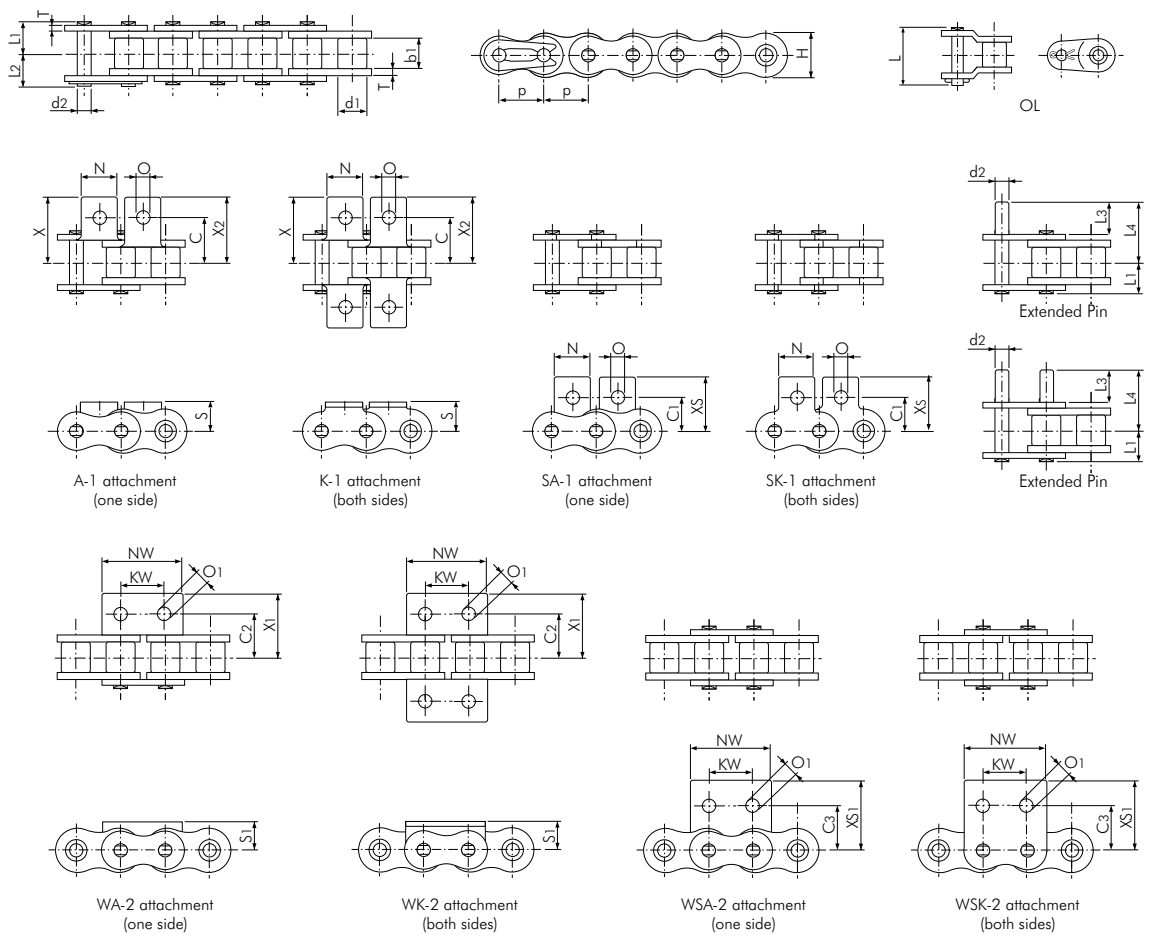
- ANSI Single Pitch Standard chain + standard attachments
- ANSI Single Pitch HP Hollow Pin chain
- ANSI Single Pitch CU Curved chain
- ANSI Double Pitch Standard chain + standard attachments
- ANSI Double Pitch HP Hollow Pin chain
- BS Single Pitch Standard chain + standard attachments
- BS Single Pitch RF chain with flat shaped link plates

Special attachments can be designed and manufactured to meet your specific requirements.

Fig. 25 Double Pitch A-2 Attachment



ANSI STANDARD ATTACHMENT CHAIN



ANSI Single Pitch Standard Chain

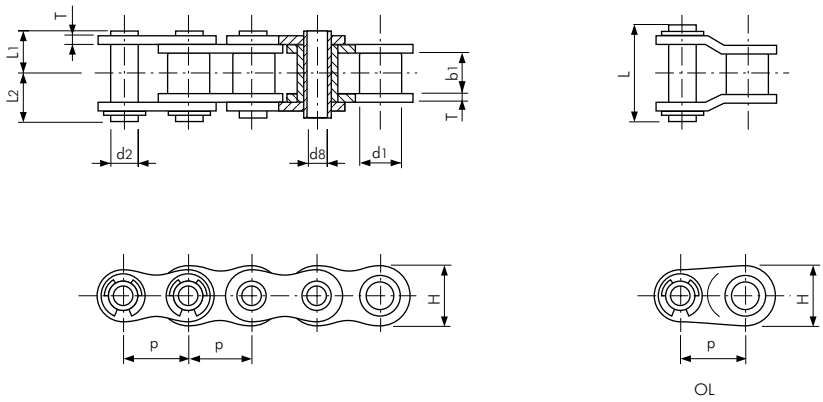
Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Height H (max.)	Approx. Mass kg/m
RS35	9.525 (3/8")	5.08	4.78	3.59	5.85	6.85	9.50	14.60	13.50	1.25	9.00	0.33
RS40	12.70 (1/2")	7.92	7.95	3.97	8.25	9.95	9.50	16.75	18.20	1.50	12.00	0.64
RS50	15.875 (5/8")	10.16	9.53	5.09	10.30	12.00	12.00	21.00	22.60	2.00	15.00	1.04
RS60	19.05 (3/4")	11.91	12.70	5.96	12.85	14.75	14.30	25.75	28.20	2.40	18.10	1.53
RS80	25.40 (1")	15.88	15.88	7.94	16.25	19.25	19.10	33.85	36.60	3.20	24.10	2.66

TSUBAKI Chain No.	Attachment Dimensions C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	Attachment Mass A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RS35	9.50	9.50	9.50	9.50	9.50	7.90	17.30	3.40	2.60	6.35	6.35	14.30	14.30	14.30	14.55	14.55	0.0008	0.0016	0.001	0.002	0.001
RS40	12.70	12.70	12.70	12.70	9.50	9.50	23.00	3.60	4.50	8.00	8.00	17.80	17.80	17.80	17.40	17.40	0.002	0.004	0.003	0.006	0.001
RS50	15.90	15.90	15.90	15.90	11.90	12.70	28.80	5.20	5.50	10.30	10.30	23.40	23.40	23.40	23.05	23.05	0.003	0.006	0.007	0.014	0.002
RS60	19.05	18.30	19.05	18.30	14.30	15.90	34.60	5.20	6.60	11.90	11.90	28.20	28.20	28.20	26.85	26.85	0.007	0.014	0.012	0.024	0.003
RS80	25.40	24.60	25.40	24.60	19.10	19.10	46.10	6.80	9.00	15.90	15.90	36.60	36.60	36.60	35.45	35.45	0.013	0.026	0.028	0.056	0.007

Note:

1. RS35 is rollerless chain (only bush). The figure shown is the bush diameter.
2. Connecting links are clip type for sizes up to RS60, and cotter type for size RS80.



ANSI Single Pitch Hollow Pin (HP) Chain

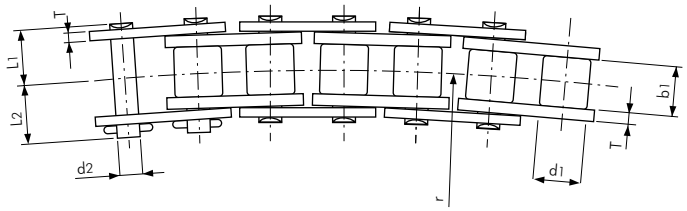
Dimensions in mm

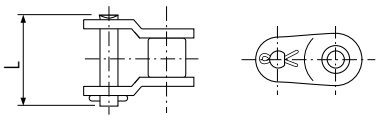
TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin					Link Plate		Approx. Mass kg/m
					Diameter d2	Hollow Pin d8	Length L1	Length L2	Length L	Thickness T	Height H (max.)	
RS40-HP	12.70	(1/2")	7.92	7.95	5.68	4.00	8.00	9.50	19.10	1.50	12.00	0.53
RS50-HP	15.875	(5/8")	10.16	9.53	7.22	5.12	10.05	11.65	23.40	2.00	15.00	0.86
RS60-HP	19.05	(3/4")	11.91	12.70	8.38	5.99	12.55	14.25	28.70	2.40	18.10	1.27
RS80-HP	25.40	(1")	15.88	15.88	11.38	8.02	16.25	17.80	35.70	3.20	24.10	2.15

Note:

1. ANSI HP chain is rollerless chain (only bush).

ANSI STANDARD ATTACHMENT CHAIN





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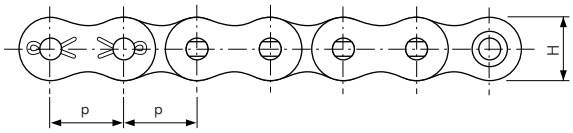
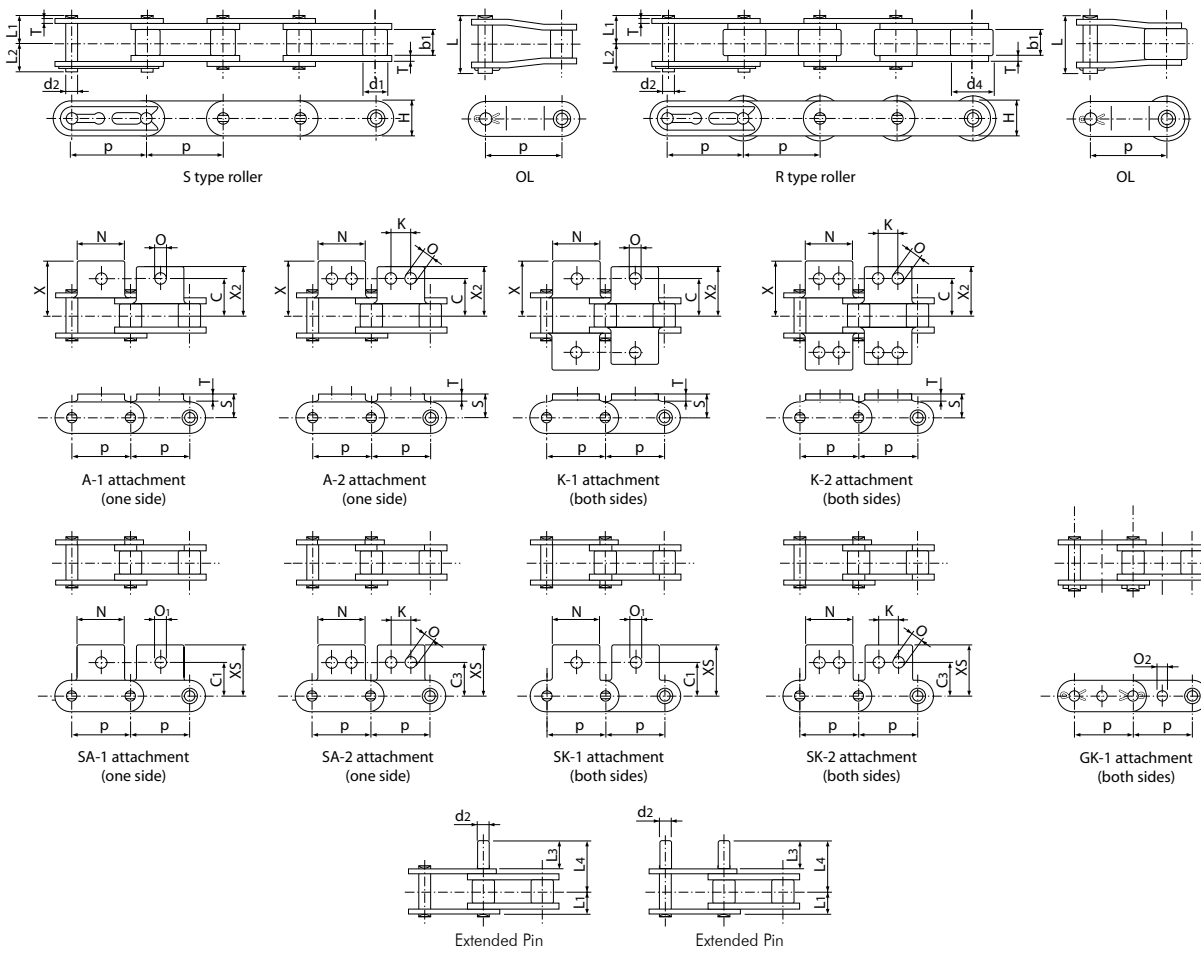


ANSI Single Pitch Curved (CU) Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin			Link Plate		Minimum Bending Radius r	Approx. Mass kg/m
					Diameter d2	Length L1	Length L2	Thickness T	Height H (max.)		
RS40-CU	12.70	(1/2")	7.92	7.95	3.97	8.45	9.75	1.50	12.00	350	0.61
RS50-CU	15.875	(5/8")	10.16	9.53	5.09	10.60	12.40	2.00	15.00	400	1.01
RS60-CU	19.05	(3/4")	11.91	12.70	5.96	13.25	15.05	2.40	18.10	500	1.40
RS80-CU	25.40	(1")	15.88	15.88	7.94	16.75	20.05	3.20	24.10	600	2.47

ANSI STANDARD ATTACHMENT CHAIN



ANSI Double Pitch Standard Chain

Dimensions in mm

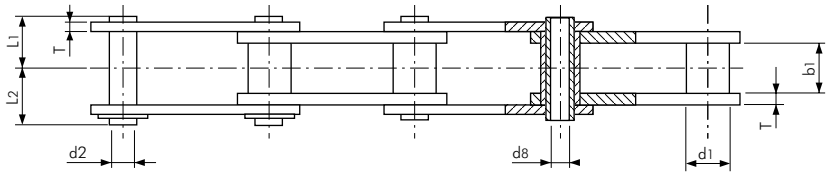
TSUBAKI Chain No.	Pitch p		Inner Width b1	Roller S Roller d1	Roller R Roller d4	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Height H	Approx. Mass S Roller kg/m	Approx. Mass R Roller kg/m
RF2040	25.40	(1")	7.95	7.92	15.88	3.97	8.25	9.95	9.50	16.75	18.20	1.50	12.00	0.51	0.87
RF2050	31.75	(1 1/4")	9.53	10.16	19.05	5.09	10.30	12.00	11.90	21.00	22.60	2.00	15.00	0.84	1.30
RF2060	38.10	(1 1/2")	12.70	11.91	22.23	5.96	14.55	16.55	14.30	27.45	31.50	3.20	17.20	1.51	2.19
RF2080	50.80	(2")	15.88	15.88	28.58	7.94	18.30	20.90	19.10	35.50	39.90	4.00	23.00	2.41	3.52
RF2100	63.50	(2 1/2")	19.05	19.05	39.69	9.54	21.80	24.50	23.80	43.40	47.50	4.80	28.60	3.54	5.80

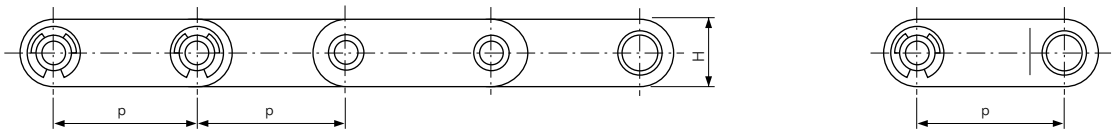
TSUBAKI Chain No.	Attachment Dimensions C	C1	C3	K	N	O	O1	O2	S	X	X2	XS	Attachment Mass A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RF2040	12.70	11.10	13.60	9.50	19.10	3.60	5.20	4.10	9.10	19.30	17.60	19.80	0.003	0.006	0.001
RF2050	15.90	14.30	15.90	11.90	23.80	5.20	6.80	5.10	11.10	24.20	22.00	24.60	0.006	0.012	0.002
RF2060	21.45	17.50	19.10	14.30	28.60	5.20	8.70	6.10	14.70	31.50	28.20	30.60	0.017	0.034	0.003
RF2080	27.80	22.20	25.40	19.10	38.10	6.80	10.30	8.10	19.10	40.70	36.60	40.50	0.032	0.064	0.007
RF2100	33.35	28.60	31.80	23.80	47.60	8.70	14.30	10.10	23.40	49.90	44.90	50.40	0.060	0.120	0.012

Note:

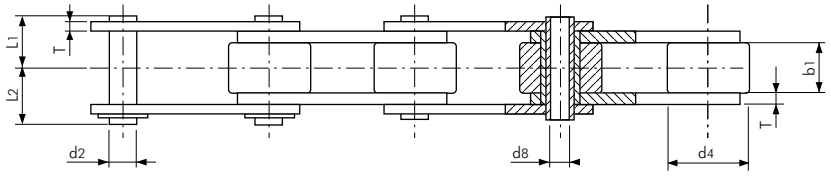
1. Connecting links are clip type for sizes up to RF2060, and cotter type for size RF2080 to RF2100; All GK-1 attachments are cotter type.
2. R-Roller is not available with GK-1 attachment.
3. Special attachments are available on request.
4. Chain with S type roller is indicated as RF2040S.
5. Chain with R type roller is indicated as RF2040R.

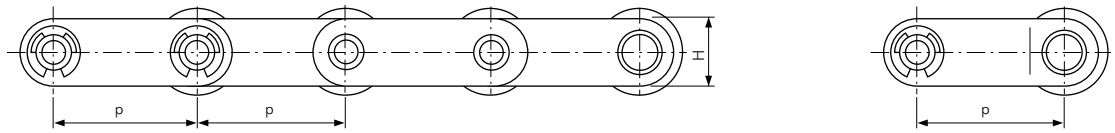
ANSI STANDARD ATTACHMENT CHAIN





S type bush OL





R type roller OL

ANSI Double Pitch Hollow Pin (HP) Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Inner Width b1	S Bush d1	R Roller d4	Pin					Link Plate		Approx. Mass	
						Diameter d2	Hollow Pin d8	Length L1	Length L2	Length L	Thickness T	Height H	S Bush kg/m	R Roller kg/m
RF2040-HP	25.40	(1")	7.95	7.92	15.88	5.68	4.00	8.00	9.50	19.10	1.50	12.00	0.46	0.82
RF2050-HP	31.75	(1 1/4")	9.53	10.16	19.05	7.22	5.12	10.05	11.65	23.40	2.00	15.00	0.75	1.21
RF2060-HP	38.10	(1 1/2")	12.70	11.91	22.23	8.38	5.99	12.55	14.25	28.70	2.40	17.20	1.38	2.06
RF2080-HP	50.80	(2")	15.88	15.88	28.58	11.38	8.02	16.25	17.80	35.70	3.20	23.00	1.80	2.81

Note:

1. Chain with S type bush is indicated as RF2040S-HP.
2. Chain with R type roller is indicated as RF2040R-HP.

ANSI ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS

Whether your operation requires a sanitary environment, is exposed to corrosive chemicals, is heated to extreme temperatures, runs through a freezer, is exposed to the outdoors or is affected by excessive moisture: our specially designed and tested chains will outlast your current chains and contribute to a cost effective application.

Corrosion Resistant Chain (Engineering Plastic base)

ANSI P Plastic Chain

ANSI P Chain consists of polyacetal chain links and SUS304 equivalent stainless steel pins and operates with standard roller chain sprockets. Based on power transmission roller chain, TSUBAKI ANSI P chain has a flat top side for conveying use. The combination of engineering plastic and stainless steel makes it a lube-free operation chain. For special environments special plastics are available on request (electro-conductive, chemical resistant and heat resistant series). The working temperature range is: -20°C to +80°C. For details on corrosion resistance, please refer to the table in the back of this catalogue.

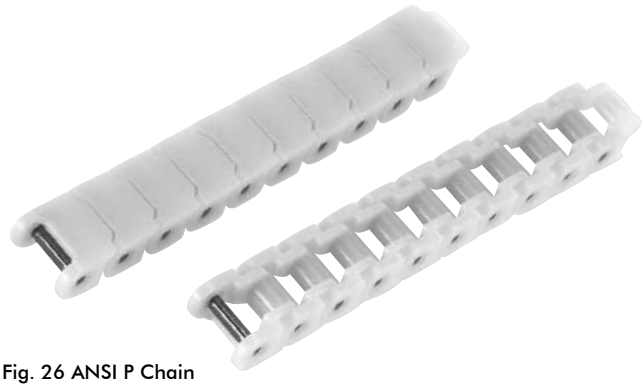


Fig. 26 ANSI P Chain

Corrosion Resistant Chain (Stainless Steel base)

ANSI PC Engineering Plastic Combination Chain

The pins, outer plates and attachments of these chains are made of SUS304 equivalent (spring clips SUS301). White Engineering Plastic is used for the inner link. This combination makes it lube-free, low noise (5 dB lower than ANSI standard roller chain) and lightweight (50% lighter than ANSI standard roller chain). The working temperature range is: -20°C to +80°C. For details on corrosion resistance, please refer to the table in the back of this catalogue.

ANSI SS Stainless Steel Chain

All basic components of this chain are made of SUS304 equivalent Stainless Steel (except the spring clips, which are made of SUS301). This chain can be used in special environments such as underwater, acidic and alkaline applications. It can also be used in high and low temperatures (-20°C to +400°C). SUS304 equivalent is only marginally magnetic, which is a result of the cold-forging process. For details on corrosion resistance, please refer to the table in the back of this catalogue.

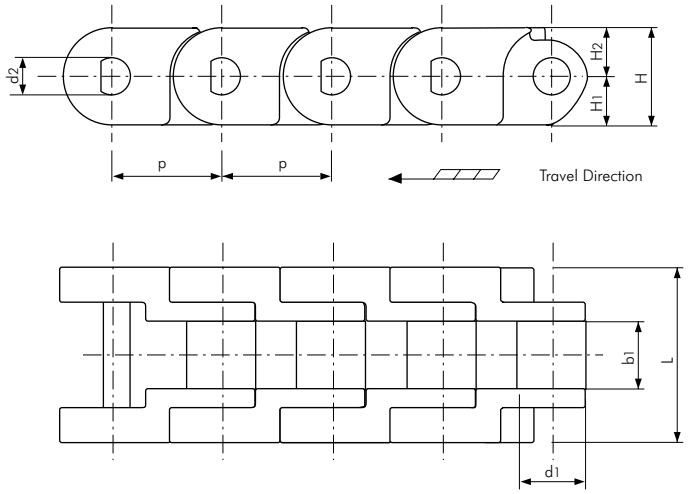
Standard Product Range

TSUBAKI has a wide variety of chains for corrosive environments; our standard product range is as follows:

- ANSI Single pitch PC chain + standard attachments
- ANSI Single pitch P Plastic chain
- ANSI Single pitch SS chain + standard attachments
- ANSI Single pitch SS HP Hollow Pin chain
- ANSI Double Pitch SS chain + standard attachments
- ANSI Double Pitch SS HP Hollow Pin chain
- BS Single pitch PC chain + standard attachments
- BS Single pitch SS chain + standard attachments
- BS Single pitch N.E.P. chain + standard attachments

Special attachments can be designed and manufactured to meet your specific requirements.

ANSI ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI Single Pitch P Chain

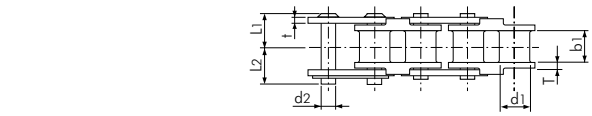
Dimensions in mm

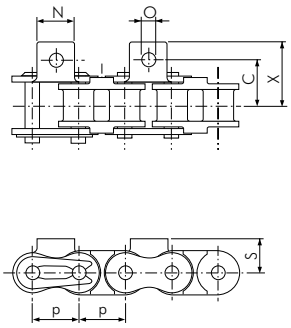
TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L	Chain Height H	Chain Height H1	Chain Height H2	Approx. Mass kg/m
RSP-40	12.70	(1/2")	7.92	7.95	4.00	20.00	12.70	6.00	6.70	0.36
RSP-60	19.05	(3/4")	11.91	12.70	6.00	30.00	17.30	8.50	8.80	0.72

Note:

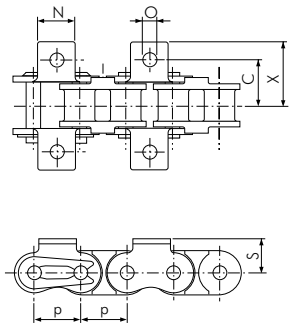
1. Standard ANSI sprockets can be used.
2. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

ANSI ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS

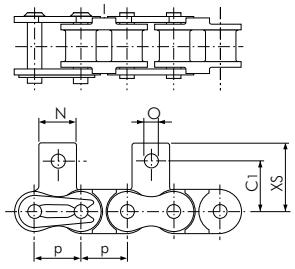




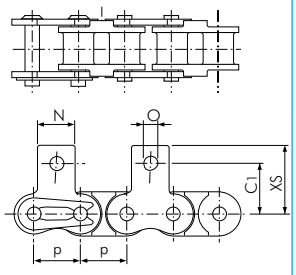
A-1 attachment
(one side)



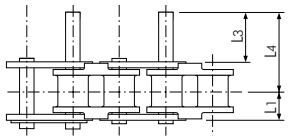
K-1 attachment
(both sides)



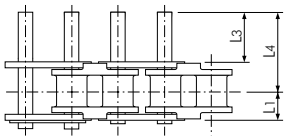
SA-1 attachment
(one side)



SK-1 attachment
(both sides)



Extended Pin



Extended Pin

ANSI Single Pitch PC Chain

Dimensions in mm

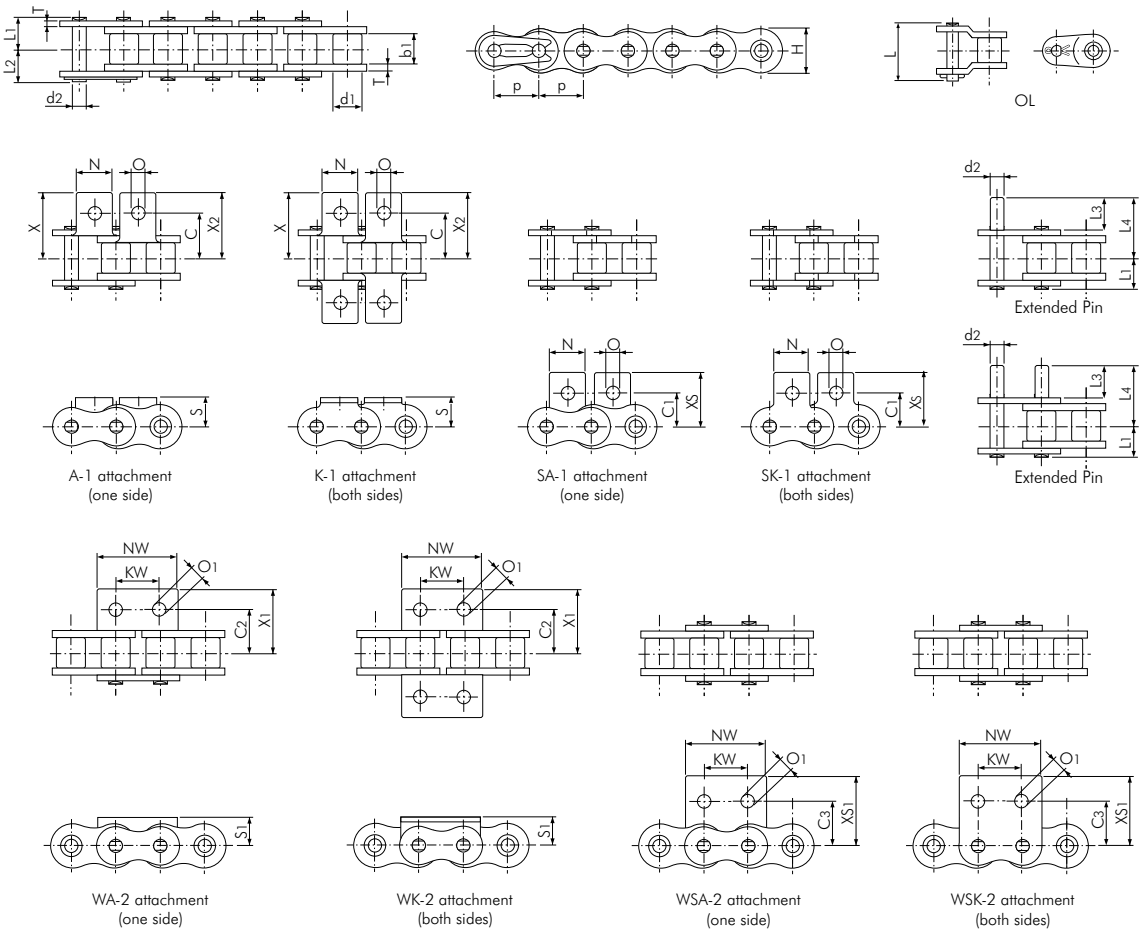
TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Link Plate Thickness T	Link Plate Thickness t	Link Plate Height H (max.)	Max. Alowable. Load acc. to Tsubaki kN	Approx. Mass kg/m
RS25-PC	6.35	(1/4")	3.30	3.18	2.31	4.50	5.50	-	-	1.30	0.75	6.00	0.08	0.095
RS35-PC	9.525	(3/8")	5.08	4.78	3.59	6.85	7.85	-	-	2.20	1.25	9.00	0.18	0.22
RS40-PC	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	9.40	16.75	1.50	1.50	12.00	0.44	0.39
RS50-PC	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	11.90	21.00	2.00	2.00	15.00	0.69	0.58
RS60-PC	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	14.20	25.75	2.40	2.40	18.10	0.88	0.82

TSUBAKI Chain No.	Attachment Dimensions C	C1	N	O	S	X	XS	Attachment Mass A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RS25-PC	7.95	7.95	5.60	3.40	4.75	11.45	11.65	0.0006	0.0012	-
RS35-PC	10.50	9.50	7.90	3.40	6.35	15.35	14.55	0.0008	0.0016	-
RS40-PC	12.75	12.70	9.50	3.60	8.00	17.80	17.40	0.002	0.004	0.001
RS50-PC	16.00	15.90	12.70	5.20	10.30	23.55	23.05	0.003	0.006	0.002
RS60-PC	19.15	18.30	15.90	5.20	11.90	28.35	26.85	0.007	0.014	0.003

Note:

1. Make sure to check the chain load again when replacing Stainless Steel Chain with PC Chain.
2. Offset links are not available.
3. Use a chain tensioner with an idler sprocket to adjust chain tension.
4. Guide rails should support the underside of the inner links
5. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.

ANSI ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI Single Pitch SS Chain

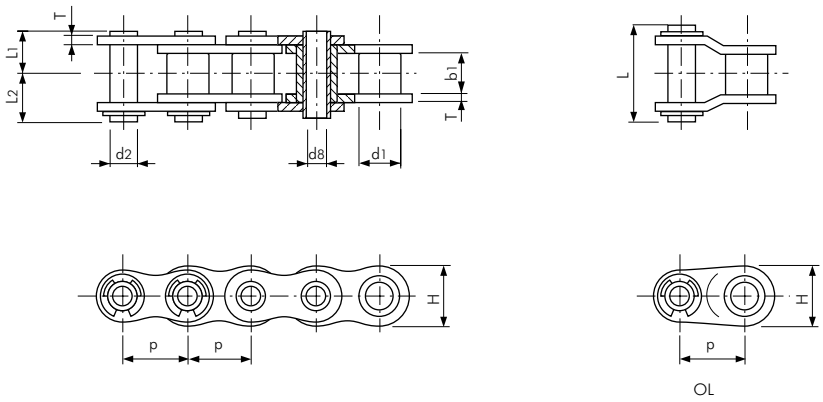
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller Diameter d1	Inner Width b1	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Height H (max.)	Approx. Mass kg/m
RS40-SS	12.70	(1/2")	7.92	7.95	3.97	8.25	9.95	9.50	16.75	18.20	1.50	12.00	0.64
RS50-SS	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	11.90	21.00	22.60	2.00	15.00	1.04
RS60-SS	19.05	(3/4")	11.91	12.70	5.96	12.85	14.75	14.30	25.75	28.20	2.40	18.10	1.53

TSUBAKI Chain No.	Attachment Dimensions C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	Attachment Mass A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RS40-SS	12.70	12.70	12.70	12.70	9.50	9.50	23.00	3.60	4.50	8.00	8.00	17.80	17.80	17.80	17.40	17.40	0.002	0.004	0.003	0.006	0.001
RS50-SS	15.90	15.90	15.90	15.90	11.90	12.70	28.80	5.20	5.50	10.30	10.30	23.40	23.40	23.40	23.05	23.05	0.003	0.006	0.007	0.014	0.002
RS60-SS	19.05	18.30	19.05	18.30	14.30	15.90	34.60	5.20	6.60	11.90	11.90	28.20	28.20	28.20	26.85	26.85	0.007	0.014	0.012	0.024	0.003

Note:

1. Connecting links are clip type.
2. For details on corrosion resistance selection, please consult our Corrosion Resistance Guide in this catalogue.



ANSI Single Pitch SS Hollow Pin (HP) Chain

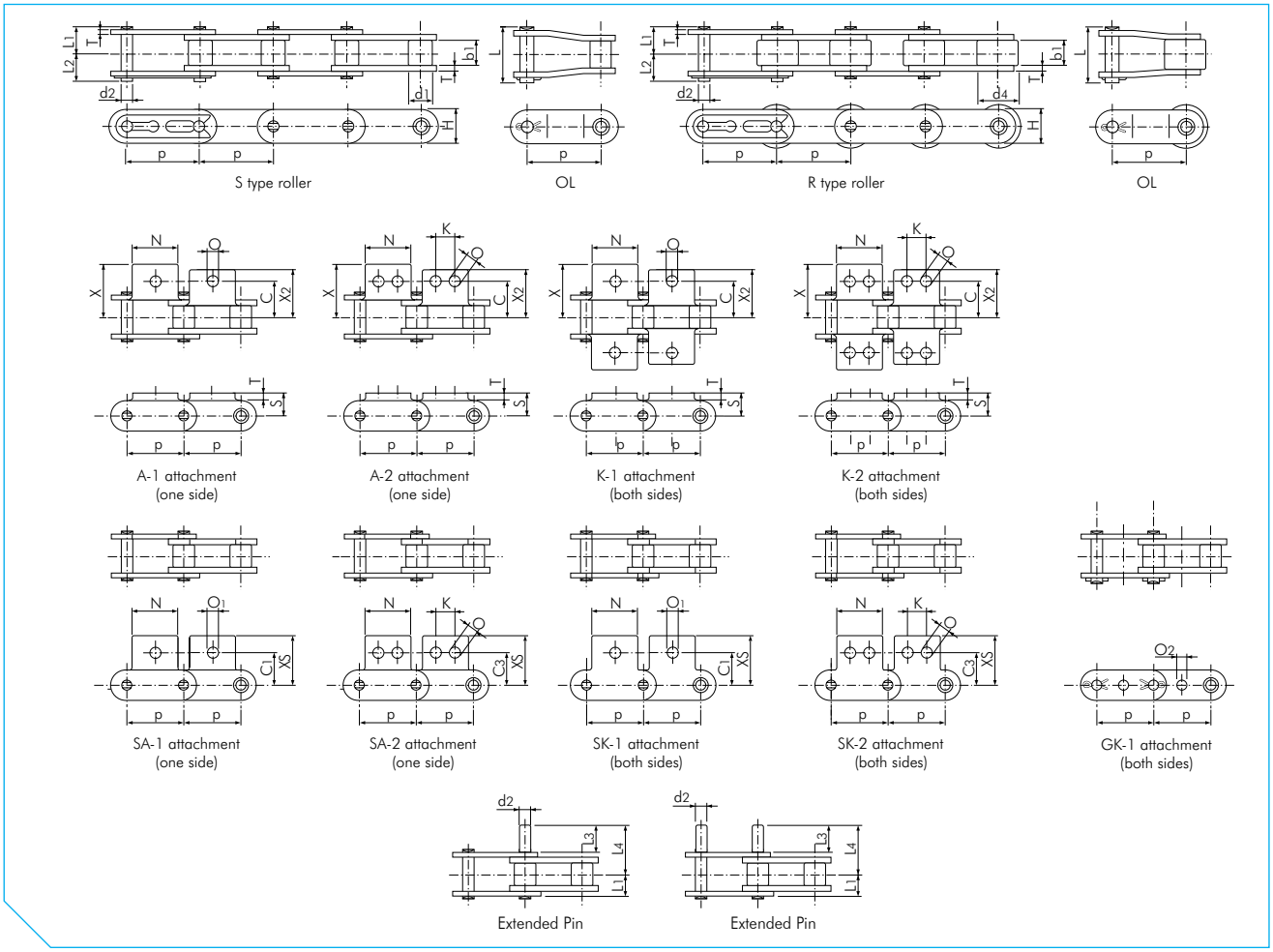
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Bush Diameter d1	Inner Width b1	Pin					Link Plate		Approx. Mass kg/m
					Diameter d2	Hollow Pin d8	Length L1	Length L2	Length L	Thickness T	Height H (max.)	
RS40-HP-SS	12.70	(1/2")	7.92	7.95	5.68	4.00	8.00	9.50	19.10	1.50	12.00	0.53
RS50-HP-SS	15.875	(5/8")	10.16	9.53	7.22	5.12	10.05	11.65	23.40	2.00	15.00	0.86
RS60-HP-SS	19.05	(3/4")	11.91	12.70	8.38	5.99	12.55	14.25	28.70	2.40	18.10	1.27
RS80-HP-SS	25.40	(1")	15.88	15.88	11.38	8.02	16.25	17.80	35.70	3.20	24.10	2.15

Note:

1. ANSI HP-SS chain is rollerless chain (only bush).

ANSI ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI Double Pitch SS Chain

Dimensions in mm

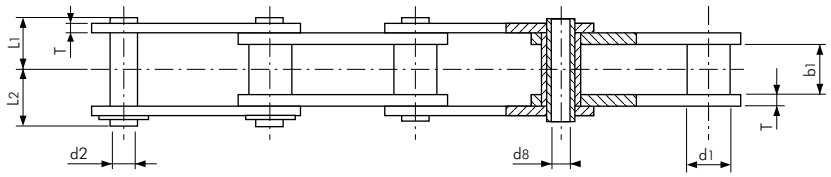
TSUBAKI Chain No.	Pitch p		Inner Width b1	Roller S Roller d1	Roller R Roller d4	Pin Diameter d2	Pin Length L1	Pin Length L2	Pin Length L3	Pin Length L4	Pin Length L	Link Plate Thickness T	Link Plate Height H	Max. Allowable Load acc. to Tsubaki kN	Approx. Mass S Roller kg/m	Approx. Mass R Roller kg/m
RF2040-SS	25.40	(1")	7.95	7.92	15.88	3.97	8.25	9.95	9.50	16.75	18.60	1.50	12.00	0.44	0.51	0.87
RF2050-SS	31.75	(1 1/4")	9.53	10.16	19.05	5.09	10.30	12.00	11.90	21.00	23.90	2.00	15.00	0.69	0.84	1.30
RF2060-SS	38.10	(1 1/2")	12.70	11.91	22.23	5.96	14.55	16.55	14.30	27.45	32.80	3.20	17.20	1.03	1.51	2.19
RF2080-SS	50.80	(2")	15.88	15.88	28.58	7.94	18.30	20.90	19.10	35.50	42.10	4.00	23.00	1.76	2.41	3.52

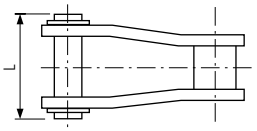
TSUBAKI Chain No.	Attachment Dimensions C	C1	C3	K	N	O	O1	O2	S	X	X2	XS	Attachment Mass A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RF2040-SS	12.70	11.10	13.60	9.50	19.10	3.60	5.20	4.10	9.10	19.30	17.60	19.80	0.003	0.006	0.001
RF2050-SS	15.90	14.30	15.90	11.90	23.80	5.20	6.80	5.10	11.10	24.20	22.00	24.60	0.006	0.012	0.002
RF2060-SS	21.45	17.50	19.10	14.30	28.60	5.20	8.70	6.10	14.70	31.50	28.20	30.60	0.017	0.034	0.003
RF2080-SS	27.80	22.20	25.40	19.10	38.10	6.80	10.30	8.10	19.10	40.70	36.60	40.50	0.032	0.064	0.007

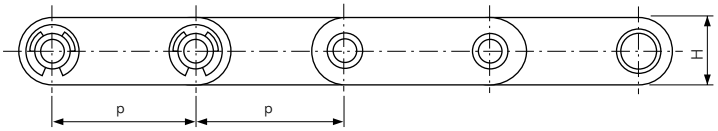
Note:

1. Connecting links are clip type for sizes up to RF2060-SS, and cotter type for RF2080-SS, all GK-1 attachments are cotter type.
2. R-Roller is not available with GK-1 attachment.
3. Special attachments are available on request.
4. Chain with S type roller is indicated as RF2040S-SS.
5. Chain with R type roller is indicated as RF2040R-SS.

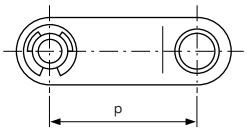
ANSI ATTACHMENT CHAIN FOR CORROSIVE ENVIRONMENTS







S type bush



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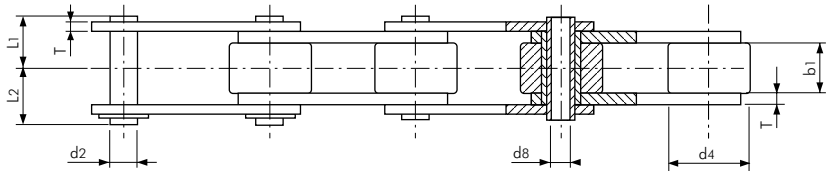
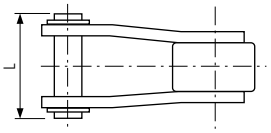
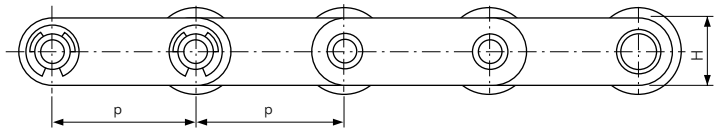
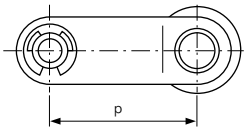






R type roller



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ANSI Double Pitch SS Hollow Pin (HP) Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p		Inner Width b1	S Bush d1	R Roller d4	Pin Diameter d2	Pin Hollow Pin d8	Pin Length L1	Pin Length L2	Pin Length L	Link Plate Thickness T	Link Plate Height H	Approx. Mass S Bush kg/m	Approx. Mass R Roller kg/m
RF2040-HP-SS	25.40	(1″)	7.95	7.92	15.88	5.68	4.00	8.00	9.50	19.10	1.50	12.00	0.46	0.82
RF2050-HP-SS	31.75	(1 1/4″)	9.53	10.16	19.05	7.22	5.12	10.05	11.65	23.40	2.00	15.00	0.75	1.21
RF2060-HP-SS	38.10	(1 1/2″)	12.70	11.91	22.23	8.38	5.99	12.55	14.25	28.70	2.40	17.20	1.38	2.06
RF2080-HP-SS	50.80	(2″)	15.88	15.88	28.58	11.38	8.02	16.25	17.80	35.70	3.20	23.00	1.80	2.81

Note:

1. Chain with S type bush is indicated as RF2040S-HP-SS.
2. Chain with R type roller is indicated as RF2040R-HP-SS.

STOCK SPECIALTY ATTACHMENT CHAIN

Can Processing Industry

Fig. 27 RS60-2 AS Special

Packaging Industry

Fig. 28 RS35 and RS40 Special WA

Book Binding Industry

Fig. 29 RS12B Special Extended Pin

Packaging Industry

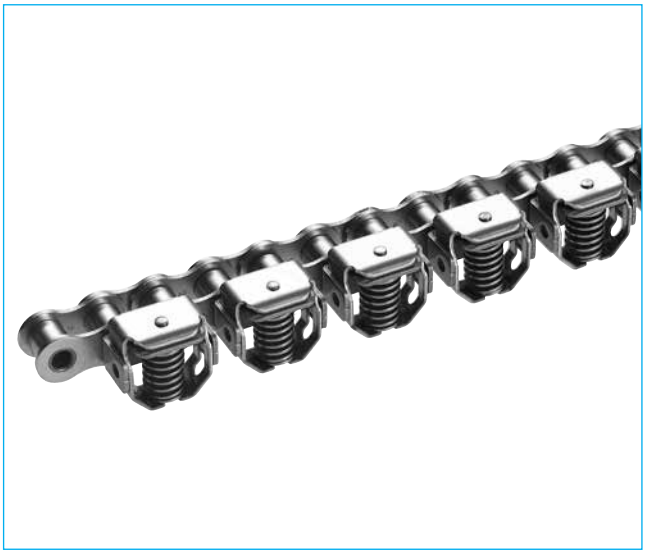


Fig. 30 RS08B and RS10B Gripper Chain

Packaging Industry

Fig. 31 RS50 and RF2050 Special Extended Pin

Automotive and Electronics Industry

Fig. 32 RF2030 VRP to RF2080 VRP Double Plus Chain

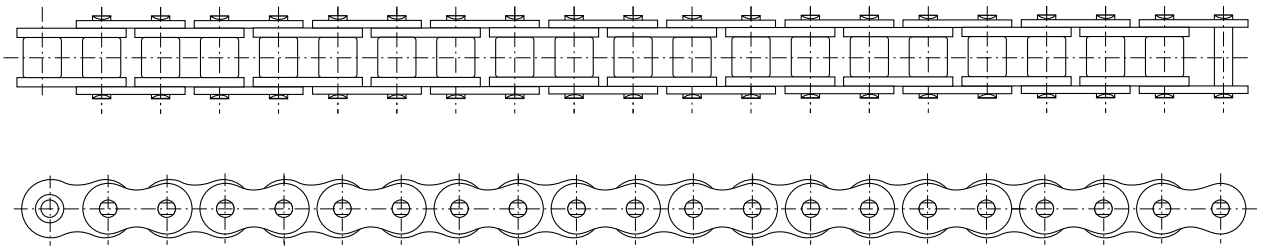
TSUBAKI ATTACHMENT CHAIN APPLICATION CHECK SHEET

Date:			
Company name:	Tel:		
Contact person:	Fax:		
1) Type of requirement	❑ New design	❑ Replacement	❑ Investigation
	If replacement -	Motor size	(kW)
		Sprocket size	(Teeth)
2) Type of conveyor	❑ Slat conveyor	❑ Bucket conveyor	
	❑ Pusher	❑ Other	
3) Mass & quantity of slats, pushers etc.:		(kg/pc)	(pc)
4) Conveying direction:	❑ Horizontal	❑ Vertical	
	Inclined - Specify Gradient		
5) Description of conveyed goods:			
6) Length of conveying portion:			(m)
7) Mass of conveyed goods in conveying portion:			(kg/pc)
8) Maximum quantity of conveyed goods: in conveying portion:			(pc)
9) Length of accumulated portion (if where):			(m)
10) Mass of conveyed goods in accumulated portion:			(kg/pc)
11) Maximum quantity of conveyed goods in accumulated portion:			(pc)
12) Size of conveyed goods	Length		(mm)
	Width		(mm)
	Height		(mm)
13) Conveying speed:			(m/min.)
14) For indexing applications	Mass (or size) of driven sprocket		kg (teeth)
	Acceleration and deceleration		(m/sec^2)
	Feed per index		(m)
	Time to complete index		(second)
	Cam curve	❑ Modified sin curve (MS)	
		❑ Modified trapezoidal curve (MT)	
		❑ Modified sin mean curve (MSC)	
15) Desired chain pitch:			(mm)
16) Desired attachment type and spacing:			
17) Number of chain strands:			(strand)
18) Lubrication condition	❑ With lubrication	❑ Without lubrication	
19) Operation time:	hours per day	days per week	weeks per year
20) Temperature:			(°C)
21) Environmental conditions (corrosive, humid etc.):			

Please complete and return to Tsubakimoto Europe B.V. on fax: +31-(0)78 6204001

TSUBAKI ATTACHMENT CHAIN LAYOUT SHEET

Tsubakimoto Europe B.V. Aventurijn 1200 3316 LB Dordrecht The Netherlands FAX: +31 (0)78-6204001 E-MAIL: info@tsubaki.eu	Customer Name: Contact: Chain type: Chain length: Total no. of attachments:



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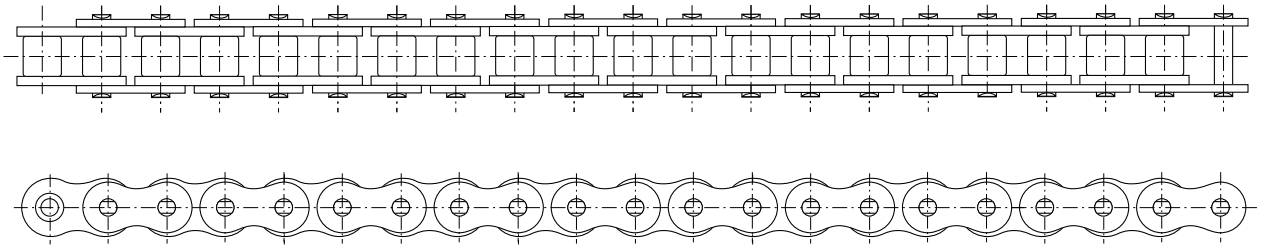

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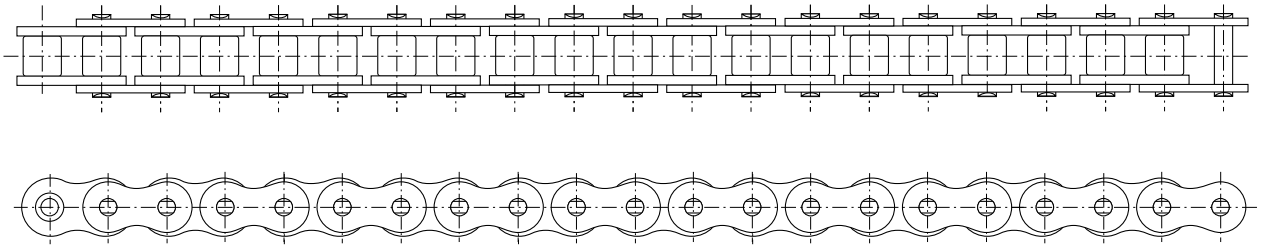

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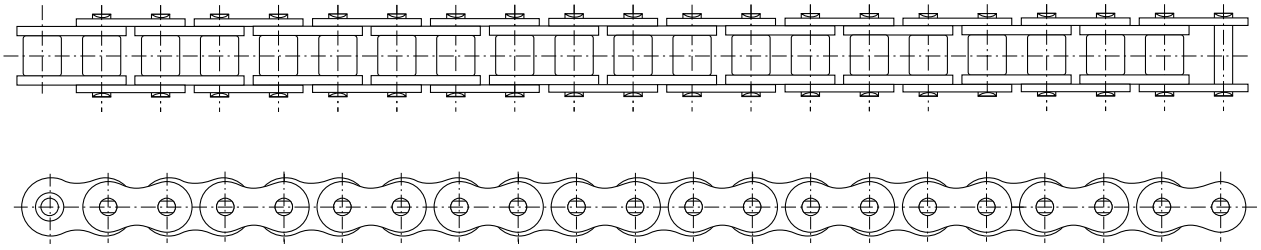

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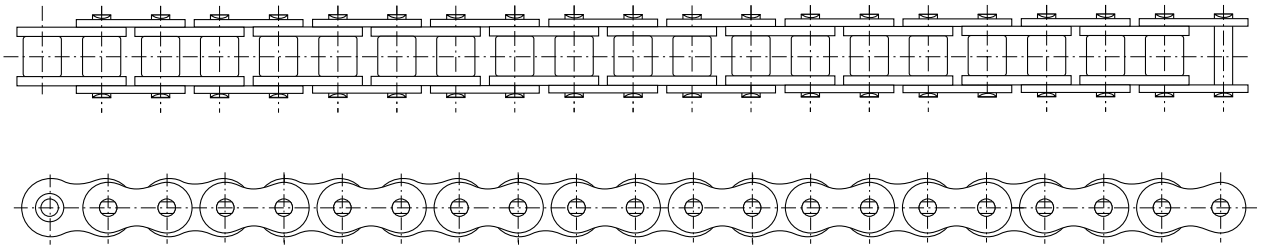

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EASY SPACING GUIDE FOR ATTACHMENT CHAINS

TEMPERATURE SELECTION METHOD

This selection method is for chains that may experience strength degradation from temperature. Additionally, lubrication should be carried out using a suitable lubricant according to the operating temperatures.

High Temperature

When chains are used in high temperatures, the following problems may occur:

- Increased wear due to decreased hardness.
- Poor articulation and increased wear due to lubricant deterioration and carbonization.
- Stiff joints and increased wear due to oxide scale formation.
- Increased elongation due to softening.
- Decreased strength.

To prevent lubricant deterioration at high temperatures, use a special lubricant.

When chains are used in temperatures above +250°C, pay special attention to the composition and heat-treatment of the chain. The most popular type of chain for high temperature is SS specification, which is made of 304 equivalent stainless steel and has a maximum working temperature of +650°C at low speeds. However, to maintain an adequate safety margin at a high temperature like this, we suggest NS specification chain. NS chain is made of 316 stainless steel, which contains molybdenum and less carbon. NS specification has worked at low speed in environments up to +700°C.

If your operation runs at temperatures higher than +400°C, consult Tsubaki before making your chain selection. Production methods and materials may be specially adapted for your application.

Low Temperature

When chains are used in low temperatures, the following problems may occur:

- Decreased shock strength due to low-temperature brittleness.
- Lubricant solidification.
- Stiff joints caused by frost or ice adhesion.

Two types of chain are especially useful at lower temperatures. KT specification chain is specially heat-treated to withstand very cold environments. SS specification chain, which is made of 304 equivalent stainless steel, may also be used at low temperatures. Low-temperature brittleness does not occur in austenitic stainless steel.
These chains cannot fix the problems of solidification of the lubricant or stiff joints caused by frost or ice. Use cold-temperature oil or grease and apply it to the inner clearances and the outside of the chain.

Standard engineered plastic chain can be run at temperatures between -20°C and +80°C. At higher temperatures, it may become soft and not keep its shape; at lower temperatures it may become brittle.

Temperature	Standard Roller Chain		KT Cold Resistant Chain*	SS, NS, AS Chain
	upto 1" pitch	1" pitch and over		
Below -60°C	-	-	unusable	-
-60°C to -50°C	-	-	MAL / 2	-
-50°C to -40°C	-	unusable	MAL / 1.5	-
-40°C to -30°C	unusable	MAL / 4	MAL	-
-30°C to -20°C	MAL / 4	MAL / 3	MAL	#
-20°C to -10°C	MAL / 3	MAL / 2	MAL	MAL
-10°C to +60°C	MAL	MAL	MAL	MAL
+60°C to +150°C	MAL	MAL	unusable	MAL
+150°C to +200°C	MAL / 1.3	MAL / 1.3	-	MAL
+200°C to +250°C	MAL / 2	MAL / 2	-	MAL
+250°C to +400°C	unusable	unusable	-	MAL
+400°C to +500°C	-	-	-	#
+500°C to +600°C	-	-	-	-
+600°C to +700°C	-	-	-	-
above +700°C	-	-	-	-

Notes:

* KT Cold Resistant Chain: Made to order.

The ambient temperature is different from the temperature of the roller chain itself.

MAL = Maximum Allowable Load. For details contact Tsubaki.

Please consult TSUBAKI for more detailed information.

CORROSION RESISTANCE GUIDE

☆☆	Highly corrosion resistant
☆	Partially corrosion resistant
×	Not corrosion resistant
-	Not tested

Substance	Concentration	Temp. °C	SS	AS	PC/P
Acetic Acid	10%	20	☆☆	☆☆	☆☆
Acetone		20	☆☆	☆☆	☆☆
Alcohol			☆☆	☆☆	☆☆
Aluminum Sulfate	Saturated	20	☆☆	×	-
Ammonia Water		20	☆☆	☆☆	☆☆
Ammonium Chloride	50%	Boiling point	☆	×	-
Ammonium Nitrate	Saturated	Boiling point	☆☆	☆☆	☆
Ammonium Sulfate	Saturated	20	☆☆	☆	-
Beer		20	☆☆	☆☆	☆☆
Benzene		20	☆☆	☆☆	☆☆
Boric Acid	50%	100	☆☆	☆☆	-
Butyric Acid		20	☆☆	☆☆	☆☆
Calcium Chloride	Saturated	20	☆	×	☆
Calcium Hydroxide	20%	Boiling point	☆☆	☆☆	☆☆
Calcium Hypochlorite	11-14%	20	☆☆	×	×
Carbonated water			☆☆	☆☆	-
Carbon Tetrachlorite (dry)		20	☆☆	☆☆	☆☆
Chlorinated Water			×	×	×
Chlorine Gas (dry)		20	☆	×	-
Chlorine Gas (moist)		20	×	×	-
Chromic Acid	5%	20	☆☆	☆	×
Citric Acid	50%	20	☆☆	☆☆	-
Coffee		Boiling point	☆☆	☆☆	☆☆
Creosote		20	☆☆	☆☆	-
Developing Solution		20	☆☆	☆	☆☆
Ethyl Ether		20	☆☆	☆☆	☆☆
Ferric Chloride	5%	20	☆	×	-
Formalin	40%	20	☆☆	☆☆	-
Formic Acid	50%	20	☆☆	☆☆	×
Fruit Juice		20	☆☆	☆	☆☆
Gasoline		20	☆☆	☆☆	☆☆
Glycerol		20	☆☆	☆☆	☆☆
Honey			☆☆	☆☆	☆☆
Hydrochloric Acid	2%	20	×	×	×
Hydrogen Peroxide	30%	20	☆☆	☆	×
Hydrogen Sulfide (dry)			☆☆	☆☆	☆☆
Hydrogen Sulfide (moist)			×	×	×
Hydroxybenzene		20	☆☆	☆☆	×
Kerosene		20	☆☆	☆☆	-
Ketchup		20	☆☆	☆☆	☆☆
Lactic Acid	10%	20	☆☆	☆	☆☆
Lard			☆☆	☆☆	-
Linseed Oil	100%	20	☆☆	☆	☆☆
Malic Acid	50%	50	☆☆	☆☆	☆☆
Mayonnaise		20	☆☆	☆	☆☆
Milk		20	☆☆	☆☆	☆☆

Key: **SS: 304 SS Series** **PC: Poly-Steel Chain**
AS: 600 AS Series

Substance	Concentration	Temp. °C	SS	AS	PC/P
Nitric Acid	5%	20	☆☆	☆	×
Nitric Acid	65%	20	☆☆	×	×
Nitric Acid	65%	Boiling point	☆	×	×
Oil (Plant, Mineral)		20	☆☆	☆☆	☆☆
Oleic Acid		20	☆☆	☆☆	☆☆
Oxalic Acid	10%	20	☆☆	☆	-
Paraffin		20	☆☆	☆☆	☆☆
Petroleum		20	☆☆	☆☆	☆☆
Phosphoric Acid	5%	20	☆☆	☆	×
Phosphoric Acid	10%	20	☆	☆	×
Picric Acid	Saturated	20	☆☆	☆☆	-
Potassium Bichromate	10%	20	☆☆	☆☆	☆☆
Potassium Chloride	Saturated	20	☆☆	☆	-
Potassium Hydroxide	20%	20	☆☆	☆☆	☆☆
Potassium Nitrate	25%	20	☆☆	☆☆	☆☆
Potassium Nitrate	25%	Boiling point	☆☆	×	-
Potassium Permanganate	Saturated	20	☆☆	☆☆	-
Sea-Water		20	☆	×	☆
Soap-and-Water-Solution		20	☆☆	☆☆	☆☆
Sodium Carbonate	Saturated	Boiling point	☆☆	☆☆	-
Sodium Chloride	5%	20	☆☆	☆	☆☆
Sodium Cyanide		20	☆☆	-	-
Sodium Hydrocarbonate		20	☆☆	☆☆	☆☆
Sodium Hydroxide	25%	20	☆☆	☆☆	☆☆
Sodium Hypochlorite	10%	20	×	×	×
Sodium Perchlorate	10%	Boiling point	☆☆	×	-
Sodium Sulfate	Saturated	20	☆☆	☆☆	-
Sodium Thiosulfate	25%	Boiling point	☆☆	☆☆	-
Soft Drink		20	☆☆	☆☆	☆☆
Stearic Acid	100%	Boiling point	×	×	×
Sugar Solution		20	☆☆	☆☆	☆☆
Sulfuric Acid	5%	20	×	×	×
Sulfur Dioxide (moist)		20	☆☆	×	-
Synthetic Detergent			☆☆	☆☆	☆☆
Syrup			☆☆	☆☆	☆☆
Tartaric Acid	10%	20	☆☆	☆☆	☆☆
Turpentine		35	☆☆	☆☆	-
Varnish			☆☆	☆☆	-
Vegetable Juice		20	☆☆	☆☆	☆☆
Vinegar		20	☆☆	☆☆	☆☆
Water			☆☆	☆☆	☆☆
Whiskey		20	☆☆	☆☆	☆☆
Wine		20	☆☆	☆☆	☆☆
Zinc Chloride	50%	20	☆	×	☆
Zinc Sulfate	Saturated	20	☆☆	☆☆	-
Wine		20	☆☆	☆☆	☆☆
Zinc Chloride	50%	20	-	☆	☆
Zinc Sulfate	25%	20	☆☆	☆☆	×

This table is intended only as a guide and TSUBAKI does not take responsibility for mishaps arising from its use.

GENERAL TERMS AND CONDITIONS OF SALE TSUBAKIMOTO EUROPE B.V.

1. General

In these general terms and conditions 'Tsubaki' shall mean Tsubakimoto Europe B.V.

2. Applicability

2.1 The applicability of the general terms and conditions used by the customer is hereby expressly excluded.

2.2 These general terms and conditions are applicable to all legal relationships in which Tsubaki acts as a seller and/or supplier or as a potential seller and/or supplier of products and/or services.

2.3 Deviations from the provisions in these general terms and conditions shall be permitted only in writing. No rights in relation to agreements that are concluded later may be derived from such deviations.

3. Conclusion of the agreement / Measurements & Weight

3.1 If the customer issues an order, the agreement shall have been concluded if Tsubaki accepts the order in writing or electronically or makes a start with its implementation.

3.2 Drawings, measurements and weights that are shown or provided on the website of Tsubaki or otherwise, shall only be used as indications. The product and/or service to be provided under the agreement need not correspond with the drawing, measurement and weight.

4. Prices / Delivery conditions

4.1 Prices are exclusive of VAT.

4.2 Prices are ex warehouse, unless otherwise agreed in writing.

4.3 Prices are as per Tsubaki described standard unit or packaging only.

4.4 In addition to the price, the customer shall fully pay, unless otherwise agreed in writing, any and all, local taxes, duties, excises, licence fees and other charges levied, assessed or imposed upon Tsubaki due to the manufacture, sale, purchase, export or delivery of the products.

4.5 The customer 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.

4.6 Changes in labour costs, cost prices of raw materials or materials and/or exchange rate movements related to the performance agreed on, shall entitle Tsubaki to pass on these costs to the customer.

5. Delivery/delivery times

5.1 The delivery period indicated by Tsubaki starts as from the moment that all data, drawings and the like necessary for the performance of the agreement have been received by Tsubaki in its entirety.

5.2 Delivery times agreed with Tsubaki are indicative and shall not constitute deadlines.

5.3 Failure to deliver within the indicated delivery period does not entitle the customer to additional or substitute damages, nor to the customer's non-fulfilment, withholding or postponement of any of its own obligations arising from the agreement.

5.4 If the customer requests Tsubaki to make changes in the performance of the agreement (including, but not limited to, changes in the design or construction of products), or otherwise delay or interrupt the progress of the work under the agreement, the customer shall fully reimburse Tsubaki for any and all additional expenses arising there from.

5.5 Tsubaki shall be entitled to perform its due obligation(s) in stages or in parts. Each partial delivery shall be deemed an independent delivery with respect to the applicability of these general terms and conditions.

6. Returned products

6.1 No products shall be acceptable for return without prior written consent of Tsubaki.

6.2 Special or made-to-order products are not returnable.

6.3 The customer shall prepay freight on all returns, and each return is subject to inspection and acceptance by Tsubaki to assure that the products are in a "re-sellable" condition.

6.4 The customer shall pay a maximum of 10% (ten percent) of the price for handling and restocking costs charge with regard to all authorized returns.

7. Payment

7.1 Payment of Tsubaki's invoices shall ultimately take place within 30 (thirty) days after the invoice date in the manner described by Tsubaki, provided however that Tsubaki may at all times request for payment in advance. Payment shall take place effectively in the currency agreed on and without deduction, set-of, discount and/or deferment.

7.2 In case of overdue payment, all payment obligations of the customer, regardless of whether Tsubaki has already issued an invoice in the matter and of whether Tsubaki has duly performed its obligations, shall be immediately due and payable and the customer shall owe an interest of 1.5% (one and a half percent) per month or per part of a month on the amount due.

7.3 Extra-judicial collection costs shall be charged to the customer in accordance with the collection rates of the Netherlands Bar Association.

7.4 Payment by or on behalf of the customer shall extend to payment of the following charges incurred, in the following order: extra-judicial collection costs, the legal costs, the interest due, and after that the unpaid capital sums according to the order of receipt, regardless of other instructions of the customer.

7.5 The customer can only object to the invoice within the term of payment.

8. Intellectual Property Rights and know-how

8.1 All documentation, sales leaflets, pictures, drawings etc., provided by Tsubaki to the customer, shall at all times remain the exclusive property of Tsubaki.

8.2 The customer shall not be entitled to use the documents referred to in paragraph 1 for any purpose other than for the use of the products to which they relate.

8.3 The customer shall not be entitled to use the documents referred to in paragraph 1 or to duplicate and/or make public to third parties data included therein or in any other way made known to the customer without express prior written consent of Tsubaki.

8.4 In the event of any violation of what has been stipulated under paragraph 2 and/or 3, the customer shall pay Tsubaki an immediately payable fine of EUR 10,000 (ten thousand euros) for each violation, regardless of any other of Tsubaki's rights to performance, dissolution, compensation, etc.

9. Retention of title

9.1 All products that are delivered or are to be delivered by Tsubaki remain the property of Tsubaki until Tsubaki is fully paid with regard to:

A. all performances due by the customer for all products that are delivered or are to be delivered in accordance with the agreement, and;

B. all claims that are the result of the customer's failing in the performance of such agreement(s); the customer shall not be allowed to claim its right of retention concerning costs of custody and to deduct these costs with the performances required by the customer.

9.2 If the customer creates a new product from or partly from products referred to in paragraph 1, this product belongs to Tsubaki and the customer shall consider Tsubaki its owner, until the customer has fully performed all of its obligations referred to in paragraph 1.

9.3 If any product belongs to Tsubaki in accordance with paragraph 1 and/or 2, the customer can have exclusive possession of this product or product within the framework of its normal business operations.

9.4 If the customer is in default in the performance of its obligations referred to in paragraph 1, Tsubaki shall be entitled to recover all the products from their location, at the expense of the customer. The customer hereby irrevocably grants authority to Tsubaki to enter the area used by or for the customer.

10. Security

10.1 If there are valid grounds to expect that the customer shall not perform its obligations, the customer shall be obliged, at the first request of Tsubaki, to immediately furnish adequate security in the form requested by Tsubaki (including complete payment in cash before or on delivery) without prejudice to customer's obligations under the agreement. If and to the extent that the customer has not fully performed its obligations, Tsubaki shall be entitled to suspend performance of its obligations.

10.2 If the customer takes no action on the request referred to in paragraph 1 within 14 (fourteen) days after having received a written warning to that effect, all its obligations shall be immediately due and payable.

11. Guarantee

11.1 With regard to the assembly carried out by Tsubaki, the following guarantee is provided: For 6 (six) months, Tsubaki shall repair faults in the assembly, free of charge, at the discretion of Tsubaki.

11.2 If and to the extent Tsubaki can claim guarantee with respect to its own suppliers, Tsubaki shall provide the following guarantee on products obtained from them: For 6 (six) months, Tsubaki shall supply alternative products, free of charge, if the products supplied exhibit manufacturing defects or defects in the material, at the discretion of Tsubaki.

11.3 The customer can only make a non-recurring claim under the guarantee mentioned in paragraphs 1 and 2 if the customer has performed all its obligations towards Tsubaki.

11.4 Defects which are the result of normal wear, improper use or improper or incorrect maintenance or which occur after changes or repair carried out by or on behalf of the customer, shall not be part of the guarantee.

11.5 Minor differences, which means 10% (ten percent) or less with regard to amounts, measures, weights, numbers and other such data provided, are not considered defects.

12. Complaints / obligation to examine / limitation period

12.1 On delivery, the customer has the obligation to examine whether the products are in conformity with the agreement. If this is not the case, the customer cannot make a claim regarding non-conformity if the customer does not notify Tsubaki in writing in a well-founded manner as soon as possible, but in any event within 8 (eight) days after delivery or after detection of non-conformity was reasonably possible.

12.2 Any and all of the customer's claims and defences based on facts that support the view that the product delivered is not in conformity with the agreement, shall expire 6 (six) months after delivery.

13. Dissolution and release

13.1 If the customer does not perform or incorrectly performs any of its obligations arising from the agreement (such as overdue payment), if the customer is placed under guardianship, involuntary liquidation, suspension of payment or closure or winding up of its company, and also in the case of prejudgment or executory attachment against the customer or if an offer or agreement with regard to an extra-judicial debt settlement with the customer has been made, Tsubaki shall be entitled, at its option, without any obligation for compensation and without prejudice to its other rights, to dissolve the agreement in whole or in part, or to suspend the further execution of the agreement. In these cases, Tsubaki shall be also entitled to claim immediate compensation of the amount due.

13.2 If the proper performance by Tsubaki is partially or completely impossible, whether temporarily or permanently, due to one or more circumstances which cannot be held accountable to Tsubaki, including the circumstances mentioned in the paragraph 14.6, Tsubaki, at its option, shall be entitled to suspend its performance or to dissolve the agreement.

13.3 If the customer is not willing to cooperate with the delivery after Tsubaki has given the customer 14 (fourteen) days to do so, Tsubaki will be released from its obligations, without prejudice to the obligations of the customer.

14. Compensation

14.1 Tsubaki shall only be liable for damages suffered by the customer which can be attributed to gross negligence or intention by Tsubaki to the amount that Tsubaki is insured in accordance with an insurance commonly used in this line of industry and which is actually paid out with respect thereto. The aggregate compensation payable by Tsubaki shall not exceed EUR 500.000 (five hundred thousand euros) per event, whereby a series of related events shall be considered as one event.

14.2 Tsubaki shall never be liable to pay any compensation other than personal injury or property damage.

14.3 Tsubaki shall never be liable for loss of income, profit or revenue, loss due to shutdown or delay in business activities, production losses, loss of operating hours and/or wages paid in vain, extra costs incurred due to external purchasing, loss due to restoration of lost information, missed savings or agreements, discounts or penalties.

14.4 Tsubaki stipulates all legal and contractual defences, which it can invoke to fend off its own liability towards the customer, also on behalf of its employees and non-employees for whose acts it is liable in accordance with the law.

14.5 Tsubaki shall not be liable with regard to products supplied by Tsubaki which originate from third parties if and to the extent that the applicable third party has excluded its liability.

14.6 Under no circumstance shall Tsubaki be held liable for the following circumstances: actions, except gross negligence or intention, of persons used by Tsubaki for the realisation of the agreement; unsuitability of products which Tsubaki uses for the realisation of the agreement; exercising one or more rights by a third party vis-à-vis the customer in the case of a failure in the performance by the customer of an agreement between the customer and the third party concerning products supplied by Tsubaki; industrial action, lockout of workers, illness, bans on import, export and/or transport, problems with transport, failure to comply with the obligations by suppliers, production failure, natural and/or nuclear disasters, and war and/or threat of war.

14.7 The customer shall indemnify Tsubaki against all claims from any third party, in whatever form, with regard to damage and/or loss, which any third party may have suffered due to products of Tsubaki.

14.8 Everything stipulated in this article shall be without prejudice to Tsubaki's liability pursuant to mandatory provisions of law.

15. Amendment of general terms and conditions

15.1 Tsubaki has the right to amend these general terms and conditions from time to time. Amendments apply also with regard to agreements already concluded. Amendments shall be notified in advance in writing or electronically to the customer and shall enter into effect 30 (thirty) days after this notification or on such date as specified in the notification.

15.2 In the event the customer fails, with respect to the amended general terms and conditions, to give written notice that it does not accept these amended general terms and conditions prior to the day on which the aforementioned terms enter into effect, such as is indicated here above, the customer shall be deemed to have accepted these amended general terms and conditions.

16. Conversion

If and to the extent that any provision in these general terms and conditions cannot be invoked on grounds of reasonableness and fairness or its unreasonably onerous nature, the provision shall be given a meaning that corresponds as much as possible to its content and purpose, making it thereby possible to invoke this provision.

17. Assignment

17.1 Tsubaki is entitled to assign one or more of its obligations or its entire legal relationship with the customer to a third party without consent of the customer. Tsubaki shall inform the customer of this transfer in writing.

17.2 The customer is only entitled to assign one or more of its obligations or its entire legal relationship with Tsubaki to a third party upon Tsubaki's express prior written consent.

18. Applicable law / competent court

18.1 All legal relationships between Tsubaki and the customer shall be governed by the laws of the Netherlands, without taking into account the principles of conflict of laws.

18.2 The applicability of the United Nations Convention on Contracts for the International Sale of Goods is expressly excluded.

18.3 All disputes which may arise between Tsubaki and the customer that fall under the jurisdiction of a district court, shall only be submitted to the court in the judicial district in which Tsubaki has its registered office, unless Tsubaki as a plaintiff or an applicant opts for the competent court in which the customer has its registered office or address for service.

19. Dutch text prevails

If and insofar as there is a discrepancy between the general terms and conditions in the Dutch language and those in the English language, those in the Dutch language shall prevail.

These conditions were filed at the Chamber of Commerce and Industry in Rotterdam.

For Safe Use

WARNING Obey the following points in order to prevent hazardous situations.

- Do not use chains and accessories (accessories and parts) for anything other than their orginal purpose.
- Never perform additional processing on the chain:
  - Do not anneal the various parts of the chain.
  - Do not clean the chain with either acid or alkali, as they may cause cracking.
  - Do not electroplate the chain or its parts, as they may cause cracking due to hydrogen embrittlement.
  - Do not weld the chain, as the heat may cause cracking or a reduction in strength.
  - When heating or cutting the chain with a torch, remove the links immediately adjacent and do not use them again.
- When there is need to replace a lost or damaged portion of a chain, always replace the whole chain with a new product rather than replacing only the lost or damaged portion.
- When using a chain on suspension equipment, establish a safety manual, etc., and strictly prevent entry to the area directly below the suspended object.
- Always employ hazard protector devices for the chain and sprocket (safety cover, etc.).
- If a substance that can cause embrittlement cracking (acid, strong alkali, battery fluid, etc.) adheres to the chain, stop using the chain immediately and replace it with a new one.
- During installation, removal, maintenance inspection and lubrication of the chain:
  - Perform the operation according to the instruction manual or this catalog.
  - Always turn off the power switch to the device and make sure that it cannot be turned on accidentally.
  - Anchor the chain and parts so that they cannot move freely.
  - Perform cutting and connecting procedures properly using a press or other special tool.
  - Wear clothing and employ protective devices that are appropriate to the job (safety glasses, gloves, safety shoes, etc.).
  - Only allow experienced personnel to perform chain replacement procedures.
- In order to prevent hazards, damage, or injury when cutting a Leaf Chain, always install hazard protection devices (safety device, etc.) on the suspension equipment employing the Leaf Chain.

CAUTION Obey the following points in order to prevent accident.

- Only handle the chain after thoroughly understanding its structure and specifications.
- When installing a chain, inspect it in advance to confirm that is has not been damaged in transport.
- Be sure to perform regular maintenance inspections on the chain and sprocket.
- Chain strength varies according to manufacturer. When selecting a chain based on a Tsubaki catalog, always use the corresponding Tsubaki product.
- Minimum tensile strength refers to the failure point when the corresponding load is applied to the chain once and does not refer to the allowable operational load.

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NOTE: in accordance with the policy of Tsubakimoto Europe B.V. to consistently improve its products, the specifications in this catalogue are subject to change without notice.

Innovation in Motion
TSUBAKI

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