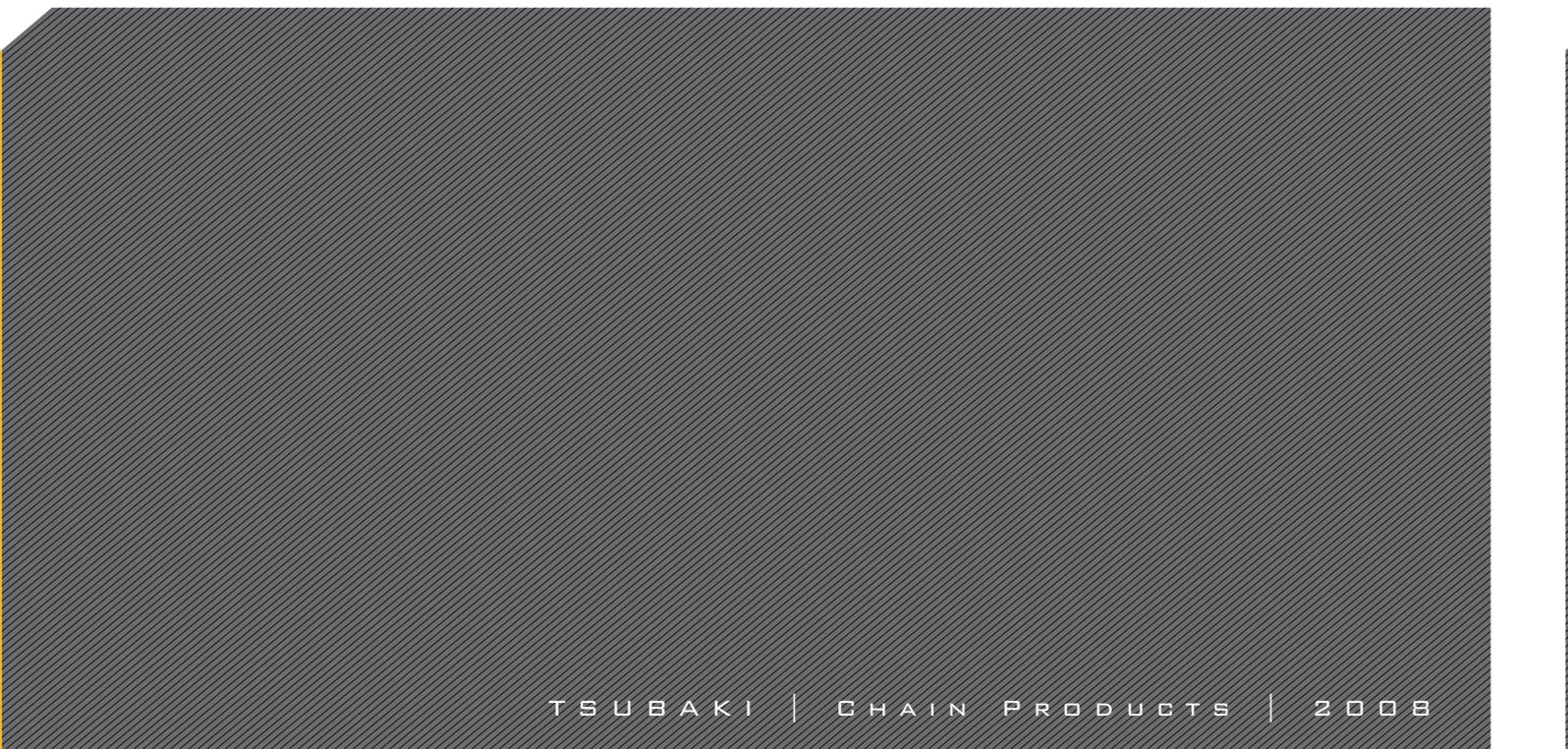




CATALOGUE 3 | CUSTOM MADE CHAIN





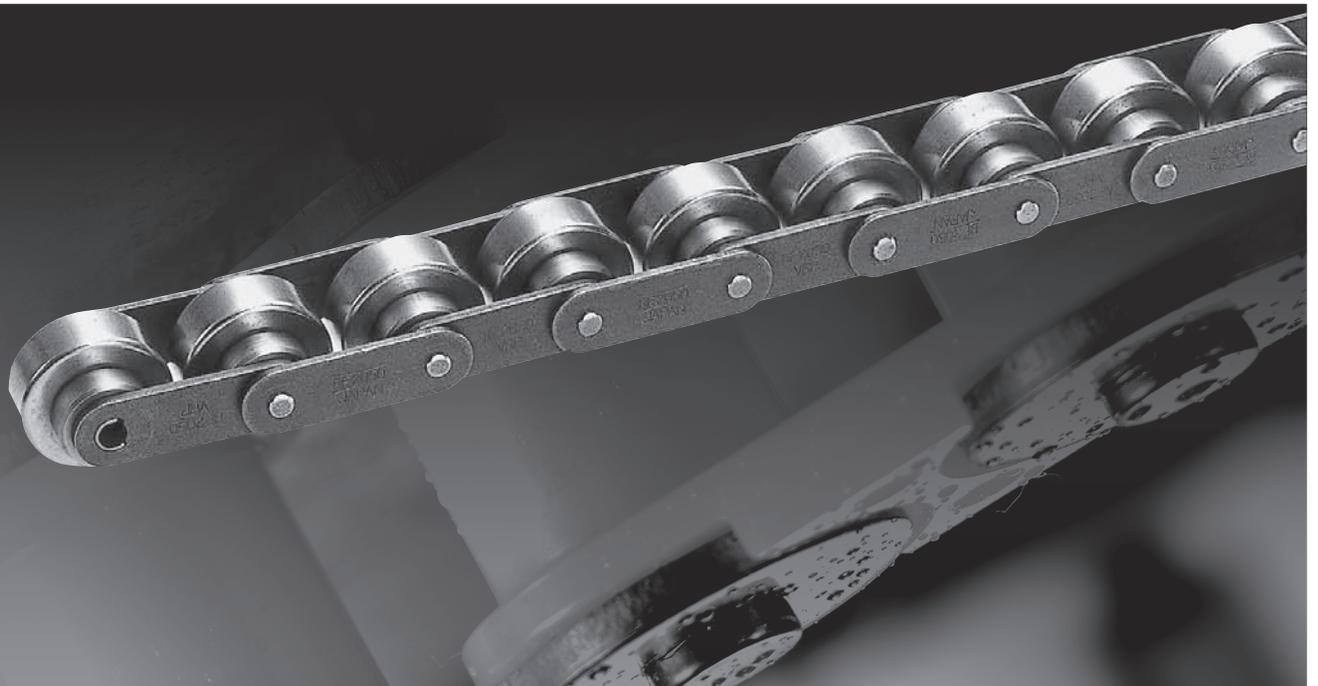
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CATALOGUE 3 CUSTOM MADE CHAIN

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 K-LAMBDA	High Temperature up to 230°C			
			ANSI FG-LAMBDA	Food Grade			
ANSI Attachment Chain		Corrosion Resistant Series	ANSI TI	All Titanium			
			ANSI PC-SY	Superior Chemical Resistance			
			ANSI NS	Ultimate Corrosion Protection, Heat Application			
ANSI Attachment Chain		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				
ANSI Attachment Chain		Special Environments	ANSI Single Pitch CK-LAMBDA	High Temperature up to 230°C			
			ANSI Single Pitch CFG-LAMBDA	Food Grade			
			ANSI Double Pitch CK-LAMBDA	High Temperature up to 230°C			
			ANSI Double Pitch CFG-LAMBDA	Food Grade			
ANSI Attachment Chain		Corrosion Resistant Series	ANSI Single Pitch SS	SUS304, Excellent Corrosion Protection			
			ANSI Single Pitch SS CU	SUS304, Curved Chain			
			ANSI Double Pitch SS	SUS304, Excellent Corrosion Protection			
Conveyor Chain	Tsubaki Standard		Standard Series	RF	Wide Variation		
			Low Maintenance Series	RFC 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							
Scrapper Series		TFM	Scraping Attachments				
		TF					

CATALOGUE 3



CATALOGUE 1 DRIVE CHAIN

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

CATALOGUE 2 ATTACHMENT CHAIN

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



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. Our Automotive Division is located in Nottingham, United Kingdom. This location also houses an additional office and warehouse supporting the Power Transmission market in the UK & Ireland. The TSUBAKI Group includes 28 production locations and 22 group companies worldwide. Our production and sales networks are now more developed than ever.

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INTRODUCTION TO TSUBAKI CUSTOM CHAIN

TSUBAKI Custom Chain is Made To Order chain for any special application or requirement. This includes special drive chain, attachment chain and large size conveyor chain according to DIN/ISO standard as well as any chain made on customer's request.

TSUBAKI offers a sensible and highly functional line-up of various types of conveyor chain and roller base chain for perfect compatibility with the attachments your application requires.

Custom Made Drive Chain

Custom made drive chains are special chains for non-standard applications in either normal or special environmental conditions. These chains form an extension of our standard Drive Chain program and contain heavy duty lube free, corrosion resistant and low and high temperature chains.



Custom Made Attachment Chain

This small size conveyor chain is widely used in a variety of industries such as food and beverages, electronics, automotive, agriculture and packaging.

These TSUBAKI designed chains combine with attachments or special chain parts to take on a wide range of conveying assignments.



Custom Made Large Size Conveyor Chain

Large size conveyor chains are big pitch chains. As our product range is mainly focussed on Made To Order chains, your special requirements are our standard. Our products are manufactured according to your particulars, but we can also develop a completely new solution for your application. We are able to provide almost any type of conveyor chain currently in demand.

We supply conveyor chain according to DIN, ISO and Tsubaki standards.



Attachment Chains other than listed

Tsubaki has a lot more attachment chain available than listed. If, however, the chain you require is not available, it can promptly be manufactured.

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 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.

INTRODUCTION TO TSUBAKI DRIVE CHAIN

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.

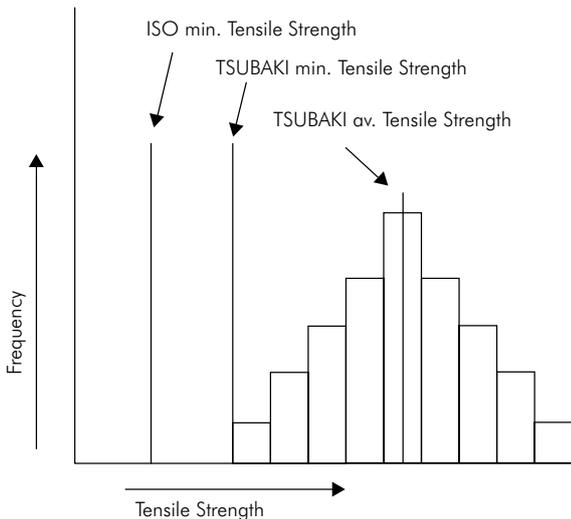


Fig. 1 Relationship between the three tensile strengths mentioned above.

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).

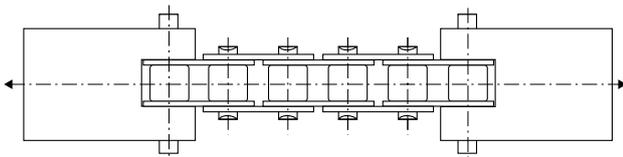


Fig. 2 Tensile Strength test

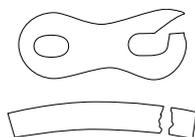


Fig. 3 Shape of fracture

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.

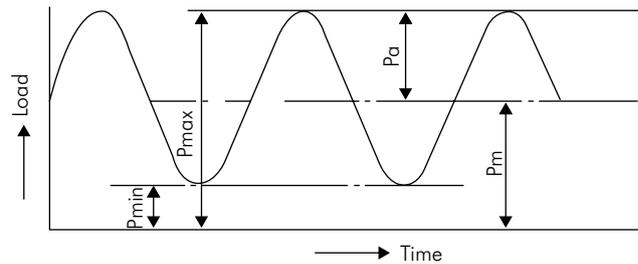


Fig. 4 Summary chart for repetitive loads

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 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 back to 100%.

TSUBAKI applies the patented Ring Coining process to all slip fit connecting links.

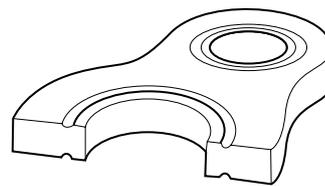


Fig. 5 Ring Coining

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

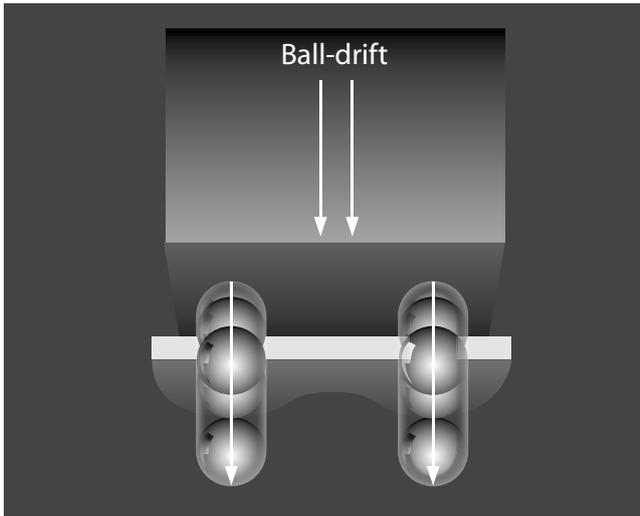


Fig. 6 Ball Drifting

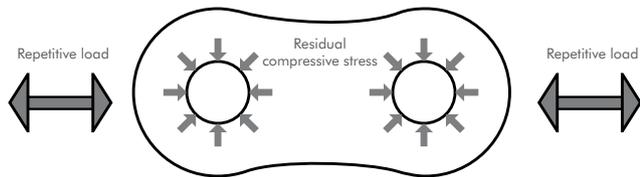


Fig. 7 Residual Compressive Stress

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) are shot peened.

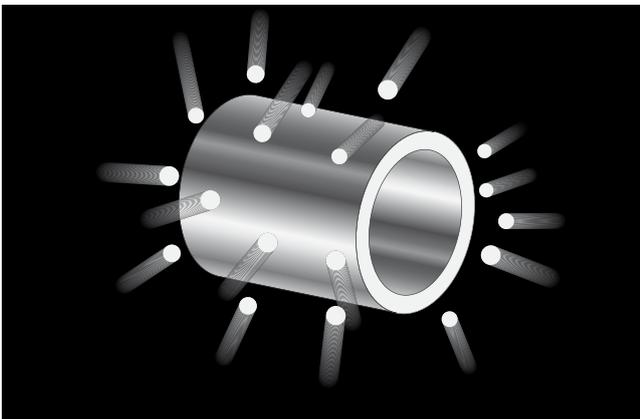


Fig. 8 Shot Peening

Shot Peening increases resistance to:

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

9. Pre-Loading Process

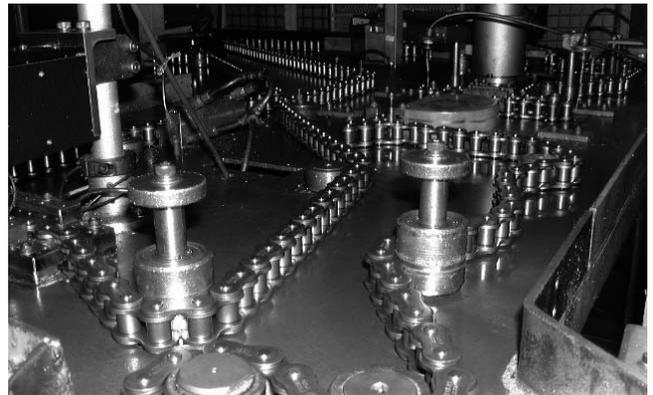


Fig. 9 Pre-Loading

After the assembly of a chain, TSUBAKI always 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. Customised Pre-Lubrication Service

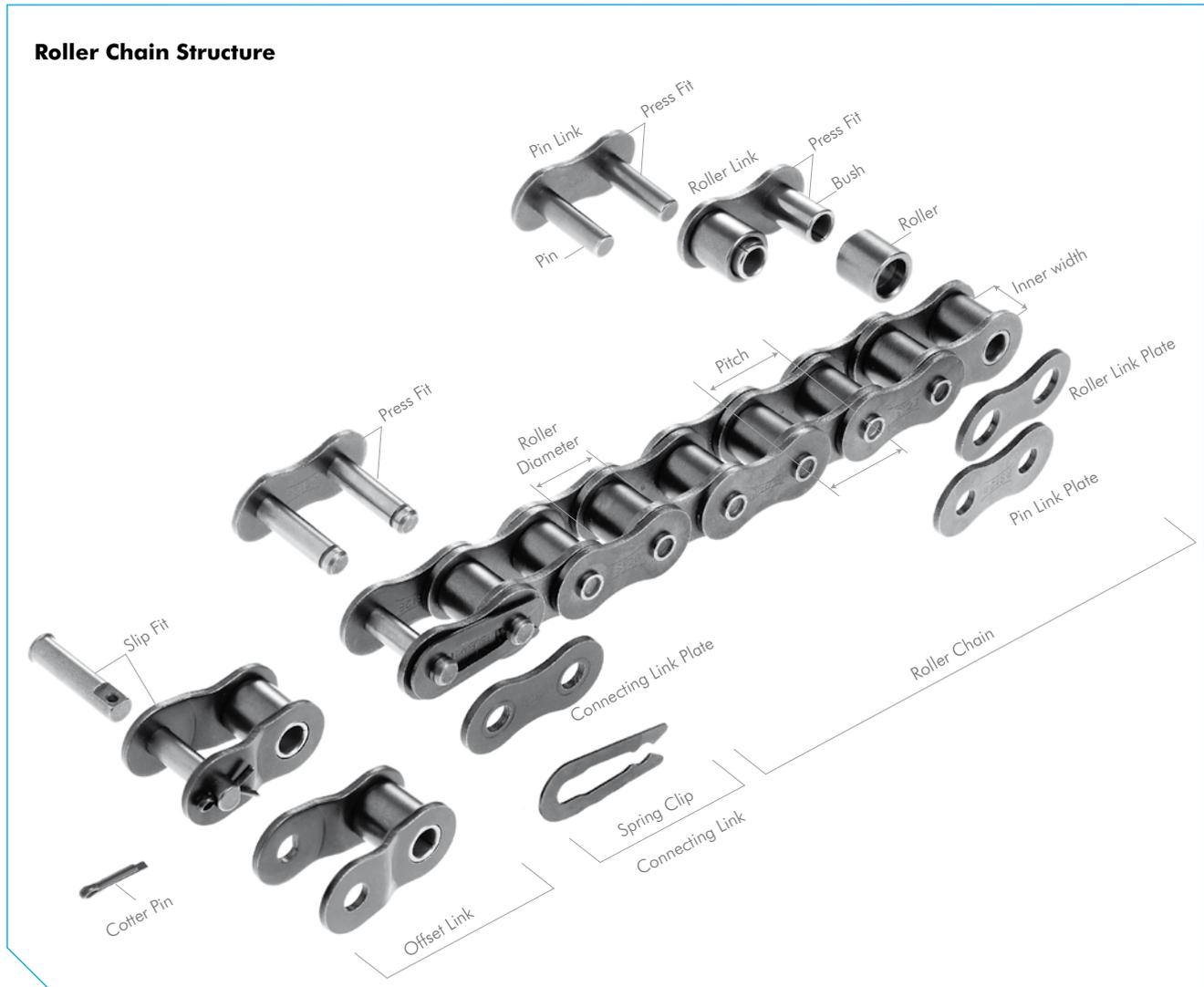
Proper lubrication is the key to extend the life and improve the performance of a chain. In order to get the best performance in general applications (-10°C to +60°C), all BS Runner drive chains are pre-lubricated.

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.

INTRODUCTION TO TSUBAKI DRIVE CHAIN



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.

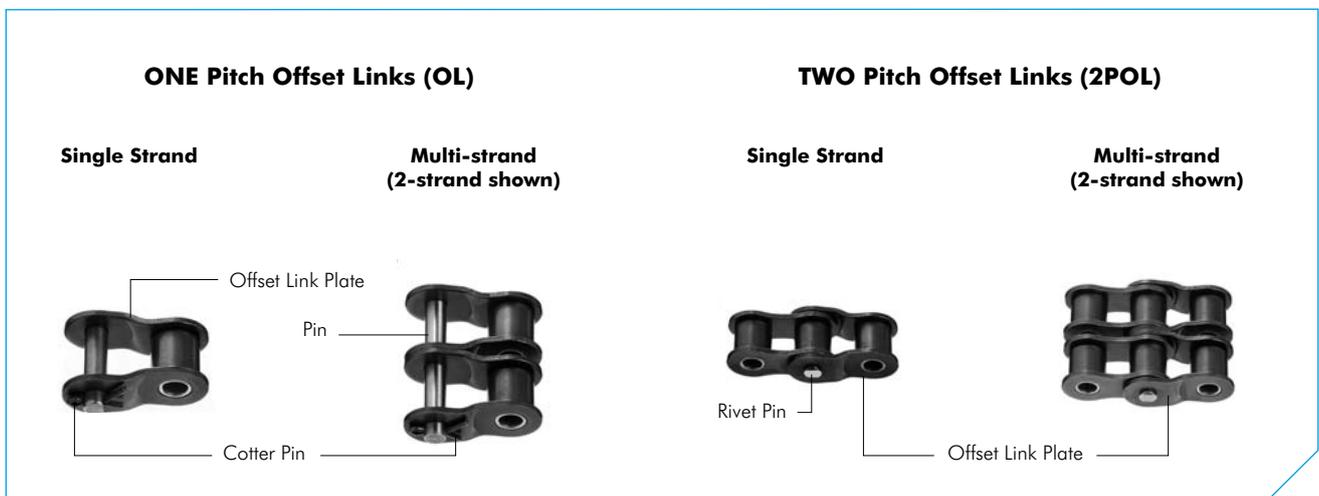
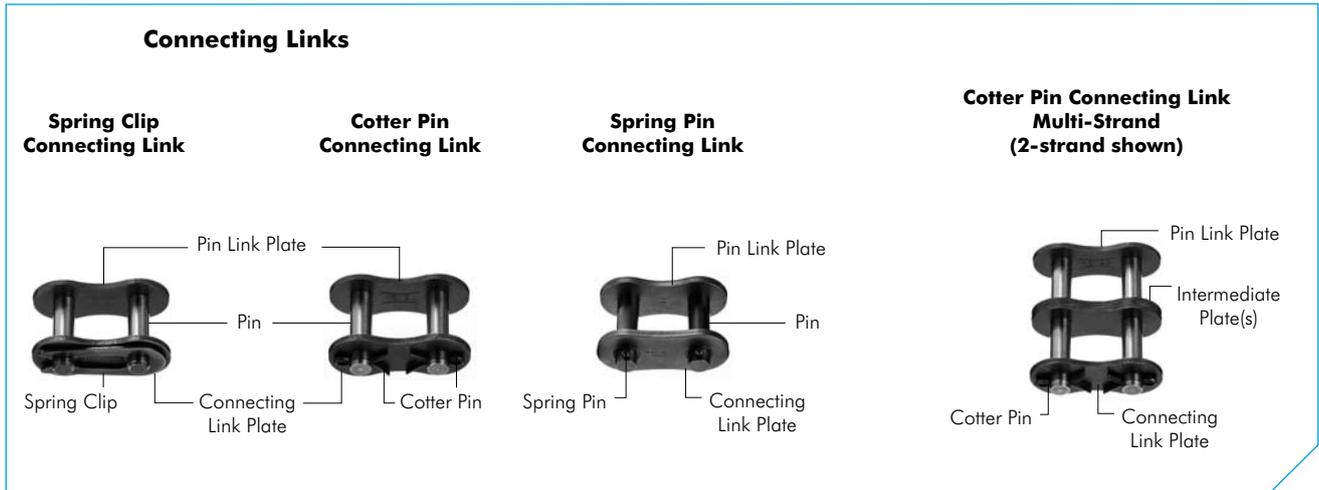
Roller

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

INTRODUCTION TO TSUBAKI DRIVE CHAIN



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% Maximum Allowable Load, where as the one-pitch offset link has a Maximum Allowable Load of 65%.

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% 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. The fatigue strength is the same as the fatigue strength of the base chain. Please refer to the dimension tables for roller chain types and sizes suitable for offset links.

ANSI LAMBDA LUBE FREE HEAVY DUTY ROLLER CHAIN

The superior performance of TSUBAKI ANSI Heavy Duty Lambda chains is the result of a comprehensive quality control network that begins with selection of the world's finest steel materials. It combined the advantage of Lambda Roller Chain, with the benefits of the Heavy Duty H series.

TSUBAKI offers Heavy Duty Lambda chains for applications that exceed the capabilities of TSUBAKI ANSI Lambda 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.

Heavy Duty Lambda Chain Series

Heavy Duty Lambda Series chain differs only from the Standard Lambda 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

The increased thickness of the link plates provides a 10% greater capacity for absorbing shock loads. In short, LMD-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.

The Heavy Duty Lambda Roller chain is only available in Duplex execution.

Sprockets:

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.

Advantages

TSUBAKI has enhanced the ANSI HEAVY DUTY LAMBDA with the following advantages:

Higher Shock Load Resistant

Suitable for high shockloads.

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

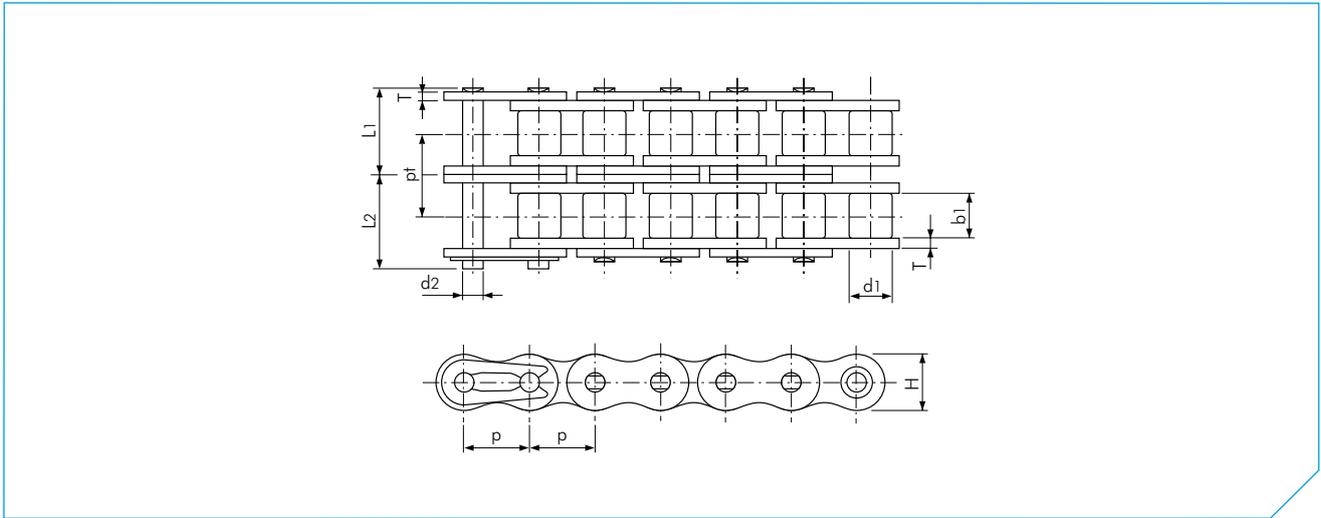
No unforeseen downtime due to chain breakdown. Less time required for maintenance and therefore more time for production.

Environmental Friendly

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



ANSI LAMBDA LUBE FREE HEAVY DUTY ROLLER CHAIN



ANSI LAMBDA HEAVY DUTY Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch		Roller Diameter	Inner Width	Pin			Link Plate		Transverse Pitch	Min. Tensile Strength acc. to ANSI	Av. Tensile Strength acc. to Tsubaki	Approx. Mass
	p		d1	b1	Diameter	Length	Length	Thickness	Height				
RS40-LMD-H-2	12.70	(1/2")	7.92	7.55	3.97	17.50	19.15	2.00	12.00	16.40	30.4	38.2	1.57
RS50-LMD-H-2	15.875	(5/8")	10.16	9.26	5.09	20.95	22.65	2.40	15.00	19.70	48.0	62.9	2.35
RS60-LMD-H-2	19.05	(3/4")	11.91	12.28	5.96	27.55	29.45	3.20	18.10	26.10	68.4	88.3	3.59
RS80-LMD-H-2	25.40	(1")	15.88	15.48	7.94	34.60	37.20	4.00	24.10	32.60	122.4	157.0	6.18
RS100-LMD-H-2	31.75	(1 1/4")	19.05	18.70	9.54	41.35	44.05	4.80	30.10	39.10	190.8	235.0	9.03

Note:

1. Connecting links are clip type for sizes up to RS60-LMD-H-2, and cotter type for size RS80-LMD-H-2 to RS100-LMD-H-2.
2. Due to increased roller link plate thickness, Drive LAMBDA H connecting links are required.
3. Due to increased roller link plate thickness, LAMBDA H double strand chains require special sprockets.
4. Due to increased roller link plate thickness, the pins are longer. Check for machine interference.
5. Offset links for LAMBDA H double strand chains are not available.

ANSI DRIVE CHAIN FOR SPECIAL 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.

Lambda Lube Free Chain (Carbon Steel base)

ANSI X-LAMBDA Ultra Long Life

The inclusion of a felt seal in the construction of the X-LAMBDA increases the anti-wear performance to more than 5 times of basic LAMBDA Chain.

ANSI LAMBDA High Temperature Chain

Lambda LMDK is developed for high temperature applications. Stable lubrication and anti-wear properties in high temperatures. Uses NSF H-1 (Food Grade) certified oil and is environmentally friendly.

Working temperature range: +150°C to +230°C

ANSI LAMBDA Food Grade Chain

Lambda FG is developed for food industry. A Special food safe lubricant (NSF-H3 certified) is impregnated in the bush and anti-corrosive oil (NSF-H1 certified) is used to prevent chain corrosion.

Working temperature range: -10°C to +150°C

Corrosion Resistant Chain (Titanium base/Stainless Steel base)

ANSI TI Titanium Chain

ANSI TI Series chains are made completely of Titanium. Available in sizes RS35TI - RS40TI, TI Series brings the unique properties of Titanium to roller chain applications, specifically extreme corrosion resistance in a lightweight chain.

TI chains are extremely lightweight (50% of the weight of carbon steel) and are made completely of titanium, making it both non-magnetic and highly corrosion resistant.

Working temperature range: -20°C to +400°C

ANSI PC Engineering Plastic Combination Chain

The pins and pin link plates of these chains are made of SUS304 (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: -10°C to +80°C

For details see our catalogue 1 and 2.

ANSI PC-SY Engineering Plastic Combination Chain

This chain combines Titanium pins and outer link plates with Engineering Plastic (off-white) inner links. It is suitable when the corrosion resistance of Poly Steel chain (PC) is not sufficient. With a working temperature range: -20°C to +80°C. The Maximum Allowable Load is 60% of that of Poly Steel chain (PC).

For details on corrosion resistance, please check out the table in the back of this catalogue as a basic guide.

ANSI NS Stainless Steel Chain

This is a roller chain composed of SUS316 stainless steel (only RS25NS clips are SUS301). This chain is suitable when corrosion resistance greater than ANSI SS chain is required. There are no magnetic parts besides the clip. ANSI NS chain can be used in high and low temperatures (-20°C to +400°C).

ANSI SS Stainless Steel Chain

All basic components of this chain are made of Stainless Steel SUS304 (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 is only marginally magnetic, due to the cold-forging process.

For details see our catalogue 1 and 2.

ANSI AS Stainless Steel Chain

The pins and rollers of this roller chain are made of precipitation-hardened, tempered stainless steel (SUS600). The link plates and the bushes are made of SUS304 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 SUS600. The working temperature range: -20°C to +400°C

For details see our catalogue 1.

ANSI DRIVE CHAIN FOR SPECIAL ENVIRONMENTS

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.

For details see our catalogue 1 and 2.

ANSI NP Nickel-Plating 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. For details see our catalogue 1.

Cold Resistant Chain (Carbon Steel base)

ANSI KT Cold Resistant Chain

This chain can be used in colder temperatures than ANSI G7 Chain while offering identical horsepower ratings. Working temperature range: -40°C to +60°C

[†] RoHS = Restriction of Hazardous Substances.



ANSI 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 ANSI LAMBDA

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

Because of this evolution ANSI X-LAMBDA chain greatly increases the performance of the ANSI 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, ANSI X-LAMBDA chain can extend the life of your operation drastically.

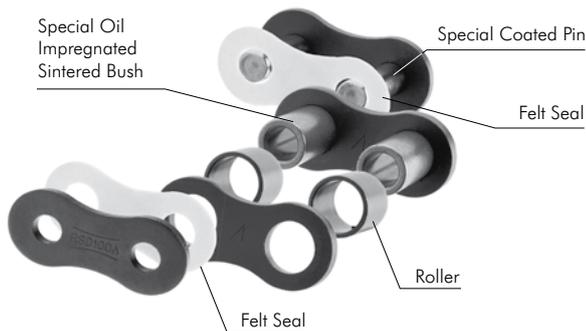


Fig. 10 Basic Construction

Advantages

In addition to all ANSI LAMBDA advantages, ANSI X-LAMBDA offers:

Extended Wear Life

Even longer wear life than basic ANSI 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 an ANSI X-LAMBDA chain connecting link (with a felt seal). As shown in Fig. 11 insert felt seals between the outer plate and the connecting link plate, then attach the link.

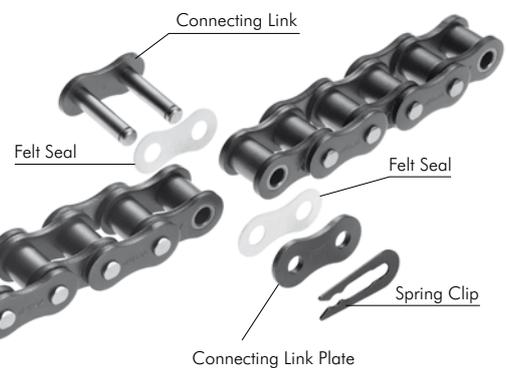


Fig. 11 Connecting Method ANSI X-LAMBDA

Inter-Changeability

Chains:

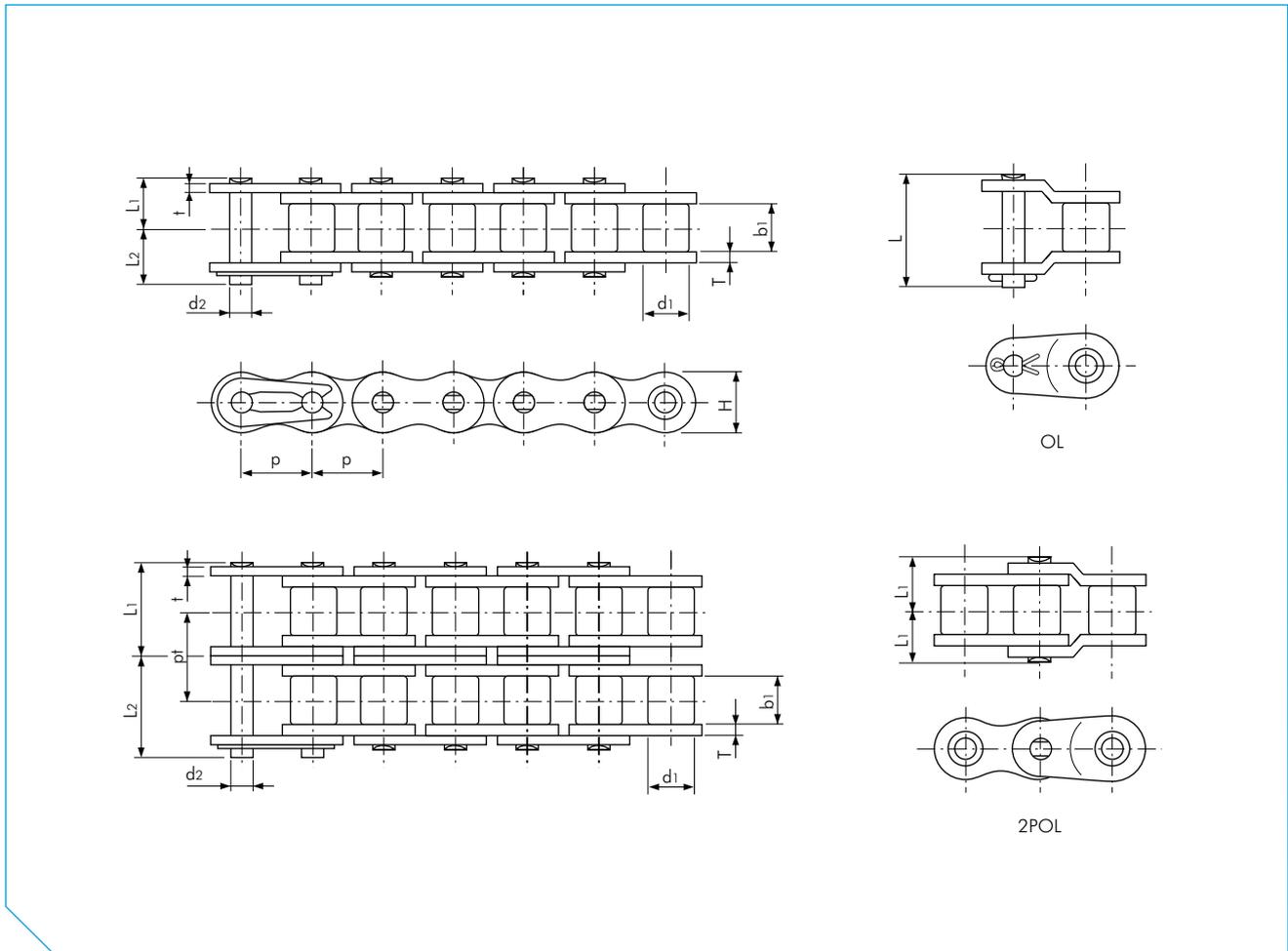
ANSI X-LAMBDA chain is interchangeable with standard ANSI roller chain. However, as the pins are longer than those of the standard ANSI roller chain, please make sure that there is no interference with the machine.

Sprockets:

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



ANSI LAMBDA LUBE FREE HIGH TEMPERATURE CHAIN



ANSI K-LAMBDA Chain

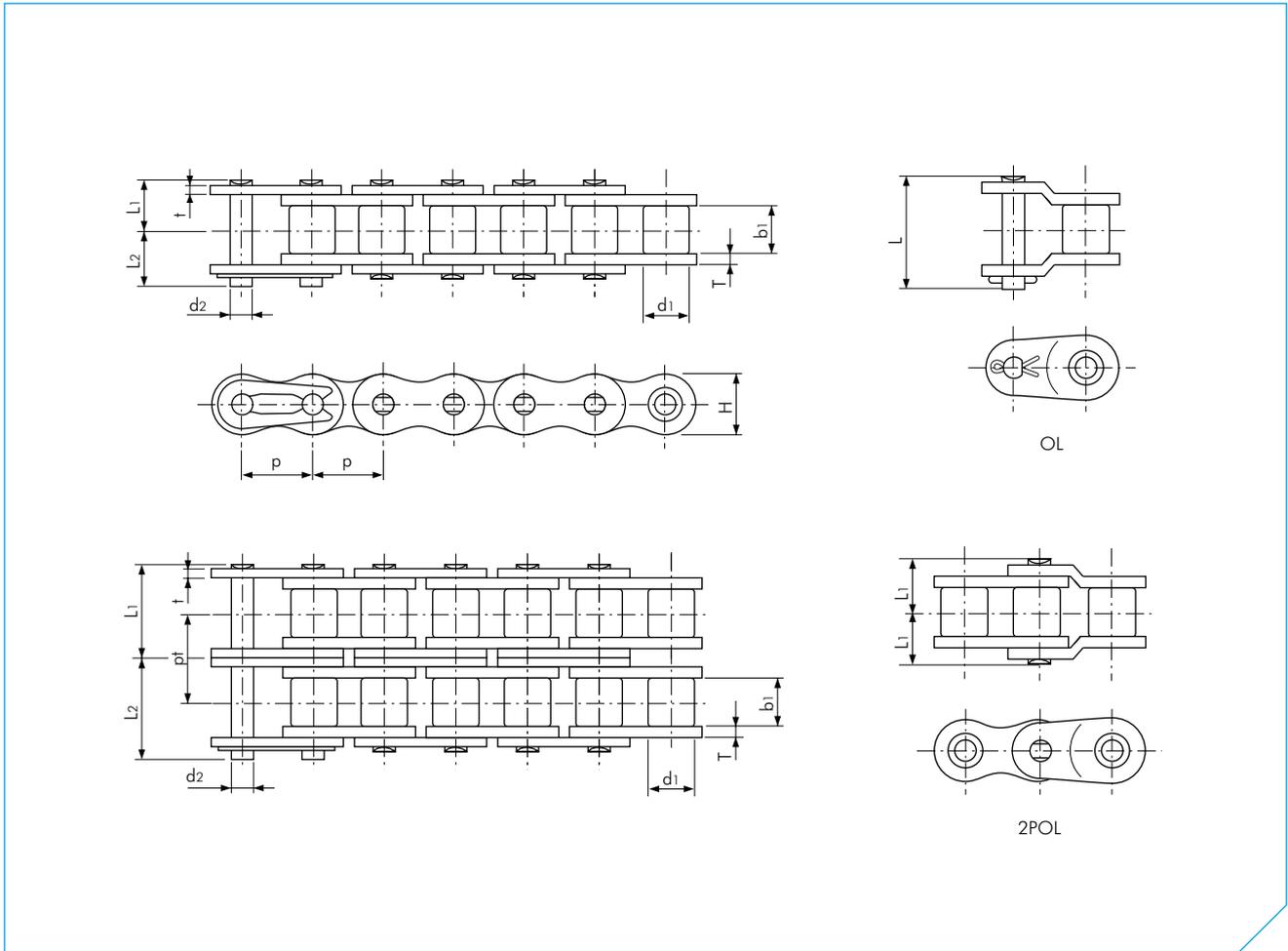
Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin			Link Plate			Transverse Pitch pt	Min. Tensile Strength acc. to ANSI kN	Av. 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-LMDK-1	12.70 (1/2")	7.95	7.55	3.97	8.78	10.45	20.00	2.00	1.50	12.00	-	15.2	19.1	0.70
RS40-LMDK-2					16.50	18.10	-				15.40	30.4	38.2	1.40
RS50-LMDK-1	15.875 (5/8")	10.16	9.26	5.09	10.75	12.45	24.00	2.40	2.00	15.00	-	24.0	31.4	1.11
RS50-LMDK-2					20.20	22.00	-				19.00	48.0	62.8	2.20
RS60-LMDK-1	19.05 (3/4")	11.91	12.28	5.96	13.75	15.65	32.00	3.20	2.40	18.10	-	34.2	44.1	1.72
RS60-LMDK-2					26.05	28.05	-				24.52	68.4	88.3	3.40
RS80-LMDK-1	25.40 (1")	15.88	15.48	7.94	17.15	20.25	39.90	4.00	3.20	24.10	-	61.2	78.5	2.77
RS80-LMDK-2					32.70	35.90	-				31.10	122.4	157.0	5.50

Note:

1. Ambient temperature range 150°C to 230°C.
2. Connecting links are clip type for sizes up to RS60-LMDK, and cotter type for size RS80-LMDK.
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 Maximum Allowable Load.

ANSI LAMBDA LUBE FREE FOOD GRADE CHAIN



ANSI FG-LAMBDA Chain

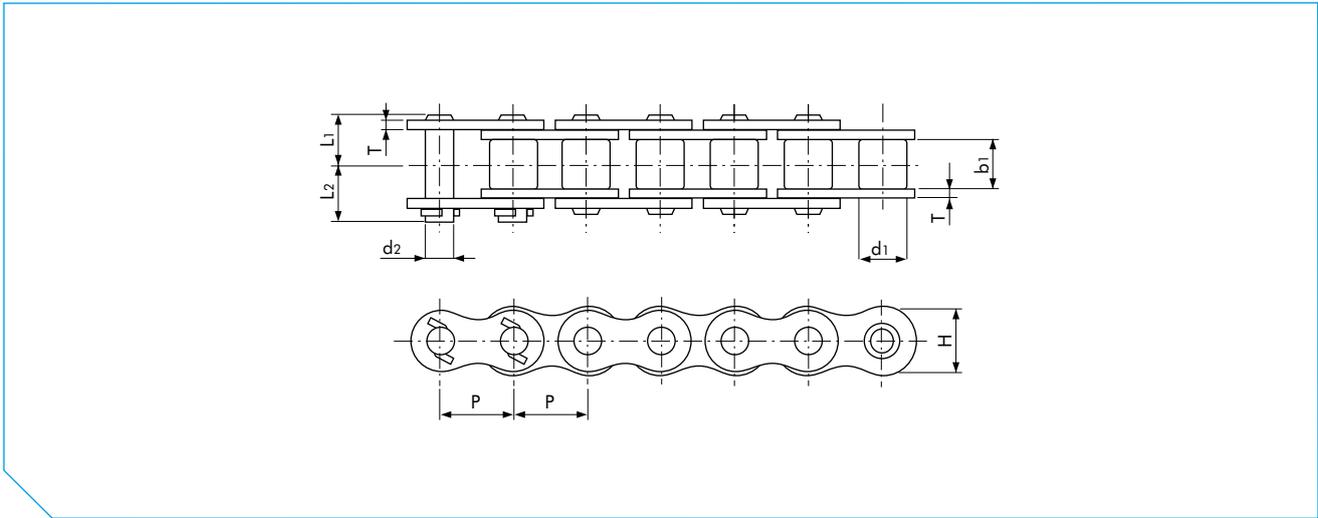
Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin			Link Plate			Transverse Pitch pt	Min. Tensile Strength acc. to ANSI kN	Av. 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-FG-1	12.70 (1/2")	7.95	7.55	3.97	8.78	10.45	20.00	2.00	1.50	12.00	-	15.20	19.10	0.70
RS40-LMD-FG-2					16.50	18.10	-				15.40	30.40	38.20	1.40
RS50-LMD-FG-1	15.875 (5/8")	10.16	9.26	5.09	10.75	12.45	24.00	2.40	2.00	15.00	-	24.00	31.40	1.11
RS50-LMD-FG-2					20.20	22.00	-				19.00	48.00	62.80	2.20
RS60-LMD-FG-1	19.05 (3/4")	11.91	12.28	5.96	13.75	15.65	32.00	3.20	2.40	18.10	-	34.20	44.10	1.72
RS60-LMD-FG-2					26.05	28.05	-				24.52	68.40	88.30	3.40
RS80-LMD-FG-1	25.40 (1")	15.88	15.48	7.94	17.15	20.25	39.90	4.00	3.20	24.10	-	61.20	78.50	2.77
RS80-LMD-FG-2					32.70	35.90	-				31.10	122.40	157.00	5.50

Note:

1. Ambient temperature range: -10°C to 150°C.
2. Connecting links are clip type for sizes up to RS60-LMD-FG, and cotter type for size RS80-LMD-FG.
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 Maximum Allowable Load.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI TI Chain

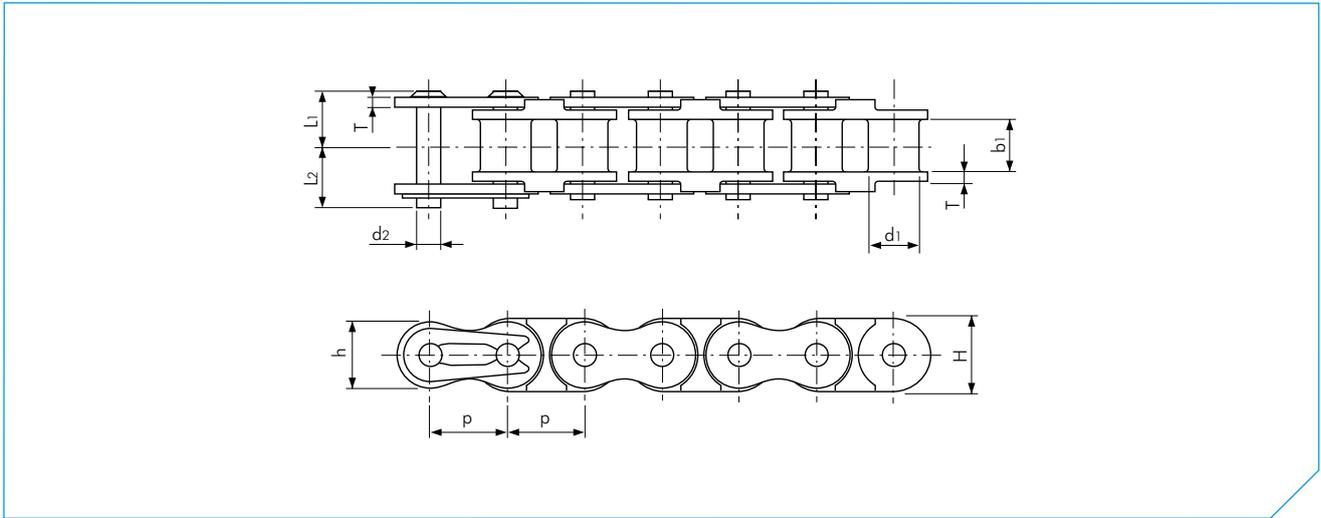
Dimensions in mm

TSUBAKI Chain No.	Pitch p		Roller 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	Height H (max.)		
RS35-TI	9.525	(3/8")	5.08	4.78	3.59	6.05	7.15	1.25	9.00	0.26	0.19
RS40-TI	12.70	(1/2")	7.92	7.95	3.97	8.25	10.10	1.50	12.00	0.44	0.37

Note:

1. RS35-TI is rollerless chain (only bush). The figure shown is the bush diameter.
2. Connecting links (CL) use Z-pins.
3. Offset links are not available.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI PC-SY Chain

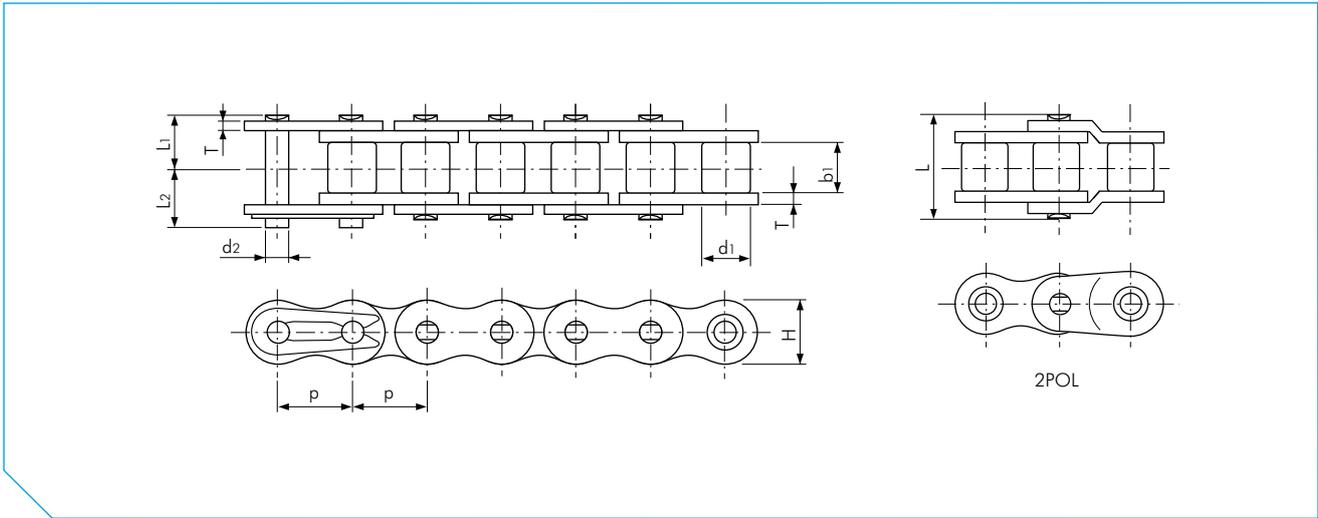
Dimensions in mm

TSUBAKI Chain No.	Pitch		Bush Diameter d1	Inner Width b1	Pin			Link Plate			Max. Allowable Load acc. to Tsubaki kN	Approx. mass kg/m
	p	(inches)			Diameter d2	Length L1	Length L2	Thickness T	Height H	Height h		
RF40 PC-SY	12.70	(1/2")	7.92	7.95	3.97	8.25	10.10	1.50	12.00	10.40	0.25	0.39
RF50 PC-SY	15.875	(5/8")	10.16	9.53	5.09	10.30	12.00	2.00	15.00	13.00	0.39	0.58
RF60 PC-SY	19.05	(3/4")	11.91	12.70	5.96	12.85	15.25	2.40	18.10	15.60	0.49	0.82

Note:

1. Offset links are not available.
2. Recheck chain load when replacing stainless steel chain with PC-SY chain.

ANSI CHAIN FOR CORROSIVE ENVIRONMENTS



ANSI NS Chain

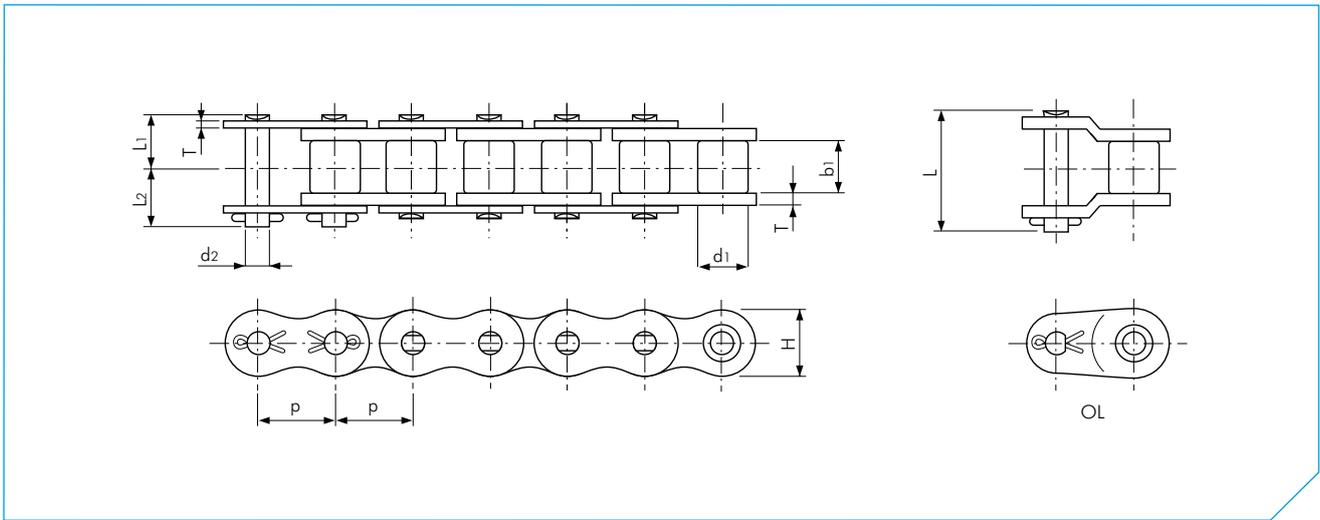
Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller 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	Length L	Thickness T			Height H (max.)
RS25-NS	6.35 (1/4")	3.30	3.18	2.31	3.80	4.80	7.60	0.75	5.85	0.12	0.14
RS35-NS	9.525 (3/8")	5.08	4.78	3.59	5.85	6.85	14.70	1.25	9.00	0.26	0.33
RS40-NS	12.70 (1/2")	7.92	7.95	3.97	8.25	9.95	18.60	1.50	12.00	0.44	0.64
RS50-NS	15.875 (5/8")	10.16	9.53	5.09	10.30	12.00	23.90	2.00	15.00	0.69	1.04
RS60-NS	19.05 (3/4")	11.91	12.70	5.96	12.85	14.75	29.40	2.40	18.10	1.03	1.53
RS80-NS	25.40 (1")	15.88	15.88	7.94	16.25	19.25	39.00	3.20	24.10	1.77	2.66

Notes:

1. RS25-NS is rollerless chain (only bush). The figure shown is the bush diameter.

ANSI LOW TEMPERATURE CHAIN



ANSI KT Chain

Dimensions in mm

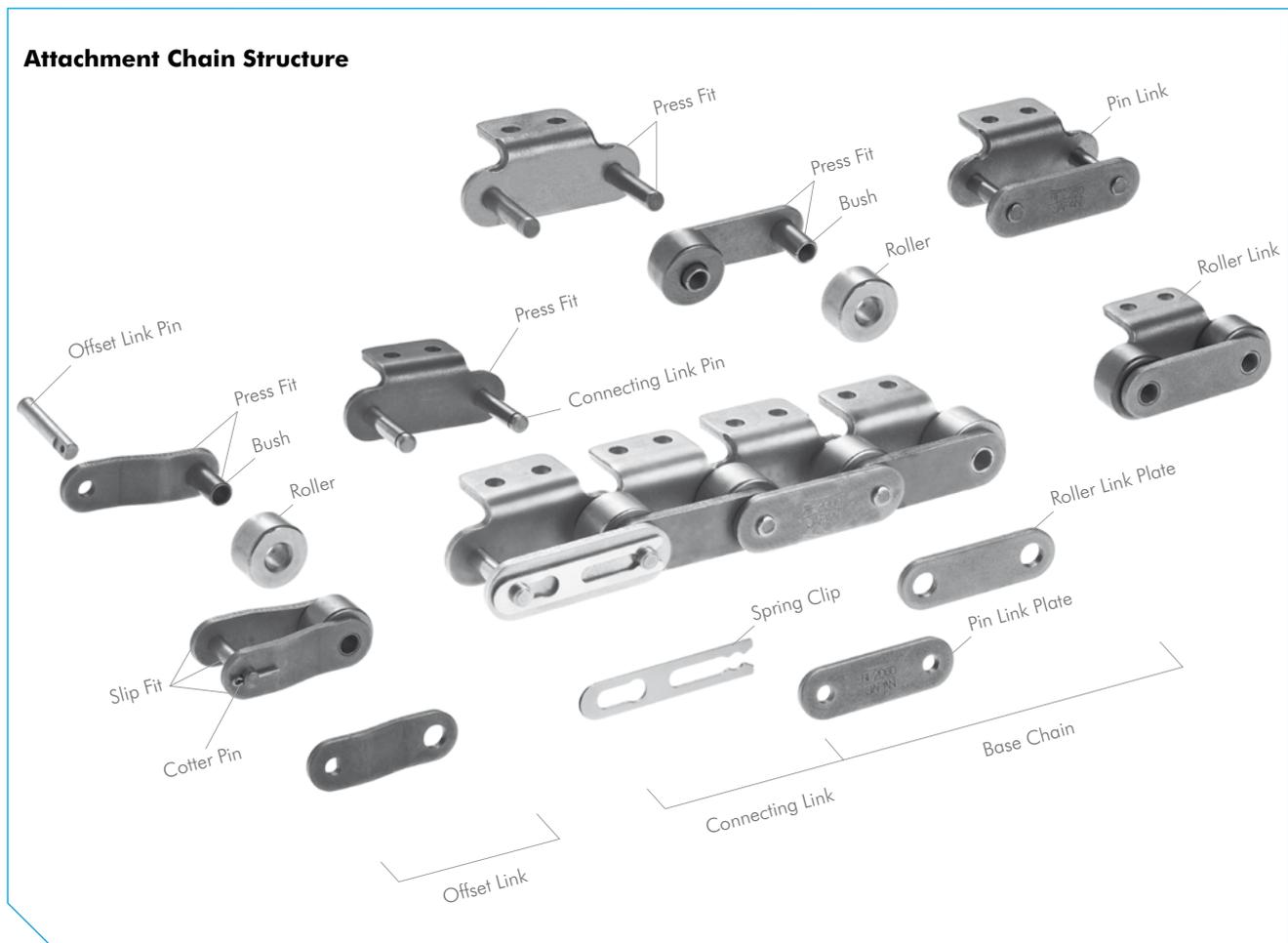
TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin			Link Plate		Min. Tensile Strength acc. to Tsubaki kN	Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m	
				Diameter d2	Length L1	Length L2	Length L	Thickness T				Height H (max.)
RS35-KT	9.525 (3/8")	5.08	4.78	3.59	5.85	7.05	13.50	1.25	9.00	9.80	11.30	0.33
RS40-KT	12.70 (1/2")	7.92	7.95	3.97	8.25	9.65	18.00	1.50	12.00	17.70	19.10	0.64
RS50-KT	15.875 (5/8")	10.16	9.53	5.09	10.30	11.90	23.70	2.00	15.00	28.40	31.40	1.04
RS60-KT	19.05 (3/4")	11.91	12.70	5.96	12.85	15.25	28.20	2.40	18.10	40.20	44.10	1.53
RS80-KT	25.40 (1")	15.88	15.88	7.94	16.25	19.25	36.60	3.20	24.10	71.60	78.50	2.66
RS100-KT	31.75 (1 1/4")	19.05	19.05	9.54	19.75	22.85	43.70	4.00	30.10	107.00	118.00	3.99
RS120-KT	38.10 (1 1/2")	22.23	25.40	11.11	24.90	28.90	55.00	4.80	36.20	148.00	167.00	5.93
RS140-KT	44.45 (1 3/4")	25.40	25.40	12.71	26.90	31.70	62.80	5.60	42.20	193.00	216.00	7.49
RS160-KT	50.80 (2")	28.58	31.75	14.29	31.85	36.85	70.20	6.40	48.20	255.00	279.00	10.10

Note:

1. Ambient temperature range -40°C to 60°C.
2. RS35-KT is rollerless chain (only bush). The figure shown is the bush diameter.
3. Offset pin shape varies according to size.
4. Normally, chains are coated only with anti-rust oil when shipped. Chain should be lubricated with an oil suitable to the ambient temperature during actual use. Customized models that are coated with a silicon (low temperature) oil are also available.
5. For details MAL see temperature selection method page 81.

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN

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



Attachment Chain Structure

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

1. Single Pitch Attachment Chain

Single pitch attachment chain is based on roller chain with attachments added to make them suitable for conveyor uses. 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. 12 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 is twice the pitch length. A major benefit being that whilst larger conveyor lengths are possible, due to it being double pitch it uses only half the components compared to a single pitch chain used in the same application, resulting in less components to wear. This series conforms to the ANSI B29.4, ISO 1275-A, and JIS B 1803 standards.

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. 13 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 or 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, especially for longer conveyors. (Please note, 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 links: spring clip connecting link and cotter pin connecting link. It's common to use slip fit spring clip connecting links for small size roller chains. Cotter 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. The pin and two plates are slip fit. The fatigue strength is 35% lower than the chain itself.

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN

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 each link plate. 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. 14 Hollow Pin Chain

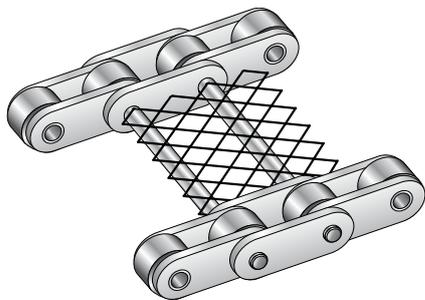


Fig. 15 Cross Rods with Mesh

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.

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, respectively (Figure 16). 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 17).



Fig. 16 A-1 Attachment

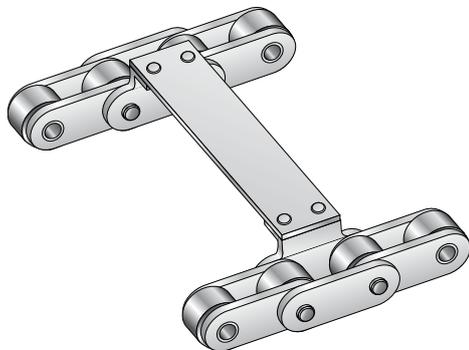


Fig. 17 A Attachment with Slat

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

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN

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 18).



Fig. 18 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 19). 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.

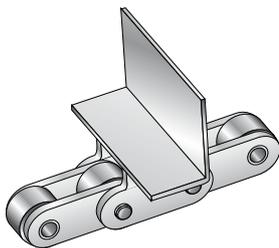


Fig. 19 K Attachment with L-angle

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 20). The attachment interval can vary the same as the A attachment. These attachments may be adapted for use with hooks or slats (Figure 21).

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. 20 SA-1 Attachment

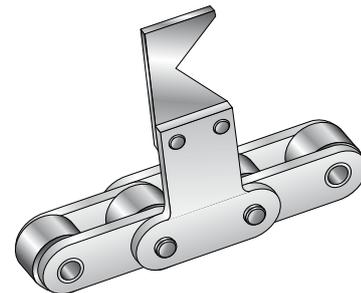


Fig. 21 SA Attachments with Hook

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 22).

Usually SK attachments are used with dogs or jigs (Figure 23). 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. 22 SK-1 Attachments

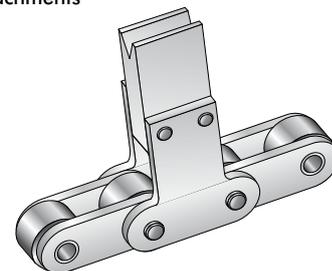


Fig. 23 SK Attachments with V-block

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN

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 24). As shown in Figure 25, two sets of extended pin 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 extended pin attachment chain can be supported by guide rails on the rollers.



Fig. 24 Extended Pin Attachment

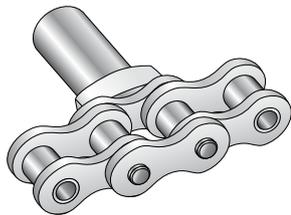


Fig. 25 Extended Pin Attachments with Jigs

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 26). 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. 26 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 +0.15%
- 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 the standard high quality. Figure 27 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. 27 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 conveyance purposes in for instance packaging machines or when a minimum of difference in chain length is required in lifting applications (accumu-

INTRODUCTION TO TSUBAKI ATTACHMENT CHAIN

lator 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!

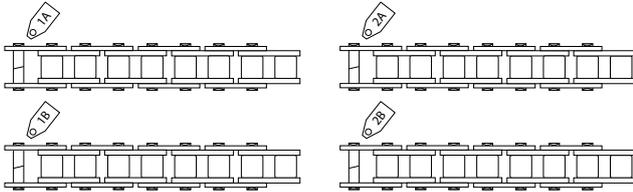


Fig. 28 Tagging of Matched Chain Strands

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.

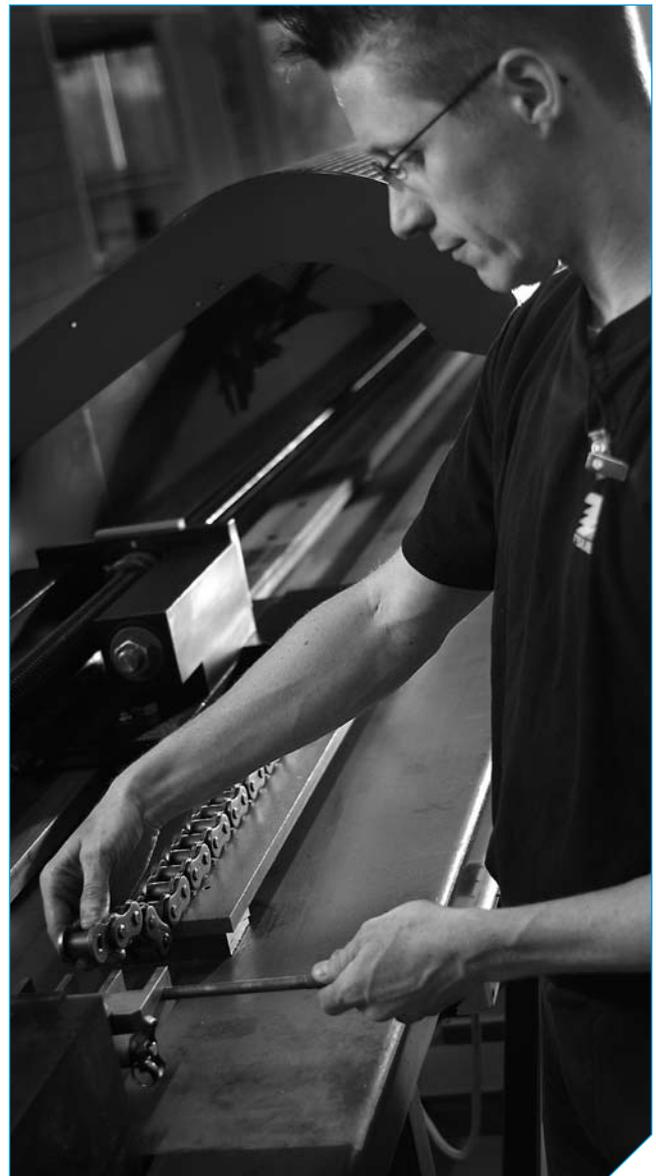


Fig. 29 Matching Chain Strands



Fig. 30 Local Assembly Service

ANSI LAMBDA LUBE FREE ATTACHMENT CHAIN

TSUBAKI's LAMBDA Attachment 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 LAMBDA has outstanding performance in temperatures up to 150°C. For temperatures above 150°C TSUBAKI has a special high-temperature LAMBDA available. See page 38 for more details.

For applications in the food industry, TSUBAKI can supply LAMBDA chain with bushes impregnated with food grade lubricating oil (NSF-H1 and H3 certified).

When an application needs water wash downs or is exposed to moisture, and lubrication is not possible or desirable, LAMBDA N.E.P. is most sufficient.

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

Chains:

Only simplex ANSI LAMBDA is interchangeable with standard ANSI roller chain. 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.

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.



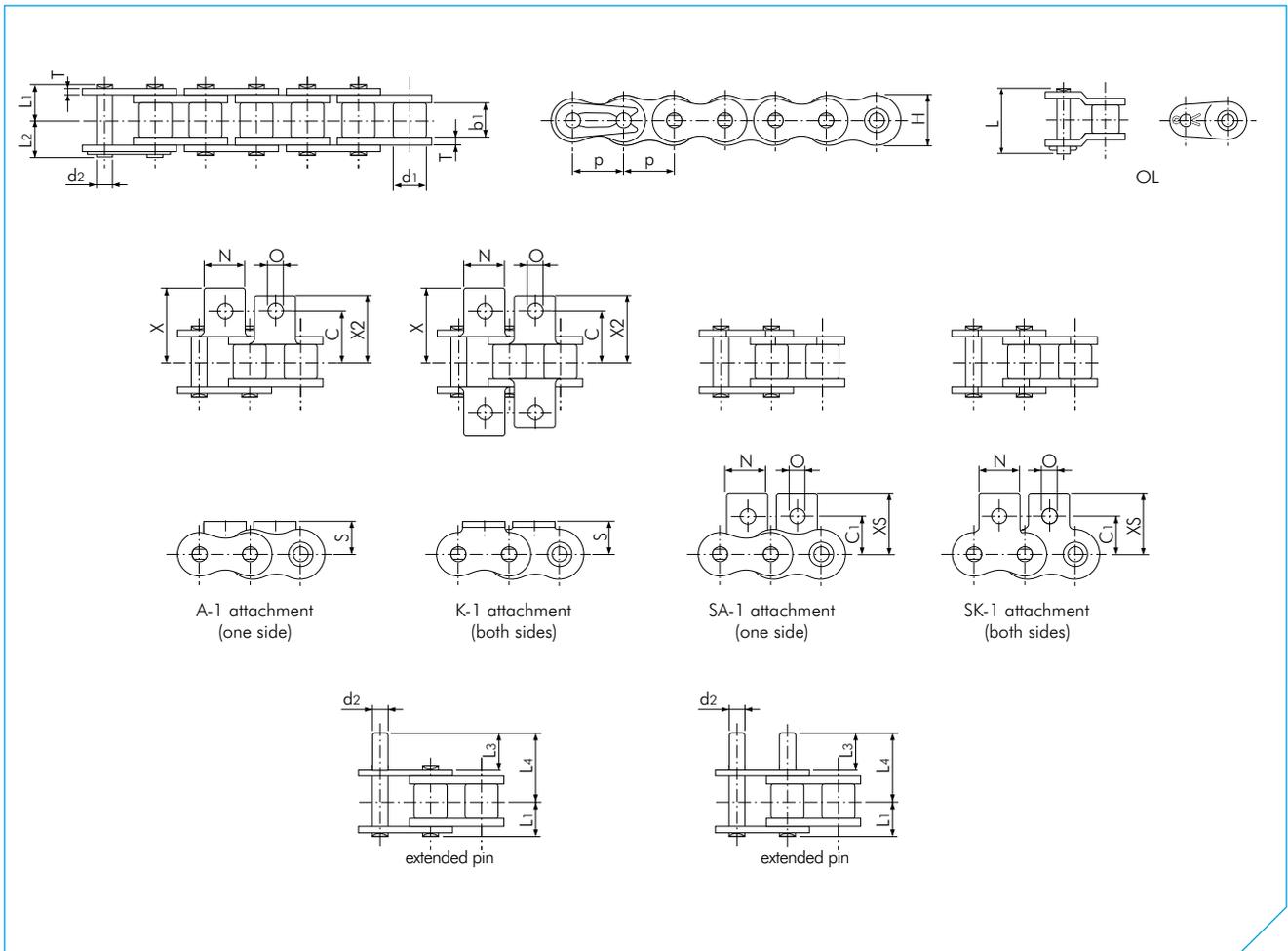
Fig. 31 Basic Construction

Special 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. We can deliver Lambda Attachment Chain in Food Grade, High Temperature and special coated corrosion resistant execution and in Stainless Steel to standard or on customer's requests.



ANSI LAMBDA LUBE FREE ATTACHMENT CHAIN



ANSI Single Pitch LAMBDA Chain

Dimensions in mm

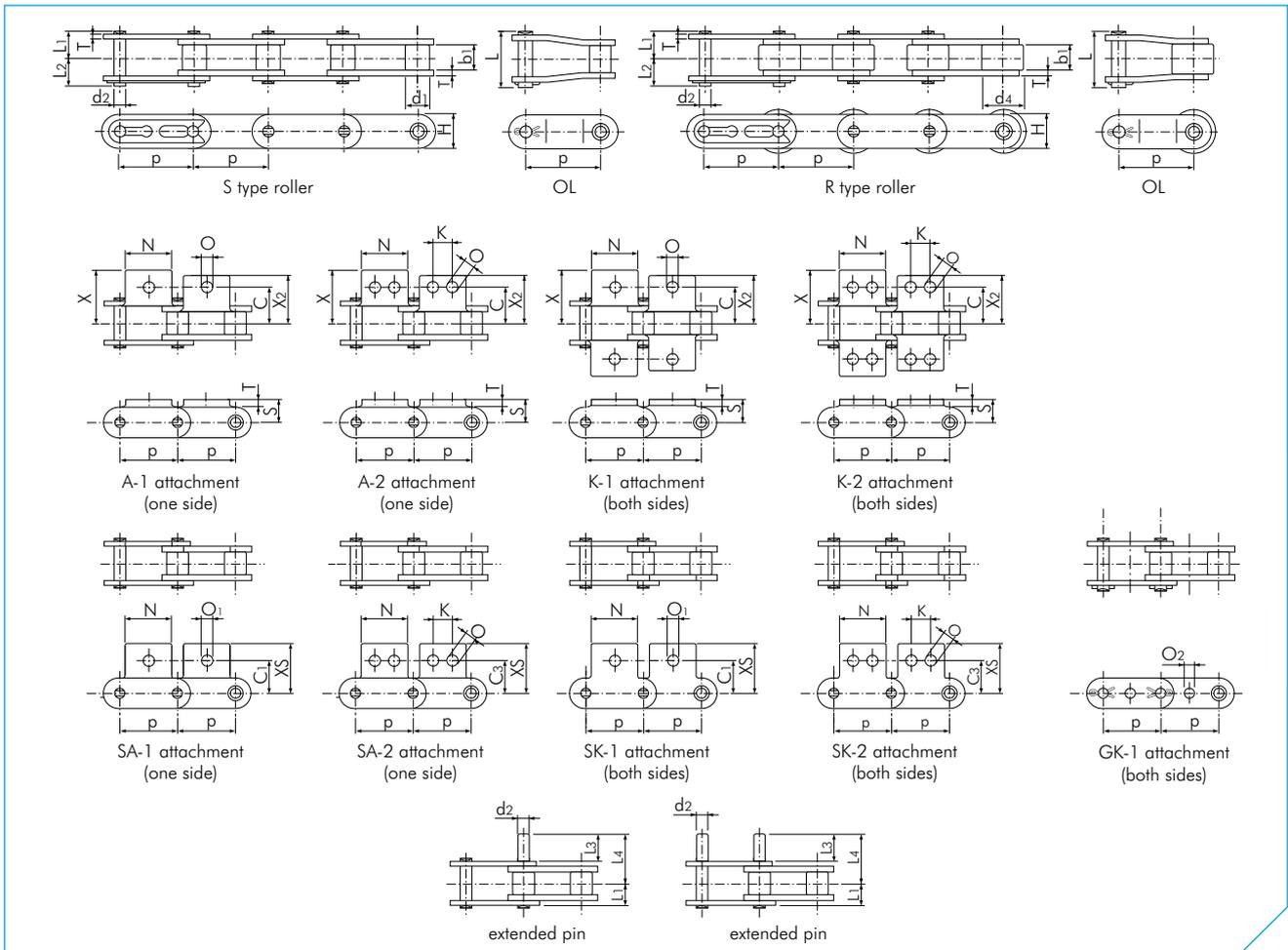
TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin						Link Plate		Approx. Mass kg/m
				Diameter d2	Length L1	Length L2	Length L3	Length L4	Length L	Thickness T	Height H (max.)	
RS35-LMC	9.525 (3/8")	5.08	4.78	3.00	5.85	6.85	9.50	14.60	13.50	1.25	9.00	0.33
RS40-LMC	12.70 (1/2")	7.92	7.95	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
RS100-LMC	31.75 (1 1/4")	19.05	19.05	9.54	19.75	22.85	23.80	41.75	43.70	4.00	30.10	3.99

TSUBAKI Chain No.	Attachment Dimensions									Attachment Mass		
	C	C1	N	O	S	X	X2	XS	A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.	
RS35-LMC	9.50	9.50	7.90	3.40	6.35	14.30	14.30	14.55	0.0008	0.0016	0.0008	
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	
RS100-LMC	31.75	31.80	25.40	8.70	19.80	44.90	44.90	44.00	0.026	0.052	0.012	

Note:

- Connecting links are clip type for sizes up to RS60-LMC, and cotter type for size RS80-LMC to RS100-LMC.
- Drive and Conveyor series LAMBDA chains cannot be intercoupled or interchanged.
- Standard ANSI sprockets can be used.
- LAMBDA Conveyor Chain can not 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.
- Special attachments are available on request.

ANSI LAMBDA LUBE FREE ATTACHMENT CHAIN



ANSI Double Pitch LAMBDA Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Roller		Pin						Link Plate		Approx. Mass	
			S Roller	R Roller	Diameter	Length	Length	Length	Length	Length	Thickness	Height	S Roller	R Roller
			d1	d4	d2	L1	L2	L3	L4	L	T	H	kg/m	kg/m
RF2040-LMC	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-LMC	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-LMC	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-LMC	50.80 (1 3/4")	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-LMC	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												Attachment Mass		
	C	C1	C3	K	N	O	O1	O2	S	X	X2	XS	A SA	K SK	Ext. Pin
	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.	kg/att.
RF2040-LMC	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-LMC	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-LMC	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-LMC	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-LMC	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-LMC, and cotter type for size RF2080-LMC to RF2100-LMC.
2. LAMBDA Conveyor Chain can not 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 situations, TSUBAKI can provide you with an outstanding Attachment Chain. This chain is manufactured in accordance with the American Standards.



Fig. 32 K-1 Attachment

Construction

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

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 a 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

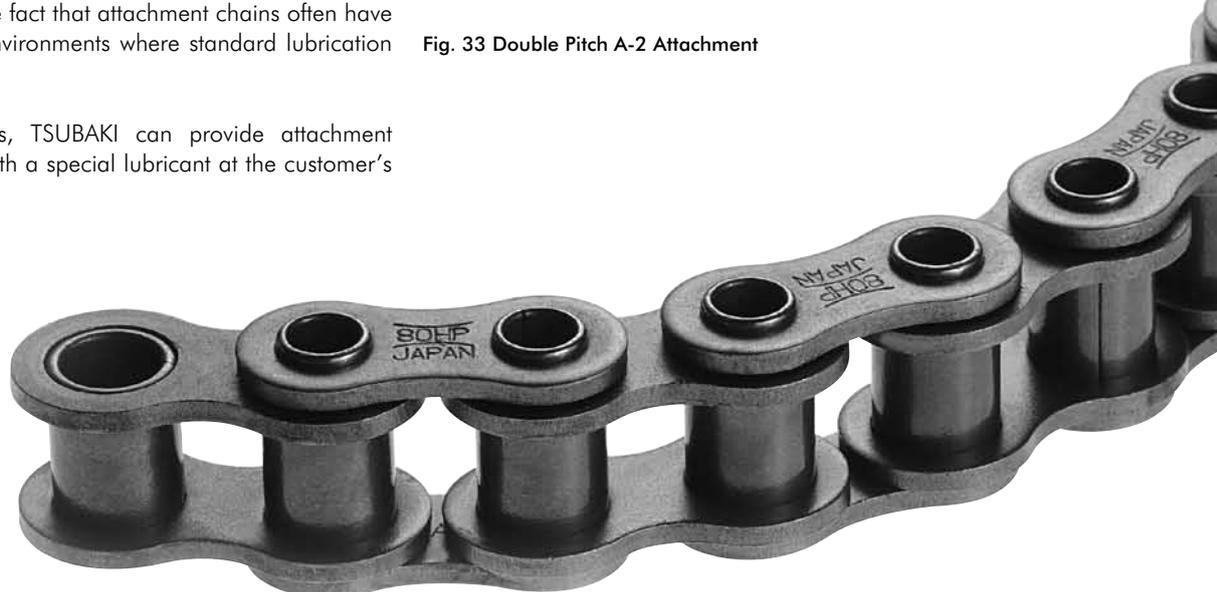
The product range for our standard attachment chains is:

- 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

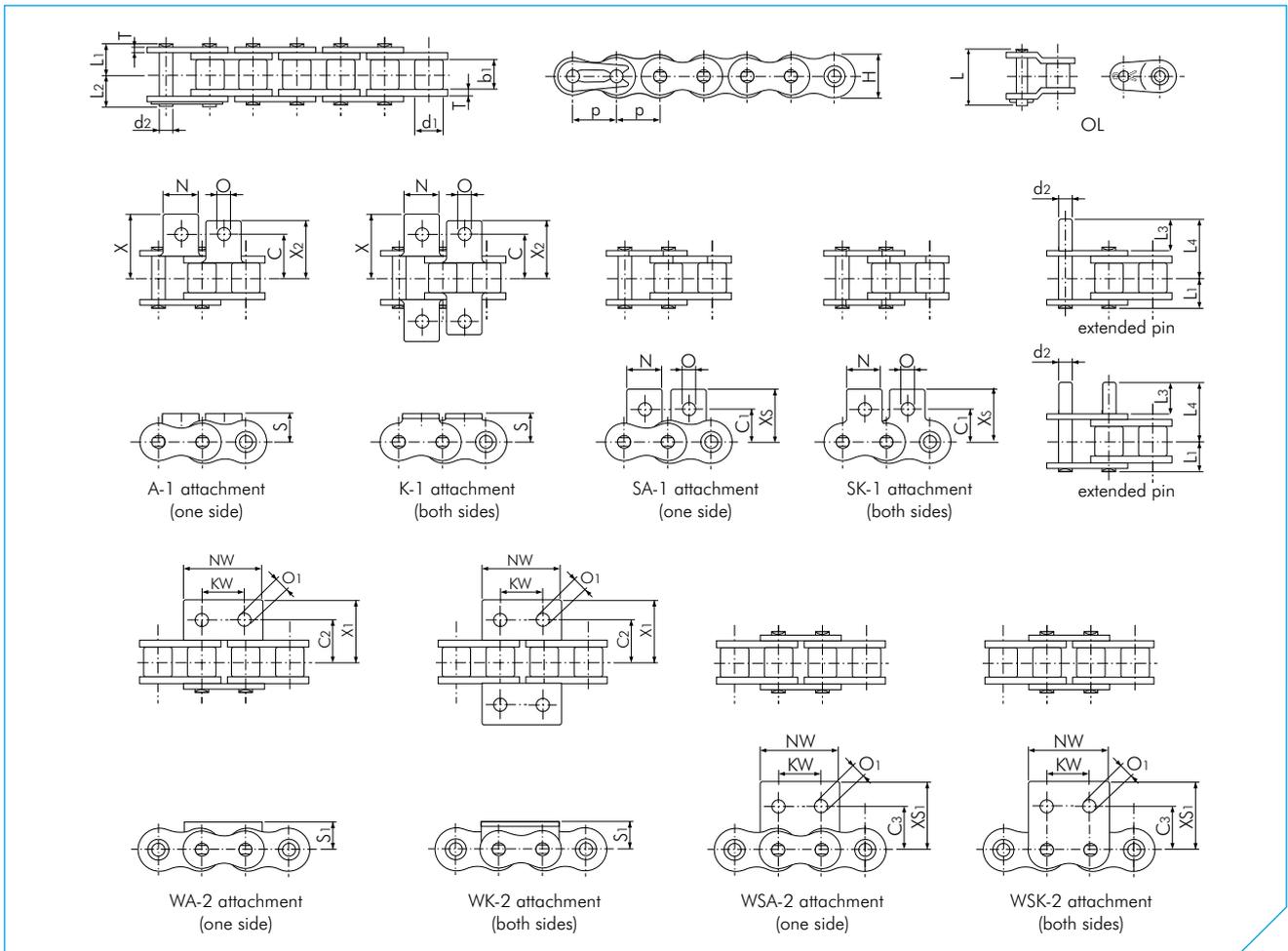
Special attachments can be designed and manufactured to meet your specific requirements.



Fig. 33 Double Pitch A-2 Attachment



ANSI STANDARD ATTACHMENT CHAIN



ANSI Single Pitch Standard Chain

Dimensions in mm

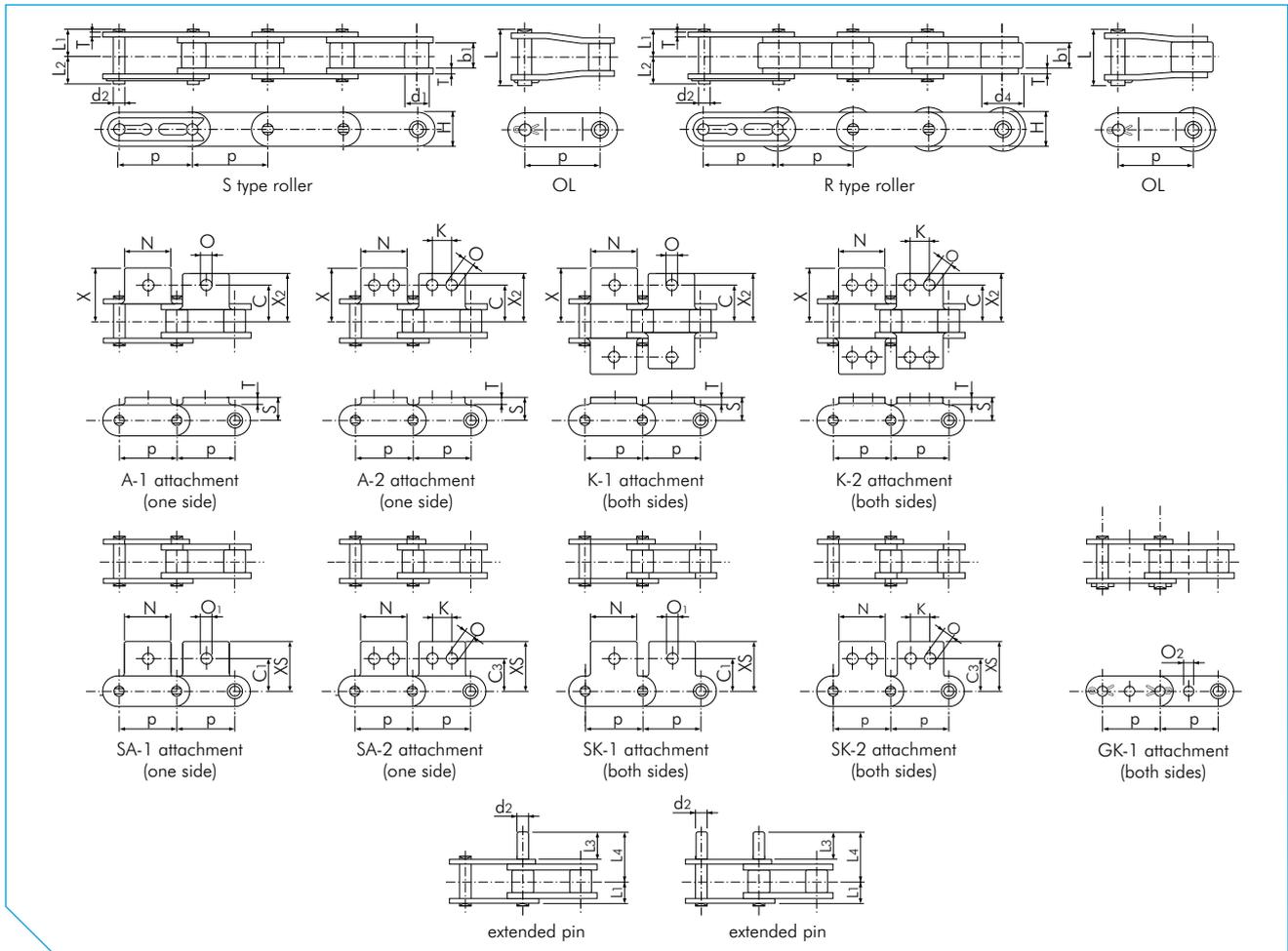
TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin							Link Plate		Approx. Mass kg/m
				Diameter d2	Length L1	Length L2	Length L3	Length L4	Length L	Thickness T	Height H (max.)		
RS25	6.35 (1/4")	3.30	3.18	2.31	3.80	4.80	-	-	-	0.75	5.84	0.14	
RS35	9.525 (3/8")	5.08	4.78	3.59	5.85	6.85	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	11.90	11.90	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	
RS100	31.75 (1 1/4")	19.05	19.05	9.54	19.75	22.85	23.80	41.75	43.70	4.00	30.10	3.99	
RS120	38.10 (1 1/2")	22.23	25.40	11.11	24.90	28.90	28.60	51.04	55.80	4.80	36.20	5.93	
RS140	44.45 (1 3/4")	25.40	25.40	12.71	26.90	31.70	33.30	57.50	60.50	5.60	42.20	7.49	
RS160	50.80 (2")	28.58	31.75	14.29	31.85	36.85	38.10	67.40	70.20	6.40	48.20	10.10	

TSUBAKI Chain No.	Attachment Dimensions																Attachment Mass				
	C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	A SA	K SK	WA WSA	WK WSK	Ext. Pin
	kg/att.																kg/att.	kg/att.	kg/att.	kg/att.	kg/att.
RS25	7.15	7.95	-	-	-	5.60	-	3.40	-	4.75	-	10.70	-	10.70	11.65	-	0.0003	0.0006	-	-	-
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
RS100	31.75	31.80	31.75	31.80	23.80	25.40	57.70	8.70	11.00	19.80	19.80	44.90	44.90	44.90	44.00	44.00	0.026	0.052	0.055	0.110	0.012
RS120	38.10	36.50	-	-	-	28.60	-	10.30	-	23.00	-	55.80	-	50.80	52.90	-	0.044	0.088	-	-	0.020
RS140	44.50	44.50	-	-	-	34.90	-	11.90	-	28.60	-	63.10	-	57.20	63.50	-	0.071	0.142	-	-	0.030
RS160	50.80	50.80	-	-	-	38.10	-	14.30	-	31.80	-	71.80	-	65.10	70.10	-	0.097	0.194	-	-	0.045

Note:

- RS25 and RS35 is rollerless chain (only bush). The figure shown is the bush diameter.
- Connecting links are clip type for sizes up to RS60, and cotter type for sizes RS80 to RS160.

ANSI STANDARD ATTACHMENT CHAIN



ANSI Double Pitch Standard Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Roller		Diameter d2	Pin					Link Plate		Approx. Mass	
			S Roller d1	R Roller d4		Length L1	Length L2	Length L3	Length L4	Length L	Thickness T	Height H	S Roller kg/m	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	34.00	53.60	47.50	4.80	28.60	3.54	5.80
RF2120	76.20 (3")	22.23	22.23	44.45	11.11	26.95	30.55	-	-	59.00	5.60	34.40	5.08	8.13
RF2160	101.60 (4")	28.58	28.58	57.15	14.29	33.95	38.45	-	-	74.10	7.15	48.20	8.96	13.70

TSUBAKI Chain No.	Attachment Dimensions											Attachment Mass			
	C	C1	C3	K	N	O	O1	O2	S	X	X2	XS	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	28.20	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
RF2120	39.70	33.30	37.30	28.60	57.20	14.00	16.00	-	27.80	60.70	54.40	59.90	0.100	0.200	-
RF2160	52.40	44.50	50.80	38.10	76.20	18.00	22.00	-	36.50	77.80	70.00	78.60	0.203	0.406	-

Note:

1. Connecting link pin type RF2040 to RF2060 = clip type; RF2080 to RF2160 = cottared type.
2. R-Roller is not available with GK-1 attachment.
3. Chain with S type roller is indicated as RF2040S.
4. Chain with R type roller is indicated as RF2040R.

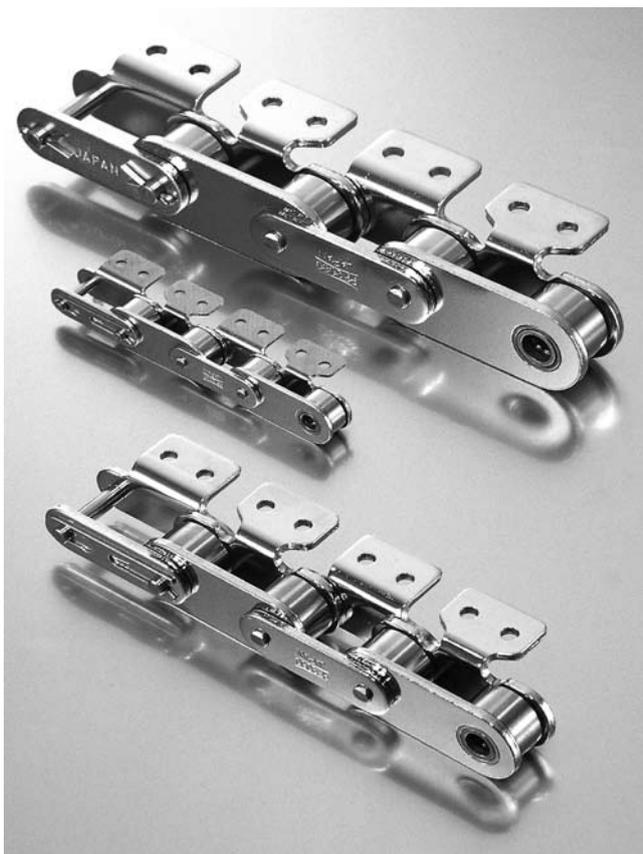
ANSI ATTACHMENT CHAIN FOR SPECIAL ENVIRONMENTS

TSUBAKI has a complete range of Custom Made Chains for special environments, Containing chains operated in a sanitary environment, exposing to corrosive chemicals, or heated to extreme temperatures.

Lambda High Temperature Lube Free Chains (Carbon Steel base)

ANSI LAMBDA High Temperature Chain

Lambda LMCK is developed for high temperature. Stable lubrication and anti-wear properties in high temperatures. Uses NSF H-1 (Food Grade) certified oil and is environmentally friendly. Working temperature range: +150°C to +230°C



Lambda Food Grade Lube Free Chains (Carbon Steel base)

ANSI LAMBDA Food Grade Chain

(special attachments on request)
Lambda FG is developed for food industry. A Special food safe lubricant (NSF-H3 certified) is impregnated in the bush and anti-corrosive oil (NSF-H1 certified) is used to prevent chain corrosion. In single pitch and double pitch available see table. Working temperature range: -10°C to +150°C

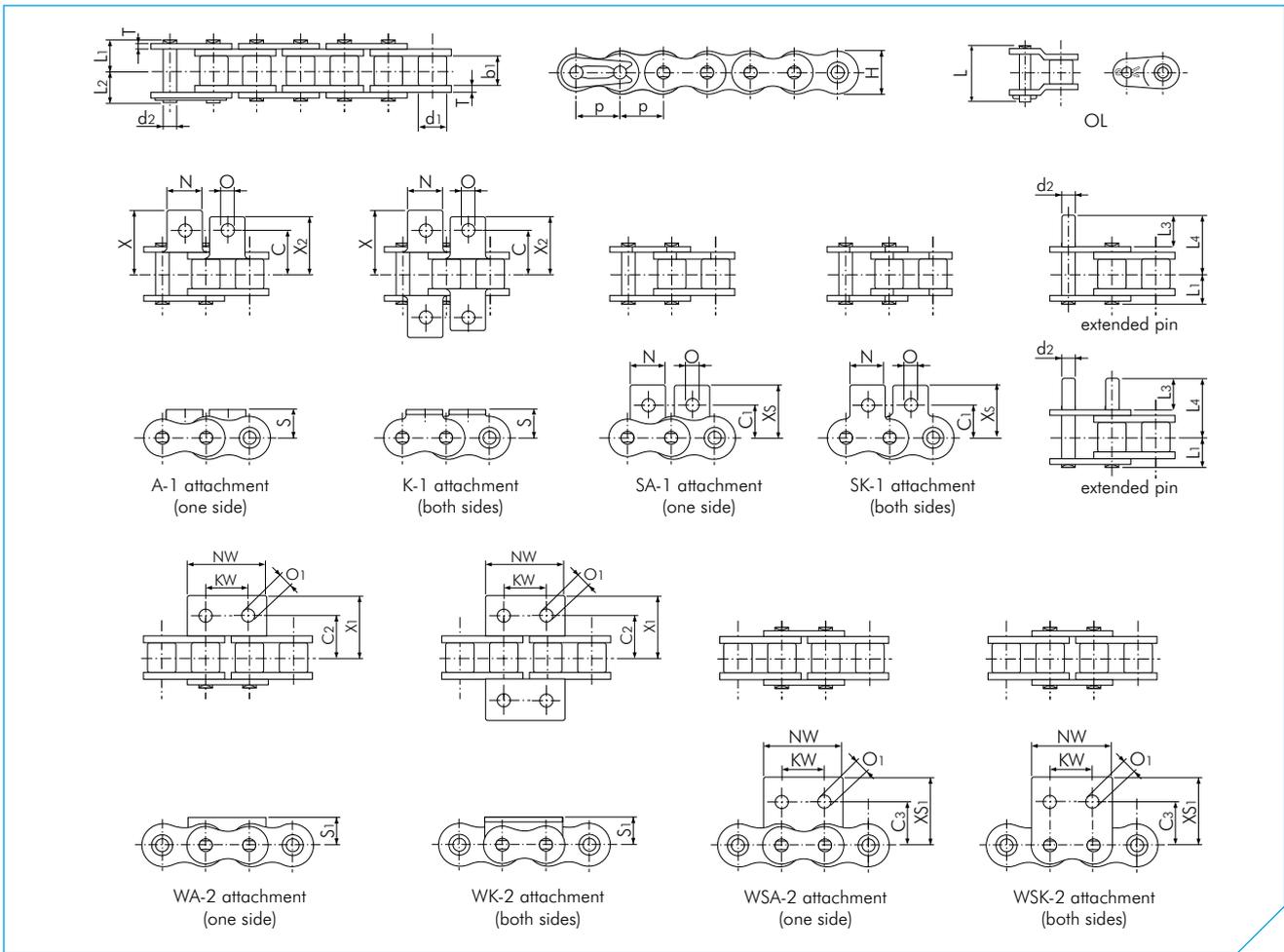
Corrosion Resistant Chain (Stainless Steel base)

ANSI SS Stainless Steel Chain

All basic components of this chain are made of Stainless Steel SUS304 (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 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 ATTACHMENT CHAIN FOR SPECIAL ENVIRONMENTS



ANSI Single Pitch High Temperature (CK) LAMBDA Chain

Dimensions in mm

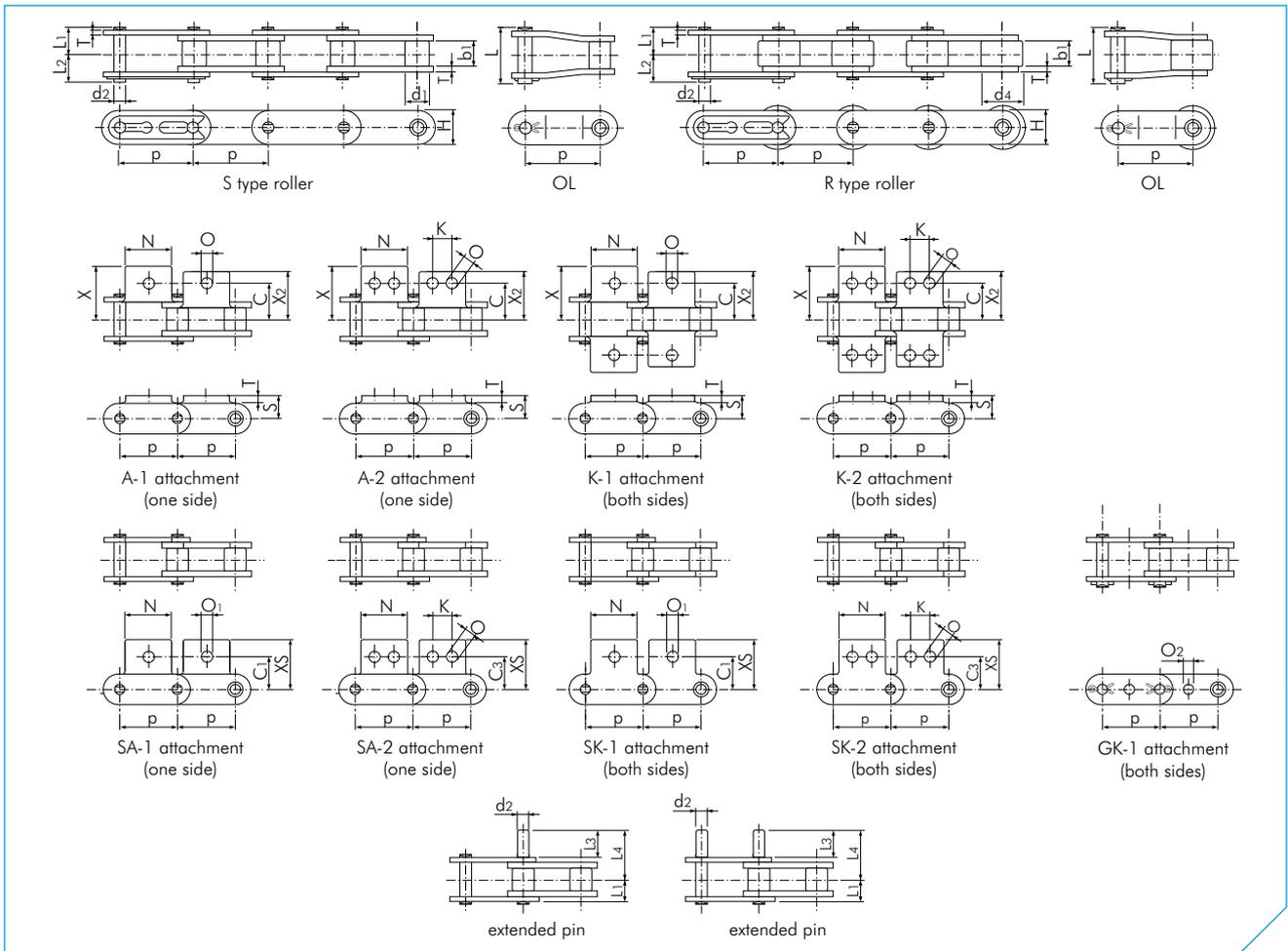
TSUBAKI Chain No.	Pitch p	Roller Diameter d_1	Inner Width b_1	Pin						Link Plate		Approx. Mass kg/m
				Diameter d_2	Length L_1	Length L_2	Length L_3	Length L_4	Length L	Thickness T	Height H (max.)	
RS40-LMCK	12.70 (1/2")	7.92	7.95	3.97	8.25	9.95	9.50	16.75	18.20	1.50	12.00	0.64
RS50-LMCK	15.875 (5/8")	10.16	9.53	5.09	10.30	12.00	11.90	21.00	22.60	2.00	15.00	1.04
RS60-LMCK	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-LMCK	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								Attachment Mass		
	C	C ₁	N	O	S	X	X ₂	X ₅	A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RS40-LMCK	12.70	12.70	9.50	3.60	8.00	17.80	17.80	17.40	0.002	0.004	0.001
RS50-LMCK	15.90	15.90	12.70	5.20	10.30	23.40	23.40	23.05	0.003	0.006	0.002
RS60-LMCK	19.05	18.30	15.90	5.20	11.90	28.20	28.20	26.85	0.007	0.014	0.003
RS80-LMCK	25.40	24.60	19.10	6.80	15.90	36.60	36.60	35.45	0.013	0.026	0.007

Note:

1. Ambient temperature range: 150°C to 230°C
2. Connecting links are clip type for sizes up to RS60-LMCK, and cotter type for size RS80-LMCK.
3. Drive and Conveyor series LAMBDA chains cannot be intercoupled or interchanged.
4. Standard ANSI sprockets can be used.
5. LAMBDA Conveyor Chain can not 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.
6. Special attachments are available on request.
7. BS/DIN is available, please contact TSUBAKI.

ANSI ATTACHMENT CHAIN FOR SPECIAL ENVIRONMENTS



ANSI Double Pitch High Temperature (CK) LAMBDA Chain

Dimensions in mm

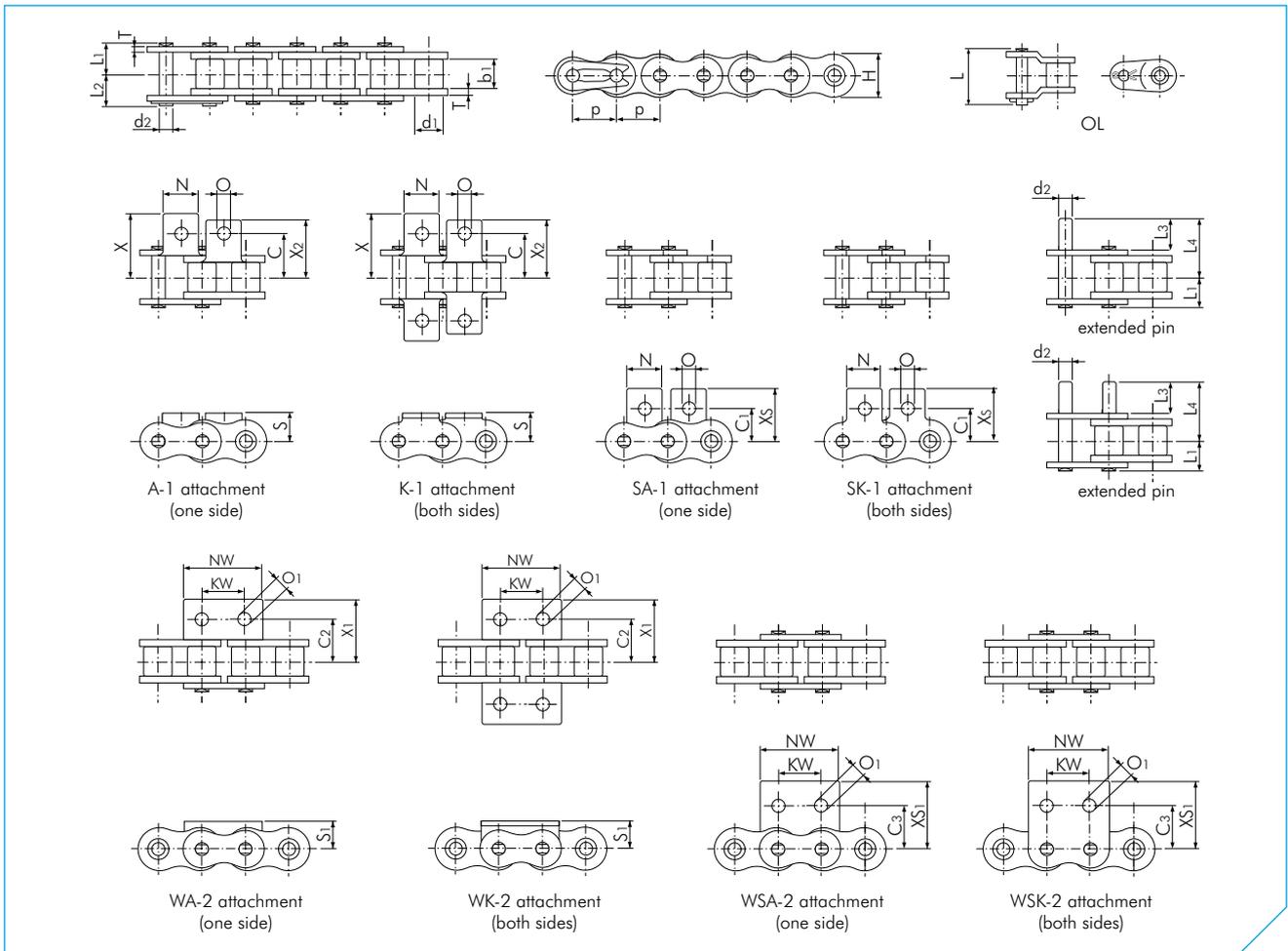
TSUBAKI Chain No.	Pitch p	Inner Width b1	Roller		Pin						Link Plate		Approx. Mass	
			S Roller d1	R Roller d4	Diameter d2	Length L1	Length L2	Length L3	Length L4	Length L	Thickness T	Height H (max.)	S Roller kg/m	R Roller kg/m
			RF2040-LMCK	25.40 (1")	7.95	7.92	15.88	3.97	8.25	9.95	9.50	16.75	18.20	1.50
RF2050-LMCK	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-LMCK	38.10 (1 1/2")	12.70	11.91	22.23	5.96	14.55	16.55	14.30	25.75	31.50	3.20	17.20	1.51	2.19
RF2080-LMCK	50.80 (1 3/4")	15.88	15.88	28.58	7.94	18.30	20.90	19.10	33.85	39.90	4.00	23.00	2.41	3.52

TSUBAKI Chain No.	Attachment Dimensions												Attachment Mass		
	C	C1	C3	K	N	O	O1	O2	S	X	X2	XS	A SA kg/att.	K SK kg/att.	Ext. Pin kg/att.
RF2040-LMCK	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-LMCK	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-LMCK	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-LMCK	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. Ambient temperature range: 150°C to 230°C
2. Connecting links are clip type for sizes up to RF2060-LMCK, and cottered type for size RF2080-LMCK.
3. Chain with S type roller is indicated as RF2040S-LMCK.
4. Chain with R type roller is indicated as RF2040R-LMCK.
5. Special attachments are available on request.
6. R-Roller is not available with GK-1 attachment.

ANSI ATTACHMENT CHAIN FOR SPECIAL ENVIRONMENT



ANSI Single Pitch SS Chain

Dimensions in mm

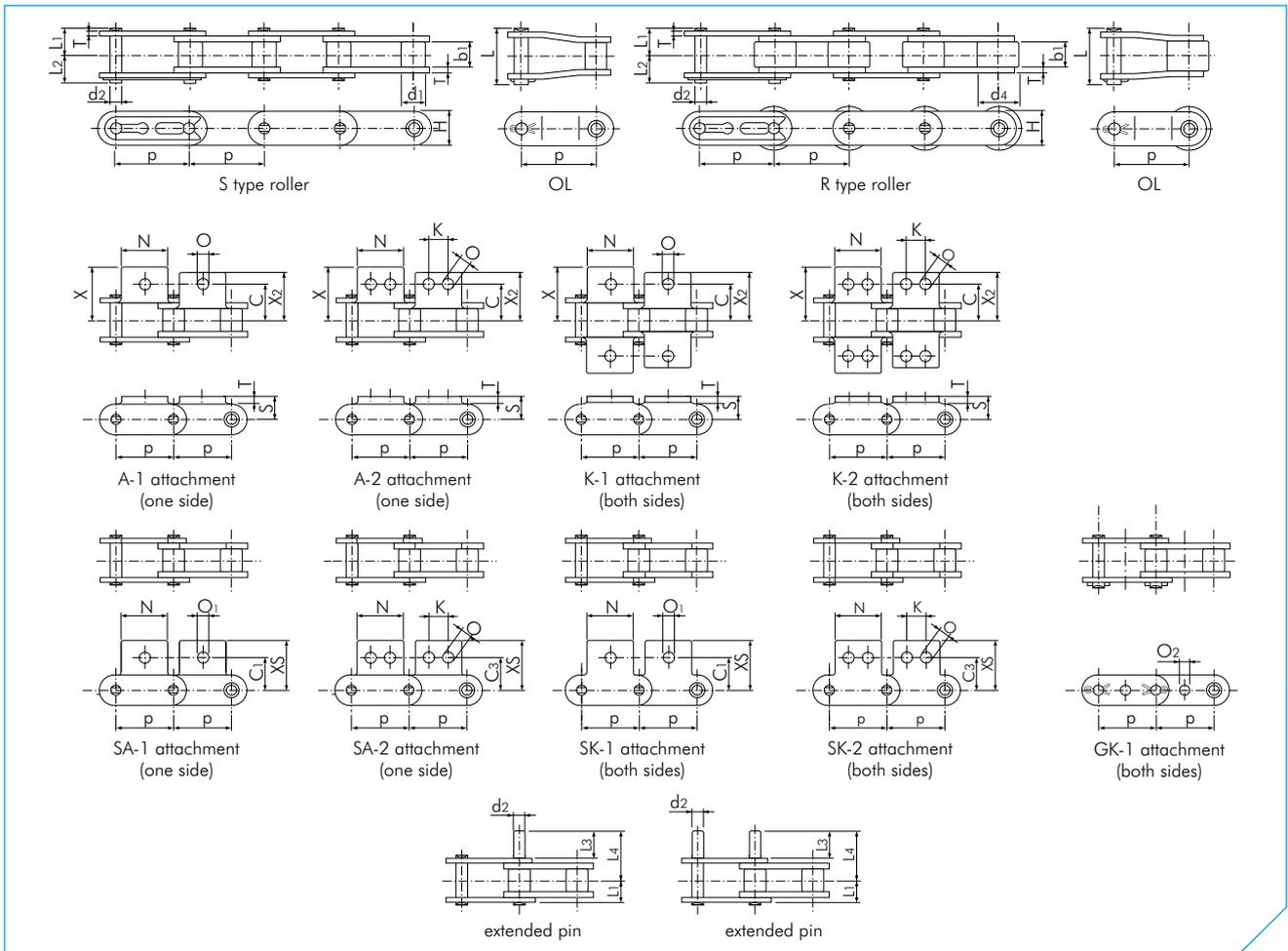
TSUBAKI Chain No.	Pitch p	Roller Diameter d1	Inner Width b1	Pin							Link Plate		Approx. Mass kg/m
				Diameter d2	Length L1	Length L2	Length L3	Length L4	Length L	Thickness T	Height H (max.)		
RS25-SS	6.35 (1/4")	3.30	3.18	2.31	3.80	4.80	6.00	9.30	-	14.70	0.75	5.84	0.14
RS35-SS	9.525 (3/8")	5.08	4.78	3.59	5.85	6.85	9.50	14.60	14.70	18.60	1.25	9.00	0.33
RS40-SS	12.70 (1/2")	7.92	7.95	3.97	8.25	9.95	9.50	16.75	18.60	23.90	1.50	12.00	0.64
RS50-SS	15.875 (5/8")	10.16	9.53	5.09	10.30	11.90	11.90	21.00	23.90	33.85	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	29.40	39.00	2.40	18.10	1.53
RS80-SS	25.40 (1")	15.88	15.88	7.94	16.25	19.25	19.10	33.85	39.00	57.90	3.20	24.10	2.66
RS100-SS	31.75 (1 1/4")	19.05	19.05	9.54	19.75	22.85	23.80	41.75	45.70	66.20	4.00	30.10	3.99
RS120-SS	38.10 (1 1/2")	22.23	25.40	11.11	25.75	29.80	28.60	51.40	59.70	77.30	5.00	36.20	6.13
RS140-SS	44.45 (1 3/4")	25.40	25.40	12.71	28.15	32.95	33.30	57.90	66.20	-	6.00	42.20	7.91
RS160-SS	50.80 (2")	28.58	31.75	14.29	33.35	38.55	38.10	67.45	77.30	-	7.00	48.20	10.86

TSUBAKI Chain No.	Attachment Dimensions															Attachment Mass					
	C	C1	C2	C3	KW	N	NW	O	O1	S	S1	X	X1	X2	XS	XS1	A SA kg/att.	K SK kg/att.	WA WSA kg/att.	WK WSK kg/att.	Ext. Pin kg/att.
RS25-SS	7.15	7.95	-	-	-	5.60	-	3.40	-	4.75	-	10.70	-	10.70	11.65	-	0.0003	0.0006	-	-	-
RS35-SS	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-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
RS80-SS	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
RS100-SS	31.75	31.80	31.75	31.80	23.80	25.40	57.70	8.70	11.00	19.80	19.80	44.90	44.90	44.90	44.00	44.00	0.026	0.052	0.055	0.110	0.012
RS120-SS	38.10	36.50	-	-	-	28.60	-	10.30	-	23.00	-	55.80	-	50.80	52.90	-	0.044	0.088	-	-	0.020
RS140-SS	44.50	44.50	-	-	-	34.90	-	11.90	-	28.60	-	63.10	-	57.20	63.50	-	0.071	0.142	-	-	0.030
RS160-SS	50.80	50.80	-	-	-	38.10	-	14.30	-	31.80	-	71.80	-	65.10	70.10	-	0.097	0.194	-	-	0.045

Note:

- RS25-SS and RS35-SS is rollerless chain (only bush). The figure shown is the bush diameter.
- Connecting links are clip type for sizes up to RS60-SS, and cotter type for sizes RS80-SS up to RS160-SS.
- For details on Corrosion Resistant selection, please consult our reference guide in this catalogue.

ANSI ATTACHMENT CHAIN FOR SPECIAL ENVIRONMENT



ANSI Double Pitch SS Chain

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Roller		Pin					Link Plate		Approx. Mass		
			S Roller d1	R Roller d4	Diameter d2	Length L1	Length L2	Length L3	Length L4	Length L	Thickness T	Height H	S Roller kg/m	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	18.20	1.50
RF2050-SS	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-SS	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-SS	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-SS	63.50 (2 1/2")	19.05	19.05	39.69	9.54	21.80	24.50	23.80	43.30	47.50	5.00	28.60	3.66	5.92
RF2120-SS	76.20 (3")	22.23	22.23	44.45	11.11	26.95	30.55	-	-	59.00	6.00	34.40	5.37	8.42
RF2160-SS	101.60 (4")	28.58	28.58	57.15	14.29	33.95	38.45	-	-	74.10	8.00	48.20	9.84	14.58

TSUBAKI Chain No.	Attachment Dimensions												Attachment Mass		
	C	C1	C3	K	N	O	O1	O2	S	X	X2	X5	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
RF2100-SS	33.35	28.60	31.80	23.80	47.60	8.70	14.30	10.10	23.40	49.90	44.90	50.40	0.063	0.126	0.012
RF2120-SS	39.70	33.30	37.30	28.60	57.20	14.00	16.00	-	27.80	60.70	54.40	59.90	0.107	0.214	-
RF2160-SS	52.40	44.50	50.80	38.10	76.20	18.00	22.00	-	36.50	77.80	70.00	78.60	0.227	0.454	-

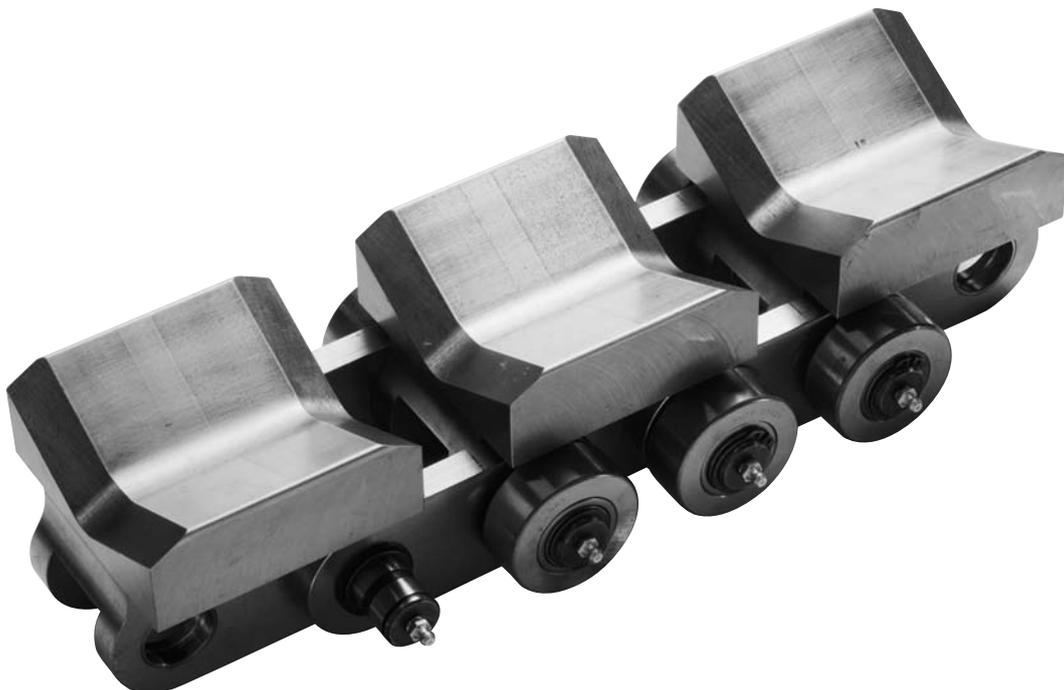
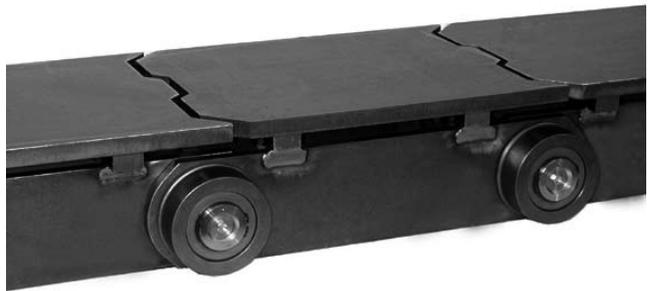
Note:

1. Connecting links are clip type for sizes up to RF2060-SS, and cotter type for size RF2080-SS to RF2160-SS. All GK-1 attachments are cotter type.
2. R-Roller is not available with GK-1 attachment.
3. Chain with S type roller is indicated as RF2040S-SS.
4. Chain with R type roller is indicated as RF2040R-SS.
5. Special attachments are available on request.

INTRODUCTION TO TSUBAKI CONVEYOR CHAIN

Tsubaki can provide large size Conveyor Chains to the ISO/DIN standard in the M and FV series as well as large size Conveyor Chains standardized by TSUBAKI in the RF series. The chains are manufactured as plain Conveyor Chains or with standard attachments (see Conveyor Chain Structure). Special attachments can be designed and manufactured at the customer's request.

ISO/DIN standard Conveyor Chain is available in many combinations of steel materials and in a wide variety of specifications. With such a longstanding reputation for production and technology development Tsubaki customers benefit from a uniform high quality built on years of experience, resulting in longer chain life and reduced maintenance costs.



INTRODUCTION TO TSUBAKI CONVEYOR CHAIN

Tsubaki's RF Conveyor Chain is also a standard Conveyor Chain and as with the ISO/DIN standard available in many steel combinations and specifications. The most advanced heat treatment possible, the latest production processes and our company's own quality control system allow us to confidently guarantee outstanding performance.

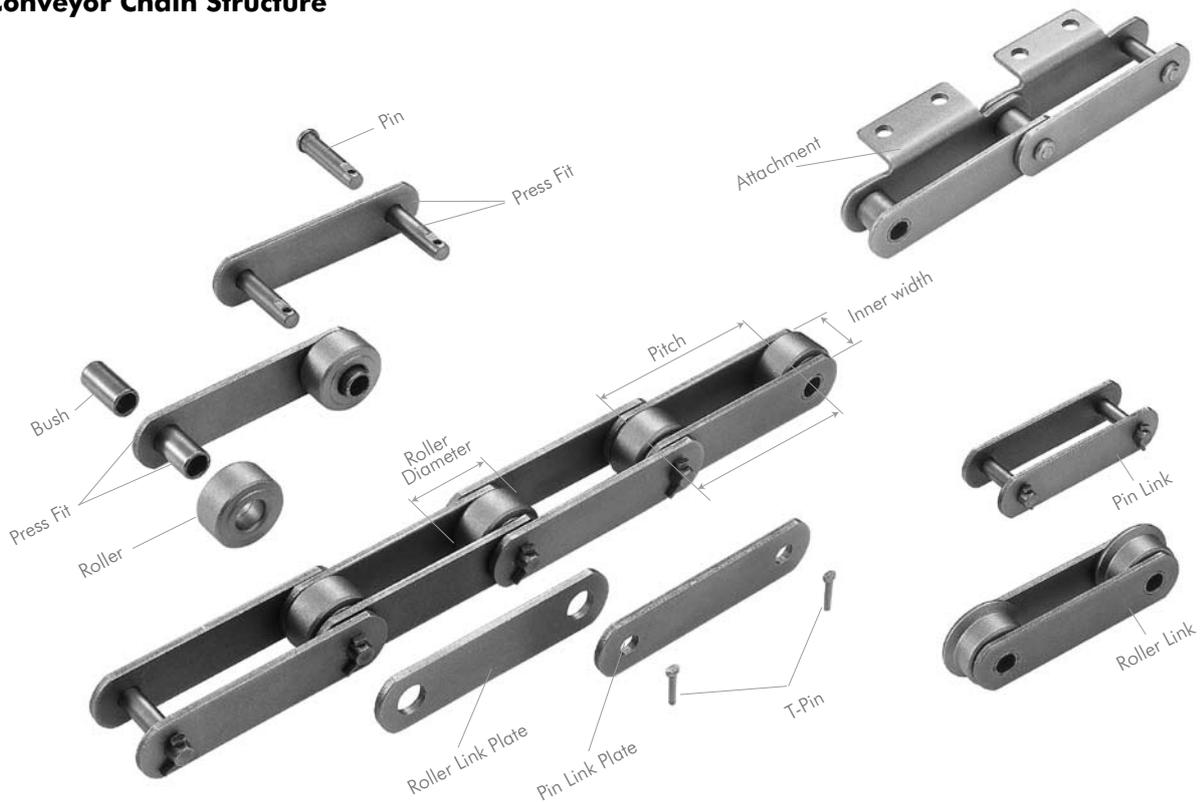
Included in the RF Conveyor Chain series range are chains for special applications such as:

- **Bearing Roller Series:**
Lower coefficient of friction and a larger allowable load
- **Plastic Roller Series:**
Bushes and rollers are maintenance free
- **Plastic Sleeve Series:**
Pins and bushes are maintenance free
- **Free Flow Series:**
Allows you to stop conveyed objects while the chain runs continuously



INTRODUCTION TO TSUBAKI CONVEYOR CHAIN

Conveyor Chain Structure



Conveyor Chain Structure

Basic Parts

Link Plate

Link plates are the component parts receiving chain tension. The holes for press-fitted pins or bushes are accurately punched to maintain uniform pitch.

Roller

Rollers are free to rotate over the bushes. When the chain engages with the sprocket, rollers work as bearings and serve to reduce shock and wear. When the chain is running on rails or wear strips, the rollers reduce running friction on the chain.

Type of Roller

Conveyor Chains have three basis types of rollers. Illustrated below are examples used with guide rails.

1. R Roller

Outside diameter of roller is larger than the height of the link plate, so the chain can roll on the guide rail. R Rollers are suitable for carrying large and heavy materials.



2. F Roller

Flanged rollers serve to retain the chain on the rails. F Rollers are also suitable for carrying large and heavy materials.



3. S, M and N Roller

The outside diameters of the S, M and N rollers are less than the heights of the link plate and are specified depending on the application. The M Roller is a little larger than the S Roller, but the same size as the N Roller. For chains with the N Roller, the pin diameter is a little larger than that of the M Roller Chain.

Bush

Bushes are made to obtain high wear resistance then press-fitted to the roller link plates, providing a bearing surface for pin rotation.

Pin

Pins are made to exact specifications for high strength, sturdiness and wear resistance, then rigidly press-fitted to the link plates. Pins resist shearing force through chain tension and rotate in the bushes, providing bearing surfaces when the chain articulates over a sprocket.

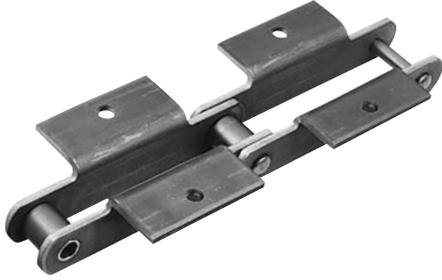
INTRODUCTION TO TSUBAKI CONVEYOR CHAIN

Attachments

Attachments are provided when necessary for fixing items to the chain. According to the application and the size and shape of the material to be conveyed, various types of chain attachments can be provided. Some of them are standardized and known as A, K, GA, SK and SA Attachments. Attachments can be assembled at any required spacing.

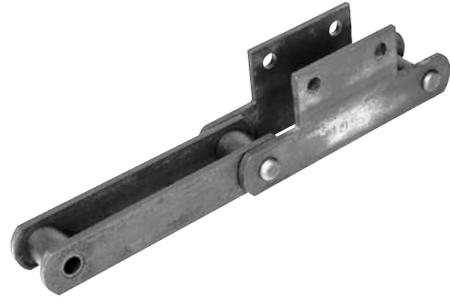
1. K Attachment

K Attachment: bent type link plate on both sides. K-1, K-2, or K-3 indicates K Attachment with one, two or three holes respectively.



4. SK Attachment

SK Attachment: straight attachment on both sides. SK-1 or SK-2 indicates SK Attachment with one or two holes, respectively.



2. A Attachment

A Attachment: bent type link plate on one side only. A-1, A-2, or A3 indicates A Attachment with one, two or three holes, respectively.



5. SA Attachment

SA attachment: straight attachment on one side only. SA-1 or SA-2 indicates SA Attachment with one or two holes, respectively.

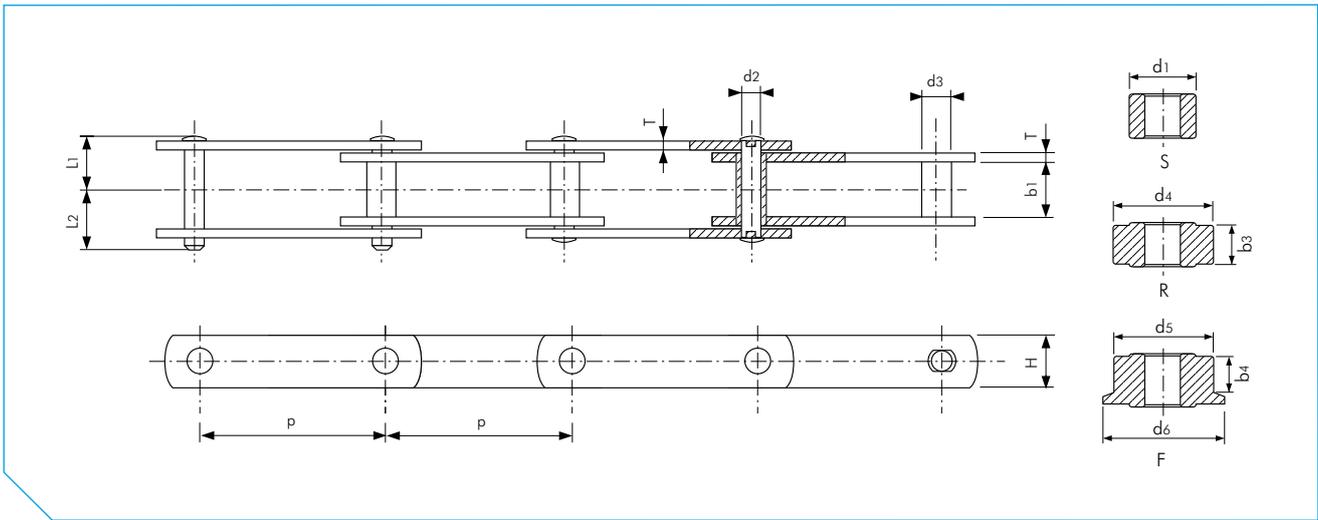


3. GA Attachment

GA Attachment: Link plates with holes. GA-2 or GA-4 indicates GA Attachment with two or four holes, respectively.



DIN STANDARD CONVEYOR CHAIN

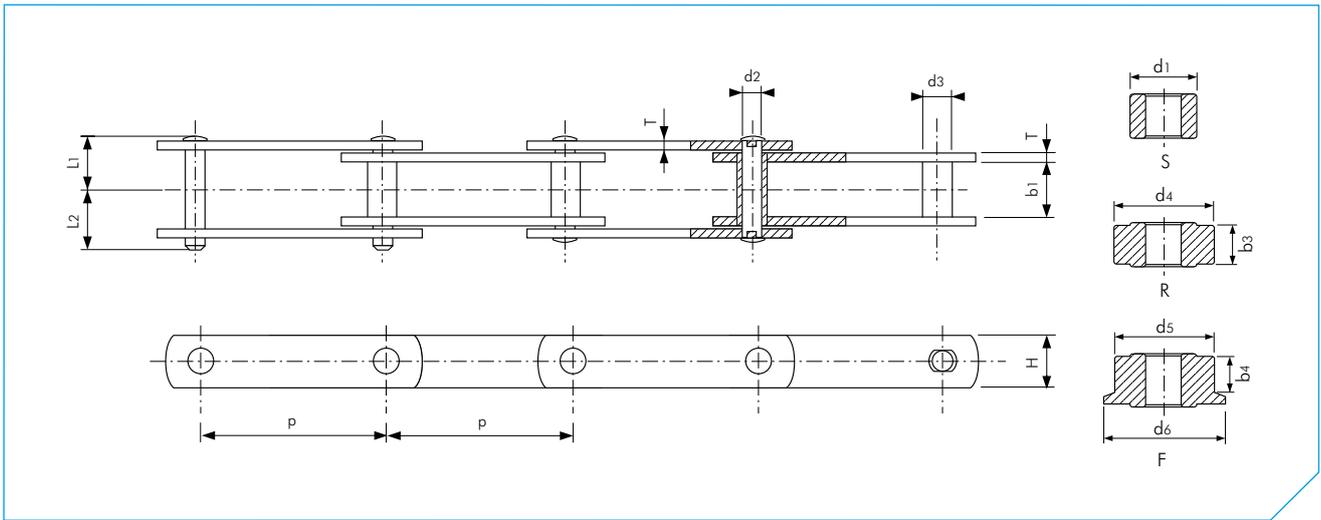


DIN 8167 M Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Roller						Pin			Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass			
				S Roller		R Roller		F Roller		Diameter d2	Length L1	Length L2	Thickness T	Height H		Bush Type	S Roller	R Roller	F Roller
				d1	d4	b3	d5	d6	b4										
M 20	40															1.28	1.44	2.48	2.64
	50															1.16	1.26	2.12	2.25
	63															1.07	1.17	1.83	1.93
	80	16	9	12.5	25	14	25	30	11.0	6.0	17.5	24.5	2.5	18	20	0.99	1.07	1.59	1.67
	100															0.93	1.00	1.41	1.48
	125															0.89	0.94	1.27	1.32
M 28	160															0.85	0.89	1.15	1.19
	50															1.57	1.82	3.18	3.38
	63															1.44	1.64	2.72	2.88
	80	18	10	15	30	16	30	36	12.5	7.0	20	28	3.0	20	28	1.34	1.49	2.34	2.47
	100															1.26	1.38	2.06	2.16
	125															1.19	1.29	1.84	1.92
M 40	160															1.14	1.22	1.64	1.71
	200															1.10	1.16	1.50	1.55
	63															2.23	2.53	4.27	4.52
	80															2.05	2.28	3.65	3.85
	100	20	12.5	18	36	18	36	42	13.5	8.5	22.5	31.5	3.5	25	40	1.91	2.10	3.20	3.35
	125															1.81	1.96	2.83	2.96
M 56	160															1.71	1.83	2.51	2.61
	200															1.64	1.74	2.29	2.36
	250															1.59	1.66	2.10	2.17
	63															3.32	3.78	6.67	7.08
	80															3.01	3.38	5.66	5.98
	100	24	15	21	42	22	42	50	17.0	10	26	36	4.0	30	56	2.79	3.08	4.90	5.16
M 80	125															2.61	2.84	4.30	4.51
	160															2.45	2.63	3.77	3.93
	200															2.33	2.48	3.39	3.52
	250															2.24	2.36	3.09	3.19
	80															4.64	5.24	9.04	9.61
	100	28	18	25	50	26	50	60	20.0	12	31	43	5.0	35	80	4.26	4.74	7.79	8.23
M 112	125															3.96	4.34	6.78	7.14
	160															3.69	3.99	5.90	6.18
	200															3.50	3.75	5.27	5.49
	250															3.35	3.55	4.76	4.94
	315															3.23	3.38	4.35	4.49
	80															6.73	7.79	13.93	14.70
M 160	100	32	21	30	60	29	60	70	22.0	15	36.5	50.5	6.0	40	112	6.13	6.98	11.90	12.52
	125															5.66	6.34	10.27	10.77
	160															5.25	5.78	8.85	9.24
	200															4.95	5.38	7.83	8.14
	250															4.71	5.05	7.02	7.27
	315															4.52	4.79	6.35	6.55
M 200	400															4.36	4.57	5.80	5.96
	100															9.61	11.06	18.76	20.04
	125															8.78	9.94	16.11	17.13
	160															8.06	8.97	13.79	14.85
	200	37	25	36	70	34	70	85	25.5	18	42.5	58.5	7.0	50	160	7.55	8.28	12.13	12.77
	250															7.14	7.72	10.80	11.31
M 250	315															6.80	7.26	9.71	10.11
	400															6.52	6.89	8.81	9.13
	500															6.32	6.61	8.15	8.40

DIN STANDARD CONVEYOR CHAIN

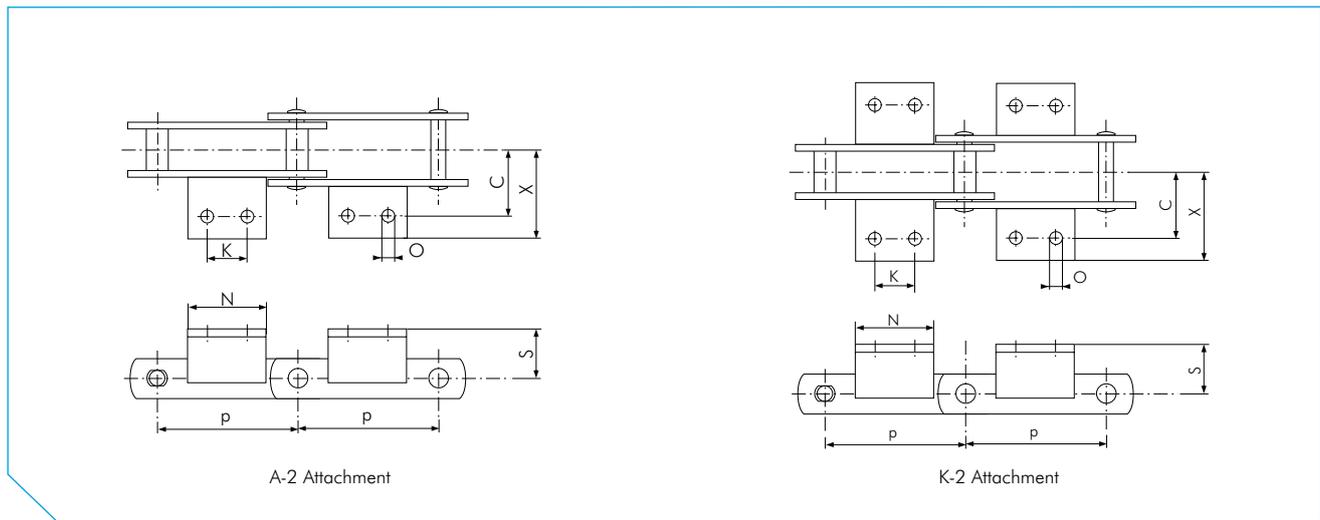


DIN 8167 M Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Roller						Pin			Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass			
				S Roller d1	R Roller d4	F Roller d5, d6, b3			Diameter d2	Length L1	Length L2	Thickness T	Height H	Bush Type kg/m		S Roller kg/m	R Roller kg/m	F Roller kg/m	
M 224	125	43	30	42	85	40	85	100	30.0	21	49	67	8.0	60	224	12.99	14.73	25.69	27.12
	160															11.79	13.16	21.72	22.84
	200															10.94	12.03	18.88	19.78
	250															10.26	11.13	16.61	17.33
	315															9.70	10.93	14.74	15.31
	400															9.24	9.78	13.21	13.66
	500															8.90	9.34	12.07	12.43
	630															8.62	8.96	11.17	11.42
M 315	160	48	36	50	100	45	100	120	33.0	25	56	77	10.0	70	315	18.05	20.18	33.37	35.45
	200															16.64	18.34	28.89	30.56
	250															15.51	16.87	25.31	26.64
	315															14.57	15.66	22.36	23.41
	400															13.81	14.67	19.94	20.77
	500															13.25	13.93	18.15	18.82
	630															12.78	13.32	16.67	17.20
	800															12.78	13.32	16.67	17.20
M 450	200	56	42	60	120	51	120	140	37.0	30	67.5	92.5	12.0	80	450	24.05	27.11	44.43	46.72
	250															22.25	24.70	38.56	40.39
	315															20.77	22.71	33.71	35.17
	400															19.56	21.09	29.75	30.90
	500															18.66	19.89	26.82	27.73
	630															17.92	18.89	24.39	25.12
	800															17.32	18.08	22.41	22.98
	1000															17.32	18.08	22.41	22.98
M 630	250	66	50	70	140	61	140	170	45.0	36	77	107	14.0	100	630	34.58	38.36	60.98	64.63
	315															31.98	34.98	52.93	55.83
	400															29.85	32.22	46.36	48.63
	500															28.28	30.17	41.48	43.30
	630															26.98	28.48	37.46	38.90
	800															25.92	27.10	34.17	35.31
	1000															25.13	26.08	31.73	32.64
	1200															25.13	26.08	31.73	32.64
M 900	250	78	60	85	170	70	170	210	52.0	44	90	127	16.0	120	900	51.04	57.65	96.13	103.81
	315															46.73	51.98	82.52	88.61
	400															43.20	47.34	71.39	76.19
	500															40.59	43.90	63.14	66.98
	630															38.43	41.06	56.33	59.38
	800															36.67	38.74	50.77	53.17
	1000															35.37	37.02	46.64	48.56
	1200															35.37	37.02	46.64	48.56

DIN STANDARD CONVEYOR CHAIN

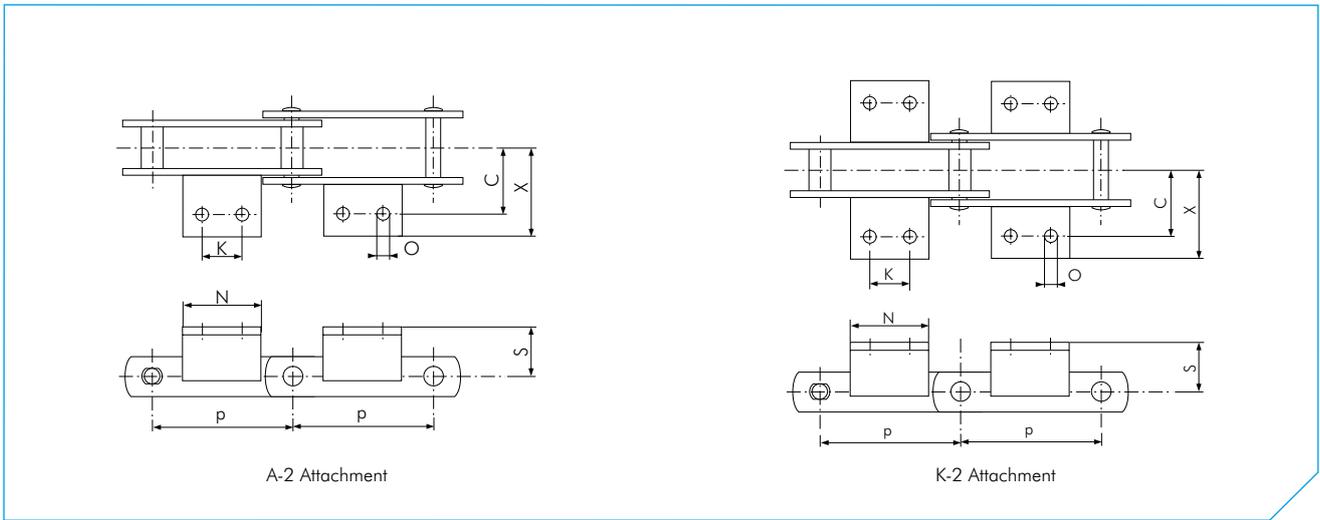


DIN 8167 M Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Attachment Dimensions						Welded attachment dimensions
		C	K	N	O	S	X	
M 20	40	27	-	14	6.6	16	42	L25x25x3
	50		-	14				
	63		20	35				
	80		35	50				
	100		50	65				
	125		50	65				
M 28	50	32	-	20	9.0	20	50	L20x30x3
	63		-	20				
	80		25	45				
	100		40	60				
	125		65	85				
	160		65	85				
M 40	63	35	-	20	9.0	25	56	L30x30x3
	80		20	40				
	100		40	60				
	125		65	85				
	160		65	85				
	200		65	85				
M 56	250	44	65	85	11.0	30	70	L40x40x4
	63		-	22				
	80		-	22				
	100		25	50				
	125		50	75				
	160		85	110				
M 80	200	48	85	110	11.0	35	80	L40x40x4
	250		85	110				
	80		-	22				
	100		-	22				
	125		50	75				
	160		85	110				
M 112	200	55	125	150	14.0	40	92	L50x50x6
	250		125	150				
	315		125	150				
	400		100	130				
	100		-	30				
	125		-	30				
M 160	160	62	50	80	14.0	45	100	L50x50x6
	200		85	115				
	250		145	175				
	315		145	175				
	400		145	175				
	500		145	175				

DIN STANDARD CONVEYOR CHAIN

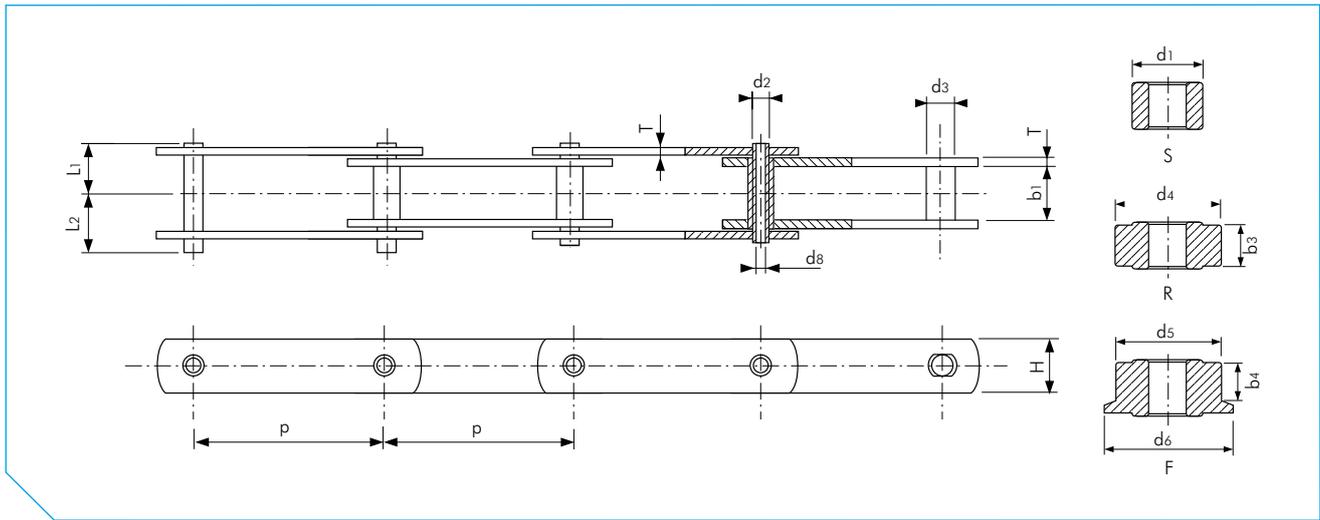


DIN 8167 M Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch	Attachment Dimensions						Welded attachment dimensions
	p	C	K	N	O	S	X	
M 224	125	70	-	35	18.0	55	114	L60x60x8
	160		-	35				
	200		65	100				
	250		125	160				
	315		190	225				
	400		190	225				
	500		190	225				
M 315	630	80	190	225	18.0	65	125	L70x70x9
	160		-	35				
	200		50	85				
	250		100	135				
	315		155	190				
	400		155	190				
	500		155	190				
M 450	630	90	155	190	18.0	75	140	L70x70x9
	200		-	40				
	250		85	125				
	315		155	195				
	400		240	280				
	500		240	280				
	630		240	280				
M 630	800	115	240	280	24.0	90	190	L100x100x12
	250		-	50				
	315		100	150				
	400		190	240				
	500		300	350				
	630		300	350				
	800		300	350				
M 900	1000	140	300	350	30.0	110	240	L120x120x15
	250		-	60				
	315		65	125				
	400		155	215				
	500		240	300				
	630		240	300				
	800		240	300				

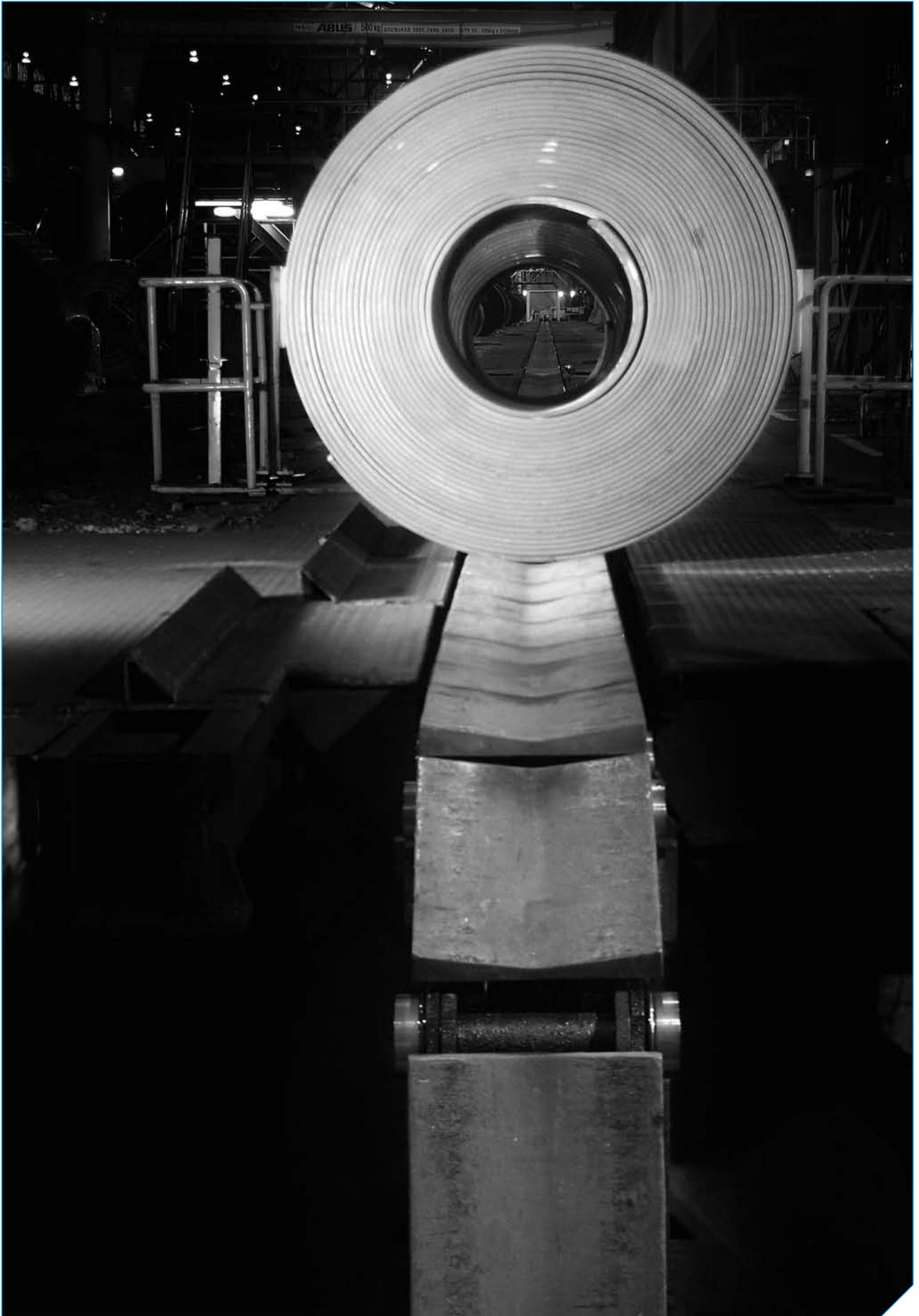
DIN STANDARD CONVEYOR CHAIN



DIN 8168 MC Series (Hollow Pin)

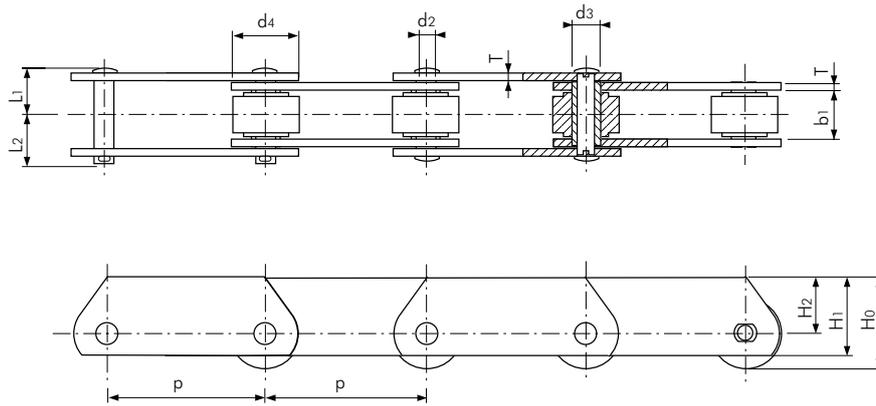
Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Hollow Pin d8	Bush Diameter d3	Roller						Pin			Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass			
					S Roller d1	R Roller d4	F Roller d5, d6, b4			Diameter d2	Length L1	Length L2	Thickness T	Height H	Bush Type		S Roller	R Roller	F Roller	
					kg/m	kg/m	kg/m	kg/m												
MC 28	63	20	8.2	17.5	25	36	18	36	42	13.5	13.0	19.5	23	3.5	25	28	2.27	2.86	4.05	4.29
	80																2.08	2.55	3.48	3.67
	100																1.94	2.31	3.06	3.21
	125																1.83	2.12	2.72	2.84
	160																1.73	1.96	2.43	2.52
MC 56	80	24	10.2	21.0	30	50	22	50	60	17.0	15.5	22.5	26.5	4.0	35	56	3.67	4.45	7.18	7.66
	100																3.37	4.00	6.19	6.57
	125																3.14	3.64	5.39	5.69
	160																2.93	3.32	4.69	4.93
	200																2.79	3.10	4.19	4.38
MC 112	100	32	14.3	29.0	42	70	29	70	85	22.0	22.0	31.25	36.05	6.0	50	112	7.99	9.70	15.40	16.46
	125																7.33	8.70	13.26	14.11
	160																6.76	7.83	11.39	12.05
	200																6.35	7.20	10.05	10.59
	250																6.02	6.71	8.99	9.41
MC 224	160	43	20.3	41.0	60	100	40	100	120	30	31.0	41	46.5	8.0	70	224	14.16	17.20	27.17	28.91
	200																13.09	15.52	23.49	24.88
	250																12.23	14.18	20.55	21.67
	315																11.52	13.06	18.13	19.01
	400																10.94	12.16	16.14	16.84
500	10.51	11.48	14.67	15.23																



Coil Conveyor Chain

DIN STANDARD CONVEYOR CHAIN

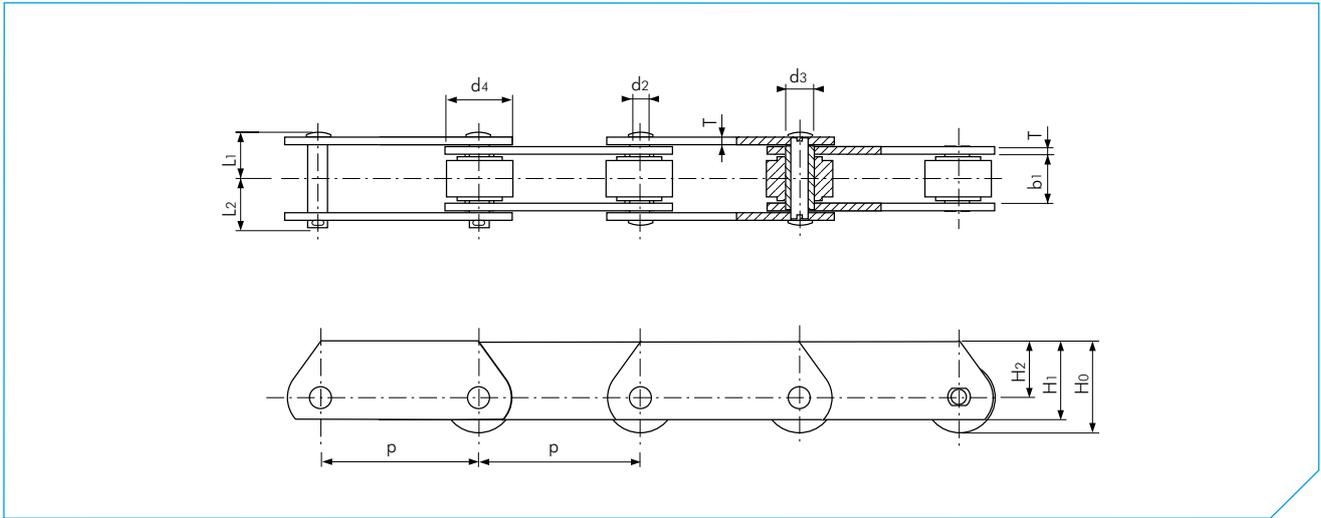


DIN 8167 MT Series (Deep Link)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Roller		Pin		Chain Height H0	Link Plate			Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
				R Roller d4	Diameter d2	Length L1	Length L2		Thickness T	Height H1	Height H2		
MT 20	40	16	9.0	25	6.0	17.5	24.5	28.5	2.5	25	16.0	20	3.01
	50												2.61
	63												2.27
	80												2.00
	100												1.79
	125												1.63
MT 28	160	18	10.0	30	7.0	20.0	28.0	35.0	3.0	30	20.0	28	1.49
	50												4.02
	63												3.48
	80												3.04
	100												2.71
	125												2.45
MT 40	160	20	12.5	36	8.5	22.5	31.5	40.5	3.5	36	22.5	40	2.23
	200												2.06
	250												2.00
	63												5.29
	80												4.58
	100												4.05
MT 56	125	24	15.0	42	10.0	26.0	36.0	51.0	4.0	42	30.0	56	3.62
	160												3.25
	200												2.99
	250												2.77
	63												8.39
	80												7.21
MT 80	100	28	18.0	50	12.0	31.0	43.0	57.5	5.0	50	32.5	80	6.33
	125												5.63
	160												5.02
	200												4.58
	250												4.23
	315												4.05
MT 112	80	32	21.0	60	15.0	36.5	50.5	70.0	6.0	60	40.0	112	11.17
	100												9.72
	125												8.56
	160												7.55
	200												6.82
	250												6.24
MT 160	315	37	25.0	70	18.0	42.5	58.5	80.0	7.0	70	45.0	160	5.76
	80												17.51
	100												15.14
	125												13.24
	160												11.58
	200												10.39
MT 200	250	42	30.0	84	24.0	52.0	72.0	105.0	8.0	84	60.0	200	9.45
	315												8.66
	100												23.03
	125												19.96
	160												17.28
	200												15.36
MT 250	250	47	35.0	91	26.0	61.0	81.0	120.0	9.0	91	70.0	250	13.83
	315												12.56
	100												28.66
	125												24.88

DIN STANDARD CONVEYOR CHAIN

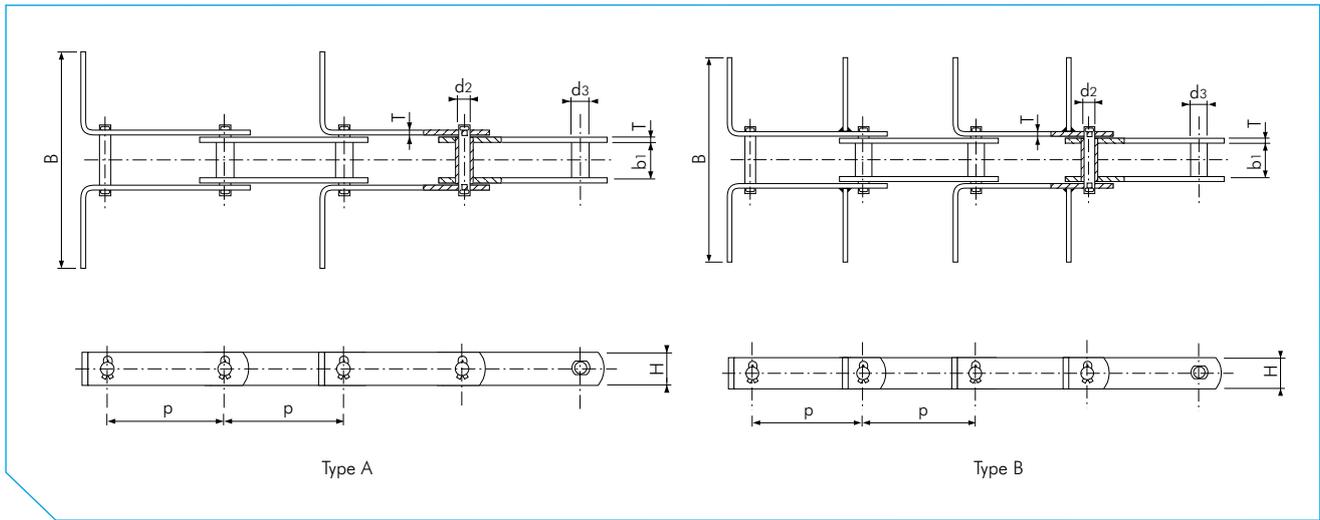


DIN 8167 MT Series (Deep Link)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Roller		Pin		Chain Height H0	Link Plate			Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
				R Roller d4	Diameter d2	Length L1	Length L2		Thickness T	Height H1	Height H2		
MT 224	125	43	30.0	85	21.0	49.0	67.0	102.5	8.0	90	60	224	32.31
	160												27.72
	200												24.44
	250												21.81
	315												19.64
MT 315	400	48	36.0	100	25.0	56.0	77.0	115.0	10.0	100	65.0	315	17.87
	160												41.52
	200												36.36
	250												32.23
	315												28.82
MT 450	400	56	42.0	120	30.0	67.5	92.5	140.0	12.0	120	80.0	450	26.03
	200												56.92
	250												50.06
	315												44.39
	400												39.76
MT 630	500	66	50.0	140	36.0	77.0	107.0	160.0	14.0	140	90.0	630	36.33
	250												75.88
	315												66.58
	400												58.97
MT 900	500	78	60.0	170	44.0	90.0	127.0	205.0	16.0	180	120.0	900	53.33
	250												123.44
	315												107.30
	400												94.10
	500												84.33

DIN STANDARD CONVEYOR CHAIN

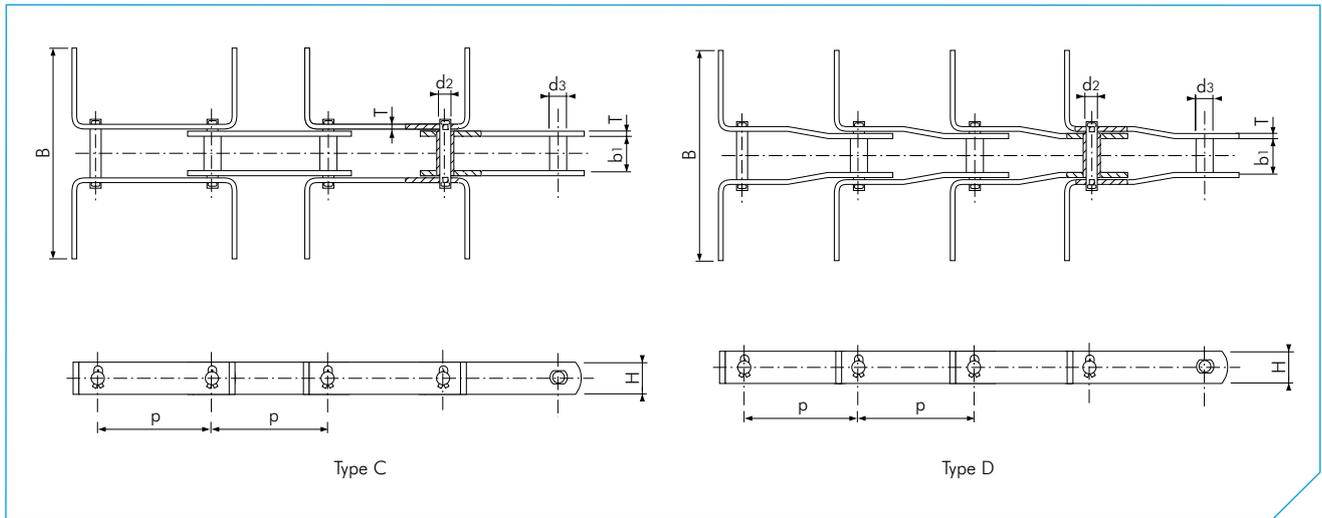


DIN 8167 TFM Series (Scraper type)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Pin Diameter d2	Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass without scraper kg/m
					Thickness T	Height H		
TFM 20	40	16	9.0	6.0	2.5	18	20	1.28
	50							1.16
	63							1.07
	80							0.99
	100							0.93
	125							0.89
TFM 28	160	18	10.0	7.0	3.0	20	28	0.85
	50							1.57
	63							1.44
	80							1.34
	100							1.26
	125							1.19
TFM 40	160	20	12.5	8.5	3.5	25	40	1.14
	200							1.10
	250							1.23
	63							2.05
	80							1.91
	100							1.81
TFM 56	125	24	15.0	10.0	4.0	30	56	1.71
	160							1.64
	200							1.59
	250							3.32
	80							3.01
	100							2.79
TFM 80	125	28	18.0	12.0	5.0	35	80	2.61
	160							2.45
	200							2.33
	250							2.24
	80							4.64
	100							4.26
TFM 112	125	32	21.0	15.0	6.0	40	112	3.96
	160							3.69
	200							3.50
	250							3.35
	315							3.23
	400							3.23
TFM 160	80	37	25.0	18.0	7.0	50	160	6.73
	100							6.13
	125							5.66
	160							5.25
	200							4.95
	250							4.71
TFM 160	315	37	25.0	18.0	7.0	50	160	4.52
	400							4.36
	500							9.61
	100							8.78
	125							8.06
	160							7.55
TFM 160	200	37	25.0	18.0	7.0	50	160	7.14
	250							6.80
	315							6.52
	400							6.52
	500							6.32

DIN STANDARD CONVEYOR CHAIN



DIN 8167 TFM Series (Scraper type)

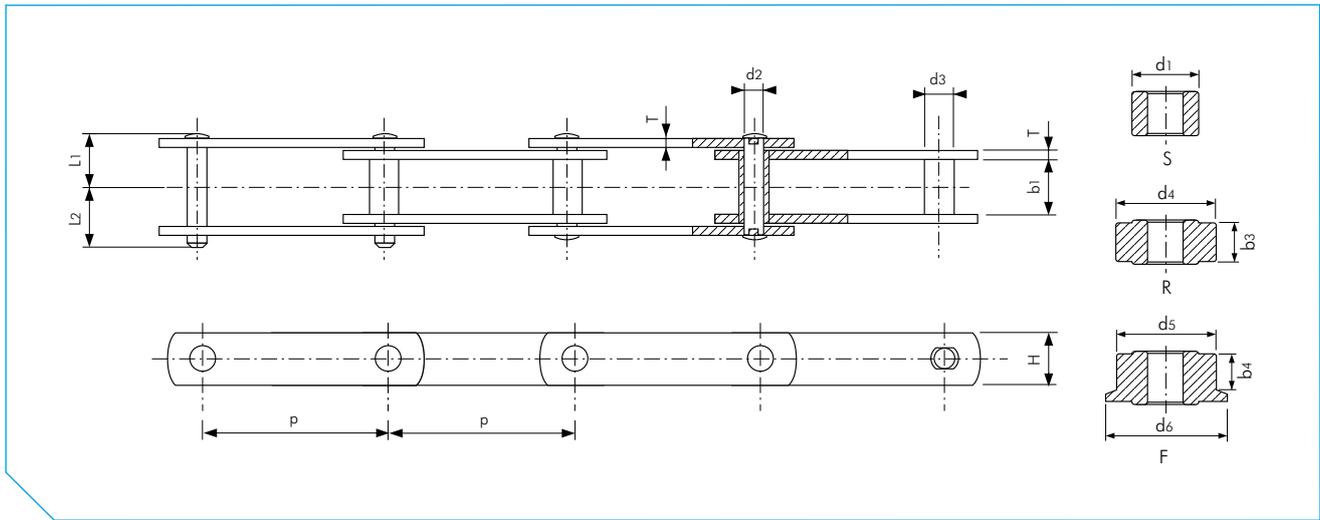
Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Pin Diameter d2	Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass without scraper kg/m
					Thickness T	Height H		
TFM 224	125	43	30.0	21.0	8.0	60	224	12.99
	160							11.79
	200							10.94
	250							10.26
	315							9.70
	400							9.24
TFM 315	500	48	36.0	25.0	10.0	70	315	8.90
	630							8.62
	160							18.05
	200							16.64
	250							15.51
	315							14.57
TFM 450	400	56	42.0	30.0	12.0	80	450	13.81
	500							13.25
	630							12.78
	200							24.05
	250							22.25
	315							20.77
TFM 630	400	66	50.0	36.0	14.0	100	630	19.56
	500							18.66
	630							17.92
	800							17.32
	250							34.58
	315							31.98
TFM 900	400	78	60.0	44.0	16.0	120	900	29.85
	500							28.28
	630							26.98
	800							25.92
	1000							25.13
	250							51.04

Note:

1) Dimension 'B' see drawing, to be specified by customer.

DIN STANDARD CONVEYOR CHAIN

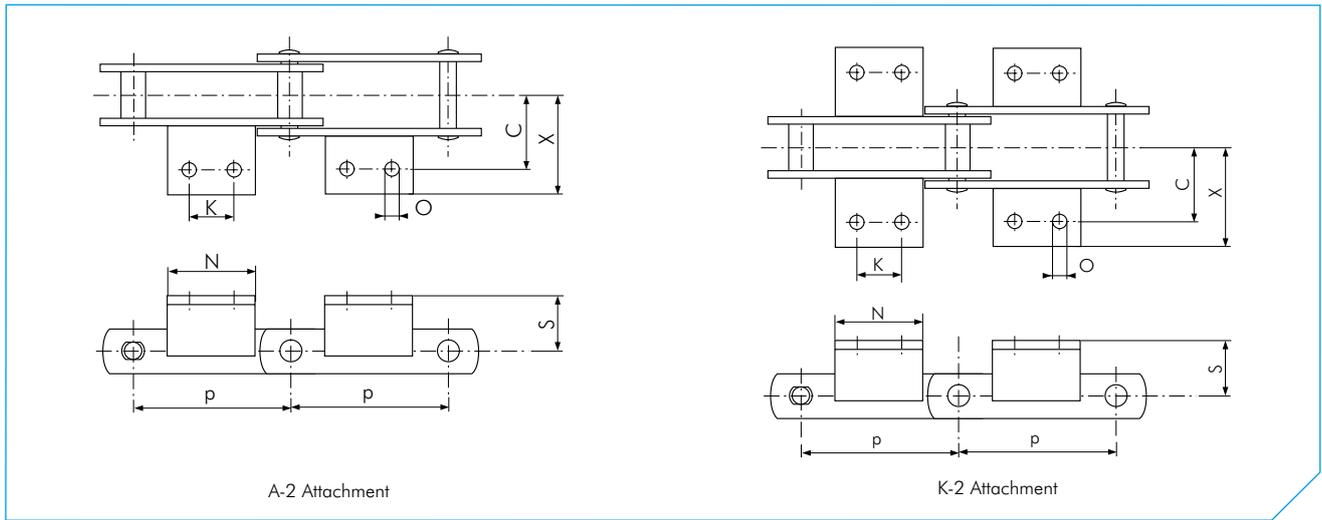


DIN 8165 FV Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Roller						Pin			Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass				
				S Roller		R Roller		F Roller		Diameter d2	Length L1	Length L2	Thickness T	Height H		Bush Type	S Roller kg/m	R Roller kg/m	F Roller kg/m	
				d1	d4	b3	d5	d6	b4											
FV 40	40	18	15	20	32	16	-	-	-	10.0	18.5	22	3.0	26	40	-	-	-	-	
	63						2.70	3.13	4.71							2.16	2.43	3.44	4.62	
	100						1.82	1.99	2.62							3.37	1.82	1.99	2.62	3.37
	63						3.52	4.21	6.04							8.35				
FV 63	100	22	18	26	40	20	50	60	15.0	12.0	23	27.5	4.0	30	63	2.91	3.35	4.50	5.96	
	125															2.71	3.06	3.98	5.14	
	160															2.53	2.80	3.52	4.43	
	63															5.28	6.42	9.61	-	
FV 90	100	25	20	30	48	23	63	73	18.0	14.0	26.5	31	5.0	35	90	4.34	5.06	7.07	9.87	
	125															4.03	4.60	6.21	8.44	
	160															3.75	4.19	5.45	7.20	
	200															3.55	3.90	4.91	6.31	
FV 112	250	30	22	32	55	28	72	87	21.5	16.0	31.5	36	6.0	40	112	3.39	3.67	4.48	5.59	
	100															6.17	7.11	10.60	15.28	
	125															5.69	6.44	9.23	12.98	
	160															5.27	5.86	8.04	10.96	
FV 140	200	35	26	36	60	32	80	95	25.0	18.0	34	40	6.0	45	140	4.97	5.44	7.18	9.53	
	250															4.73	5.10	6.50	8.37	
	100															7.61	8.87	13.50	20.16	
	125															6.94	7.94	11.65	16.97	
FV 180	160	45	30	42	70	42	100	120	34.0	20.0	43	50	8.0	50	180	6.35	7.13	10.03	14.19	
	200															5.92	6.55	8.87	12.20	
	250															5.59	6.09	7.95	10.61	
	315															5.31	5.71	7.18	9.29	
FV 250	400	55	36	50	80	50	125	145	40.0	26.0	49	57	8.0	60	250	10.78	12.61	19.18	31.44	
	160															9.80	11.23	16.36	25.94	
	200															9.09	10.24	14.34	22.01	
	250															8.53	9.45	12.73	18.86	
FV 315	315	65	42	60	90	60	140	170	48.0	30.0	58.5	66.5	10.0	70	315	8.07	8.79	11.40	16.27	
	400															7.69	8.26	10.31	14.14	
	160															14.78	17.92	27.75	-	
	200															13.19	15.65	23.33	43.09	
FV 400	200	70	44	60	100	64	150	185	52.0	32.0	65.5	75.5	12.0	70	400	12.06	14.03	20.17	35.98	
	250															11.16	12.73	17.65	30.29	
	315															10.41	11.66	15.56	25.60	
	400															9.80	10.78	13.85	21.76	
FV 500	160	80	50	70	110	72	160	195	57.0	36.0	70.5	80.5	12.0	80	500	20.38	24.84	35.44	-	
	200															18.50	22.07	30.55	55.02	
	250															17.00	19.85	26.64	46.21	
	315															15.76	18.02	23.41	38.94	
FV 630	400	90	56	80	120	80	170	210	62.0	42.0	76.5	86.5	12.0	100	630	14.75	16.53	20.77	33.00	
	160															24.27	28.62	44.46	-	
	200															22.05	25.53	38.21	67.95	
	250															20.28	23.06	33.20	57.00	
FV 630	315	90	56	80	120	80	170	210	62.0	42.0	76.5	86.5	12.0	100	630	18.81	21.02	29.07	47.96	
	400															17.62	19.36	25.70	40.57	
	160															30.40	37.61	57.75	-	
	200															27.34	33.11	49.21	85.71	
FV 630	250	90	56	80	120	80	170	210	62.0	42.0	76.5	86.5	12.0	100	630	24.88	29.50	42.38	71.59	
	315															22.86	26.52	36.75	59.92	
	400															21.20	24.09	32.14	50.39	
	500															19.98	22.29	28.73	43.33	
FV 630	200	90	56	80	120	80	170	210	62.0	42.0	76.5	86.5	12.0	100	630	36.96	45.82	66.24	-	
	250															33.34	40.42	56.76	92.74	
	315															30.34	35.97	48.93	77.49	
	400															27.90	32.33	42.54	65.03	
500	26.09	29.63	37.80	55.79																

DIN STANDARD CONVEYOR CHAIN



A-2 Attachment

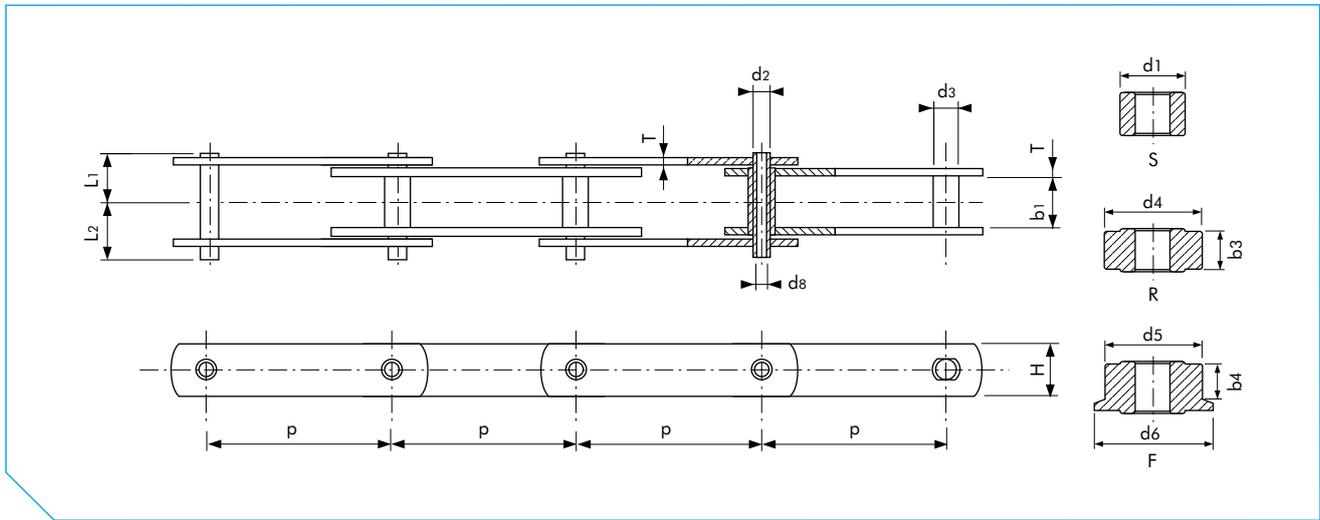
K-2 Attachment

DIN 8165 FV Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Attachment Dimensions								Bracket DIN 1028
		C	2C	K	N	O	S	X	2X (max.)	
FV 40	63	25	50	-	31	6.6	20	50	100	25x25x3
	100			30	40					
FV 63	63	34	68	-	40	9.0	30	55	110	30x30x3
	100			30	50					
	125			40	60					
	160			50	70					
FV 90	100	40	80	30	50	9.0	35	65	130	40x40x4
	125			40	60					
	160			50	70					
	200			60	80					
FV 112	250	50	100	65	85	11.0	40	70	140	40x40x5
	100			30	50					
	125			40	65					
	160			50	75					
FV 140	200	50	100	65	90	11.0	45	85	170	50x50x5
	250			80	105					
	315			100	125					
	400			125	150					
FV 180	125	64	128	35	65	13.5	45	95	190	50x50x6
	160			50	80					
	200			65	95					
	250			80	110					
FV 250	315	69	138	100	130	13.5	55	115	230	65x65x7
	400			100	130					
	125			-	50					
	160			50	80					
FV 315	200	85	170	65	95	13.5	60	130	260	70x70x9
	250			80	110					
	315			100	130					
	400			100	130					
FV 400	160	95	190	-	50	17.5	65	145	290	80x80x10
	200			60	100					
	250			80	120					
	315			100	140					
FV 500	400	100	200	100	140	17.5	70	300	300	80x80x10
	160			-	50					
	200			50	90					
	250			80	120					
FV 630	315	115	230	100	140	17.5	80	175	350	100x100x10
	400			100	140					
	250			70	110					
	500			100	140					

DIN STANDARD CONVEYOR CHAIN

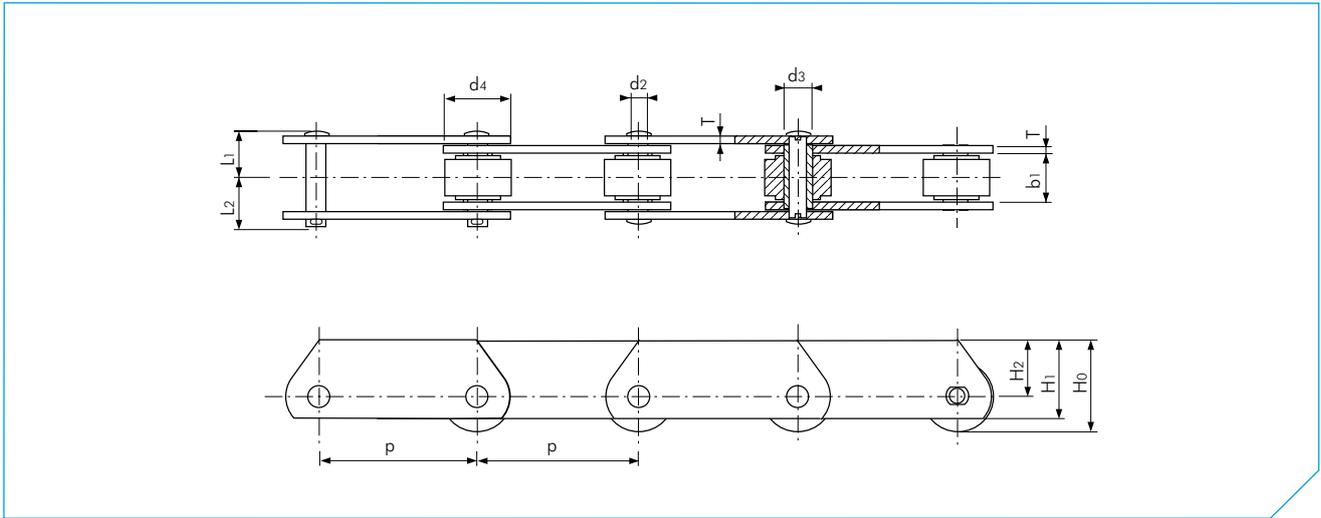


DIN 8165 FVC Series (Hollow Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Hollow Pin d8	Bush Diameter d3	Roller						Pin			Link Plate			Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass			
					S Roller d1	R Roller d4	F Roller d5, d6, b4			Diameter d2	Length L1	Length L2	Length L1+L2	Thickness T	Height H	Without Roller kg/m		S Roller kg/m	R Roller kg/m	F Roller kg/m	
FVC 40	40	18	6.0	15	20	32	16	40	40	48	10	17.3	20.8	38.1	3.0	26	30	2.54	2.96	4.54	-
	63																	2.06	2.33	3.33	4.52
	100																	1.75	1.92	2.55	3.30
FVC63	63	22	8.0	18	26	40	20	50	50	60	12.0	21.5	25.0	46.5	4.0	30	38	3.28	3.97	5.80	8.11
	100																	2.76	3.20	4.35	5.81
	125																	2.59	2.94	3.86	5.02
FVC 90	160	25	10.0	20	30	48	23	63	63	73	14.0	25.25	28.75	54.0	5.0	35	45	2.43	2.71	3.43	4.34
	63																	4.84	5.98	9.17	-
	100																	4.07	4.78	6.79	9.59
FVC 112	125	30	10.0	22	32	55	28	72	72	87	16.0	29.75	33.75	63.5	6.0	40	74	3.80	4.38	5.98	8.22
	160																	3.57	4.02	5.28	7.02
	200																	3.41	3.76	4.77	6.17
FVC 140	250	35	12.0	26	36	60	32	80	80	95	18.0	32.25	36.25	68.5	6.0	45	85	3.28	3.56	4.37	5.48
	100																	5.84	6.78	10.27	14.95
	125																	5.43	6.18	8.97	12.71
FVC 180	160	45	14.0	30	42	70	42	100	100	120	20.0	42.0	46.5	88.5	8.0	50	96	5.06	5.65	7.83	10.76
	200																	4.80	5.27	7.02	9.36
	250																	4.60	4.97	6.37	8.24
FVC 250	315	55	18.0	36	50	80	50	125	125	145	26.0	47.0	52.0	99.0	8.0	60	166	7.09	8.34	12.98	19.63
	160																	6.52	7.52	11.23	16.55
	200																	6.02	6.81	9.70	13.86
FVC 315	250	65	20.0	42	60	90	60	140	140	170	30.0	56.0	61.5	117.5	10.0	70	236	5.66	6.29	8.61	11.94
	315																	5.38	5.88	7.74	10.40
	400																	5.14	5.54	7.01	9.13
FVC 400	160	70	22.0	44	60	100	64	150	150	185	32.0	62.5	68.5	131.0	12.0	70	254	10.04	11.87	18.44	30.70
	200																	9.22	10.65	15.78	25.36
	250																	8.63	9.77	13.88	21.54
FVC 500	315	80	26.0	50	70	110	72	160	160	195	36.0	67.5	73.5	141.0	12.0	80	292	8.16	9.07	12.36	18.49
	400																	7.77	8.50	11.11	15.97
	500																	7.45	8.03	10.08	13.91
FVC 630	160	90	30.0	56	80	120	80	170	170	210	42.0	72.5	79.0	151.5	12.0	100	407	13.39	16.53	26.36	-
	200																	12.11	14.56	22.25	42.01
	250																	11.19	13.16	19.30	35.11
	315																	10.46	12.03	16.95	29.60
	400																	9.86	11.10	15.01	25.05
	500																	9.36	10.35	13.42	21.32
	200																	18.76	23.22	33.83	-
	250																	17.21	20.78	29.26	53.72
	315																	15.96	18.82	25.60	45.18
	400																	14.94	17.20	22.59	38.12
	500																	14.10	15.88	20.12	32.36
	200																	22.06	26.41	42.26	-
	250																	20.29	23.77	36.45	66.19
	315																	18.87	21.65	31.79	55.59
	400																	17.70	19.91	27.95	46.84
	500																	16.74	18.48	24.82	39.69
	200																	27.07	34.28	54.41	-
	250																	24.67	30.44	46.55	83.05
	315																	22.75	27.36	40.25	69.45
	400																	21.17	24.83	35.06	58.23
	500																	19.87	22.76	30.81	49.06
	200																	18.91	21.22	27.66	42.26
	250																	33.13	41.99	62.41	-
	315																	30.27	37.36	53.70	89.68
	400																	27.91	33.54	46.50	75.06
	500																	25.99	30.41	40.62	63.12
																		24.56	28.10	36.27	54.26

DIN STANDARD CONVEYOR CHAIN

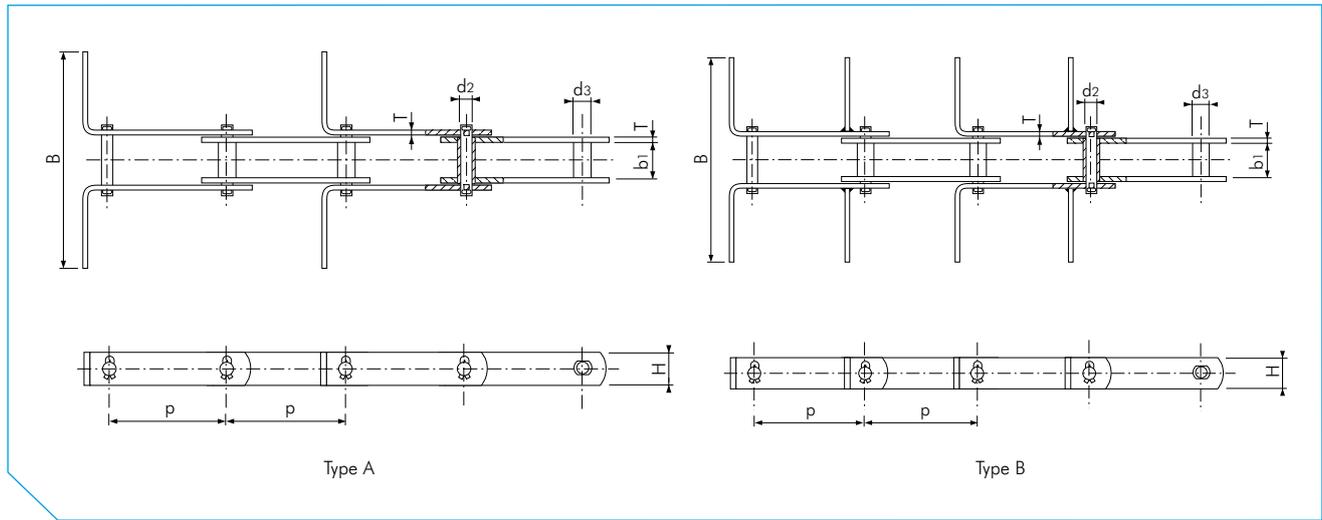


DIN 8165 FVT Series (Deep Link)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Roller		Pin		Chain Height	Link Plate			Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass kg/m
				R Roller d4	Diameter d2	Length L1	Length L2		Thickness T	Height H1	Height H2		
FVT 40	40	18	15	32	10	18.5	22.0	38	3	35	22.0	40	5.54
	63												4.12
	100												3.20
FVT 63	63	22	18	40	12	23.0	27.5	45	4	40	25.0	63	7.13
	100												5.42
	125												4.84
FVT 90	160	25	20	48	14	26.5	31.0	51.5	5	45	27.5	90	4.33
	63												11.15
	100												8.33
FVT 112	125	30	22	55	16	31.5	36.0	57.5	6	50	30.0	112	7.37
	160												6.53
	200												5.93
FVT 140	250	35	26	60	18	34.0	40.0	67.5	6	60	37.5	140	5.45
	100												12.28
	125												10.76
FVT 180	160	45	30	70	20	43.0	50.0	80	8	70	45.0	180	9.44
	200												8.49
	250												7.74
FVT 250	315	55	36	80	26	49.0	57.0	90	8	80	50.0	250	15.91
	125												13.86
	160												12.06
FVT 315	200	65	42	90	30	58.5	66.5	100	10	90	55.0	315	10.78
	250												9.75
	315												8.91
FVT 400	400	70	44	100	32	65.5	75.5	105	12	90	55.0	400	23.09
	160												19.96
	200												17.73
FVT 500	250	80	50	110	36	70.5	80.5	115	12	100	60.0	500	27.26
	160												23.82
	200												21.06
FVT 630	315	90	56	120	42	76.5	86.5	130	12	120	70.0	630	18.79
	400												16.93
	500												16.19

DIN STANDARD CONVEYOR CHAIN

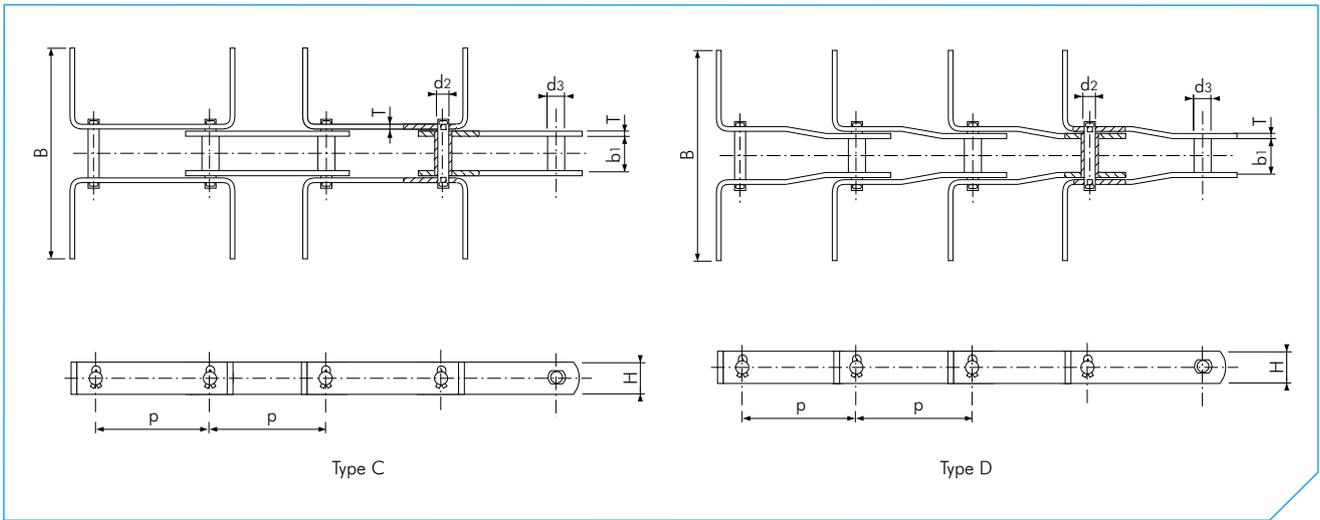


DIN 8165 TF Series (Scraper Type)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Pin Diameter d2	Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass without scraper kg/m
					Thickness T	Height H		
TF 40	40	18	15	10	3	26	40	2.70
	63							2.16
	100							1.82
TF 63	63	22	18	12	4	30	63	3.52
	100							2.91
	125							2.71
	160							2.53
TF 90	63	25	20	14	5	35	90	5.28
	100							4.34
	125							4.03
	160							3.75
	200							3.55
TF 112	250	30	22	16	6	40	112	3.39
	100							6.17
	125							5.69
	160							5.27
	200							4.97
TF 140	250	35	26	18	6	45	140	4.73
	100							7.61
	125							6.94
	160							6.35
	200							5.92
TF 180	250	45	30	20	8	50	180	5.59
	315							5.31
	125							10.78
	160							9.80
	200							9.09
	250							8.53
TF 250	315	55	36	26	8	60	250	8.07
	400							7.69
	125							14.78
	160							13.19
	200							12.06
	250							11.16
	315							10.41
	400							9.80

DIN STANDARD CONVEYOR CHAIN



DIN 8165 TF Series (Scraper Type)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Bush Diameter d3	Pin Diameter d2	Link Plate		Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass without scraper kg/m
					Thickness T	Height H		
TF 315	160	65	42	30	10	70	315	20.38
	200							18.50
	250							17.00
	315							15.76
TF 400	400	70	44	32	12	70	400	14.75
	160							24.27
	200							22.05
	250							20.28
TF 500	315	80	50	36	12	80	500	18.81
	400							17.62
	160							30.40
	200							27.34
TF 630	250	90	56	42	12	100	630	24.88
	315							22.86
	400							21.20
	500							19.98
	200							36.96
	250							33.34
	315							30.34
	400							27.90
	500							26.09

LARGE SIZE RF CONVEYOR CHAIN

LINE-UP

Series	Product Name	Features/Application	Special Features	Ambient Temperature Range
General Use	DT Series	Economical, versatile	Heat treated pin and bush	-20°C to 200°C
Wear Resistant/ Heavy Duty	GT Series	Increased wear life between roller - bush	Higher roller load capacity than DT Series	-20°C to 200°C
	AT Series	Compact design	Approximately two times the tensile strength of the DT Series with a higher roller load capacity	-60°C to 400°C
	CT Series	Increased wear life between pin and bush	Special heat treatment on pin and bush	-20°C to 200°C
	BT Series	Optimal for conveying loose materials	Approximately two times the tensile strength of the CT Series	-20°C to 200°C
Long Life Series Bearing Roller Conveyor Chain	Standard Series (original series)	Perfect for direct conveyance of heavy items. Reduces necessary chain size, provides energy and space savings. Used for item conveyance.	Cylindrical bearings inside the roller lowers the coefficient of friction and increases roller load capacity	-20°C to 80°C
	Standard Series (anti-dust series)	Use in environments with dust or airborne particulates		
	Lube Free Series (standard series)	Lube-free version of standard series. Perfect for direct conveyance of heavy items. Reduces necessary chain size, provides energy and space savings. Used for item conveyance.		
	Lube Free Series (water-resistant series)	Perfect for environments where chain is exposed to water		
Corrosion Resistant Series	Stainless Steel DS Series *1 (former NT Series)	Corrosive Resistant, Heat Resistant, Cold Resistant	All parts use SUS400	-70°C to 400°C
	Stainless Steel GS Series *1 (former PT Series)		1.6 times the tensile strength of DS Series	-70°C to 400°C
	Stainless Steel SS Series *1 (former ST Series)		All parts use SUS300	-100°C to 400°C
	MT Series	Slightly water resistant	Pin and bush are SUS400	-20°C to 200°C
	RT Series		Pin, bush, and roller are SUS400	-20°C to 200°C
	YT Series	Perfect for fly ash conveyance	Approximately two times the tensile strength of RT Series	-20°C to 400°C
	N.E.P Series Coated Chain	Treated with a corrosion resistant surface coating (hexavalent chromium-free)	All parts can be treated	-20°C to 200°C

*1. The specification codes for stainless steel Corrosion Resistant Conveyor Chain have been changed as follows: NT→DS, PT→GS, ST→SS.

LARGE SIZE RF CONVEYOR CHAIN

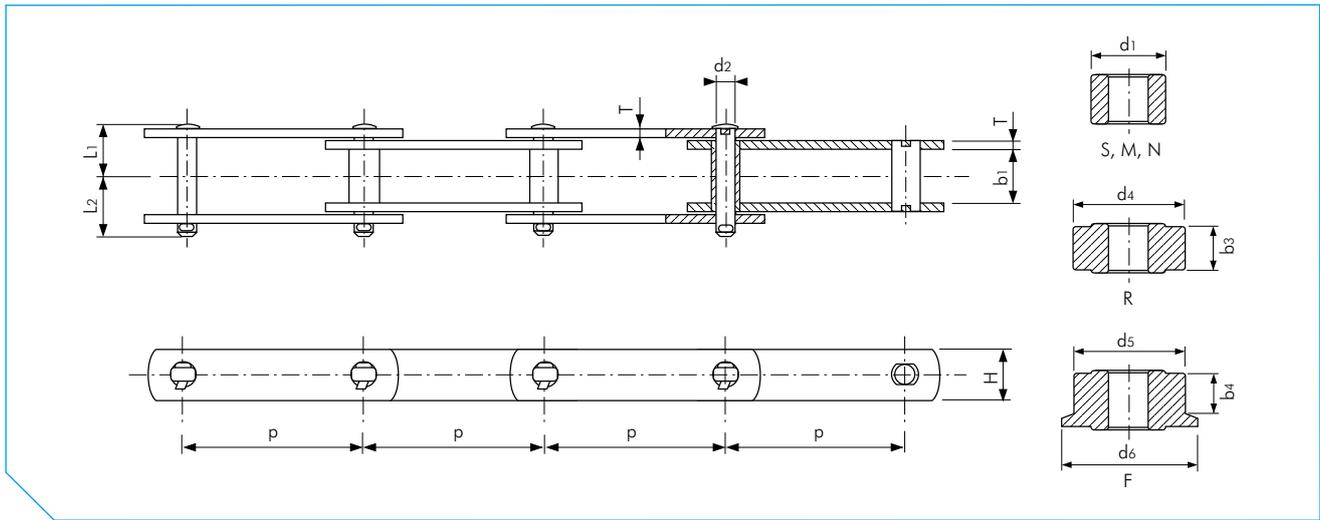
LINE-UP

Series	Product Name	Features/Application	Special Features	Ambient Temperature Range
Specialty Series	Needle Bush Conveyor Chain	Used for high precision positioning in indexing operations and item conveyance	Uses needle bearings between pin and bush, will not elongate	-10°C to 60°C
	Double Plus Conveyor Chain	Can convey as a free flow conveyor chain, as well as accumulate	The combination of large and small diameter rollers allows items to be conveyed 2.3 times the chain speed	-20°C to 200°C
	Top Roller Conveyor Chain		Direct conveyance of items on top rollers	*2.-20°C to 200°C
	Outboard Roller Conveyor Chain		Sprocket engages the chain in the center of the S roller	*2.-20°C to 200°C
	Deep Link Conveyor Chain	Items to be conveyed can be placed directly on the tall plates	Equipped with a R roller with little frictional resistance	*2.-20°C to 200°C
	Lambda Plastic Roller Conveyor Chain	Perfect for use in clean environments	Uses a specially lubricated bush (lube-free)	0°C to 50°C
	Bucket Elevator Conveyor Chain	Specialty chain emphasizing wear resistance and fatigue strength	Optimal material for abrasive environments	-20°C to *3200°C
	Coil Transfer Conveyor Chain	Extremely high stiffness for conveying heavy loads	Uses TSUBAKI's unique cylindrical bearings in the rollers	-20°C to 200°C
	Flow Conveyor Chain	Perfect for conveyance in hermetically sealed cases	Great wear resistance Wide variety of attachment types available	*2.-20°C to 200°C
	Fly Ash Conveyor Chain	Perfect for conveying fly ash	Special surface treatment for increased wear resistance	*2.-20°C to 200°C
	Conveyor Chain for Waste Treatment Plants	Perfect for conveying material from the waste treatment process	Increased wear/corrosion resistance thanks to the right combination of part materials	*2.-20°C to 200°C
	Shoulder Bush Conveyor Chain	Can convey heavier items than the RF Conveyor Chain	Large bush outer diameter, increasing roller load capacity	*2.-20°C to 200°C
	Block Chain		Superior structural stiffness and high tensile strength	Uses two outer plates and one or two inner plates and pin
Block Chain for flow conveyors			Used for conveyance in extreme wear environments	-60°C to 400°C

*2. Usage temperature will change depending on chain specification. The temperature shown is for DT Series.

*3. Y Series is 400°C.

RF STANDARD CONVEYOR CHAIN

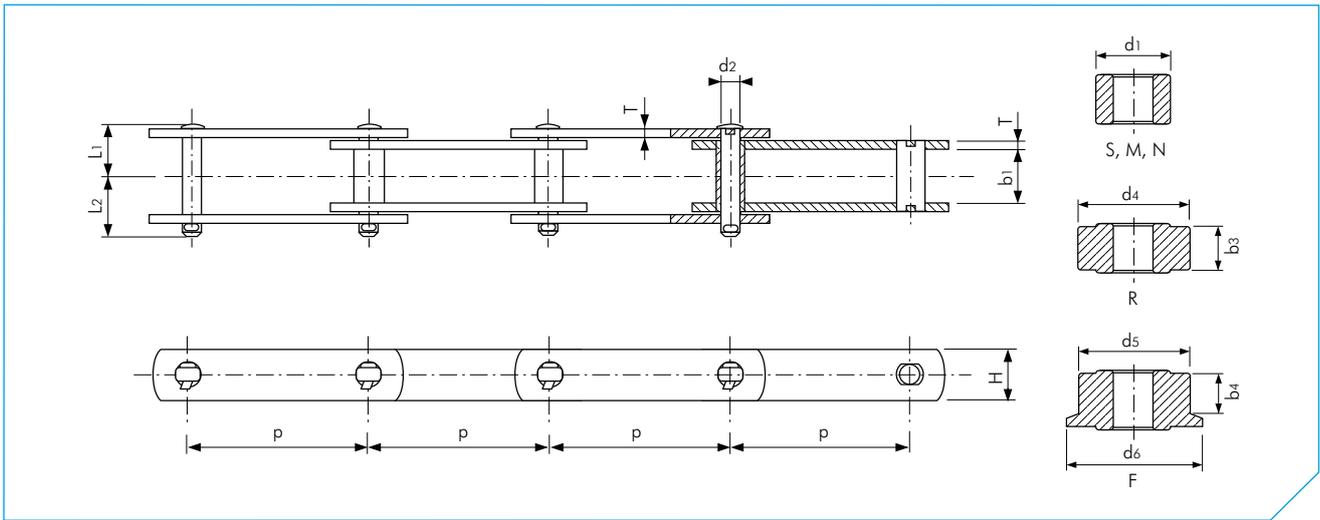


RF Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Type	Inner Width b1	Roller							Pin			Link Plate		Av. Tensile Strength acc. to Tsubaki kN
				S Roller d1	M+N Roller	R Roller		F Roller			Diameter d2	Length L1	Length L2	Thickness T	Height H	
RF03075	75	R.F.S	16.1	15.9	-	31.8	15.5	31.8	42.0	12.0	8.0	18.0	20.0	3.2	22.0	29
RF03100	100															
RF430	101.6	R.S	22.6	20.1	-	38.1	19.0	-	-	-	9.7	25.5	29.5	4.8	25.4	54
RF05075	75	S														
RF05100	100															
RF05125	125	R.F.S	22.0	22.2	-	40.0	19.0	40.0	50.0	14.0	11.3	25.0	28.5	4.5	32.0	69
RF05150	150															
RF204	66.27	S	27.0	22.2	-	-	-	-	-	-	11.3	31.0	34.5	6.3	28.6	
RF450	101.6															
RF08125	125	R.F.S	27.0	22.2	25.4	44.5	23.0	44.5	55.0	18.0	11.3	31.0	34.5	6.3	28.6	78
RF08150	150															
RF650	152.4	R.F.S.M	30.2	25.8	31.8	50.8	26.0	50.8	65.0	20.0	11.3	32.5	36.5	6.3	38.1	
RF10100	100	R.S.M														
RF10125	125	R.F.S.M	30.0	29.0	31.8	50.8	27.0	50.8	65.0	20.0	14.5	33.0	36.0	6.3	38.1	113
RF10150	150															
RF214	101.6	R.S.M	31.6	31.8	34.9	44.5	27.0	-	-	-	15.9	37.5	40.0	7.9	38.1	127
RF205	78.11	S	37.1	31.8	-	-	-	-	-	-	15.9	40.5	43.0	7.9	38.1	
RF6205	152.4	R.F.S.M	37.1	34.9	38.1	57.2	32.0	57.2	70.0	25.0	15.9	40.5	43.0	7.9	44.5	
RF12200	200	R.F.S.M	37.1	34.9	38.1	65.0	32.0	65.0	80.0	24.0	15.9	40.5	43.0	7.9	44.5	186
RF12250	250															
RF212	152.4	R.S.M	37.1	40.1	44.4	69.9	32.5	-	-	-	19.1	44.5	51.0	9.5	50.8	
RF17200	200															
RF17250	250	R.F.S.M	51.4	40.1	44.5	80.0	44.0	80.0	100.0	34.0	19.1	51.5	58.0	9.5	50.8	245
RF17300	300															
RF26200	200	S.M														
RF26250	250															
RF26300	300	R.F.S.M	57.2	44.5	50.8	100.0	50.0	100.0	125.0	38.0	22.2	55.5	61.0	9.5	63.5	314
RF26450	450															
RF36250	250	S.M														
RF36300	300															
RF36450	450	R.F.S.M	66.7	50.8	57.2	125.0	56.0	125.0	150.0	42.0	25.4	68.0	78.0	12.7	76.2	475
RF36600	600															
RF52300	300															
RF52450	450	R.F.S	77.0	57.2	-	140.0	65.0	140.0	170.0	49.0	31.8	82.0	90.0	16.0	76.2	500
RF52600	600															
RF60300	300															
RF60350	350	R.F.N	77.0	-	70.0	140.0	68.0	140.0	170.0	49.0	35.0	77.0	83.5	12.7	90.0	500
RF60400	400															
RF90350	350	N														
RF90400	400	R.F.N	88.0	-	85.0	170.0	76.0	170.0	205.0	56.0	42.0	89.5	100.0	16.0	110.0	789
RF90500	500															
RF120400	400	R.N	100.0	-	100.0	200.0	87.0	-	-	-	50.0	105.5	113.0	19.0	130.0	1 110
RF120600	600	R.F.N														
RF280400	400	N														
RF280600	600	R.N	120.0	-	120.0	220.0	105.0	-	-	-	56.0	118.5	123.5	19.0	160.0	3 040
RF360400	400	N														
RF360600	600	R.N	130.0	-	130.0	230.0	115.0	-	-	-	61.0	126.5	131.5	22.0	170.0	3 629
RF440400	400	N														
RF440600	600	R.N	145.0	-	145.0	250.0	130.0	-	-	-	68.0	140.0	145.0	25.0	185.0	4 462

RF STANDARD CONVEYOR CHAIN

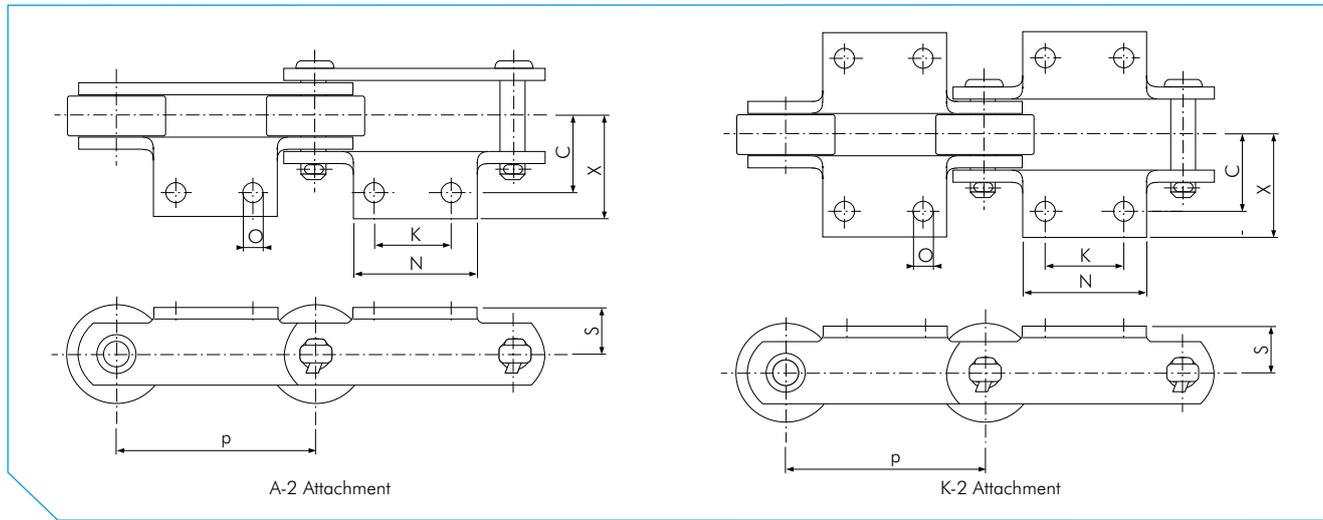


RF Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Approx. Mass				Attachment Type							
	S Roller kg/m	M+N Roller kg/m	R Roller kg/m	F Roller kg/m	A-1 K-1	A-2 K-2	A2 (welded)	A3 (welded)	SA-2 SK-2	GA-2	GA-4	
RF03075	1.9	-	2.7	2.8	R.F.S	R.F.S	-	-	R.S	-	-	
RF03100	1.7	-	2.3	2.4	-	-	-	-	-	-	-	
RF430	3.0	-	4.3	-	R.S	R.S	-	-	R.S	-	-	
RF05075	4.2	-	-	-	S	S	-	-	-	-	-	
RF05100	3.8	-	5.2	5.4	-	-	-	-	-	R.S	-	
RF05125	3.4	-	4.5	4.6	R.F.S	R.F.S	-	-	R.S	R.F.S	-	
RF05150	3.3	-	4.1	4.4	-	-	-	-	-	-	-	
RF204	5.6	-	-	-	S	S	-	-	-	-	-	
RF450	4.6	4.9	6.8	7.2	-	-	-	-	-	-	-	
RF08125	4.2	-	5.9	6.2	-	-	-	-	-	-	-	
RF08150	4.0	4.2	5.5	5.8	R.F.S.M	R.F.S.M	-	-	R.S.M	R.F.S	-	
RF650	6.0	6.4	7.7	8.0	-	-	-	-	-	R.F.S.M	S.M	
RF10100	7.0	7.3	10.0	-	R.S.M	R.S.M	-	-	-	S.M	-	
RF10125	6.3	6.5	8.7	9.0	R.F.S.M	R.F.S.M	-	-	R.S.M	R.F.S.M	S.M	
RF10150	5.9	6.1	8.0	8.3	-	-	-	-	-	-	-	
RF214	8.7	9.1	10.4	-	R.S.M	R.S.M	-	-	R.S.M	-	-	
RF205	10.4	-	-	-	-	S	-	-	-	-	-	
RF6205	9.3	9.6	12.1	12.4	-	-	-	-	-	-	-	
RF12200	8.4	8.7	11.4	11.9	R.F.S.M	R.F.S.M	-	-	R.S.M	R.F.S.M	S.M	
RF12250	7.8	8.0	10.3	10.6	-	-	-	-	-	-	-	
RF212	12.6	13.1	17.1	-	R.S.M	R.S.M	-	-	R.S.M	-	-	
RF17200	12.0	12.6	18.8	19.8	-	-	-	-	-	-	-	
RF17250	11.1	11.6	16.5	17.3	R.F.S.M	R.F.S.M	-	-	-	R.F.S.M	S.M	
RF17300	10.5	10.9	15.0	15.7	-	-	R.F.S.M	-	-	-	-	
RF26200	16.0	17.0	-	-	-	-	S.M	-	-	-	-	
RF26250	14.7	15.5	25.3	26.2	-	-	R.F.S.M	-	-	-	S.M	
RF26300	13.8	14.5	22.3	23.6	-	-	-	-	-	-	-	
RF26450	13.0	13.0	19.0	19.0	-	-	R.F.S.M	R.F.S.M	-	R.F.S.M	S.M	
RF36250	24.4	25.5	-	-	-	-	-	-	-	-	-	
RF36300	22.9	23.8	39.0	40.1	-	-	-	-	-	-	S.M	
RF36450	13.0	13.0	19.0	19.0	-	-	R.F.S.M	R.F.S.M	-	R.F.S.M	-	
RF36600	19.0	19.5	26.9	27.8	-	-	-	-	-	-	-	
RF52300	29.7	-	48.8	52.5	-	-	-	-	-	-	-	
RF52450	26.2	-	37.5	39.3	-	-	R.F.S	R.F	-	R.F.S	-	
RF52600	24.4	-	32.9	34.3	-	-	-	-	-	-	-	
RF60300	-	31.0	52.4	55.1	-	-	-	-	-	-	-	
RF60350	-	28.8	47.2	49.5	-	-	R.F.N	R.F.N	-	-	-	
RF60400	-	27.7	43.8	45.8	-	-	-	-	-	-	-	
RF90350	-	47.6	-	-	-	-	N	-	-	-	-	
RF90400	-	45.1	71.0	74.4	-	-	-	-	-	-	-	
RF90500	-	41.6	62.3	65.0	-	-	R.F.N	R.F.N	-	-	-	
RF120400	-	63.9	105.7	-	-	-	R.N	-	-	-	-	
RF120600	-	55.4	83.3	88.0	-	-	R.F.N	R.F.N	-	-	-	
RF280400	-	90.0	-	-	-	-	-	-	-	-	-	
RF280600	-	75.0	112.0	-	-	-	-	-	-	-	-	
RF360400	-	112.0	-	-	-	-	-	-	-	-	-	
RF360600	-	92.0	135.0	-	-	-	-	-	-	-	-	
RF440400	-	145.0	-	-	-	-	-	-	-	-	-	
RF440600	-	120.0	175.0	-	-	-	-	-	-	-	-	

RF STANDARD CONVEYOR CHAIN



RF Series (Solid Pin)

Dimensions in mm

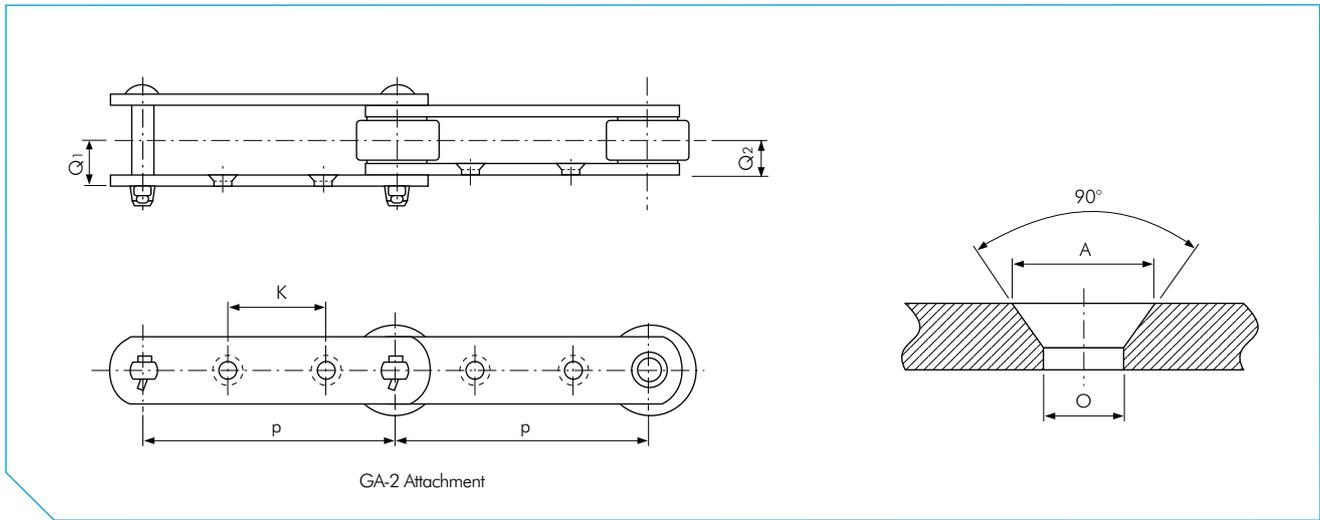
TSUBAKI Chain No.	Pitch p	Roller Type	Attachment Dimensions						Welded attachment dimensions	Additional Mass per attachment kg/Att.
			C	K	N	O	S	X		
RF03075	75	R.F.S	30	30	55	10	20	46	-	0.05
RF03100	100	R.F.S	30	40	65	10	20	46	-	0.06
RF430	101.6	R.S	40	40	70	12	22	54	-	0.11
RF05075	75	S	35	30	55	10	22	52	-	0.07
RF05100	100	R.F.S	35	40	65	10	22	52	-	0.08
RF05150	150	S	35	60	85	10	22	52	-	0.10
RF204	66.27	S	45	-	35	12	24	59	-	0.08
RF450	101.6	R.F.S.M	50	40	70	12	28	64	-	0.18
RF08150	150	R.F.S.M	50	60	90	12	28	64	-	0.22
RF650	152.4	R.F.S.M	50	60	90	12	32	64	-	0.22
RF10100	100	R.S.M	50	40	70	12	28	65	-	0.16
RF10150	150	R.F.S.M	50	60	90	12	28	65	-	0.20
RF214	101.6	R.S.M	55	40	80	15	35	73	-	0.28
RF205	78.11	S	60	30	65	12	35	75	-	0.23
RF6205	152.4	R.F.S.M	60	60	100	15	38	79	-	0.37
RF12200	200	R.F.S.M	60	80	120	15	38	79	-	0.45
RF12250	250	R.F.S.M	60	125	170	15	38	79	-	0.62
RF212	152.4	R.S.M	65	60	100	15	45	83	-	0.49

TSUBAKI Chain No.	Pitch p	Roller Type	Attachment Dimensions						Welded attachment dimensions	Additional Mass per attachment kg/Att.
			C	K	N	O	S	X		
RF17200	200	R.F.S.M	75	80	120	15	45	98	-	0.66
RF17250	250	R.F.S.M	75	125	170	15	45	98	-	0.86
RF17300	300	R.F.S.M	75	180	220	15	45	111	L65X65X6	1.34
RF26300	300	R.F.S.M	80	180	220	15	55	124	L75X75X9	2.22
RF60300	300	R.F.N	115	110	160	24	90	165	L100X100X13	3.30
RF90350	350	N	140	100	180	28	100	210	L130X130X15	5.20
RF90400	400	R.F.N	140	150	230	28	100	210	L130X130X15	6.60
RF120400	400	R.N	150	120	200	28	120	220	L130X130X15	5.80
RF26450	450	R.F.S.M	80	140	320	15	55	124	L75X75X9	3.26
RF36450	450	R.F.S.M	100	140	330	19	70	160	L100X100X10	5.07
RF36600	600	R.F.S.M	100	180	410	19	70	160	L100X100X10	6.26
RF52450	450	R.F	120	140	330	24	80	171	L100X100X13	6.30
RF52600	600	R.F	120	180	410	24	80	171	L100X100X13	7.80
RF60350	350	R.F.N	115	80	220	24	90	165	L100X100X13	4.20
RF60400	400	R.F.N	115	100	260	24	90	165	L100X100X13	6.00
RF90500	500	R.F.N	140	130	340	28	100	210	L130X130X15	9.80
RF120600	600	R.F.N	150	160	400	28	220	220	L130X130X15	11.50

Note:

1. Attachments with one hole A-1/K-1 also available.

RF STANDARD CONVEYOR CHAIN

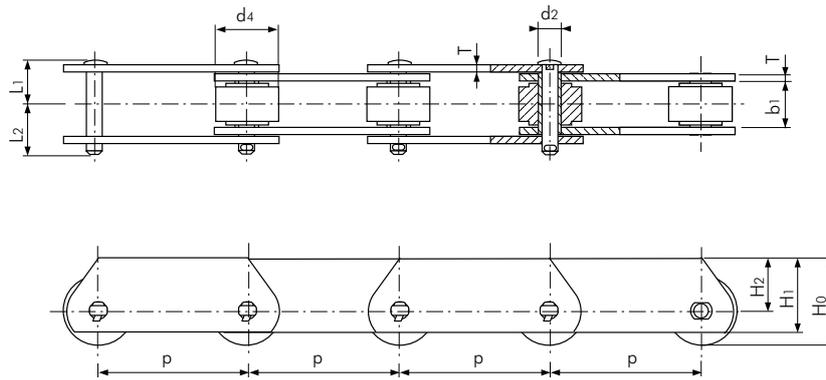


RF Series (Solid Pin)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Roller Type	Attachment Dimensions					Pin Length (max.)		Approx. Mass			
								A	K	O	Q1	Q2	Pin Link
			kg/m	kg/m	kg/m	kg/m							
RF05100	100	R.S	15	40	10	21.0	15.5	36	26	3.8	-	5.2	-
RF05150	150	R.F.S	15	60	10	21.0	15.5	36	26	3.3	-	4.1	4.4
RF650	152.4	R.F.S.M	20	60	12	28.5	21.5	49	35	6.0	6.4	7.7	8.0
RF10100	100	S.M	20	30	12	28.5	21.5	49	35	7.0	7.3	-	-
RF10150	150	R.F.S.M	20	60	12	28.5	21.5	49	35	5.9	6.1	8.0	8.3
RF6205	152.4	R.F.S.M	26	50	15	35.5	26.5	63	45	9.3	9.6	12.1	12.4
RF12200	200	R.F.S.M	26	80	15	35.5	26.5	63	45	8.4	8.7	11.4	11.9
RF12250	250	R.F.S.M	26	125	15	35.5	26.5	63	45	7.8	8.0	10.3	10.6
RF17200	200	R.F.S.M	26	70	15	45.5	35.0	81	61	12.0	12.6	18.8	19.8
RF17250	250	R.F.S.M	26	110	15	45.5	35.0	81	61	11.1	11.6	16.5	17.3
RF17300	300	R.F.S.M	26	150	15	45.5	35.0	81	61	10.5	10.9	15.0	15.7
RF26300	300	R.F.S.M	26	140	15	48.0	35.0	88	67	13.8	14.5	22.3	23.6
RF26450	450	R.F.S.M	26	220	15	48.0	35.0	88	67	13.0	13.0	19.0	19.0
RF36450	450	R.F.S.M	32	220	19	60.0	46.0	105	75	13.0	13.0	19.0	19.0
RF36600	600	R.F.S.M	32	300	19	60.0	46.0	105	75	19.0	19.5	26.9	27.8
RF52450	450	R.F.S	38	200	24	71.5	45.5	125	90	26.2	-	37.5	39.3
RF52600	600	R.F.S	38	300	24	71.5	45.5	125	90	24.4	-	32.9	34.3

RF STANDARD CONVEYOR CHAIN



RFD Series (Deep Link)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Roller	Pin		Chain Height H0	Link Plate			Av. Tensile Strength acc. to Tsubaki kN	Approx. Mass Kg/m	
			R Roller d4	Diameter d2	Length L1		Length L2	Height H1	Height H2			Thickness T
RFD03100-R	100	16.1	31.8	8.0	18.0	20.0	36.9	32.0	21.0	3.2	29	3.2
RFD05100-R	100	22.0	40.0	11.3	25.0	38.5	44.0	40.0	24.0	4.5	69	5.9
RFD05150-R	150											4.9
RFD10150-R	150	30.0	50.8	11.3	33.0	36.0	57.4	51.0	32.0	6.3	113	10.0
RFD10200-R	200											8.8
RFD6205-R	152.4	37.1	57.2	14.5	40.5	43.0	63.5	57.2	35.0	7.9	186	14.6
RFD12200-R	200	37.1	65.0	15.9	40.5	43.0	73.5	63.2	41.0	7.9	250	15.2
RFD12250-R	250											14.1
RFD17250-R	250	51.4	80.0	19.1	51.5	58.0	90.0	75.4	50.0	9.5	245	23.0
RFD17300-R	300											21.5
RFD26300-R	300	57.2	85.0*	22.2	55.5	61.0	95.5	84.7	53.0	9.5	314	24.3
RFD36300-R	300	66.7	100.0*	25.4	68.0	78.0	112.0	100.1	62.0	12.7	476	39.0
RFD36400-R	400											34.2
RFD52450-R	450	77.0	110.0*	31.8	82.0	90.0	125.0	108.1	70.0	16.0	500	46.0

Note:

1. Roller diameter marked with * in the tabel is different from the diameter of RF Standard Conveyor Chain.

RF BEARING ROLLER CONVEYOR CHAIN

Tsubaki RF Bearing Roller Conveyor Chain is a general purpose high performance chain used for large conveyance. In this large conveyor chain, cylindrical roller bearings are installed between the bush Features.

Features

- **compact with high performance**

The cylindrical roller bearing provides superior performance through increased strength and reduced friction. This allows selection of a chain two sizes smaller and greater cost effectiveness for your application.

- **virtually maintenance free long chain life**

Use of cylindrical roller bearings inside the chain rollers lowers frictional forces and reduces the need for lubrication and maintenance by 5-10 times (depending on the application) compared to conventionally constructed conveyor chains. The result is a chain with an increased life and almost no required maintenance.

- **wide selection of sizes**

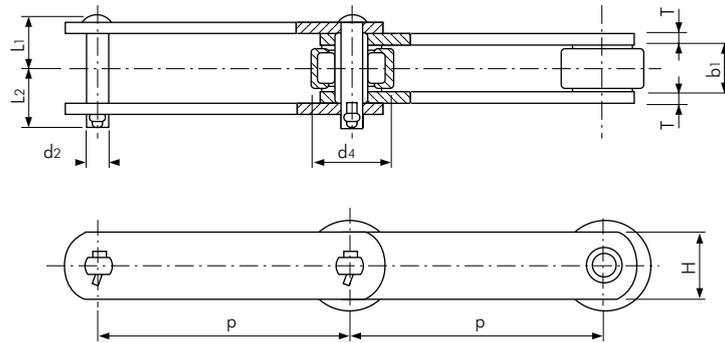
Small pitch to large, heavy duty sizes of Tsubaki Bearing Roller Conveyor Chains are readily available in a range of specifications and can be delivered quickly upon receipt of your order.

- **prevention of stick-slipping**

There is no stick-slipping with Tsubaki Bearing Roller Conveyor Chains. Use this chain in applications where stick-slipping cannot be tolerated.



RF BEARING ROLLER CONVEYOR CHAIN



BR Series

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width	Roller		Link Plate		Pin			Av. Tensile Strength acc. to Tsubaki kN	Approx. Weight kg/m
			R Roller d4	Height H	Thickness T	Diameter d2	Length L1+L2	Length L1	Length L2		
RF03075BR	75	16.1	31.8	22	3.2	8.0	38	18	20	29	2.7
RF03100BR	100										2.3
RF05100BR	100	22	40	32	4.5	11.3	53.5	25	28.5	69	5.0
RF05150BR	150										4.1
RF450BR	101.6	27	44.5	28.6	6.3	11.3	65.5	31	34.5	78	6.8
RF08150BR	150	27	44.5	28.6	6.3	11.3	65.5	31	34.5	78	5.5
RF10100BR	100	30	50.8	38.1	6.3	14.5	69		36	113	9.8
RF10150BR	150										7.9
RF12200BR	200	37.1	65	44.5	7.9	15.9	83.5	40.5	43	186	11.4
RF12250BR	250										10.3
RF17200BR	200										18.8
RF17250BR	250	51.4	80	50.8	9.5					245	16.5
RF17300BR	300										15.0
RF26250BR	250							55.5	61		25.3
RF26300BR	300	57.2	100	63.5	9.5	22.2	116.5			314	22.3
RF26450BR	450										18.0
RF36300BR	300										39.0
RF36450BR	450	66.7	125	76.2	12.7	25.4	146	68	78	476	30.7
RF36600BR	600										26.9

Note:

1. Standard attachments are available.
2. RF Bearing Roller Conveyor Chain is also available with Flange Rollers (BF series).
3. Anti-dust (DBR) and Lube-Free (EBR and WEBR) series are available.

RF LOW MAINTENANCE CONVEYOR CHAIN

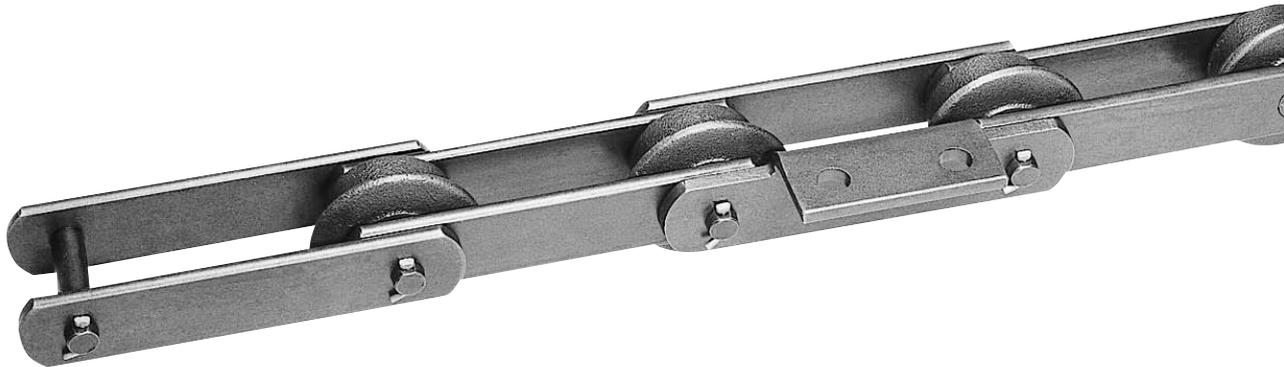
Tsubaki offers a wide variety of Low Maintenance Conveyor Chains. These Chains can be applied in environments where lubrication is not desirable, noise reduction or power saving is needed.

RFC Lambda Conveyor Chain

The RFC Lambda Conveyor Chain is a lube-free, long life and low-noise conveyor chain that uses special oil-impregnated bushes and engineered plastic rollers.

Features:

- Significantly improved wear life between pins, bushes and rollers.
- 5 to 7dB noise reduction than steel rollers.
- 55% lower running resistance than steel rollers (unlubricated).
- 30% decrease in chain weight.
- Operating temperature: 0°C to +50°C
- Max. Chain Speed: 25 m/min.
- Standard RF Conveyor sprockets can be used.



RF FREE FLOW CONVEYOR CHAIN

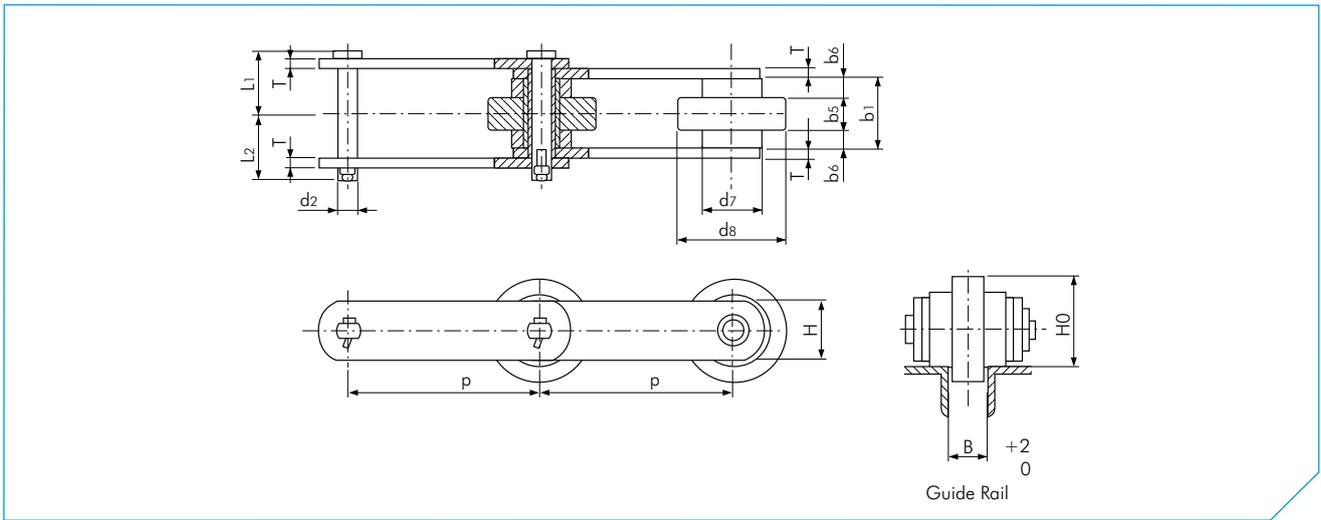
TSUBAKI Free-Flow Conveyor Chain allows continuous motion and free speed control of objects while also providing the ability to stop and/or accumulate conveyed items at a work station or other functional location. Tsubaki manufactures several types of free-flow chain, including Top Roller, Outboard Roller, and Roller Table; and our revolutionary Double Plus Chain, which permits conveyed items to travel 2.3 times faster than the chain drive speed. A variety of features are available within this wide selection, such as electro-conductive plastic rollers to counter static electricity and dust, as well as anti-corrosion and low noise features to suit application requirements in a variety of industries

RF-VR Double Plus Conveyor Chain

Tsubaki's Double Plus free flow conveyor chain conveys objects 2.3 times faster than the actual chain speed. As a result, motor speeds up to 60% slower can be used, leading to improved system reliability and substantial reductions in energy costs and chain noise, the latter by as much as 15dB compared to outboard plastic roller chains.



FREE FLOW CONVEYOR CHAIN



VR Series (Double Plus)

Dimensions in mm

TSUBAKI Chain No.	Pitch p	Inner Width b1	Roller		Roller Diameter		Pin			Link Plate		Conv. Height H0	Guide Width B	Approx. Mass Kg/m
			b5	b6	d7	d8	d2	L1	L2	Thickness T	Height H			
RF03075VR	75	30.0	12.0	8.5	31.8	42.0	8.0	24.5	27.0	3.2	32.0	36.9	14.5	4.7
RF03100VR	100													4.0
RF05100VR	100													8.0
RF05125VR	125	39.0	16.0	11.0	40.0	53.0	11.3	33.5	37.0	4.5	32.0	46.5	18.5	7.0
RF05150VR	150													6.0
RF10125VR	125	54.0	20.0	14.0	50.8	67.0	14.5	45.0	48.0	6.3	38.1	58.9	25.0	14.0
RF10150VR	150													12.0
RF6205VR	152.4	62.0	22.0	16.0	57.2	75.5	15.9	53.0	55.5	7.9	44.5	66.3	28.0	18.0
RF12200VR	200													15.0
RF17200VR	200	69.0	25.0	18.0	65.0	65.0	19.1	60.5	66.5	9.5	50.8	75.5	31.0	20.0

SPECIAL CHAIN CATALOGUES AND LEAFLETS

Due to the large and specialized chain program of Tsubakimoto, there are more catalogues, leaflets and downloads available. We can offer you on request some special documentation on the following subjects:

Roller Chain

- Bearing Bush Chain
- Energy Series™ Chain
- Engineering Plastic Chain
- Gripper Chain
- Heat Resistant Lambda Chain
- Installation & Maintenance Guide
- Lambda Chain
- Low Noise Drive Chain
- Multi Free Flow Chain
- N.E.P. Chain
- Plus Alpha Attachment Chain
- RS Roller Chain G7
- Snap Cover Chain
- Stainless Steel Products
- The Complete Guide to Chain

Industry Specific

- Amusement Park Chains
- Bakery Operations Brochure
- Cement Mill Chain
- Food Industry Brochure
- Mining Industry Brochure
- Pin Oven Chain
- Sugar Mill Chain
- V Class Oilfield Chain
- Waste Treatment Chain

Power Transmission Products

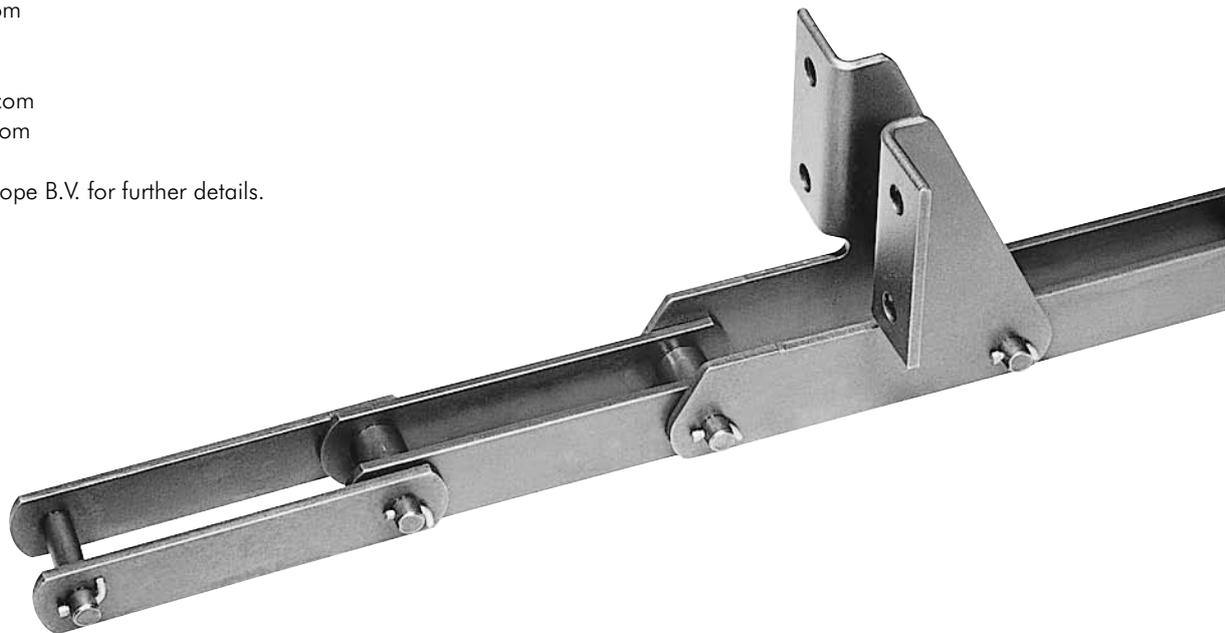
- Cam Clutch Catalogue
- Overload Protection
- PTUC Products
- Power Cylinder™
- Power Lock® (AS Series)
- Roller Chain Couplings
- The Antidote Powerlock® SS

Tsubaki Websites

Visit one of Tsubakimoto's websites around the world:

- <http://tsubaki.eu>
- www.tsubakimoto.com
- www.ustsubaki.com
- www.tsubaki.ca
- www.lubefreechain.com
- <http://chain-guide.com>

Or ask Tsubakimoto Europe B.V. for further details.



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 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 you to use 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 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	unusable
- 40°C to - 30°C	unusable	MAL / 4	MAL	MAL
- 30°C to - 20°C	MAL / 4	MAL / 3	MAL	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	-	-	-	MAL / 1.2
500°C to 600°C	-	-	-	MAL / 1.5
600°C to 700°C	-	-	-	MAL / 1.8
above 700°C	-	-	-	unusable

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.

CORROSION RESISTANCE GUIDE

☆☆ Highly corrosion resistant
 ☆ Partially corrosion resistant
 - Unknown
 ✕ Not corrosion resistant

Substance	Concentration	Temp. °C	AS	SS	PC+P	NS	TI	PC-SY
Acetic Acid	10%	20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Acetone		20	☆☆	☆☆	☆☆	☆☆	☆☆	✕
Alcohol			☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Aluminum Sulfate	Saturation	20	-	☆☆	✕	☆☆	☆☆	-
Ammonia Water		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Ammonium Chloride	50%	Boiling	-	☆	✕	☆☆	☆☆	-
Ammonium Nitrate		Boiling	☆☆	☆☆	☆	☆☆	☆☆	☆☆
Ammonium Sulfate	Saturation	Boiling	☆	☆☆	✕	☆☆	☆☆	-
Beer		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Benzene		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Boric Acid	50%	Boiling	☆☆	☆☆	✕	☆☆	☆☆	-
Butyric Acid		20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Calcium Chloride	Saturation	20	-	☆	☆	☆☆	☆☆	☆☆
Calcium Hydroxide	20%	Boiling	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Calcium Hypochlorite	11-14%	20	-	☆☆	✕	☆☆	☆☆	☆☆
Carbolic Acid			☆☆	☆☆	✕	☆☆	☆☆	☆☆
Carbon Tetrachlorite (dry)		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Chlorinated Water			-	-	-	☆☆	☆☆	-
Chlorine Gas (dry)		20	-	☆	✕	☆	☆☆	☆☆
Chlorine Gas (moist)		20	-	-	✕	☆	☆☆	☆☆
Chromic Acid	5%	20	☆	☆☆	-	☆☆	☆☆	☆☆
Citric Acid	50%	20	☆☆	☆☆	✕	☆☆	☆☆	☆☆
Coffee		Boiling	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Creosote		20	☆☆	☆☆	✕	☆☆	☆☆	-
Developing Solution		20	☆	☆☆	☆☆	☆☆	☆☆	☆☆
Ethyl Ether		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Ferric Acid	50%	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 (wet)			-	-	-	✕	☆☆	-
Hydroxybenzene		20	☆☆	☆☆	-	☆☆	☆☆	-
Kerosene		20	☆☆	☆☆	✕	☆☆	☆☆	-
Ketchup		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Lactic Acid	10%	20	☆	☆☆	☆☆	☆☆	☆☆	☆☆
Lard			☆☆	☆☆	✕	☆☆	☆☆	-
Linseed Oil	100%	20	☆	☆☆	☆☆	☆☆	☆☆	☆☆
Malic Acid	50%	Boiling	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Mayonnaise		20	☆	☆☆	☆☆	☆☆	☆☆	☆☆
Milk		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆

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

CORROSION RESISTANCE GUIDE

Substance	Concentration	Temp. °C	AS	SS	PC+P	NS	TI	PC-SY
Nitric Acid	5%	20	☆	☆☆	-	☆☆	☆☆	☆☆
Nitric Acid	65%	20	-	☆☆	-	☆☆	☆☆	☆☆
Nitric Acid	65%	Boiling	-	☆	-	☆	☆☆	✘
Oil (Plant, Mineral)		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Oleic Acid		20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Oxalic Acid	10%	20	☆	☆☆	-	☆☆	☆☆	☆☆
Paraffin		20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Petroleum		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Phosphate			☆☆	☆☆	✘	☆☆	☆☆	-
Phosphoric Acid	5%	20	☆	☆☆	-	☆☆	☆☆	☆☆
Phosphoric Acid	10%	20	☆	☆	-	☆	☆☆	☆☆
Picric Acid	Saturation	20	☆☆	☆☆	✘	☆☆	☆☆	-
Potassium	Saturation	20	☆	☆☆	✘	☆☆	☆☆	-
Potassium Bichromate	10%	20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Potassium Chloride	Saturation	20	☆	☆☆	✘	☆☆	☆☆	-
Potassium Hydroxide	20%	20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Potassium Nitrate	25%	20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Potassium Nitrate	25%	Boiling	-	☆☆	✘	☆☆	☆☆	-
Potassium Permanganate	Saturation	20	☆☆	☆☆	✘	☆☆	☆☆	☆☆
Sal Ammoniac	50%	Boiling	-	☆	✘	☆☆	☆☆	-
Sea-Water		20	-	☆	☆	☆☆	☆☆	☆☆
Soap-and-Water-Solution		20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Sodium Carbonate	Saturation	Boiling	☆☆	☆☆	✘	☆☆	☆☆	-
Sodium Chloride	5%	20	☆	☆☆	☆☆	☆☆	☆☆	☆☆
Sodium Cyanide		20	✘	☆☆	✘	☆☆	☆☆	-
Sodium Hydrocarbonate		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Sodium Hydroxide	25%	20	☆☆	☆☆	☆☆	☆☆	☆☆	-
Sodium Hypochlorite	10%	20	-	-	-	☆☆	☆☆	☆☆
Sodium Perchlorate	10%	Boiling	-	☆☆	✘	☆☆	☆☆	-
Sodium Sulfate	Saturation	20	☆☆	☆☆	✘	☆☆	☆☆	-
Sodium Thiosulfate	25%	Boiling	☆☆	☆☆	✘	☆☆	☆☆	-
Soft Drink		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Stearic Acid	100%	Boiling	-	-	-	☆☆	☆☆	-
Sugar Solution		20	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆
Sulfuric Acid	5%	20	-	-	-	☆☆	☆☆	☆☆
Sulfur Dioxide		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	25%	20	☆☆	☆☆	✘	☆☆	☆☆	☆☆

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

TSUBAKI CHAIN APPLICATION CHECK SHEET

Date:			
Company name:		Tel:	
Contact person:		Fax:	
1) Type of requirement	<input type="checkbox"/> New design	<input type="checkbox"/> Replacement	<input type="checkbox"/> Investigation
	If replacement -	Motor size	(kW)
		Sprocket size	(Teeth)
2) Type of conveyor	<input type="checkbox"/> Slat conveyor	<input type="checkbox"/> Bucket conveyor	
	<input type="checkbox"/> Pusher	<input type="checkbox"/> Other	
3) Mass & quantity of slats, pushers etc.:		(kg/pc)	(pc)
4) Conveying direction:	<input type="checkbox"/> Horizontal	<input type="checkbox"/> 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:			(pc)
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			(pc)
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	<input type="checkbox"/> Modified sin curve (MS)	
		<input type="checkbox"/> Modified trapezoidal curve (MT)	
		<input type="checkbox"/> 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	<input type="checkbox"/> With lubrication	<input type="checkbox"/> 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 CHAIN LAYOUT SHEET

Tsubakimoto Europe BV

Aventurijn 1200
3316 LB Dordrecht
The Netherlands

FAX: +31 (0)78-6204001
E-MAIL: info@tsubaki.nl

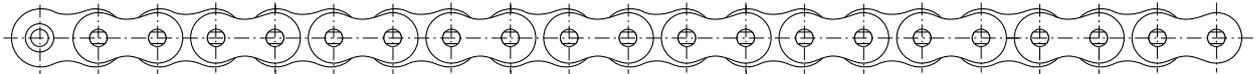
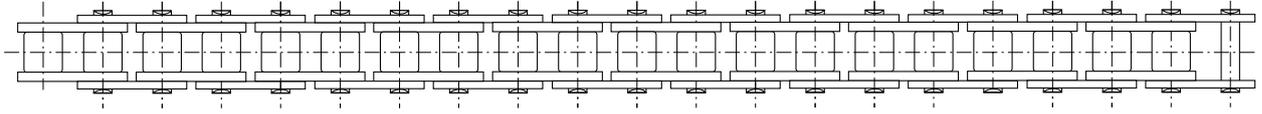
Customer Name:

Contact:

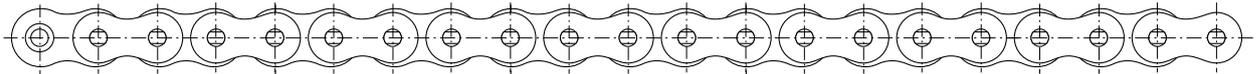
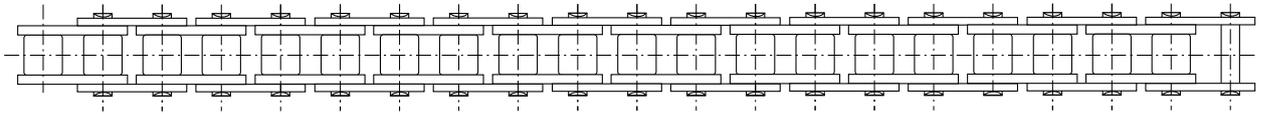
Chain type:

Chain length:

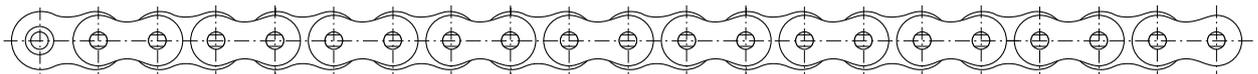
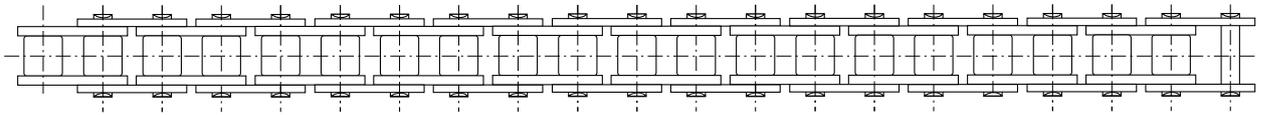
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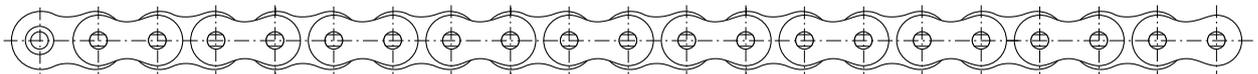
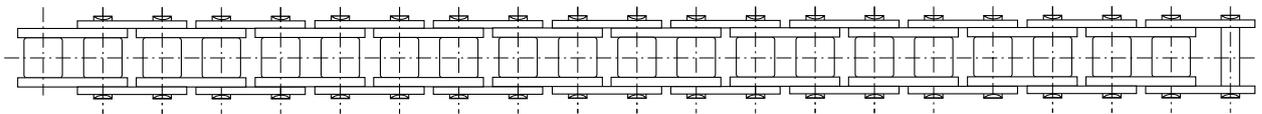
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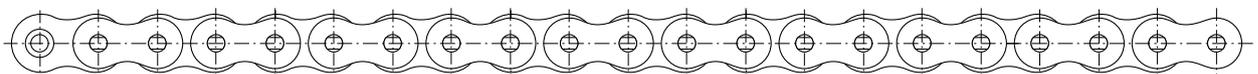
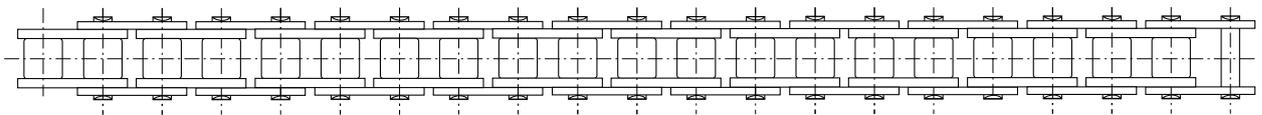
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60



80



100

EASY SPACING GUIDE FOR ATTACHMENT CHAINS

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-off, 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.

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

- 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, lock-out 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 original 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 it 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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TSUBAKIMOTO EUROPE B.V.

AVENTURIJN 1200
3316 LB DORDRECHT
THE NETHERLANDS

PHONE: +31 (0)78 620 4000
FACSIMILE: +31 (0)78 620 4001
E-MAIL: INFO@TSUBAKI.EU
URL: [HTTP://TSUBAKI.EU](http://TSUBAKI.EU)

TSUBAKIMOTO UK LTD.

OSIER DRIVE, SHERWOOD PARK
ANNESLEY, NOTTINGHAM NG15 0DX
UNITED KINGDOM

PHONE: +44 (0)1623 68 87 00
FACSIMILE: +44 (0)1623 98 87 89
E-MAIL: SALES@TSUBAKI.CO.UK
URL: [HTTP://TSUBAKI.EU](http://TSUBAKI.EU)