HITACHI CONVEYOR CHAINS

Hitachi Metals Techno,Ltd.

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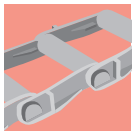


Hitachi Conveyor Chains

As a comprehensive chain manufacturer, we produce roller chains, conveyor chains, cast chains and many other types of chains.
We provide a full range of manufacturing processes, from machining through heat treatment to assembly based on our experience and technology accumulated over more than 100 years in business to.
We are proud of the ongoing contribution our products make to industrial progress, in Japan and abroad.

HITACHI CONVE

Introduction

Our conveyor chains, sprockets and other products are widely used in mainstream conveyor systems, to meet customer needs. Their specifications, applications and environments are very diverse.
Nevertheless, errors or shortcomings in selection, handling and maintenance can not only impede the flow of material on the conveyor but can cause major accidents, including chain breakage and conveyor damage. This catalog includes information to assist in the correct selection, handling and maintenance of chains and sprockets, so please read it with care before using our products.

Key to symbols

This catalog uses the two symbols below. Please check their meanings and be sure you fully understand them before reading the rest of the catalog.

Symbol	Meaning
⚠Warning	This symbol indicates content which, if ignored, can lead to incorrect handling that could result in death or serious injury.
Caution	This symbol indicates content which, if ignored, can lead to incorrect handling that could result in personal injury and equipment damage.

Caution

Japan Chain Industry Association

We take great care in manufacturing the chains, sprockets and other products described here. Nevertheless, errors or shortcomings in selection, handling and maintenance can cause major accidents, including chain breakage and conveyor damage.
Refer to the relevant design documents, selection criteria, instruction manuals and other documentation about the selection, handling and maintenance of chains and sprockets before using them.
If any points are unclear, please contact the manufacturer for clarification.

YOR CHAINS

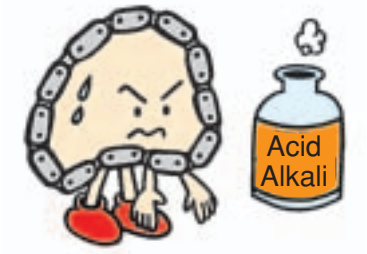
Please pay particular attention to the following points when using conveyor chains and sprockets.

1. Select the right product.

146P Refer to "Selecting Conveyor Chains"

[1] Conveyor chains may break when an excessive load is placed on them. Be sure to use any chain only within its proper load capacity, based on an understanding of its structure and specifications.

[2] Use of conveyor chains in alkaline or acidic surroundings can cause brittle fracture, so be sure to select a chain appropriate for the conditions in which it will be used.



[3] The performance of conveyor chains declines at high and low temperatures, possibly causing them to break in some situations, so be sure to select the right chain for the conditions.

⚠ Warning

The following points must be strictly observed when using conveyor chains for vertical conveying.

- **People must not be the area beneath the conveyor system.**
- **To prevent death, injury and equipment damage, use a mechanism to prevent the load from falling in the event of a chain break, or take other safety precautions to prevent danger.**

2. Attach chains correctly

160P Refer to "Handling of Conveyor Chains and Sprockets"

[1] Conveyor chains may break due to uneven loading and wear caused by poor alignment of equipment or changes over time. Make sure the chain is attached correctly.

[2] Do not subject the conveyor chain to direct impact, or to direct heating by blowtorch etc. Such treatment will greatly reduce chain performance and could cause the chain to break.

[3] Re-machining chains and sprockets is dangerous.

Never electroplate heat-treated chains or sprockets, as it can cause hydrogen embrittlement fracture.

Never weld heat-treated chains or sprockets, as heat effects can reduce strength, causing the chain to break.

After using a blowtorch or other heat source to heat or cut a chain, be sure to remove all components on either side of the heated area that may have been affected by the heat.

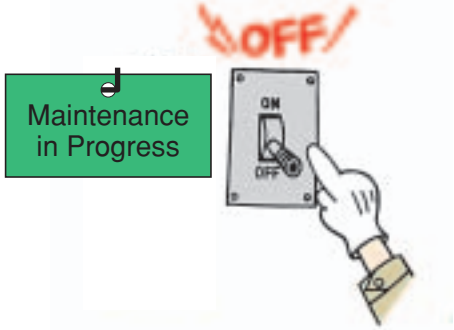
[4] Safety covers etc. must be installed to make sure nobody can touch equipment while it is in operation.

[5] If any foreign body etc. gets tangled in the conveyor chain while it is in motion, the chain may slip off the sprocket or, in some cases, break.

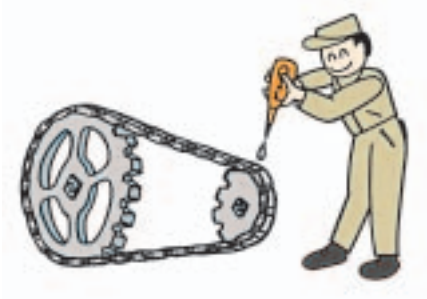
3. Maintain Equipment Properly

160P Refer to "Handling Conveyor Chains and Sprockets"

[1] Make sure the main power supply is switched off before starting maintenance and inspection work, and take precautions to prevent anyone from switching it on by mistake.



[2] The lifespan of a conveyor chain varies enormously depending on whether it receives proper maintenance and lubrication. Wear extension can cause the chain to ride off the sprocket, or to break, so practice appropriate maintenance and lubrication.



[3] Conveyor chains and sprockets are consumable parts. As such, they require proper periodic maintenance and replacement. Avoid replacing only part of a chain. Replace the chain as a whole.

4. Storage of conveyor chains and sprockets

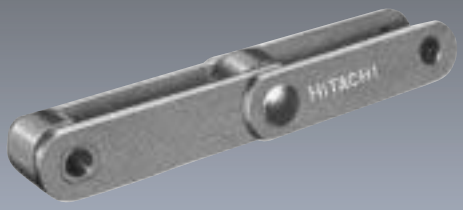
Handle chains and sprockets as mechanical components. Do not throw or drop them when unpacking them, and store them away from rain, condensation, dust etc.

List of Conveyor Chains

Standard Conveyor Chains

17P

These chains are assembled from precisely-fitted links, bushes and pins, each made from carbon steel or hardened steel, to give accurate dimensions.
Rollers are available in R, F or S roller types to suit different applications.



HB bushed chains

20P

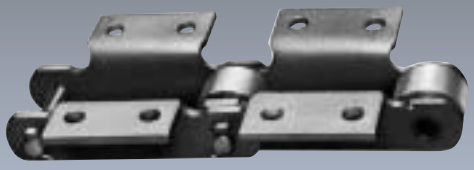
These chains have no rollers, and are used in trolley conveyors and log haul conveyors.

Conveyor chains with attachments

23P

Conveyor chains with attachments are standard conveyor chains mounted with various attachments as required.

A-type attachment

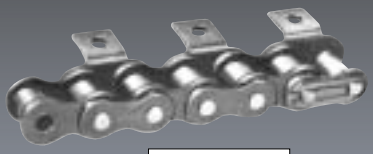


K-type attachment

Roller chains with attachments

31P

Roller chains with attachments are standard roller chains mounted with various attachments as required.



A-1 attachment

K-1 attachment

Double pitch roller chains for conveyors

36P

S roller chains (C2040~C2160H) have double the pitch with the same pin, bush and roller measurements as standard roller chains, while R roller chains (C2042~CC2162H) have double the external diameter of rollers.

S-type roller

R-type roller

D pinned chains

39P

These chains are standard roller chains or double-pitch conveyor roller chains in which the pins are extended on one side. They are suitable for a wide range of uses, as special attachments can be fastened to all links, or at desired intervals.

Hollow pin chains

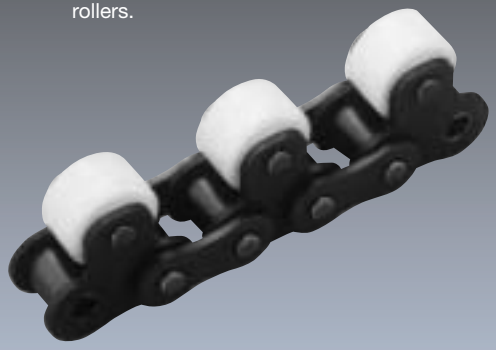
42P

These chains are made with special hollow pins, allowing mounting of various types of attachments. They are indicated by the "HP" suffix on the chain number.

Top Roller Chains

43P

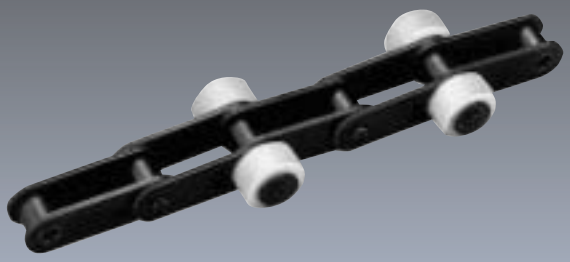
These chains have rollers attached on top, in the middle of each pitch, so that objects can be placed directly onto the top rollers for continuous operation, allowing conveyed items to be stored or paused. We also make the quality, plastic top rollers.



Side Roller Chains

44P

These chains are standard roller chains or double pitch roller chains with side rollers attached to one or both sides, in parallel or staggered arrangements. Plastic rollers are used to reduce noise.



SAV stainless chains

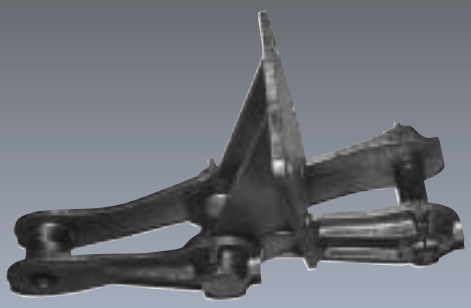
63P

These chains are mainly used for agitation of sludge in sewage treatment works. They are made of stainless steel for superior corrosion and wear resistance.

HEP plastic chains

68P

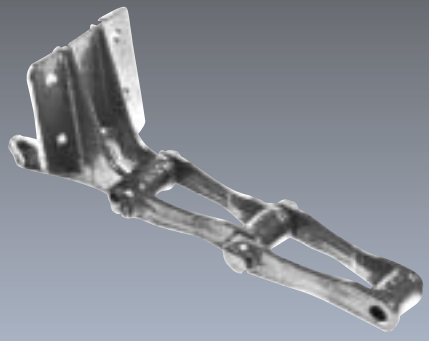
We used our wide-ranging expertise from conventional metal chains to develop this specialized chain, made from engineering plastic, for sludge agitation.



TAW pintle chains

69P

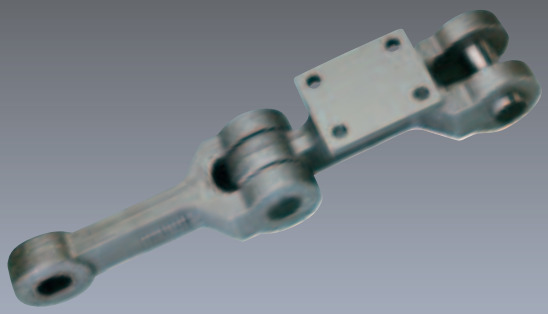
This chain offers improved wear resistance. There are 730TAW and S730TAW types for use in water treatment.



List of Conveyor Chains

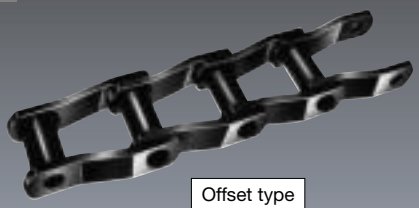
96P Intermediate Carrier Chain

These chains are used for Sugar Industry.
We can offer various type of chain with good workmanship.

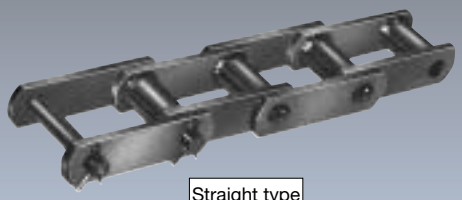


98P Welded chains

This chain has a welded structure, in which the barrels are welded to the link plates.



Offset type



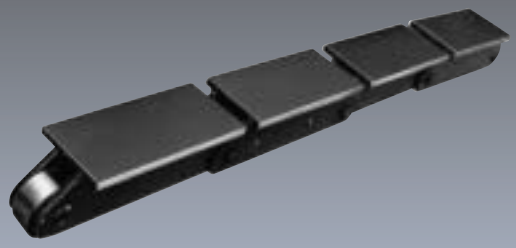
Straight type

105P Steel block chains

These chains incorporate precisely-machined steel blocks. They are used for carrying heavy items in locations such as steelworks, as well as in applications such as draw benches and sluice gates.

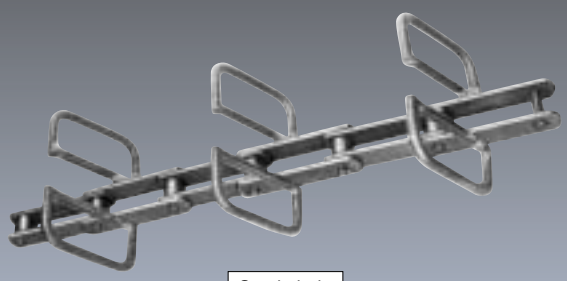
106P Coil conveyor chains

Chains used in steel works have to operate in harsh conditions, carrying heavy objects while exposed to steel particles, scale, heat and other challenges. These can withstand various heavy loadings, according to their applications.



109P Case conveyor chains

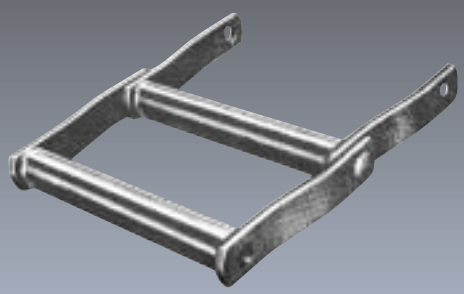
These chains are used in case conveyors, and we offer various Attachment to suit their applications. Materials include steel chains and depending on the applications required.



Steel chain

118P Steel drag chains

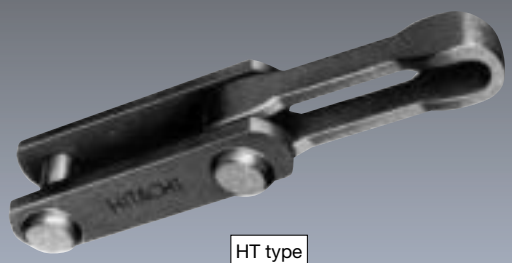
These chains have wide bases and are used to carry loose cases and troughs.



Trolley chains

126P

These chains are used for trolley conveyors.
The two standard varieties are the HT and HRX types, and we make hangers for each.



HT type

Detachable chains

131P

These chains can be detached easily at any point, and their structures are very easy to handle. They run smoothly, with little rusting, even in corrosive environments.

Pintle chains

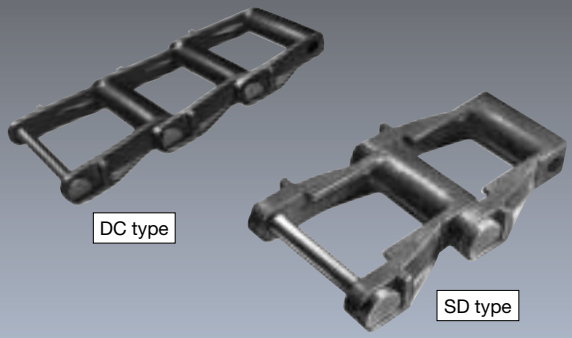
133P

The chain body elements are cast and the pins are of carbon steel in this simple chain type.

Drag chains

137P

A simple and sturdy structure, making a wide and heavy chain that can carry rough and hard materials. The SD type has better wear resistance than the standard DC type.



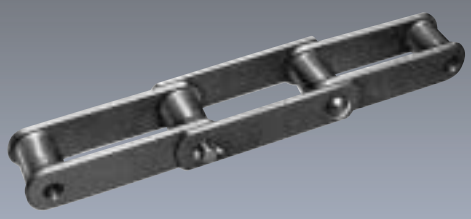
DC type

SD type

Combination chains

139P

The block elements are cast and the link plates are of steel plate in a rational chain design that exploits the characteristics of each material.
The C730, C112 and C113 are available, each with special material properties for their blocks and link plates, for use in water treatment.

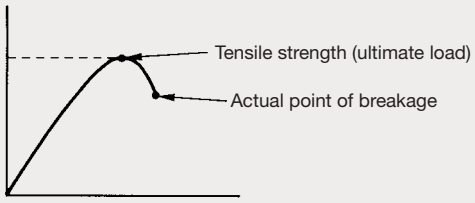
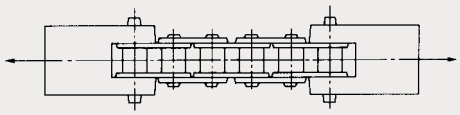


Terminology Concerning Chain Strength

Extracted from Japan Chain Industry Association documents

In current chain terminology, there may be many ways of saying the same thing, and differences of expression may result in different interpretations, depending on the person or the situation. These inconsistencies can cause problems.
Therefore, the Japan Chain Industry Association is working to prevent problems by standardizing terminology and unifying interpretations of meanings, beginning with the following glossary of chain strength.

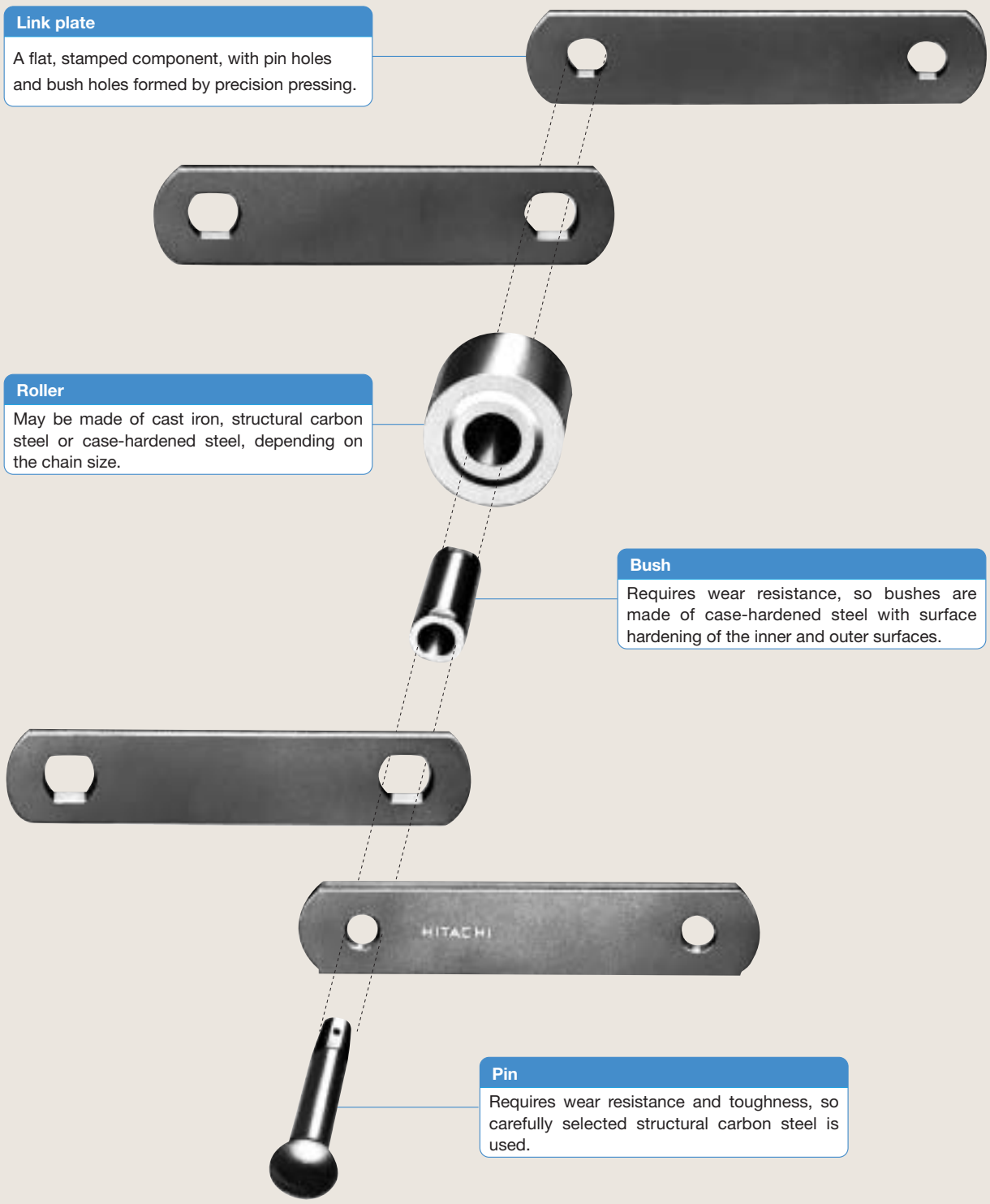
* indicates terms which may be treated as synonymous.

No.	Term	Meaning
1.	Ultimate tensile strength * Breaking strength * Breaking load	The maximum load when the chain is pulled to the point of breaking.  **Test method (*)** As shown in the diagram, a chain consisting of at least five links is fastened into a clamping device and arranged so that it is not subject to stresses from torsion, bending etc. It is then subjected to a gradually increasing tensile force until it breaks, at which point the maximum load is measured.  Notes 1. Values resulting from failure of the clamping device are not applicable. 2. The clamping device is able to move freely.
2.	Average ultimate tensile strength	The average value of tensile test results over a period sufficient to represent a process.
3.	Assured tensile strength	This is the tensile strength that the manufacturer guarantees in transactions with the market in general, or with a specific user. It is generally set according to the minimum tensile strength, but may be determined in other ways in other circumstances.
4.	Maximum allowable load (tensile)	This is the allowable limit of maximum load T acting on the chain. Maximum load T is generally calculated by the formula below. T= [Load acting on the chain] × [Use factor] × [Speed factor]

* In some cases, the tensile strength testing method employed by this company may use only three links.

Conveyor Chain Structures

Conveyor chains comprise components such as link plates, pins, bushes and rollers. The example below is a standard conveyor chain.



Conveyor Chain Specification Codes

Conveyor chains are categorized as in the table, according to the component materials and heat treatment used.

Table of specification codes

Application category	Code	Link plate	Pin	Bush	Roller		Main characteristics
					S, M	R, F	
Standard series	DH	CS	CSⒽ			CS	● Economical ● General-purpose ● Quick delivery
Strong series	AH	CSⒽ ASⒽ	ASⒽ			CSⒽ ASⒽ	● Around double the breakage strength of DH, with the same dimensions. ● Improved wear resistance between pins and bushes. ● Improved wear resistance between bushes and rollers.
Applied series	GH	CS	CSⒽ				● Improved wear resistance between bushes and rollers.
	CH	CS	ASⒽ			CSⒽ ASⒽ	● Improved wear resistance between pins and bushes. ● Improved wear resistance between bushes and rollers.
	BH	CSⒽ ASⒽ	ASⒽ			CSⒽ ASⒽ	● Around double the breakage strength of CH, with the same dimensions. ● Improved wear resistance between pins and bushes. ● Improved wear resistance between bushes and rollers. ● Special heat treatment of pin surfaces.
Environment-resistant series	PH	SUS400Ⓗ					● Improved corrosion and heat resistances. ● SUS400 series materials used for all components.
	YH	ASⒽ	SUS400Ⓗ				● Improved corrosion and heat resistances. ● SUS400 series materials used for pins, bushes and rollers.
	SH	SUS300					● Even better corrosion and heat resistances than PH. ● SUS300 series materials used in all components.

Key to codes
CS: Carbon steel
AS: Alloy steel
SUS400: 400-series stainless steel
SUS300: 300-series stainless steel
Ⓗ : Heat treated

Table of average ultimate tensile strengths

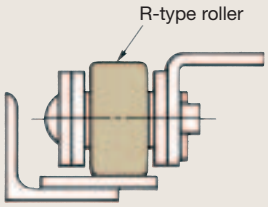
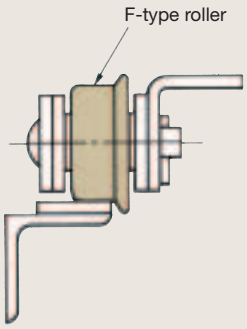
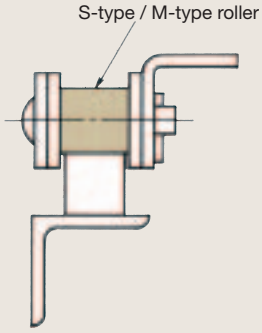
Specification code / Chain No.	DH, GH, CH		AH, BH, YH		PH		SH	
	kN	kgf	kN	kgf	kN	kgf	kN	kgf
HRS03075 03100 03150	29.4	3000	69.6	7100	53.9	5500	33.3	3400
HRS05075 05100 05150	68.6	7000	142.2	14500	107.9	11000	68.6	7000
HR10105	53.9	5500	98.1	10000	83.4	8500	48.1	4900
HR10108	78.5	8000	142.2	14500	122.6	12500	68.6	7000
HR15208	78.5	8000	142.2	14500	142.2	14500	68.6	7000
HR10011 15011	112.8	11500	225.6	23000	176.5	18000	107.9	11000
HR7813 10113	132.4	13500	240.3	24500	186.3	19000	122.6	12500
HR15215 20015 25015	186.3	19000	279.5	28500	264.8	27000	132.4	13500
HR15219 20019 25019 30019	245.2	25000	387.4	39500	357.9	36500	186.3	19000
HR25026 30026 45026	313.8	32000	519.8	53000	460.9	47000	250.1	25500
HR30048 45048 60048	475.6	48500	681.6	69500	—	—	—	—
HR30054 45054 60054	529.2	54000	1029.7	105000	—	—	—	—

Note

Values in this table are average strengths obtained from static tensile tests. They may differ from values for impact loading and repeated loading.

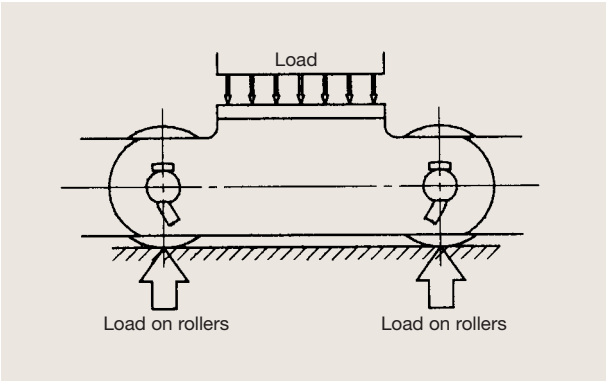
Roller forms

The roller forms for conveyor chains can be broadly classified as below.

Roller form	Diagram	Characteristics
R-type rollers  RTYPE		The external diameter of the roller exceeds the height of the link plate, making this the basic form for a conveyor chain. Normally used in flat or inclined conveyors.
F-type rollers  FTYPE		This type has a flange added to the form of an R-type roller, so that it uses the rail edge as a guide while moving. Normally used in flat or inclined conveyors.
S-type and M-type rollers  S,MTYPE		The external diameter of the roller is smaller than the height of the link plate, with the aim of avoiding wear to the sprockets and to the chain bushes. M-type rollers have larger external diameters than S-type rollers.

Allowable load on rollers

For conveyor chains which move while carrying a load, the allowable load on the rollers must be considered when selecting the chain. The allowable loads that can be borne by well-lubricated rollers are as described in the table below.



Allowable load per roller

Chain No.	R-type and F-type rollers				S-type and M-type rollers	
	Normal series		Strong series			
	kN	kgf	kN	kgf	kN	kgf
HRS03075 03100 03150	0.54	55	0.88	90	0.54	55
HRS05075 05100 05150	1.03	105	1.71	175	1.03	105
HR10105	0.93	95	1.57	160	0.93	95
HR10108	1.27	130	2.11	215	1.27	130
HR15208	1.42	145	2.35	240	1.42	145
HR10011 15011	1.77	180	2.94	300	1.77	180
HR7813 10113	2.11	215	3.38	345	2.11	215
HR15215 20015 25015	2.50	255	4.17	425	2.50	255
HR15219	3.14	320	5.10	520	3.14	320
HR20019 25019 30019	4.12	420	6.86	700	4.12	420
HR25026 30026 45026	5.39	550	8.82	900	5.39	550
HR30048 45048 60048	7.64	780	12.5	1280	7.64	780
HR30054 45054 60054	10.1	1030	16.7	1700	10.1	1030

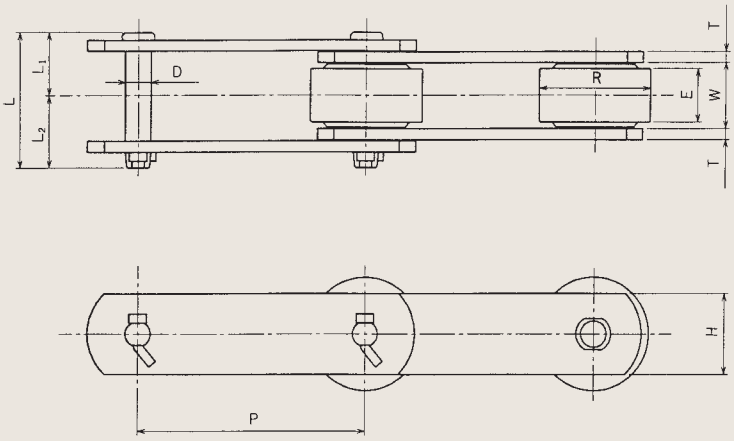
Note

Materials used for rails must have tensile strength of at least 400N/mm^2 (41kgf/mm^2).

HITACHI CONVEYOR CHAINS

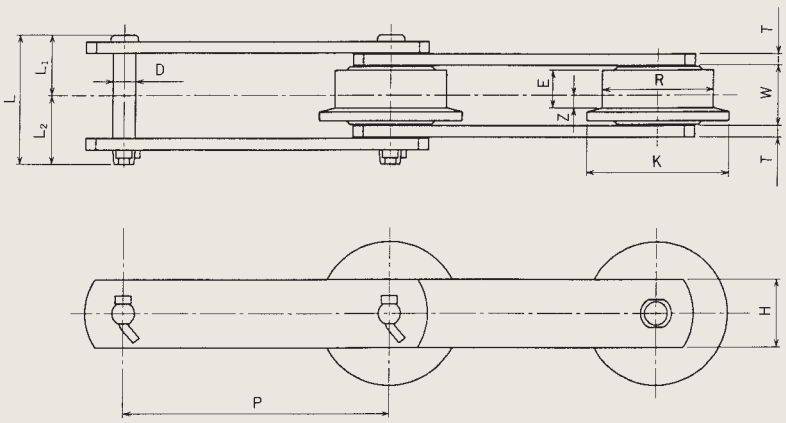
Standard Conveyor Chains

Standard conveyor chain (R roller type)



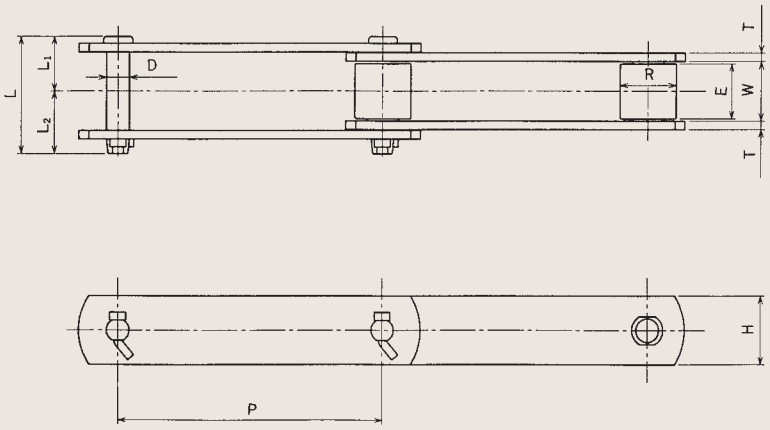
Chain No.	pitch P (mm)	Roller		Inner width W (mm)	Pin				Link plate		Average ultimate strength		Mass (kg/m)
		Outer Dia. R (mm)	face width E (mm)		Dia. D (mm)	Length L (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H (mm)	Thickness T (mm)	(kN)	(kgf)	
HRS03075-R	75	30.0	14.0	16.0	7.9	38.0	16.8	21.2	22.2	3.2	29.4	3000	2.3
HRS03100-R	100												1.9
HRS03150-R	150												1.7
HRS05100-R	100	40.0	19.0	22.0	11.0	53.4	23.9	29.5	31.8	4.7	68.6	7000	4.9
HRS05150-R	150												4.0
HR10105-R	101.6	38.1	19.0	22.6	9.5	53.0	24.2	28.8	25.4	4.7	53.9	5500	4.3
HR10108-R	101.6	44.5	23.0	27.0	11.0	65.7	30.6	35.1	28.6	6.3	78.5	8000	6.7
HR15208-R	152.4	50.8	26.0	30.2		68.0	31.4	36.6	38.1				7.8
HR10011-R	100	50.8	26.7	30.2	14.2	72.2	32.8	39.4	38.1	6.3	112.8	11500	9.8
HR15011-R	150												8.1
HR10113-R	101.6	44.5	27.0	31.6	15.8	81.3	37.3	44.0	38.1	7.9	132.4	13500	10.4
HR15215-R	152.4	57.2	32.0	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	12.1
HR20015-R	200	65.0											11.4
HR25015-R	250												10.3
HR15219-R	152.4	69.9	32.5	37.1	18.9	97.1	44.3	52.8	50.8	9.5	245.2	25000	17.1
HR20019-R	200	80.0	44.0	51.4		111.3	51.4	59.9					18.8
HR25019-R	250												16.5
HR30019-R	300												15.0
HR25026-R	250	100.0	50.0	57.2	22.1	119.6	55.3	64.3	63.5	9.5	313.8	32000	27.1
HR30026-R	300												22.3
HR45026-R	450												18.0
HR30048-R	300	125.0	56.0	66.7	25.2	143.7	67.6	76.1	76.2	12.7	475.6	48500	42.2
HR45048-R	450												30.7
HR60048-R	600												26.9
HR30054-R	300	140.0	65.0	77.0	31.6	169.3	81.6	87.7	76.2	16.0	529.6	54000	52.2
HR45054-R	450												37.5
HR60054-R	600												32.9

Standard conveyor chain (F roller type)



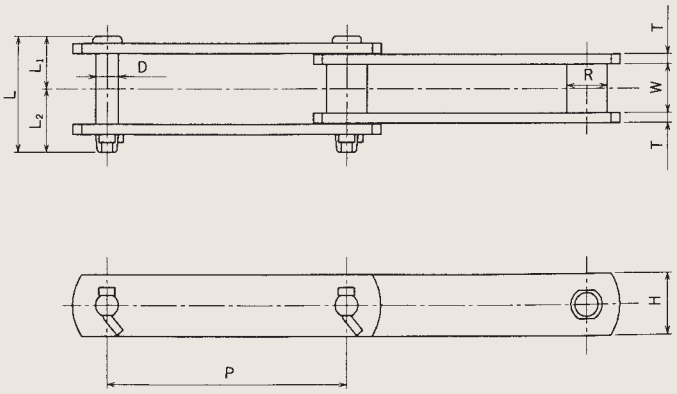
Chain No.	pitch P (mm)	Roller				Inner width W (mm)	Pin				Link plate		Average ultimate strength		Mass (kg/m)
		Outer Dia. R (mm)	face width E (mm)	Flange diameter K (mm)	Offset Z (mm)		Dia. D (mm)	Length L (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H (mm)	Thickness T (mm)	(kN)	(kgf)	
HRS03075-F	75	30.0	10.6	38	3.6	16.0	7.9	38.0	16.8	21.2	22.2	3.2	29.4	3000	2.4
HRS03100-F	100														2.1
HRS03150-F	150														1.8
HRS05100-F	100	40.0	14.5	50	4.8	22.0	11.0	53.4	23.9	29.5	31.8	4.7	68.6	7000	5.0
HRS05150-F	150														4.1
HR10108-F	101.6	44.5	18.0	55	6.5	27.0	11.0	65.7	30.6	35.1	28.6	6.3	78.5	8000	7.2
HR15208-F	152.4	50.8	20.0	65	7.0	30.2		68.0	31.4	36.6	38.1				8.0
HR10011-F	100	50.8	20.0	65	7.0	30.2	14.2	72.2	32.8	39.4	38.1	6.3	112.8	11500	10.0
HR15011-F	150														8.1
HR10113-F	101.6	44.5	20.0	60	7.0	31.6	15.8	81.3	37.3	44.0	38.1	7.9	132.4	13500	11.0
HR15215-F	152.4	57.2	25.0	75	9.0	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	12.4
HR20015-F	200	65.0	24.0	85	8.0										12.4
HR25015-F	250														10.6
HR20019-F	200	80.0	34.0	105	12.0	51.4	18.9	111.3	51.4	59.9	50.8	9.5	245.2	25000	19.8
HR25019-F	250														17.3
HR30019-F	300														15.7
HR25026-F	250	100.0	38.0	130	13.0	57.2	22.1	119.6	55.3	64.3	63.5	9.5	313.8	32000	29.0
HR30026-F	300														23.6
HR45026-F	450														18.9
HR30048-F	300	125.0	42.0	160	14.0	66.7	25.2	143.7	67.6	76.1	76.2	12.7	475.6	48500	45.0
HR45048-F	450														31.9
HR60048-F	600														27.8
HR30054-F	300	140.0	49.0	180	16.5	77.0	31.6	169.3	81.6	87.7	76.2	16.0	529.6	54000	48.0
HR45054-F	450														39.3
HR60054-F	600														34.3

Standard conveyor chain (S roller type)



Chain No.	pitch P (mm)	Roller outer Dia. R (mm)	Inner width W (mm)	Pin				Link plate		Average ultimate strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H (mm)	Thickness T (mm)			
					L (mm)	L_1 (mm)	L_2 (mm)			(kN)	(kgf)	
HRS03075-S	75	15.9	16.0	7.9	38.0	16.8	21.2	22.2	3.2	29.4	3000	1.6
HRS03100-S	100											1.4
HRS03150-S	150											1.3
HRS05075-S	75	22.2	22.0	11.0	53.4	23.9	29.5	31.8	4.7	68.6	7000	4.1
HRS05100-S	100											3.5
HRS05150-S	150											3.1
HR10105-S	101.6	20.1	22.6	9.5	53.0	24.2	28.8	25.4	4.7	53.9	5500	3.0
HR6608-S	66.27	22.2	27.0	11.0	65.7	30.6	35.1	28.6	6.3	78.5	8000	5.6
HR10108-S	101.6											4.6
HR15208-S	152.4	25.4	30.2		68.0	31.4	36.6	38.1				6.0
HR10011-S	100	29.0	30.2	14.2	72.2	32.8	39.4	38.1	6.3	112.8	11500	6.8
HR15011-S	150											5.5
HR7813-S	78.11	31.8	37.1	15.8	87.5	40.0	47.5	38.1	7.9	132.4	13500	10.4
HR10113-S	101.6		31.6		81.3	37.3	44.0					8.7
HR15215-S	152.4	34.9	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	9.3
HR20015-S	200											8.4
HR25015-S	250											7.8
HR15219-S	152.4	39.7	37.1	18.9	97.1	44.3	52.8	50.8	9.5	245.2	25000	12.6
HR20019-S	200		51.4	18.9	111.3	51.4	59.9					12.0
HR25019-S	250											11.1
HR30019-S	300											10.5
HR20026-S	200	44.5	57.2	22.1	119.6	55.3	64.3	63.5	9.5	313.8	32000	16.5
HR25026-S	250											14.7
HR30026-S	300											13.8
HR45026-S	450											13.8
HR30048-S	300	50.8	66.7	25.2	143.7	67.6	76.1	76.2	12.7	475.6	48500	22.9
HR45048-S	450											20.2
HR60048-S	600											19.0
HR30054-S	300	57.2	77.0	31.6	169.3	81.6	87.7	76.2	16.0	529.6	54000	29.7
HR45054-S	450											26.2
HR60054-S	600											24.2

HB-type bushed chain



Chain No.	pitch P (mm)	Bush outer Dia. R (mm)	Inner width W (mm)	Pin				Link plate		Average ultimate strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H (mm)	Thickness T (mm)			
					L (mm)	L_1 (mm)	L_2 (mm)			(kN)	(kgf)	
HB10105	101.6	18.2	22.6	9.5	53.0	24.2	28.8	25.4	4.7	53.9	5500	2.9
HB10007	100.0	20.0	22.0	11.1	53.4	23.9	29.5	31.8	4.7	73.5	7500	3.6
HB6608	66.27	22.2	27.0	11.1	65.7	30.6	35.1	28.6	6.3	78.5	8000	5.6
HB10011	100.0	25.4	30.2	14.2	72.2	32.8	39.4	38.1	6.3	112.8	11500	6.7
HB15011	150.0											5.7
HB7811	78.11	31.8	37.1	15.8	87.5	40.0	47.5	38.1	7.9	137.3	14000	10.3
HB10316	103.2	44.5	44.5	18.9	97.5	44.5	53.0	50.8	7.9	186.3	19000	15.1

Attachment types

Standard attachments

Conveyor chains must be used with various attachments to suit their applications. We offer A-type, K-type and G-type standard attachments.

A-type

Fins with bolt holes are attached to one side of the chain. Named A-1 or A-2, according to the number of bolt holes.

K-type

Fins with bolt holes are attached to both sides of the chain. Named K-1 or K-2, according to the number of bolt holes.

G-type

Link plates on one side of the chain have bolt holes. Named G-2 or G-4, according to the number of bolt holes.

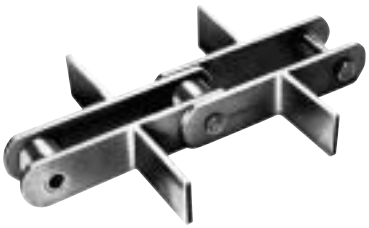
G-2

G-4

Special attachments

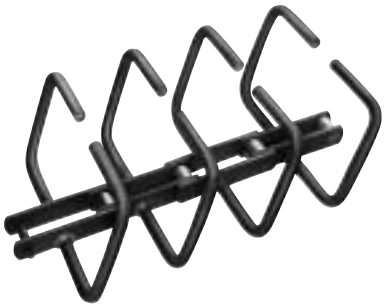
T-type, for case conveyors

Used to convey objects in cases, mainly horizontally.



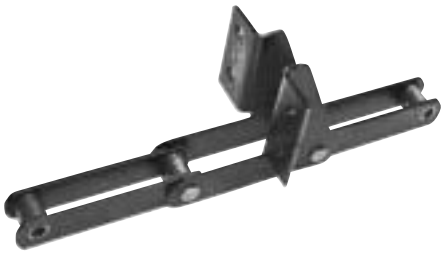
U-type, for case conveyors

Used to convey objects in cases at an incline or vertically.



SF4-type, for water treatment

Used to attach flights for agitating sludge.

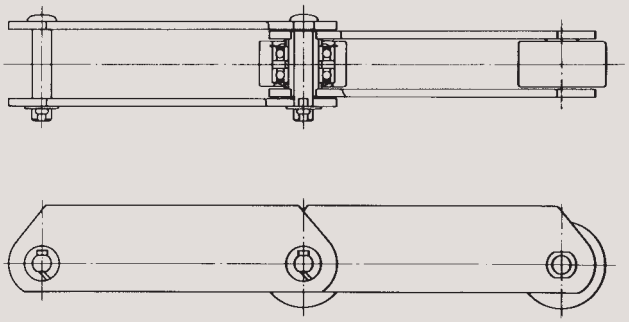


T-1-type, for water treatment

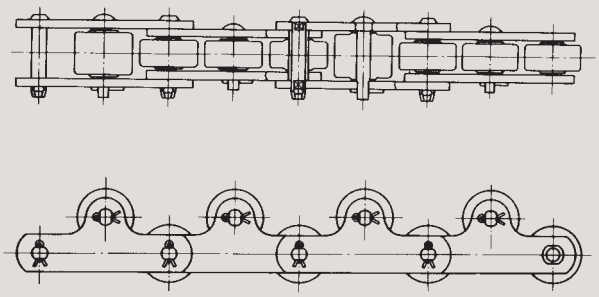
Used to attach rakes for collecting garbage.

Special attachments

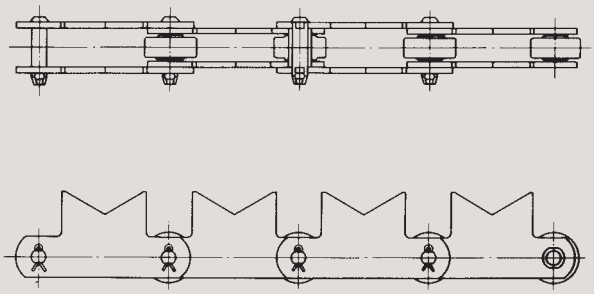
We manufacture special attachments such as those below, to suit load conveying requirements.



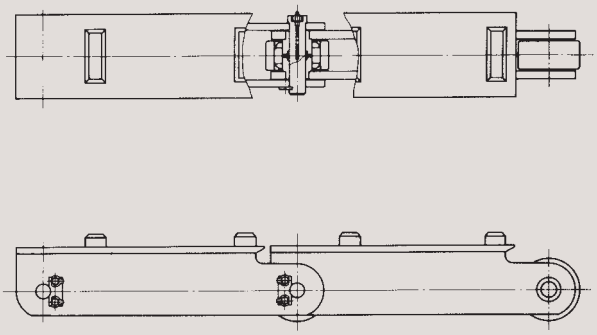
Deep link chain



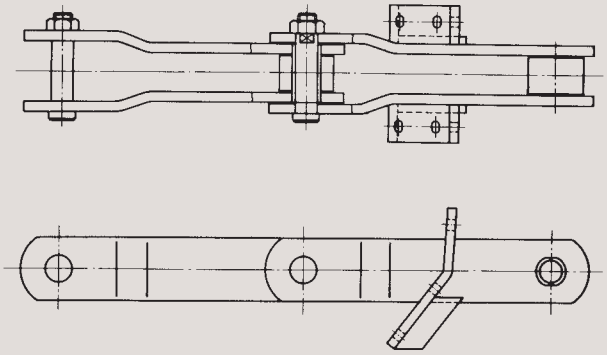
Chain with top rollers



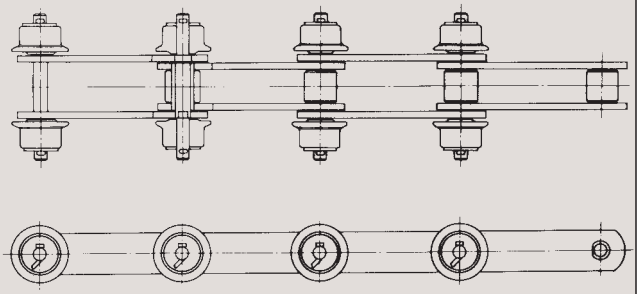
Chain for conveying round bars



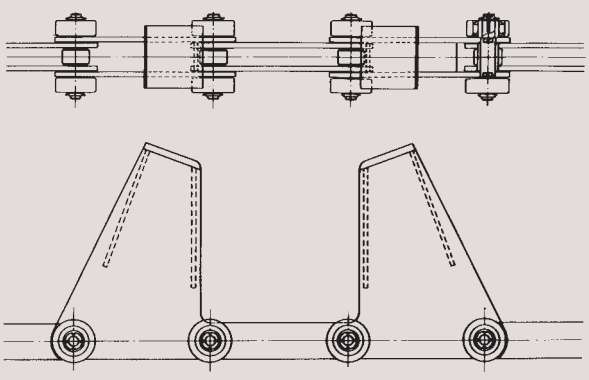
Chain for conveying slabs



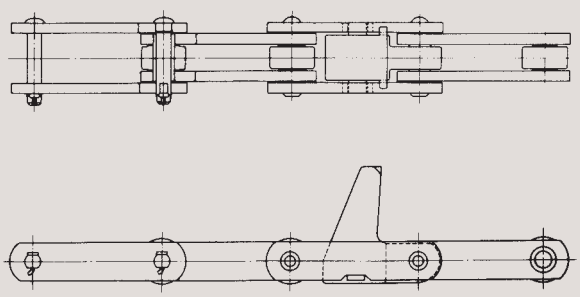
Chain for digesters



Chain with side rollers



Chain with saddles

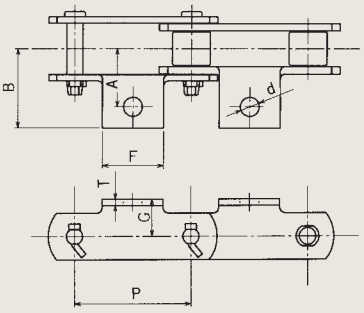


Chain with docks

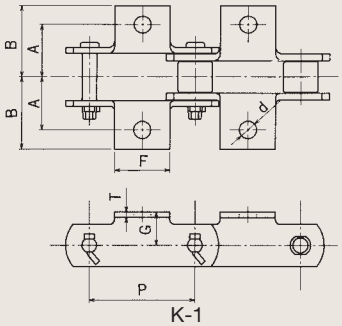
Standard attachments

HR-type and HRS-type attachments

A-1, K-1 attachment



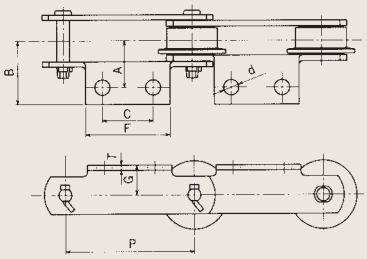
A-1



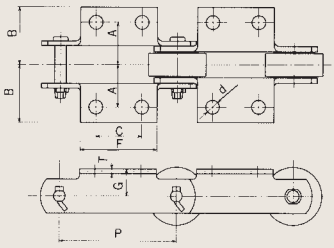
K-1

Chain No.	Pitch P (mm)	Dimensions (mm)						Added mass per attachment (kg)	
		A	B	d	F	G	T	A-1	K-1
HR6608	66.27	45	64	12	35	24	6.3	0.10	0.20
HR7813	78.11	60	78.5	12	45	35	7.9	0.15	0.30

A-2, K-2 attachment



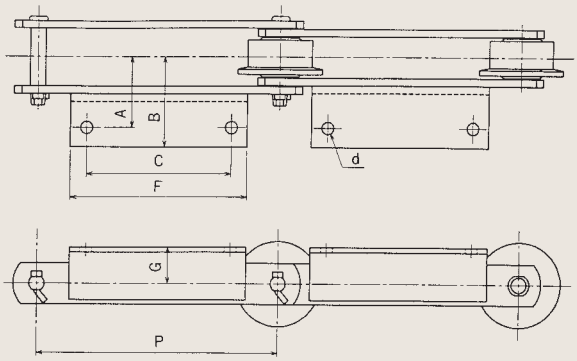
A-2



K-2

Chain No.	Pitch P (mm)	Dimensions (mm)							Added mass per attachment (kg)	
		A	B	C	d	F	G	T	A-2	K-2
HRS03075	75	30	46	30	10	55	20	3.2	0.05	0.10
HRS03100	100	30	46	40	10	65	20	3.2	0.06	0.12
HRS03150	150	30	46	60	10	85	20	3.2	0.11	0.22
HRS05075	75	35	52	30	10	55	22	4.7	0.07	0.14
HRS05100	100	35	52	40	10	65	22	4.7	0.10	0.20
HRS05150	150	35	52	60	10	85	22	4.7	0.15	0.30
HR7813	78.11	60	78.5	30	12	65	35	7.9	0.25	0.50
HR10105	101.6	40	58	40	12	70	22	4.7	0.15	0.30
HR10108	101.6	50	64	40	12	70	28	6.3	0.20	0.40
HR10113	101.6	55	76	40	15	80	35	7.9	0.30	0.60
HR15208	152.4	50	67	60	12	90	32	6.3	0.25	0.50
HR15215	152.4	60	81	60	15	100	38	7.9	0.40	0.80
HR15219	152.4	65	86	60	15	100	45	9.5	0.55	1.10
HR10011	100	50	64	40	12	70	28	6.3	0.15	0.30
HR15011	150	50	64	60	12	90	28	6.3	0.20	0.40
HR20015	200	60	81	80	15	120	38	7.9	0.50	1.00
HR20019	200	75	96	80	15	118	45	9.5	0.65	1.30
HR25015	250	60	81	125	15	170	38	7.9	0.70	1.40
HR25019	250	75	96	125	15	168	45	9.5	0.90	1.80

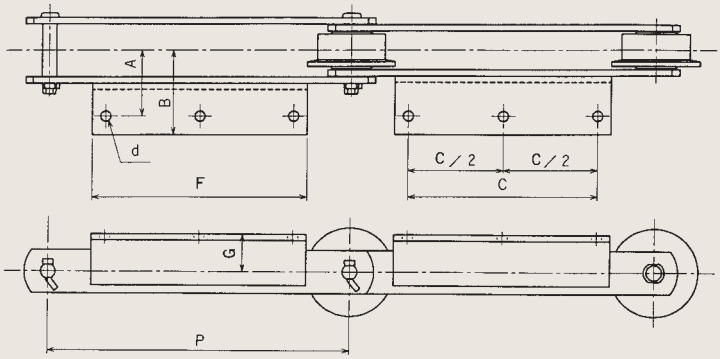
A-2 Attachment



A-2

Chain No.	Pitch P (mm)	Dimensions (mm)						Angle used (mm)	Added mass per attachment (kg)
		A	B	C	d	F	G		
HR30019	300	75	110.5	180	15	220	45	L65×65×6	1.35
HR30026	300	80	123.5	180	15	220	55	L75×75×9	2.20

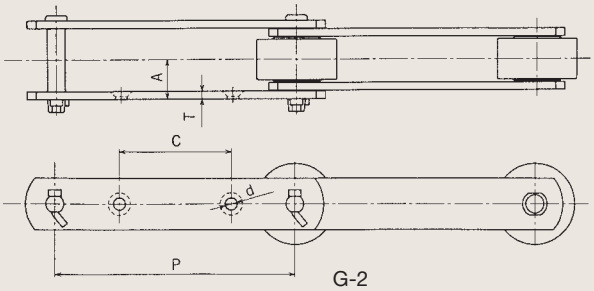
A-3 attachment



A-3

Chain No.	Pitch P (mm)	Dimensions (mm)						Angle used (mm)	Added mass per attachment (kg)
		A	B	C	d	F	G		
HR45026	450	80	123.5	280	15	320	55	L75×75×9	3.30
HR45048	450	100	159.5	280	19	320	70	L100×100×10	5.10
HR60048	600	100	159.5	360	19	410	70	L100×100×10	6.30

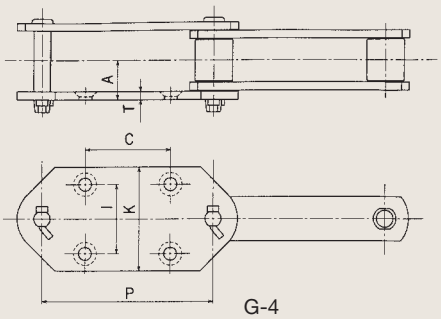
G-2 attachment



G-2

Chain No.	Pitch P (mm)	Dimensions (mm)			
		A	d	C	T
HR10105	101.6	21.2	9.5	45	4.7
HR10108	101.6	26.6	12.0	35	6.3
HR15208	152.4	28.2	12.0	60	6.3
HR10011 HR15011	100.0 150.0	28.4	12.0	35 60	6.3
HR10113	101.6	32.3	12.0	35	7.9
HR15215 HR20015 HR25015	152.4 200.0 250.0	35.0	15.0	50 80 125	7.9
HR20019 HR25019 HR30019	200.0 250.0 300.0	45.5	15.0	70 110 150	9.5
HR30026 HR45026	300.0 410.0	48.4	15.0	140 220	9.5
HR45048 HR60048	410.0 600.0	59.6	19.0	220 300	12.7
HR41054 HR60054	450.0 600.0	71.6	22.0	220 300	16.0

G-4 attachment

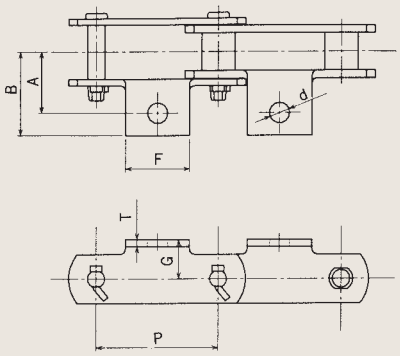


G-4

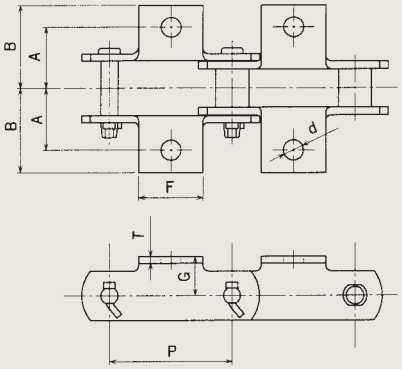
Chain No.	Pitch P (mm)	Dimensions (mm)						Added mass per attachment (kg)
		A	C	d	I	K	T	
HR15208	152.4	28.2	75	12	70	110	6.3	0.49
HR15011	150	28.4						0.48
HR15215	152.4	35.0	75	15	70	110	7.9	0.52
HR20015	200		100		70	110		0.84
HR25015	250		140		100	150		1.55
HR15219	152.4	38.5	75	15	70	110	9.5	0.66
HR20019	200	45.5	100		80	120		0.90
HR25019	250	45.5	140		100	150		1.70
HR20026	200	48.4	100	15	80	120	9.5	0.90
HR25026	250		140		100	150		1.43
HR30026	300		180		100	150		1.99
HR25048	250	59.6	140	19	100	150	12.7	1.50
HR30048	300		180					2.40

HB-type attachments

A-1, K-1 attachment



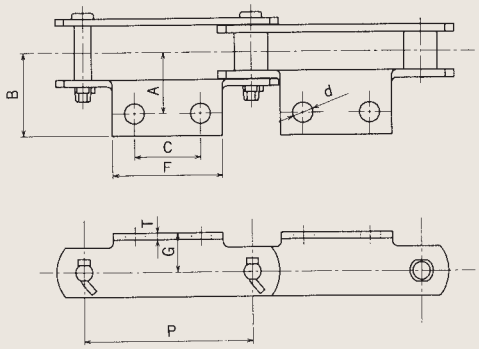
A-1



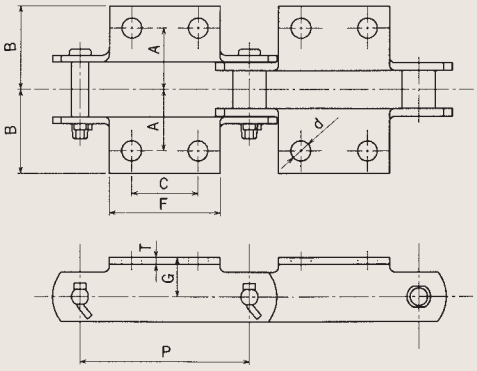
K-1

Chain No.	Pitch P (mm)	Dimensions (mm)						Added mass per attachment (kg)	
		A	B	d	F	G	T	A-1	K-1
HB6608	66.27	45	64	12	35	24	6.3	0.10	0.20
HB7811	78.11	60	78.5	12	45	35	7.9	0.15	0.30

A-2, K-2 attachment



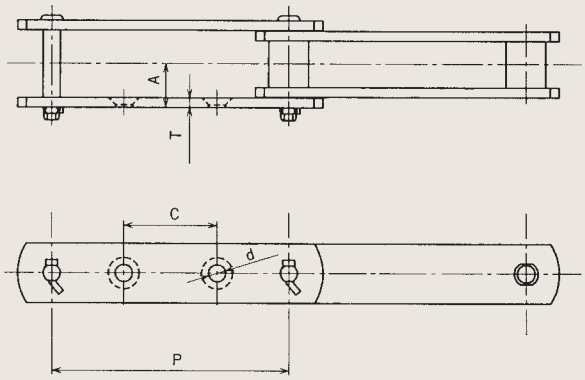
A-2



K-2

Chain No.	Pitch P (mm)	Dimensions (mm)							Added mass per attachment (kg)	
		A	B	C	d	F	G	T	A-2	K-2
HB7811	78.11	60	78.5	30	12.0	65	35	7.9	0.25	0.50
HB10007	100	35	52	40	10.0	65	22	4.8	0.10	0.20
HB10011	100	50	64	40	12.0	70	28	6.3	0.15	0.30
HB15011	150	50	64	60	12.0	90	28	6.3	0.20	0.40

G-2 attachment



G-2

Chain No.	Pitch P (mm)	Dimensions (mm)			
		A	d	C	T
HB10007	100	20.9	10.0	40	4.8
HB10011	100	28.4	11.0	35	6.3
HB15011	150	28.4	11.0	60	6.3

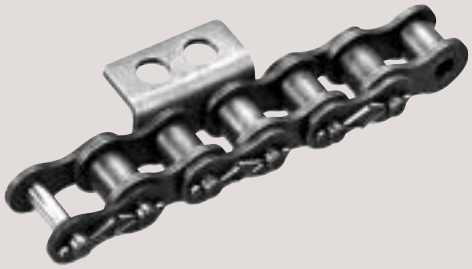
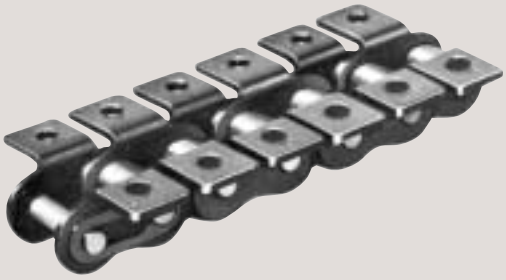
HITACHI CONVEYOR CHAINS

Steel Conveyor Chains

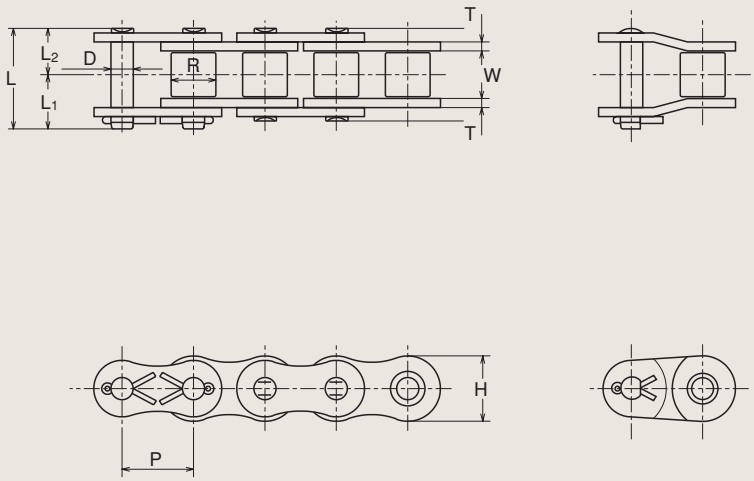
Roller chains with attachments

These chains are standard roller chains with attachments added as necessary.

Main attachment types

Type	Form	Type	Form
A-1		WA-2	
K-1		WSA-2	
SA-1		D-1	
SK-1		D-3	

Dimensions of standard roller chains



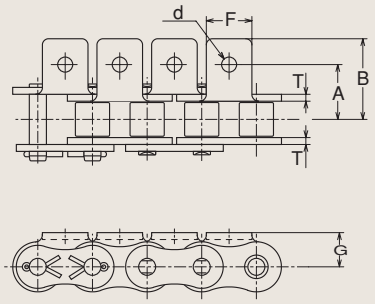
Chain No.	pitch P (mm)	Roller outer Dia. R (mm)	Inner width W (mm)	Pin				Link plate	
				Dia. D (mm)	Length L (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H (mm)	Thickness T (mm)
※35	9.525	5.08	4.8	3.58	12.9	6.9	6.0	8.9	1.25
40	12.70	7.94	7.95	3.96	17.6	9.4	8.2	11.6	1.5
50	15.875	10.16	9.53	5.08	21.8	11.6	10.2	14.5	2.0
60	19.05	11.91	12.7	5.95	26.9	14.2	12.7	17.4	2.4
80	25.40	15.88	15.88	7.93	35.4	19.1	16.3	23.4	3.2
100	31.75	19.05	19.05	9.53	43.1	23.3	19.8	29.3	4.0
120	38.10	22.23	25.4	11.10	53.6	28.7	24.9	35.1	4.8
140	44.45	25.4	25.4	12.70	58.5	31.3	27.2	40.9	5.6
160	50.80	28.58	31.75	14.28	68.8	36.6	32.2	46.7	6.4

Chain No.	Average ultimate strength		Maximum allowable load		Mass (kg/m)	
	(kN)	(kgf)	(kN)	(kgf)	Cotter type	Rivet type
※35	11.8	1200	2.25	230	–	0.32
40	19.2	1960	3.72	380	–	0.62
50	31.9	3250	6.17	630	–	1.02
60	43.1	4400	8.62	880	–	1.47
80	78.5	8000	14.7	1500	2.52	2.52
100	118	12000	22.5	2300	3.84	–
120	167	17000	30.4	3100	5.68	–
140	216	22000	40.2	4100	7.61	–
160	275	28000	52.9	5400	10.1	–

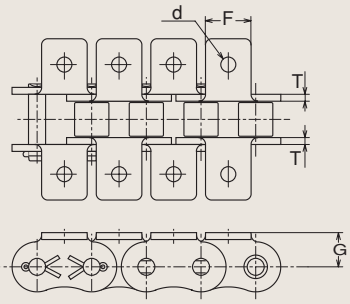
※indicates bushed chains, so the outer roller diameter is the outer bush diameter.

Attachment types and dimensions

A-1, K-1 attachment



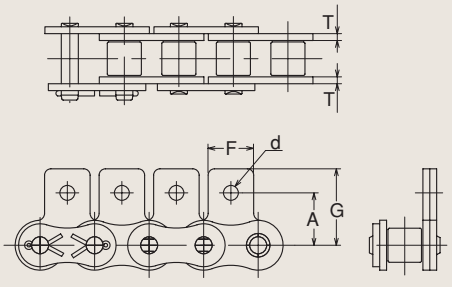
A-1



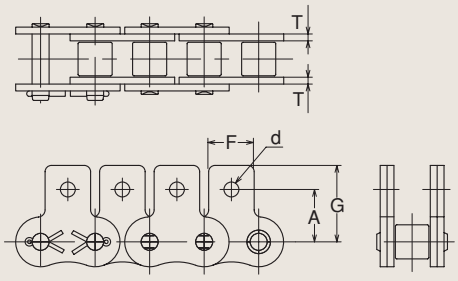
K-1

Chain No.	Dimensions (mm)						Added mass per attachment (g)	
	A	B	d	F	G	T	A-1	K-1
35	9.5	14.3	3.4	7.9	6.4	1.25	0.9	1.8
40	12.7	17.5	3.6	9.5	8.0	1.5	1.2	2.4
50	15.9	23.0	5.2	12.7	10.3	2.0	4.0	8.0
60	19.1	27.8	5.2	15.9	11.9	2.4	6.5	13.0
80	25.4	35.9	6.8	19.1	15.9	3.2	13.0	26.0
100	31.8	44.3	8.8	25.4	19.8	4.0	27.0	54.0
120	38.1	54.7	10.5	28.3	23.0	4.8	47.0	94.0
140	44.5	63.2	12.0	34.7	28.6	5.6	65.0	130.0
160	50.8	71.9	14.0	38.1	31.8	6.4	88.0	176.0

SA-1, SK-2 attachment



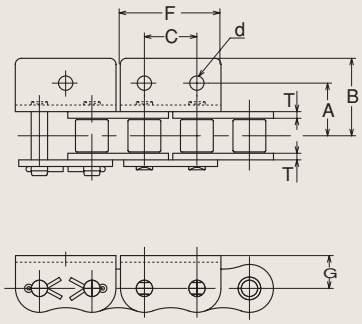
SA-1



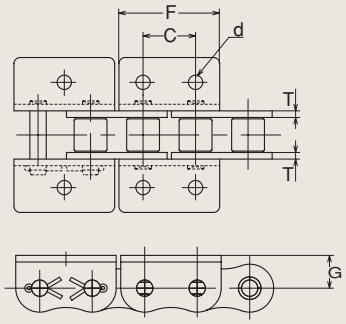
SK-1

Chain No.	Dimensions (mm)					Added mass per attachment (g)	
	A	d	F	G	T	SA-1	SK-1
35	9.5	3.4	7.9	15.9	1.25	0.9	1.8
40	12.7	3.6	9.5	18.8	1.5	1.2	2.4
50	15.9	5.2	12.7	25.0	2.0	4.0	8.0
60	18.3	5.2	15.9	26.7	2.4	6.5	13.0
80	24.6	6.8	19.1	34.5	3.2	13.0	26.0
100	31.8	8.8	25.4	43.0	4.0	27.0	54.0
120	36.6	10.5	28.3	51.4	4.8	47.0	94.0
140	44.4	12.0	34.7	63.1	5.6	65.0	130.0
160	50.8	14.0	38.1	69.5	6.4	88.0	176.0

WA-1, WA-2, WK-1, WK-2 attachment



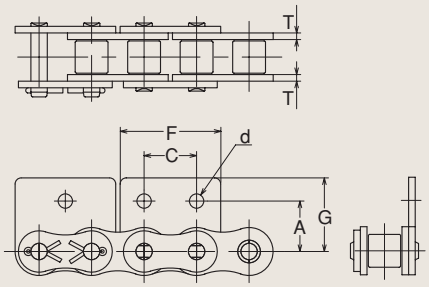
WA



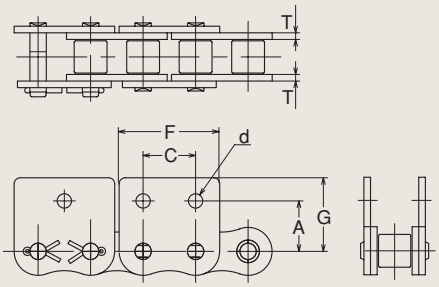
WK

Chain No.	Dimensions (mm)							Added mass per attachment (g)	
	A	B	C	d	F	G	T	WA-1, WA-2	WK-1, WK-2
40	12.7	17.5	9.5	4.5	23.1	7.9	1.5	3.0	6.0
50	15.9	23.0	11.9	5.5	30.9	10.3	2.0	7.0	14.0
60	19.1	28.2	14.3	6.6	34.6	11.9	2.4	12.0	24.0
80	25.4	35.9	19.1	9.0	48.6	15.9	3.2	28.0	56.0
100	31.8	44.3	23.8	11.0	61.0	19.8	4.0	55.0	110.0

WSA-1, WSA-2, WSK-1, WSK-2 attachment



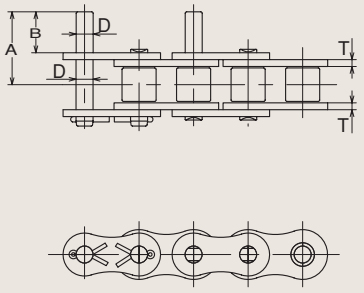
WSA



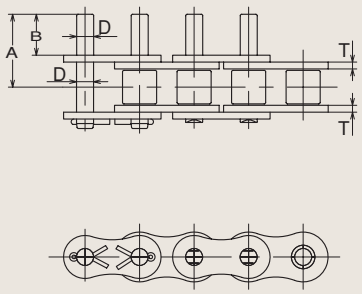
WSK

Chain No.	Dimensions (mm)						Added mass per attachment (g)	
	A	C	d	F	G	T	WSA-1, WSA-2	WSK-1, WSK-2
40	12.7	9.5	4.5	23.1	17.2	1.5	3.0	6.0
50	15.9	11.9	5.5	30.9	23.0	2.0	7.0	14.0
60	18.3	14.3	6.6	34.6	26.9	2.4	12.0	24.0
80	24.6	19.1	9.0	48.6	34.5	3.2	28.0	56.0
100	31.8	23.8	11.0	61.0	43.0	4.0	55.0	110.0

D-1, D-3 attachment



D-1



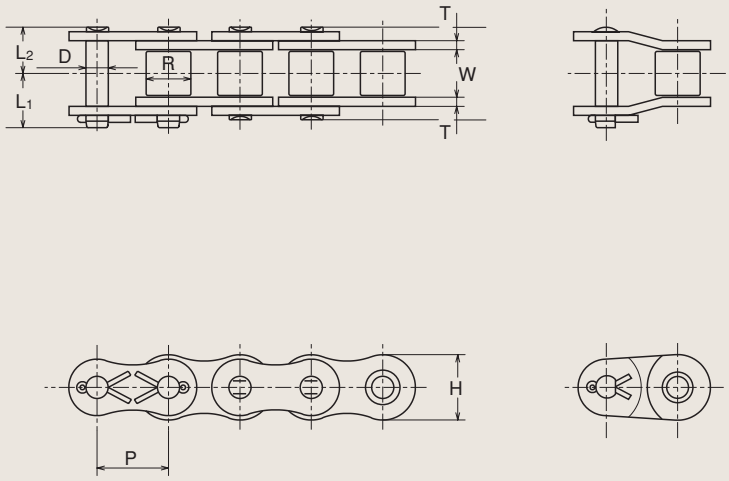
D-3

Chain No.	Dimensions (mm)				Added mass per attachment (g)	
	A	B	D	T	D-1	D-3
35	14.6	9.5	3.58	1.25	0.8	1.6
40	16.7	9.5	3.96	1.5	1.0	2.0
50	21.0	11.9	5.08	2.0	2.0	4.0
60	25.7	14.3	5.95	2.4	3.0	6.0
80	33.9	19.0	7.93	3.2	7.0	14.0
100	41.9	23.8	9.53	4.0	12.0	24.0
120	51.4	28.6	11.10	4.8	20.0	40.0
140	57.5	33.3	12.70	5.6	30.0	60.0
160	67.4	38.1	14.28	6.4	45.0	90.0

Stainless steel roller chains with attachments

These chains are stainless steel roller chains with attachments added as necessary.

Dimensions of stainless steel roller chains

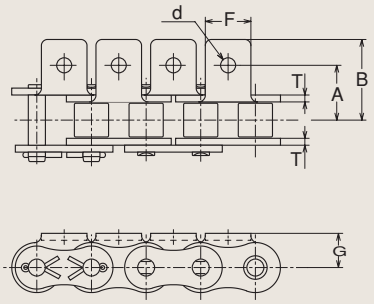


Chain No.	pitch P (mm)	Roller outer Dia. R (mm)	Inner width W (mm)	Pin			Link plate		Maximum allowable load		Mass (kg/m)	
				Dia. D (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H (mm)	Thickness T (mm)	(kN)	(kgf)	Cotter type	Rivet type
※35SS	9.525	5.08	4.8	3.58	7.4	6.0	8.9	1.25	0.24	25	–	0.34
40SS	12.70	7.94	7.95	3.96	10.0	8.2	11.6	1.5	0.44	45	–	0.63
50SS	15.875	10.16	9.53	5.08	11.8	10.2	14.5	2.0	0.68	70	–	1.02
60SS	19.05	11.91	12.7	5.95	14.8	12.7	17.4	2.4	1.07	110	–	1.45
80SS	25.40	15.88	15.88	7.93	19.0	16.3	23.4	3.2	1.71	175	2.46	2.42
100SS	31.75	19.05	19.05	9.53	23.4	19.8	29.3	4.0	2.64	270	3.84	3.77
120SS	38.10	22.23	25.4	11.10	28.9	25.1	35.1	4.8	3.82	390	5.68	5.58
140SS	44.45	25.4	25.4	12.70	31.3	27.2	40.9	5.6	4.70	480	7.61	7.50
160SS	50.80	28.58	31.75	14.28	36.6	32.2	46.7	6.3	6.37	650	10.10	9.94

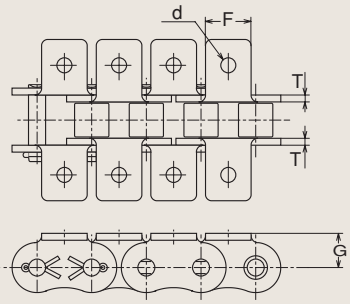
※indicates bushed chains, so the outer roller diameter is the outer bush diameter.

Attachment types and dimensions

A-1, K-1 attachment



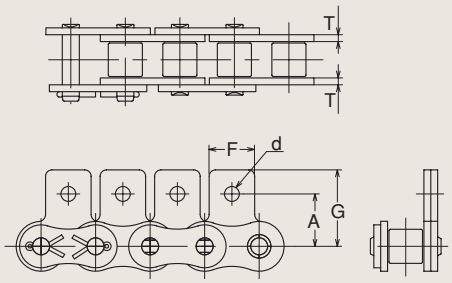
A-1



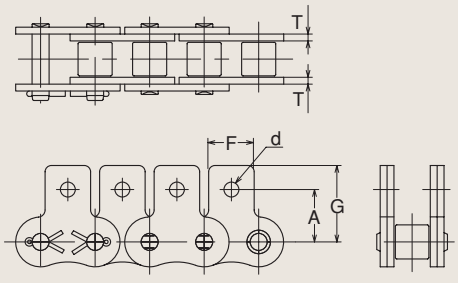
K-1

Chain No.	Dimensions (mm)						Added mass per attachment (g)	
	A	B	d	F	G	T	A-1	K-1
35SS	9.5	14.5	3.4	7.9	6.4	1.25	0.9	1.8
40SS	12.7	17.5	3.6	9.5	8.0	1.5	1.3	2.6
50SS	15.9	23.5	5.2	12.7	10.3	2.0	3.2	6.4
60SS	19.1	28.2	5.2	15.9	11.9	2.4	5.9	11.8
80SS	25.4	36.0	6.8	19.1	15.9	3.2	13.5	27.0
100SS	31.8	44.5	8.8	25.2	19.8	4.0	19.5	39.0
120SS	38.1	55.0	10.5	28.3	23.0	4.8	31.0	62.0
140SS	44.5	63.5	12.0	34.9	28.6	5.6	65.0	130.0
160SS	50.8	72.8	14.0	38.1	31.8	6.4	88.0	176.0

SA-1, SK-1 attachment



SA-1



SK-1

Chain No.	Dimensions (mm)					Added mass per attachment (g)	
	A	d	F	G	T	SA-1	SK-1
35SS	9.5	3.4	7.9	14.7	1.25	0.9	1.8
40SS	12.7	3.6	9.5	18.8	1.5	1.3	2.6
50SS	15.9	5.2	12.7	23.0	2.0	3.2	6.4
60SS	18.3	5.2	15.9	26.7	2.4	5.9	11.8
80SS	24.6	6.8	19.1	34.5	3.2	13.5	27.0
100SS	31.8	8.8	25.2	43.0	4.0	19.5	39.0
120SS	36.5	10.5	28.3	51.4	4.8	31.0	62.0
140SS	45.6	12.0	34.9	63.4	5.6	65.0	130.0
160SS	51.2	14.0	38.1	70.4	6.4	88.0	176.0

Double pitch roller chains for conveyor use

These chains use straight link plates. They are divided into the large roller series and the small roller series, according to the outer diameter of the rollers used.

Small roller series

(S roller type)

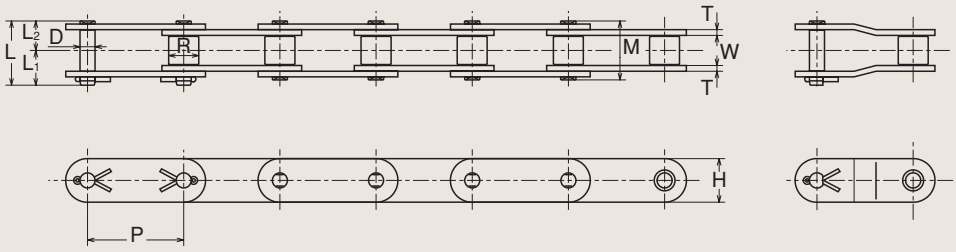
- Indicated by a "0" as the last digit of the chain number.
- The outer diameter of the roller is the same as for the standard roller chain on which it is based.
  Ex.: The outer roller diameter for the C2040 is the same as that of the No.40 standard roller chain.
- Standard sprockets can be used if they have at least 30 teeth.
  Ex.: The C2040 32-tooth sprocket (16 working teeth) can be used with the No.40 32-tooth standard sprocket.

Large roller series

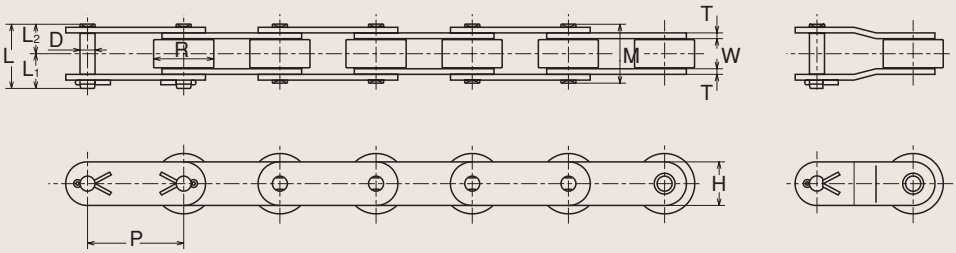
(R roller type)

- Indicated by a "2" as the last digit of the chain number.
- The outer diameter of the roller is the same as for the standard roller chain which has the same pitch as the double pitch roller chain.
  Ex.: The roller outer diameter of the C2042 is the same as that of the N0.80 standard roller chain, because the chain pitch is 25.4mm (the roller outer diameter is 15.88mm).
- Use specialized sprockets.

Dimensions of double pitch roller chains for conveyor use



Small roller series



Large roller series

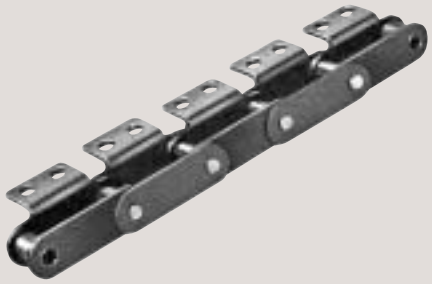
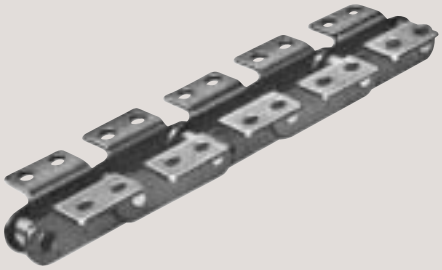
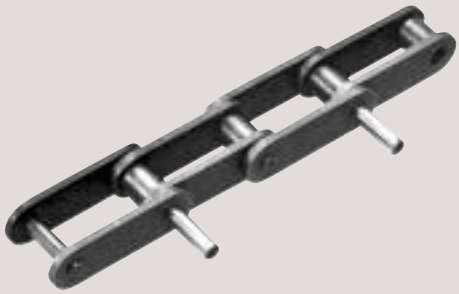
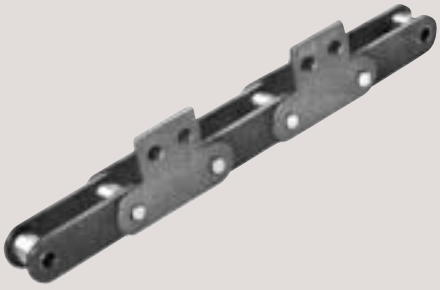
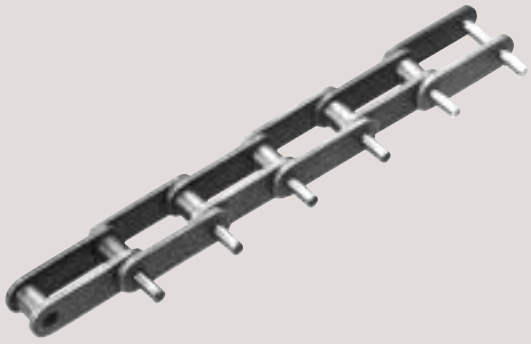
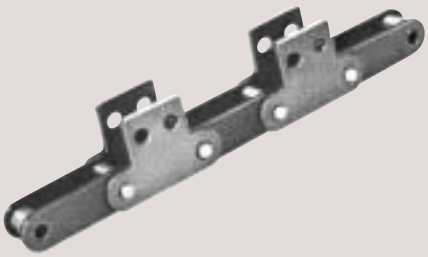
Chain No.	pitch P (mm)	Roller Outer Dia.(mm) R	Roller Outer Dia.(mm) R1	Inner width W (mm)	Pin Dia. D (mm)	Pin Length (mm) M	Pin Length (mm) L	Pin Length (mm) L1	Pin Length (mm) L2	Link plate Height H (mm)	Link plate Thickness T (mm)	Average ultimate strength (kN)	Average ultimate strength (kgf)	Maximum allowable load (kN)	Maximum allowable load (kgf)	Mass (kg/m)
C2040	25.4	7.94	–	7.95	3.96	16.4	18.2	10.0	8.2	11.5	1.5	16.7	1700	2.64	270	0.50
C2042		–	15.88													0.85
C2050	31.75	10.16	–	9.53	5.08	20.4	22.2	12.0	10.2	15.0	2.0	27.5	2800	4.31	440	0.85
C2052		–	19.05													1.30
C2060H	38.1	11.91	–	12.70	5.95	28.7	31.0	16.7	14.3	17.0	3.2	40.2	4100	6.27	640	1.50
C2062H		–	22.23													2.15
C2080H	50.8	15.88	–	15.88	7.93	35.6	38.8	21.0	17.8	22.8	4.0	68.6	7000	10.6	1090	2.50
C2082H		–	28.58													3.65
C2100H	63.5	19.05	–	19.05	9.53	42.2	45.8	24.7	21.1	28.8	4.8	108	11000	17.0	1740	3.46
C2102H		–	39.67													5.64
C2120H	76.2	22.23	–	25.40	11.10	52.4	57.0	30.7	26.3	35.0	5.6	151	15400	23.9	2440	4.92
C2122H		–	44.45													7.87
C2160H	101.6	28.58	–	31.75	14.28	67.3	72.9	39.0	33.9	47.8	7.2	258	26300	40.8	4170	8.02
C2162H		–	57.15													12.77

Note: Rivet pins are standard, but cotter pins may also be used.

Double pitch roller chains with attachments

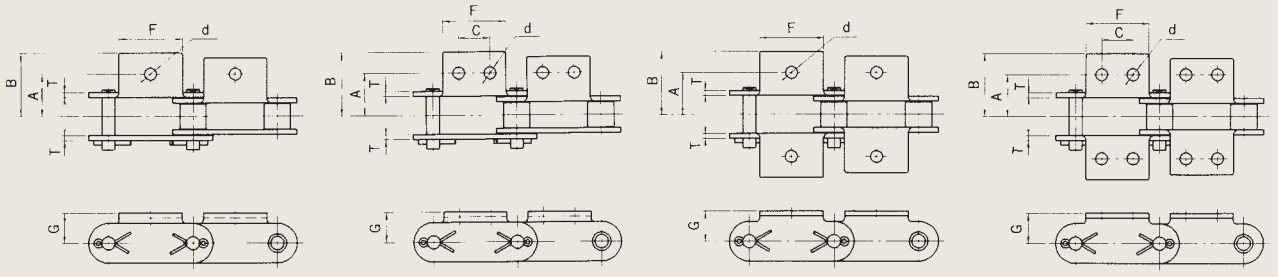
These chains are double pitch roller chains for conveyor use, with various attachments added as necessary.

Main attachment types

Type	Form	Type	Form
A-2		GK-1	
K-2		D-1	
SA-2		D-3	
SK-2			

Attachment types and dimensions

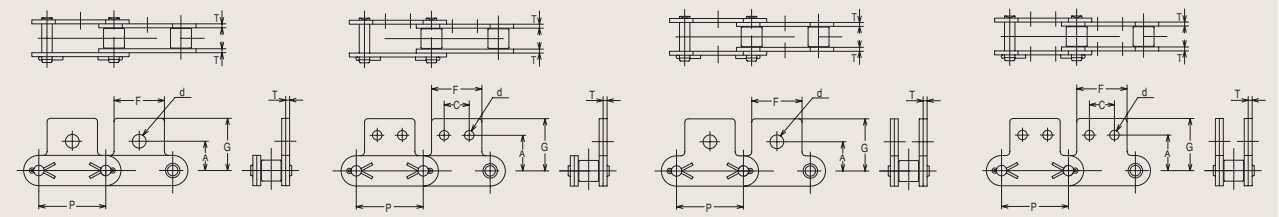
A-1, A-2, K-1, K-2 attachments



A-1 A-2 K-1 K-2

Chain No.	Dimensions (mm)							Added mass per attachment (g)	
	A	B	C	d	F	G	T	A-1, A-2	K-1, K-2
C2040 C2042	12.7	19.1	9.5	3.6	19.1	9.1	1.5	3.2	6.4
C2050 C2052	15.9	24.2	11.9	5.2	23.8	11.1	2.0	6.3	12.6
C2060H C2062H	21.4	31.2	14.3	5.2	28.6	14.7	3.2	14.9	29.8
C2080H C2082H	27.8	40.6	19.1	6.8	38.1	19.1	4.0	31.5	63.0
C2100H C2102H	33.3	50.0	23.8	8.8	47.6	23.4	4.8	64.0	128.0
C2120H C2122H	39.7	61.9	28.6	10.5	57.2	27.8	5.6	102.0	204.0
C2160H C2162H	52.4	76.1	38.1	14.0	76.2	36.5	7.2	262.0	524.0

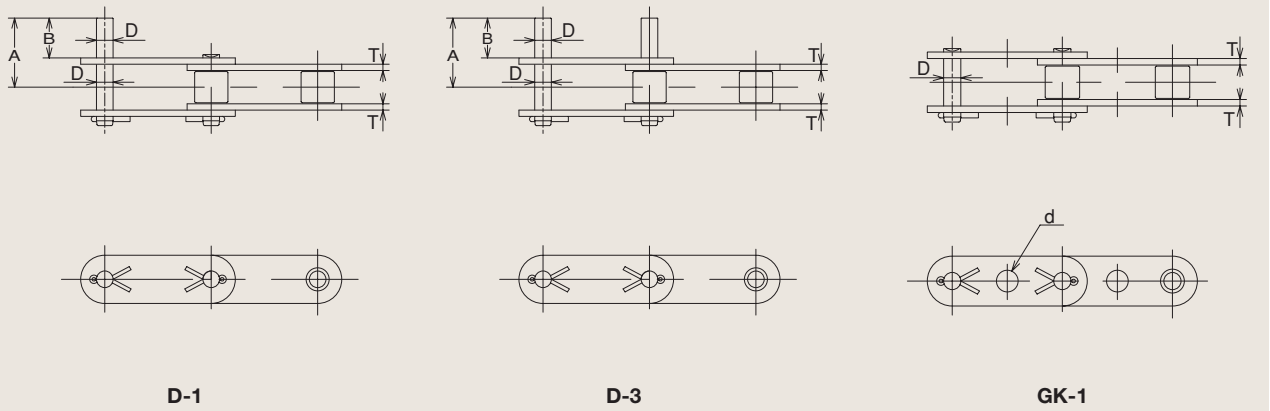
SA-1, SA-2, SK-1, SK-2 attachments



SA-1 SA-2 SK-1 SK-2

Chain No.	Dimensions (mm)									Added mass per attachment	
	A		C	d		F	G	T		SA-1 SA-2	SK-1 SK-2
	SA-1, SK-1	SA-2, SK-2		SA-1, SK-1	SA-2, SK-2						
C2040 C2042	11.1	13.5	9.5	5.2	3.6	19.1	19.8	1.5		2.7	5.4
C2050 C2052	14.3	15.9	11.9	6.8	5.2	23.8	24.6	2.0		5.9	11.8
C2060H C2062H	17.5	19.1	14.3	8.7	5.2	28.6	30.6	3.2		14.4	28.8
C2080H C2082H	22.2	25.4	19.1	10.3	6.8	38.1	40.2	4.0		31.5	63.0
C2100H C2102H	28.6	31.8	23.8	14.0	8.8	47.6	50.3	4.8		66.0	132.0
C2120H C2122H	33.3	37.3	28.6	16.0	10.5	57.2	61.1	5.6		97.0	194.0
C2160H C2162H	44.5	50.8	38.1	21.0	14.0	76.2	76.2	7.2		233.0	466.0

D-1, D-3, GK-1 attachments



D-1 D-3 GK-1

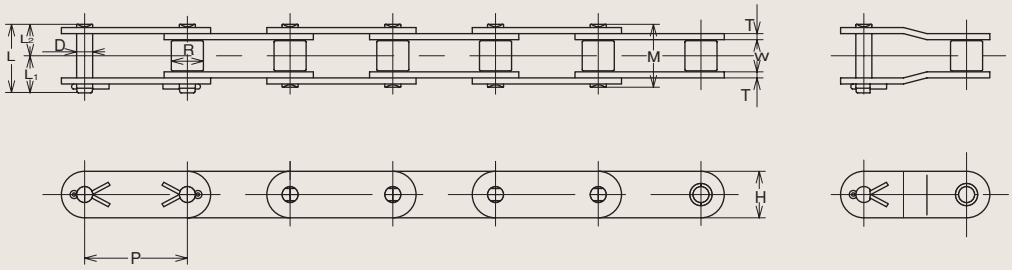
Chain No.	Dimensions (mm)					Added mass per attachment (g)	
	A	B	D	※d	T	D-1	D-3
			D-1, D-3	GK-1			
C2040	16.8	9.5	3.96	4.1	1.5	0.9	1.8
C2042							
C2050	21.1	11.9	5.08	5.1	2.0	1.8	3.6
C2052							
C2060H	27.5	14.3	5.95	6.1	3.2	3.0	6.0
C2062H							
C2080H	35.6	19.0	7.93	8.1	4.0	7.0	14.0
C2082H							
C2100H	43.2	23.8	9.53	10.1	4.8	12.0	24.0
C2102H							
C2120H	53.0	28.6	11.1	12.1	5.6	20.0	40.0
C2122H							
C2160H	69.0	38.1	14.23	16.0	7.2	44.0	88.0
C2162H							

※We also manufacture to special dimensions.

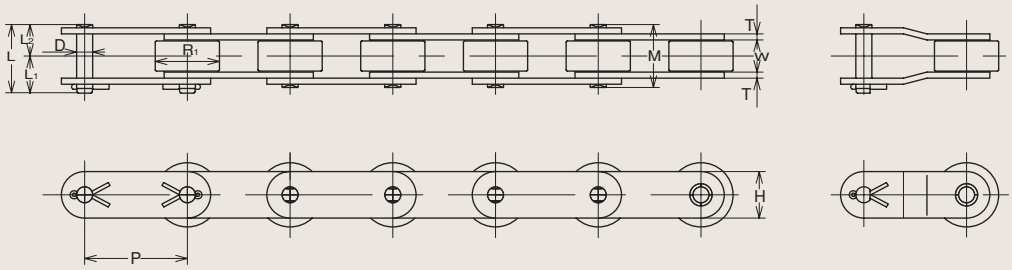
Double pitch stainless steel roller chains for conveyor use

Double pitch stainless steel roller chains for conveyor use are made from 300-class stainless steel.
They can be used in acid, alkaline or wet conditions, hot and cold conditions, and in other special atmospheres which require temperature and corrosion resistance.

Dimensions of double pitch stainless steel roller chains for conveyor use



Small roller series



Large roller series

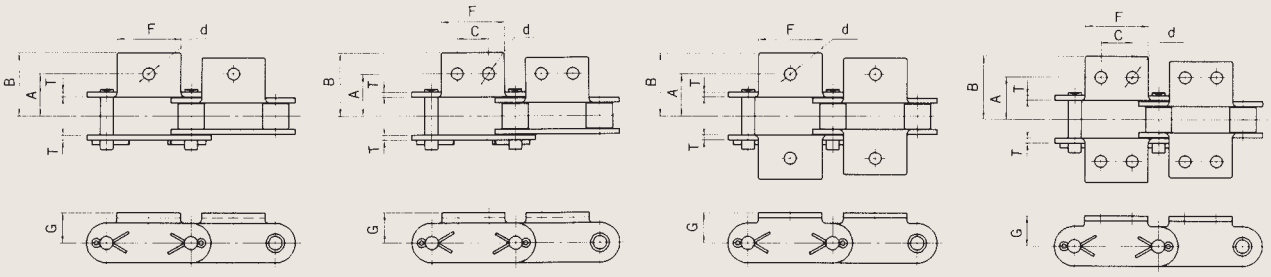
Chain No.	pitch P (mm)	Roller		Inner width W (mm)	Pin					Link plate		Average ultimate strength		Maximum allowable load		Mass (kg/m)
		Outer Dia.(mm)			Dia. D (mm)	Length (mm)				Height H (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	
		R	R_1			M	L	L_1	L_2							
C2040SS	25.4	7.94	–	7.95	3.96	16.4	18.2	10.0	8.2	11.5	1.5	12.4	1260	0.44	45	0.50
C2042SS		–	15.88													0.85
C2050SS	31.75	10.16	–	9.53	5.08	20.4	22.2	12.0	10.2	15.0	2.0	20.3	2070	0.68	70	0.85
C2052SS		–	19.05													1.30
C2060HSS	38.1	11.91	–	12.7	5.95	28.7	31.0	16.7	14.3	17.0	3.2	27.4	2790	1.02	105	1.50
C2062HSS		–	22.23													2.15
C2080HSS	50.8	15.88	–	15.88	7.93	35.6	38.8	21.0	17.8	22.8	4.0	47.1	4800	1.76	180	2.50
C2082HSS		–	28.58													3.65
C2100HSS	63.5	19.05	–	19.05	9.53	42.2	45.8	24.7	21.1	28.8	4.8	56.9	5800	2.59	265	3.46
C2102HSS		–	39.67													5.64
C2120HSS	76.2	22.23	–	25.4	11.1	52.4	57.0	30.7	26.3	35.0	5.6	76.5	7800	3.87	395	4.92
C2122HSS		–	44.45													7.87
C2160HSS	101.6	28.58	–	31.75	14.28	67.3	72.9	39.0	33.9	47.8	7.2	123	12500	6.37	650	8.02
C2162HSS		–	57.15													12.77

Note: Rivet pins are standard, but cotter pins may also be used.

Double pitch stainless steel chains with attachments

These chains are double pitch stainless steel chains for conveyor use, with attachments added as necessary.

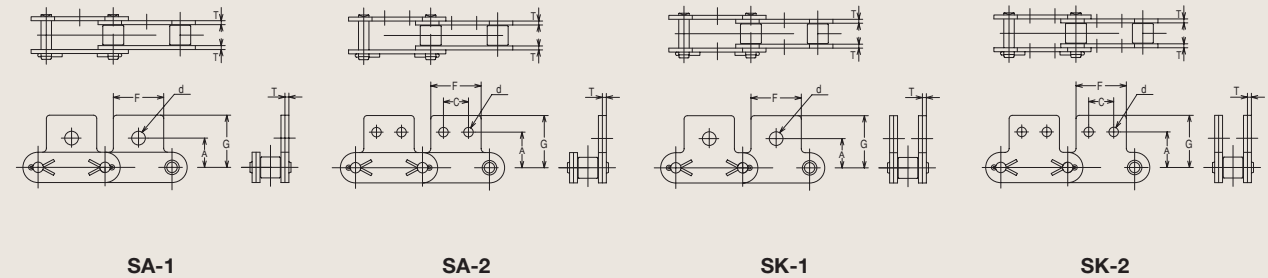
A-1, A-2, K-1, K-2 attachments



A-1 A-2 K-1 K-2

Chain No.	Dimensions (mm)							Added mass per attachment (g)	
	A	B	C	d	F	G	T	A-1, A—2	K-1, K-2
C2040SS C2042SS	12.7	19.1	9.5	3.6	19.0	9.1	1.5	3.0	6.0
C2050SS C2052SS	15.9	24.2	11.9	5.2	23.8	11.1	2.0	7.0	14.0
C2060HSS C2062HSS	21.4	32.8	14.3	5.2	28.6	14.7	3.2	17.0	34.0
C2080HSS C2082HSS	27.8	42.2	19.1	6.8	38.1	19.1	4.0	36.0	72.0
C2100HSS C2102HSS	33.3	50.0	23.8	8.8	47.6	23.4	4.8	64.0	128.0
C2120HSS C2122HSS	39.7	61.9	28.6	10.5	57.2	27.8	5.6	102.0	204.0
C2160HSS C2162HSS	52.4	76.1	38.1	14.0	76.2	36.5	7.2	262.0	524.0

SA-1, SA-2, SK-1, SK-2 attachments



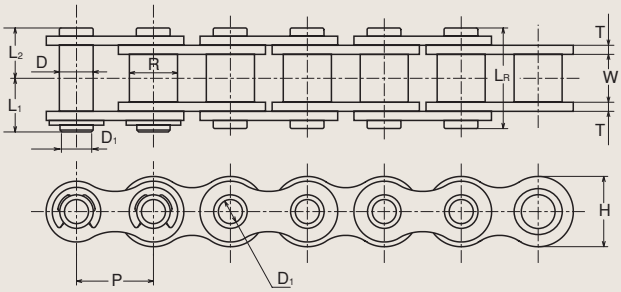
SA-1 SA-2 SK-1 SK-2

Chain No.	Dimensions (mm)									Added mass per attachment (g)	
	A		C	d		F	G	T		SA-1, SA-2	SK-1, SK-2
	SA-1, SK-1	SA-2, SK-2		SA-1, SK-1	SA-2, SK-2						
C2040SS C2042SS	11.1	13.5	9.5	5.2	3.6	19.0	19.8	1.5		3.0	6.0
C2050SS C2052SS	14.3	15.9	11.9	6.8	5.2	23.8	24.6	2.0		7.0	14.0
C2060HSS C2062HSS	17.5	19.1	14.3	8.7	5.2	28.6	31.8	3.2		17.0	34.0
C2080HSS C2082HSS	22.2	25.4	19.1	10.3	6.8	38.1	41.7	4.0		36.0	72.0
C2100HSS C2102HSS	28.6	31.8	23.8	14.0	8.8	47.6	50.3	4.8		66.0	132.0
C2120HSS C2122HSS	33.3	37.3	28.6	16.0	10.5	57.2	61.1	5.6		97.0	194.0
C2160HSS C2162HSS	44.5	50.8	38.1	21.0	14.0	76.2	76.2	7.2		233.0	466.0

Hollow pin chains

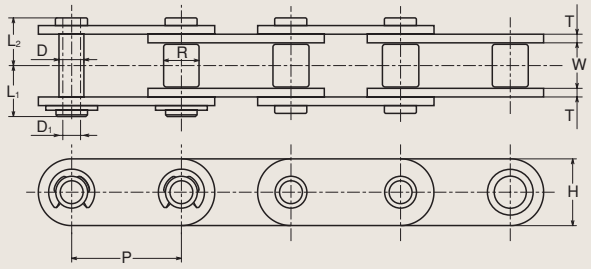
These chains have hollow pins so that the holes can be used to mount various pins and attachments.

Standard chain series

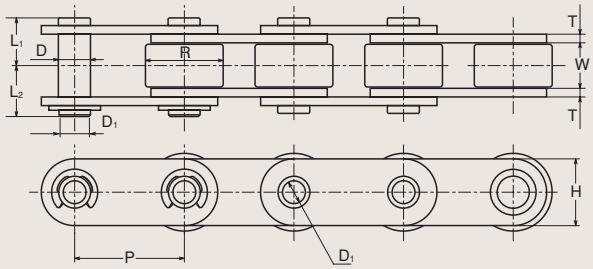


Chain No.	pitch P (mm)	Bush outer Dia. R (mm)	Inner width W (mm)	Pin				Link plate		Average ultimate strength		Maximum allowable load		Mass (kg/m)
				Outer Dia. D (mm)	Inner Dia. D1 (mm)	Length (mm)		Height H (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	
						L1	L2							
40HP	12.70	7.94	7.95	5.63	4.0	9.2	8.3	12.0	1.5	12.7	1300	1.76	180	0.58
50HP	15.875	10.16	9.53	7.09	5.15	11.2	10.1	15.0	2.0	19.6	2000	3.13	320	0.97
60HP	19.05	11.91	12.7	8.29	6.03	14.1	12.9	18.1	2.4	28.4	2900	4.21	430	1.46
80HP	25.40	15.88	15.88	11.34	8.05	18.8	16.2	24.1	3.2	51.0	5200	7.64	780	2.47

Double pitch chain series



Small roller series



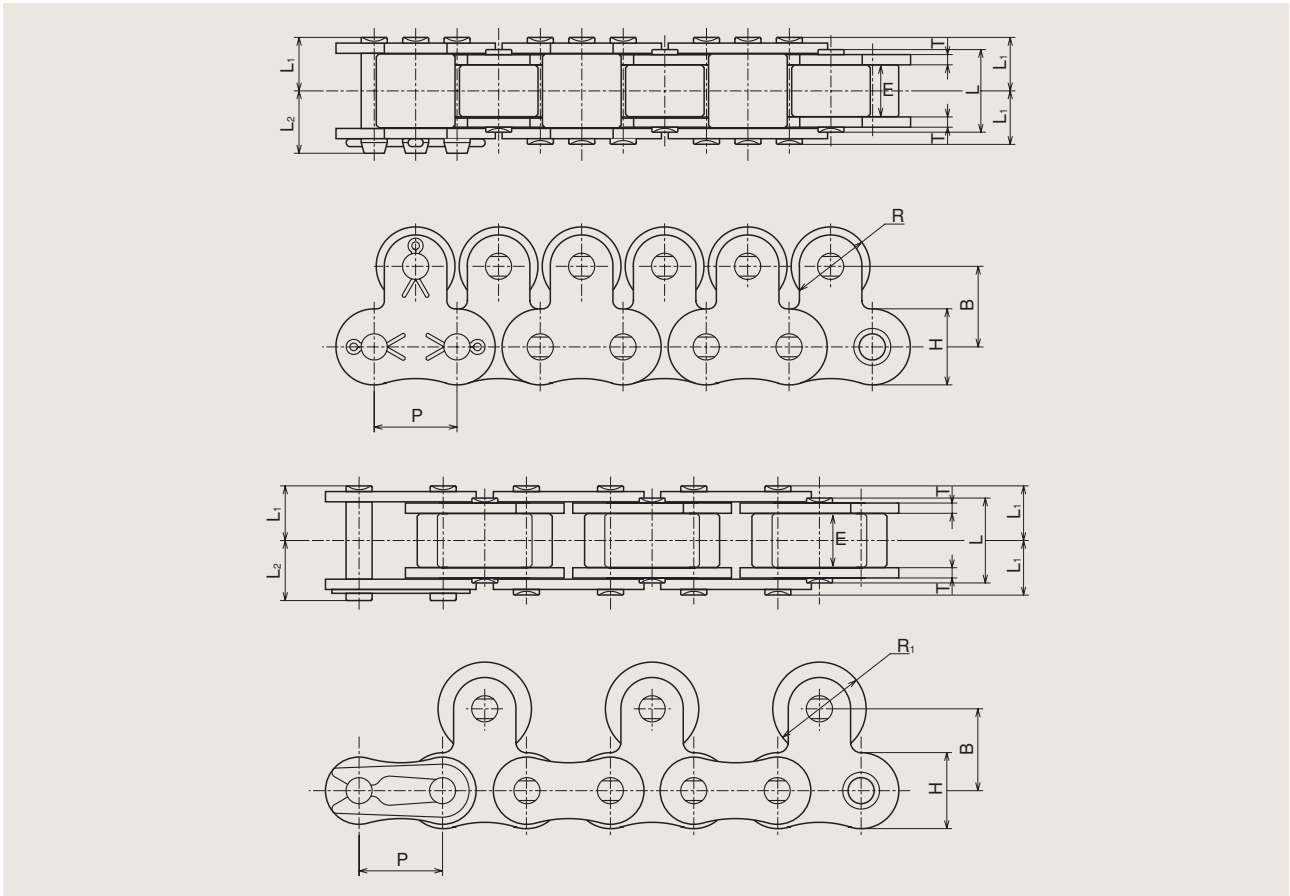
Large roller series

Chain No.	pitch P (mm)	Roller outer Dia. R (mm)	Inner width W (mm)	Pin				Link plate		Average ultimate strength		Maximum allowable load		Mass (kg/m)
				Outer Dia. D (mm)	Inner Dia. D1 (mm)	Length (mm)		Height H (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	
						L1	L2							
※C2040HP	25.40	7.94	7.95	5.63	4.0	9.2	8.3	12.0	1.5	12.7	1300	1.76	180	0.46
C2042HP		15.88												0.81
※C2050HP	31.75	10.16	9.53	7.09	5.15	11.2	10.1	15.0	2.0	19.6	2000	3.13	320	0.76
C2052HP		19.05												1.25
※C2060HP	38.10	11.91	12.7	8.29	6.03	14.1	12.9	18.1	2.4	28.4	2900	4.21	430	1.12
C2062HP		22.23												1.79
※C2080HP	50.80	15.88	15.88	11.34	8.05	18.8	16.2	24.1	3.2	51.0	5200	7.64	780	1.98
C2082HP		28.58												3.17

※indicates bushed chains, so the outer roller diameter is the outer bush diameter.

Top Roller Chains

- These chains have rollers attached above the center of each chain pitch, so that objects can be placed directly on top of the top rollers.
- Conveyed materials can be stored and paused on top while the chain is moving continuously.
- We also make the quality, plastic top rollers.



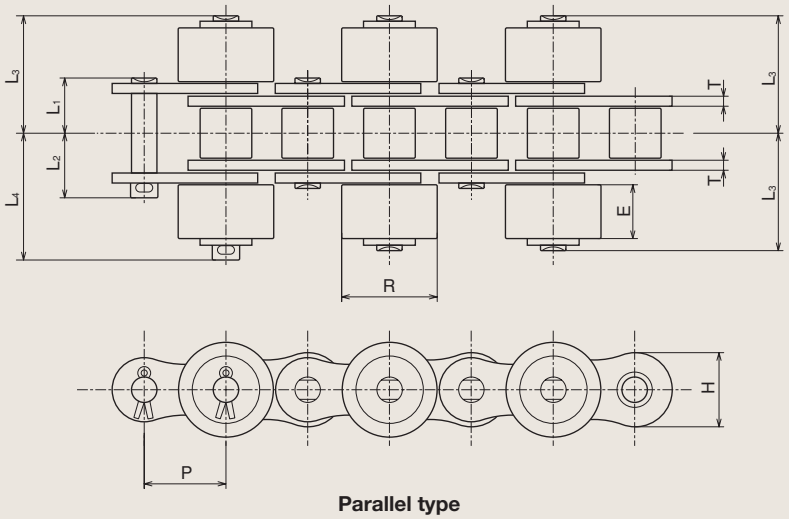
Chain No.	pitch P (mm)	Top roller			Pin length		Link plate		Center height B (mm)	Mass (kg/m)			
		Outer Dia.		Width			Height H (mm)	Thickness T (mm)		Plastic rollers		Steel rollers	
		R (mm)	R1 (mm)	E (mm)	L1 (mm)	L2 (mm)				Per 1 Liter	Per 2 Liters	Per 1 Liter	Per 2 Liters
40	12.70	11.0	15.88	7.6	8.2	9.4	11.6	1.5	12.7	0.92	0.85	1.83	1.41
50	15.875	15.0	19.05	9.2	10.2	11.6	14.5	2.0	15.9	1.56	1.38	2.39	2.18
60	19.01	18.0	22.23	12.5	12.7	14.2	17.4	2.4	18.3	2.30	2.03	3.60	3.18
80	25.40	24.0	28.58	15.6	16.3	18.7	23.4	3.2	24.6	3.90	3.44	6.09	5.27
100	31.75	30.0	39.67	18.5	19.6	23.2	29.3	4.0	31.8	6.06	5.41	9.30	8.85
C2040	25.40	–	15.88	7.6	8.2	10.0	11.5	1.5	15.0	0.86	–	1.29	–
C2050	31.75	–	19.05	9.2	10.2	11.8	15.0	2.0	19.0	1.37	–	1.98	–
C2060H	38.10	–	22.23	12.5	14.4	16.4	17.0	3.2	23.0	2.63	–	3.57	–
C2080H	50.80	–	28.58	15.6	17.8	20.8	22.8	4.0	29.0	4.07	–	5.48	–

Chain No.	Average ultimate strength		Maximum allowable load		Allowable load per top roller							
					When roller outer Dia. is R				When roller outer Dia. is R1			
					Plastic rollers		Steel rollers		Plastic rollers		Steel rollers	
	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)
40	16.7	1700	2.64	270	0.03	3	0.1	10	0.05	5	0.15	15
50	27.5	2800	4.31	440	0.05	5	0.12	12	0.07	7	0.20	20
60	40.2	4100	6.27	640	0.10	10	0.20	20	0.10	10	0.29	30
80	68.7	7000	10.6	1090	0.15	15	0.34	35	0.18	18	0.54	55
100	108.0	11000	17.0	1740	0.22	22	0.54	55	0.29	30	0.78	80
C2040	16.7	1700	2.64	270	–	–	–	–	0.05	5	0.15	15
C2050	27.5	2800	4.31	440	–	–	–	–	0.07	7	0.20	20
C2060H	40.2	4100	6.27	640	–	–	–	–	0.10	10	0.29	30
C2080H	68.7	7000	10.6	1090	–	–	–	–	0.18	18	0.54	55

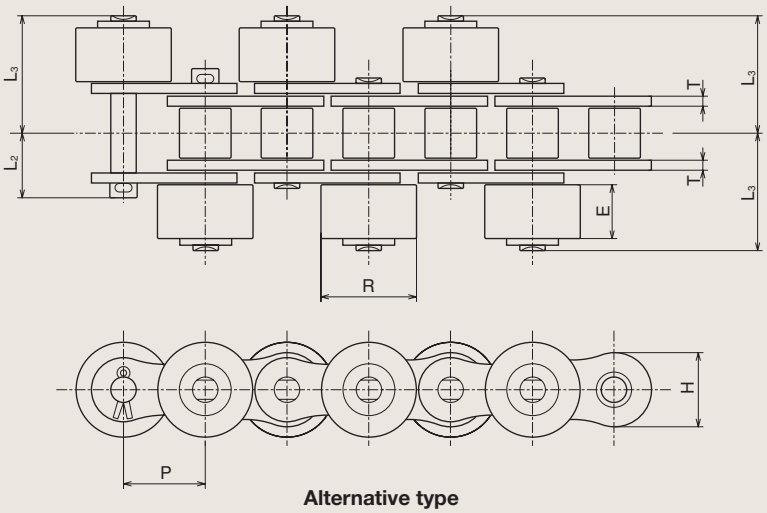
Note: Refer to the base roller chain or double pitch roller conveyor chain for dimensions not stated here.

Side Roller Chains

- These chains have side rollers attached to one or both sides, in either parallel or staggered arrangements.
- As they have side rollers, the motion of these chains is extremely stable.
- Plastic Side rollers can be used to reduce noise.



Parallel type



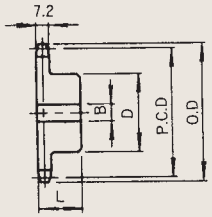
Alternative type

Chain No.	pitch P (mm)	Side roller		Pin length				Link plates		Average ultimate strength		Maximum allowable load		Allowable load per 1piece side roller				Mass (kg/m)	
								Height	Thickness					Plastic roller		Steel roller			
		Dia. (mm)	Width E (mm)	L_1 (mm)	L_2 (mm)	L_3 (mm)	L_4 (mm)	H (mm)	T (mm)	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	Plastic rollers	Steel rollers
40	12.70	15.88	7.6	8.2	10.0	17.4	19.1	11.6	1.5	16.7	1700	2.64	270	0.05	5	0.15	15	0.94	1.67
50	15.875	19.05	9.2	10.2	11.8	21.2	23.1	14.5	2.0	27.5	2800	4.31	440	0.07	7	0.20	20	1.42	2.42
60	19.01	22.23	12.5	12.7	14.8	27.9	30.0	17.4	2.4	40.2	4100	6.27	640	0.10	10	0.29	30	2.11	3.63
80	25.40	28.58	15.6	14.3	19.2	34.0	37.0	23.4	3.2	68.7	7000	10.6	1090	0.18	18	0.54	55	3.57	5.92
100	31.75	39.67	18.5	19.6	23.2	41.0	44.5	29.3	4.0	108.0	11000	17.0	1740	0.29	30	0.78	80	5.56	10.02
C2040	25.40	15.88	7.6	8.2	10.0	17.4	19.1	11.5	1.5	16.7	1700	2.64	270	0.05	5	0.15	15	0.66	1.02
C2042		23.0												0.07	7	0.20	20	0.89	1.30
C2050	31.75	19.05	9.2	10.2	11.8	21.2	23.1	15.0	2.0	27.5	2800	4.31	440	0.07	7	0.20	20	1.03	1.53
C2052		27.0												0.10	10	0.29	30	1.23	1.70
C2060H	38.10	22.23	12.5	14.4	16.4	28.8	31.0	17.0	3.2	40.2	4100	6.27	640	0.10	10	0.29	30	1.80	2.56
C2062H		30.0												0.15	15	0.44	45	1.93	2.64
C2080H	50.80	28.58	15.6	17.8	20.8	35.6	38.8	22.8	4.0	68.7	7000	10.6	1090	0.18	18	0.54	55	3.12	4.30

Note: Refer to the base roller chain or double pitch roller conveyor chain for dimensions not stated here.

Sprockets for double pitch roller chains

2040 sprocket



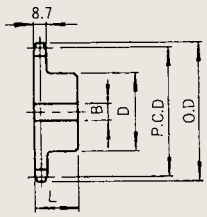
B type

(mm)

No. of teeth	No. of working teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type Bore Dia. B Pilot bore	Maximum	Hub Dia. D	Width L	Mass (kg)	Material
18	9	74.27	80	13	34	54	30	0.60	B type S35C
19	9½	78.23	84	13	34	54	30	0.65	
20	10	82.20	88	13	36	56	40	0.75	
21	10½	86.17	92	13	36	56	40	0.80	
22	11	90.16	96	13	36	56	40	0.90	
23	11½	94.14	100	13	36	56	40	1.00	
24	12	98.14	104	13	36	56	40	1.10	
25	12½	102.14	108	13	36	56	40	1.15	
26	13	106.14	112	13	36	56	40	1.20	
27	13½	110.14	116	13	40	65	40	1.25	
28	14	114.15	120	13	40	65	40	1.30	
29	14½	118.16	124	13	40	65	40	1.40	
30	15	122.17	129	13	40	65	40	1.50	

Note: Sprockets with 18~30 teeth have hardened tooth surface.

2050 sprocket



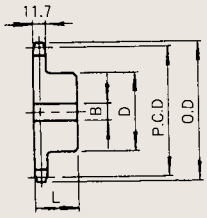
B type

(mm)

No. of teeth	No. of working teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type Bore Dia. B Pilot bore	Maximum	Hub Dia. D	Width L	Mass (kg)	Material
17	8½	87.89	94	13	40	65	40	0.95	B type S35C
18	9	92.84	100	13	40	65	40	1.20	
19	9½	97.78	104	13	42	66	40	1.30	
20	10	102.75	110	13	45	70	45	1.60	
21	10½	107.72	115	13	45	70	45	1.75	
22	11	112.70	120	16	45	70	45	1.80	
23	11½	117.68	125	16	45	70	45	1.85	
24	12	122.67	130	16	45	70	45	1.90	
25	12½	127.67	135	16	45	70	45	2.00	
26	13	132.67	140	16	45	70	45	2.10	
27	13½	137.67	145	16	45	70	45	2.20	
28	14	142.68	150	16	45	70	45	2.35	
29	14½	147.70	155	16	45	70	45	2.50	
30	15	152.70	161	16	45	70	45	2.60	

Note: Sprockets with 17~30 teeth have hardened tooth surface.

2060 sprocket



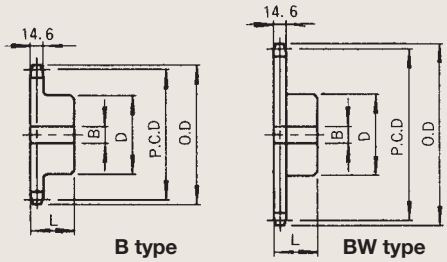
B type

(mm)

No. of teeth	No. of working teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type Bore Dia. B Pilot bore	Maximum	Hub Dia. D	Width L	Mass (kg)	Material
14	7	87.81	95	16	35	56	40	1.0	B type S35C
15	7½	93.67	101	16	35	56	40	1.1	
16	8	99.57	107	16	35	56	40	1.2	
17	8½	105.47	113	16	45	70	40	1.6	
18	9	111.40	119	16	45	70	40	1.9	
19	9½	117.34	125	16	45	70	40	2.1	
20	10	123.30	132	16	50	80	45	2.4	
21	10½	129.26	138	16	50	80	45	2.5	
22	11	135.24	144	16	50	80	45	2.6	
23	11½	141.22	150	16	50	80	45	2.8	
24	12	147.21	156	16	50	80	45	3.0	
25	12½	153.20	162	16	50	80	45	3.2	
26	13	159.20	168	16	50	80	45	3.3	
27	13½	165.21	174	16	50	80	45	3.5	
28	14	171.22	181	16	50	85	50	3.6	
29	14½	177.23	187	16	50	85	50	3.7	
30	15	183.26	193	20	50	85	50	4.0	

Note: Sprockets with 14~30 teeth have hardened tooth surface.

2080 sprocket



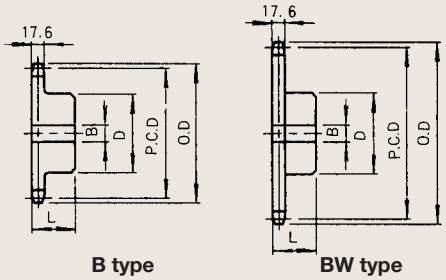
B type BW type

(mm)

No. of teeth	No. of working teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type Bore Dia. B Pilot bore	Maximum	Hub Dia. D	Width L	Mass (kg)	Material
14	7	117.09	126	17	50	80	50	2.4	B type S35C
15	7½	124.90	134	20	50	80	50	2.6	
16	8	132.74	143	20	50	80	50	3.0	
17	8½	140.63	151	20	55	90	50	3.3	
18	9	148.54	159	20	55	90	50	3.5	
19	9½	156.45	167	20	55	90	50	3.7	
20	10	164.39	176	20	55	90	50	4.3	
21	10½	172.35	184	20	55	90	50	4.4	
22	11	180.31	192	20	60	93	50	4.7	BW type SS400
23	11½	188.29	200	20	60	93	50	5.0	
24	12	196.28	208	20	60	93	50	5.3	
25	12½	204.27	216	20	60	93	50	5.6	
26	13	212.27	224	20	60	93	50	5.9	
27	13½	220.28	233	20	60	93	50	6.2	
28	14	228.30	241	20	60	93	50	6.5	
29	14½	236.31	249	20	60	93	50	6.9	
30	15	244.35	257	20	60	93	50	7.2	

Note: Sprockets with 14~21 teeth have hardened tooth surface.
Sprockets with 22~30 teeth have welded structures of SS400.

2100 sprocket

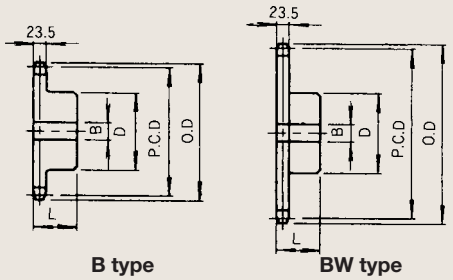


(mm)

No. of teeth	No. of working teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
				Bore Dia. B		Hub		Mass (kg)	Material
				Pilot bore	Maximum	Dia. D	Width L		
14	7	146.35	158	26	65	100	70	5.60	B type S35C
15	7½	156.12	168	26	65	100	70	6.05	
16	8	165.93	179	26	65	100	70	6.55	
17	8½	175.78	189	26	65	105	80	7.65	
18	9	185.66	199	26	65	105	80	7.95	
19	9½	195.57	209	26	65	105	80	8.35	
20	10	205.49	220	26	65	105	80	8.65	
21	10½	215.43	230	26	65	105	80	8.90	
22	11	225.39	240	26	70	108	60	8.61	BW type SS400
23	11½	235.36	250	26	70	108	60	9.17	
24	12	245.35	260	26	70	108	60	9.65	
25	12½	255.34	270	26	70	108	60	10.2	
26	13	265.34	281	26	70	108	60	10.8	
27	13½	275.35	291	26	70	108	60	11.6	
28	14	285.37	301	26	70	108	60	12.0	
29	14½	295.39	311	26	70	108	60	12.7	
30	15	305.42	321	26	70	108	60	13.3	

Note: Sprockets with 14~21 teeth have hardened tooth surfaces.
Sprockets with 22~30 teeth have welded structures of SS400.

2120 sprocket

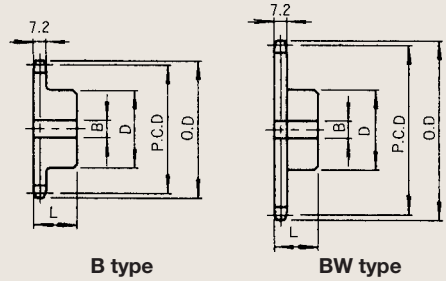


(mm)

No. of teeth	No. of working teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
				Bore Dia. B		Hub		Mass (kg)	Material
				Pilot bore	Maximum	Dia. D	Width L		
13	6½	163.97	177	26	65	105	70	6.35	B type S35C
14	7	175.62	190	26	65	105	70	6.85	
15	7½	187.34	202	26	65	105	70	7.55	
16	8	199.12	214	26	65	115	80	10.6	
17	9½	210.94	227	26	65	115	80	10.7	
18	9	222.79	239	26	65	120	80	11.1	
19	9½	234.68	251	26	65	120	80	11.6	
20	10	246.59	263	26	65	120	80	12.0	
21	10½	258.52	276	26	65	120	80	12.4	
22	11	270.47	288	30	75	117	70	14.9	BW type SS400
23	11½	282.43	300	30	75	117	70	15.9	
24	12	294.41	312	30	75	117	70	17.1	
25	12½	306.40	324	30	75	117	70	18.1	
26	13	318.41	337	30	75	117	70	19.1	
27	13½	330.42	349	30	75	117	70	20.1	
28	14	342.44	361	30	75	117	70	21.1	
29	14½	354.47	373	30	75	117	70	22.1	
30	15	366.50	385	30	75	127	75	24.5	

Note: Sprockets with 13~21 teeth have hardened tooth surfaces.
Sprockets with 22~30 teeth have welded structures of SS400.

2042 sprocket

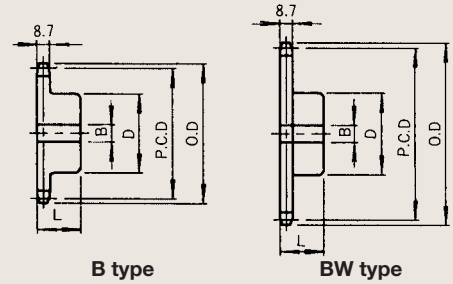


(mm)

No. of teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
			Bore Dia. B		Hub		Mass (kg)	Material
			Pilot bore	Maximum	Dia. D	Width L		
9	74.26	85	16	32	50	30	0.70	B type S35C
10	82.19	93	20	35	56	40	0.98	
11	90.16	101	20	35	56	40	1.00	
12	98.14	110	20	35	56	40	1.10	
13	106.14	118	20	40	65	40	1.60	
14	114.15	126	20	40	65	40	1.70	
15	122.17	134	20	40	65	40	1.75	
16	130.20	142	20	40	65	40	2.00	
17	138.23	151	20	45	70	45	2.10	BW type SS400
18	146.27	159	20	45	70	45	2.15	
19	154.32	167	20	45	70	45	2.30	
20	162.37	175	20	45	70	45	2.50	
21	170.42	183	20	55	87	45	2.60	
22	178.48	192	20	55	87	45	2.70	
23	186.54	200	20	55	87	45	2.80	
24	194.60	208	20	55	87	45	2.90	
25	202.66	216	20	55	87	45	3.00	
26	210.72	224	20	55	87	45	3.10	
28	226.86	241	20	55	87	45	3.20	
30	243.00	257	20	55	87	45	3.40	

Note: None of the sprockets have hardened tooth surfaces.
Sprockets with 17~30 teeth have welded structures of SS400.

2052 sprocket

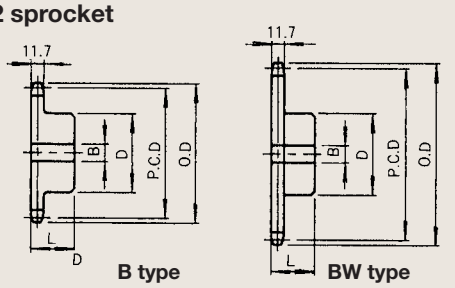


(mm)

No. of teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
			Bore Dia. B		Hub		Mass (kg)	Material
			Pilot bore	Maximum	Dia. D	Width L		
9	92.83	106	20	40	60	30	1.4	B type S35C
10	102.74	116	20	45	70	45	1.9	
11	112.70	127	20	45	70	45	2.0	
12	122.67	137	20	45	70	45	2.2	
13	132.67	147	20	45	70	45	2.3	
14	142.68	157	20	45	70	45	2.4	
15	152.71	167	20	45	70	45	2.5	
16	162.74	178	20	45	70	45	2.7	
17	172.79	188	20	50	83	50	3.0	BW type SS400
18	182.84	198	20	55	87	55	4.0	
19	192.90	209	20	55	87	55	4.3	
20	202.96	219	20	55	87	55	4.4	
21	213.03	229	20	55	87	55	4.6	
22	223.10	240	20	55	87	55	4.8	
23	233.17	250	20	55	87	55	4.9	
24	243.25	260	20	55	87	55	5.0	
25	253.32	270	20	55	87	55	5.5	
26	263.40	281	20	55	87	55	6.0	
28	283.57	301	20	55	87	55	6.8	
30	303.75	321	20	55	87	55	7.0	

Note: None of the sprockets have hardened tooth surfaces.
Sprockets with 17~30 teeth have welded structures of SS400.

2062 sprocket

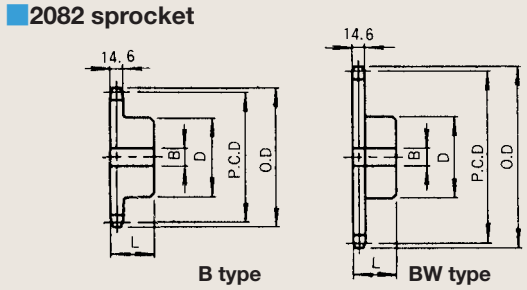


(mm)

No. of teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
			Bore Dia. B		Hub		Mass (kg)	Material
			Pilot bore	Maximum	Dia. D	Width L		
9	111.40	128	20	50	80	32	2.2	
10	123.29	140	26	50	80	45	2.4	
11	135.24	152	26	50	80	45	2.6	B type S35C
12	147.21	165	26	50	80	45	2.8	
13	159.20	177	26	55	85	50	3.1	
14	171.22	190	26	55	85	50	3.7	
15	183.25	202	26	55	83	50	3.8	
16	195.29	214	26	55	83	50	4.1	
17	207.35	227	26	55	87	55	4.9	
18	219.41	239	26	55	87	55	5.3	
19	231.48	251	26	55	87	55	5.6	
20	243.55	263	26	55	87	55	6.0	
21	255.63	276	26	55	87	55	6.4	BW type SS400
22	267.72	288	26	55	87	55	6.7	
23	279.80	300	26	55	87	55	7.3	
24	291.90	312	26	55	87	55	7.7	
25	303.99	324	26	55	87	55	8.6	
26	316.09	337	26	55	87	55	10.0	
28	340.29	361	26	55	87	55	10.9	
30	364.50	385	26	55	87	55	12.3	

Note: None of the sprockets have hardened tooth surfaces.
Sprockets with 15~30 teeth have welded structures of SS400.

2082 sprocket

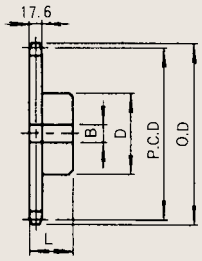


(mm)

No. of teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
			Bore Dia. B		Hub		Mass (kg)	Material
			Pilot bore	Maximum	Dia. D	Width L		
9	148.53	170	25	60	93	50	4.1	
10	164.39	186	25	60	93	50	5.0	
11	180.31	204	25	60	93	50	5.9	B type S35C
12	196.28	220	25	60	93	50	6.8	
13	212.27	237	32	70	108	55	7.7	
14	228.30	253	32	70	108	55	8.6	
15	244.33	269	32	70	108	55	9.1	
16	260.39	286	32	70	108	55	10.1	
17	276.46	302	32	70	108	55	10.5	
18	292.55	319	32	70	108	55	11.8	
19	308.64	335	32	70	108	55	12.7	
20	324.74	351	32	70	108	55	13.6	
21	340.84	368	32	70	108	60	14.1	BW type SS400
22	356.96	384	32	70	108	60	14.5	
23	373.07	400	32	70	108	60	15.5	
24	389.19	416	32	70	108	60	17.7	
25	405.32	433	32	70	108	60	18.6	
26	421.45	449	32	70	108	60	19.5	
28	453.72	481	32	70	108	60	20.5	
30	485.99	514	32	70	108	60	21.4	

Note: None of the sprockets have hardened tooth surfaces.
Sprockets with 15~30 teeth have welded structures of SS400.

2102 sprocket



(mm)

No. of teeth	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	B type, BW type					
			Bore Dia. B		Hub		Mass (kg)	Material
			Pilot bore	Maximum	Dia. D	Width L		
11	225.39	254	32	70	108	55	7.5	
12	245.34	275	32	70	108	55	8.5	
13	265.34	296	32	70	108	55	9.5	
14	285.37	316	32	70	108	55	10.7	
15	305.42	337	32	70	108	55	11.9	
16	325.49	357	32	70	108	60	13.7	
17	345.58	378	32	70	108	60	15.1	
18	365.68	398	32	70	108	60	16.6	
19	385.79	419	32	70	108	60	18.2	BW type SS400
20	405.92	439	32	70	108	60	19.9	
21	426.05	459	32	70	108	60	21.6	
22	446.20	480	32	70	108	60	23.5	
23	466.34	500	32	70	108	60	25.4	
24	486.49	520	32	70	108	60	27.4	
25	506.65	541	32	70	108	60	29.5	
26	526.81	561	32	70	108	60	31.7	
28	567.14	602	32	70	108	60	36.3	
30	607.49	642	32	70	108	60	46.3	

Note: None of the sprockets have hardened tooth surfaces.
Sprockets with 11~30 teeth have welded structures of SS400.

HITACHI CONVEYOR CHAINS

Sprockets for Standard Conveyor Chains

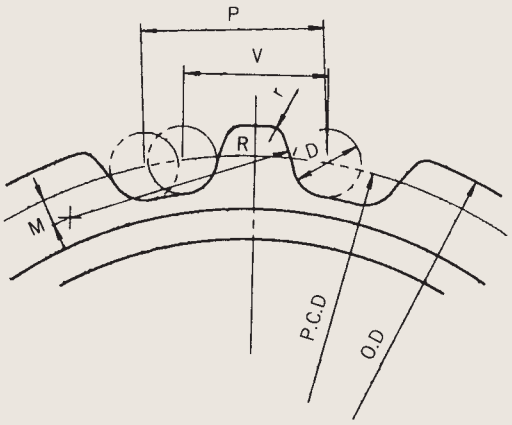
Sprockets for standard conveyor chains

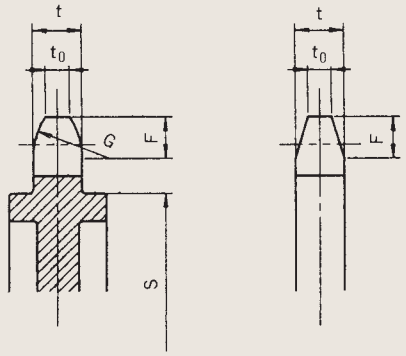
If chain and sprocket do not match the chain will not run smoothly, and both chain and sprocket will have to be replaced more frequently.

The necessary conditions for sprocket are as follows:

1. **The form and pitch of the teeth must be precise and uniform.**
2. **Wear resistance must be adequate.**
3. **The structure must be sturdy, with adequate shock resistance.**

Tooth design criteria





$$P.C.D. = P \times \frac{1}{\sin \frac{180^\circ}{N}}$$

$O.D. = P.C.D. + 0.7d$

$V = 2d$ When $d>h$

$= 3d$ When $d<h$

(However, P-V≧5mm must be satisfied)

$D = d + 2$ $(d \leqq 50)$

$= d + 3$ $(50 < d \leqq 100)$

$= d + 4$ $(100 < d)$

$R \fallingdotseq P$

$$r = \frac{O.D. - P.C.D.}{2}$$

$$M = \frac{P.C.D. - 0.95P.C.D.}{2}$$

$F = 0.6d$

$t = 0.75W \sim 0.85W$

$$G = \frac{2F^2}{t} + \frac{t}{8} \quad \text{or to} = 0.5t$$

$$S = P.C.D. - \left(P \times \tan \frac{180^\circ}{2N} + 1.2h + 20\right)$$

Standard dimensions

- P :Chain pitch
- N : No. of teeth
- d : Roller, bush or barrel diameter
- h : Link plate height
- W: Width between inner link plates, or width of parallel part of barrel.

Pitch Circle Diameter

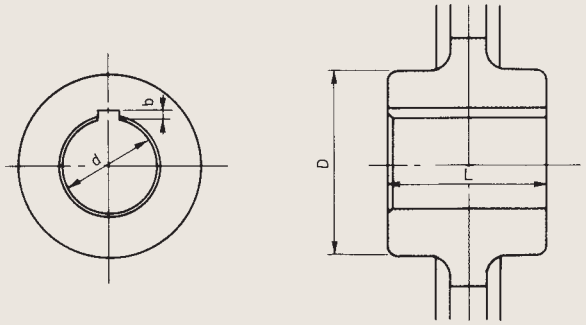
The sprocket pitch circle diameter (P.C.D.) can be found simply by multiplying the chain pitch by the coefficient below.

$$P.C.D. = P \times \frac{1}{\sin \frac{180^\circ}{N}}$$

No. of teeth (N)	Coefficient $\left(\frac{1}{\sin \frac{180^\circ}{N}}\right)$	No. of teeth (N)	Coefficient $\left(\frac{1}{\sin \frac{180^\circ}{N}}\right)$	No. of teeth (N)	Coefficient $\left(\frac{1}{\sin \frac{180^\circ}{N}}\right)$
5	1.7013	17	5.4422	29	9.2491
5½	1.8496	17½	5.6005	29½	9.4080
6	2.0000	18	5.7588	30	9.5668
6½	2.1518	18½	5.9171	30½	9.7256
7	2.3048	19	6.0755	31	9.8845
7½	2.4586	19½	6.2340	31½	10.0434
8	2.6131	20	6.3925	32	10.2023
8½	2.7682	20½	6.5510	32½	10.3612
9	2.9238	21	6.7095	33	10.5201
9½	3.0798	21½	6.8681	33½	10.6790
10	3.2361	22	7.0267	34	10.8380
10½	3.3926	22½	7.1853	34½	10.9969
11	3.5495	23	7.3439	35	11.1558
11½	3.7065	23½	7.5026	35½	11.3148
12	3.8637	24	7.6613	36	11.4737
12½	4.0211	24½	7.8200	36½	11.6327
13	4.1786	25	7.9787	37	11.7916
13½	4.3362	25½	8.1375	37½	11.9506
14	4.4940	26	8.2962	38	12.1096
14½	4.6518	26½	8.4550	38½	12.2685
15	4.8097	27	8.6138	39	12.4275
15½	4.9677	27½	8.7726	39½	12.5865
16	5.1258	28	8.9314	40	12.7455
16½	5.2840	28½	9.0902		

Boss diameter and width

The boss diameter and boss width for standard sprockets are as shown in the table below, but in some cases the conditions of use or constraints imposed by the installation location may require a special design. The following is a summary of how to find the boss diameter and width.



D (boss diameter) = αd + 2b + 5
L (boss width) = (0.6~0.8) × D

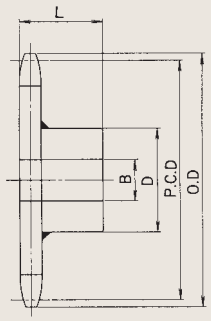
- d : Shaft diameter
- b : Boss key channel depth
- α : 1.6 for normal cast iron (Min. 1.4)
  - Special cast iron 1.4
  - Forged steel (Min. 1.25)

Note

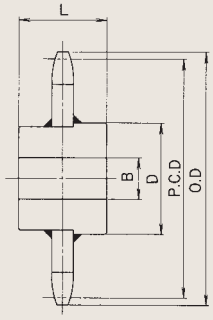
The method here for calculating boss diameter and boss width is a simplified approach. For a more detailed approach, use standard mechanical design.

Table of dimensions

Sprocket for HRS type bushed roller chain



BW type

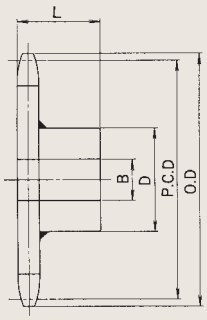


CW type

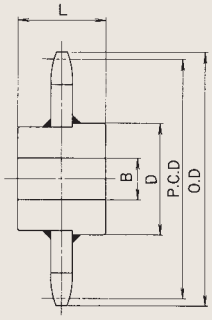
(mm)

Chain No.	Roller type	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	BW type					CW type				
					Bore Dia. B		Hub		Mass (kg)	Bore Dia. B		Hub		Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L		Pilot bore	Maximum	Dia. D	Width L	
HRS03075	R	6	150.0	159	26	40	65	52	2.9	26	40	70	55	3.4
		8	196.0	211		45	70	57	4.5		45	75	60	4.6
		10	242.7	260		50	75	62	5.9		50	85	70	6.9
		12	289.8	309		50	75	62	7.9		50	85	70	8.5
		14	337.0	358		55	85	67	10.7		55	90	75	11.2
	F	6	150.0	159		40	65	49	2.5		40	70	55	3.0
		8	196.0	211		45	70	54	3.4		45	75	60	4.1
		10	242.7	260		50	75	59	4.9		50	85	70	5.9
		12	289.8	309		50	75	59	6.5		50	85	70	7.1
		14	337.0	358		55	85	64	8.6		55	90	75	9.2
	S	6	150.0	161		40	65	52	2.9		40	70	55	3.4
		8	196.0	207		45	70	57	4.5		45	75	60	4.6
		10	242.7	254		50	75	62	5.9		50	85	70	6.9
		12	289.8	301		50	75	62	7.9		50	85	70	8.5
		14	337.0	348		55	85	67	10.7		55	90	75	11.2
HRS03100	R	6	200.0	203	26	45	70	57	4.4	26	45	75	60	4.8
		8	261.3	271		50	75	62	6.5		50	85	70	7.6
		10	323.6	337		50	75	62	9.4		50	85	70	10.1
		12	386.4	403		55	85	67	13.2		55	90	75	13.9
		14	449.4	468		55	90	72	17.7		60	100	80	18.5
	F	6	200.0	203		45	70	54	3.5		45	75	60	4.0
		8	261.3	271		50	75	59	5.4		50	85	70	6.6
		10	323.6	337		50	75	59	7.5		50	85	70	8.5
		12	386.4	403		55	85	64	11.0		55	90	75	12.1
		14	449.4	468		55	90	69	13.6		60	100	80	14.9
	S	6	200.0	211		45	70	57	4.4		45	75	60	4.4
		8	261.3	272		50	75	62	6.5		50	85	70	7.6
		10	323.6	335		50	75	62	9.4		50	85	70	10.1
		12	386.4	398		55	85	67	13.2		55	90	75	13.9
		14	449.4	461		55	90	72	17.7		60	100	80	18.5
HRS03150	R	6	300.0	302	26	50	75	62	8.1	26	50	85	70	8.7
		8	392.0	395		55	85	67	13.4		55	90	75	14.1
		10	485.4	491		55	85	67	19.7		55	90	75	20.1
		12	579.6	589		55	90	72	27.3		60	100	80	28.5
		14	674.1	687		65	100	77	37.0		70	110	90	38.8
	F	6	300.0	302		50	75	59	6.3		50	85	70	7.3
		8	392.0	395		55	85	64	10.5		55	90	75	11.3
		10	485.4	491		55	85	64	15.1		55	90	75	15.9
		12	579.6	589		55	90	69	21.1		60	100	80	22.5
		14	674.1	687		65	100	74	28.6		70	110	90	30.7
	S	6	300.0	311		50	75	62	8.1		50	85	70	8.7
		8	392.0	403		55	85	67	13.4		55	90	75	14.1
		10	485.4	497		55	85	67	19.7		55	90	75	20.1
		12	579.6	591		55	90	72	27.3		60	100	80	28.5
		14	674.1	685		65	100	77	37.0		70	110	90	38.8

※Tooth surfaces can be hardened, as specified.



BW type



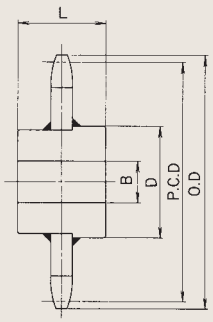
CW type

(mm)

Chain No.	Roller type	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	BW type					CW type				
					Bore Dia. B		Hub		Mass (kg)	Bore Dia. B		Hub		Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L		Pilot bore	Maximum	Dia. D	Width L	
HRS05075	R	8	196.0	215	30	60	90	76	6.4	30	60	100	80	7.6
		10	242.7	264		65	100	81	8.8		70	110	90	11.2
		12	289.8	313		65	100	81	11.8		70	110	90	13.1
		14	337.0	362		70	110	86	16.5		75	120	100	18.1
	F	8	196.0	215		60	90	72	5.4		60	100	80	6.6
		10	242.7	264		65	100	77	7.9		70	110	90	10.0
		12	289.8	312		65	100	77	9.8		70	110	90	11.1
		14	337.0	362		70	110	87	13.3		75	120	100	15.7
	S	8	196.0	212		60	90	76	6.4		60	100	80	7.6
		10	242.7	258		65	100	81	8.8		70	110	90	11.2
		12	289.8	305		65	100	81	11.8		70	110	90	13.1
		14	337.0	353		70	110	86	16.5		75	120	100	18.1
HRS05100	R	6	200.0	207	30	60	90	76	6.4	30	60	100	80	7.5
		8	261.3	275		65	100	81	10.1		70	110	90	12.1
		10	323.6	341		65	100	81	14.2		70	110	90	14.9
		12	386.4	407		70	110	91	19.9		75	120	100	22.1
		14	449.4	472		75	120	96	26.0		80	130	105	28.3
	F	6	200.0	207		60	90	72	5.8		60	100	80	7.0
		8	261.3	275		65	100	77	9.1		70	110	90	11.1
		10	323.6	341		65	100	77	12.0		70	110	90	13.2
		12	386.4	407		70	110	87	16.9		75	120	100	19.1
		14	449.4	477		75	120	92	21.0		80	130	105	23.7
	S	6	200.0	216		60	90	76	6.4		60	100	80	7.5
		8	261.3	277		65	100	81	10.1		70	110	90	12.1
		10	323.6	339		65	100	81	14.2		70	110	90	14.9
		12	386.4	402		70	110	91	19.9		75	120	100	22.1
		14	449.4	477		75	120	96	26.0		80	130	105	28.3
HRS05150	R	6	300.0	304	30	65	100	81	12.0	30	70	110	90	13.9
		8	392.0	400		70	110	91	19.8		75	120	100	21.9
		10	485.4	495		75	120	96	30.1		80	130	105	32.1
		12	579.6	593		80	130	101	41.2		90	140	115	44.1
		14	674.1	691		90	140	106	55.8		95	150	120	58.5
	F	6	300.0	304		65	100	77	11.0		70	110	90	12.1
		8	392.0	400		70	110	87	16.9		75	120	100	19.0
		10	485.4	495		75	120	92	24.1		80	130	105	26.9
		12	579.6	593		80	130	97	32.8		90	140	115	37.1
		14	674.1	691		90	140	102	43.6		95	150	120	47.7
	S	6	300.0	316		65	100	81	12.0		70	110	90	13.9
		8	392.0	408		70	110	91	19.8		75	120	100	21.9
		10	485.4	501		75	120	96	30.1		80	130	105	32.1
		12	579.6	595		80	130	101	41.2		90	140	115	44.1
		14	674.1	690		90	140	106	55.8		95	150	120	58.5

※Tooth surfaces can be hardened, as specified.

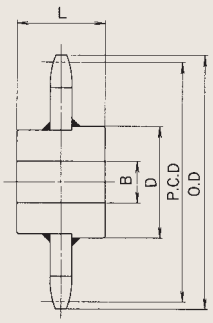
Sprockets for HR type bushed roller chains



(mm)

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.			Bore Dia. B		Hub		Mass (kg)		
			R roller type	F roller type	S roller type	Pilot bore	Maximum	Dia. D	Width L	R roller type	F roller type	S roller type
HR6608	8	173.2	–	–	189	30	70	110	70	–	–	7.2
	9	193.8	–	–	210		70	115	70	–	–	8.8
	10	214.4	–	–	230		70	115	70	–	–	10.0
	11	235.2	–	–	251		75	120	80	–	–	12.0
	12	256.0	–	–	272		75	120	80	–	–	14.0
	14	297.8	–	–	314		75	120	80	–	–	17.0
	16	339.7	–	–	356		75	120	80	–	–	19.6
	18	381.6	–	–	398		80	125	90	–	–	22.0
	20	423.6	–	–	440		80	125	90	–	–	24.0
	22	465.7	–	–	482		80	130	90	–	–	27.0
	24	507.7	–	–	524		85	140	100	–	–	32.0
	30	634.0	–	–	650	40	95	150	100	–	–	45.0
HR7813	8	204.1	–	–	227	30	70	115	80	–	–	10.5
	9	228.4	–	–	251		70	115	80	–	–	12.5
	10	252.8	–	–	276		75	120	80	–	–	15.0
	11	277.3	–	–	300		75	120	85	–	–	18.5
	12	301.8	–	–	325		75	120	85	–	–	20.5
	14	351.0	–	–	374		80	130	85	–	–	24.0
	16	400.4	–	–	423		85	140	100	–	–	30.0
	18	449.8	–	–	473		85	140	100	–	–	34.0
	20	449.3	–	–	522		85	140	100	–	–	41.0
	22	548.9	–	–	572	40	90	145	100	–	–	50.0
	24	598.4	–	–	621		90	145	100	–	–	57.0
	30	747.3	–	–	770		90	145	100	–	–	78.0
HR10007	6	200.0	207	207	215	30	70	115	70	7.0	6.7	6.7
	8	261.3	275	275	276		75	120	80	11.8	11.4	11.4
	9	292.4	308	308	307		75	120	80	14.0	13.5	13.5
	10	323.6	341	341	339		75	120	80	15.3	14.7	14.7
	11	355.0	374	374	370		80	125	80	17.7	17.0	17.1
	12	386.4	407	407	401		80	125	90	18.0	18.0	18.1
	14	449.4	472	472	464		80	130	90	22.4	21.6	21.7
	16	512.6	536	536	528		85	140	100	27.6	26.7	26.8
	18	575.9	601	601	591		85	140	100	32.3	31.3	31.4
	20	639.3	665	665	654	40	95	150	100	38.4	37.2	37.8
HR10105	6	203.2	209	–	218	40	60	95	65	5.5	–	6.2
	8	265.5	279	–	281		65	100	70	10.8	–	10.6
	9	297.1	313	–	312		65	100	70	14.2	–	12.3
	10	328.8	346	–	344		70	115	80	16.0	–	15.5
	11	360.6	380	–	376		70	115	80	17.2	–	16.2
	12	392.6	413	–	408		70	115	80	18.4	–	18.0
	14	456.6	479	–	472		75	120	85	21.5	–	22.2
	16	520.8	544	–	536		80	130	90	27.0	–	27.2
	18	585.1	610	–	600		80	130	90	30.0	–	30.5
	20	649.5	675	–	655		80	130	90	36.5	–	35.0

※Tooth surfaces can be hardened, as specified.

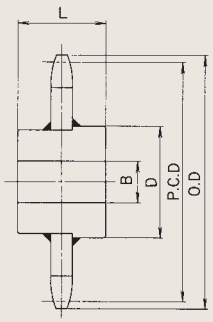


(mm)

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.			Bore Dia. B		Hub		Mass (kg)		
			R roller type	F roller type	S roller type	Pilot bore	Maximum	Dia D	Width L	R roller type	F roller type	S roller type
HR10108	6	203.2	221	221	219	40	70	115	70	9.5	8.7	8.3
	8	265.5	291	291	282		75	120	80	14.8	14.0	13.8
	9	297.1	325	325	313		75	120	80	16.2	14.9	16.1
	10	328.8	358	358	345		75	120	80	20.0	18.0	18.1
	11	360.6	392	392	377		80	125	80	22.5	20.5	20.5
	12	392.6	425	425	409		80	125	90	25.4	23.4	22.0
	14	456.6	489	489	473		80	130	90	30.5	27.0	26.5
	16	520.8	553	553	537		85	140	100	33.5	31.5	33.5
	18	585.1	617	617	601		85	140	100	40.5	36.5	38.0
	20	649.5	682	682	666		95	150	100	49.0	40.0	45.0
HR10113	6	203.2	235	–	226	40	75	120	85	11.0	–	9.1
	8	265.5	298	–	289		80	130	90	17.6	–	16.7
	9	297.1	329	–	320		80	130	90	21.6	–	20.0
	10	328.8	361	–	352		85	135	95	24.7	–	23.0
	11	360.6	393	–	384		90	145	100	31.5	–	27.5
	12	392.6	425	–	416		90	145	100	32.5	–	30.5
	14	456.6	489	–	480		95	150	105	36.5	–	36.0
	16	520.8	553	–	544	50	100	160	110	48.0	–	46.0
	18	585.1	617	–	608		105	165	115	55.5	–	52.5
	20	649.5	682	–	673		105	165	115	65.0	–	60.5
HR15011	6	300.0	305	305	320	30	80	130	90	19.0	16.5	19.2
	8	392.0	408	408	412	40	90	145	100	31.5	26.5	32.0
	9	438.6	458	458	458		90	145	100	35.0	28.7	36.3
	10	485.4	507	507	505		95	150	105	39.5	30.0	40.5
	11	532.4	556	556	552		95	150	105	45.0	32.5	45.5
	12	579.6	605	605	600		100	160	110	52.5	38.5	53.0
	14	674.1	703	703	694	50	105	165	115	62.5	52.5	64.0
	16	768.9	800	800	788		105	170	120	76.0	69.5	78.1
HR15208	6	304.8	317	317	323	30	70	115	80	18.7	14.6	18.1
	8	398.2	421	421	416		75	120	85	26.0	22.1	27.4
	9	445.6	472	472	464		80	130	90	29.2	24.8	29.6
	10	493.2	523	523	511		85	135	95	35.0	30.0	37.0
	11	540.9	573	573	559		85	135	95	38.0	34.0	38.0
	12	588.8	622	622	607	40	90	145	100	43.0	38.0	43.0
	14	684.9	721	721	703		95	150	105	56.5	50.5	55.5
	16	781.2	817	817	799		95	150	105	64.5	63.5	64.5
HR15215	6	304.8	329	329	330	40	90	145	100	28.0	25.0	23.3
	8	398.2	433	433	423		95	150	105	36.0	32.0	36.5
	9	445.6	484	484	471		100	160	110	40.0	34.0	45.5
	10	493.2	534	534	518		100	160	110	44.0	37.0	51.0
	11	540.9	582	582	566		100	160	115	60.0	42.5	57.7
	12	588.8	630	630	614	50	105	170	120	64.0	56.5	67.5
	14	684.9	726	726	710		115	180	125	77.0	68.0	79.5
	16	781.2	822	822	806		115	185	130	93.0	81.0	92.5

※Tooth surfaces can be hardened, as specified.

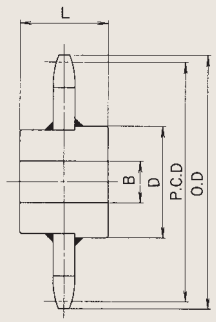
Sprockets for Standard Conveyor Chains



(mm)

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.			Bore Dia. B		Hub		Mass (kg)		
			R roller type	F roller type	S roller type	Pilot bore	Maximum	Dia. D	Width L	R roller type	F roller type	S roller type
HR15219	6	304.8	343	343	333	40	95	150	105	26.0	–	25.0
	8	398.2	447	447	426	50	105	165	115	43.5	–	41.5
	9	445.6	496	–	474		105	165	115	49.5	–	50.5
	10	493.2	543	–	521		105	170	120	53.0	–	53.5
	11	540.9	591	–	569		115	180	125	61.0	–	59.5
	12	588.8	639	–	617		115	180	125	68.0	–	67.5
	14	684.9	735	–	713		115	185	130	82.0	–	79.5
	16	781.2	831	–	809		125	200	140	103.0	–	100.0
HR20015	6	400.0	412	412	425	40	95	150	105	37.5	31.5	36.5
	8	522.6	548	548	548	50	105	165	115	57.0	45.0	49.0
	9	584.8	615	615	610		105	165	115	65.0	50.0	58.5
	10	647.2	681	681	672		105	165	115	75.0	63.0	64.0
	11	709.9	747	747	735		115	180	125	85.0	74.0	74.0
	12	772.7	812	812	798		115	185	130	96.0	81.5	82.0
	14	898.8	942	942	924		115	185	130	115.0	103.0	104.0
HR20019	6	400.0	426	426	428	40	100	160	105	47.5	40.5	50.8
	8	522.6	562	562	551		100	160	105	73.5	64.0	72.5
	9	584.8	629	629	613	50	105	170	110	83.5	73.0	80.0
	10	647.2	695	695	675		105	170	110	89.5	80.5	90.0
	11	709.9	761	761	738		105	170	110	105.0	92.0	100.0
	12	772.2	826	826	801		115	180	115	114.0	110.0	111.0
	14	898.8	956	956	927		115	180	115	125.0	128.0	137.0
HR25015	6	500.0	505	505	525	40	100	160	110	51.0	44.0	56.0
	8	653.3	669	669	678	50	105	170	120	72.0	62.0	80.0
	9	731.0	752	752	756		115	180	125	94.0	72.0	91.0
	10	809.0	835	835	834		115	185	130	100.0	89.0	106.0
	11	887.4	917	917	912		115	185	130	121.0	100.0	122.0
	12	965.9	1,000	1,000	991		120	190	135	136.0	111.0	143.0
HR25019	6	500.0	513	513	528	50	105	170	120	67.0	60.0	70.0
	8	653.3	683	683	681		115	185	130	93.0	90.0	100.0
	9	731.0	766	766	759		120	195	135	111.0	110.0	119.0
	10	809.0	849	849	837		125	200	140	133.0	125.0	135.0
	11	887.4	931	931	915		130	210	150	149.0	140.0	154.0
	12	965.9	1,013	1,013	994		130	210	150	167.0	161.0	172.0
HR25026	6	500.0	–	–	532	50	120	190	135	–	–	84.0
	8	653.3	–	–	685		125	200	140	–	–	114.0
	9	731.0	–	–	763		125	200	140	–	–	122.0
	10	809.0	–	–	841	60	140	220	155	–	–	155.0
	11	887.4	–	–	919		140	225	160	–	–	173.0
	12	965.9	–	–	998		145	230	165	–	–	186.0
HR30019	6	600.0	606	606	628	50	115	180	125	89.0	79.0	90.0
	8	783.9	804	804	812		125	200	140	128.0	122.0	131.0
	9	877.1	904	904	905		125	200	140	145.0	136.0	147.0
	10	970.8	1,003	1,003	999		130	210	150	173.0	160.0	174.0

Notes: 1. In those sprockets for HR450XX HR600XX the outer diameter (O.D.) dimension may differ according to the method of use, so please inquire in advance.
2. Tooth surfaces can be hardened if specified.

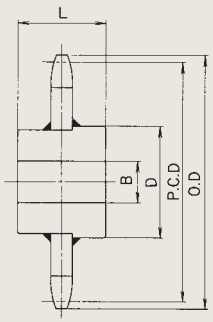


(mm)

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.			Bore Dia. B		Hub		Mass (kg)		
			R roller type	F roller type	S roller type	Pilot bore	Maximum	Dia. D	Width L	R roller type	F roller type	S roller type
HR30026	6	600.0	619	619	632	50	125	200	140	108.0	92.0	108.0
	7	691.4	722	722	723	60	140	220	155	137.0	128.0	138.0
	8	783.9	824	824	816		140	220	155	160.0	137.0	166.0
	9	877.1	924	924	909		140	220	155	185.0	166.0	198.0
	10	970.8	1,023	1,023	1,003		145	235	165	210.0	195.0	214.0
HR30048	6	600.0	–	–	636	60	130	210	150	–	–	137.0
	7	691.4	–	–	727		140	220	150	–	–	165.0
	8	783.9	–	–	820		140	220	150	–	–	192.0
	9	877.1	–	–	913		145	230	160	–	–	224.0
	10	970.8	–	–	1,007		150	240	165	–	–	254.0
HR30054	6	600.0	–	–	641	60	140	220	160	–	–	154.0
	8	783.9	–	–	825		150	240	170	–	–	223.0
HR45026	6	900.0	971	971	932	50	125	200	150	187.0	162.0	188.0
	8	1,175.9	1,247	1,247	1,208		125	200	160	276.0	235.0	280.0
HR45048	6	900.0	989	989	936	60	140	220	160	218.0	177.0	222.0
	8	1,175.9	1,265	1,265	1,212		155	250	180	325.0	287.0	334.0
HR45054	6	900.0	1,000	1,000	941	60	145	230	165	246.0	208.0	256.0
	8	1,175.9	1,276	1,276	1,217		160	255	180	368.0	319.0	384.0
HR60048	6	1,200.0	1,289	1,289	1,236	60	160	255	180	347.0	297.0	368.0
	8	1,567.9	1,657	1,657	1,604		160	255	180	497.0	402.0	552.0
HR60054	6	1,200.0	1,300	1,300	1,241	70	175	280	195	399.0	356.0	438.0
	8	1,567.9	1,668	1,668	1,609		190	305	215	635.0	514.0	721.0

Notes: 1. In those sprockets for HR450XX HR600XX the outer diameter (O.D.) dimension may differ according to the method of use, so please inquire in advance.
2. Tooth surfaces can be hardened if specified.

Sprockets for HB type bushed chains



(mm)

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	Bore Dia. B		Hub		Mass (kg)	Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	Bore Dia. B		Hub		Mass (kg)
				Pilot bore	Maximum	Dia. D	Width L						Pilot bore	Maximum	Dia. D	Width L	
HB6608	8	173.2	189	30	70	110	70	7.2	HB10011	6	200.0	218	30	75	120	85	9.0
	9	193.8	210		70	115	70	8.8		8	261.3	279		80	125	85	16.5
	10	214.4	230		70	115	70	10.0		9	292.4	310		80	125	85	19.8
	11	235.2	251		75	120	80	12.0		10	323.6	342		80	130	85	22.7
	12	256.0	272		75	120	80	14.0		11	355.0	373		80	130	85	27.1
	14	297.8	314		75	120	80	17.0		12	386.4	404		80	130	85	30.0
	16	339.7	356		75	120	80	19.6		14	449.4	467		85	140	90	35.5
	18	381.6	398		80	125	90	22.0		16	512.6	531	40	90	145	100	45.0
	20	423.6	440		80	125	90	24.0		18	575.9	594		90	145	100	50.0
HB7811	8	204.1	227	30	70	115	80	10.5		20	639.3	657		95	150	100	58.0
	9	228.4	251		70	115	80	12.5	HB15011	6	300.0	305	30	80	130	90	19.0
	10	252.8	276		75	120	80	15.0		8	392.0	410	40	90	145	100	31.7
	11	277.3	300		75	120	85	18.5		9	438.6	457		90	145	100	36.0
	12	301.8	325		75	120	85	20.5		10	485.4	503		95	150	105	40.1
	14	351.2	374		80	130	100	24.0		11	523.4	550		95	150	105	45.0
	16	400.4	423		85	140	100	30.0		12	579.6	598		100	160	110	52.0
	18	449.8	473		85	140	100	34.0		14	674.1	692	50	105	165	115	63.2
	20	499.3	522		85	140	100	41.0		16	768.9	787		105	170	120	75.3
HB10007	6	200.0	215	30	70	115	70	6.7									
	8	261.3	276		75	120	80	11.4									
	9	292.4	307		75	120	80	13.5									
	10	323.6	339		75	120	80	14.8									
	11	355.0	370		80	125	80	17.1									
	12	386.4	401		80	125	90	18.1									
	14	449.4	464		80	130	90	21.7									
	16	512.6	528		85	140	100	26.8									
	18	575.9	591		85	140	100	31.4									
	20	639.3	654	40	95	150	100	37.8									

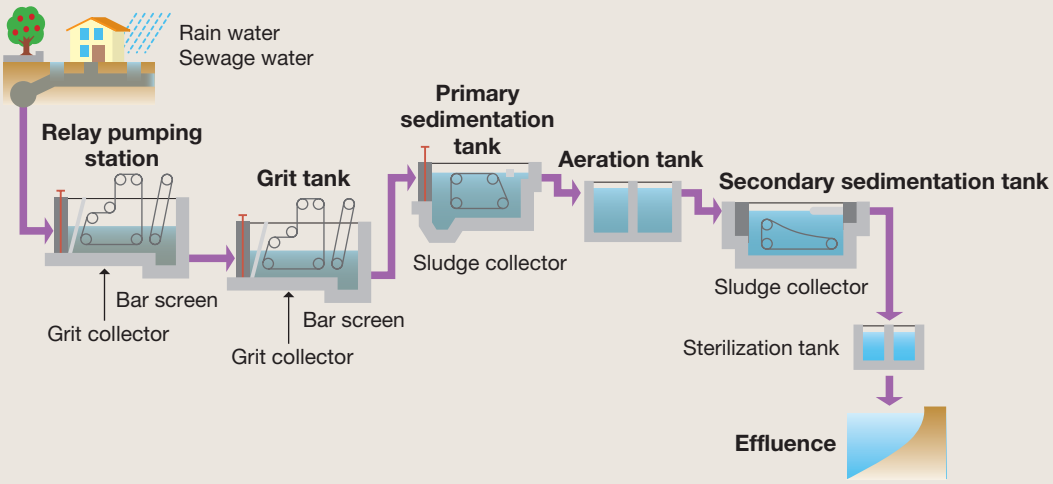
※Tooth surfaces can be hardened if specified.

HITACHI CONVEYOR CHAINS

Chains for Water Treatment Systems

Chains for Water Treatment Systems

Flow diagram for sewage treatment facilities



Suitable chains

Bar screen chains	Grit collector chains		Sludge collector chains			Drive chains
HSC15219	HSC15228	C730TAW	OSV15215–B	HEP720S	720TAW	HB120
HSC15228	HSC15235	C112TAW	OSV15219–B		730TAW	HB140
HSC15235	HSC15248	C113TAW	SAV15211–B		730TAWN	HB160
HSC15248	HSS15225		SAV15215–B		S730TAW	HB200
HSS15219	HSS15235		SAV15219–B			HB240
HSS15225			HSS15215–B			HB78
HSS15235			HSS15219–B			HSS4124

Note: The above chain numbers indicate the chains most commonly used at present.

Features

We offer many types of chains for water processing treatment, with different materials and strengths to suit the machines which use them and the conditions under which they are used. We have developed and enhanced these products through many years of research, as well as field tests in treatment and pumping facilities around the country.

SAV type stainless chains

This is a chain saver type of stainless steel chain improved from the HSS type stainless steel chain, which has a long record of service in settlement tank sludge collector.

HSS type stainless chains

These chains are designed for use in mains water, sewage and water drainage facilities, to suit the increasingly complex water quality and environmental conditions of water discharges. They are made from stainless steel for wear and corrosion resistance.

OSV type stainless chains

These offset type chains were developed from the HSS type and SAV type stainless steel chains.

HEP type plastic chains

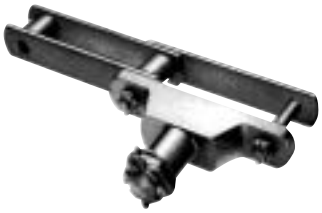
These engineering plastic chains were developed specifically for sludge collector. They offer various superior properties compared to metal chains, including light weight and corrosion resistance. They are also easy to handle, making day to day maintenance more efficient.

TAW pintle chains

These chains, which are mainly used for collector sludge, are made from cast components for wear and corrosion resistance.

HSC type steel chains

These chains are designed for use in grit collector and they use 400 class stainless steel for the pins and bushes to prevent loss of flexure and improve wear and corrosion resistance.



TAW combination chains

These chains are used for grit collector and removal in grit tanks. The blocks are castings, and the link plates and pins are of alloy steel, making high-strength chains.

HB type stainless bushed chains

These stainless steel drive chains offer superior corrosion and wear resistance.

Settlement tank equipment

Settlement tank equipment impels precipitated sludge sediments in the sedimentation tank to the sludge trap at the edge of the tank and uses sludge pumps to pump it to sludge treatment facilities. The primary settlement tank precipitates and removes sedimentary solids. Next, activated sludge in the aeration tank acts on the sewage before it is pumped to the final settlement tank. In that tank, solids are again settled out, and the supernatant water is rendered harmless before discharge.

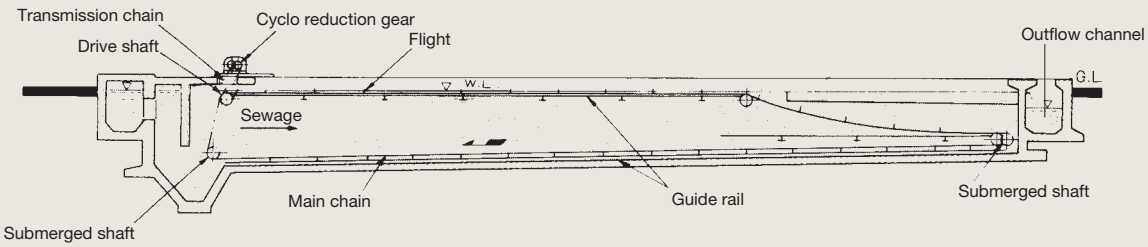
Sludge impeller

1. Chain type (single level tank, two level tank, three level tank).
2. Rotary (central drive, peripheral drive).
3. Miter type
4. Siphon type

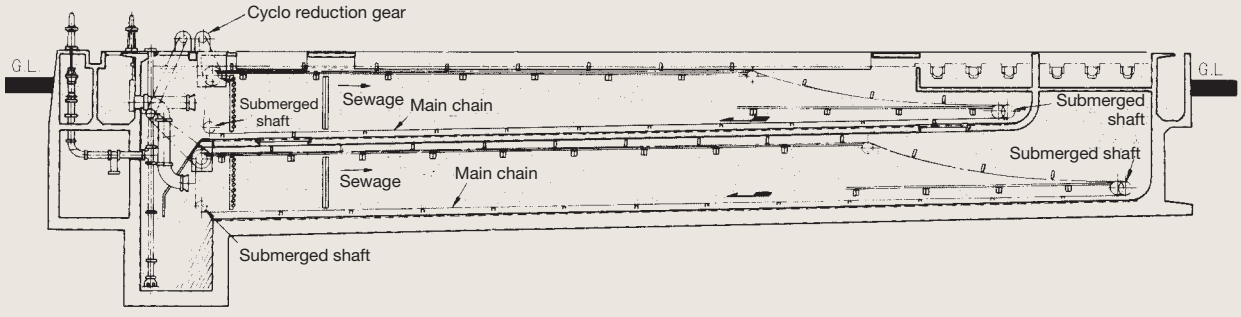
Related facilities

1. Scum removal equipment (pipe, flight conveyor, dumper types).
2. Overflow type.
3. Gate (slide gate).
4. Piped (inlet pipe, sludge pipe, cleaning)

Chain type (one level tank)



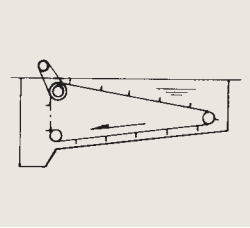
Chain type (two level tank)



Settlement tank sludge impeller

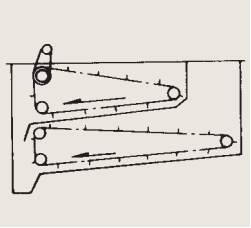
Chain type (one-layer tank)

Two endless chains fitted with FRP or cypress flights impel the sludge on the bottom of the tank to the sludge trap.



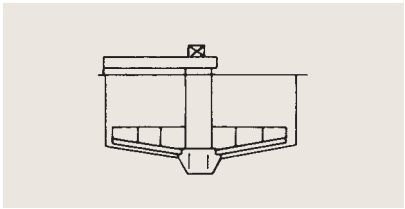
Chain type (two-layer tank)

Two endless chains fitted with FRP or cypress flights impel the sludge on the bottom of the first and second layers to a single sludge trap.



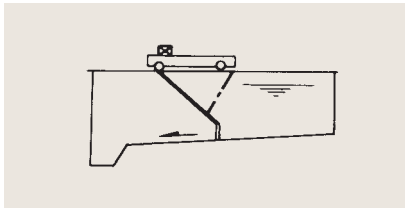
Rotary type(peripheral drive)

A rotor supported by a pillar in the center of a circular or square tank rotates around it to push sludge into the center.
The drive wheels run around the top of the tank wall.



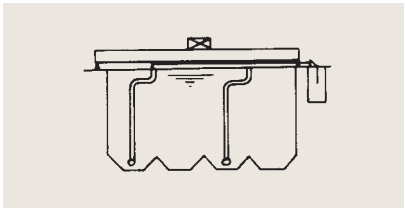
Miter Type

A plate is suspended from a gantry running on the top of the wall to impel sludge into the trap.



Siphon type

A gantry that runs along the top of the tank wall is equipped with a vacuum source, a siphon tube and a rotation device. It lowers hoses into the tank and continuously sucks up sludge from the bottom.

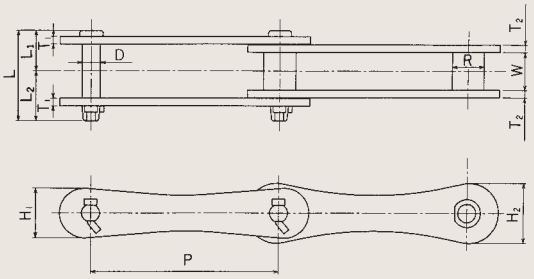


Chains for sludge collectors

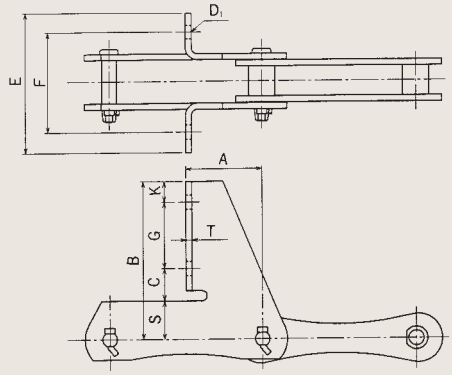
SAV type stainless chains

SAV type stainless steel chains were improved from the stainless steel HSS type for settlement tank impelling. They use saver-type sprockets, so they have a longer lifespan with reduced weight, making them very economical (SUS403).
They are compatible with HSS type stainless steel chains (except SAV709).
For customers who wish to change to stainless steel chains because of rapid extension and wear on the plastic chains they are using, we recommend SAV709 (SUS403). The chain can simply be replaced, without changing the current sprockets.
For use in highly corrosive water, we recommend SAV713 (SUS304).

Chain saver mechanism



SAV type stainless chain



attachment

SAV type stainless chains

(mm)

Chain No.	Pitch P	Bush Dia. R	Inner width W	Pin Dia. D	Pin Length L	Pin Length L1	Pin Length L2	Pin link Height H1	Pin link Thickness T1	Bush link Height H2	Bush link Thickness T2	Average ultimate strength (kN)	Average ultimate strength (kgf)	Assured tensile strength (kN)	Assured tensile strength (kgf)	Mass (kg/m)
SAV709	148.4	22.4	32	11.5	66	29.8	36.2	31	5	37	5	83.4	8500	74.5	7700	3.3
SAV713	152.4	26	30	14.5	72	32	40	40	6	48	6	127	13000	114	11700	5.3
SAV715	152.4	26	30	14.5	72	32.5	39.5	40	6	48	6	147	15000	129	13200	5.3

(in)

Chain No.	Pitch P	Bush Dia. R	Inner width W	Pin Dia. D	Pin Length L	Pin Length L1	Pin Length L2	Pin link Height H1	Pin link Thickness T1	Bush link Height H2	Bush link Thickness T2	Average ultimate strength (lbs)	Assured tensile strength (lbs)	Mass (lbs/ft)
SAV709	5.843	0.882	1.26	0.453	2.6	1.17	1.43	1.22	0.197	1.46	0.197	19000	17000	2.1
SAV713	6.000	1.024	1.181	0.57	2.835	1.26	1.575	1.575	0.236	1.89	0.236	28700	25800	3.5
SAV715	6.000	1.024	1.181	0.57	2.835	1.28	1.555	1.575	0.236	1.89	0.236	33000	29000	3.5

attachments

(mm)

Chain No.	Dimensions (mm) A	B	C	D1	E	F	G	K	S	T	Added mass per attachment (kg)
F228	76	200	38.1	11	140	95.3	114.3	25.1	22.5	6	2.4
F226	76	155	38.1	11	140	95.3	66.7	27.7	22.5	6	2.0
F228(SAV709)	74	210	41.6	11.1	140	95.3	114.3	28.7	25.4	5	1.5

(in)

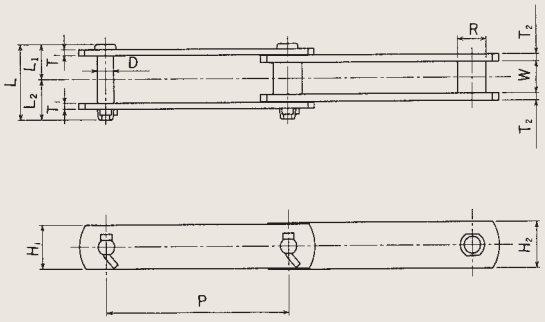
Chain No.	Dimensions (in) A	B	C	D1	E	F	G	K	S	T	Added mass per attachment (lbs)
F228	2.992	7.874	1.5	0.433	5.512	3.752	4.5	0.988	0.886	0.236	5.4
F226	2.992	6.102	1.5	0.433	5.512	3.752	2.626	1.09	0.886	0.236	4.5
F228(SAV709)	2.913	8.268	1.638	0.437	5.512	3.752	4.5	1.13	1	0.197	3.3

Note

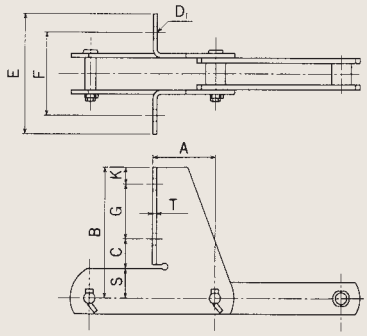
Pay close attention to the attachment dimensions when changing from pintle chain to stainless steel chain.

HSS type stainless chains

The components of these chains are made from carefully selected 400-class stainless steel, shaped in a high-precision press and specially heat treated. Dimensional precision is high, and the lightweight design has sufficient tensile strength. These chains also offer superior corrosion and wear resistance.



HSS type stainless chain



SF4 attachment

HSS type stainless chains

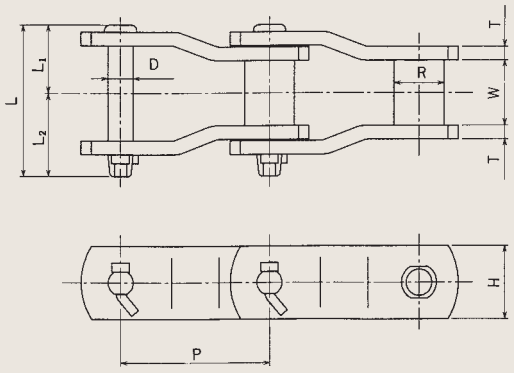
Chain No.	Pitch P (mm)	Bush Dia. R (mm)	Inner width W (mm)	Pin				Pin link		Bush link		Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H_1 (mm)	Thickness T_1 (mm)	Height H_2 (mm)	Thickness T_2 (mm)	(kN)	(kgf)	(kN)	(kgf)	
					L (mm)	L_1 (mm)	L_2 (mm)									
HSS15215-B	152.4	24	26	13.5	62	29	33	36	5	38	6	147	15000	137	14000	4.7
HSS15219-B	152.4	26	30	14.5	72	32	40	38	6	44	6	186	19000	172	17500	5.7
HSS15219-B special	152.4	30	30	14.5	72	32	40	38	6	44	6	186	19000	172	17500	6.0

SF4 attachments

Chain No.	Dimensions (mm)										Added mass per attachment (kg)	Notes
	A	B	C	D_1	E	F	G	K	S	T		
HSS15215	76	140	38	14	145	100	60	20	22	5	0.8	Equivalent to 720
HSS15219	76	155	32	14	140	100	65	20	38	6	1.6	Standard type
	76	155	40	14	140	100	75	17.5	22.5	6	1.2	Equivalent to 730
	76	142.5	40	14	150	112	60	20	22.5	6	1.1	Equivalent to S730

HB78 stainless bushed chains

HB78 stainless bushed chains have come to be widely used as drive chains for sludge collectors, because of their superior corrosion resistance. These chains have high dimensional precisions, delivering adequate tensile strength at light weight, together with superior wear and corrosion resistance.



HB78

HB78

(mm)

Chain No.	Pitch P (mm)	Bush Dia. R (mm)	Inner Width W (mm)	Pin				Link plate		Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	
					L (mm)	L_1 (mm)	L_2 (mm)							
HB78	66.27	22.23	28.6	11.17	66.5	30.1	36.4	31.8	6	106.9	10900	93.1	9500	5.74

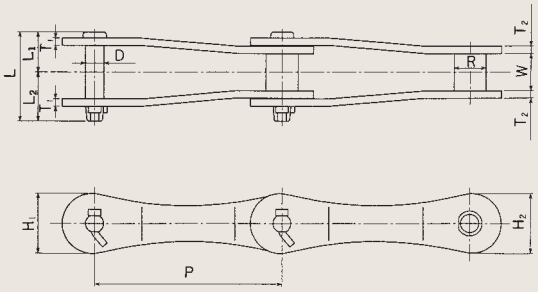
(in)

Chain No.	Pitch P (in)	Bush Dia. R (in)	Inner Width W (in)	Pin				Link plate		Average ultimate strength	Assured tensile strength	Mass (lbs/ft)
				Dia. D (in)	Length			Height H (in)	Thickness T (in)	(lbs)	(lbs)	
					L (in)	L_1 (in)	L_2 (in)					
HB78	2.609	0.875	1.126	0.44	2.618	1.185	1.433	1.252	0.236	24.000	21.000	3.8

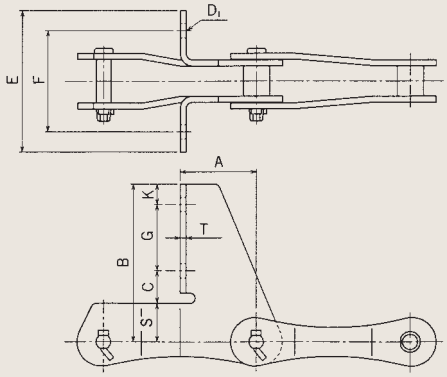
OSV type stainless chains

These offset chains, developed from HSS type and SAV type stainless steel chains, have the following features:

- As offset chains, they have superior wear resistance.
- They can be used with chain saver sprockets.
- Chains can be separated and joined in one link units.
- Compatible with HSS type and SAV type stainless chain.



OSV type stainless chain



SF4 attachment

OSV type stainless chains

Chain No.	Pitch P (mm)	Bush Dia. R (mm)	Inner width W (mm)	Pin				Link plate		Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	
					L (mm)	L_1 (mm)	L_2 (mm)							
OSV15215-B	152.4	26	30	14.5	72	32	40	48	6	147	15000	137	14000	5.7
OSV15219-B	152.4	26	30	14.5	72	32	40	48	6	186	19000	172	17500	5.7

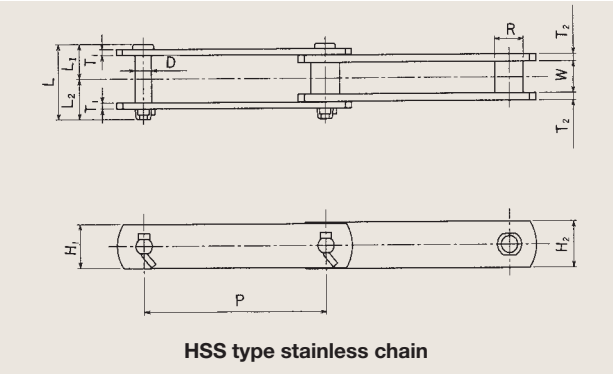
SF4 attachments

Chain No.	Dimensions (mm)										Added mass per attachment (kg)
	A	B	C	D_1	E	F	G	K	S	T	
OSV15215-B	76	155	32	14	140	100	65	20	38	6	1.5
OSV15219-B	76	155	32	14	140	100	65	20	38	6	1.5

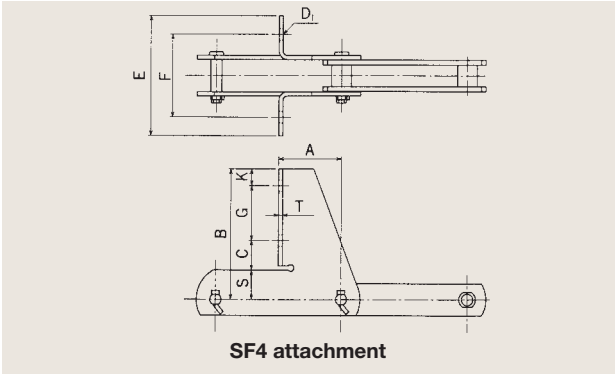
300 class stainless chains

These chains have even better corrosion resistance than 400 class stainless chains.

HSS type stainless chains (300 class stainless)



HSS type stainless chain



SF4 attachment

HSS type stainless chain table of dimensions

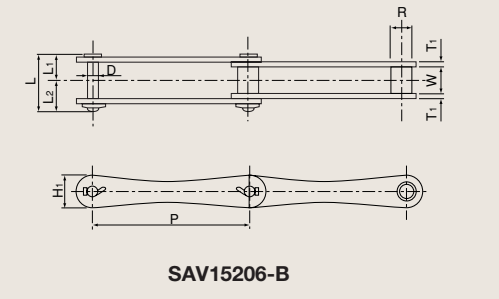
Chain No.	Pitch P (mm)	Bush Dia. R (mm)	Inner width W (mm)	Pin				Pin link		Bush link		Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H_1 (mm)	Thickness T_1 (mm)	Height H_2 (mm)	Thickness T_2 (mm)	(kN)	(kgf)	(kN)	(kgf)	
					L (mm)	L_1 (mm)	L_2 (mm)									
HSS15210-B	152.4	24	26	13.5	62	28.8	33.2	36	5	38	6	103	10500	88	9000	4.7
HSS15213-B	152.4	26	30	14.5	72	32	40	38	6	44	6	127	13000	114	11700	5.7

SF4 attachments

Chain No.	Dimensions (mm)										Added mass per attachment (kg)	Notes
	A	B	C	D_1	E	F	G	K	S	T		
HSS15210	76	140	38	14	145	100	60	20	22	5	0.8	Equivalent to 720
HSS15213	76	155	32	14	140	100	65	17.5	38	6	1.6	Standard type
	76	155	40	14	140	100	75	17.5	22.5	6	1.2	Equivalent to 730
	76	142.5	40	14	150	112	60	17.5	22.5	6	1.1	Equivalent to S730

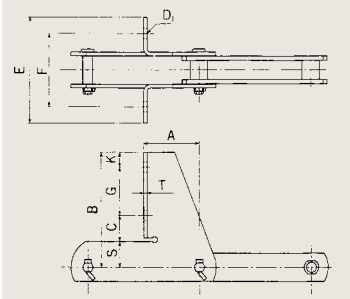
SAV type stainless chain (300 class stainless)

SAV type stainless chain



SAV15206-B

SF4 attachment



SAV type stainless chains

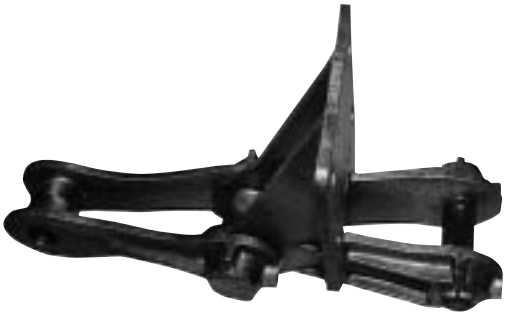
Chain No.	Pitch P (mm)	Bush Dia. R (mm)	Inner width W (mm)	Pin				Pin link		Bush link		Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length			Height H_1 (mm)	Thickness T_1 (mm)	Height H_2 (mm)	Thickness T_2 (mm)	(kN)	(kgf)	(kN)	(kgf)	
					L (mm)	L_1 (mm)	L_2 (mm)									
SAV15206-B	152.4	22.2	27.4	11.6	55	25	30	31	4	—	—	58.8	6000	52.9	5400	2.5

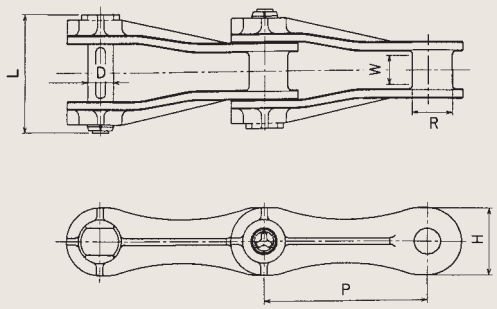
SF4 attachments

Chain No.	Dimensions (mm)										Added mass per attachment (kg)
	A	B	C	D_1	E	F	G	K	S	T	
SAV15206-B	76	155	32	14	140	100	65	20	38	4	1.0

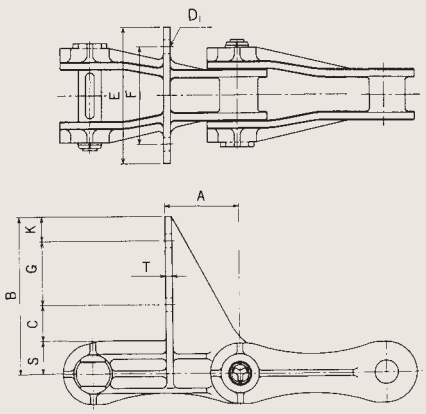
HEP type plastic chains

We used our wide ranging expertise from conventional metal chains to develop HEP type chains, made from engineering plastic, for sludge collector. Compared to conventional steel products, engineering plastic makes these chains lighter and more corrosion resistant. They are also easier to handle, and can be used with plastic or stainless steel sprockets to further improve wear resistance.





HEP 720S plastic chain



SF4 attachment

HEP720S plastic chains

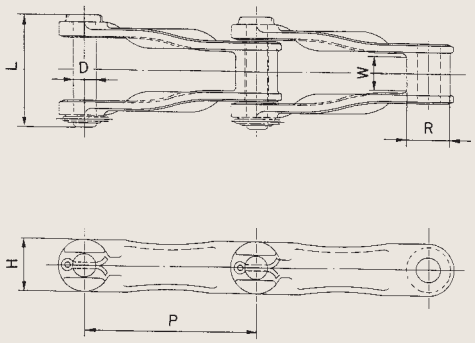
Chain No.	Pitch P (mm)	Barrel Dia. R (mm)	Sprocket tooth width W (mm)	Pin		Height H (mm)	Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length L (mm)		(kN)	(kgf)	(kN)	(kgf)	
HEP720S	152.4	36.5	27	23.5	110	62	29.4	3000	24.5	2500	2.22

SF4 attachments

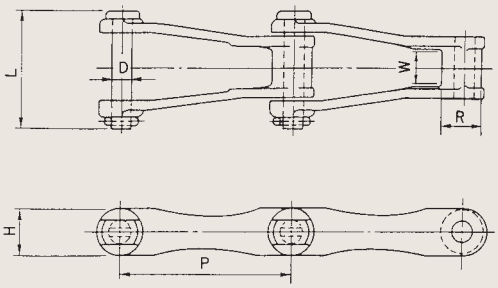
Chain No.	Dimensions (mm)										Added mass per attachment (kg)
	A	B	C	D_1	E	F	G	K	S	T	
HEP720S	76	160	36.5	14	140	100	65	25	33.5	7	0.28

TAW pintle chains

TAW chains are cast chains designed for wear and corrosion resistance, to serve as main chains for sludge collector.
The wear resistance of these chains is enhanced by special heat treatment.



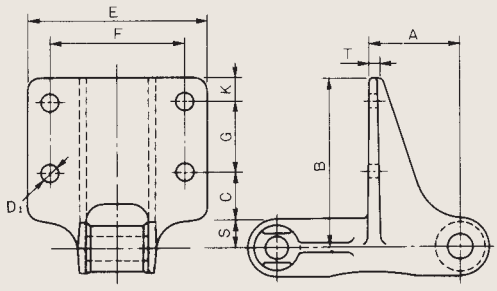
TAW pintle chain



TAWN pintle chain

TAW pintle chains

Chain No.	Pitch P		Barrel Dia. R	Sprocket tooth width W	Pin		Link plate height H	Average ultimate strength		Assured tensile strength		Mass
	(mm)	(in)	(mm)	(mm)	Dia. D (mm)	Length L (mm)	(mm)	(kN)	(kgf)	(kN)	(kgf)	(kg/m)
730TAW	152.4	6	38.1	29	19.0	99.5	44.5	186	19000	167	17100	9.45
730TAWN	152.4	6	38.0	29	17.5	101.0	38	186	19000	167	17100	8.53
S730TAW	152.4	6	40.0	35	20.6	108.5	45.0	186	19000	167	17100	11.09



SF4 attachment

SF4 attachments

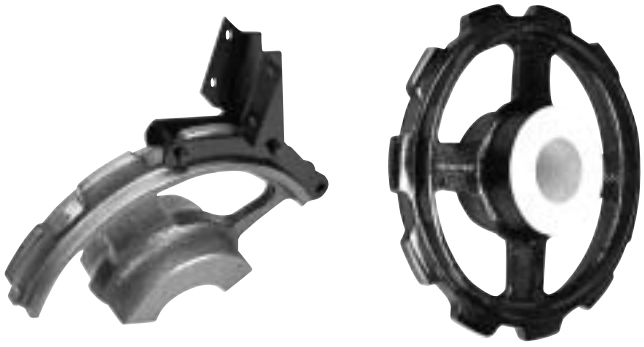
Chain No.	Dimensions (mm)										Added mass per attachment (kg)
	A	B	C	D_1	E	F	G	K	S	T	
730TAW	76	160.0	38.0	14	140	100	75	25	22	9	1.61
730TAWN	76	160.0	41.0	14	150	100	75	25	19	9	1.05
S730TAW	76	142.5	40.0	14	150	112	60	20	22.5	9	1.48

Sprockets for sludge impellers

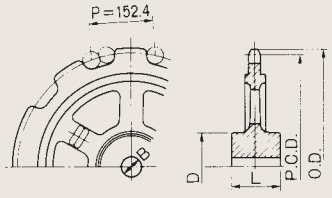
Ductile cast iron (FCD600) was previously the standard material for sprockets, but corrosion and wear within sewage water wore them out faster than stainless steel chains, so that only the sprockets had to be changed.
We pursued research and improvement on the basis of our long experience, to develop our corrosion-resistant sprocket series (stainless steel assembled parts).

Stainless steel sprockets

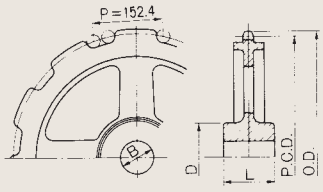
Stainless steel sprockets (SCS2) offer superior corrosion and wear resistance, minimizing the advance of wear and corrosion to extend sprocket lifespan.
Use of stainless steel sprockets also realizes synergistic benefits between chains and sprockets, further extending wear life.
Use of saver sprockets further reduces wear.



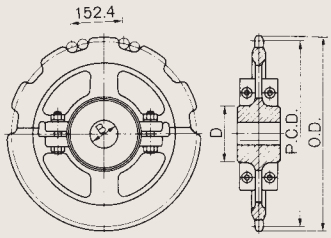
Saver type sprocket



C type



C type (saver type)



Split type

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D. (mm)	Outer Dia. O.D. (mm)	Type	Bore Dia. B (mm)		Hub (mm)		Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L	
SAV15211-B	11	540.9	557	C type (saver type)	80	125	200	140	61
	11	540.9	557	Split type (saver type)	80	125	200	140	65
HSS15215-B	11	540.9	558	C type	80	125	200	140	51
	11	540.9	558	Split type	80	125	200	140	63
OSV15215-B	11	540.9	560	C type (saver type)	80	125	200	140	64
OSV15219-B	11	540.9	560	Split type (saver type)	80	125	200	140	70
SAV15215-B	11	540.9	560	C type	70	110	170	140	52
SAV15219-B	11	540.9	560	C type	90	125	200	140	58
HSS15219-B	11	540.9	560	Split type	80	125	200	140	68
SAV15219-B special	11	540.9	562	C type	110	150	230	130	56
HSS15219-B special	11	540.9	562	C type (saver type)	110	150	230	130	60
HEP720S	11	540.9	580	C type	80	125	200	140	65

Assembled sprockets

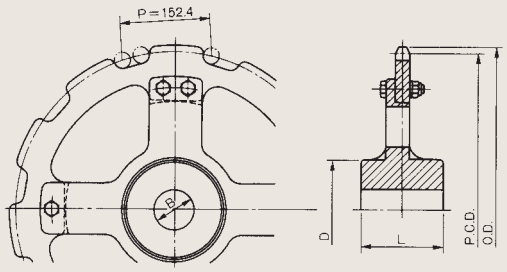
Assembled sprockets come in segmented and ring types.

1. Segmented type: Tooth tips are of cast stainless steel and bosses are of ductile cast iron.
2. Ring type: The tooth tips are of stainless steel or plastic and bosses are of ductile cast iron.

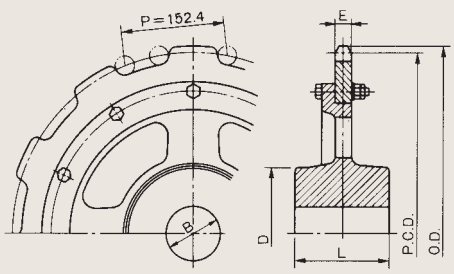
Assembled sprockets also help to achieve similar lifespan extension in stainless chains.
For stainless the boundary between the tooth tip and the boss is treated to prevent electrolytic corrosion.

Ring type

Segmented type



Segmented type sprocket



Ring type sprocket

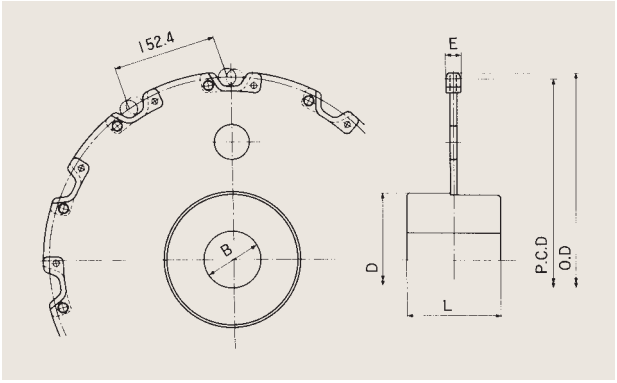
Plastic sprockets and stainless sprockets

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D. (mm)	Outer Dia. O.D. (mm)	Type	Bore Dia. B (mm)		Hub (mm)		Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L	
SAV15211-B HSS15215-B	11	540.9	557	C type	80	125	200	140	(53) 55
	11	540.9	557	C type (saver type)	80	125	200	140	63
	11	540.9	558	C type	80	125	200	140	(53) 57
SAV15215-B SAV15219-B OSV15215-B OSV15219-B HSS15219-B	11	540.9	560	C type	80	125	200	140	(55) 57
	11	540.9	560	Saver type	80	125	200	140	70
SAV15219-B special HSS15219-B special	11	540.9	562	C type	110	150	230	130	(58) 70
	11	540.9	562	Saver type	110	150	230	130	75
HEP720S	11	540.9	580	C type	80	125	210	140	(65)

Note: Figures in ( ) are mass when tooth tips are made of plastic.

Replaceable piece tooth sprocket

Replaceable piece tooth sprocket are replacement pieces that can be bolted to the sprocket body to form a single unit. The sprocket itself is of structural steel, and the replacement tooth pieces are of stainless steel or special plastic. The replacement tooth piece can be replaced just by removing the bolts. The replacement tooth piece has a unitary structure for superior wear resistance.

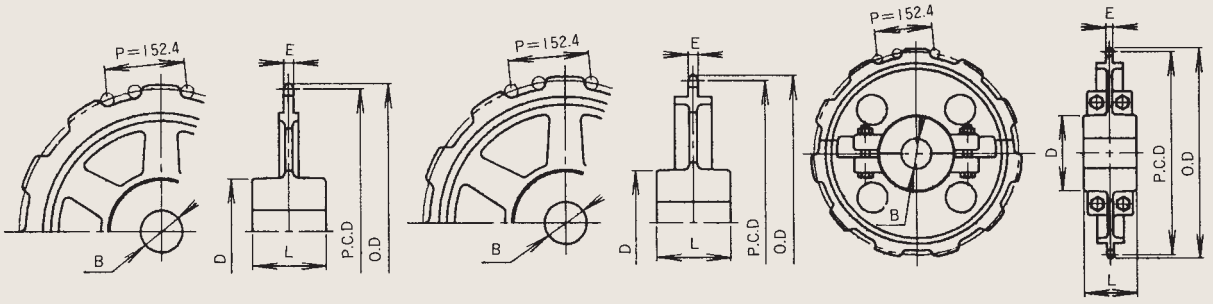


Chain No.	No. of teeth N	Pitch circle Dia. P.C.D. (mm)	Outer Dia. O.D. (mm)	Type	Bore Dia. B (mm)		Hub (mm)		Tooth Width E (mm)	Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L		
SAV15211-B	11	540.9	557	C type	80	125	200	140	19	43
HSS15215-B	11	540.9	558	C type	80	125	200	140	22	45
SAV15215-B SAV15219-B OSV15215-B OSV15219-B HSS15219-B	11	540.9	560	C type	80	125	200	140	25	47

Note: We can manufacture sprockets with 9~13 teeth.

Sprockets for TAW pintle chains

Sprockets for TAW pintle chains are made from ductile cast iron (FCD600) for strength and durability. The tooth tips are hardened for superior wear resistance.



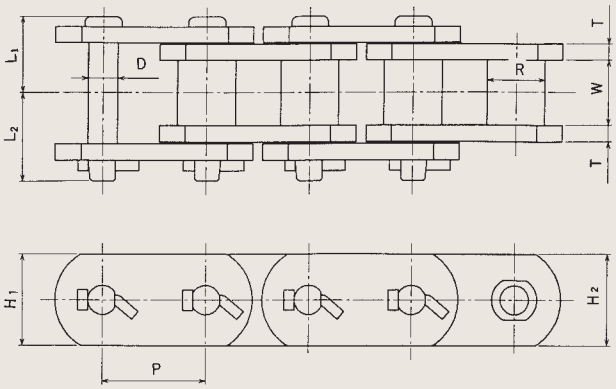
C type　　C type (saver type)　　Split type

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D. (mm)	Outer Dia. O.D. (mm)	Type	Bore Dia. B (mm)		Hub (mm)		Tooth Width E (mm)	Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L		
730TAW	11	540.9	568	C type	100	125	200	140	29	60
	11	540.9	568	C type (saver type)	100	125	200	140	29	66
	11	540.9	568	Split type (saver type)	100	125	200	140	29	80
730TAWN	11	540.9	568	C type (saver type)	100	125	200	140	29	67
	11	540.9	568	Split type (saver type)	100	125	200	140	29	81
S730TAW	11	540.9	570	C type	100	150	230	130	35	75
	11	540.9	570	C type (saver type)	100	150	230	130	35	84
	11	540.9	570	Split type (saver type)	100	150	230	130	35	94

Drive chains

HB type stainless bushed chains

Standard roller chains were used in the past for sludge collectors, but recently it has been more common to use HB type bushed stainless steel chains, which offer better wear resistance. Pitch, bush diameter and width between internal links are the same as for standard roller chains. Also, the HBD type is a double-pitch version of the HB type.

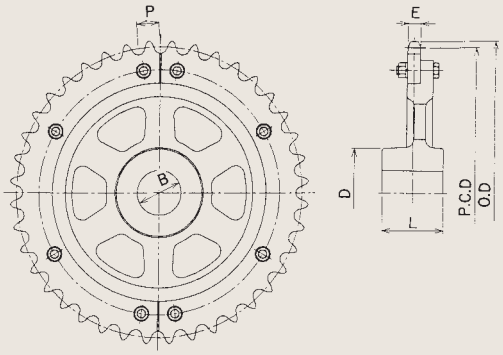


Chain No.	Pitch P (mm)	Bush Dia. R (mm)	Inner width W (mm)	Pin			Link plate			Average ultimate strength		Assured tensile strength		Mass (kg/m)
				Dia. D (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H_1 (mm)	Height H_2 (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	
HB120	38.1	22.23	25.40	11.11	28.4	33.7	31.8	31.8	6	100	10200	89	9100	7.4
HBD120	76.2													6.3
HB140	44.45	25.40	25.40	12.65	29.4	34.7	38.1	38.1	6	147	15000	127	13000	9.1
HBD140	88.9													6.8
HB160	50.8	28.58	31.70	14.23	38.0	42.6	40.0	44.5	8	233	23800	196	20000	12.4
HBD160	101.6													9.4
HB200	63.5	39.69	38.10	19.85	47.9	55.7	52.0	57.2	10	353	36000	304	31000	21.2
HBD200	127.0													19.5
HB240	76.2	47.60	47.63	23.81	56.7	65.3	59.0	63.5	12	451	46000	392	40000	30.3
HBD240	152.4													29.1

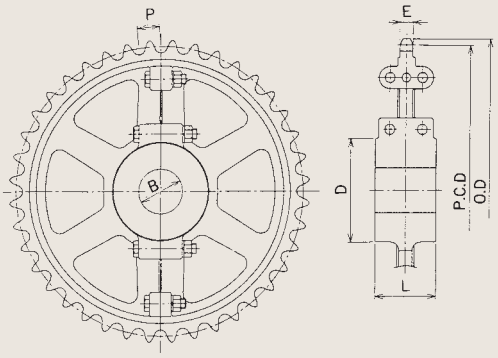
Note: When selecting standard roller chain sprockets for use with HBD type chains, use sprockets with at least 30 teeth.

Drive chain sprockets

Drive chain sprockets are available in three types: Unitary, assembly and split types. They can be made from cast stainless steel or ductile cast iron. Assembly type sprockets combine stainless steel teeth tips with ductile cast iron bosses.



Assembly type



Split type

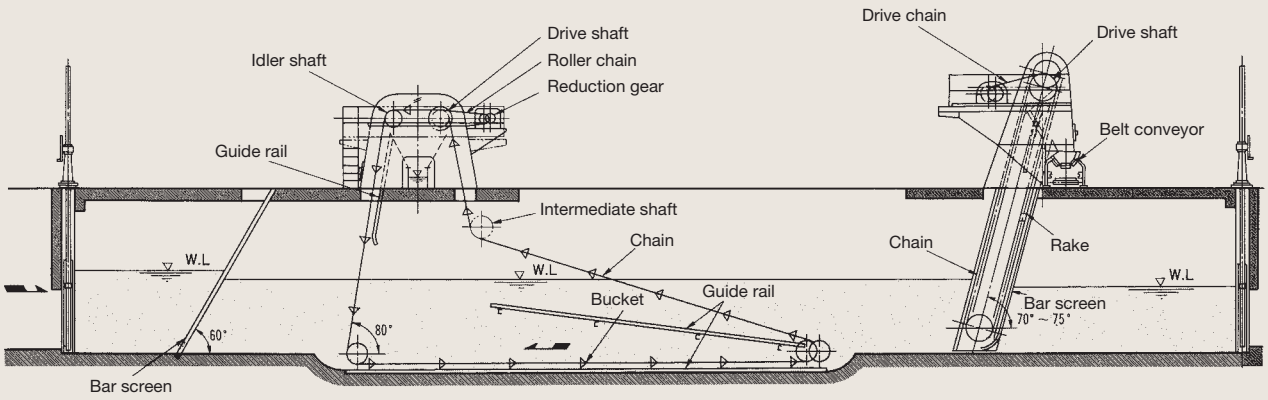
Chain No.	No. of teeth N	Pitch circle Dia. P.C.D. (mm)	Outer Dia. O.D. (mm)	Type	Bore Dia. B (mm)		Hub (mm)		Tooth Width E (mm)	Mass (kg)
					Pilot bore	Maximum	Dia. D	Width L		
HB140	11	157.78	178	Unitary type	40	60	100	100	23.5	8
	35	495.88	521	Unitary type	53	95	150	100		36
				Assembly type	80	125	200	130		78
				Split type						55
	40	566.54	591	Unitary type	58	105	170	110		45
				Assembly type	80	125	200	130		84
				Split type						75
	45	637.22	662	Unitary type	58	105	170	110		56
				Assembly type	80	125	200	130		99
				Split type						83
	50	707.91	733	Unitary type	58	105	170	110		57
				Assembly type	80	125	200	130		110
				Split type		145	230			97
HB160	11	180.31	204	Unitary type	40	70	115	120	29.4	12
	30	485.99	514	Unitary type	58	105	170	110		45
	35	566.71	595	Unitary type	58	105	170	110		55
				Assembly type	80	125	200	140		96
				Split type		145	230			94
	37	599.01	627	Split type	125	160	250	160		104
	40	647.47	676	Unitary type	68	125	200	130		72
				Assembly type	80			140		106
				Split type		145	230			99
	45	728.25	757	Unitary type	68	125	200	130		86
				Assembly type	80			140		128
				Split type		145	230			110
	50	809.04	838	Unitary type	68	125	200	130		94
				Assembly type	80			140		148
				Split type		145	230			130
	55	889.84	919	Unitary type	68	125	200	130		114
				Assembly type	80	145	230	140		195
				Split type						138
HB200	11	225.39	254	Unitary type	50	90	145	120	35.3	21
	35	708.39	744	Unitary type	88	160	250	160		112
				Split type	90					128
	37	748.77	784	Split type	125	160	250	160		131
	40	809.34	845	Unitary type	88	160	250	160		118
				Split type	90					144
	45	910.31	946	Unitary type	98	175	280	180		158
				Split type	100					188
HB240	11	270.47	305	Unitary type	50	95	150	120	44.1	29
	37	898.52	941	Split type	125	160	250	160		196

Note: The unitary and split types are made from cast stainless steel.

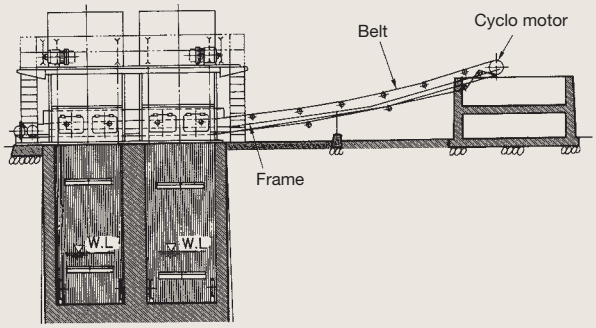
Grit tank equipment

Grit tanks are installed with relay pumping stations on sewage mains and chains, or at the intake pumps of treatment stations. They comprise debris removal and grit removal facilities.

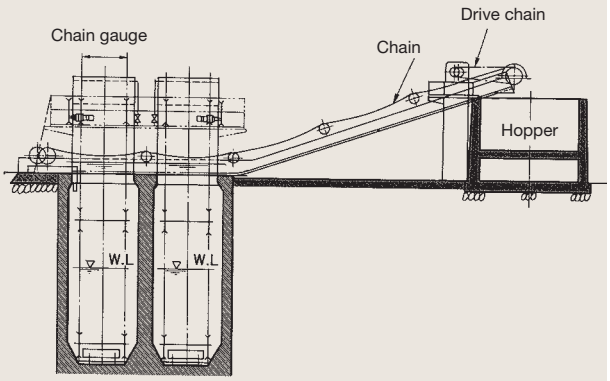
Debris removal equipment	Bar screen Discharger Storage	**Grit removal equipment**	Collectors Discharger Storage



●Grit tank mechanical equipment



●Debris barrier and discharger

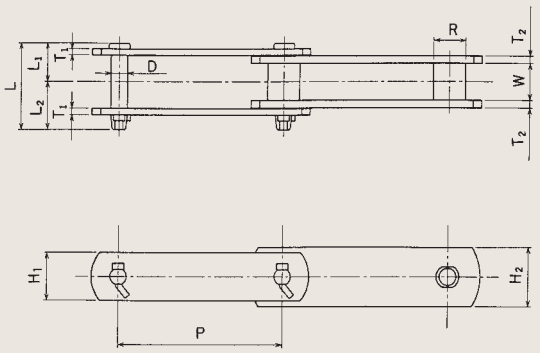


●Grit collector and discharger

Chains for grit tanks

HSS type stainless chains

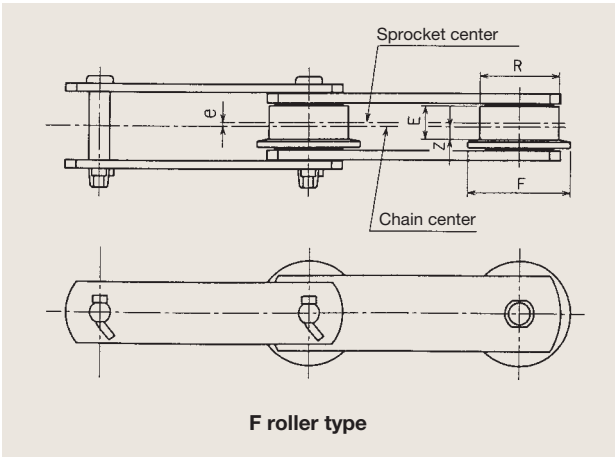
Chain components are made from carefully selected 400-class stainless steel, which is accurately pressed and specially heat treated. They have excellent dimensional precision, and are designed to deliver adequate tensile strength at low weight. They also offer superior corrosion and wear resistance.
We offer SF4 attachments for mounting collector flights, D-22 attachments for mounting dredger buckets, and T-1 and A-2 attachments for mounting debris remover rakes.



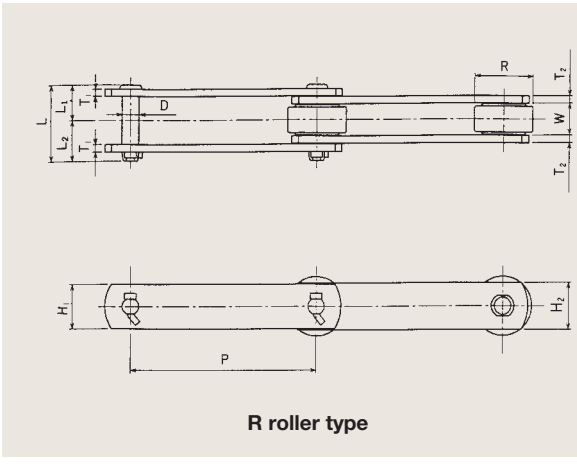
HSS type stainless chain

HSS type stainless chains

Chain No.	Pitch P (mm)	Roller (bush) Dia. R (mm)				Inner width W (mm)	Pin				Pin link		Bush link		Average ultimate strength		Assured tensile strength		Mass (kg/m)			
							Dia. D (mm)	Length			Height	Thickness	Height	Thickness								
		Bushed type	S roller type	F roller type	R roller type			L (mm)	L_1 (mm)	L_2 (mm)	H_1 (mm)	T_1 (mm)	H_2 (mm)	T_2 (mm)	(kN)	(kgf)	(kN)	(kgf)	B	S	F	R
HSS15215	152.4	24	29	48	48	26	13.5	62	29	33	36	5	38	6	147	15000	137	14000	4.2	4.6	7.3	7.2
HSS15219	152.4	26	32	50	50	30	14.5	72	32.5	39.5	38	6	44	6	186	19000	172	17500	5.8	6.7	8.5	8.0
HSS15225	152.4	30	36	58	58	34	15.3	80	36	44	44	6	54	7	245	25000	225	23000	6.9	7.7	11.5	11
HSS15235	152.4	36	42	70	70	38	18.9	88	40	48	54	7	60	7	343	35000	313	32000	10.3	11.7	16.4	16
HSS15248	152.4	–	44.5	80	80	57.2	22.1	120	56	64	63.5	10	63.5	10	490	50000	441	45000	–	19.0	28.8	27.8



F roller type



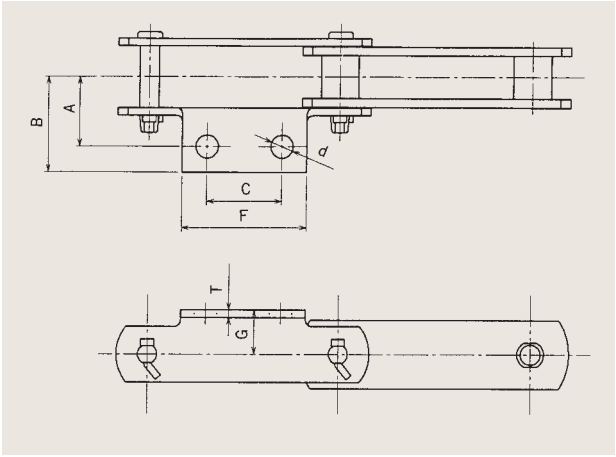
R roller type

HSS type stainless chains (F roller type)

Chain No.	Dimensions (mm)				
	R	E	e	F	Z
HSS15215	48	16	2.25	60	5.75
HSS15219	50	20	3.0	65	7.0
HSS15225	58	24	3.0	75	9.0
HSS15235	70	25	4.0	90	8.5
HSS15248	80	38	6.0	95	13.0

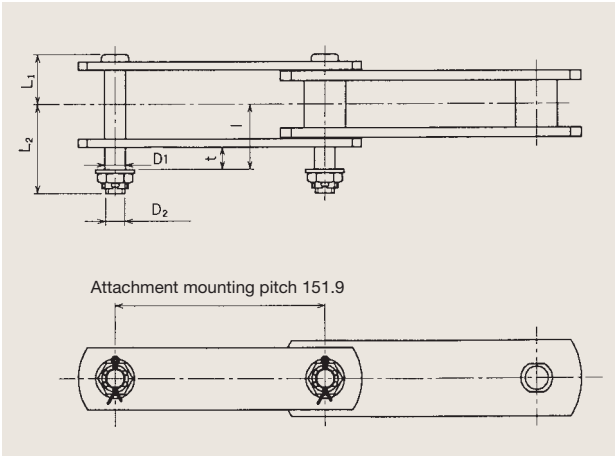
Attachments for HSS type stainless chains

A-2 attachment



Chain No.	Dimensions (mm)							Added mass per attachment (kg)
	A	B	C	d	F	G	T	
HSS15215	45	60	60	14	90	30	5	0.16
HSS15219	50	65	60	14	90	32	6	0.21
HSS15225	55	75	60	18	100	35	6	0.27
HSS15235	65	90	60	18	100	42	7	0.39

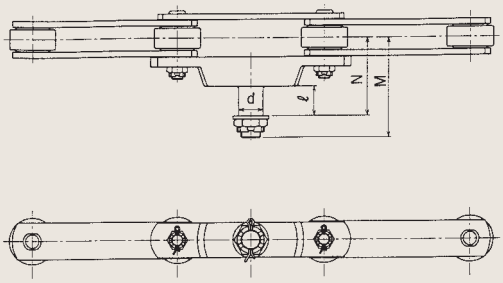
D-22 attachment



Note: The attachment mounting pitch for the HSS15235 is 151.8mm.

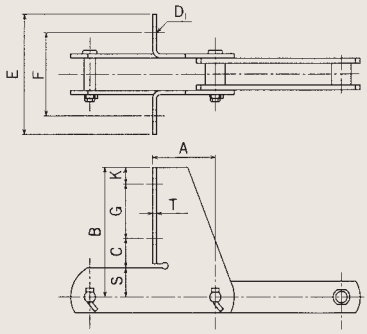
Chain No.	Dimensions (mm)						Added mass per attachment (kg)
	L_1	L_2	D_1	D_2	l	t	
HSS15215	29	51	13	M12	37	12	0.11
HSS15219	32	58	14	M12	44	16	0.12
HSS15225	36	64	15	M14	47	16	0.13
HSS15235	40	72	18	M16	53	19	0.19
HSS15248	55.6	85	18	M16	65.6	16	0.20

T-1 attachment



Chain No.	Dimensions (mm)				Added mass per attachment (kg)
	d	ℓ	M	N	
HSS15215	25	30	102	80	1.2
HSS15219	30	35	108	85	1.4
HSS15225	40	44	149	122	2.8
HSS15235	40	44	151	124	3.4
HSS15248	50	50	184	145	5.1

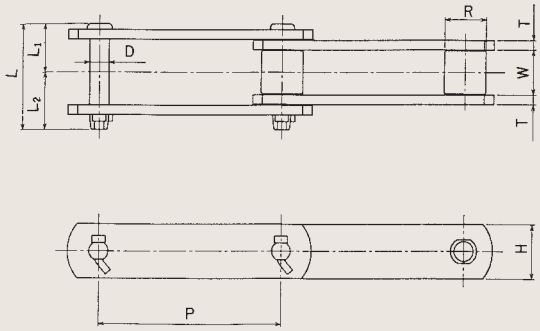
SF4 attachment



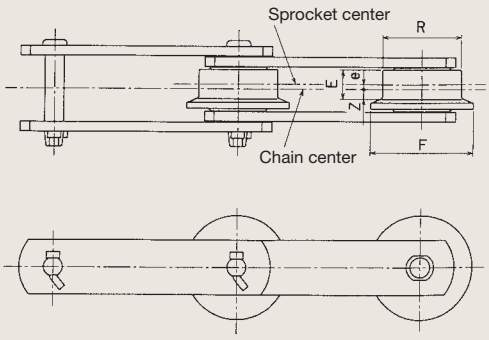
Chain No.	Dimensions (mm)										Added mass per attachment (kg)	Notes
	A	B	C	D1	E	F	G	K	S	T		
HSS15215	76	140	38	14	145	100	60	20.0	22.0	5	1.0	Equivalent to 720
HSS15219	76	155	32	14	140	100	65	20.0	38.0	6	1.4	Standard type
	76	155	40	14	140	100	75	17.5	22.5	6	1.3	Equivalent to 730
	76	142.5	40	14	150	112	60	20.0	22.5	6	1.4	Equivalent to S730
HSS15225	76	162	40	18	145	100	75	20.0	27.0	6	1.6	
HSS15235	76	175	40	18	150	110	75	25.0	35.0	7	1.9	

HSC type steel chains

HSC type steel chains use 400 class stainless steel for the pins and bushes to prevent corrosion, wear and poor flexion.



S roller type



F roller type

HSC type steel chains

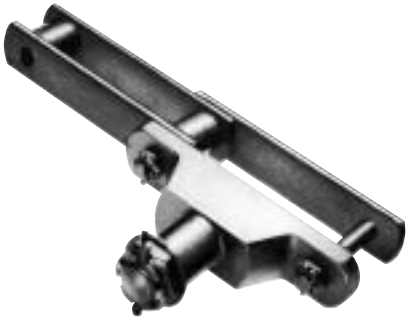
Chain No.	Pitch P (mm)	Roller Dia. R (mm)				Inner width W (mm)	Pin				Link plate		Average ultimate strength		Assured tensile strength		Mass (kg/m)		
		Bushed	S roller	F roller	R roller		Dia. D (mm)	Length L (mm)	L_1 (mm)	L_2 (mm)	Height H (mm)	Thickness T (mm)	(kN)	(kgf)	(kN)	(kgf)	B, S	F	R
HSC15215	152.4	25.4	25.4	50.8	50.8	30.2	11.05	69.0	31.0	38.0	38.1	6.3	147	15000	132	13500	6.0	8.0	7.8
HSC15219	152.4	29.0	29.0	50.8	50.8	30.2	14.18	73.3	32.8	40.5	38.1	6.3	216	22000	196	20000	6.6	8.0	7.8
HSC15228	152.4	34.9	34.9	65.0	65.0	37.1	15.8	87.5	40.0	47.5	44.5	7.9	275	28000	250	25500	9.3	13.0	12.0
HSC15235	152.4	39.7	39.7	70.0	70.0	37.1	18.94	97.5	44.5	53	50.8	9.5	373	38000	343	35000	12.6	18.1	17.1
HSC15248	152.4	44.5	44.5	80.0	80.0	57.2	22.11	119.6	55.3	64.3	63.5	9.5	510	52000	460	47000	17.8	27.9	26.9

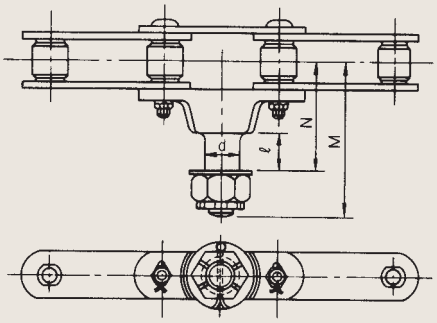
HSC type steel chains (F roller type)

Chain No.	Dimensions (mm)				
	R	E	e	F	Z
HSC15215	50.8	20	3	65	7
HSC15219	50.8	20	3	65	7
HSC15228	65.0	24	4	85	8
HSC15235	70.0	25	3.5	85	9
HSC15248	80.0	38	6	95	13

Attachments for HSC type steel chains

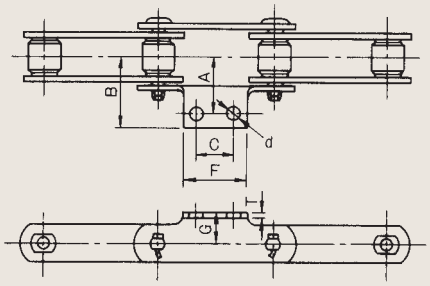
T-1 attachments





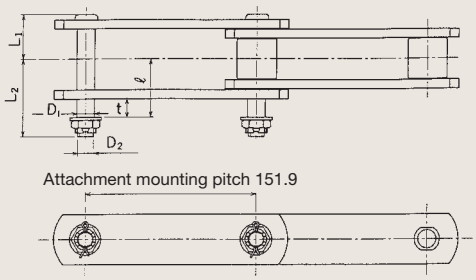
Chain No.	Dimensions (mm)				Added mass per attachment (kg)
	d	ℓ	M	N	
HSC15215	25	30	102	80	1.2
HSC15219	30	35	108	85	1.4
HSC15228	40	44	149	122	2.8
HSC15235	40	44	151	124	3.4
HSC15248	50	50	184	145	4.5

A-2 attachments



Chain No.	Dimensions (mm)							Added mass per attachment (kg)
	A	B	C	d	F	G	T	
HSC15215	50	66	60	14	90	32	6.3	0.25
HSC15219	50	66	60	14	90	32	6.3	0.25
HSC15228	60	81	60	18	100	38	7.9	0.40
HSC15235	65	86	60	18	100	45	9.5	0.55
HSC15248	80	105	60	18	100	55	9.5	0.65

D-22 attachments

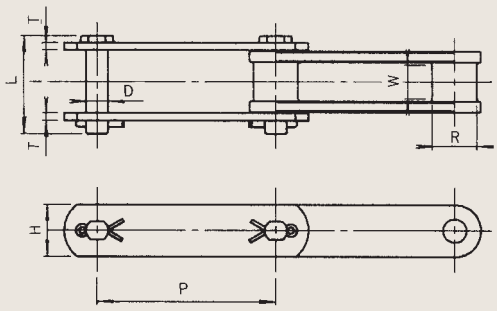


Note: The attachment mounting pitch for the HSC15235 is 151.8mm.

Chain No.	Dimensions (mm)						Added mass per attachment (kg)
	L_1	L_2	D_1	D_2	ℓ	t	
HSC15219	32.8	59	13.5	M12	44.3	16	0.12
HSC15228	40.0	68	15.5	M14	51.1	16	0.13
HSC15335	44.5	74	18.0	M16	54.4	16	0.19
HSC15248	55.4	85.4	18.0	M16	64.4	16	0.25

TAW combination chains

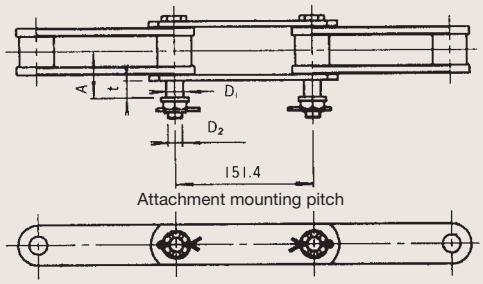
These are the main chains for grit tank collectors and dischargers.
The blocks are TAW-processed steel castings to improve wear resistance, and the link plates and pins are made from heat-treated special steel alloy, for high strength and toughness.



Chain No.	Pitch P		Dimensions (mm)						No. of links in one length	Average ultimate strength		Assured tensile strength		Mass (kg)	
	(mm)	(in)	R	W	D	L	H	T		(kN)	(kgf)	(kN)	(kgf)	1 length	1 m
C730TAW	152.4	6	38.1	29	19	84	44.5	6.3	20	245	25000	220	22500	29.1	9.65
C112TAW	152.4	6	38.0	46	19	102	50.8	6.3	20	294	30000	264	27000	34.0	11.15
C113TAW	152.4	6	44.5	56	22	128	50.8	9.5	20	392	40000	353	36000	50.8	17.4

Attachments for TAW combination chains

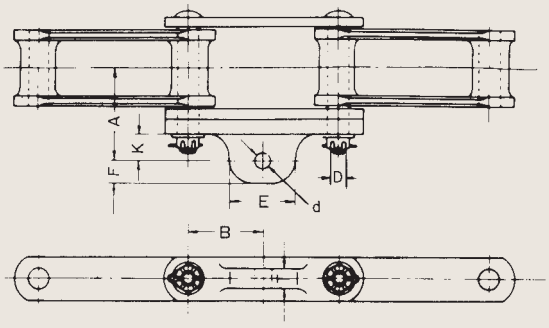
D-22 attachment



Chain No.	Dimensions (mm)				Mass of one set (kg)
	A	D_1	D_2	t	
C730TAW	52.3	18.8	M16	19	3.13
C112TAW	60.8	18.8	M16	19	3.58
C113TAW	78.0	21.8	M20	25	5.5

Note: One set of attachments is 2 links.

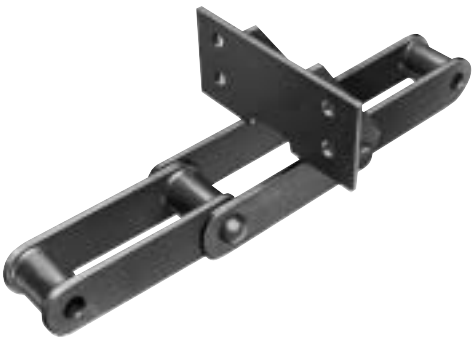
A42S attachment

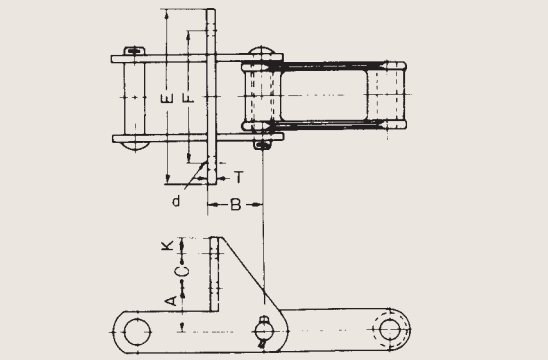


Chain No.	Dimensions (mm)								Mass of one set (kg)
	A	B	d	D	E	F	K	T	
C730TAW	79.3	76.2	17	M16	68	22	27.0	24	4.85
C112TAW	90.0	76.2	20	M16	80	25	32.2	28	5.56
C113TAW	113.0	76.2	23	M20	80	28	35.0	28	8.21

Note: One set of attachments is 2 links.

SF4 attachment



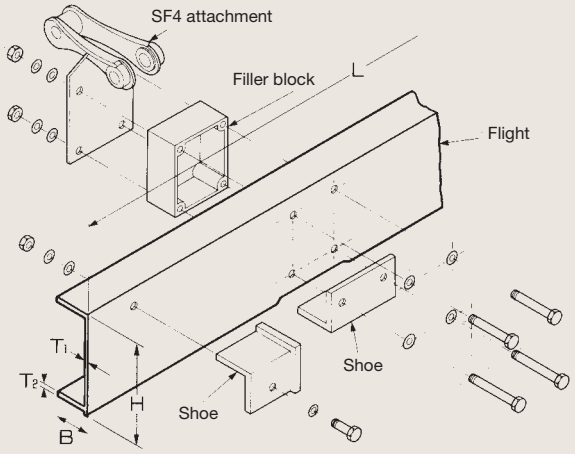


Chain No.	Dimensions (mm)								Mass of one set (kg)
	A	B	C	d	E	F	K	T	
C730TAW	55	76.3	40	15	140	100	22.8	6.3	4.88
C112TAW	55	66.3	40	14	200	140	19.6	6.3	4.75
C113TAW	55	67.0	40	15	220	160	19.6	9.5	6.23

Note: One set of attachments is 2 links.

FRP flights

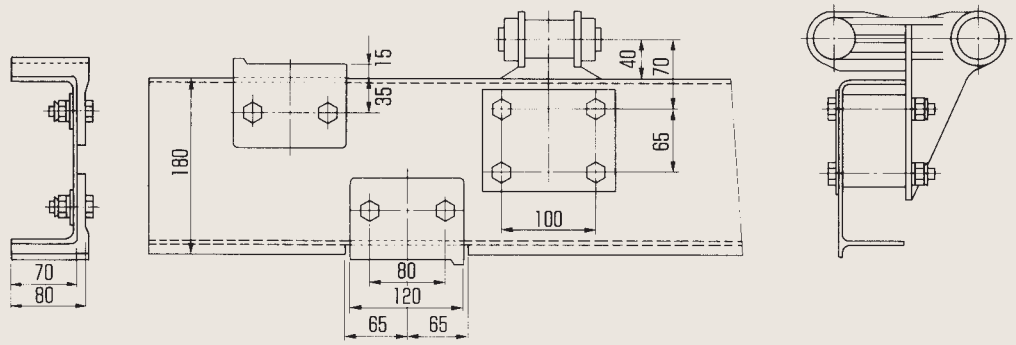
Flights for sludge collectors used to be made from American cypress or synthetic wood, but they were difficult to work with because of their weight, and strong buoyancy while underwater could disengage the chains. FRP flights overcome these defects, as they are light and have no buoyancy. They also have superior corrosion resistance.



Mounting procedure

H (mm)	B (mm)	T_1 (mm)	T_2 (mm)	L (mm)	Mass (kg)
180	70	4	4	2,000	4.6
				2,500	5.7
				3,000	6.9
				3,500	8.0
				4,000	9.1
				4,500	10.3
				5,000	11.4
				5,500	12.6
				6,000	13.7

Note: 1. Total flight length should not exceed 6,000mm.
2. Filler blocks are required to mount flights onto chains. Two sets of filler blocks will be provided for each flight.



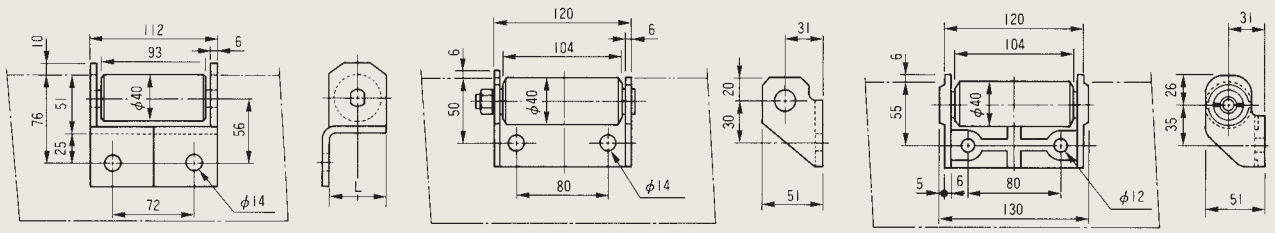
Chain and shoe attachment dimensions

Roller shoes

Roller shoes have the following characteristics, compared to traditional sliding shoes:

- Contact with the rail rolls rather than slides, extending lifespan.
- Reduced rolling resistance cuts running costs.
- Rail wear is reduced by rolling contact.
- The rollers can be replaced separately.

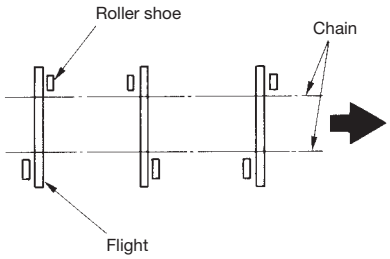
Type	Dimension A (mm)	Mass (kg)
Under type	50	1.1
	60	1.2
	70	1.3
Side type	–	1.0
FRP type	–	0.5



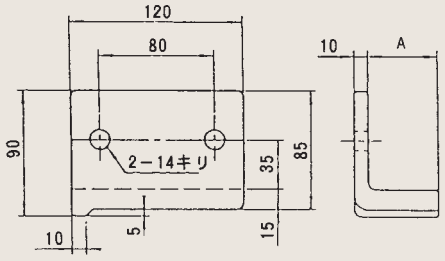
Under type **Side type** **FRP type**

Note

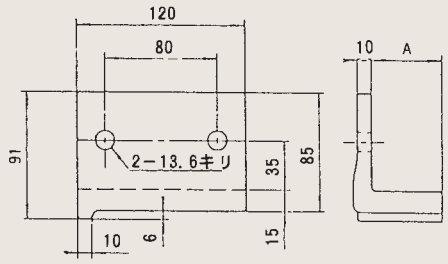
- The rails should be made from stainless steel or plastic.
- Side-type shoes should be attached alternately, as shown in the diagram on the right, to ensure balance of the flights.
- Remove any foreign bodies (spatter, mortar fragments, etc.) from on the rail before running the machinery.



Shoes



Cast ductile iron, cast stainless steel, cast chrome iron



Plastic

Dimension A	Material	Mass (kg)
50	Cast ductile iron	1.6
	Cast stainless steel	
	Cast chrome iron	
	Plastic	0.22
60	Cast ductile iron	1.7
	Cast stainless steel	
	Cast chrome iron	
	Plastic	0.24
70	Cast ductile iron	1.8
	Cast stainless steel	
	Cast chrome iron	
	Plastic	0.25

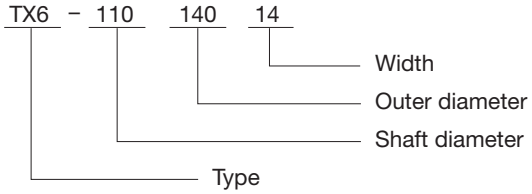
Note: Specify dimension A and the material when placing your order.

TX6 type oil seals

Oil seals for rotating components used under water must have excellent sealing performance.
TX6 type oil seals have a triple-lipped structure for excellent performance, and prevent grease deterioration. They also block the entry of grit and other foreign bodies, extending the service lives of bushes, sleeves and other components.

Model numbering system for TX6 type oil seals

(Ex.) TX6-11014014



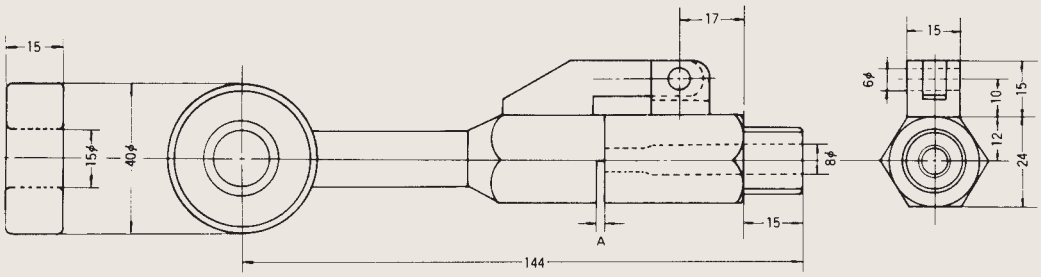
(mm)

Shaft Dia.	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	150
Outer Dia.	82	88	95	100	105	110	115	120	125	135	140	145	150	155	160	165	170	180
Width	12	12	13	13	13	13	13	13	13	14	14	14	14	14	14	14	14	14

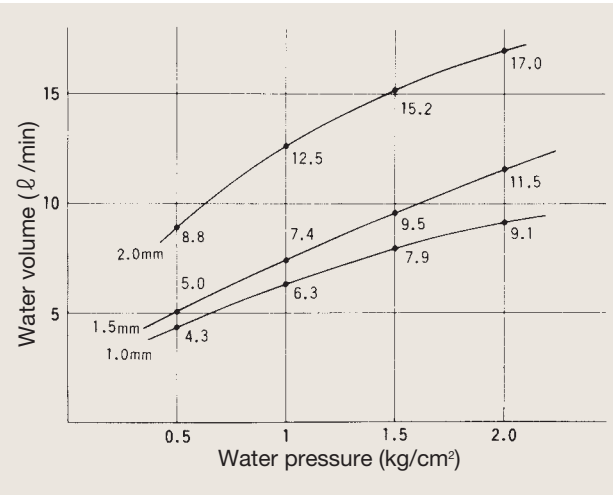
Stainless spray nozzles

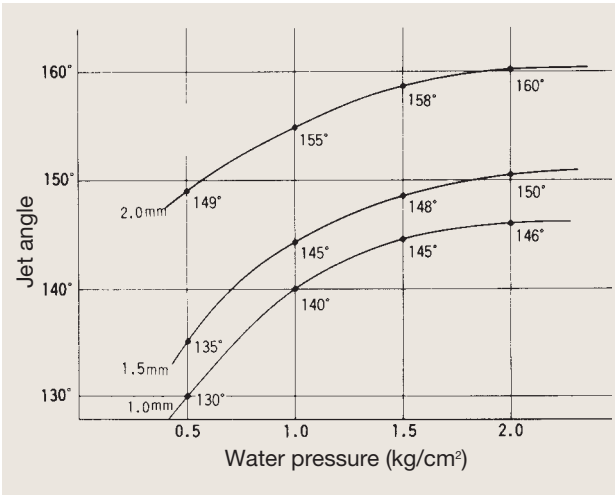
Features

- Simple structures for easy removal of foreign bodies.
- All components are made from 300-class stainless steel, for excellent corrosion resistance.
- Strong pins and screws improve durability.



Type	Slit width A (mm)	Water volume (ℓ/min)				Jet angle (degrees)				Mass (g)
		0.5kg/cm²	1.0kg/cm²	1.5kg/cm²	2.0kg/cm²	0.5kg/cm²	1.0kg/cm²	1.5kg/cm²	2.0kg/cm²	
SK3-1.0	1.0	4.3	6.3	7.9	9.1	130	140	145	146	515
SK3-1.5	1.5	5.0	7.4	9.5	11.5	135	145	148	150	
SK3-2.0	2.0	8.8	12.5	15.2	17.0	149	155	158	160	

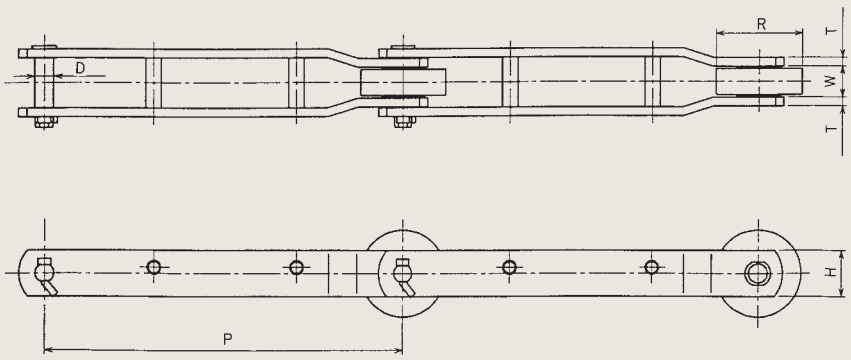




Note: Use the above as a guideline for water pressure, water volume and jet angle.

Carrying chains

These are large offset-type bushed roller chains used in automatic debris removal equipment at the coolant water intakes of power stations. They incorporate various design features in materials, heat treatments and other aspects to enable use in sea water.



Chain No.	Pitch P (mm)	Roller Dia. R (mm)	Inner width W (mm)	Pin Dia. D (mm)	Link plate		Average ultimate strength		Mass (kg/m)
					Height H (mm)	Thickness T (mm)	(kN)	(kgf)	
HR60020R	600	100	34.0	18.9	50.8	9.5	196	20000	11.7
HR60025R		100	38.0	22.1	63.5	9.5	245	25000	14.3
HR60040R		100	54.0	25.2	76.2	12.7	392	40000	23.3
HR60050R		100	64.0	28.0	76.2	16.0	490	50000	28.3
HR60063R		115	72.0	31.6	90.0	16.0	618	63000	35.8
HR60080R		125	80.0	35.5	100	19.0	784	80000	48.3

HITACHI CONVEYOR CHAINS

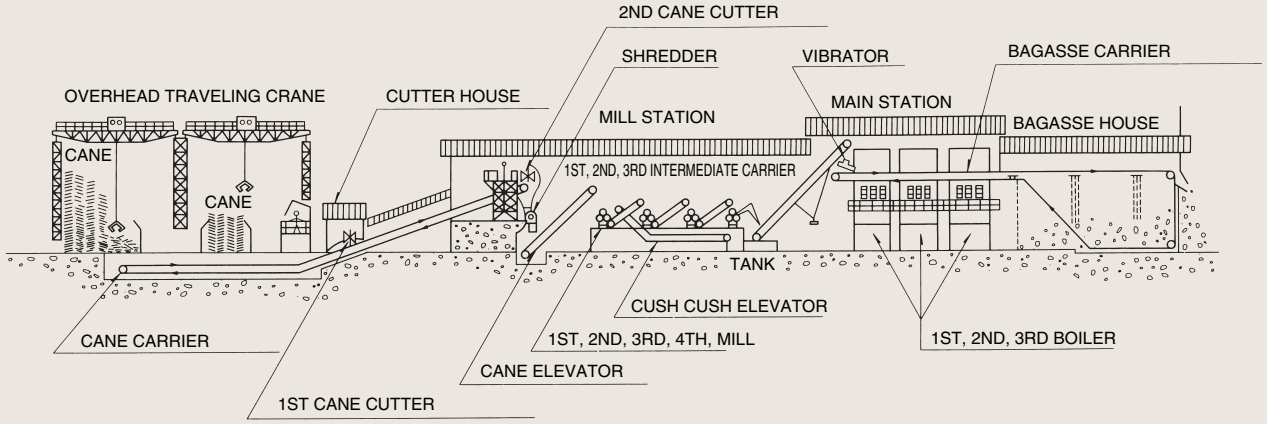
Chains for Sugar industry

Chains for Sugar industry

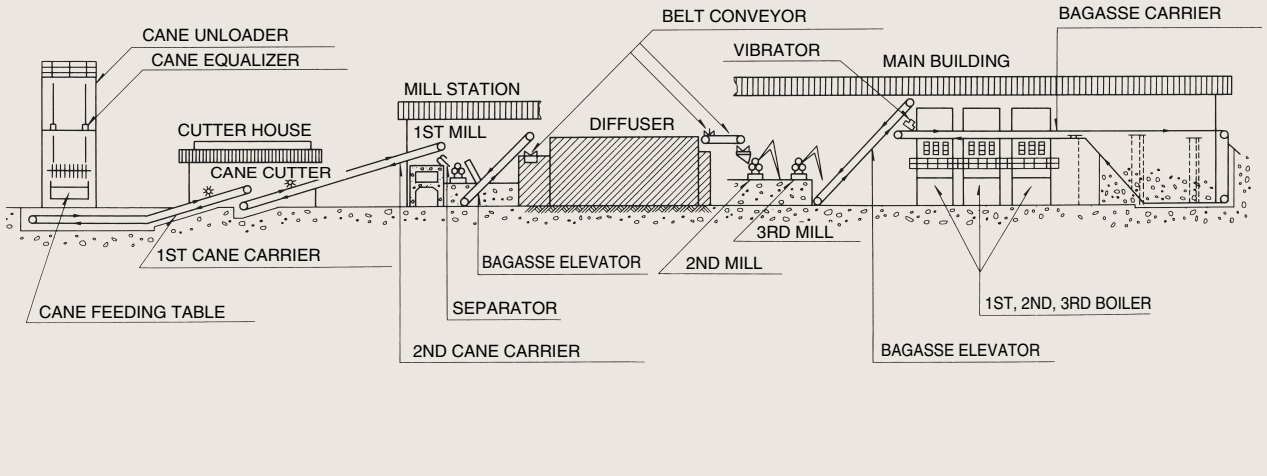
Commitment to excellence

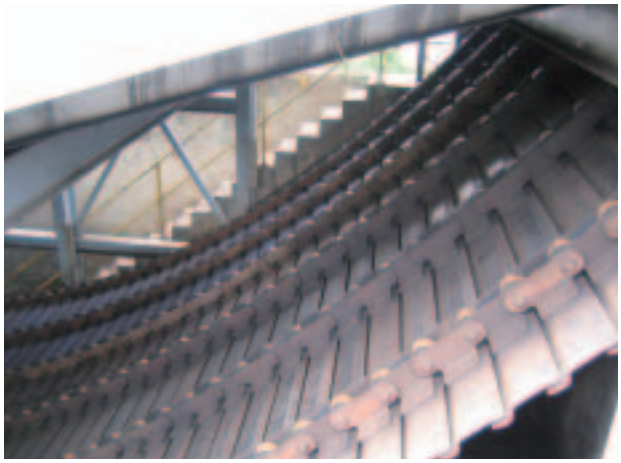
Hitachi commitment to excellenece encompasses total satisfaction of customer's needs and requirements.
Kantou Works in Kumagaya is dedicated to the manufacture of the highest quality chains, without compromise.
The metallurgical knowledge acquired over nearly a century, is fully utilised in the production of standard and 'custom made' chain products.
Technological research in product quality and improvements, is the Hitachi way of life.
Hitachi have business partnerships throughout the world, with only top class distributors, whose commitment to excellence is common.

Mill System



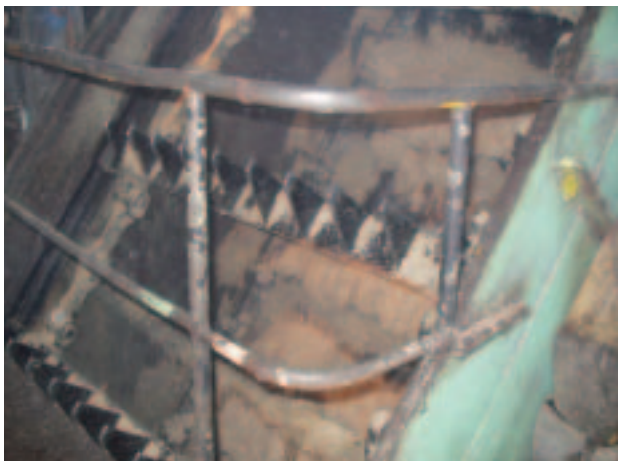
Diffuser System





Cane feeder and Cane carrier

Link chain (P=152.4 & 228.6)	SS960	ATTACHMENT	K2
Rivetless chain (X458～698)	SS996		K2
	SS800		K2
	SS1796		K2



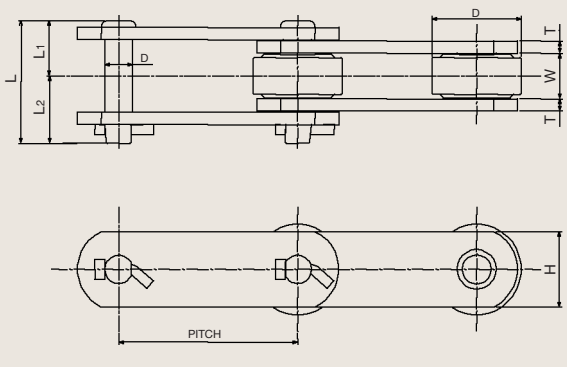
Intermediate Carrier
P=304.8mm Intermediate carrier chain

Drive chain
H2570H～H6042
ANSI No.160～240

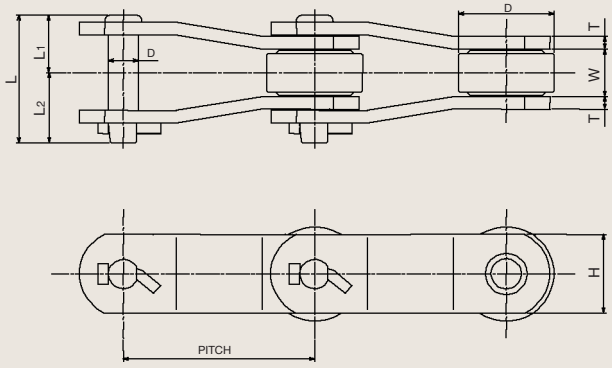
Bagasse carrier
SS2184 A42＋2C
SS1796 A42＋2C

Roller Carrier Chains

Used for feeder tables, bagasse carriers and scratchers.



Straight Sidebar (A)



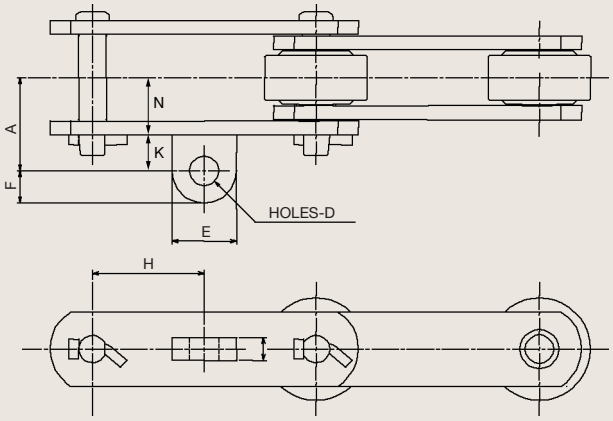
Offset Sidebar (B)

Chain No.	Type	Pitch	Roller Dia.	Inner Width	Pin				Link plate		Average Ultimate Strength	Mass/m
					Dia.	Length			Hight	Thickness		
						L	L_1	L_2				
SS1113	B	102.6	50.8	37.5	17.5	83	38	45	38.1	6.3	9500	13.2
SS1124	B	101.6	50.8	32	12.8	80.6	37.8	42.8	38.1	7.9	8500	17.5
SS1125	B	101.6	50.8	32.6	17.4	83	38	45	44.5	7.9	15500	14.3
SS1114	A	152.4	50.8	32.5	15.88	81.7	38.5	43.2	38.1	7.9	12700	11.8
SS1130	B	152.4	63.5	37.6	18.9	82	38.5	43.5	50.8	6.3	15400	13.7
SS1796 Hyper	AB	152.4	76.2	38.2	22.25	101	45	56	57.2	9.5	48000	25.7
SS2184 Hyper	B	152.4	76.2	34.9	22.2	97	44	53	50.8	9.5	37000	20
SS960	A	152.4	70	38.1	22.22	118.3	54.8	63.5	57.2	14	43000	26
SS996	A	152.4	69.9	38.1	18.9	97.1	44.8	52.3	50.8	9.5	32000	17.9
SS800	AB	203.2	89	46.1	25.4	125	60	65	76.2	12.7	76000	29
SS22840	B	228.6	90	37.1	25.4	101.5	46.5	88	63.5	9.5	40000	22.2
0904	A	101.6	50.8	29.4	17.44	79	36.2	42.8	44.5	7.9	18150	12.5
09060	AB	152.4	69.9	38.2	18.9	98	45	53	50.8	9.5	31000	17.5
09061	AB	152.4	69.9	37.1	18.94	97.1	44.4	52.7	57.2	9.5	38600	20
09063	A	152.4	76.2	38.2	23.8	103	46.5	56.5	63.5	10.3	63500	24.3

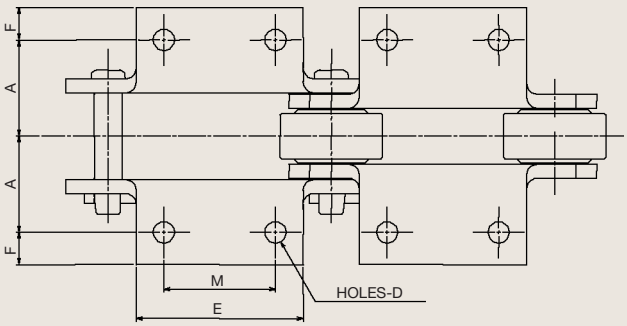
A: Straight Sidebar Type
B: Offset Sidebar Type
Roller dia.: Other dia. Available on request

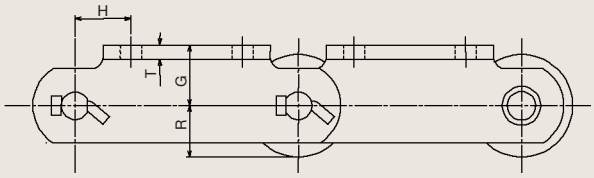
Standard Attachments

A range of chains are available, with Standard Attachments, For Use on main and auxiliary cane feeder conveyors and bagasse elevator conveyors.

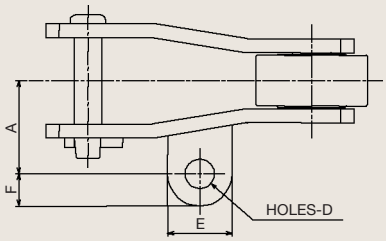


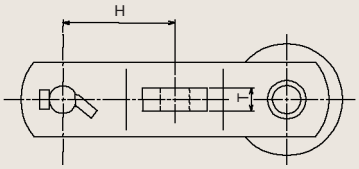
A42 attachment (A)





K2 attachment



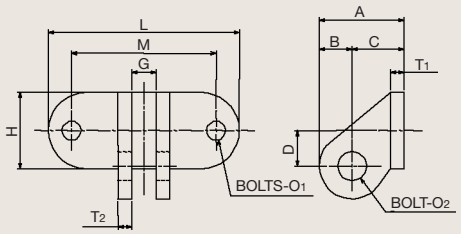


A42 attachment (B)

Attachment No.	Chain No.	Dimensions (mm)										Mass	
		A	D	E	F	G	H	K	M	N	T	Kg/m	Kg/pc
K2	SS1796	111	12.5	110	150	41.3			76.2			25	
	SS800	132	17.5	165	183	55.5			114.5			45.5	
	SS960	111.4	14.3	111	152.6	41.3			76.2			27.2	
	SS996	111.1	14.5	136	174	41.3			76.2			24.9	
	09060	111.1	14.5	114	175	41.3			76.2			23.8	
	09061	111.1	14.5	113	176	41.3			76.2			25.6	
	09063	111.1	12.7	114	170	44.5			76.2			28.7	
A42(B)	SS1113	60.3	16.8	49.5	20		50.3				13.5		0.22
	SS1124	50.8	11	35	17.5		50.8				10.3		0.1
	SS1125	54	16.7	42	18.3		50.8				12.7		0.15
	SS1130	61.9	17.5	55	27.8		76.2				15		0.34
	SS1796	63.5	20	44	20		76.2				15.5		0.18
	SS2184	66.7	17	55	25.4		76.2				15		0.32
	SS800	81.7	17	68	25.4		101.6				15.5		0.39
	09063	70	17	50	25		76.2				14.3		0.29
	HR22840	80	21	100	25		95				19		0.63
A42(A)	SS1114	60.3	17	48	23		76.2	59.15		24.15	14		0.26
	SS1796	63.5	20	44	20		75.9	24.5		39	15.5		0.19
	09060	63.5	20	44	20		76.2	35.45		28.05	15.5		0.24
	09061	63.5	20	44	20		75.9	25.15		38.35	15.5		0.18
	09063	63.5	20	44	20		76.2	34.1		29.4	15.5		0.2

Flight Wing

These are used with A42 attachment (mainly for bagasse carrier)

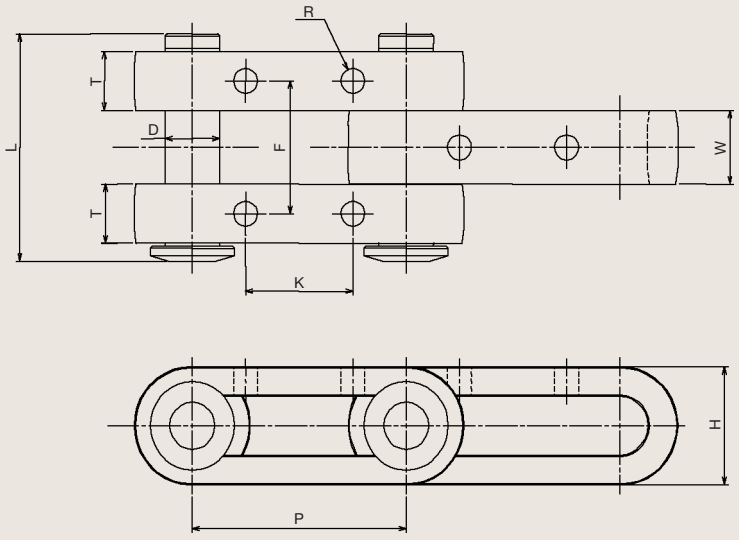


Flight Wing

Attachment No.	Dimensions (mm)												Mass Kg/pc
	A	B	C	D	G	H	L	M	O_1	O_2	T_1	T_2	
0C	49.1	19	30.1	20.6	14.3	44.5	111	84.1	11.1	16.7	7.9	7.9	0.44
1C	64.7	25	39.7	25.4	14.4	50.8	127	88.9	15	16	9.5	9.5	0.62
2C	92.1	25.4	66.7	25.4	15.9	50.8	127	88.9	14	16	7.9	9.5	0.91
5C	56	21	35	20.6	14.5	50.8	120.6	69.9	14.3	16	7.9	10.25	0.58
17C	50	15	35	27.8	11.1	48	111	76.2	15	11	7.9	7.9	0.38

Link chains

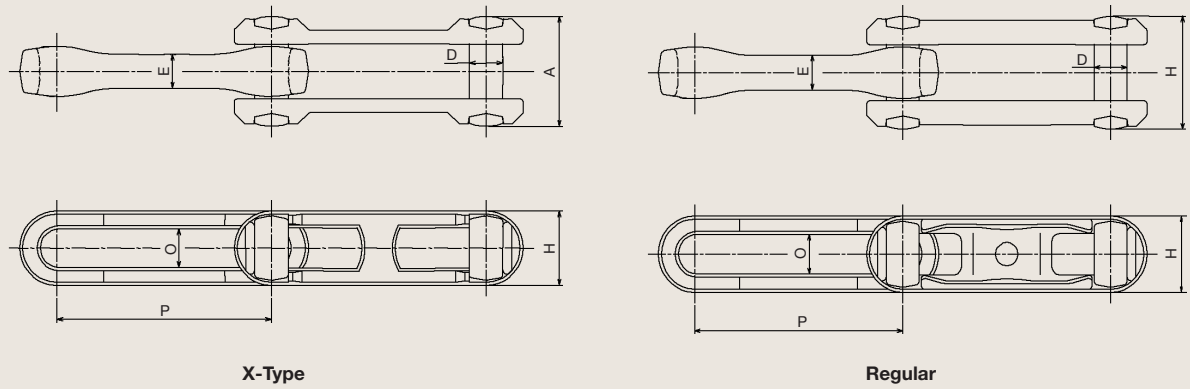
Used for main and auxiliary cane carrier



Chain No.	Average Pitch	Average Ultimate Strength	Dimensions (mm)								Average Mass Kg/m
			Overall Width A	Pin Dia. D_1	Width of Inner Link W	Width of Outer Link T	Height H	Hole Pitch (A) F	Hole Pitch (B) K	Hole Dia. R	
P=152.4	152.4	34000	152.4	30	45	45	60	93	64	13	24.4
P=152.4	153.2	63000	152.4	39	50	40	80	90	76.4	17	43.8
P=228.6	228.6	71400	154.2	39	50	40	80	90	95	17	36.5

Drop forged Rivetless chains

Advantage Feature - Ease of assembly and disassembly



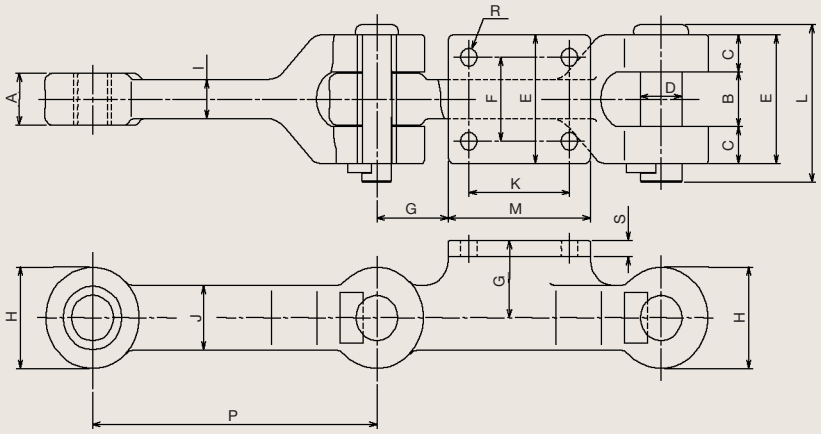
X-Type Regular

Chain No.	Average Pitch	Average Ultimate Strength		Dimensions (mm)					Average Mass Kg/m
		Not heat Treated	Heat Treated	Overall Width A	Pin Dia. D	Width of Inner Link E	Height H	Length of Opening O	
X458	102.4	–	21800	55.7	16	25.2	35.7	17.3	4.35
X678	153.2	–	38500	77	22	31.8	50.8	25.4	3.03
468	102.4	17200	31800	81	19.1	28.6	47.6	22.2	3.1
678	153.2	18100	32700	77	22	20.6	50.8	25.4	3
698	153.2	45400	59000	95.3	28.6	25.4	68.3	31.8	18.1

Intermediate Carrier Chain (Alloy cast steel)

Features

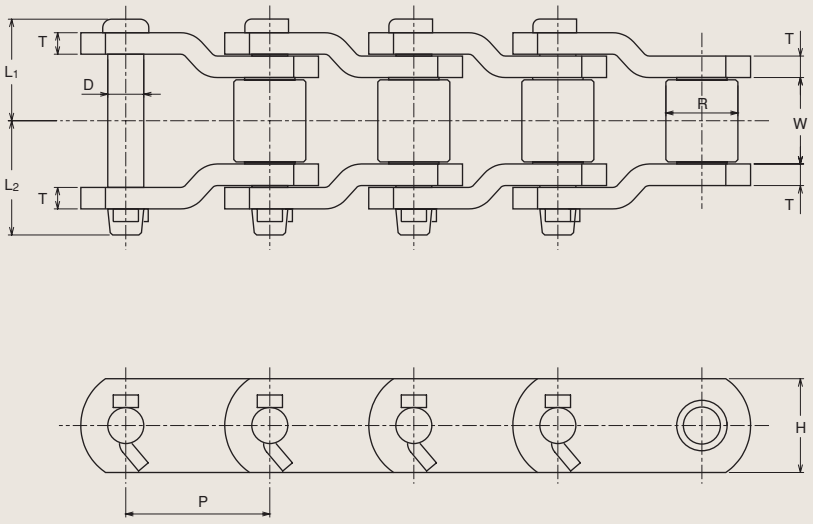
The attachment incorporates smooth curving to ensure high rigidity against impact and cyclic loads.
Corner of the chain link has heen well rounded in order to distribute stress more evenly. The strength of the chain link is thus stabilised.
Bushing is made from special material, heat treated through proprietary process, to enhance wear and corrosion characteristics.



Chain No.	Average Pitch P (mm)	Average Ultimate Strength (kg)	Dimensions (mm)															Average Mass Kg/link	
			A	B	C	D	E	F	G	H	I	J	K	L	M	S	R	Plain	Attachment
P=304.8 Intermediate Carrier	304.8	88,000	50.8	54	36.5	44.5	127	82.6	76.2	101.6	38.1	63.5	108	145	152.4	16	17.5	14	17

Heavy Duty Drive Chains

These chains are suitable for power transmission in machines which are subjected to extremly large forces and shocks, such as civil enginnering, construction and Sugar Industry. Heat-treated special steel is used for their main components, and they are machined to high precision. These are offset-type chains, which give them superior impact resistance.

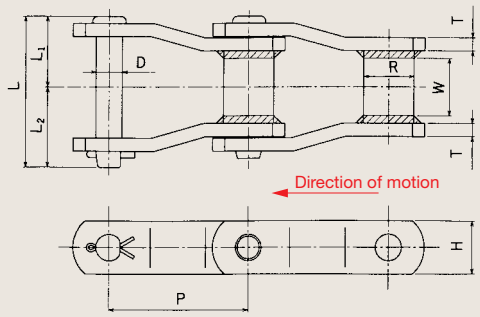


Chain No.	Dimensions (mm)								Average Ultimate Strength		Minimum Ultimate Strength		Mass
	Pitch	Roller		Pin			Plate						
		Width	Dia.	Dia.	Length		Height	Thickness					
	P	W	R	D	L_1	L_2	H	T	(kN)	(kgf)	(kN)	(kgf)	(kg/m)
H2570H	63.5	38.1	31.75	15.88	44.8	50.3	41.3	9.5	333	34000	290	29600	11.3
H3011	77.90	39.7	41.28	19.05	45.6	54.3	57.2	9.5	490	50000	431	44000	18.3
HP3H	78.11	38.1	31.75	15.88	44.8	50.3	41.3	9.5	333	34000	290	29600	13
H3125	79.38	41.3	41.28	20.32	46.4	55.1	57.2	9.5	510	52000	458	46800	18.8
H238	88.9	38.1	44.45	22.10	55.25	57.75	57.2	12.7	623	63500	560	57200	20.68
H10199	101.6	58.7	57.15	28.63	64.6	74.4	76.2	12.7	978	99700	850	86700	37.2
H1242	103.20	49.2	44.45	22.23	56.8	65.4	57.2	12.7	618	63000	556	56700	23.8
HP4H	103.20	49.0	44.45	23.23	63.3	73.7	58.7	16.0	755	77000	679	69300	30
H1245	103.45	49.2	45.24	23.83	60.0	69.0	60.3	14.3	755	77000	657	67000	29.8
H10398	103.89	49.2	47.63	25.40	62.5	69.5	76.2	14.3	961	98000	836	85300	31.9
H635	114.30	52.4	57.15	27.80	61.6	73.4	76.2	14.3	981	100000	853	87000	35.3
H1602A	127.0	69.8	63.5	31.75	73.5	84.7	88.9	15.9	1245	127000	1078	110000	47.23
H6042	152.4	76.3	76.2	38.10	85.8	93.8	101.6	19.0	1863	190000	1618	165000	72

Welded chains

Specifically designed for heavy durty conveying and elevating applications.
Widely used in sugar milling, timber, steel, pulp and paper industries.
Advantage feature - High strength:mass ratio

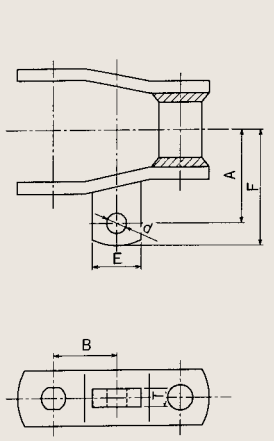
Offset type



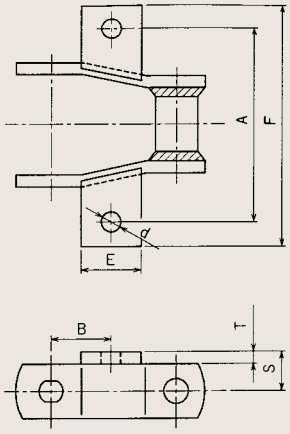
Chain No.	Pitch P		Barrel		Pin				Link plate		Average ultimate tensile strength		Mass (kg/m)
			Dia. R	Width W	Dia. D	Length			Height H	Thickness T			
	(mm)	(in)	(mm)	(mm)	(mm)	L (mm)	L_1 (mm)	L_2 (mm)	(mm)	(mm)	(kN)	(kgf)	
WR78	66.27	2.609	22.2	28.4	12.7	79.7	38.0	41.7	28.6	6.3	106	10800	5.9
WH78											159	16200	
WR78HD	66.27	2.609	22.2	28.4	14.3	94.2	45.0	49.2	31.8	9.5	177	18000	9.0
WH78HD											221	22500	
WR82	78.11	3.075	27.0	31.8	14.3	87.4	41.6	45.8	31.8	6.3	115	11700	7.2
WH82											177	18000	
WR82HD	78.11	3.075	27.0	31.8	14.3	102.0	49.0	53.0	31.8	9.5	177	18000	10.8
WH82HD											221	22500	
WH9103HD	78.11	3.075	31.75	31	19.05	95.0	44.6	50.4	38.1	9.5	267	27200	13.0
WR124	101.6	4.0	36.6	41.3	19.05	109.0	51.3	57.7	38.1	9.5	203	20700	12.1
WH124											265	27000	
WH124HD	103.2	4.063	41.3	41.3	22.2	119.3	56.6	62.7	50.8	12.7	441	45000	23.0
WR110	152.4	4.76	31.8	47.6	19.05	114	53.7	60.3	38.1	9.5	203	20700	12.6
WH110											265	27000	
WR111	120.9	4.76	36.6	57.2	19.05	124.9	59.2	65.7	38.1	9.5	203	20700	12.6
WH111											265	27000	
WR132	153.67	6.05	44.5	74.4	25.4	165.9	77.7	88.2	50.8	12.7	371	37800	19.7
WH132											441	45000	
WR150	153.67	6.05	44.5	74.4	25.4	165.9	77.7	88.2	63.5	12.7	441	45000	23.8
WH150											556	56700	

Note: 1. For the WR type, only pins are heat treated, while for the WH type, all components are heat treated.
2. HD is the strong type.

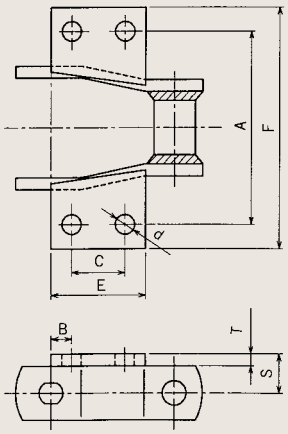
Offset type attachments



A22



K-1



K-2

A22

Chain No.	Dimensions (mm)						Added mass (kg/m)
	A	B	d	E	F	T	
WR78	47.6	33.2	10.4	25.4	63.5	9.5	7.3
WR132	95.3	76.8	20.6	50.8	116.7	12.7	22.0
WR150	95.3	76.8	20.6	50.8	116.7	12.7	26.1

K-1

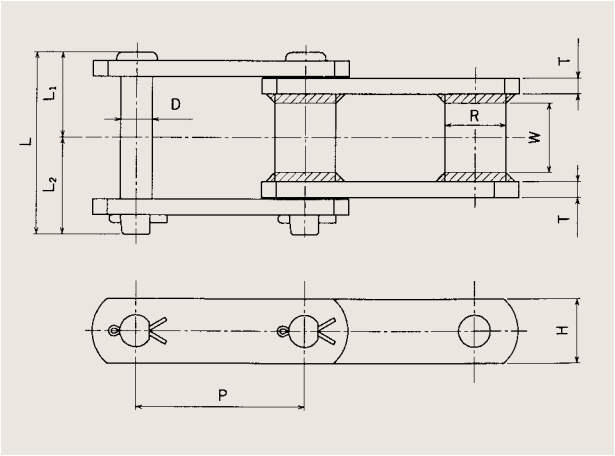
Chain No.	Dimensions (mm)							Added mass (kg/m)
	A	B	d	E	F	S	T	
WR78	101.6	31.8	10.4	31.8	127	20.6	6.3	8.2
WR82	106.4	38.1	10.4	44.5	140	22.2	6.3	10.7

K-2

Chain No.	Dimensions (mm)								Added mass (kg/m)
	A	B	C	d	E	F	S	T	
WR78	101.6	10.3	28.6	10.4	50.8	127	20.6	6.3	9.4
WR82	108	19	33.3	10.4	57	136	22.2	6.3	11.3
WR110	135	54	44.5	10.4	76	165	28.6	9.5	12.7
WR111	159	31.4	58.5	13	89	190	28.6	9.5	18.5
WR124	133	22.2	49.2	10.4	76	162	28.6	9.5	17.4
WR132	190.5	41.3	69.8	13	106	233	38.1	12.7	28.7
WR150	190.5	41.3	69.8	13	106	233	44.5	12.7	32.8

Dimensions are nominal, for reference purpose only

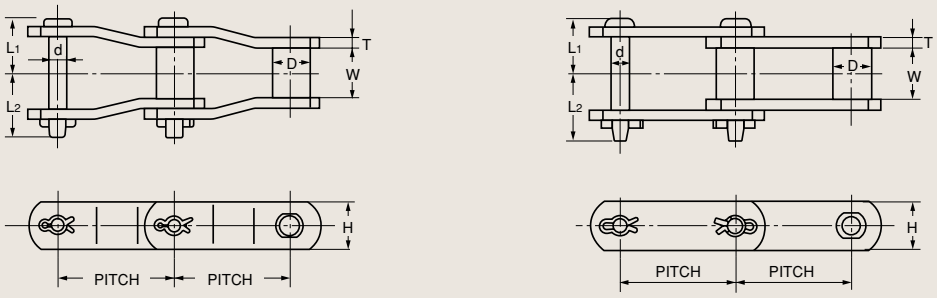
Straight type



Chain No.	Pitch P		Barrel		Pin				Link plate		Average ultimate tensile strength		Mass (kg/m)
			Dia. R	Width W	Dia. D	Length			Height H	Thickness T			
	(mm)	(in)	(mm)	(mm)	(mm)	L (mm)	L_1 (mm)	L_2 (mm)	(mm)	(mm)	(kN)	(kgf)	
WRC188	66.27	2.609	22.2	23.8	12.7	76.2	35.9	40.3	28.6	6.3	106	10800	5.5
WHC188											159	16200	
WRC78	66.27	2.609	22.2	28.4	12.7	79.7	38.0	41.7	28.6	6.3	106	10800	5.9
WHC78											159	16200	
WRC82	78.11	3.075	27.0	31.8	14.3	87.4	41.6	45.8	31.8	6.3	115	11700	8.1
WHC82											177	18000	
WRC131	78.11	3.075	28.6	31.8	15.88	101.0	47.2	53.8	38.1	9.5	203	20700	10.0
WHC131											265	27000	
WRC124	101.6	4.000	36.5	41.3	19.05	109.0	51.3	57.7	38.1	9.5	203	20700	12.5
WHC124											265	27000	
WRC111	120.9	4.760	36.5	57.2	19.05	124.9	59.2	65.7	38.1	9.5	203	20700	12.4
WHC111											265	27000	
WRC132	153.67	6.050	44.5	74.4	25.4	165.9	77.7	88.2	50.8	12.7	371	37800	20.0
WHC132											441	45000	

Note: For the WRC type, only pins are heat treated, while for the WHC type, all components are heat treated.

Bushed Chains



Type 1 Chain **Type 2 Chain**

Dimensions and Strength of Bushed Chains

Dimensions and Strength of Bushed Chains

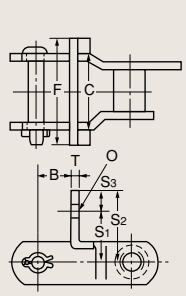
(mm)

Chain No.	Chain Type	Pitch		Breaking Strength Min. (kg)	Bushing		Pin			Link Plate		Mass kg/m
		mm	m		D	W	d	L_1	L_2	I	H	
SS234	2	66.27	2.609	5,200	22.58	27.0	11.32	31.0	35.0	6.3	28.6	5.8
SS488	1	66.27	2.609	8,000	22.58	28.6	11.10	31.9	37.1	6.3	28.6	5.9
SS488	2	66.27	2.609	8,000	22.58	28.6	11.10	31.9	37.1	6.3	28.6	5.4
SS4103	1	78.11	3.075	14,500	31.80	31.8	19.05	39.0	45.5	7.9	44.5	12.2
SS0340	1	101.60	4.000	14,500	36.50	41.3	15.88	45.1	49.2	7.9	44.5	10.9
SSH124	1	101.60	4.000	14,500	36.50	54.0	19.05	52.3	57.2	7.9	44.5	21.5

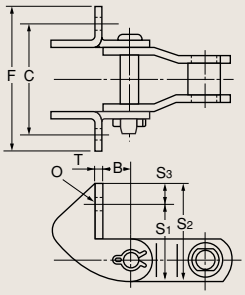
(in.)

Chain No.	Chain Type	Pitch	Breaking Strength Min. (kg)	Bushing		Pin			Link Plate		Mass lbs/it.
		in.		D	W	d	L_1	L_2	I	H	
SS234	2	2.609	11,500	57/64	1-1/16	0.045	1- 7/32	1- 3/8	1/4	1-1/8	3.9
SS488	1	2.609	17,500	57/64	1-1/8	7/16	1- 1/4	1-29/64	1/4	1-1/8	4.0
SS488	2	2.609	17,500	57/64	1-1/8	7/16	1- 1/4	1-29/64	1/4	1-1/8	3.6
SS4103	1	3.075	32,000	1- 1/4	1-1/4	3/4	1-17/32	1-51/64	5/16	1-3/4	8.2
SS0340	1	4.000	32,000	1- 7/16	1-5/8	5/8	1-25/32	1-15/16	5/16	1-3/4	7.3
SSH124	1	4.000	32,000	1- 7/16	2-1/8	3/4	2- 1/16	2- 1/4	5/16	1-3/4	14.4

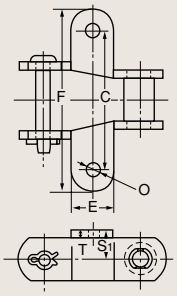
Bushed Chain Attachment



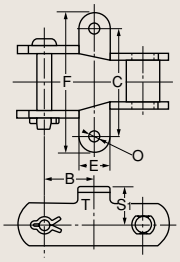
Type 3 Chain



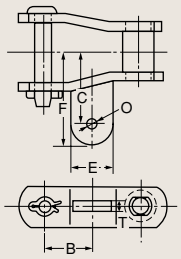
Type 4 Chain



Type 5 Chain



Type 6 Chain



Type 7 Chain

Dimensions of Attachment

(mm)

Attachment No.	Chain No.	Chain Type	Dimensions									Mass kg/m
			S_1	S_2	S_3	R	C	F	E	O	I	
F2	SS488	3	35.0	50.0	15.0	24.0	51.6	75.0	–	9.5	6.0	8.4
	SS4103	4	80.0	101.5	21.5	28.0	114.3	151.5	–	13.5	7.9	23.6
	SSH124	4	70.0	95.0	25.0	30.1	136.0	166.0	–	12.0	7.9	21.5
K1	SS488	5	21.4	–	–	–	96.8	128.6	28.6	7.0	6.3	7.7
	SS0340	6	38.0	–	–	50.8	111.2	143.0	31.8	11.12	7.9	10.9
A22	SS488	7	–	–	–	33.13	48.4	64.3	28.4	7.2	9.5	6.3
A42	SS0340	7	–	–	–	80.8	63.5	79.4	38.1	12.7	9.4	12.8

(in.)

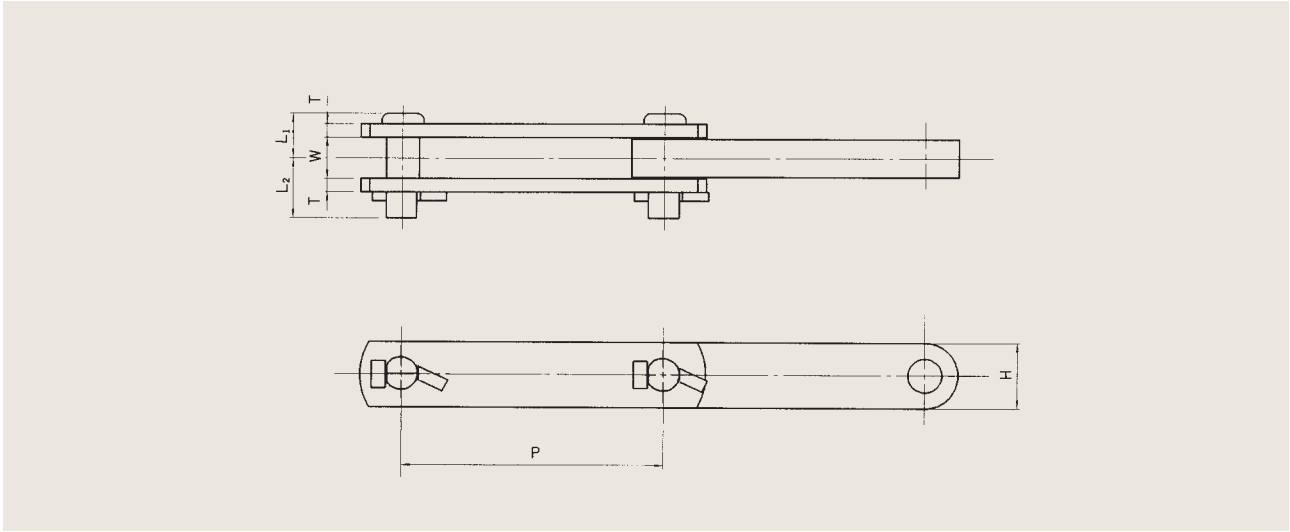
Attachment No.	Chain No.	Chain Type	Dimensions									Mass lbs/it.
			S_1	S_2	S_3	R	C	F	E	O	I	
F2	SS488	3	1- 3/8	1-31/32	19/32	15/16	2- 1/32	2-61/64	–	3/8	16/64	5.6
	SS4103	4	3- 5/32	4	27/32	1- 7/64	4- 1/2	5-31/32	–	17/32	5/16	15.9
	SSH124	4	2- 3/4	3-47/64	63/64	1- 3/16	5-23/64	6-17/32	–	15/32	5/16	14.4
K1	SS488	5	27/32	–	–	–	3-13/16	5- 1/16	1-1/8	9/32	1/4	5.2
	SS0340	6	1- 1/2	–	–	2	4- 3/8	5- 5/8	1-1/4	7/16	5/16	7.3
A22	SS488	7	–	–	–	1- 5/16	1-29/32	2-17/32	1-1/8	9/32	3/8	4.2
A42	SS0340	7	–	–	–	2	2- 1/2	3- 1/8	1-1/2	1/2	3/8	8.6

HITACHI CONVEYOR CHAINS

Chains for Special Applications

Steel block chains

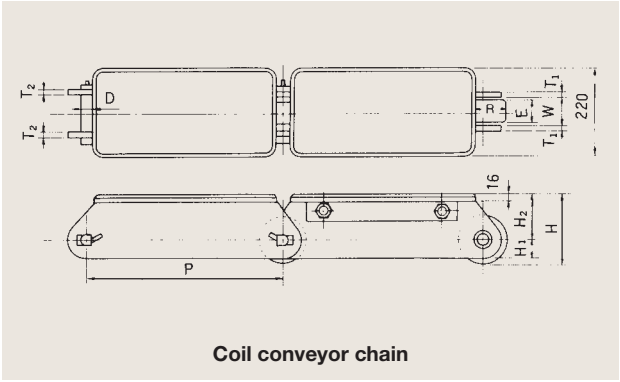
This kind of chain is mainly used in transfer conveyors, carrying billets and blooms in steelworks. They can also be used as draw bench chains with high loads.



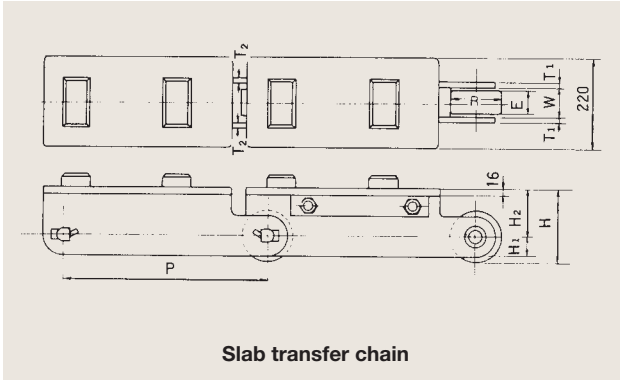
Chain No.	Pitch P (mm)	Pin Length		Link height H (mm)	Outer link thickness T (mm)	Width between outer links W (mm)	Average ultimate strength		Mass (kg/m)
		L_1 (mm)	L_2 (mm)				(kN)	(kgf)	
SBS3150	150	25.7	34.3	38.1	7.9	23.5	309	31500	7.0
SBS3200	200								6.8
SBS4150	150	28.4	35.6	44.5	7.9	27.0	397	40500	9.0
SBS4200	200								8.5
SBS5200	200	30.5	41.5	50.8	9.5	30.0	490	50000	12.5
SBS5250	250								12.1
SBS6200	200	32.5	43.5	57.2	9.5	34.0	618	63000	14.2
SBS6250	250								13.6
SBS6300	300								13.2
SBS7200	200	32.5	43.5	63.5	9.5	34.0	721	73500	16.2
SBS7250	250								15.5
SBS7300	300								15.2
SBS9200	200	35.5	46.5	63.5	12.7	38.0	883	90000	21.0
SBS9250	250								20.0
SBS9300	300								19.5
SBS11250	250	41.5	52.5	76.2	12.7	43.0	1118	114000	25.0
SBS11300	300								24.0
SBS14250	250	47.5	58.0	76.2	16.0	48.0	1373	140000	32.0
SBS14300	300								31.0

※We can also machine special dimensions.

Coil conveyor chain and slab transfer chain

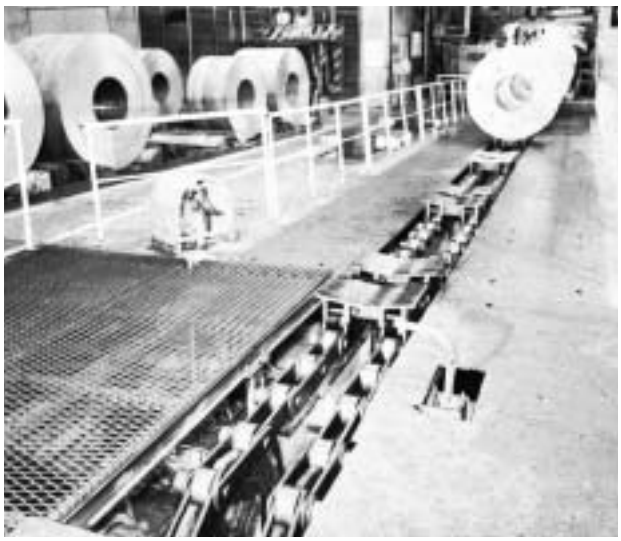


Coil conveyor chain



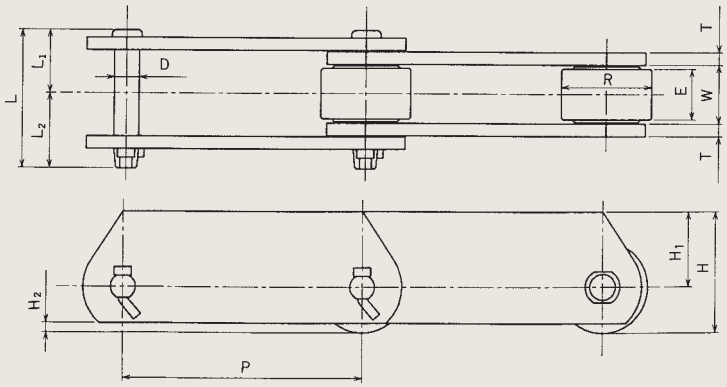
Slab transfer chain

Chain No.	Pitch P (mm)	Roller		Inner width W (mm)	Pin outer Dia. D (mm)	Link plate thickness		Chain height			Average ultimate strength		Mass (kg/m)	Bearing rated load C/Co (kN)
		Outer Dia. R (mm)	Width E (mm)			T_1 (mm)	T_2 (mm)	H (mm)	H_1 (mm)	H_2 (mm)	(kN)	(kgf)		
HRP-Px 125φ×60T	300	125	60	65	28.0	12.7	12.7	171.0	42.5	108.5	588	60000	88	157
	400												80	
	500												76	136
HRP-Px 135φ×90T	300	135	65	70	30.0	16	14	182.5	54.0	115.0	883	90000	108	216
	400												99	
	500												95	
	600												86	196
HRP-Px 150φ×130T	300	150	70	76	38.5	16	14	195.0	62.0	120.0	1275	130000	119	281
	400												109	
	500												102	
	600												95	259
HRP-Px 150φ×150T	400	150	70	76	38.5	19	16	195.0	69.0	120.0	1471	150000	118	281
	500												109	
	600												102	259
HRP-Px 175φ×180T	400	175	80	85	41.5	22	19	225.0	70.0	135.0	1765	180000	160	302
	500												148	
	600												138	343
HRP-Px 180φ×180T	500	180	90	95	45.0	22	22	225.0	70.0	135.0	1765	180000	177	410
	600												160	460



HRD type deep link chain

These chains are based on standard conveyor chains, but the link plate height is increased to allow conveyance of heavier objects, and an R type roller is used for reduced frictional resistance. They are mainly used in applications such as thick plate and steel section conveyance in steel works, and container assembly and movement lines.



Chain No.	Pitch P (mm)	Roller		Inner width W (mm)	Pin			Link plate			Chain height H (mm)
		Outer Dia R (mm)	Roller face width E (mm)		Dia. D (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H_1 (mm)	Height H_2 (mm)	Thickness T (mm)	
HRD03100-R	100	30	14	16	7.9	16.8	21.2	21	4.9	3.2	36.9
HRD05100-R	100	40	19	22	11.0	23.9	29.5	24	4	4.7	44
HRD05150-R	150										
HRD15011-R	150	50.8	26.7	30.2	14.2	32.8	39.4	32	6.4	6.3	57.4
HRD20011-R	200										
HRD15215-R	152.4	57.2	32	37.1	15.8	40.0	47.5	35	6.1	7.9	63.6
HRD20015-R	200	65	32	37.1	15.8	40.0	47.5	41	10	7.9	73.5
HRD25015-R	250										
HRD25019-R	250	80	44	51.4	18.9	51.4	59.9	50	13.8	9.5	90
HRD30019-R	300										
HRD30026-R	300	85※	50	57.2	22.1	55.3	64.3	53	10.5	9.5	95.5
HRD30048-R	300	100※	56	66.7	25.2	67.6	76.1	62	12	12.7	112
HRD40048-R	400										
HRD60054-R	450	110※	65	77	31.6	81.6	87.7	70	17	16	125

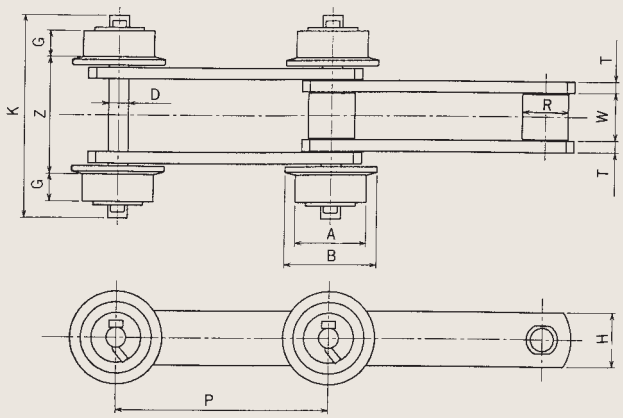
※The outer diameters of rollers marked with an asterisk differ from standard conveyor chains and require the manufacture of specialized sprockets.

Chain No.	Allowable load on rollers (per 1 roller)				Average ultimate strength				Mass (kg/m)
	Standard series		Strong series		Standard series		Strong series		
	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	(kN)	(kgf)	
HRD03100-R	0.53	55	0.88	90	29.4	3000	69.6	7100	2.8
HRD05100-R	1.02	105	1.71	175	68.6	7000	142.2	14500	5.9
HRD05150-R									4.9
HRD15011-R	1.76	180	2.94	300	112.8	11500	225.6	23000	9.7
HRD20011-R									8.5
HRD15215-R	2.50	255	4.16	425	186.3	19000	279.5	28500	14.0
HRD20015-R	2.50	255	4.16	425	186.3	19000	279.5	28500	14.9
HRD25015-R									13.5
HRD25019-R	4.11	420	6.86	700	245.2	25000	387.4	39500	22.5
HRD30019-R									21.5
HRD30026-R	5.39	550	8.82	900	313.8	32000	519.8	53000	24.3
HRD30048-R	7.64	780	12.5	1280	475.6	48500	681.8	69500	39.0
HRD40048-R									34.2
HRD60054-R	10.1	1030	16.6	1700	529.6	54000	1029.7	105000	42.0

HR type side roller chains

These chains are based on S roller type standard conveyor chains, but the pins are extended and flanged rollers attached on both sides. The sprockets mesh with the central S type rollers and the conveyed objects are supported by the side rollers.

Use these chains if the link plates become unstable due to the mounting of special attachments, if it is difficult to support the load with the central rollers, or if it is difficult to guide the chain on the return side. They can be used for a wide range of applications when mounted with various attachments.



Chain No.	Pitch P (mm)	Roller outer Dia. R (mm)	Inner width W (mm)	Pin Dia. D (mm)	Link plate		Side roller					Allowable load on side rollers (at one point)				Added mass per point (kg)
					Height H (mm)	Thickness T (mm)	A (mm)	B (mm)	G (mm)	K (mm)	Z (mm)	Standard specification (kN)	Standard specification (kgf)	Hardened specification (kN)	Hardened specification (kgf)	
HRS03075SR	75	15.9	16.0	7.9	22.2	3.2	30	38	12	76	38	0.68	70	1.07	110	0.3
HRS03100SR	100															
HRS05075SR	75	22.2	22.0	11.0	31.8	4.7	40	50	14	102	55	1.17	120	1.96	200	0.5
HRS05100SR	100															
HRS05150SR	150															
HR10105SR	101.6	20.1	22.6	9.5	25.4	4.7	38.1	50	15	104	57	0.98	100	1.56	160	0.5
HR10108SR	101.6	22.2	27.0	11.0	28.6	6.3	44.5	55	20	130	71	1.66	170	2.35	240	0.7
HR15208SR	152.4	25.4	30.2	11.0	38.1	6.3	50.8	65	20	136	73	1.96	200	3.28	330	1.0
HR10011SR	100	29.0	30.2	14.2	38.1	6.3	50.8	65	20	136	73	1.96	200	3.28	330	1.0
HR15011SR	150															
HR15215SR	152.4	34.9	37.1	15.8	44.5	7.9	57.2	75	25	167	91	2.74	280	4.60	470	1.3
HR20015SR	200	34.9	37.1	15.8	44.5	7.9	65	85	24	167	93	2.74	280	4.60	470	1.8
HR25015SR	250															
HR20019SR	200	39.7	51.4	18.9	50.8	9.5	65	85	24	189	113	3.13	320	5.29	540	3.8
HR25019SR	250															
HR30019SR	300															
HR20026SR	200	44.5	57.2	22.1	63.5	9.5	80	105	34	230	125	4.90	500	8.43	860	6.9
HR25026SR	250															
HR30026SR	300															
HR25048SR	250	50.8	66.7	25.2	76.2	12.7	100	130	38	268	151	6.57	670	11.0	1130	11.7
HR30048SR	300															
HR45048SR	450															

Note: Specify the interval between side roller mounting points when placing your order.

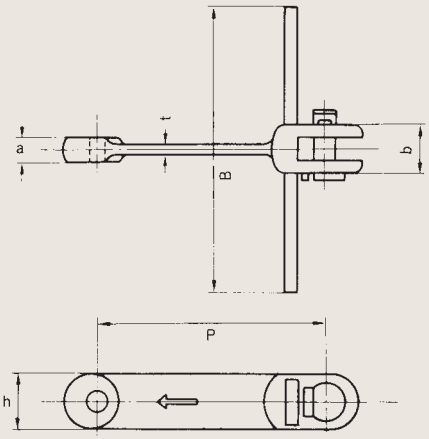
Case conveyor chains and sprockets

Case conveyors run the chain inside a casing to convey loads. They can operate vertically or on an incline, as well as horizontally.
The optimum chain varies with the type of conveyor and the nature of the conveyed loads. Types include T type, U type, special UA type, UB type and UC type. For any type, we can produce special vane forms for efficient conveying.

Forged chains

These light and precise chains are strengthened by our unique heat treatment technology. They are suitable for long case conveyors.

T type attachment

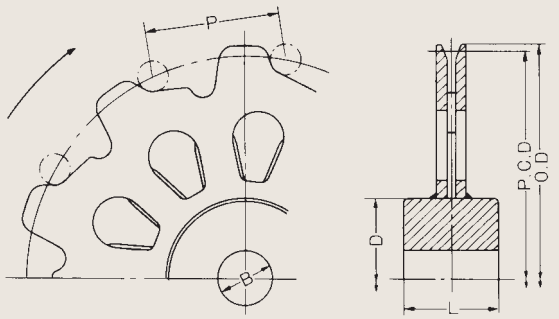


Note: Use in the direction indicated by the arrow.

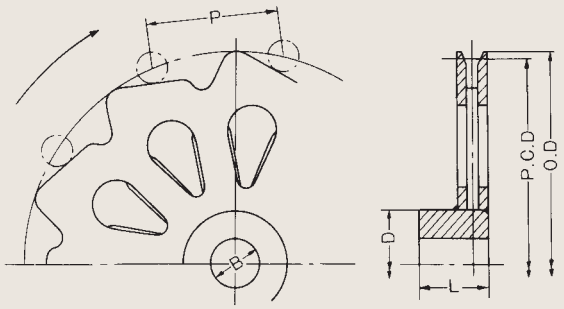
Chain No.	Pitch P (mm)	Chain dimensions (mm)				Attachment dimension B (mm)	Average ultimate strength		Mass (kg/m)	Added mass per attachment link (kg)
		a	b	h	t		(kN)	(kgf)		
FT05125 FT05150 FT05190	120	10	21	26	6	125 150 190	49.0	5000	1.93	0.15 0.16 0.2
FT10125 FT10150 FT10190 FT10240 FT10290 FT10340	150	15	32	34	8	125 150 190 240 290 340	98.1	10000	3.67	0.26 0.31 0.36 0.47 0.59 0.9
FT15290	150	18	37	40	10	290	196	20000	5.6	0.7
FT20340 FT20410	150	20	41	46	11	340 410	294	30000	7.6	1.26 1.52
FT30410 FT30480	200	20	41	46	12	410 480	392	40000	7.1	2.0 2.4
FT40480 FT40570	200	22	45	52	12	480 570	471	48000	9.0	2.7 3.3
FT50570	200	26	54	54	14	570	569	58000	11.5	4.0
FT80640	260	39	90	80	20	640	785	80000	32.7	7.1
FT100690	260	39	90	90	20	690	981	100000	38.1	8.1

Note: We also manufacture special attachments.

Sprocket for forged chains



Sprocket for forged chains (driving)



Sprocket for forged chains (driven)

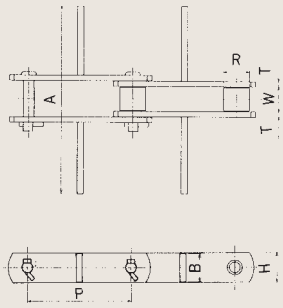
Sprocket for forged chains (drive end)

Chain No.	No. of teeth N	Pitch P (mm)	Pitch Circle Dia. P.C.D. (mm)	Outer Dia. O.D. (mm)	Maximum bore Dia. B (mm)	Hub (mm)		Mass (kg)
						Diameter D	Width L	
FT-10	8 9 10	150	392.0 438.6 485.4	416 462 510	85	135	90	24.8 28 31.5
FT-15	9 10 11	150	438.6 485.5 532.4	466 512 560	95	150	100	36 40.5 45.4
FT-20	9 10 11	150	438.6 585.5 532.4	470 516 564	110	180	120	52.9 58.2 64.2
FT-30	10 11 12	200	647.2 709.9 772.7	680 742 804	145	230	160	100 113 123
FT-40	10 11 12	200	647.2 709.9 772.7	682 746 810	160	260	180	139 151 163
FT-50	11 12 13	200	709.9 772.7 835.7	748 810 874	165	270	190	167 180 198

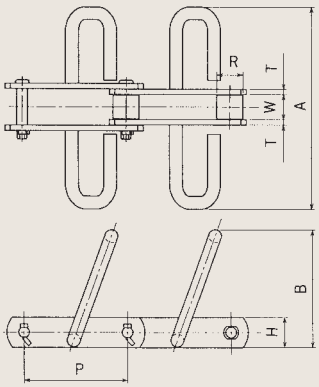
Note: We recommend that the idle end sprocket should be a toothed sprocket rather than a guide roller.

Steel chains

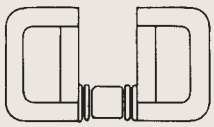
These chains are specially designed for case conveyors which convey powders. They have increased clearances between pins and bushes so that powder entering the space does not impair flexure.
Twin-roller type chains were developed to prevent powders, granules and other conveyed particles from adhering between bushes and rollers and impairing roller rotation.



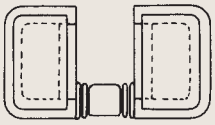
T type attachment



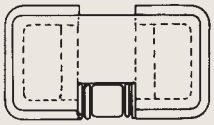
U type attachment



UA type



UB type

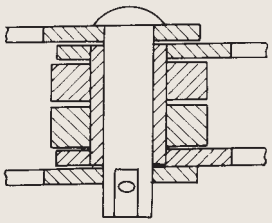


UC type

Special attachments

Twin roller type chains

We recommend special steel alloys for use with conveyors to carry raw materials and powders (cement, chemical fertilizers etc.), to resist wear. Consult us if the environment in which the chain will be used is wear or corrosive.

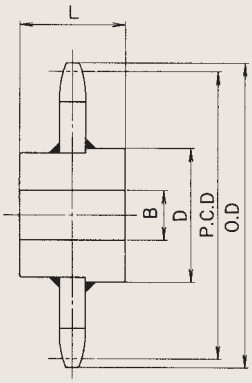


Twin roller type chain

Chain No.	Chain pitch P (mm)	Roller outer Dia. R (mm)	Inner width W (mm)	Link plate		Attachment dimensions (mm)			Average ultimate strength		Mass (kg/m)	
				Height H (mm)	Thickness T (mm)	A	B					
							T type	U type	(kN)	(kgf)	T type	U type
HC10107	101.6	25.4	22.6	31.8	4.7	125	28	90	73.5	7500	5.1	9.3
HC10111	101.6	31.8	27.0	38.1	6.3	125 150 180	38	90 105 120	107.9	11000	8.1 8.9 8.9	11.3 9.9 14.1
HC15211	152.4	31.8	30.2	38.0	6.3	150	38	105	107.9	11000	8.0	9.0
HC15217	152.4	38.1	37.1	44.5	7.9	150 180 230 290	44	105 120 140 155	186.3	19000	10.8 11.2 13.0 14.2	12.0 16.5 18.6 24.1
HC15222	152.4	44.5	37.1	50.8	9.5	180 230	50	160 120	245.2	25000	16.4 16.6	20.0 20.5
HC20022	200	44.5	51.4	50.8	9.5	230 290 340 410	50	140 145 160 280	245.2	25000	15.4 16.5 18.9 20.5	19.3 23.6 26.0 34.5
HC25031	250	50.8	57.2	63.5	9.5	340 410 470 570	60	150 280 350 390	304.0	31000	21.4 23.0 27.2 33.0	26.8 32.4 38.0 39.2
HC25049	250	57.2	66.7	76.2	12.7	470 570	75 55	240 340	480.5	49000	39.4 46.5	40.9 45.7

Note: 1. We will manufacture cleaners and cups on request. 2. We can also manufacture special attachments.

Sprockets for steel chains



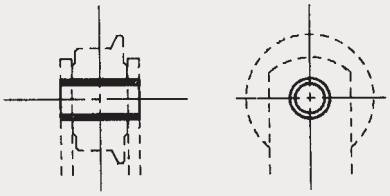
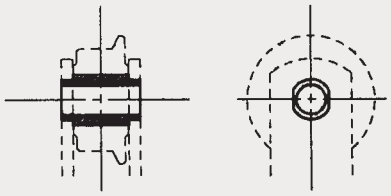
(mm)

Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	Bore Dia. B		Hub		Mass (kg)	Chain No.	No. of teeth N	Pitch circle Dia. P.C.D.	Outer Dia. O.D.	Bore Dia. B		Hub		Mass (kg)
				Pilot Bore	Maximum	Diameter D	Width L						Pilot Bore	Maximum	Dia. D	Width L	
	8	265.5	283		65	100	70	15.0		8	398.2	430		105	165	115	43.0
	9	297.1	315		65	100	70	16.0		9	445.6	477		105	165	115	51.0
HC10107	10	328.8	346	40	70	115	80	17.5	HC15222	10	493.2	524	50	105	170	120	61.0
	11	360.6	378		70	115	80	19.5		11	540.9	572		115	180	125	74.0
	12	392.6	410		70	115	80	22.0		12	588.8	620		115	180	125	84.0
	8	265.5	288		75	120	80	13.5		8	522.6	554		100	160	105	75.0
	9	297.1	320		75	120	80	15.5		9	584.8	616		105	170	110	94.0
HC10111	10	328.8	350	40	75	120	80	18.5	HC20022	0	647.2	678	50	105	170	110	110.0
	11	360.6	383		80	125	80	22.0		11	709.9	740		105	170	110	130.0
	12	392.6	415		80	125	90	24.0		12	772.7	803		115	180	115	153.0
	8	398.2	420		75	120	85	28.5		8	653.3	690	50	125	200	140	140.0
	9	445.6	468		80	130	90	35.7		9	731.0	767		125	200	140	170.0
HC15211	10	493.2	515	40	85	135	95	44.0	HC25031	10	809.0	845		140	220	155	210.0
	11	540.9	563		85	135	95	52.0		11	887.4	923	60	140	225	160	250.0
	12	588.8	610		90	145	100	62.0		12	965.9	1000		145	230	165	290.0
	8	398.2	425		95	150	105	40.0		8	653.3	693		130	210	150	150.0
	9	445.6	472		100	160	110	50.0		9	731.0	770	60	140	220	150	190.0
HC15217	10	493.2	520	40	100	160	110	58.5	HC25049	10	809.0	850		145	230	160	230.0
	11	540.9	568		100	160	115	69.0		11	887.4	927	70	150	240	170	270.0
	12	588.8	615		105	170	120	82.0		12	965.9	1006	80	155	250	175	320.0

HW type conveyor chains for use in garbage incinerator equipment

The chains used in garbage incinerator chains face adverse conditions due to the nature of the materials conveyed, including entry of ash etc. between chain elements, and use underwater. Therefore, wear on the outer surfaces of bushes and inner surfaces of rollers have a great impact on chain lifespan, so a more wear-resistant specification is required, compared to general conveyor chains. In addition, clearances are specially designed to avoid reduced flexion and rotation.

Characteristics of HW type conveyor chains for use in garbage incinerator equipment

Component name	Standard Conveyor Chains		HW type conveyor chains for use in garbage incinerator equipment	
	Materials	Heat treatment	Materials	Heat treatment
Link plate	Carbon steel	None	Carbon steel	None
Pin	Carbon steel	Hardening and tempering	Alloy steel	Hardening and tempering
Bush	Case hardened steel	Carburizing, hardening and tempering	Alloy steel	Hardening and tempering
Roller	Carbon steel	None	Carbon steel	Induction hardened of inner surfaces
Bush form	 Straight bush		 Stepped bush	

Bushes

As a wear resistant specification, bushes are made of Alloy steel, heat treated for uniform hardness from surface to core.

Rollers

As a wear resistant specification, rollers are treated with induction hardened of their inner faces. Their outer faces roll on rails, so wear resistance is not a problem in general.

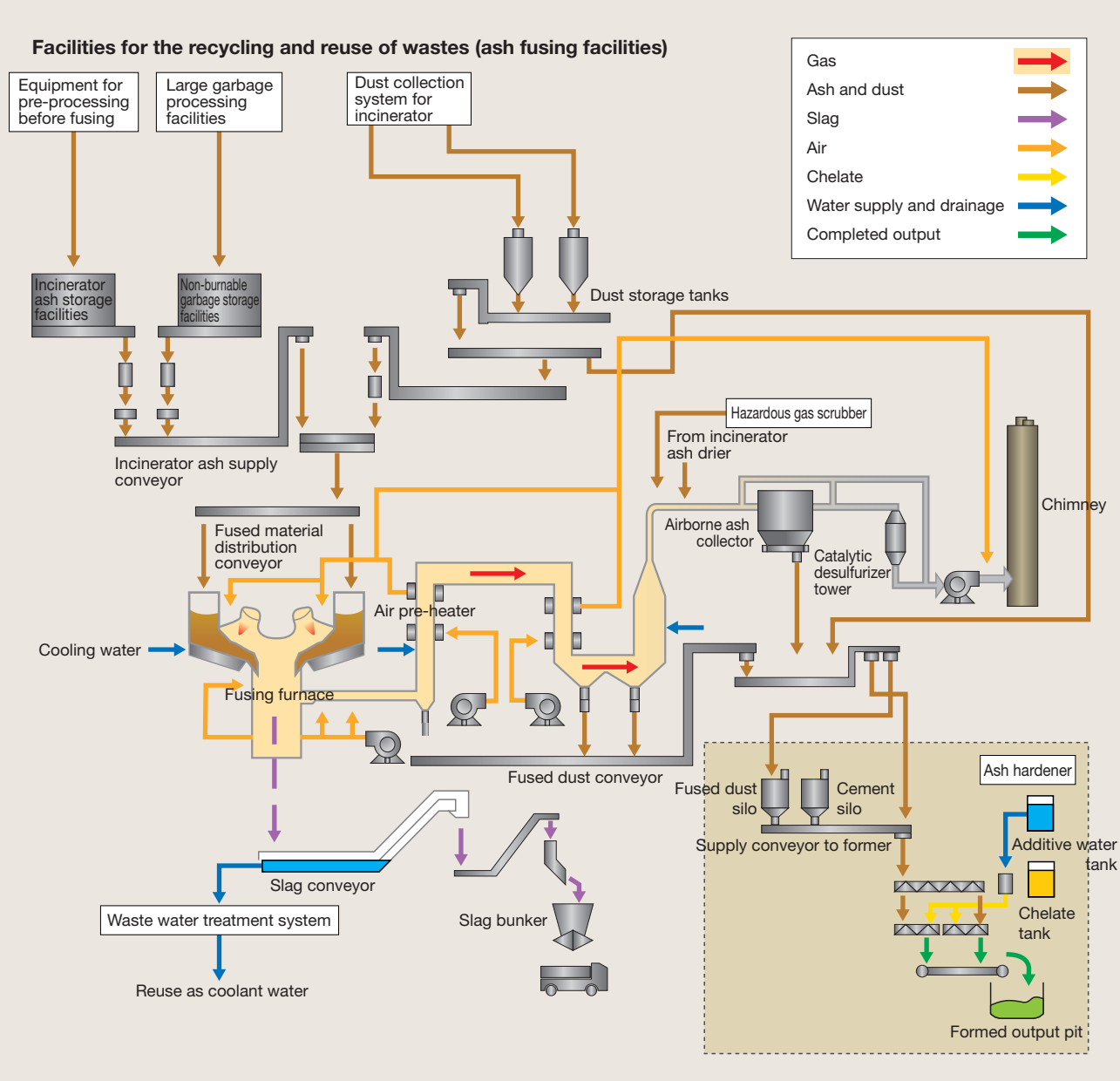
Bush form

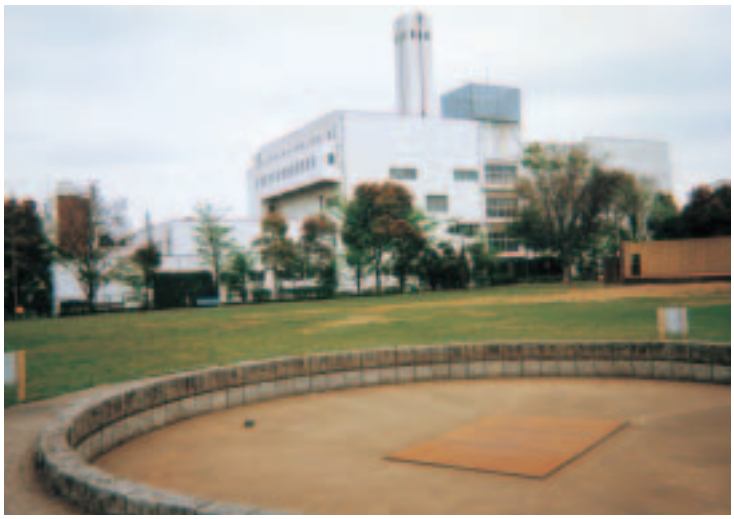
The bushes and rollers are components which greatly influence lifespan, so the bushes are designed with larger outer diameters, and the contact surfaces are wider.

Garbage incinerator facility

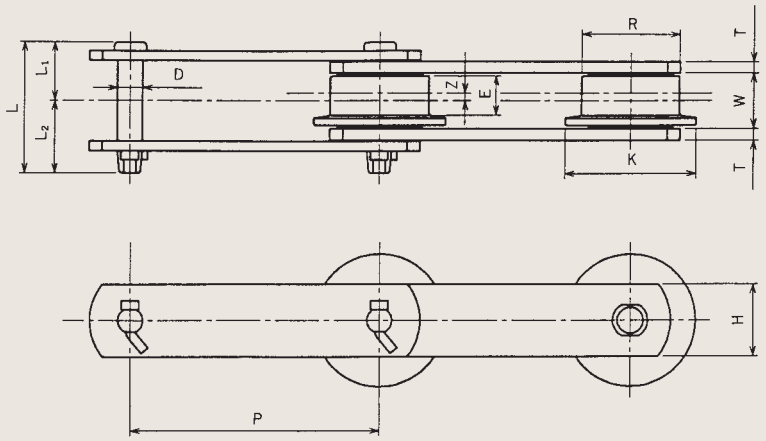
HW type conveyor chains for use in garbage incinerator equipment

Flow of garbage processing





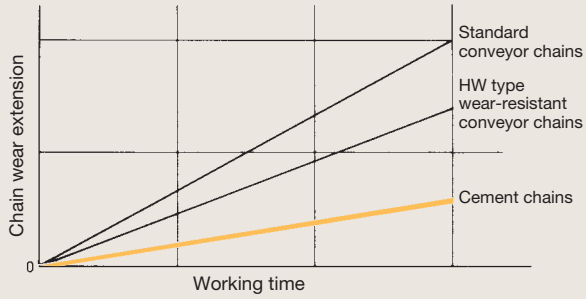
HW type conveyor chains for use in garbage incinerator equipment



Chain No.	Pitch P (mm)	Roller				Inner width W (mm)	Pin				Link plate		Average ultimate strength		Mass (kg/m)
		Outer Dia. R (mm)	Rolling surface width E (mm)	Flange Dia. K (mm)	Offset Z (mm)		Dia. D (mm)	Length			Height H (mm)	Thickness T (mm)			
								L (mm)	L_1 (mm)	L_2 (mm)			(kN)	(kgf)	
HW10108-F	101.6	44.5	18	55	2.5	27	11.0	65.7	30.6	35.1	28.6	6.3	78.5	8000	7.2
HW15208-F	152.4	50.8	20	65	3	30.2	11.0	68.0	31.4	36.6	38.1	6.3	78.5	8000	8.0
FW15011-F	150	50.8	20	65	3	30.2	14.2	72.2	32.8	39.4	38.1	6.3	112.8	11500	8.1
HW15215-F	152.4	57.2	25	75	3.5	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	12.4
HW20015-F	200	65	24	85	4	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	12.5
HW25015-F	250														10.6
HW20019-F	200	80	34	105	5	51.4	18.9	111.3	51.4	59.9	50.8	9.5	245.2	25000	19.8
HW25019-F	250														17.3
HW30019-F	300														15.7
HW30026-F	300	100	38	130	6	57.2	22.1	119.6	55.3	64.3	63.5	9.5	313.8	32000	23.6

HWS type conveyor chains for cement

Our chains for cement are designed on the basis of many years of experience and the data from countless field trials. Pin surfaces are hardened, and bushes use special high-alloy steel, achieving a considerable improvement in wear lifespan compared to previous wear-resistant conveyor chains.

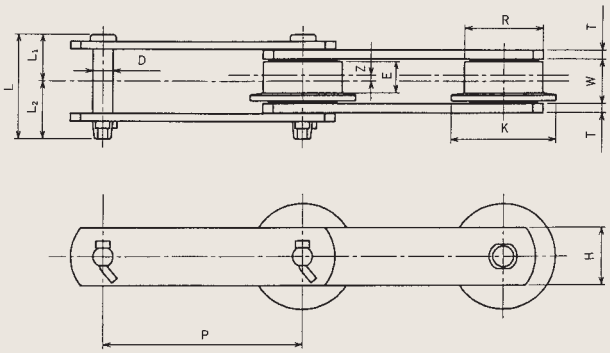


Wear resistance performance graph

Applications

1. Cement factory: Conveying clinker, raw material mill, lime stone etc.
2. Glass and ceramics: Conveying raw materials, metal powders for sintering, etc.
3. Mining: Conveying iron and steel nuggets, particles etc.
4. Steelmaking: Conveying collector dust, sinter, cokes, hot rolling scale, etc.
5. Other: Severely abrasive atmosphere

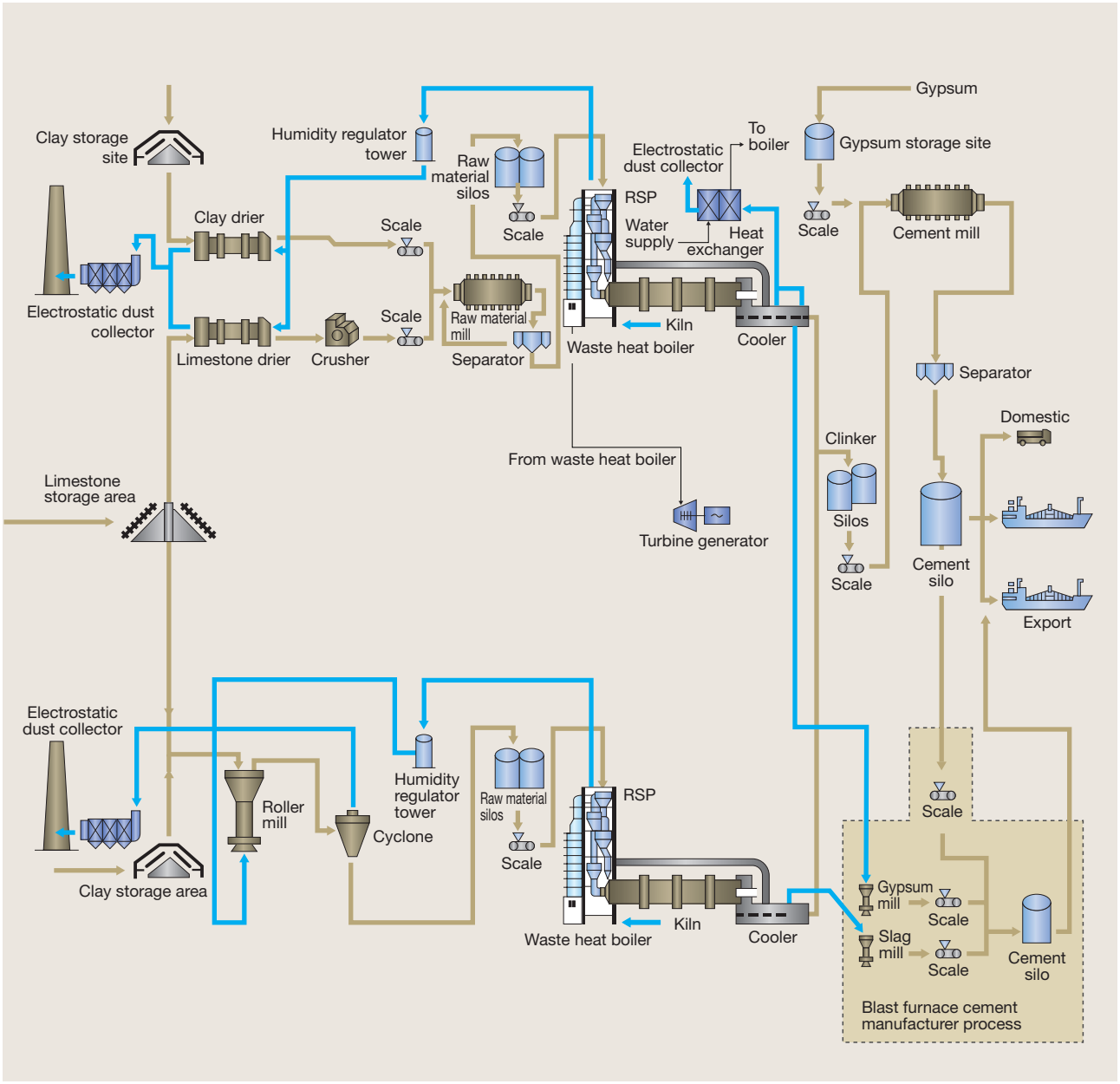
The main applications include pan conveyors, apron conveyors, case conveyors and bucket elevators.



Chain No.	Pitch P (mm)	Roller				Inner width W (mm)	Pin				Link plate		Average ultimate strength		Mass (kg/m)
		Outer Dia. R (mm)	Rolling surface width E (mm)	Flange Dia. K (mm)	Offset Z (mm)		Dia. D (mm)	Length L (mm)	Length L_1 (mm)	Length L_2 (mm)	Height H (mm)	Thickness T (mm)	(kN)	(kgf)	
HWS15215-F	152.4	57.2	25	75	9	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	12.4
HWS20015-F	200	65	24	85	8	37.1	15.8	87.5	40.0	47.5	44.5	7.9	186.3	19000	12.4
HWS25015-F	250														10.6
HWS20019-F	200	80	34	105	12	51.4	18.9	111.3	51.4	59.9	50.8	9.5	245.2	25000	19.8
HWS25019-F	250														17.3
HWS30019-F	300														15.7
HWS30026-F	300	100	38	130	13	57.2	22.1	119.6	55.3	64.3	63.5	9.5	313.8	32000	23.6
HWS45026-F	450														18.9
HWS45048-F	450	125	42	160	14	66.7	25.2	143.7	67.6	76.1	76.2	12.7	475.6	48500	31.9
HWS68048-F	600														27.8
HWS45054-F	450	140	49	180	16.5	77.0	31.6	169.3	81.6	87.7	76.2	16.0	529.6	54000	39.3
HWS60054-F	600														34.3

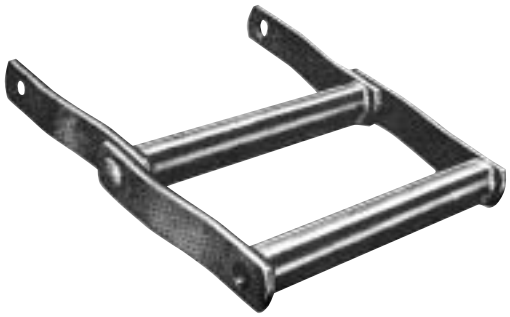
HWS type conveyor chains for cement

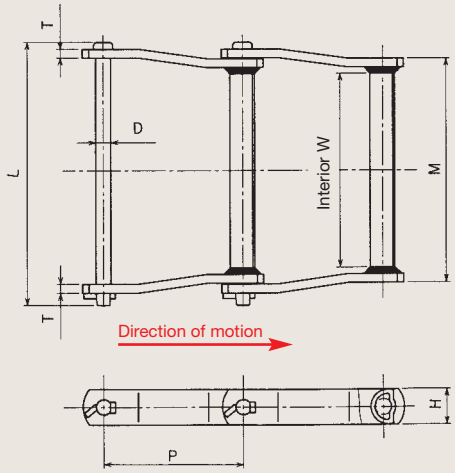
Cement manufacturing processes and main equipment



Steel drag chains

The barrels are welded to the link plates, making a simple and strong structure.
The chains themselves are heavy and their undersides are wide, so they can be used to convey hard, heavy materials.
The fronts of the barrels are vertical, so that they can push materials forward effectively, and so that the chain does not climb above the materials.



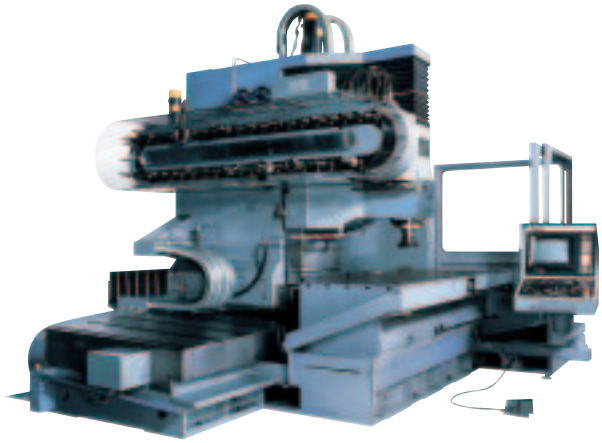


Chain No.	Pitch P (mm)	Pin		Link plate		M (mm)	W (mm)	Average ultimate strength		Mass (kg/m)
		Dia. D (mm)	Length L (mm)	Height H (mm)	Thickness T (mm)			(kN)	(kgf)	
WS102	127.0	19.1	240	38.1	9.5	198.4	165.1	177	18000	17.7
WS104	152.4	19.1	183	38.1	9.5	139.7	104.8	177	18000	12.7
WS110	152.4	19.1	307	38.1	9.5	263.5	228.6	177	18000	16.7
WS112	203.2	19.1	307	38.1	9.5	263.5	228.6	177	18000	16.6
WS116	203.2	19.1	406	44.5	9.5	358.7	303.2	226	23000	16.7
WS118	203.2	22.0	433	50.8	12.7	377.8	336.6	294	30000	38.4
WS120	152.4	22.0	320	50.8	12.7	262.0	222.2	294	30000	32.5
WS122	203.2	22.0	320	50.8	12.7	262.0	222.2	294	30000	26.0
WS480	203.2	22.0	382	50.8	12.7	325.0	280.2	294	30000	27.1

Chain tool pot for ATC (automatic tool changer system)

- This system was developed with the emphasis on high precision and durability for ATC chains used in the ATC equipment of machining centers.
- The tool pot was developed with special strengthened plastic as the main material, with consideration for the following points:

1. Changing dimensions over time.
2. Dimensional precision.
3. Durability.
4. Tool extraction force.



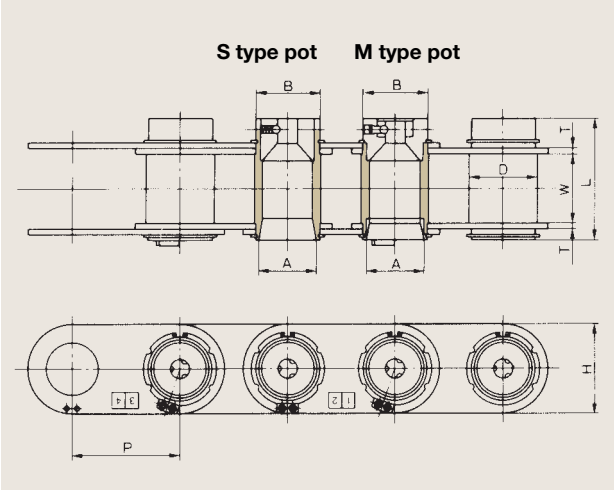
Types

HLP-S and, M (unit pot types)

In these types, tool pots are combined with hollow pins for reduced weight and size. There are two types, as described below.

Features

1. S type Single steel pots
   The tool pots are combined with hollow pins, and the parts that come into contact with the tools are coated.
2. M type Modular pots
   A special plastic insert is added to the front of the unit pot to improve wear resistance.



Chain No.	Pitch P (mm)	Dimensions (mm)						
		A	B	D	H	L	T	W
HLP90-40S M	90	44.45	55	60	82	89	4.0	60
HLP100-40S M	100							
HLP125-40S M	125							
HLP115-50S M	115	69.85	78	82	108	148	6.3	83
HLP130-50S M	130							
HLP140-50S M	140							
HLP160-50S M	160							

Note: 1. We can also manufacture to special dimensions.
2. Modular pot Pat. Pending.

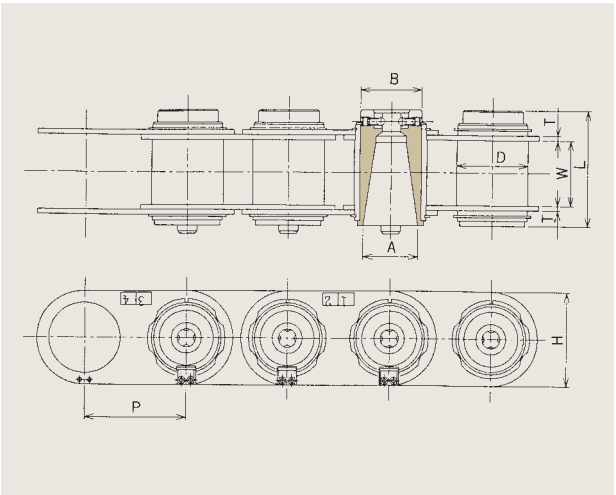
Chains and tool pots for ATC (Automatic Tool Changer) systems

HLP-F type (plastic pot type)

Plastic tool pots are built into the hollow pins of the chain.

Features

1. Tool pots are easy to change.
2. Tool pots are made from special plastic for adequate durability.



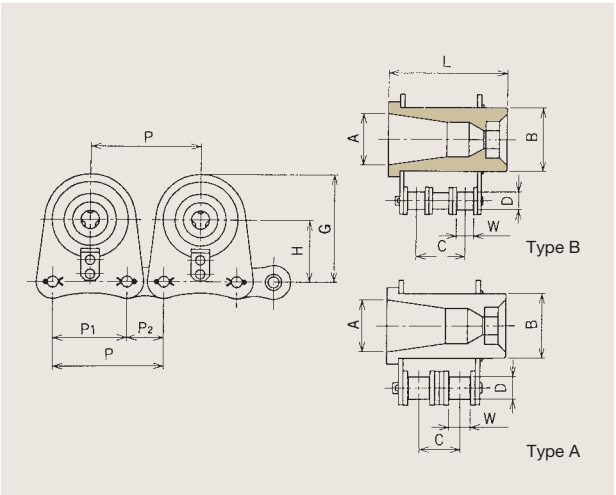
Chain No.	Pitch P (mm)	Dimensions (mm)						
		A	B	D	H	L	T	W
HLP90-40F	90	44.45	55	68	88	105	4.0	60
HLP100-40F	100							
HLP125-40F	120							
HLP130-50F	130	69.85	78	92	120	146	6.3	83
HLP140-50F	140					144		
HLP160-50F	160							

SAK-F type (plastic pot type)

Similar to the structure of the SAW type, with tool pots built into unitary chains.

Features

1. Light and economical, offering stability and rigidity.
2. Easy to position the tools.



Chain No.	Pitch (mm)			Dimensions (mm)							
	P	P_1	P_2	A	B	C	D	G	H	L	W
SAK100-40F	95.25	63.5	31.75	44.45	55	53.18	19.05	92.0	53.0	102	19.05
SAK120-50F	114.30	76.2	38.10	69.85	78	77.10	22.23	115.3	68.3	148	25.40
SAK140-50F	133.35	88.9	44.45	69.85	78	73.60	25.4	136.0	80.0	148	25.40

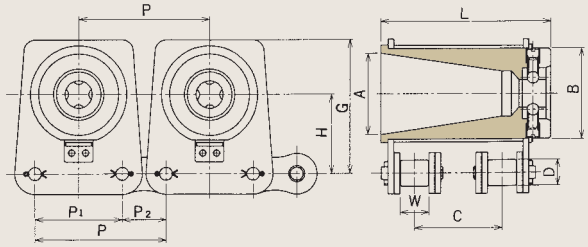
Chains and tool pots for ATC (Automatic Tool Changer) systems

SAW-F type (plastic pots)

Plastic tool pots are built into a chain that splits between left and right sides.

Features

1. Lightweight and economical.
2. Easy to position the tools.



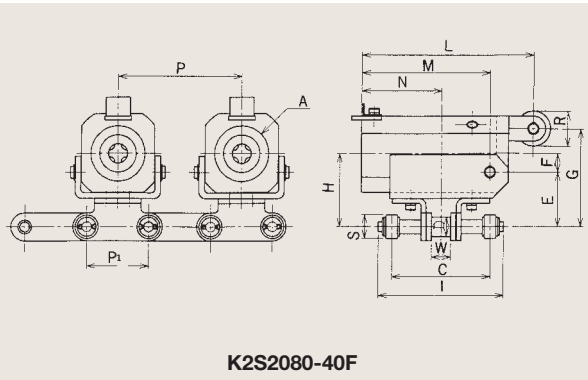
Chain No.	Pitch (mm)			Dimensions (mm)							
	P	P1	P2	A	B	C	D	G	H	L	W
SAW120-50F	114.30	76.2	38.10	69.85	78	52.6	22.23	115.3	68.3	155	25.4
SAW120-50F	114.30	76.2	38.10	69.85	78	77.1	22.23	136.0	80.0	148	25.4
SAW140-50F	133.35	88.9	44.45	69.85	78	73.6	25.40	136.0	80.0	148	25.4

K2S-F type (plastic pot type)

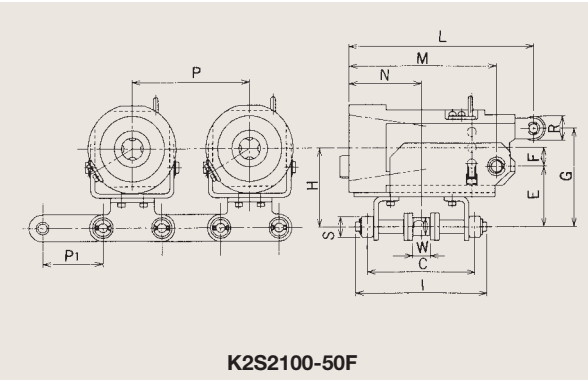
This type has a chain attachment with a tool pot tipping function, so that it can be used in upright machining centers.

Features

1. The tool changing system can be simplified.
2. The chain has side rollers, so the tools are prevented from tilting or swaying.



K2S2080-40F



K2S2100-50F

Chain No.	Pitch (mm)		Dimensions (mm)													
	P	P1	A	C	D	E	F	G	H	I	L	M	N	R	S	W
K2S2080-40F	101.6	50.8	44.45	70	15.88	43.5	15	78.5	58.5	92.6	140	105	60.00	28	19.05	15.88
K2S2100-50F	127.0	63.5	69.85	117	19.05	70.0	20	120.0	90.0	143.0	200	150	91.25	28	22.22	19.40

Chains and tool pots for ATC (Automatic Tool Changer) systems

Sprocket Pitch Circle Diameter (P.C.D.) and Outer Diameter (O.D.)

HLP type

$$\text{P.C.D.} = \frac{P}{\sin\frac{180^\circ}{N}}$$

$$\text{O.D.} = P \times \left(0.5 + \cot\frac{180^\circ}{N}\right)$$

SAW, SK types

$$\text{P.C.D.} = \frac{\sqrt{P_1^2 + P_2^2 + 2P_1 \cdot P_2 \cos\frac{180^\circ}{N}}}{\sin\frac{180^\circ}{N}}$$

$$\text{O.D.} = \text{P.C.D.} + 0.8D$$

K2S type

$$\text{P.C.D.} = \frac{P}{\sin\frac{180^\circ}{N}}$$

$$\text{O.D.} = \text{P.C.D.} + 0.8D$$

P = Chain pitch
P_1 = Long pitch
P_2 = Short pitch
N = No. of teeth (the number corresponding to pitch P)
D = Roller diameter

Handling

Observe the following precautions when handling ATC chains

1. Chain initial tension
   1) Chain vibration has an adverse effect not just on the chain itself, but also on the machine as a whole, so be sure to apply a suitable initial tension.
   2) Once the chain has been used, adjust tension to reduce vibration.
2. Operation precautions
   1) Before trial operation, check that the tools are securely inserted.
   2) Remove any foreign bodies, such as cutting dust, from inside the pots.

Warning

· If the tools are not securely inserted into the pots, they can drop out, potentially causing major accidents.

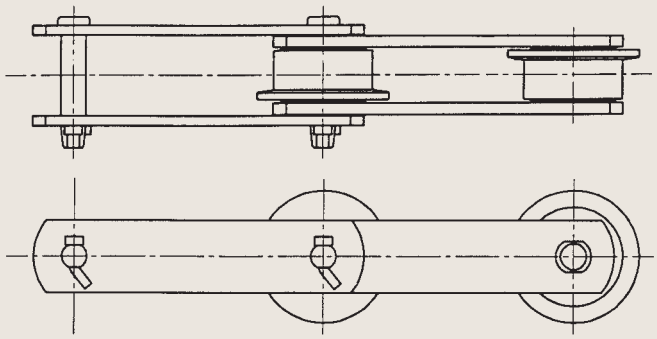
3. Chain lubrication (oiling)
   Chain lifespan is greatly influenced by extension caused by wear from flexion. Proper lubrication is essential as an effective way to limit wear extension.
   1) Apply oil regularly with an oil dropper or brush.
   2) Use lubricant oil in the SAE30 or SAE40 classes.

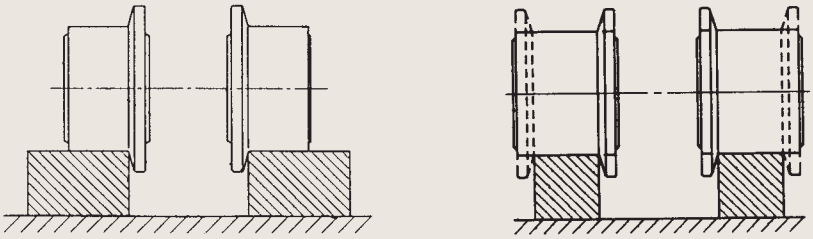
Caution

· Avoid using acidic or alkaline water-soluble cutting oil and similar highly corrosive lubricants with Teflon coated tool

Anti-meandering chains

Anti-meandering chains alternate the orientation of the F type roller every one or two links.





1. Features

1) It is more difficult for the chain to meander on the rail, so loads can be moved more stably.
2) Chains come off the rail less often, lessening the risk of major incidents.
3) When multiple chains are used, it is possible to use an anti-meandering chain on one side only, with an R roller type on the other side.
4) As the top of the rail is flat, the structure can be simpler.

2. Applications

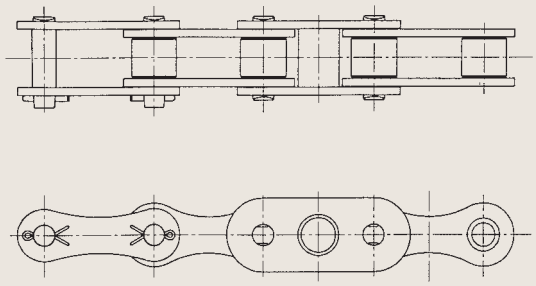
1) Apron conveyors.
2) Dust vemover for water treatment.
3) Automatic car assembly line conveyors.
4) Mold conveyors.
5) Other long conveyors.

Caution

・When the load used is large, there is high pressure on the F type roller contact face and the sprocket. Therefore, a chain with a wider internal width must be used to lower the pressure.

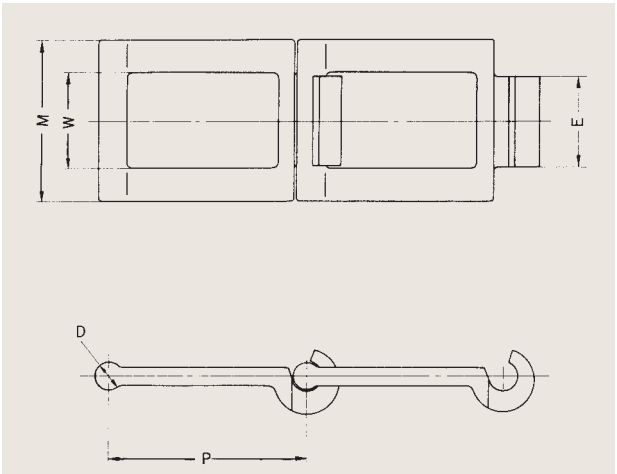
Escalator chains

We provide high precision conveyor chains for escalators used in train stations and departments stores, to provide comfort as well as safety.



Steel detachable chains

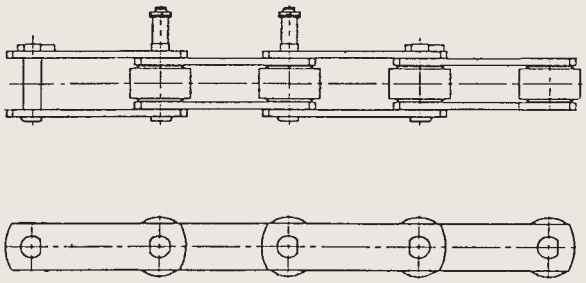
It is easy to attach and detach these chains, and their structure is simple. Made of steel, they are also stronger than cast chains. They are used in hay conveyors and other agricultural machinery.



Chain No.	Pitch P (mm)	Dimensions (mm)				Average ultimate tensile strength		Mass (kg/m)
		D	E	M	W	(kN)	(kgf)	
55	41.66	6.5	18	37	20	24.5	2500	1.2
57	58.93	8.0	26	48	28	39.2	4000	1.7
78	66.27	10.7	36	66	38	68.6	7000	4.1

Unloader chains

Continuous unloaders, which are port cargo handling equipment to move large volumes of lime stone, iron ore, rock salt etc. use chain-type bucket elevators. The chains must be able to move loads vertically, and to do so rapidly with heavy loads, so we design and manufacture them for light weight with high resistance against corrosion and wear.



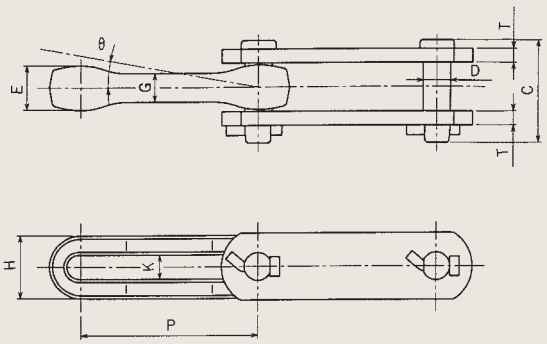
HT type trolley chains and trolley hangers

HT type trolley chains

These chains are an economical solution for long-distance conveying.

Features

1. They can be used three dimensionally, bending laterally and vertically.
2. They are driven at multiple points, so they can be used for long-distance conveying.



Chain No.	Pitch P		Dimensions (mm)							Average ultimate tensile strength		Mass (kg/m)	Bending angle θ (degrees)
	(mm)	(in)	C	D	E	G	H	K	T	(kN)	(kgf)		
HT348	77.0	3.031	47	12.7	19.0	12.7	28.6	14	6.3	79.9	8150	3.3	8
HT458	102.4	4.031	60	15.8	25.4	17.0	35.0	17	8.0	133.0	13600	4.1	7

Trolley hangers

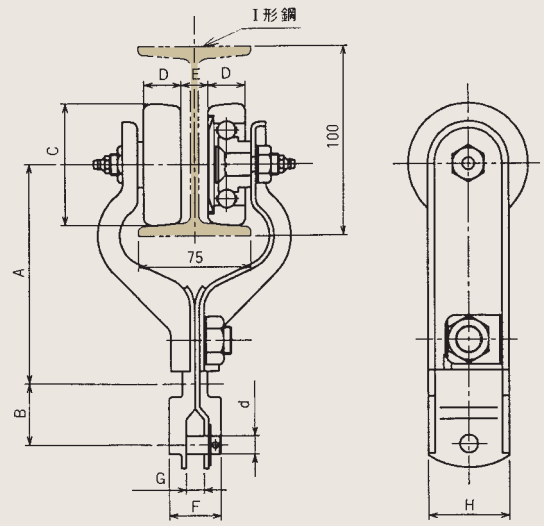
Table of trolley dimensions

Chain No.	Dimensions (mm)									Suspended imposed load		Mass per hanger (kg)
	A	B	C	D	d	E	F	G	H	(kN)	(kg)	
HT348	111	35	58	20	12	18	25	10	40	1.27	150	2.4
HT458	144	40	80	25	12	18	32	12	54	2.94	300	3.9

Trolley chain minimum bending radius

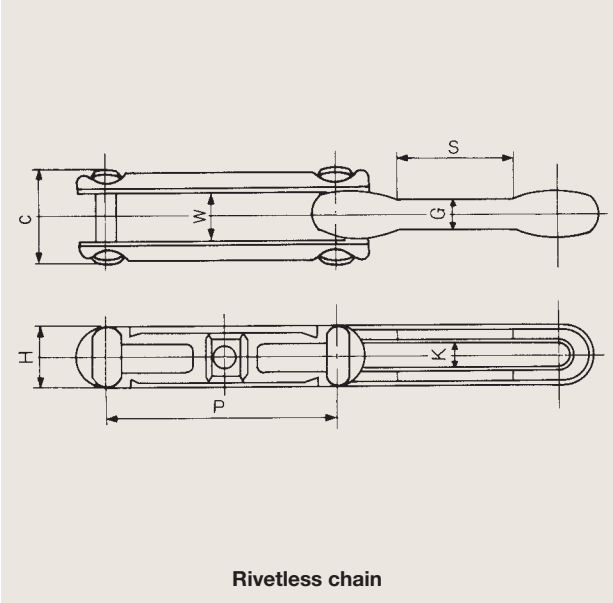
Mounting interval	Trolley chain minimum bending radius (mm)	
	HT348	HT458
2pitch	550	840
4pitch	1100	1680
6pitch	1650	2520

Note: 1. Design for a hanger pitch of up to 500mm.
2. The minimum radius of curvature is shown from the center line of the I section.

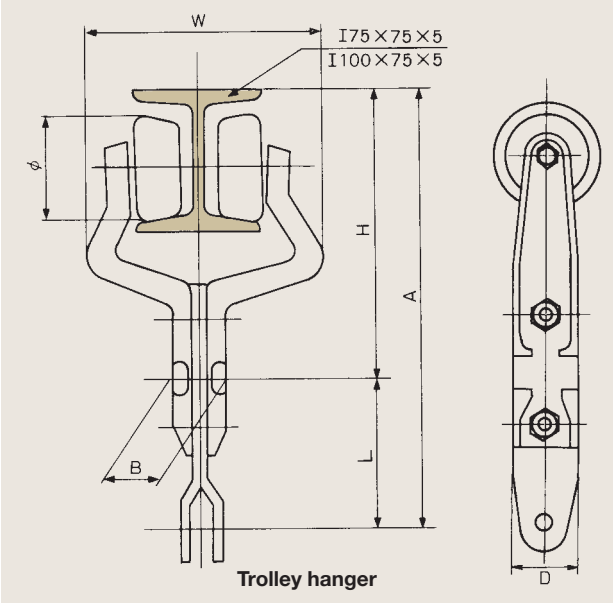


HRX type rivetless chains and trolley hangers

HRX type rivetless chains



Rivetless chain



Trolley hanger

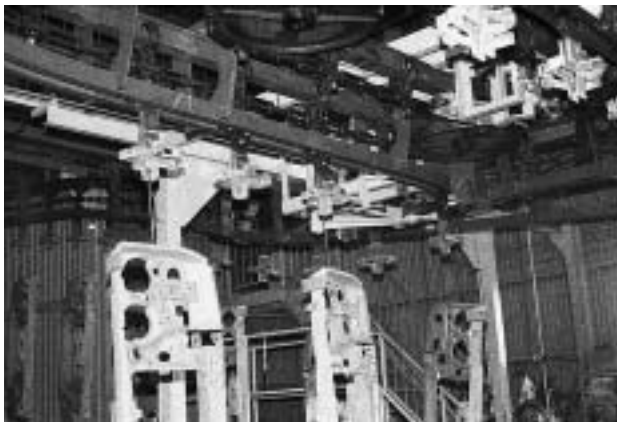
Rivetless chain table of dimensions

Chain No.	Pitch P		Dimensions (mm)						Average ultimate tensile strength		Mass (kg/m)
	(mm)	(in)	G	H	K	S	W	C	(kN)	(kgf)	
HRX348	77.0	3.031	13	28	14	46	21	44.1	103	10500	2.75
HRX458	102.4	4.031	17	35	17	56	27	55.5	206	21000	4.35

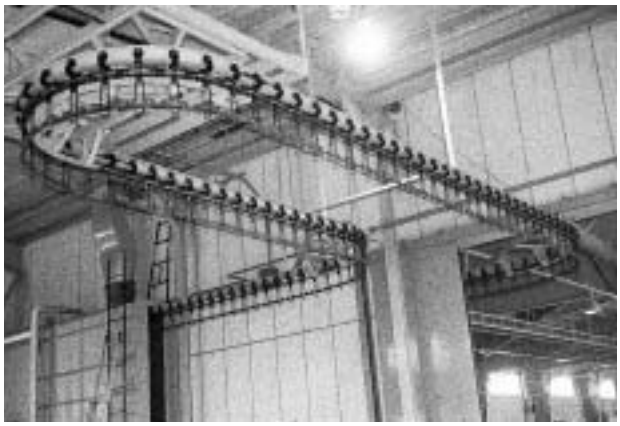
Trolley hangers

Trolley hanger table of dimensions

Chain No.	Dimensions (mm)							Mass per hanger (kg/m)	Suspended imposed load	
	A	B	D	H	L	W	ϕ		(kN)	(kgf)
HRX348	220.2	28	40	140	70	122	54	1.5	1.22	125
HRX458	256	35	54	183	70	137	80	2.8	2.45	250



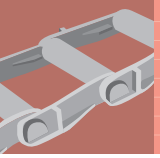
P&F conveyor



Trolley conveyor

HITACHI CONVEYOR CHAINS

Cast Chains



Cast Chains

Use

Caution: Re-machining of cast chains is hazardous

- Never electroplate heat-treated chains or sprockets, as it can cause hydrogen embrittlement fracture.
- Never weld heat-treated chains or sprockets, as heat effects can reduce strength, causing the chain to break.
- After using a blowtorch or other heat source to heat or cut a chain, be sure to remove all components on either side of the heated area that may have been affected by the heat.

Caution: Dimensional precision of cast chains

The dimensional tolerance of cast chains is relatively large, because of their manufacturing methods and structures. Therefore, pay attention to the following points:

- When using cast chains in parallel, check to make sure that dimensional differences between the chains are within a range that causes no operational problems.
- There is some dimensional inconsistency between different production lots of cast chains. When replacing chains etc., beware of problems such as excess slack in chains.

Features

Cast chains have the following features.

Superior corrosion resistance

Because of their superior corrosion resistance, these chains are used with conveyors that carry corrosive materials, and in urban water treatment.

A rational structure allows a wide range of attachments

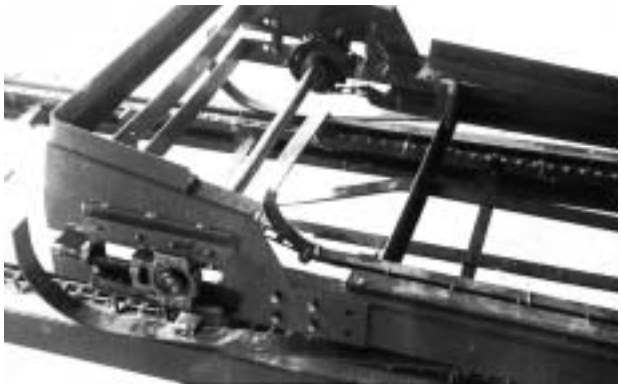
As the chain itself is fabricated by casting, the thickness of the metal and other aspects can be designed rationally, so various attachments can be produced freely and accurately.

We produce chains that stand up to harsh usage conditions

Even for very difficult usage conditions, we can manufacture special cast chains that make use of the special properties of cast material.

Application examples

Tatami straw matting weaver



(Detachable chain)

Detachable chains are widely used as the main example of cast chains.
Both structure and handling are extremely simple, as the chain is assembled from its own components only. Therefore, even in a corrosive environment, there is little rusting of the chain and it can run smoothly.,

Bottle conveyor

(Pintle chain)

Pintle chains are used in line conveyors for filling and washing bottles in food or chemical factories, because the chains must be simple in structure and able to withstand exposure to water without risk of rusting.

Drag chain conveyor

(Drag chain)

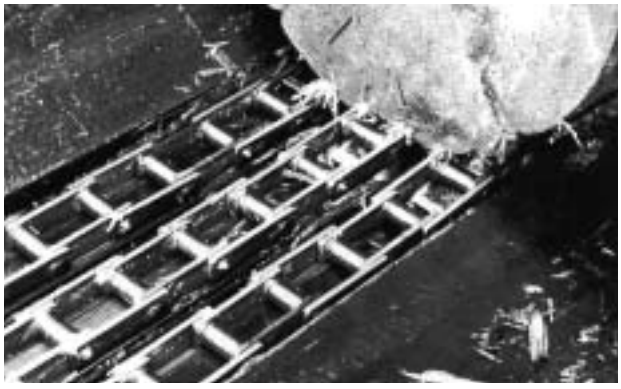
Drag chain conveyors are a kind of trough chain conveyor in which the barrel portion of the chain is formed to serve as a scraper. They are generally used to move coal ash, wood chips, waste and similar materials.

Scale collector

(Combination chains)

These chains continuously dredge up sediments from water using scrapers. As they move underwater, corrosion-resistant cast chains are suitable.

Line conveyors



(Combination chain)

The load is placed and carried directly on top of multiple chains.

Sludge collectors

(Pintle chain)

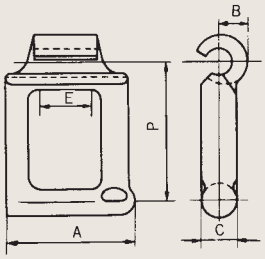
700 class pintle chains are widely used as the main chain for sludge collectors in sewage treatment works.

Detachable chains

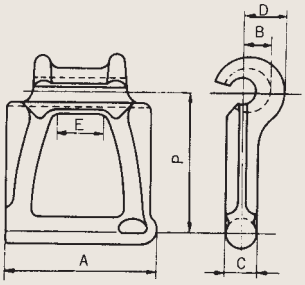
One side of the chain link is the pin and the other is a hook, fitting together to make one of the widely-used main types of cast chains. Pins and hooks can be detached and reattached easily at any desired position.
The A Type is used for small chains, while the B Type, with reinforcing ribs on the hook, is used for No.77 and larger sizes.

A type

B type



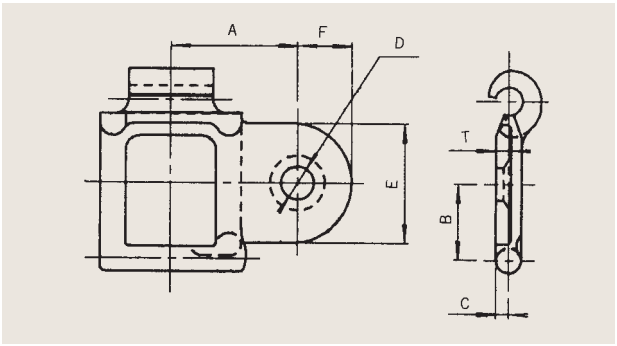
A type



B type

Chain No.	Pitch P		Dimensions (mm)					Type	No. of links in one length	Average ultimate strength		Maximum allowable load		Mass (kg)	
	(mm)	(in)	A	B	C	D	E			(kN)	(kgf)	(kN)	(kgf)	1 length	1 m
25	22.91	0.902	19.1	5.2	3.6	–	10	A	133	3.09	315	0.49	50	1.11	0.37
32	29.31	1.154	25.4	6.4	4.3	–	13	A	104	4.90	500	0.78	80	1.72	0.57
42	34.93	1.375	32.1	7.1	5.5	–	16	A	88	7.06	720	1.07	110	2.78	0.93
45	41.40	1.630	33.3	7.6	5.5	–	18	A	74	7.55	770	1.27	130	2.48	0.83
51	29.34	1.155	31.8	9.1	6.6	–	15	A	104	8.43	860	1.47	150	3.78	1.26
52	38.25	1.506	38.8	8.7	6.7	–	16	A	80	10.2	1040	1.66	170	4.04	1.34
55	41.43	1.631	34.9	9.1	6.7	–	18	A	74	9.81	1000	1.66	170	3.38	1.13
57	58.62	2.308	44.5	10.3	6.7	–	18	A	52	12.7	1300	2.15	220	3.90	1.30
62	42.01	1.654	42.1	10.3	6.0	–	22	A	73	14.2	1450	2.35	240	5.05	1.68
67	58.62	2.308	50.8	10.9	8.0	–	18	A	52	14.7	1500	1.96	200	4.96	1.65
77	58.34	2.297	56.0	9.0	10.0	15.0	18	B	52	15.7	1600	2.64	270	7.14	2.38
78	66.27	2.609	66.7	11.1	10.7	16.7	24	B	46	24.5	2500	4.11	420	8.70	2.90
88	66.27	2.609	69.9	11.1	12.3	21.0	24	B	46	28.4	2900	4.80	490	11.50	3.83
103	78.11	3.075	83.4	15.5	14.6	25.4	28	B	39	44.1	4500	7.45	760	18.87	6.29
114	82.55	3.250	88.0	20.6	16.8	29.8	27	B	37	53.0	5400	8.92	910	25.52	8.51

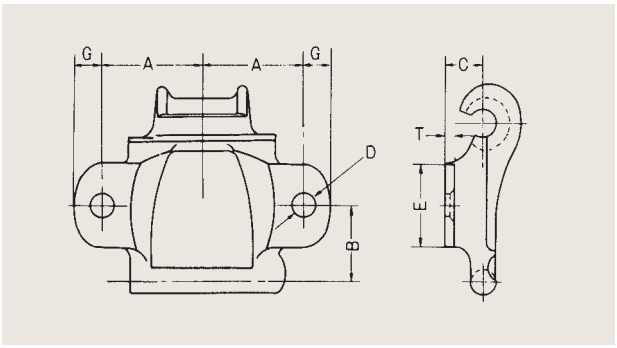
A-1 attachments



Chain No.	Dimensions (mm)							Mass (kg)	
	A	B	C	D	E	F	T	1 length	1 m
25	22.2	11.1	2.4	5.6	18.3	8.7	2.4	1.84	0.61
32	22.2	15.9	2.4	5.6	18.3	8.7	3.2	2.36	0.79
42	27.8	16.7	2.8	7.2	26.2	11.9	3.6	3.63	1.21
52	30.2	19.8	3.2	6.8	27.0	11.1	3.2	5.08	1.69

Note: We have right-handed and left-handed versions.

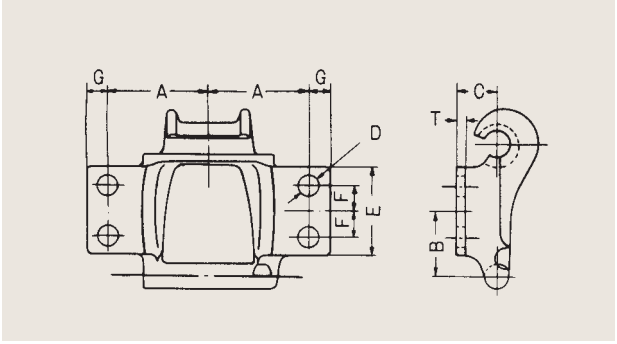
K-1 attachments



Chain No.	Dimensions (mm)							Mass (kg)	
	A	B	C	D※	E	F	T	1 length	1 m
25	15.9	12.7	8.7	4.0	11.1	5.6	2.4	2.15	0.72
32	22.2	15.1	9.5	5.6	15.1	7.1	2.4	3.42	1.14
42	25.4	17.5	9.5	5.6	19.1	8.7	3.2	4.50	1.50
45	25.4	19.8	10.3	5.6	21.4	8.7	3.2	4.31	1.44
52	30.2	18.3	11.1	5.6	22.2	11.1	3.2	6.40	2.13
55	25.4	19.8	10.3	7.0	22.2	8.7	3.2	4.80	1.60
62	30.2	21.4	11.9	7.1	23.8	11.9	4.0	7.65	2.55
77	38.1	28.6	16.7	7.1	32.5	11.1	4.0	11.40	3.80
88	48.4	31.8	19.1	8.7	34.9	11.1	4.8	16.40	5.47
103	53.2	38.1	22.2	10.3	43.7	12.7	6.4	25.35	8.45
114	61.1	41.3	22.2	13.5	44.5	19.1	7.9	35.45	11.82

※25~62 have round holes.
77~114 have angular holes.

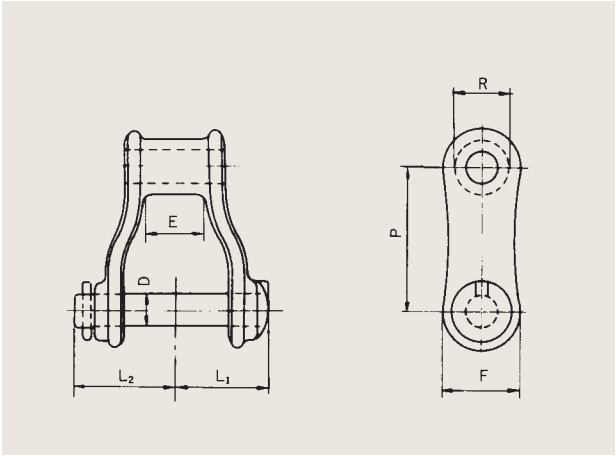
K-2 attachments



Chain No.	Dimensions (mm)								Mass (kg)	
	A	B	C	D	E	F	G	T	1 length	1 m
88	50.8	32.5	20.6	10.3	44.5	12.7	11.1	4.8	17.48	5.83

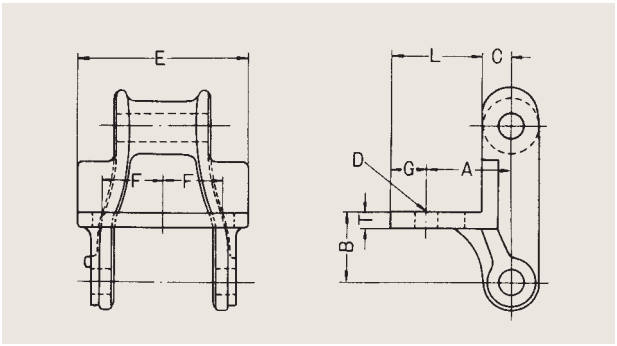
400 class pintle chains

The barrel and link are a single casting, and the chain is assembled by inserting carbon steel pins. The increased strength, relative to detachable chains, allows a wider range of applications.
Standard pintle chains are also called 400 class pintle chains, and have the same pitch dimensions as detachable chains, so they can be used with the same sprockets. However, No.477 is used with No.67.



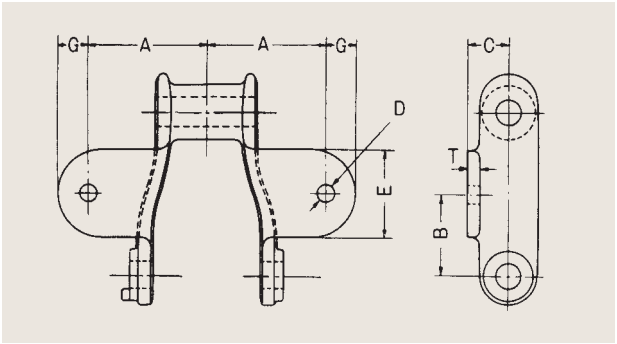
Chain No.	Pitch P		Dimensions (mm)						No. of links in one length	Average ultimate strength		Maximum allowable load		Mass (kg)	
	(mm)	(in)	L_1	L_2	D	R	E	F		(kN)	(kgf)	(kN)	(kgf)	1 length	1 m
455	41.40	1.630	27.0	29.5	9.5	15.9	18	21.4	74	32.4	3300	4.70	480	8.79	2.93
477	58.62	2.308	30.3	33.2	11.1	20.6	18	25.4	52	42.7	4350	6.22	635	11.16	3.72
488	66.27	2.609	35.5	39.1	11.1	22.2	24	23.8	46	61.3	6250	10.0	1020	13.32	4.44
4103	78.11	3.075	42.2	46.3	19.0	31.0	28	38.1	39	123.0	12500	19.6	2000	26.32	8.77
4124	103.20	4.063	56.9	62.2	20.6	43.7	32	44.5	30	147.0	15000	20.2	2070	42.90	14.30

F-2 attachments



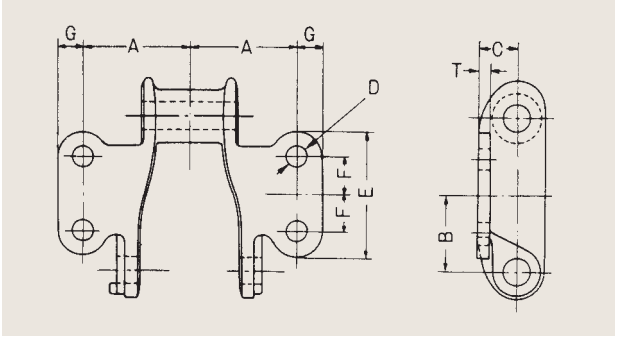
Chain No.	Dimensions (mm)									Mass (kg)	
	A	B	C	D	E	F	G	L	T	1 length	1 m
488	35.0	30.0	11.9	9.5	73.0	25.8	15.0	38.1	7.0	22.62	7.54
4103	50.8	31.8	19.1	11.0	76.2	28.2	16.7	48.4	7.9	39.50	13.17

K-1 attachments



Chain No.	Dimensions (mm)							Mass (kg)	
	A	B	C	D	E	G	T	1 length	1 m
455	25.4	20.6	11.1	7.0	20.6	11.1	4.0	11.16	3.72
477	38.1	29.4	16.7	7.0	34.9	11.9	4.0	14.84	4.95
488	48.5	33.3	16.7	9.0	35.0	12.0	4.8	18.25	6.08
4103	53.2	38.1	20.6	11.0	43.7	15.9	5.6	32.64	10.88
4124	76.2	51.6	25.4	18.0	63.5	25.4	7.9	54.00	18.00

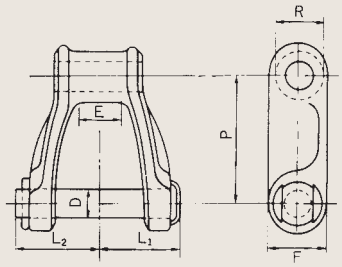
K-2 attachments



Chain No.	Dimensions (mm)								Mass (kg)	
	A	B	C	D	E	F	G	T	1 length	1 m
488	46.0	32.5	16.7	9.0	54.0	16.0	11.1	4.8	19.65	6.55
4103	52.4	38.9	21.4	14.0	66.7	19.1	14.3	7.9	36.36	12.12
4124	63.5	48.0	30.0	11.0	79.0	23.0	15.8	7.0	55.80	18.60

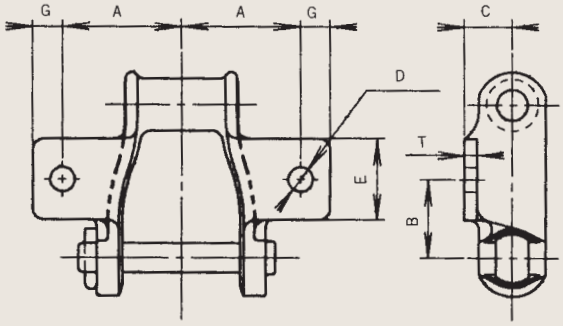
H class pintle chains

These chains have ribs under the links that widen the sliding area when the chain slides over a trough or floor, reducing friction.
When using these chains, attach them so that the ribbed part of the chain is in contact with the sliding surface.



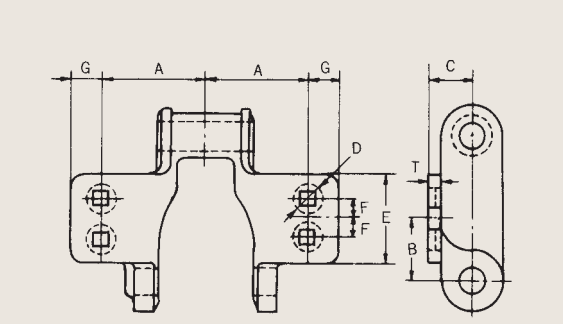
Chain No.	Pitch P		Dimensions (mm)						No. of links in one length	Average ultimate strength		Maximum allowable load		Mass (kg)	
	(mm)	(in)	L_1	L_2	D	R	E	F		(kN)	(kgf)	(kN)	(kgf)	1 length	1 m
H78	66.27	2.609	39.6	46.0	12.7	22.2	24	28.6	46	71.2	7260	10.5	1080	18.35	6.12
H82	78.11	3.075	48.9	51.6	14.3	31.0	28	31.8	39	88.9	9070	13.7	1400	29.30	9.77
H124	101.60	4.000	61.7	65.8	19.0	36.5	40	40.0	30	133.0	13600	22.2	2270	41.70	13.90

K-1 attachments



Chain No.	Dimensions (mm)							Mass (kg)	
	A	B	C	D	E	G	T	1 length	1 m
H78	50.8	33.8	20.6	10.5	35.0	12.7	5.6	24.69	8.23

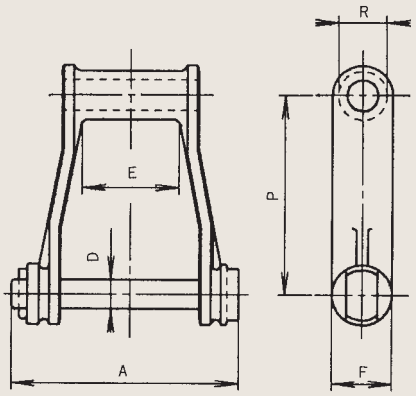
K-2 attachments



Chain No.	Dimensions (mm)								Mass (kg)	
	A	B	C	D	E	F	G	T	1 length	1 m
H82	54.0	35.7	22.2	10.5	55.6	16.7	15.9	7.9	35.9	11.97
H124	66.7	46.8	30.2	11.0	73.0	24.6	14.3	7.9	55.3	18.43

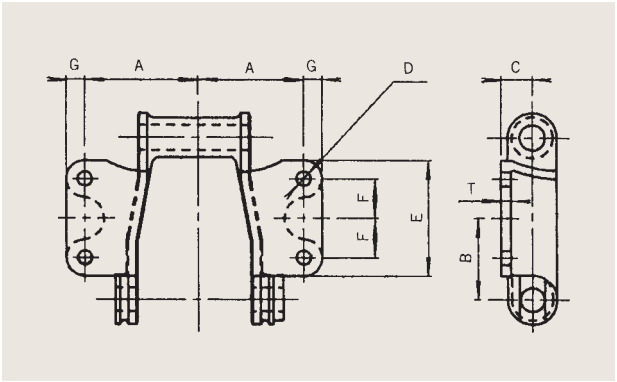
700 class pintle chain

700 class pintle chains are able to withstand intense wear, which makes them the right chain for use with bucket elevators that carry sand and gravel in asphalt plants.



Chain No.	Pitch P		Dimensions (mm)					No. of links in one length	Average ultimate strength		Maximum allowable load		Mass (kg)	
	(mm)	(in)	A	D	R	E	F		(kN)	(kgf)	(kN)	(kgf)	1 length	1 m
710	119.89	4.720	135.0	17.5	29.0	60	36.0	25	123	12500	15.6	1600	27.51	9.17

K-2 attachments

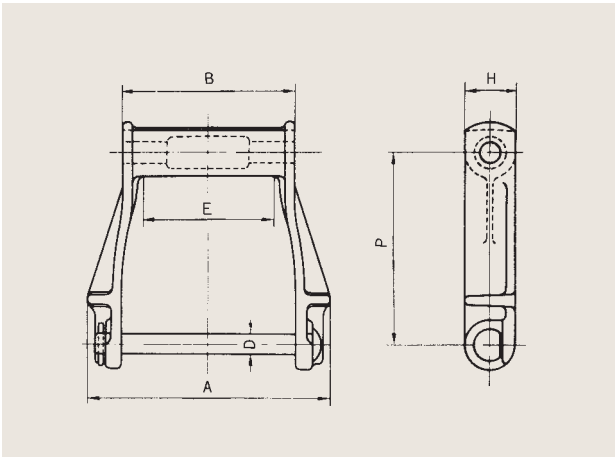


Chain No.	Dimensions (mm)								Mass (kg/ link)
	A	B	C	D	E	F	G	T	
710	80	60	23	10.5	85	29	13.5	7.5	1.60

Drag chains

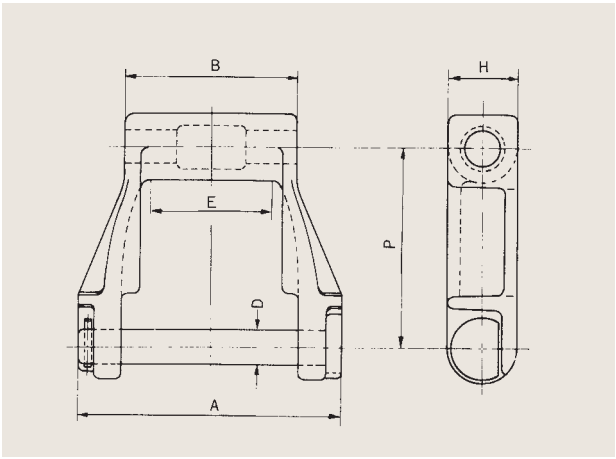
Drag chains are designed with wear resistant structures, using heavy, wide bottomed links. Use SD drag chains when particularly high wear resistance is required.

DC type



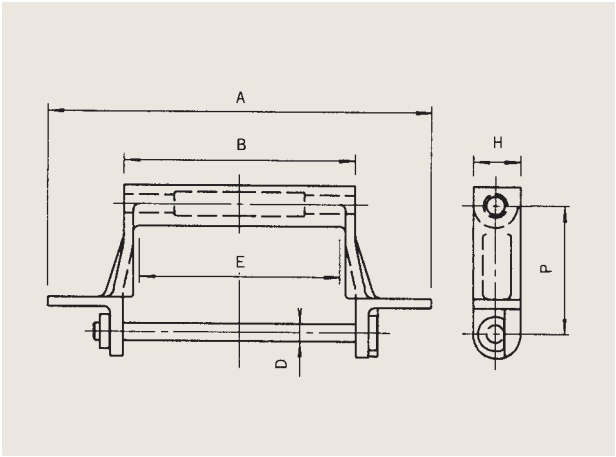
Chain No.	Pitch P		Dimensions (mm)					Average ultimate strength		Maximum allowable load		Mass (kg/link)
	(mm)	(in)	A	B	D	E	H	(kN)	(kgf)	(kN)	(kgf)	
DC507	127.0	5	187	143	16	113	38	143	14600	18.6	1900	2.05
DC607	152.4	6	190	135	16	105	38	143	14600	18.6	1900	2.16
DC613	152.4	6	314	270	16	240	38	143	14600	18.6	1900	3.31
DC816	203.2	8	422	368	19	330	45	194	19800	28.4	2900	7.20

SD Type

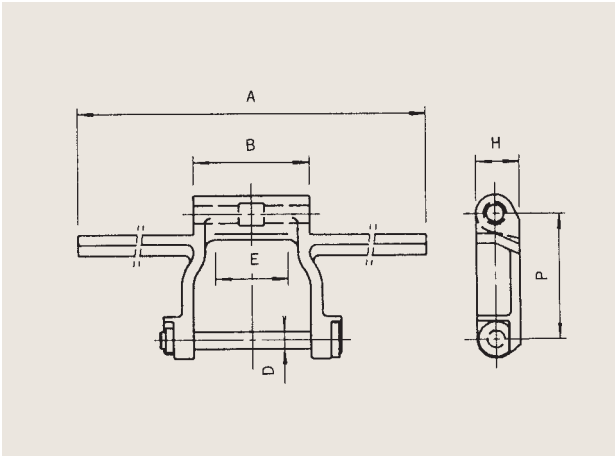


Chain No.	Pitch P		Dimensions (mm)					Average ultimate strength		Maximum allowable load		Mass (kg/link)
	(mm)	(in)	A	B	D	E	H	(kN)	(kgf)	(kN)	(kgf)	
SD19	152.4	6	203	133	25.4	93	51	275	28000	68.6	7000	4.80
SD27	228.6	9	254	175	28.6	100	64	441	45000	83.3	8500	11.05

Vaned types



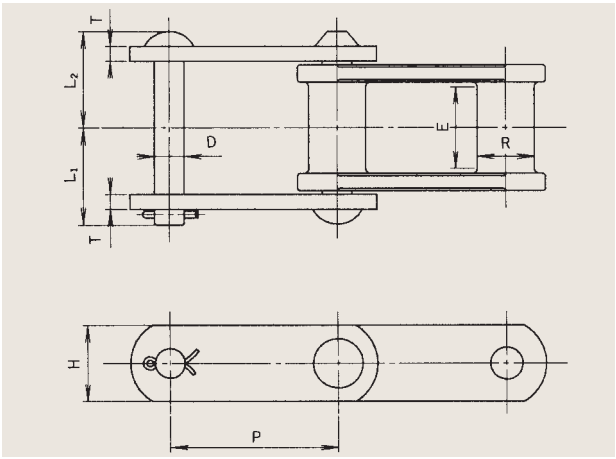
Chain No.	Pitch P (mm)	Dimensions (mm)					Average ultimate strength		Maximum allowable load		Mass (kg/link)
		A	B	D	E	H	(kN)	(kgf)	(kN)	(kgf)	
SD824	203.2	608	366	28	318	75	471	48000	78.5	8000	18.9



Chain No.	Pitch P (mm)	Dimensions (mm)					Average ultimate strength		Maximum allowable load		Mass (kg/link)
		A	B	D	E	H	(kN)	(kgf)	(kN)	(kgf)	
SD1033	250	850	230	34	184	75	981	100000	147.0	15000	29.0

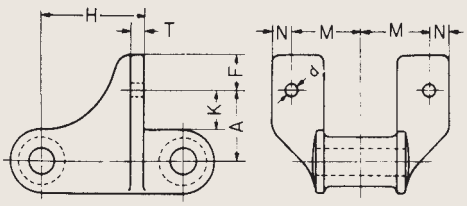
Combination chains

Combination chains are comprised of cast blocks and steel plate links, and are used in a wide variety of applications.



Chain No.	Pitch P		Dimensions (mm)							No. of links in one length	Average ultimate strength		Maximum allowable load		Mass (kg)	
	(mm)	(in)	L_1	L_2	D	R	E	H	T		(kN)	(kgf)	(kN)	(kgf)	1 length	1 m
C102B	101.60	4.000	57.8	52.2	15.9	25.4	43	38.0	9.5	30	107	10890	17.7	1810	29.1	9.7
C102½	102.62	4.040	59.5	58.5	19.0	35.0	48	44.5	9.5	30	160	16330	24.7	2520	41.4	13.8
C110	152.40	6.000	58.0	54.0	16.0	32.0	48	38.1	9.5	20	107	10890	17.7	1810	27.4	9.13
C111	120.90	4.760	63.0	63.0	19.0	36.0	57	44.5	9.5	26	160	16330	26.4	2700	40.6	13.53
C131	78.11	3.075	47.3	42.8	16.0	32.0	28	38.0	9.5	40	107	10890	14.3	1460	35.1	11.7
C132	153.67	6.050	82.7	77.4	25.4	45.2	67	50.8	12.7	20	222	22680	37.0	3780	66.0	22.0

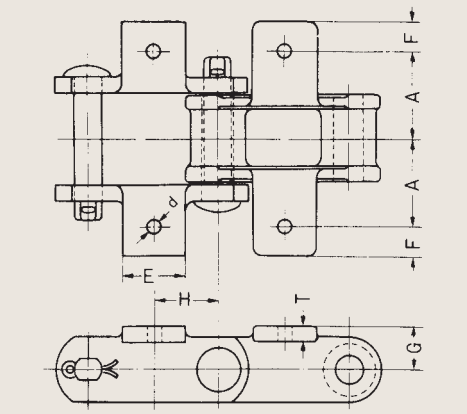
F-2 attachments



Chain No.	Dimensions (mm)								Mass (kg)	
	A	d	F	H	K	M	N	T	1 length	1 m
C102½	50.0	11.0	27.0	73.8	28.6	73.0	17.5	7.9	58.05	19.35
C111	51.0	11.0	25.0	76.0	28.8	83.0	16.0	8.7	49.05	16.35
C131	42.8	11.0	27.0	54.0	23.8	59.5	18.3	8.0	44.9	14.97

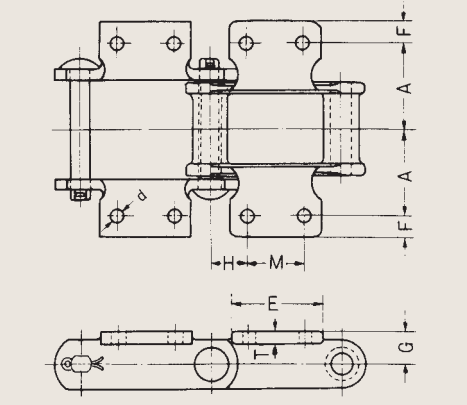
Note: 1. Masses indicated are for attachments mounted on block links every two pitches.
2. We only manufacture attachments for use inner blocks.

K-1 attachments



Chain No.	Dimensions (mm)							Mass (kg)	
	A	d	E	F	G	H	T	1 length	1 m
C131	52.4	11	38.1	17.5	25.4	38.1	9.5	41.98	13.99

K-2 attachments

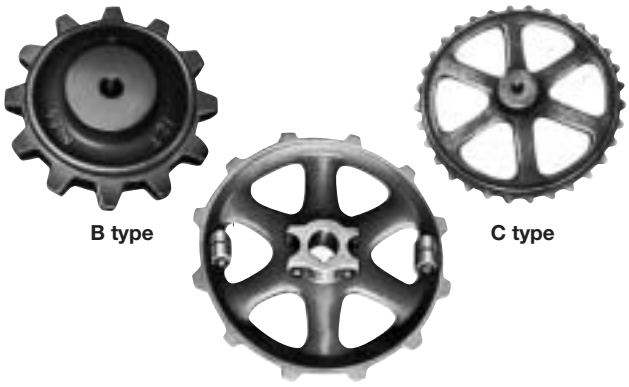


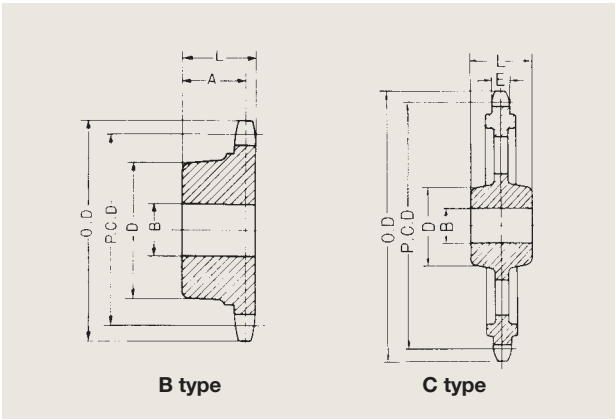
Chain No.	Dimensions (mm)								Mass (kg)	
	A	d	E	F	G	H	M	T	1 length	1 m
C102B	67.5	11	71.5	17.0	25.4	28.6	44.5	9.5	40.8	13.6
C102½	67.5	13	71.5	15.0	25.4	29.4	44.5	9.5	53.4	17.8
C110	67.5	11	73.0	16.7	25.4	54.0	44.5	9.5	36.4	12.13
C111	79.4	14	89.0	16.0	28.6	31.0	58.7	9.5	55.55	18.52
C131	52.0	14	67.0	14.0	25.0	19.8	38.0	9.5	36.1	12.03
C132	94.3	14	102.0	19.0	31.8	42.1	69.8	12.7	84.7	28.23

Sprockets for cast chains

The sprockets we manufacture are based on many years of design experience.
Ductile cast iron (FCD600) is the standard material for sprockets for cast chains. If the application requires, we also manufacture sprockets with surface hardened tooth tips for improved wear resistance.

Sprockets for cast chains table of dimensions





Note: Dimension E is Dimension E from the table of chain (plain links) dimensions.

For No. 25 (pitch 22.91 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	52.80	60	B	20	40	48	32	0.4
8	59.87	68	B	23	45	48	32	0.5
9	66.98	74	B	27	50	50	34	0.7
10	74.14	81	B	30	55	50	34	0.8
11	81.32	89	B	30	55	50	34	0.9
12	88.52	96	B	30	55	50	34	1.0
14	102.96	110	B	30	55	50	34	1.3
16	117.43	125	B	36	65	50	34	1.6
18	131.93	139	B	36	65	50	34	1.8
20	146.45	154	B	36	65	50	34	2.0
24	175.52	183	C	40	70	60	–	2.5
30	219.18	127	C	40	70	60	–	3.2

For No. 42 (pitch 34.93 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	80.51	91	B	36	65	55	35	1.6
8	91.28	101	B	36	65	55	35	1.8
9	102.13	112	B	36	65	55	35	2.1
10	113.04	123	B	40	70	55	35	2.4
11	123.98	134	B	40	70	55	35	2.9
12	134.96	145	B	50	85	55	35	3.1
14	156.98	167	C	50	85	60	–	3.8
16	179.04	189	C	54	90	65	–	4.4
18	201.15	211	C	54	90	65	–	5.0
20	223.29	233	C	54	90	65	–	5.8
24	267.61	278	C	54	90	65	–	7.0
30	334.17	344	C	54	90	65	–	9.0

For No. 32 (pitch 29.31 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	67.55	77	B	27	50	50	32	0.8
8	76.59	86	B	30	55	50	32	1.0
9	85.70	95	B	30	55	50	32	1.2
10	94.85	104	B	36	65	55	37	1.4
11	104.04	113	B	36	65	55	37	1.6
12	113.25	122	B	40	70	55	42	1.8
14	131.72	141	B	40	70	60	42	2.1
16	150.24	159	B	40	70	60	42	2.5
18	168.79	178	C	40	70	60	–	2.8
20	187.36	196	C	40	70	60	–	3.2
24	244.55	234	C	40	70	60	–	4.0
30	280.40	289	C	40	70	60	–	5.1

For No. 45. 445, 455 (pitch 41.40 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	95.42	1.6	B	36	65	55	35	2.8
8	108.18	119	B	36	65	55	35	3.2
9	121.05	132	B	36	65	55	35	3.5
10	133.97	145	B	50	85	55	35	3.9
11	146.95	158	B	50	85	55	35	4.2
12	159.96	171	C	54	90	65	–	4.6
14	186.05	197	C	54	90	65	–	5.4
16	212.21	223	C	54	90	65	–	6.1
18	238.41	249	C	54	90	65	–	6.8
20	264.65	275	C	54	90	65	–	7.6
24	317.18	328	C	54	90	65	–	9.1
30	396.07	408	C	54	90	65	–	11.4

For No. 51 (pitch 29.34 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	67.62	81	B	27	50	55	35	1.2
8	76.67	90	B	27	50	55	35	1.3
9	85.78	99	B	33	60	55	35	1.5
10	94.95	108	B	33	60	55	35	1.7
11	104.14	117	B	33	60	55	35	2.0
12	113.36	126	B	40	70	55	35	2.3
14	131.85	145	B	40	70	55	35	3.3
16	150.39	163	C	40	70	65	–	4.1
18	168.96	182	C	40	70	65	–	4.9
20	187.55	201	C	40	70	65	–	6.0
24	224.78	238	C	54	90	65	–	6.5

For No. 52 (pitch 38.25mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	88.16	101	B	30	55	55	35	2.0
8	99.95	112	B	36	65	55	35	2.4
9	111.84	124	B	36	65	55	35	2.7
10	123.78	136	B	40	70	55	35	3.1
11	135.77	148	C	40	70	55	35	3.5
12	147.79	160	C	40	70	65	–	3.8
14	171.90	184	C	40	70	65	–	4.6
16	196.06	208	C	40	70	65	–	5.3
18	220.27	233	C	54	90	65	–	6.0
20	244.51	257	C	54	90	65	–	6.6
24	293.04	305	C	60	95	75	–	9.0
26	317.33	330	C	60	95	75	–	10.2
30	365.93	378	C	60	95	75	–	12.5

For No. 55 (pitch 41.43 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Center position A (mm)	Mass (kg)
					Diameter D (mm)	Width L (mm)		
7	95.49	108	B	36	65	55	35	2.2
8	108.26	121	B	36	65	55	35	2.6
9	121.13	134	B	36	65	55	35	3.0
10	134.07	147	B	54	90	65	45	3.7
11	147.06	160	B	54	90	65	45	4.0
12	160.07	173	C	54	90	65	–	4.4
14	186.19	199	C	54	90	65	–	5.2
16	212.36	225	C	54	90	65	–	6.0
18	238.59	252	C	54	90	65	–	6.4
20	264.84	278	C	54	90	65	–	7.5
24	317.41	330	C	60	95	75	–	9.6
28	370.03	383	C	60	95	75	–	11.8

For No. 62 (pitch 42.01 mm)

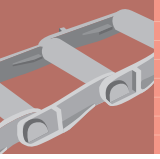
No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	109.78	124	C	33	60	60	3.2
9	122.83	137	C	33	60	60	3.9
10	135.95	151	C	40	70	60	4.6
11	149.11	164	C	40	70	60	5.3
12	162.31	177	C	43	75	60	5.8
14	188.79	203	C	54	90	60	6.8
16	215.33	230	C	60	95	75	8.7
18	241.93	257	C	60	95	75	10.0
20	268.54	283	C	66	110	75	10.6
24	321.85	337	C	66	110	75	13.2
28	375.21	390	C	66	110	75	15.6

For No. 57, 67, 477 (pitch 58.62 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	153.18	168	C	43	75	60	4.6
9	171.39	186	C	50	85	70	5.6
10	189.70	204	C	60	95	75	6.6
11	208.07	223	C	60	95	75	7.5
12	226.49	241	C	60	95	75	8.4
14	263.44	278	C	66	110	75	10.4
16	300.47	315	C	66	110	75	11.5
18	337.58	352	C	66	110	75	12.5
20	374.72	389	C	66	110	75	14.4
24	449.11	464	C	70	115	90	18.4
28	523.56	538	C	70	115	90	23.5

For No. 77 (pitch 58.34 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	152.45	165	C	43	75	60	4.6
9	170.57	184	C	50	85	70	5.6
10	188.79	202	C	60	95	75	6.6
11	207.08	220	C	60	95	75	7.5
12	225.41	238	C	60	95	75	8.4
14	262.18	275	C	66	110	75	10.4
16	299.04	312	C	66	110	75	11.5
18	335.97	349	C	66	110	75	12.5
20	372.93	386	C	66	110	75	14.4
24	446.96	460	C	70	115	90	18.4
28	521.06	534	C	70	115	90	23.5



Sprockets for cast chains

For No. 78, 88, 488, H78 (pitch 66.27 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	173.17	189	C	60	95	75	7.5
9	193.76	210	C	60	95	75	9.5
10	214.46	230	C	60	95	75	11.0
11	235.23	251	C	63	100	75	13.0
12	256.05	272	C	63	100	75	15.0
14	297.82	314	C	63	100	90	18.5
16	339.69	355	C	70	115	90	21.8
18	381.64	397	C	70	115	90	23.0
20	423.62	439	C	70	115	90	27.0
24	507.71	523	C	70	115	90	34.0
26	549.79	566	C	80	130	90	40.0
30	633.99	650	C	80	130	90	55.0

For No. 124 (pitch 101.6 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
7	234.17	260	C	70	150	100	15.8
8	265.49	291	C	75	150	110	20.8
9	297.06	323	C	75	150	110	24.4
10	328.78	354	C	85	165	115	26.0
11	360.63	386	C	85	165	115	28.5
12	392.55	418	C	100	185	125	34.8
13	424.55	450	C	100	185	125	38.5
14	456.59	482	C	100	185	125	42.1

For No. 103, 4103, H82 (pitch 78.11 mm)

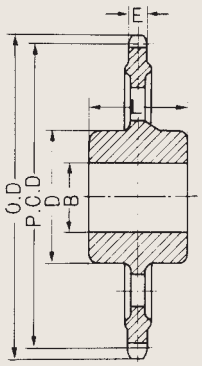
No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	204.11	226	C	70	115	90	14.0
9	228.38	250	C	70	115	90	15.0
10	252.77	275	C	85	140	90	17.0
11	277.25	299	C	85	140	90	18.5
12	301.79	324	C	85	140	90	20.0
14	351.03	373	C	85	140	90	24.2
16	400.38	422	C	85	140	100	28.6
18	449.82	472	C	85	140	100	32.0
20	499.31	521	C	85	140	100	37.0
24	598.42	620	C	85	140	115	48.0

For No. 4124 (pitch 103.20 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	269.67	301	C	85	140	115	16.0
9	301.74	333	C	85	140	115	22.0
10	333.97	365	C	85	140	115	27.0
12	398.73	430	C	95	150	115	32.0
14	463.78	495	C	95	150	125	44.7
16	528.98	560	C	95	150	125	51.3
18	594.31	625	C	100	165	140	69.0
20	659.70	691	C	100	165	140	80.0
24	790.65	822	C	100	165	140	100.0

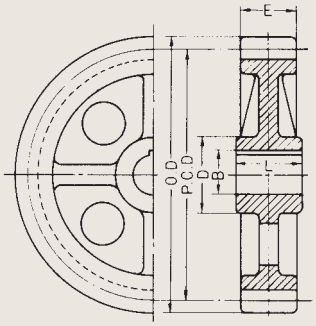
For No. 114 (pitch 82.55 mm)

No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
8	215.71	245	C	80	130	100	11.1
9	241.36	271	C	80	130	100	12.6
10	267.14	296	C	80	130	100	15.2
12	318.95	348	C	85	140	100	24.0
14	370.98	400	C	85	140	100	30.0
16	423.13	452	C	85	140	100	33.0
18	475.39	505	C	85	140	115	42.0
24	632.44	662	C	100	165	125	60.0



●Sprockets for 710 pintle chains

Note: Dimension E is Dimension E from the table of chain (plain links) dimensions.

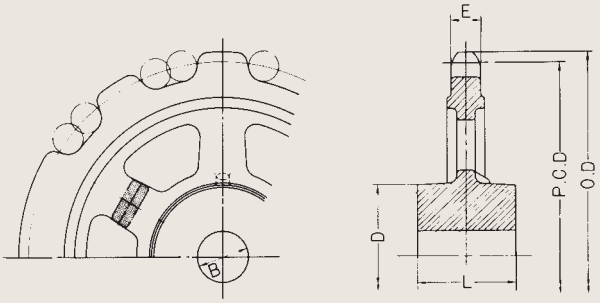


●Sprockets for drag chains

Note: Dimension E is Dimension E from the table of chain (plain links) dimensions.

Sprockets for 710 pintle chains

Chain No.	No. of teeth N.T.	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)		Boss		Mass (kg)
					Maximum	最小	Diameter D (mm)	Width L (mm)	
710	13	500.97	521	C	100	70	150	110	45.0
	20	766.40	787	C	110	70	170	125	82.0
	24	918.51	939	C	110	70	170	125	100.0



●Sprocket for combination chains

Note: Dimension E is Dimension E from the table of chain (plain links) dimensions.

For No. 55 (pitch 41.43 mm)

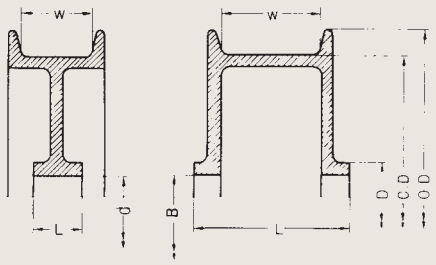
Chain No.	No. of teeth N.T.	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
						Diameter D (mm)	Width L (mm)	
C102½	10	332.09	357	C	75	150	110	26.0
	14	461.17	486	C	75	150	110	42.0
	16	526.01	551	C	75	150	110	50.0
C110	9	445.59	470	C	75	150	110	36.0
	10	493.18	518	C	75	150	110	40.0
	11	540.94	565	C	75	150	110	44.0
	13	636.82	661	C	85	170	125	59.0
C111	10	391.24	416	C	75	150	110	36.0
	13	505.19	530	C	75	150	110	52.0
	16	619.71	645	C	85	170	125	70.0

Sprockets for SD type drag chains

Chain No.	No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
SD19	6	304.80	340	90	140	110	35
	7	351.25	387	90	140	110	40
	8	398.24	434	90	140	110	48
	9	445.59	481	90	140	110	53
SD27	6	457.20	502	95	165	140	100
	7	526.88	572	95	165	140	116
	8	597.35	642	95	165	140	131
	9	668.38	713	100	175	150	149

Sprockets for DC type drag chains

Chain No.	No. of teeth N	Pitch circle diameter P.C.D. (mm)	Outer diameter O.D. (mm)	Shaft hole diameter B (mm)	Boss		Mass (kg)
					Diameter D (mm)	Width L (mm)	
DC507	6	254.00	281	65	120	100	27.3
	7	292.71	319	65	120	100	31.7
	8	331.86	358	65	120	100	36.3
	9	371.32	398	65	120	100	40.6
DC607	6	304.80	331	80	150	130	40.0
	7	351.25	378	80	150	130	47.3
	8	398.24	425	80	150	130	51.8
	9	445.59	472	80	150	130	57.0
DC613	6	304.80	331	65	130	210	65.8
	7	351.25	378	65	130	210	78.4
	8	398.24	425	65	130	210	89.8
	9	445.59	472	65	130	210	101.8
DC816	6	406.40	438	80	140	200	97.0
	7	468.34	500	80	140	200	114.0
	8	530.98	562	80	140	200	128.0
	9	594.12	629	80	140	200	144.0



A type B type

●End roller for drag chains

End rollers for drag chains

Applicable chain No.	Contact face width (mm)	Wheel outer diameter C.D. (mm)	Flange outer diameter O.D. (mm)	Type	Shaft hole diameter B (mm)	Boss		Mass (kg)
						Diameter D (mm)	Width L (mm)	
DC507 DC607	230	300	355	A	60	110	90	56
		350	405	A	60	110	120	95
		460	515	A	60	110	120	135
DC613	355	450	505	A	75	140	140	159
		600	655	A	80	140	140	221
DC816	455	450	535	B	75	140	480	209
		600	680	B	75	140	480	245

How to attach chains

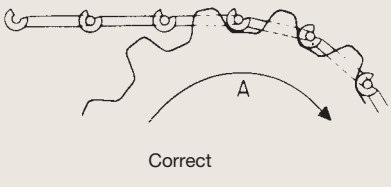
The way the chain is attached to the sprocket can impede its functional operation and accelerate wear of the chain and the sprocket

How to attach chains

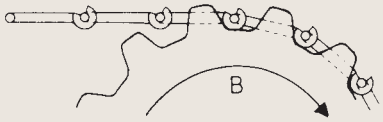
When the chain is on the sprocket and ready to turn, it must be attached so that there is no rotating wear between the barrels of the chain and the sprocket teeth.

If an offset chain (detachable chain or pintle chain) is used with a conveyor, and the sprocket meshes with the chain as shown in Figure A on the right at the driving sprocket, where there is the highest load, the only wear is between the pin and pin hole of the chain. If the chain and sprocket are meshed as shown in Figure B on the right, there is also friction between the chain barrels and the sprocket teeth, which causes accelerated tooth wear.

With non-offset chains (steel bushed chains, combination chains) alternate teeth are worn, so it is better to use the odd-numbered teeth.



Correct



Incorrect

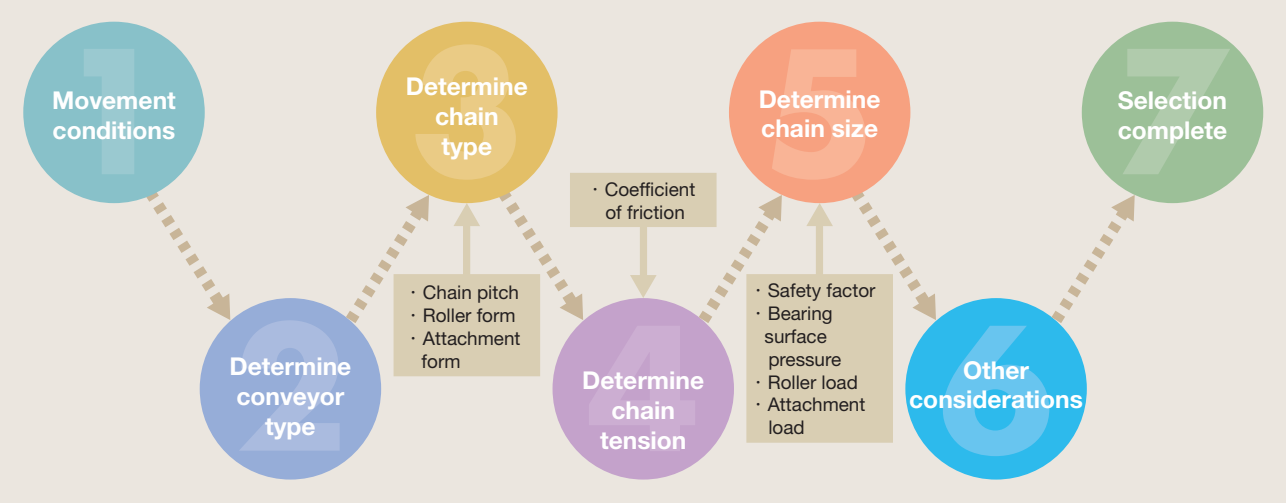
HITACHI CONVEYOR CHAINS

Selecting Conveyor Chains

Selecting conveyor chains

To select a conveyor chain, first consider the form and specifications of the conveyor and then choose the optimum chain for that conveyor.

Selection procedure



Movement conditions

Conveyor name	
Conveyed loads	
· Dimensions	
· Mass	(kg)
· Temperature	(°C)
· Corrosiveness	Normal / Mildly corrosive / Highly corrosive
· Wear	Normal / Mildly corrosive / Highly corrosive
Quantity of goods conveyed	(t/h)
· Specific gravity of loose objects	(g/mm^3)
Individual items	(kg/item)
Conveyor length	(m)
Chain speed	(m/min)
No. of chains	
Distance between chains	(m)
Operating time	(h/day)
Lubricated	Yes / No
Reverse operation possible	Yes / No
Motor used	(kW)
Ambient temperature	(°C)
Level of shock	Smooth / Light shock / Heavy shock
Cooling and drying	
Movement method	
Other conditions	

If the chain has been determined

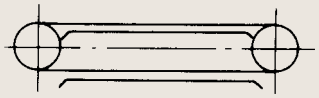
Chain No.	
Chain pitch	(mm)
Average ultimate tensile strength	(kgf)
Attachment type	
Attachment mounting interval	(per pitch)

Sprockets

Teeth	
Boss type	
Boss diameter	(mm)
Boss width	(mm)
Bore diameter	(mm)

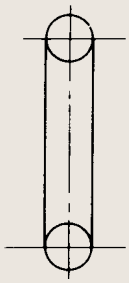
Conveyor type

Horizontal conveyor



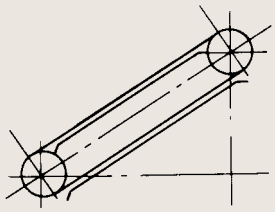
(Ex.) Slat conveyor
Apron conveyor
Case conveyor

Vertical conveyor



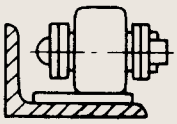
(Ex.) Bucket elevator

Inclined conveyor

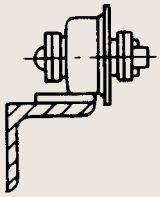


(Ex.) Scraper conveyor

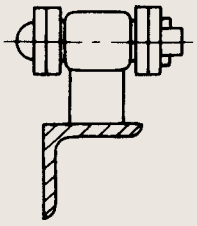
Roller type



R type roller



F type roller



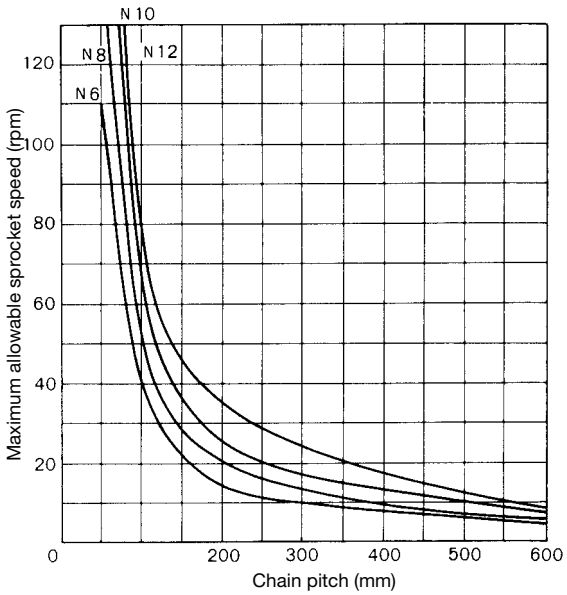
S, M type roller

Selecting chain speed and pitch

Greater chain speed leads to increased vibration of the chain and objects attached to it, and stronger shocks from meshing with the sprockets, leading to reduced chain lifespan. Therefore, the chain pitch is restricted by the speed.
In general, the selected chain pitch should be the smallest value within the range that satisfies the required conditions, as smaller pitch reduces shocks and lengthens lifespan.

The speed of the sprocket n is determined from the chain pitch by the formula below.

$$\text{Sprocket speed n (rpm)} = \frac{1000 \times \text{chain speed (m/min)}}{\text{No. of teeth N} \times \text{chain pitch (mm)}}$$



Chain pitch and maximum allowable sprocket speed related

Coefficients used in selection

1. Motor efficiency η (Mechanical transmission efficiency of the drive train)

Chain speed (m/min)	efficiency η
Up to 10	0.75
10~20	0.80
20~30	0.85
30 or more	0.90

2. Coefficient of friction μ_1 between chain and guide rail

(1) Rolling coefficient of friction μ_1 between chain and guide rail

Roller outer diameter (mm)	Oiled	Oil-less
50 or less	0.15	0.20
50~65	0.14	0.19
65~75	0.13	0.18
75~100	0.12	0.17
100 or more	0.11	0.16
Roller with bearing	0.03~0.05	
Bushed chain (sliding)	0.30	0.43

(2) Sliding coefficient of friction μ_1 between chain and guide rail

Temperature(℃)	Oiled	Oil-less
Normal~400	0.20	0.30
400~600	0.30	0.35
600~800	0.35	0.40
800 or more	–	0.45

3. Safety factor SF depending on chain speed

Chain speed (m/min)	Safety factor SF
Up to 20	7
20~30	7~9
30~40	8~10
40~50	9~13
50~60	10~15
60 or more	12~20

4. Correction factor α for running conditions

Conditions of use	Operating time per day		
	<5 hours	5~10 hours	>10 hours
Good	1.0	1.0	1.2
Normal	1.0	1.2	1.4
Somewhat bad	1.2	1.4	1.6
Very bad	1.4	1.6	1.8

"Good" conditions here means:
(1) Largely uniform loading.
(2) No shock loading.
(3) Clean atmosphere at normal temperature.
(4) Chain is well lubricated.

5. Coefficient of friction μ_2 between steel plate and the conveyed load and apparent specific gravity

Conveyed load	μ_2	Apparent specific gravity (g/cm³)
Zinc	0.72	0.44
Zinc powder	0.50	1.55~2.36
Alumina	0.36	0.74
Lead particles	0.56	4.0
Iron particles	0.50	2.04~2.36
Clinker	0.43	1.59
Phosphorous ore	0.49	1.42~1.60
Silicon or manganese ore	0.56	5.0
Titanium oxide ore	0.39	2.43
Fluorite powder	0.42	1.75~2.30
Sintered ore particles	0.40	1.57
Bauxite	0.65	0.09~1.30
Raw silica	0.53	0.25
Silica sand	0.46	1.34
Cement	0.54	1.15~1.58
Cement firing dust	0.50	0.88~1.18
Cokes	0.32	0.50
Lime dust	0.53~0.64	0.48
Kaolin	0.50	1.06
Slaked lime	0.53	0.42
Calcium carbonate	0.83	0.17
Thenardite	0.49	0.85
Chemical fertilizer	0.55	1.13
Urea	0.64	0.54~0.69
Acetate raw material	0.58	0.34
Wood chips	0.69	0.21
Vinyl chloride powder	0.29	0.61
Vinyl pellets	0.46	0.75
Pellets	0.53	0.50
Wheat	0.50	0.70~0.77
Barley	0.48	0.75
Starch	0.55	0.62

Caution

- Values presented here are averages for general usage conditions. They may not be applicable to special conditions. In such cases, please consult us.

Chain size determination

Chain size is determined by multiplying the calculated chain tension (see p.151) by the safety factor SF for the chain speed, and the correction factor for operating conditions to find the necessary strength, then choosing a chain size that satisfies the strength requirement.

calculated tension × speed-based safety factor SF × correction factor for operating conditions α ≦ average ultimate tensile strength

Caution

- This formula is a basic approach to chain selection. When making the actual selection, it is also necessary to consider the environment in which the chain will be used (presence of abrasive wear, corrosiveness, high and low temperatures, etc.) as well as strength.
- Refer to p143 "Selecting based on atmosphere."

Guidelines for allowable average surface pressure on bearings

Chain friction is influenced by allowable bearing surface pressure.
In particular, it is strongly affected by the material the chain contacts, its hardness and the precision of its machining.
The table below shows allowable average bearing surface pressures for combinations of materials used with ordinary chains.

Allowable average bearing surface pressures (kg/cm^2)

Combination of materials	P_1 when meshed with sprocket	When running	
		P_2	P_3
Carburized steel - carburized steel	300	60	25
Carburized steel - hardened steel	250	60	20
Carburized steel - hardened steel	200	55	20
Hardened steel - hardened steel	230	50	17
Carburized steel - high-frequency hardened steel	230	60	25
Hardened steel - high-frequency hardened steel	220	55	25
Carburized steel - non-hardened steel	180	30	17
Carburized steel - cast steel	–	25	17

How to calculate average bearing surface pressure

(1) Pressure P_1 between pin and bush

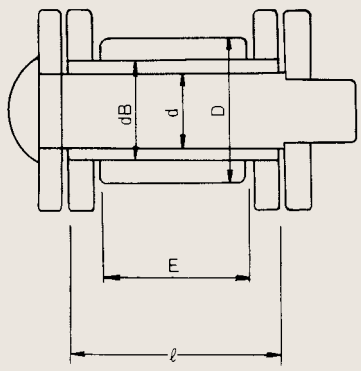
$$P1 = \frac{\text{chain tension}}{d \times \ell} \ (\text{kg/cm}^2)$$

(2) Pressure P_2 between bush and roller

$$P2 = \frac{\text{roller load}}{dB \times E} \ (\text{kg/cm}^2)$$

(3) Pressure P3 (rolling pressure) between roller and rail

$$P3 = \frac{\text{roller load}}{D \times E} \ (\text{kg/cm}^2)$$



Base dimension used in surface pressure calculation

Caution

- Values presented in the table above are valid when there is appropriate lubrication and there are no special atmospheric conditions. Consult us about cases when the chain is used in special conditions.

Chain tension calculation

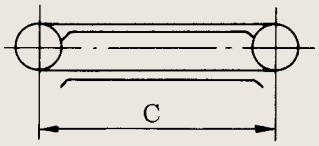
The maximum tension on the chain can be calculated.

Caution

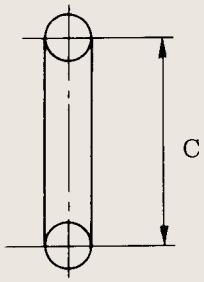
- Note that shock loadings when starting up or in motion differ depending on the conveyor structure, the nature of the load carried, the running conditions and other factors.

Symbols used in the calculation

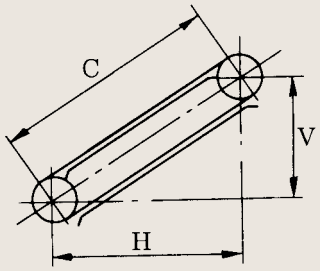
Horizontal conveyor



Vertical conveyor



Inclined conveyor



Symbol	Meaning	Units
T	Maximum tension acting on the chain	kgf
Q	Maximum quantity conveyed	t/hr
S	Movement speed (chain speed)	m/min
C	Distance between sprocket centers	m
V	Vertical distance between sprocket centers	m
H	Horizontal distance between sprocket centers	m
ω	Mass of moving parts (chains, buckets, apron etc.)	kg/m
μ1	Coefficient of friction between chain and guide rail	—
μ2	Coefficient of friction between the load and side and bottom plates	—
η	Mechanical transmission efficiency of drive train	—
kW	Required power	kW
W	Total moved mass on the conveyor	kg

Formula for chain tension calculation

Type of conveying			Calculation formula	
			Chain tension	Required power
Horizontal conveying	Load is placed on conveyor and moved (Slat conveyor, apron conveyor, etc.)	Movement of individual items	$T=(W+2.1\times\omega\times C)\times\mu_1$	$kW=\frac{T\times S}{6120}\times\frac{1}{\eta}$
		Movement of loose items	$T=(16.7\times\frac{Q}{S}+2.1\times\omega)\times C\times\mu_1$	
	Load is scraped up and carried (Flight conveyor etc.)	—	$T=(16.7\times\frac{Q}{S}\times\mu_2+2.1\times\omega\times\mu_1)\times C$	
Vertical conveying	Load is carried suspended (Tray elevator etc.)	Movement of individual items	$T=(W+\omega\times C)$	$kW=\frac{Q\times C}{366}\times\frac{1}{\eta}$
	Load is particulate (Bucket elevator etc.)	Movement of loose items	$T=(16.7\times\frac{Q}{S}+\omega)\times C$ **Caution** Considering the load increase when load is placed in the buckets of a bucket elevator, increase the distance C between sprocket centers by the value below for the purpose of calculation. Continuous bucket elevator 1.5m Intermittent bucket elevator 3.0m	
Inclined conveying	Load is placed on conveyor and moved (Slat conveyor, apron conveyor, etc.)	Movement of individual items	$T=(W+\omega\times C)\times(\frac{H\times\mu_1+V}{C})+1.1\times\omega\times(H\times\mu_1-V)$	$kW=\frac{T\times S}{6120}\times\frac{1}{\eta}\times\{T-\omega\times(V-H\times\mu_1)\}$
		Movement of loose items	$T=(16.7\times\frac{Q}{S}+\omega)\times(H\times\mu_1+V)+1.1\times\omega\times(H\times\mu_1-V)$	
	Load is scraped up and carried (Flight conveyor etc.)	—	$T=(16.7\times\frac{Q}{S}\times(H\times\mu_2+V)+\omega\times(H\times\mu_1+V)+1.1\times\omega\times(H\times\mu_1-V)$	
	—		**Caution** In the formula for T, take ($H\times\mu1-V=0$) when ($H\times\mu1-V<0$) In the formula for kW, take ($V-H\times\mu1=0$) when ($V-H\times\mu1<0$)	

Selecting based on atmosphere

When the chain is used in atmospheres as described below, a chain which meets the materials and hardness requirements for the atmosphere must be selected.

1. Abrasive environment

Conveying highly abrasive materials such as sand or cokes (as in case conveyors, bucket elevators, scraper conveyors etc.) leads to more rapid wear as the load penetrates to spaces between inner and outer link plates, between pins and bushes, and between bushes and rollers.

The following countermeasures are effective:

(1) Use a chain one size larger to reduce the bearing surface pressure (between pins and bushes, and between bushes and rollers).

(2) Lower the chain speed to reduce the frequency of meshing with the sprockets.

(3) Use special steels, such as chrome molybdenum steel or bearing steel, for components, and harden them by heat treating to enhance wear resistance.

(4) Increase the thickness of the bushes to lower bearing surface pressure, and use wear-resistant steel.

2. When the chain is affected by temperature

(1) When the chain is used in high temperatures

When the chain passes through a drying kiln or carries hot materials, the effect of temperature on the chain must be considered.

If the ambient temperature is around 200℃, a normal specification chain can be used. When the chain is exposed to 300℃ and above, the effect of hardening is reduced, shortening the life of the chain. In such cases, special alloy steel must be used.

(2) When the chain is used in low temperatures

In general, the extension and drawing of materials reduces as the temperature lowers.

In particular, impact values drop sharply with falling temperature, so that must be considered when selecting a chain.

Typical materials used for high temperatures

Usage temperature (℃)	Materials used
Normal～200	Standard material
～450	Special alloy steel, stainless steel
～700	Stainless steel

Typical materials used for low temperatures

Usage temperature (℃)	Materials used
Normal～−10	Standard material
～−30	Special alloy steel, stainless steel
～−60	Stainless steel

Caution

- The materials indicated here are typical examples. Please consult us about the selection of specific materials.
- When selecting a chain according to the temperature it will be used in please choose carefully and bear in mind the following temperature related phenomena.

(1) For high temperatures
- Loss of strength due to material oxidation by heat.
- Accelerated wear due to the diminished effects of heat treatment.
- Poor rotation and flexure due to thermal expansion.
- Reduced lubrication effect due to carbonization of oil.

(2) For low temperatures
- Reduced strength due to low-temperature brittleness.
- Poor rotation and flexure due to freezing of moisture.
- Seizure due to freezing of lubricant oil

3. When the chain is exposed to water or steam

When the chain is directly exposed to water, as in washing equipment, disinfection equipment and water screens, or when it passes through heated steam, oxidation of the chain can reduce the lifespan of the chain. If necessary in such situations, take anti-corrosion measures such as painting, or use a special corrosion-resistant material such as stainless steel.

Sea water requires particular care as it causes both corrosion and abrasive wear.

Clearances between components should be kept as large as possible to avoid corrosive seizure.

4. When there is chemical action, such as acidic or alkaline substances

When the chain is exposed to sulfuric or nitric acid etc., corrosion is added to mechanical wear, accelerating wear.

Chains are more easily penetrated by acids than by alkalis.

Care is also required because there is the possibility of stress corrosion fractures, even under low loading, or cracking can start from joints due to hydrogen embrittlement.

Typical materials used for corrosion resistance

Liquid name	Standard material	400 class stainless steel	300 class stainless steel
Water	×	○	○
Steam	×	○	○
Soapy water	△	○	○
Ammonia water	△	○	○
Caustic soda	×	○	○
Sea water	×	×	△
Hydrochloric acid	×	×	×
Sulfuric acid	×	×	×
Acetic acid	×	×	○
Phosphoric acid	×	×	△
Nitric acid	×	△	○
Hydrogen fluoride	×	×	×
Ligneous acid	×	△	○
Sewage sludge	×	○	○

(O: Corrosion resistant △: Some corrosion resistance X: Not corrosion resistant)

Caution

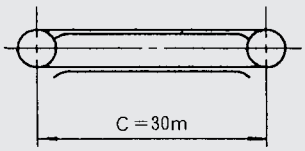
・This table presents typical examples, but it is important to check the corrosion resistance of the chain in advance, with reference to the usage conditions, before making the selection.

Selection example 1

Conveyor name Slat conveyor, apron conveyor (horizontal)

Conveyor summary

Quantity conveyed	Q	100 (t/h)
Conveyor length	C	30 (m)
Chain speed	S	5 (m/min)
No. of chains	n	2 (strands)
Chain used		
Chain pitch	P	200 (mm)
Roller type		F type roller
Attachments		A-2 attachment on each link
Slat mass	W	25kg/slat
Teeth per sprocket	N	12
Operating time		24 (h/day)
Lubrication conditions		Oil-less



Selection procedure

(1) No. of chain links L

$$L=\left\{\left(\frac{\text{Conveyor length C}}{\text{Chain pitch P}}\times 2\right)+\text{Sprocket teeth N}\right\}\times\text{No. of chains n}$$

$$=\left\{\left(\frac{30000}{200}\times 2\right)+12\right\}\times 2=624\ (\text{links})$$

(2) Chain tension calculation

①Calculate the force F1 required to move the load only.

・Mass of load on the conveyor W_1

$$W_1=16.7\times\frac{\text{Conveyed quantity Q}}{\text{Chain speed S}}\times\text{Conveyor length C}$$

$$=16.7\times\frac{100}{5}\times 30=10020\ (\text{kg})$$

・Rolling coefficient of friction μ_1 between chain and guide rail

Chain is oil-less, so according to the table on p139

$\mu_1=0.2$(Provisional)

・Calculate F_1

$F_1=W_1\times\mu_1=10020\times 0.2=2004\ (\text{kgf})$

②Calculate force F_2 required to move the moving parts only.

Chain mass is unknown, so calculate from the mass of slats.

・Slat mass W_2 per meter

$$W_2=\text{Slat mass W}\times\frac{1000}{\text{Chain pitch P}}$$

$$=25\times\frac{1000}{200}=125\ (\text{kg/m})$$

・Calculate F_2

$F_2=2.1\times W_2\times$conveyor length C$\times$coefficient of friction$\mu_1=2.1\times 125\times 30\times 0.2=1575$ (kgf)

③Calculate the force F required to move the conveyor

$F=F_1+F_2=2004+1575=3579$ (kgf)

(3) Provisionally select a chain with average ultimate tensile strength at least ten times as high as the F calculated in step (2).

・F×10＝35790 (kgf)

・Average ultimate tensile strength of Chain No. HR20019-F is 25000 (kgf) ×2 chains＝50000 (kgf)

Therefore provisionally set HR20019-F with A-2 on each link.

(4) Formally calculate chain tensile strength

①Calculate chain tension T_2 for 2 chains

From the formula on p152. (Horizontal conveying—load placed and carried—loose items)

$$T_2 = (16.7 \times \frac{\text{Conveyed quantity Q}}{\text{Chain speed S}} + 2.1 \times \omega) \times \text{Conveyor length C} \times \text{Coefficient of friction} \mu_1$$

Where ω is the mass of moving parts per meter.

$\omega = (W_3 + W_4) \times 2 + W_2 = (19.8 + 3.25) \times 2 + 125 = 171.1$ (kg)

W_3 : Chain mass (kg/m)

From p18, $W_3 = 19.8$ (kg/m)

W_4 : Added mass of attachments A-2 (kg/m)

From p23, the added mass per A-2 attachment is 0.65kg, so

$$W_4 = 0.65 \times \frac{1000}{200} = 3.25 \text{ (kg/m)}$$

W_2 : Slat mass (kg/m)

From (2)

$W_2 = 125$ (kg/m)

μ_1 : Coefficient of friction

From the table on p149

$\mu_1 = 0.17$

$$T_2 = (16.7 \times \frac{100}{5} + 2.1 \times 171.1) \times 30 \times 0.17 = 3536 \text{ (kgf)}$$

②Calculate chain tension T_1 for one chain

From the chain tension calculated for 2 chains in ①, allowing for eccentric loading,

$$T_1 = \frac{T_2}{2} \times 1.2 = \frac{3536}{2} \times 1.2 = 2122 \text{ (kgf)}$$

Caution

- In this example, tension was multiplied by a factor of 1.2 to represent an increase of 20% due to eccentric loading when two chains are used.

(5) Calculate the safety factor to check whether the provisionally selected chain is suitable.

$$\text{Safety factor} = \frac{\text{Average ultimate tensile strength}}{T_1} = \frac{25000}{2122} = 11.8 > 10$$

The above indicates that the provisionally selected HR20019-F with A-2 on each link can be used.

Caution

- When making the actual selection, consider the usage environment (presence of abrasive or corrosive atmosphere, high or low temperature, etc.) as well as strength.
- Refer to p.153 "Selecting based on atmosphere".

(6) Calculate required power in kW.

From the formulae on p152 (horizontal conveying—Load is placed on conveyor and moved—Movement of loose material)

$$kW = \frac{\text{Maximum tension T acting on the chain x chain speed S}}{6120} \times \frac{1}{\eta}$$

Using T_2 for the chain tension in two chains, as calculated in (4),

$T = T_2 = 3536$ (kgf)

From the table on p149, mechanical transmission efficiency of the drive train.

$\eta = 0.75$

$$kW = \frac{3536 \times 5}{6120} \times \frac{1}{0.75} = 3.9 \text{ (kW)}$$

(7) Calculate drive sprocket speed r.

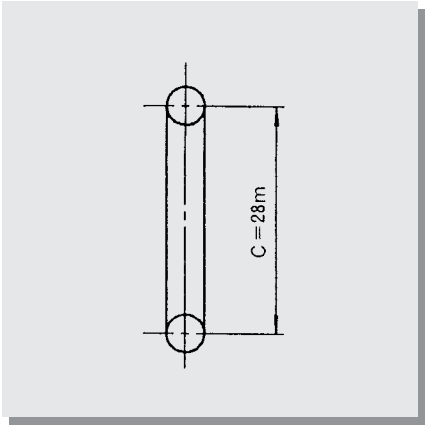
$$r = \frac{1000 \times \text{chain speed S}}{\text{Sprocket teeth N} \times \text{Chain pitch P}} = \frac{1000 \times 5}{12 \times 200} = 2.08 \text{ (rpm)}$$

Selection example 2

Conveyor name Conveyor name Continuous bucket elevator (vertical)

Conveyor summary

Quantity conveyed	Q	100 (t/h)
Conveyor length	C	28 (m)
Chain speed	S	30 (m/min)
No. of chains	n	2 (strands)
Chain used		
Chain pitch	P	250 (mm)
Roller type		S type roller
Attachments		G-4 attachment on alternate links
Bucket mass	W	25kg/Bucket
Teeth per sprocket	N	12
Operating time		24 (h/day)
Lubrication conditions		Oil-less



Selection procedure

(1) No. of chain links L

$$L=\{(\frac{\text{Conveyor length C}}{\text{Chain pitch P}}\times 2)+\text{Sprocket teeth N}\}\times\text{No. of chains n}$$

$$=\{(\frac{28000}{250}\times 2)+12\}\times 2=472\ (\text{links})$$

(2) Chain tension calculation

①Mass of load on the conveyor W_1

$$W_1=16.7\times\frac{\text{Conveyed quantity Q}}{\text{Chain speed S}}\times\text{Conveyor length C}$$

$$=16.7\times\frac{100}{30}\times 28=1559\ (\text{kg})$$

②Calculate mass of moving parts W_2

Chain mass is unknown, so calculate from the mass of buckets.

$W_2=W_3\times$Conveyor length C

Where W_3 is the mass of buckets per 1m. (kg/m)

$$W_3=\text{Bucket mass W}\times\frac{1000}{2\times\text{chain pitch P}}$$

$$=25\times\frac{1000}{2\times 250}=50\ (\text{kg/m})$$

$W_2=50\times 28=1400$ (kg)

③Calculated chain tension T

$T=W_1+W_2=1559+1400=2959$ (kgf)

(3) Provisionally select a chain for which the safety factor would be approximately 10.

Provisionally select a chain with average ultimate tensile strength at least ten times as high as the T calculated in step (2).

- $T\times 10=29590$ (kgf)
- Average ultimate tensile strength of Chain No. HR25019-S is 25000 (kgf) ×2 chains=50000 (kgf)

Therefore provisionally select HR25019-S with G-4 on alternate links.

(4) Formally calculate chain tensile strength

①Calculate chain tension T_2 for 2 chains

From the formula on p152. (Vertical conveying— particulate load—loose material)

$$T_2=(16.7\times\frac{\text{Conveyed quantity Q}}{\text{Chain speed S}}+\omega)\times\text{Conveyor length C}$$

Where ω is the mass of moving parts per 1m.

$\omega=(W_4+W_5)\times2+W_3=(11.1+3.4)\times2+50=79$ (kg)

W_4 : Chain mass (kg/m)

From p19, $W_4=11.1$ (kg/m)

W_5 : Added mass of G-4 attachments (kg/m)

From p25, the mass of one G-4 attachment is 1.7kg, so

$$W_5=1.7\times\frac{1000}{2\times250}=3.4\ (\text{kg/m})$$

W_3 : Bucket mass (kg/m)

From (2)

$W_3=50$ (kg/m)

$$T_2=(16.7\times\frac{100}{30}+79)\times(28+1.5)=3973\ (\text{kgf})$$

②Calculate chain tension T_1 per chain

From the chain tension calculated for 2 chains in ①, allowing for eccentric loading,

$$T_1=\frac{T_2}{2}\times1.2=\frac{3973}{2}\times1.2=2384\ (\text{kgf})$$

Caution

- In this example, tension was multiplied by a factor of 1.2 to represent an increase of 20% due to eccentric loading when two chains are used.

(5) Calculate the safety factor to check whether the provisionally selected chain is suitable.

$$\text{Safety factor}=\frac{\text{Average ultimate tensile strength}}{T_1}=\frac{25000}{2384}=10.5>10$$

The above indicates that the provisionally selected HR25019-S with G-4 on alternate links can be used.

Caution

- When making the actual selection, consider the usage environment (presence of abrasive or corrosive atmosphere, high or low temperature, etc.) as well as strength.
- Refer to p.153 "Selection based on atmosphere".

(6) Calculate required power in kW.

From the formulae on p152. (Vertical conveying—particulate load—movement of loose material)

$$kW=\frac{\text{Quantity moved Q}\times\text{Conveyor length C}}{366}\times\frac{1}{\eta}$$

Where η is the mechanical transmission efficiency of the drive train from the table on p149.

$\eta=0.85$

$$kW=\frac{100\times(28+1.5)}{366}\times\frac{1}{0.85}=9.5\ (\text{kW})$$

(7) Calculate drive sprocket speed r.

$$r=\frac{1000\times\text{chain speed S}}{\text{Sprocket teeth N}\times\text{Chain pitch P}}=\frac{1000\times30}{12\times250}=10\ (\text{rpm})$$

HITACHI CONVEYOR CHAINS

Handling Conveyor Chains and Sprockets

Handling Conveyor Chains and Sprockets

Pay attention to the following points when cutting and joining, maintaining, attaching, inspecting or otherwise working with conveyor chains.

⚠ Warning

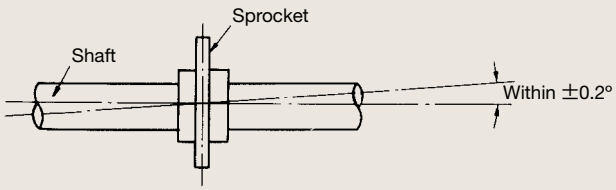
- Turn off the power supply and all other drive sources before starting work, and take precautions to make sure nobody can switch the power on by mistake.
- Always wear appropriate clothes and protective equipment (safety goggles, safety boots, etc.).
- Strictly observe the general standards of the Ordinance on Labor Safety and Hygiene, Volume 2, chapter 1, section 1 (see p.174).

Attachment

Incorrect sprocket attachment can have a major impact on the smooth operation of the conveyor, and can cause eccentric load on the chains, greatly shortening their service life. The general attachment and alignment methods and allowable values are presented below.

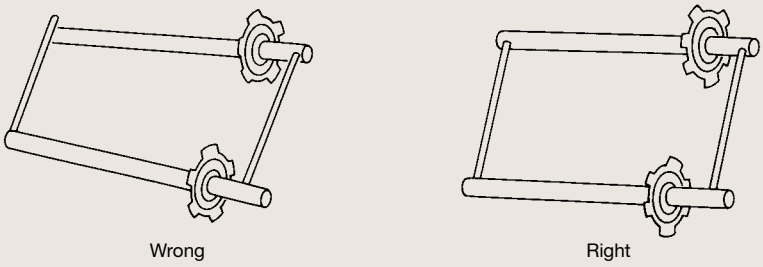
Shaft horizontality

Adjust the horizontality of the shaft to +/-0.2°, using a level.



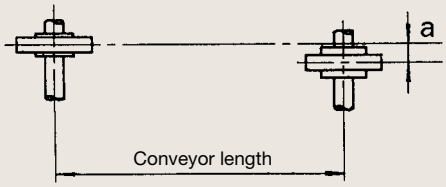
Shaft parallelism

Use a scale, piano wire etc. to adjust the parallelism of the shafts to within +/-1mm.



Sprocket alignment

Use a straight edge to adjust the toothed sides (machined parts) of the pair of sprockets, so that distance "a" is within the allowable value (guideline).
If the conveyor is long, use piano wire etc. for measurement. When doing so, turn the sprockets to make sure there is no inconsistency in the value of "a".



Caution

- When using sprockets in parallel, make sure their teeth are in phase.

Cutting and joining

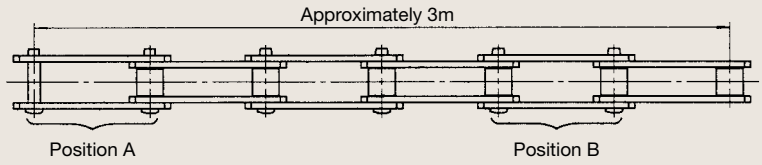
For ease of handling conveyor chains, they are divided into lengths of approximately 3m long, so they must be joined on site to make the required length. They must also be cut and spliced when replaced. The method is described below.

Caution

- Use jigs (stands, press plates) for cutting and joining work.

How to cut a conveyor chain

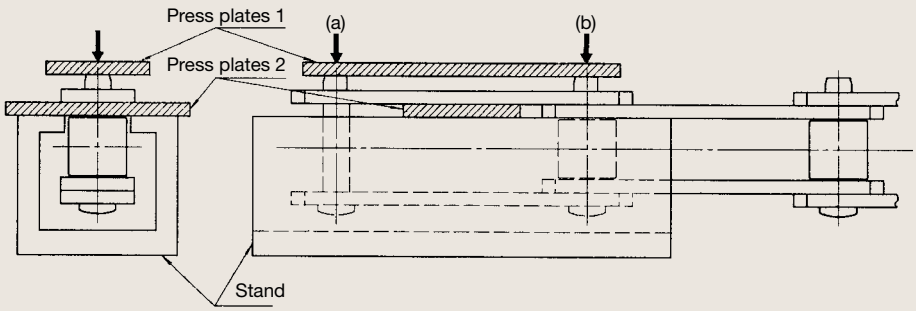
Conveyor chains are delivered in approximately the form below. Follow the methods below to disassemble the chain at a joint end (position A), or at the middle (position B).



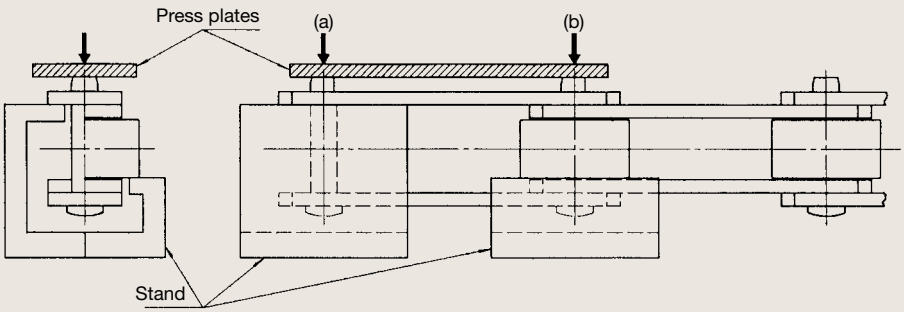
How to cut at a joint end

To cut the joint end, use a stand as shown in the diagram below, place press plates 1 and 2 over the pins, then hit (a) and (b) alternately with a hammer, to remove the pins.

With an S (M) type roller



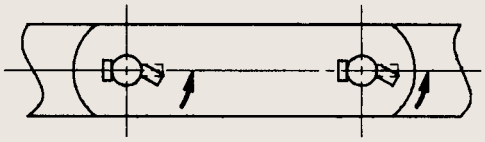
With an R (F) type roller



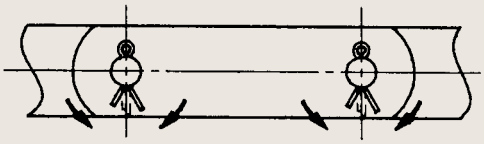
Central disassembly

(1) Extract the T pins (split pins)

Remove the two split pins at the break point. Use a spanner or pliers to straighten bent T pins or split pins for extraction.



T pin



Split pin

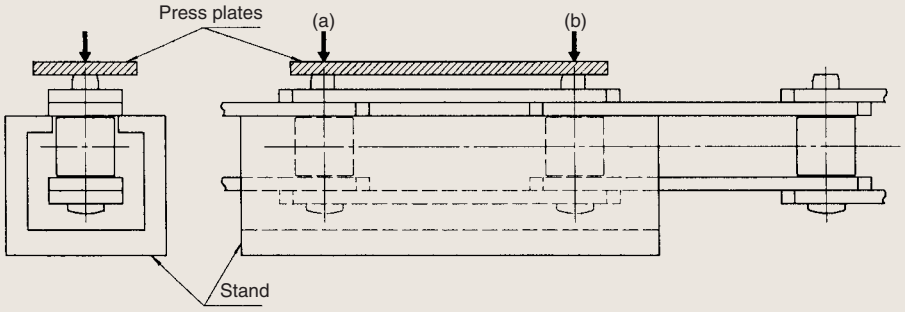
Caution

- Do not reuse straightened T pins or split pins.

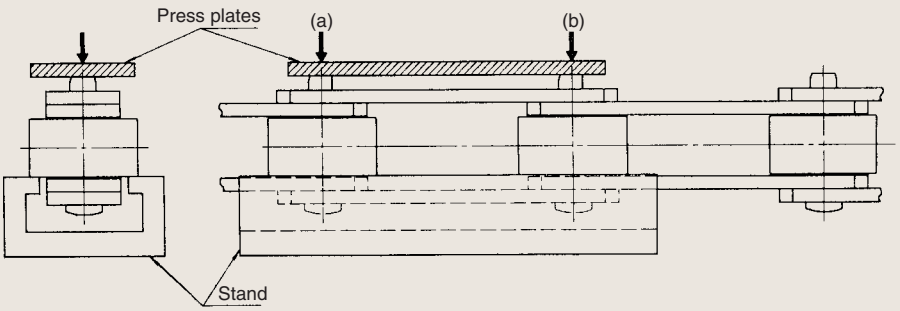
(2) Extract the pins

To break a chain in the center, use the stand as shown below, place press plates against the pins, and then hit (a) and (b) alternately with a hammer, to remove the pins.

With an S (M) type roller



With an R (F)-type roller



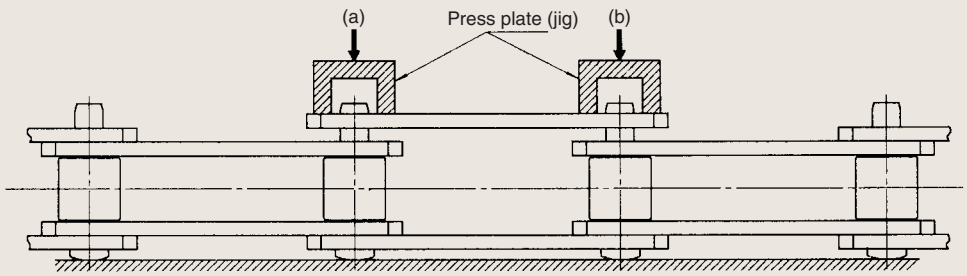
Caution

- You must place press plates over the pins before hitting them with a hammer.
- The pins are hardened by heat treatment, so they could break if struck directly, possibly causing injury.

How to join conveyor chains

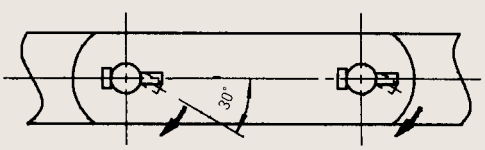
(1) Chain joining (push fitting outer plates)

To join the chains, use press plates (jigs), as shown in the diagram below, to strike alternately around the holes at (a) and (b), pushing the plate into place.

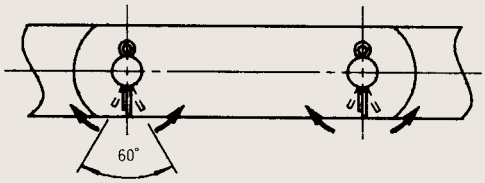


(1) T pin (split pin) bending

After pressing the outer plate into place, insert the T pins (split pins) and bend them securely.



T pin



Split pin

Caution

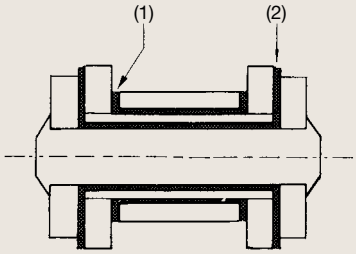
- Use a spanner or pliers to bend the T pins (split pins). Avoid hitting them with a hammer.
- Bend T pins through 30° and split pins through 60°, as standard.

Lubrication (oiling)

Lubrication of conveyor chains is extremely important. Without proper lubrication, the chain will run through its lifespan much more quickly. It is becoming more common for standard conveyor chains to be used in very harsh conditions, making lubrication even more important than before. In some cases, the usage environment may make lubrication impossible. Consult us in such cases.
This section explains oiling points, oiling methods, types of lubricant oil and related matters. Always observe these instructions when oiling chains.

Oiling locations and methods

Oil the chain at points (1) and (2) with a dropper or a brush.



Caution

- When a new chain is first used, there is initial wear as the sliding surfaces run in, so oil as frequently as possible at that time.
- Chains are treated with anti-corrosion oil when shipped, but they should be thoroughly oiled and greased before use, and should be run unladen for 30 minutes at first.

Types of lubricant oil

Commercially available lubricant oil (reference)

Viscosity \ Manufacturer		Idemitsu Kosan	Japan Energy	Mitsubishi Sekiyu	Nisseki	Showa Shell
ISO VG	150	Daphne Super gear oil 150	Reductus 150	Diamond gear oil SP150	Bonnoc SP150	Omala Oil 150
	220	Daphne Super gear oil 220	Reductus 220	Diamond gear oil SP220	Bonnoc SP220	Omala Oil 220

Caution

- Special oil is required if the ambient temperature falls to 0℃ or below, or rises to 50℃ or above. In some environments, oiling is not possible. Consult us in such cases.

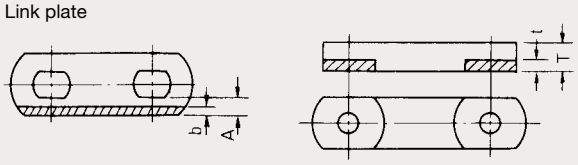
Maintenance and inspection

Guideline for replacement

Chain components wear as they are used, and the degree of wear can be used as a guideline for when to replace a chain.

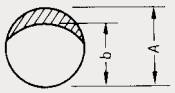
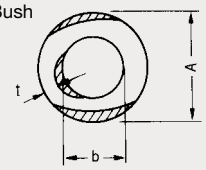
(1) Link plate wear

The undersides of link plates are worn down by contact with the load and casing. Wear is also caused by contact between inner and outer link plates, and between the inner face of the inner links and the sides of the rollers.

Component	Replacement guideline	Notes
Link plate 	$t=\frac{1}{3}T$	When the chain is subjected to lateral loads.
	$b=\frac{A}{2}$	When the link touches the guide rail.

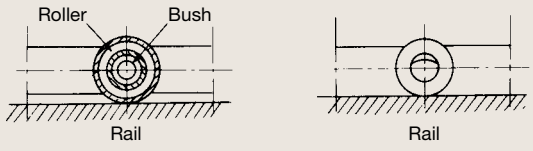
(2) Pin and bush wear

Chains flex where they mesh with sprockets, causing sliding wear between pins and bushes, which leads to pitch extension.

Component	Guideline for replacement For carburized materials	Guideline for replacement For hardened or tempered materials	Notes
Pin 	$\frac{b}{A}=0.975$	$\frac{b}{A}=0.85$	There is a risk of pin fracture when its cross-sectional area has fallen to half.
Bush 	When wear of the inner diameter has reached 0.025b.	$t=(A-b)\times\frac{1}{2}\times0.4$	

(3) Roller wear

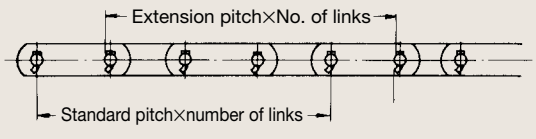
R type and F type rollers suffer increasing frictional resistance against the link plates and rails as their wear increases, increasing chain tension. That situation should be the guideline for replacement.
For S type rollers, the limit of use is reached when the roller becomes pitted or cracked.



Roller wear

(4) Chain pitch extension

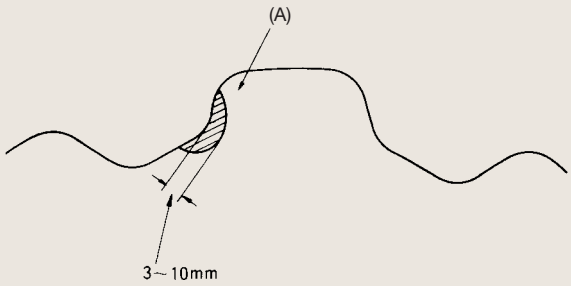
With long-term use, wear to chain pins and bushes causes the chain to lengthen, so that it runs poorly on the sprockets. Therefore, the guideline for replacement is when pitch extension reaches 2~3% of the standard dimension.
Measure chain length across four or more links, as shown in the diagram on the right.



How to measure chain length

(5) Sprocket wear

As sprocket wear progresses, it reaches the state shown in the diagram on the right, which causes the chain rollers to catch in area (A), so that it tends to wind around the roller (chain separates poorly from the sprocket). Wear at the base of the tooth varies with the size and speed of the chain, but the sprocket should be replaced or repaired when wear reaches 3~10mm.



Sprocket wear

Inspection of conveyor chains and sprockets

(1) Running inspection

- Are the chains and sprockets attached correctly ?
- Are the T pins etc. correctly attached at chain joints ? (Note the degree of pin bending).
- Is chain take up tension appropriate ? (Is the chain too slack or too tight ?).
- Are there any foreign bodies that impede the motion of the chain ?
- Is the chain properly oiled ?
- Does the chain make any abnormal sound (vibration, noise, etc.) when it moves ?

(2) Daily inspection

- Is there any abnormal vibration or noise ?
- Is the chain visibly corroded, dirty etc. ?
- Are there any abnormalities in the chain components ? (Particularly damage, deformation, uneven wear, breakage etc. of link plates and rollers).
- Do the chains and sprockets mesh smoothly ?
- Does the chain flex and the rollers roll smoothly ?
- Is there any wear extension in the chain ?
- Is there any abnormally uneven wear at points of contact between the chains and sprockets (inner faces of inner plates, sides of sprockets) ?
- Is chain tension appropriate ?
- Is the chain oiled appropriately ? (Is meshing with sprockets noisy ?)

(3) Regular inspection

- Carry out visual and measurement inspections as described in (1) and (2) above while the chain is running, at rest and removed.
- Regular inspection should be tailored to the environment and conditions of use. Increase the frequency of inspection when conditions are harsh.

(4) Identifying and correcting problems

Carry out preventive measures with reference to the table below.

Identifying and correcting problems

Problem	Potential cause	Solution
Chain rises off sprocket	· Excess chain slack. · Excess wear at the bases of sprocket teeth. · Excess chain extension. · Foreign material stuck to the bases of sprocket teeth.	· Adjust the amount of slack. · Replace the sprocket. · Replace the chain. · Remove the foreign material from the bases of the teeth.
Chain separates poorly from the sprocket	· Sprocket misalignment. · Excess chain slack. · Excess wear at the bases of sprocket teeth.	· Adjust alignment. · Adjust the amount of slack. · Replace the sprocket.
Wear to sides of link plates and sprockets	· Sprocket misalignment.	· Adjust alignment.
Poor chain flexure	· Inadequate oiling. · Foreign materials between pins and bushes. · Corrosion between pins and bushes. · Sprocket misalignment.	· Lubricate properly. · Wash the chain to remove foreign materials, then oil it. · Replace with an environment resistant chain series. · Adjust alignment.
Abnormal noise	· Chain is too taut or too loose. · Inadequate oiling. · Excess wear of sprockets and chain. · Contact with the chain case. · Damaged bearings. · Sprocket misalignment.	· Adjust slack. · Lubricate properly. · Replace chain and sprockets. · Eliminate contact with the case. · Replace the bearings. · Adjust alignment.
Chain vibration	· Excess chain slack. · Excess load variation. · Excess chain speed leading to pulsation. · Chain flexes poorly at some points. · Sprocket wear.	· Adjust slack. · Reduce load variation or replace chain. · Use guide stoppers to stop chain swaying. · Remove the affected points. · Replace the sprockets.
Damage to pins, bushes, rollers **Deformation of link plate holes**	· Inadequate oiling. · Jammed foreign bodies. · Corroded components. · Use with greater than allowable load. · Abnormal load action.	· Lubricate properly. · Remove foreign bodies. · Replace with an environment resistant chain series. · Review chain and sprocket selections. · Eliminate the abnormal load, and review chain and sprocket selections.
Overall corrosion **Corrosive wear**	· Corrosion due to moisture, acid or alkali.	· Replace with an environment resistant chain series.

HITACHI CONVEYOR CHAINS

Engineering and Construction Conveyor Equipment and Magnetic Devices

Engineering and Construction Conveyor Equipment and Magnetic Devices

Engineering and Construction Conveyor Equipment

Mud carriers

A bucket elevator designed with the properties of mud in mind, with a simple structure for easy maintenance and repair.

Centipede conveyor

A conveyor ideally suited for ready-mix concrete and sludge.

Screw conveyor

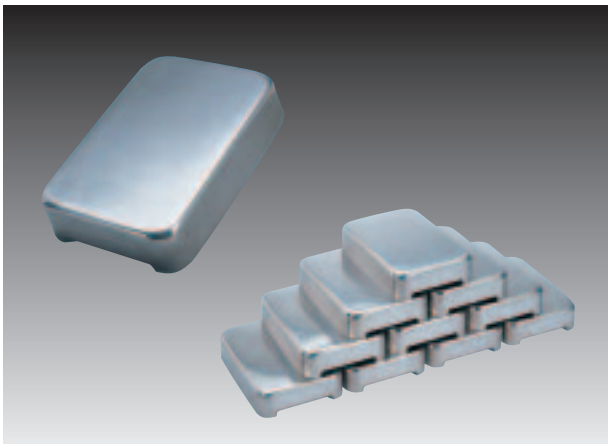
This conveyor uses a rotating screw to move the load.

Magnetic Devices

Magnetic Drum Separator

A rotating drum eliminates magnetic foreign bodies from particulate raw materials and products.

HMM type Microseparator 200



High-performance magnets are used for advanced purification of returned oil. Strong magnetism effectively extracts abrasives and fine scale out of circulated oil.

Lift power

Compact, light and portable magnets for applications such as moving steel components in a materials warehouse.

Precautions for Handling Chains and Sprockets

Extracted from Japan Chain Industry Association documents

Handle chains, sprockets and related components correctly, based on an awareness of their structures and specifications, to avoid errors in handling, attachment, use and maintenance.

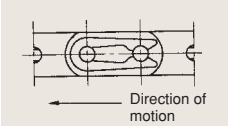
1. Precautions for Handling Chains and Sprockets

Observe the following instructions when moving and handling chains and sprockets and cutting and joining chains.

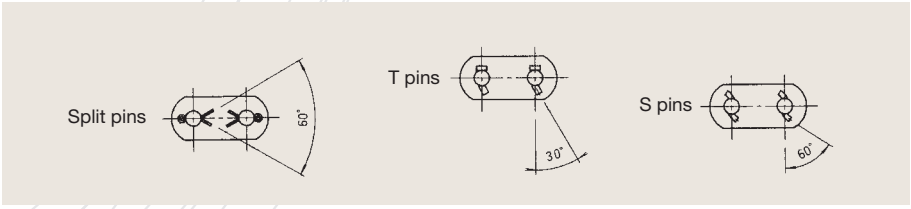
a) Wear suitable clothing and protective equipment (safety glasses, safety boots, etc.) when working.
b) Support the chain, and make sure the chain and other components are not free to move.
c) We recommend the use of press equipment. The jigs used with presses must be in good condition and used correctly.
d) Extract and insert pins from the right direction.
e) Follow the "Precautions for handling" when attaching chains and sprockets.
f) People close to the working area、even if not involved in the job, must observe the above precautions.
g) Strictly observe the general standards of the Industrial Safety and Health Law, Volume 2, chapter 1, section 1
h) Be sure to turn off the power.
Before starting work to attach or detach chains or sprockets, or to oil, inspect or service them, always turn off the electrical power and all other power sources, and take precautions to make sure nobody can turn them on by mistake.
i) Special precautions when using hoisting equipment
When using a chain in hoisting equipment, never enter the area immediately under it.
j) Prevention of secondary damage
Keep your surroundings tidy and work safely to avoid secondary damage.
k) Partial replacement of chains is hazardous
When replacing worn chains or sprockets, avoid replacing only the worn or damaged portions with new parts. You are advised to replace the whole chain or sprocket with new.
l) Re-machining chains is hazardous
Nearly all chain components are heat treated, with a few exceptions. It is very dangerous to re-machine such products.
A. Never electroplate heat-treated chains or sprockets, as it can cause hydrogen embrittlement fracture.
B. Never weld heat-treated chains or sprockets or their components. They could crack, and heat effects can reduce their strength.
C. Never anneal heat-treated chains or sprockets or their components. After using a blowtorch or other heat source to heat or cut a chain, be sure to remove all components on either side of the heated area that may have been affected by heat.

2. Precautions for chain assembly and attachment

a) Refer closely to section 1 above.
b) Joints
A. Cover plates
i. Slip-fit plates Easy to fit.
ii. Knock-in plates Knock into place with a hammer.
iii. Press fit in plates Fit with a press
B. Spring clips
Insert far enough, and from the right direction.
C. Cotter pins
Do not use commercially available split pins.
Set cotter pins correctly, as in the diagram.



Spring clip insertion direction



Examples of cotter pin insertion

c) If it is difficult to fit cover plates during assembly, or for any other reason, never drill the hole larger, file the pin narrower or use similar methods.
d) Do not reuse spring clips, split pins and similar components.
e) Adjustment of chain and sprocket equipment
For chains to run correctly, they must be positioned on the same line, and the sprocket shafts must be parallel, such that they are perpendicular to the chains. If the sprockets are not in the same line, the chain will be twisted when used, severely degrading its performance.
f) After assembly and mounting and before applying power, check the following:
A. Are the joints accurately and thoroughly joined?
B. Does the chain mesh well with the sprocket teeth?
C. Are there any objects placed nearby that could interfere with the moving parts or fly off?
D. Attach all safety covers before switching on.
E. Switch off if you hear any abnormal noises.
F. Are any moving parts clashing with the safety covers?
G. Are any parts clashing with the chains?
H. Is anything wrong with the joints?
Check the above and similar points, remove anything that interferes with the mechanisms, reassemble the joints and any other measures that may be necessary, then put the covers back and start the equipment moving again.

3. Attach preventive safety equipment without fail

Always attach preventive safety equipment (safety covers) to chain and sprocket devices. If a chain breaks due to an unexpected overload, it can fly off the sprockets with great force. In addition to adequate safety covers, equip the machinery with load regulators to prevent unexpected overloads, and with brakes or other systems to stop the chains.

4. Removal of interfering objects

Objects which get in the way of drive chains and sprockets are dangerous in themselves, and they shorten the service lives of the chains and sprockets. Always check for the presence of such objects, and remove them.

5. Oiling

With the exceptions of some special materials and structures, most chains need lubrication, which can give them a considerable lifespan. Conversely, a chain that needs lubrication and does not get it will have a shorter lifespan than would otherwise be expected. Some components will suffer wear leading to chain extension, rusting, corrosion, reduced flexibility and other defects.
If the chain is to be used in an environment where lubrication is not possible, the chain must be selected to withstand that environment.

6. Washing

Washing chains and sprockets
Do not use acids, alkalis, gasoline or volatile solvents to wash chains. Soak the chain in kerosene for washing, then oil it thoroughly.

7. Chain lifespan and sprocket lifespan

Even for identical types and dimensions of chains and sprockets, the chain lifespan can differ greatly due to factors such as environmental conditions where they are used, the numbers of teeth on the sprockets, the state of oiling and various other conditions. The same is true of sprockets. Naturally, the lifespan of a sprocket is not the same as that of a chain. Putting a new chain with an old sprocket with worn teeth, or new sprockets with a chain that has extended with wear and is near the end of its service life, will result in malfunctions, possibly including chain fractures.

Volume 2 Safety Standards

Chapter 1 Prevention of hazards due to machinery

Section1 General standards

(Prevention of hazards due to motors, rotating shafts and similar equipment)

Article 101 The business operator must provide mechanical equipment, such as motors, rotating shafts, gears, pulleys, belts and other elements which could threaten workers, with covers, barriers, sleeves, footbridges and other necessary devices. (Source 20(1))

2 The business operator shall use fastenings for rotating shafts, gears, pulleys,
flywheels and similar devices that are embedded or provided with a cover. (Source 20(1))

3 The business operator shall not use projecting fittings in the seams of belts. (Source 20(1))

4 The footbridges provided by the business operator under article 1 shall be provided by hand rails 90cm high. (Source (20(1))

5 When a footbridge is available, the worker must use said footbridge. (Source 26)

(Prevention of hazards due to breakage of belts)

Article 102 Where a belt passes over a passage or working area, and where said belt is 3m or more between pulleys, 15cm or more wide, or runs at a speed of 10m/s or more, the business operator shall install barriers surrounding the area beneath the belt. (Source 20(1))

(Power cutoff devices)

Article 103 The business operator shall provide a power cutoff device, such as a switch, clutch or belt shifter, for every machine. However, this requirement need not apply to a series of linked machines which have a single, common power cutoff device, and which do not require physical human action within the process to feed in or remove raw materials etc. (Source 20(1))

2 Where the machinery in the preceding article includes machining functions such as cutting, extracting, compressing, striking out, bending or squeezing, the business operator shall provide a position from which the operator engaged in said machining processes can operate the power cutoff device described in the same article without moving from the standard working position. (Source 20(1))

3 The power cutoff device described in clause 1 shall be easy to operate, and shall be free from any risk that the machinery could start to move again unexpectedly due to contact, vibration or other cause. (Source 20(1))

(Operation starting signals)

Article 104 Where the operator is to start the operation of a machine, and that operation could pose a hazard for the operator, the business operator shall establish a certain, fixed signal, appoint a person to issue that signal, and make all concerned employ the signal. (Source 20(1))

2 Workers must obey the signals specified in the preceding clause.

(Prevention of hazards due to flying machined products or other objects.)

Article 105 Where there is a risk that machined objects could, on being cut off or broken, fly through the air and put workers at risk, the business operator shall provide covers and barriers around machinery that could scatter such machined objects. However, this requirement need not apply if the nature of the work is such that the installation of said covers and barriers would be difficult, provided the workers are made to wear protective equipment. (Source 20(1))

2 If workers are ordered to wear protective equipment under the exception to the preceding clause, they must do so. (Source 26)

(Prevention of hazards due to flying cutting fragments)

Article 106 Where there is a risk of injury to workers from flying cutting fragments, the business operator shall provide covers or barriers around machines that generate such cuttings. However, this requirement need not apply if the nature of the work is such that the installation of said covers and barriers would be difficult, provided the workers are made to wear protective equipment. (Source 20(1))

2 If workers are ordered to wear protective equipment under the exception to the preceding clause, they must do so. (Source 26)

(Cessation of operation for cleaning and similar operations)

Article 107 When a machine (excluding cutting parts) is to be cleaned, oiled, inspected or repaired, and there is potential risk to workers, the business operator must stop the operation of said machine. However, this requirement need not apply if it is necessary to carry out the work while the machine is in operation, provided measures are taken such as covering the hazardous locations. (Source 20(1))

2 When the operation of a machine has been stopped under the preceding clause, safety measures, such as securing the starting device for said machine with a lock and labeling it, must be taken by the business operator to ensure that no worker not involved in said work can start the machine. (Source 20(1))

(Cessation of operation for cleaning of cutting parts, and similar operations)

Article 108 When the cutting parts of a machine are to be cleaned, oiled, inspected or repaired, and there is potential risk to workers, the business operator must stop the operation of said machine. However, this requirement need not apply if the structure of the machine is such that there is no risk to the worker. (Source 20(1))

2 When the operation of a machine has been stopped under the preceding clause, safety measures, such as securing the starting device for said machine with a lock and labeling it, must be taken by the business operator to ensure that no worker not involved in said work can start the machine. (Source 20(1))

3 When cutting dust is swept away from, or cutting agent is applied to, the cutting parts of a machine in operation, the business operator must ensure that the worker uses a brush or other suitable implement. (Source 20(1))

4 A worker ordered to use such an implement under the preceding clause must do so. (Source 26)

(Prevention of hazards due to winding rollers etc.)

Article 109 Where there is a risk of injury to workers from rollers, coils or similar devices for paper, cloth, wire rope etc., the business operator shall provide covers or barriers around such devices. (Source 20(1))

(Wearing of working hats etc.)

Article 110 Where there is a risk that the hair or clothing of workers working on a power-driven machine could become entangled in said machine, the business operator shall ensure that said workers wear suitable working hats and working clothing. (Source 20(1))

2 A worker ordered to wear working clothes or a working hat under the preceding clause must do so. (Source 26)

(Prohibition on the use of gloves)

Article 111 Where there is a risk that the hands of a worker working on a drilling machine, chamfering machine or other device with rotating blades could become entangled in the machine, the business operator shall not allow the worker to wear gloves. (Source 20(1))

2 A worker prohibited from wearing gloves under the preceding clause must not do so. (Source 26)

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