

TSUBAKI

CONVEYOR CHAINS

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Standard Attachment Chain

RS ROLLER CHAIN ATTACHMENTS

Tsubaki RS single pitch roller chains may be adapted for conveying duties by the addition of attachments. The standard types of attachments include bent or straight type attachments on one or both sides, extended pin, and wide contour attachments. A wide variety of assembled chain and components are stocked for quick delivery service.

RS attachment chains are available in carbon steel, nickel-plated, WP®, and stainless steel.

RS Attachment Chain



A-1 Attachment



K-1 Attachment



SA-1 Attachment



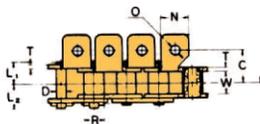
SK-1 Attachment



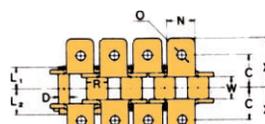
D-1 Attachment



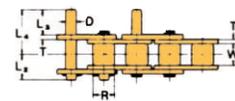
D-3 Attachment



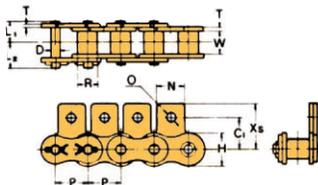
A-1 Attachment



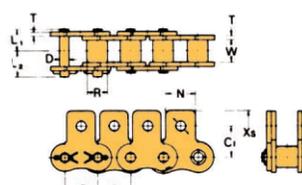
K-1 Attachment



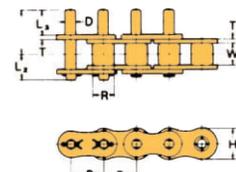
D-1 Attachment



SA-1 Attachment



SK-1 Attachment



D-3 Attachment

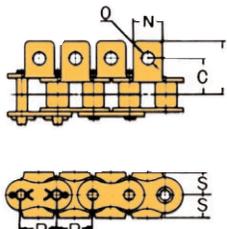
TSUBAKI Chain No.	Pitch P	Width Between Roller Link Plates W	Roller Dia. R	Pin			Link Plate		Average Tensile Strength lbs.	Max. Allowable Load lbs.	Approx. Weight lbs./ft.	No. of Links per 10 ft.
				D	L ₁	L ₂	H	T				
RS25 ▲	.250	.125	* .130	.090	.150	.189	.230	.030	926	143	.094	480
RS35 ▲	.375	.188	* .200	.141	.230	.270	.354	.050	2,120	342	.22	320
RS41	.500	.250	.306	.141	.266	.313	.386	.050	2,120	353	.27	240
RS40	.500	.312	.312	.156	.325	.392	.472	.060	3,750	595	.43	240
RS50	.625	.375	.400	.200	.406	.472	.591	.080	6,170	970	.70	192
RS60	.750	.500	.469	.234	.506	.581	.713	.094	9,040	1,410	1.03	160
RS80	1.000	.625	.625	.312	.640	.758	.949	.125	15,400	2,400	1.79	120
RS100	1.250	.750	.750	.375	.778	.900	1.185	.156	24,300	3,840	2.68	96
RS120	1.500	1.000	.875	.437	.980	1.138	1.425	.187	34,000	5,380	3.98	80
RS140	1.750	1.000	1.000	.500	1.059	1.248	1.661	.221	45,900	7,280	5.03	68
RS160	2.000	1.250	1.125	.562	1.254	1.451	1.898	.250	58,000	9,190	6.79	60

TSUBAKI Chain No.	Attachment									Additional Weight per Attachment lbs./att.		
	C	C ₁	N	O	S	X	X _s	L ₃	L ₄	A•SA	K•SK	D-1
RS25 ▲	.281	.313	.220	.134	.187	.421	.459	-	-	.001	.002	-
RS35 ▲	.375	.375	.311	.102	.250	.563	.573	.375	.575	.002	.004	.002
RS41	.469	.500	.375	.141	.281	.646	.656	.375	.608	.004	.007	.002
RS40	.500	.500	.375	.141	.315	.701	.685	.375	.661	.004	.009	.002
RS50	.625	.625	.500	.205	.406	.921	.907	.469	.827	.007	.013	.004
RS60	.750	.720	.626	.205	.469	1.110	1.057	.563	1.018	.015	.031	.007
RS80	1.000	.969	.752	.268	.625	1.441	1.396	.752	1.335	.029	.057	.015
RS100	1.250	1.252	1.000	.342	.780	1.768	1.732	.937	1.648	.057	.115	.027
RS120	1.500	1.437	1.126	.386	.906	2.197	2.081	1.126	2.024	.097	.194	.044
RS140	1.750	1.750	1.375	.448	1.125	2.420	2.437	1.311	2.264	.157	.313	.066
RS160	2.000	2.000	1.500	.516	1.250	2.840	2.750	1.500	2.654	.214	.428	.099

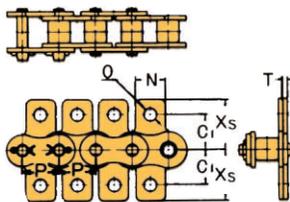
▲ Rollerless * Bushing Diameter

Spring clip type connecting links will be provided for RS25 to RS60 unless otherwise specified.

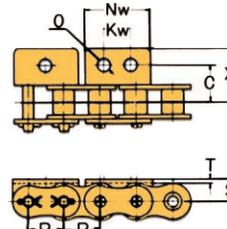
Additional Attachments



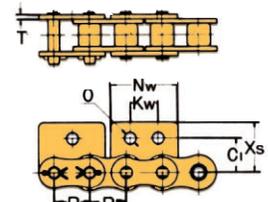
AA-1 Attachment



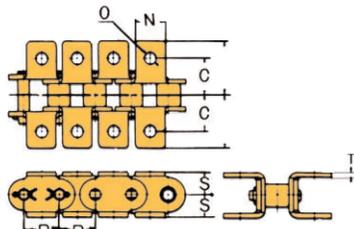
SAA-1 Attachment



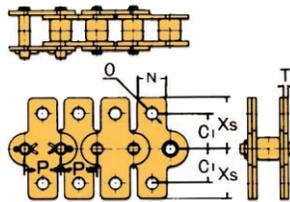
WA-1, WA-2 Attachment



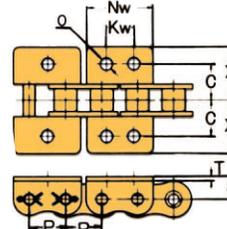
WSA-1, WSA-2 Attachment



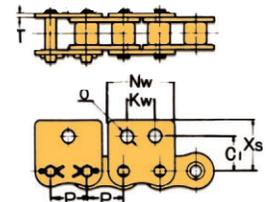
KK-1 Attachment



SKK-1 Attachment



WK-1, WK-2 Attachment



WSK-1, WSK-2 Attachment

TSUBAKI Chain No.	Pitch P	Attachment										Additional Weight per attachment lbs./att.			
		C	C ₁	N	O	S	T	X	X _s	Nw	Kw	AA,SAA	KK,SKK	WA,WSA	WK,WSK
RS40	.500	.500	.500	.375	.141	.315	.060	.701	.685	0.97	.500	.007	.014	.007	.014
RS50	.625	.625	.625	.500	.205	.406	.080	.921	.907	1.21	.625	.013	.026	.015	.030
RS60	.750	.750	.720	.626	.205	.469	.094	1.110	1.057	1.46	.750	.031	.062	.026	.052
RS80	1.000	1.000	.969	.752	.268	.625	.125	1.441	1.396	1.94	1.000	.057	.114	.062	1.24
RS100	1.250	1.250	1.252	1.000	.342	.780	.156	1.768	1.732	2.41	1.250	.121	.242	.121	.242

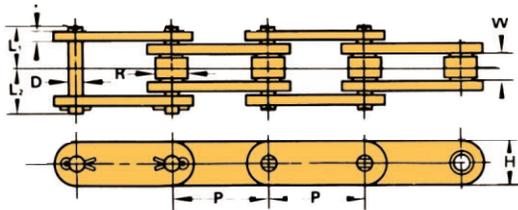
Note: Spring clip type connecting links will be provided for RS40 to RS60 unless otherwise specified.

TSUBAKI STANDARD ATTACHMENT CHAIN

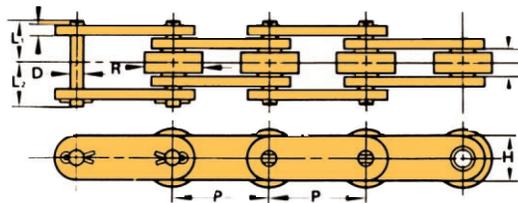
Double Pitch Attachment Chain

DOUBLE PITCH ROLLER CHAIN ATTACHMENTS

Tsubaki Double Pitch conveyor chains are available with standard bent or straight type attachments on one or both sides. Extended pin attachments are also available from our Service Centers. Many assembled chains and components are stocked for quick delivery.



STANDARD "S" ROLLER TYPE



OVERSIZE "R" ROLLER TYPE



A-1 Attachment



K-2 Attachment



SA-1 Attachment



SK-2 Attachment



D-3 Attachment



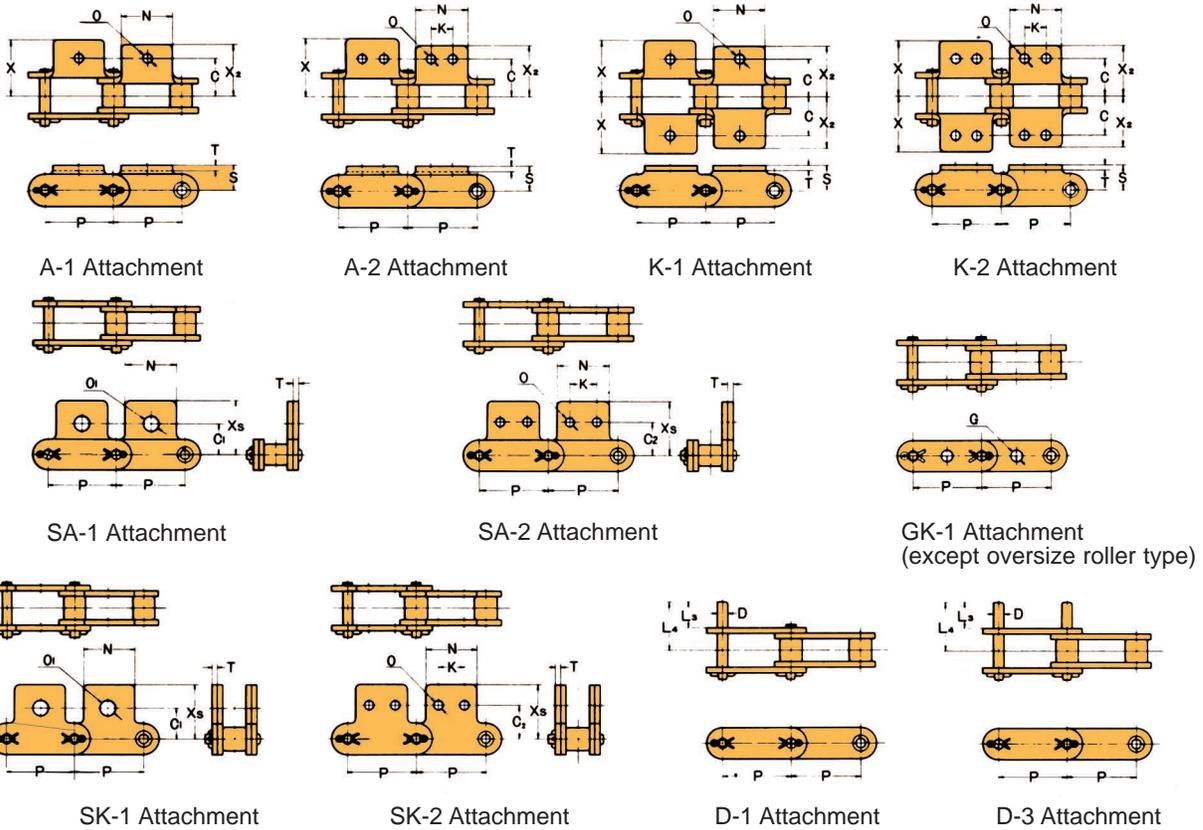
GK-1 Attachment

TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Pin			Link Plate		Average Tensile Strength lbs.	Max. Allowable Load lbs.	Approx. Weight lbs. / ft.	Additional Weight per Attachment lbs./att.		
				D	L ₁	L ₂	T	H				A & SA Att.	K & SK Att.	D-1 Att.
STANDARD ROLLER TYPE														
C2040	1.000	.312	.312	.156	.325	.392	.060	.472	3,750	595	.34	.007	.013	.002
C2050	1.250	.400	.375	.200	.406	.472	.080	.591	6,170	970	.56	.013	.026	.004
C2060H	1.500	.469	.500	.234	.573	.652	.125	.677	9,040	1,410	1.01	.037	.075	.007
C2080H	2.000	.625	.625	.312	.720	.823	.156	.906	15,400	2,400	1.62	.071	.141	.015
C2100H	2.500	.750	.750	.375	.830	.980	.187	1.15	24,300	3,840	2.38	.132	.265	.026
C2120H	3.000	.875	1.000	.427	1.030	1.210	.219	1.37	34,000	5,380	3.41	.221	.441	—
C2160H	4.000	1.125	1.250	.563	1.337	1.514	.281	1.87	58,000	9,190	6.02	.448	.895	—
OVERSIZE ROLLER TYPE														
C2042	1.000	.625	.312	.156	.325	.392	.060	.472	3,750	595	.58	.007	.013	.002
C2052	1.250	.750	.375	.200	.406	.472	.080	.591	6,170	970	.87	.013	.026	.004
C2062H	1.500	.875	.500	.234	.573	.652	.125	.677	9,040	1,410	1.47	.037	.075	.007
C2082H	2.000	1.125	.625	.312	.720	.823	.156	.906	15,400	2,400	2.37	.071	.163	.015
C2102H	2.500	1.562	.750	.375	.830	.980	.187	1.15	24,300	3,840	3.90	.132	.295	.026
C2122H	3.000	1.750	1.000	.437	1.030	1.210	.219	1.37	34,000	5,380	5.46	.221	.441	—
C2162H	4.000	2.250	1.250	.563	1.337	1.514	.281	1.87	58,000	9,190	9.21	.448	.895	—

Note: 1. Heavy side plates are used for C2060(2)H and up.

2. Spring clip type connecting links will be provided for C2040(2) ~ C2060(2)H, unless otherwise specified.

m Attachments



Chain No.	A-1, A-2, K-1 and K-2 Attachments								SA-1, SA-2, Sk-1 and SK-2 Attachments							D and Gk-1 Attachments			
	X	X ₂	C	S	K	N	O	X _s	C ₁	C ₂	K	N	O	O ₁	T	D	L ₃	L ₄	G
C2040	.760	.693	.500	.358	.374	.752	.142	.780	.437	.535	.374	.752	.142	.205	.060	.156	.374	.663	.161
C2050	.953	.866	.626	.437	.469	.937	.205	.969	.563	.626	.469	.937	.205	.268	.080	.200	.469	.833	.201
C2060H	1.240	1.110	.844	.579	.563	1.126	.205	1.205	.689	.752	.563	1.126	.205	.343	.125	.234	.563	1.083	.240
C2080H	1.602	1.441	1.094	.752	.752	1.500	.268	1.594	.874	1.000	.752	1.500	.268	.406	.156	.312	.752	1.401	.319
C2100H	1.95	1.65	1.312	.922	.937	1.875	.323	1.984	1.125	1.250	.938	1.875	.323	.516	.187	.375	.937	1.687	-
C2120H	2.39	2.11	1.562	1.093	1.125	2.250	.386	2.361	1.312	1.468	1.125	2.250	.386	.578	.219	.437	1.125	2.062	-
C2160H	3.06	2.76	2.062	1.437	1.500	3.000	.516	3.093	1.750	2.000	1.500	3.000	.516	.771	.281	.562	1.500	2.718	-

- Note: 1. Attachments for standard roller type chain and for oversize roller type chain have the same dimensions except for G.
 2. Attachments can be spaced as desired upon request.
 For even number of spacing, attachments will be fitted on pin link unless otherwise specified.
 3. Spring clip type connecting links will be provided for C2040 (2) ~ C2060 (2) H.
 4. Dimensions O, O₁ and G show actual hole diameter.

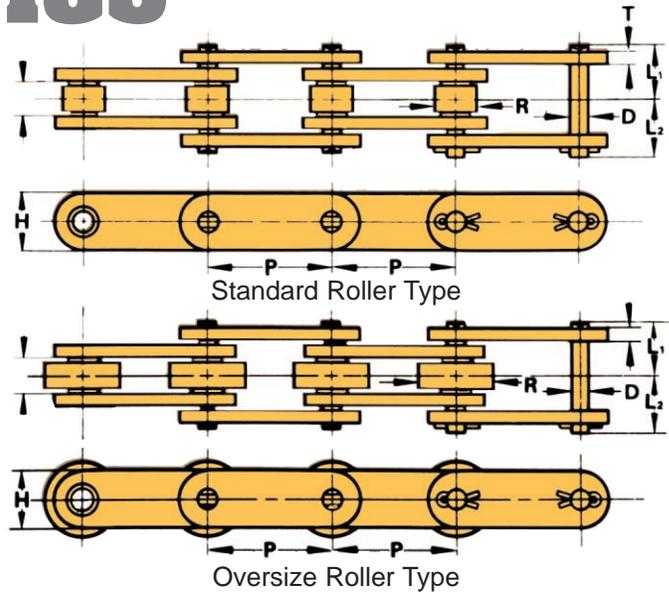
TSUBAKI STANDARD ATTACHMENT CHAIN

Conveyor Series

DOUBLE PITCH ROLLER CHAINS



These chains provide a high quality conveying medium for material handling equipment, road building machinery, textile machinery, farming implements, baking, packaging, and bottling equipment.



TSUBAKI Chain No.	Pitch	Roller Diameter	Width Between Roller Link Plates	Pin			Link Plate		Average Tensile Strength lbs.	Max. Allowable Load lbs.	Approx. Weight lbs./ft.	No. of Links per 10 ft.
	P	R	W	D	L ₁	L ₂	T	H				
STANDARD ROLLER TYPE												
C2040	1.000	.312	.312	.156	.325	.380	.060	.472	3,750	595	.34	120
C2050	1.250	.400	.375	.200	.406	.469	.080	.591	6,170	970	.56	96
C2060H	1.500	.469	.500	.234	.573	.652	.125	.677	9,040	1,410	1.01	80
C2080H	2.000	.625	.625	.312	.720	.823	.156	.906	15,400	2,400	1.62	60
C2100H	2.500	.750	.750	.375	.858	.965	.187	1.126	24,300	3,840	2.38	48
C2120H	3.000	.875	1.000	.437	1.061	1.203	.219	1.354	34,000	5,380	3.41	40
C2160H	4.000	1.125	1.250	.562	1.337	1.514	.281	1.898	58,000	9,190	6.02	30
OVERSIZE ROLLER TYPE												
C2042	1.000	.625	.312	.156	.325	.380	.060	.472	3,750	595	.58	120
C2052	1.250	.750	.375	.200	.406	.469	.080	.591	6,170	970	.87	96
C2062H	1.500	.875	.500	.234	.573	.652	.125	.677	9,040	1,410	1.47	80
C2082H	2.000	1.125	.625	.312	.720	.823	.156	.906	15,400	2,400	2.37	60
C2102H	2.500	1.562	.750	.375	.858	.965	.187	1.126	24,300	3,830	3.89	48
C2122H	3.000	1.750	1.000	.437	1.061	1.203	.219	1.354	34,000	5,380	5.46	40
C2162H	4.000	2.250	1.250	.562	1.337	1.514	.281	1.898	58,000	9,190	9.21	30

- Note: 1. Refer to pages B-3 to B-4 for chains with attachments.
 2. Heavy side plates are used for C2060(2)H and up.
 3. Spring clip type connecting links will be provided for C2040(2) ~ C2060(2)H, unless otherwise specified.

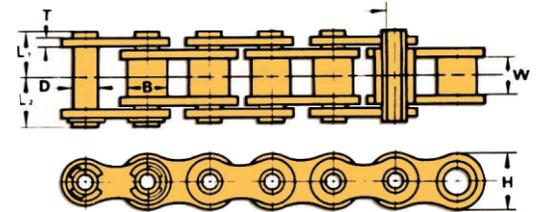
✳ **Sprocket for RS and Double Pitch Roller Conveyor Chain.**

There are special sprockets for RS and Double Pitch Roller Conveyor Chains. However, ANSI standard sprockets are also available for use if the roller is a standard roller and the number of sprocket teeth is 30 or over. Contact Tsubaki for details of special sprockets.

Hollow Pin Chain

RS TYPE

Standard attachments are available for Tsubaki Hollow Pin chain in both single and double pitch types. Cross rods may be inserted into any link without disassembling the chain.

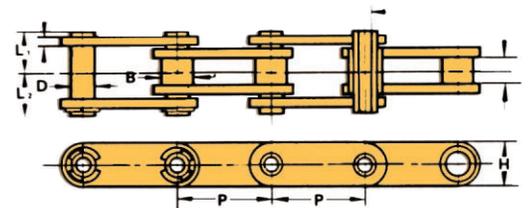


RS Type (Single pitch type)

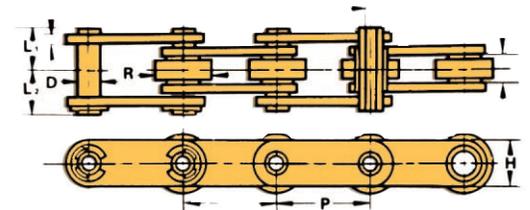


TSUBAKI Chain No.	Pitch	Width Between Inner Link Plates	Bushing Diameter	Pin				Link Plate		Average Tensile Strength lbs.	Maximum Allowable Load lbs.	Approx. Weight lbs./ft.
	P			W	B	D	F	L ₁	L ₂			
RS40HP	.500	.312	.312	.224	.157	.315	.374	.060	.472	2,430	397	.36
RS50HP	.625	.375	.400	.284	.202	.396	.459	.080	.591	4,410	705	.58
RS60HP	.750	.500	.469	.330	.236	.494	.561	.094	.713	5,950	948	.85
RS80HP	1.000	.625	.625	.448	.316	.640	.701	.125	.949	10,800	1,720	1.60

DOUBLE PITCH TYPE



Double Pitch Type – Standard “S” roller type



Double Pitch Type – Oversize “R” roller type

TSUBAKI Chain No.	Pitch	Width Between Inner Link Plates	Bushing Diameter	Roller Diameter	Pin				Link Plate		Average Tensile Strength lbs.	Maximum Allowable Load lbs.	Approx. Weight lbs./ft.
	P				W	B	R	D	F	L ₁			
DOUBLE PITCH TYPE - STANDARD ROLLER													
C2040HP	1.000	.312	.312	–	.224	.157	.315	.374	.060	.472	2,430	397	.31
C2050HP	1.250	.375	.400	–	.284	.202	.396	.459	.080	.591	4,410	705	.50
C2060HP	1.500	.500	.469	–	.330	.236	.494	.561	.094	.677	5,950	948	.93
C2080HP	2.000	.625	.625	–	.448	.316	.640	.701	.125	.906	10,800	1,720	1.21
DOUBLE PITCH TYPE - OVERSIZE ROLLER													
C2042HP	1.000	.312	–	.625	.224	.157	.315	.374	.060	.472	2,430	397	.55
C2052HP	1.250	.375	–	.750	.284	.202	.396	.459	.080	.591	4,410	705	.81
C2062HP	1.500	.500	–	.875	.330	.236	.494	.561	.094	.677	5,950	948	1.38
C2082HP	2.000	.625	–	1.125	.448	.316	.640	.701	.125	.906	10,800	1,720	1.89

TSUBAKI STANDARD ATTACHMENT CHAIN

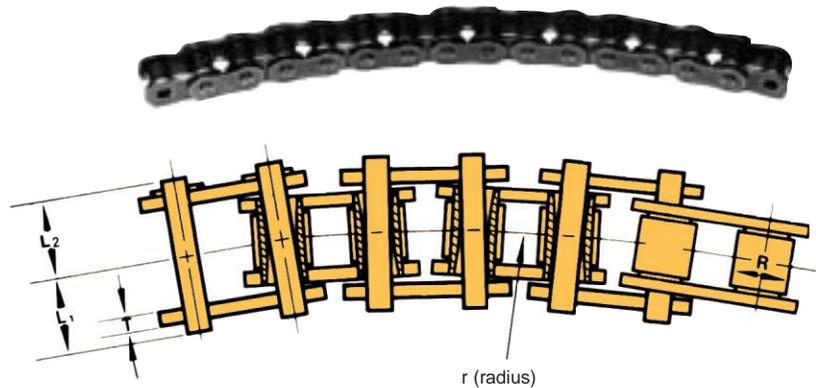
Curved Attachment Chain

CURVED CHAIN

Tsubaki Curved chain has additional clearance between the pins and bushings and between the roller links and pin link plates to permit extra flexibility and greater lateral displacement. The basic dimensions of this chain are the same as those of ANSI standard roller chain.

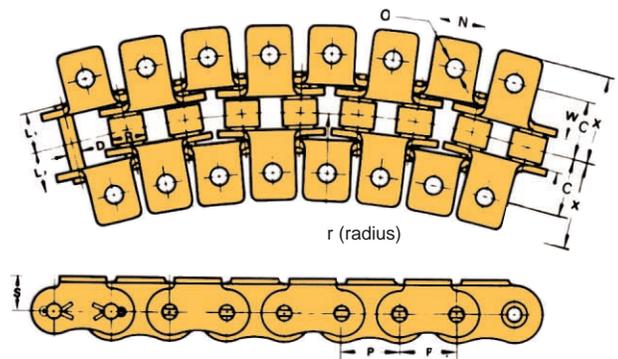
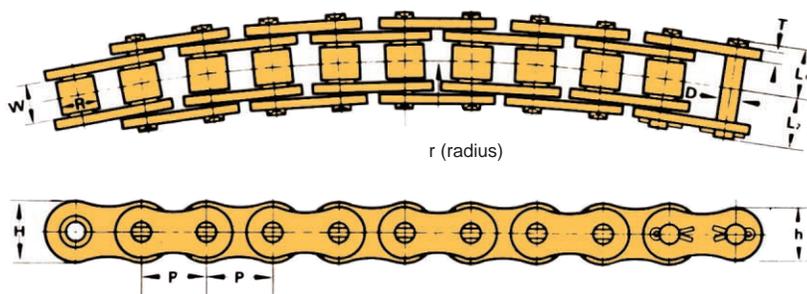
• Available in Carbon Steel or Stainless Steel.

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



TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates		Pin			Link Plate			Min. Radius of Side Bow r (inches)
			W	D	L ₁	L ₂	L ₁ + L ₂	T	H	h	
RS35CU▲	.375	.200	.188	.125	.238	.301	.539	.050	.354	.307	10
RS40CU	.500	.312	.312	.156	.333	.384	.717	.060	.472	.409	14
RS50CU	.625	.400	.375	.200	.417	.488	.905	.080	.591	.512	16
RS60CU	.750	.469	.500	.234	.522	.593	1.115	.094	.713	.614	20
RS80CU	1.000	.625	.625	.312	.659	.789	1.448	.125	.949	.819	24

NOTE: ▲ Rollerless (bushing only)

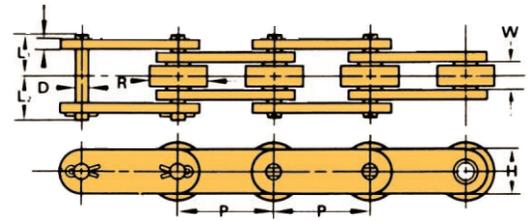


TSUBAKI Chain No.	Average Tensile Strength lbs.	Maximum Allowable Load lbs.	Approx Weight lbs./ft.	Attachment						Additional Weight per Attachment lbs/att.	
				C	N	O	S	X	A Att.	K Att.	
RS35CU▲	1,800	.210	.22	.375	.311	.102	.250	.571	.0017	.0034	
RS40CU	3,480	420	.41	.500	.374	.141	.315	.709	.0044	.0088	
RS50CU	5,420	640	.68	.626	.500	.205	.406	.933	.0066	.0132	
RS60CU	7,830	900	.94	.750	.625	.205	.469	1.122	.0154	.0308	
RS80CU	13,840	1,560	1.66	1.000	.752	.268	.626	1.461	.0287	.0574	

NOTE: ▲ Rollerless (bushing only)

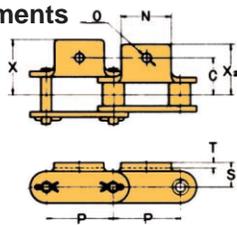
Plastic Roller Chain

This chain with plastic (polyacetal resin) rollers offers smooth, quiet operation and long wear life. It is available from our factory on a made to order basis. Stainless steel chain with plastic rollers is also available for those applications where corrosion resistance is required.

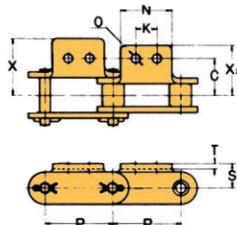


TSUBAKI Chain No.	Pitch P	Roller Dia. R	Width Between Roller Link Plates W	Pin					Link Plate		Average Tensile Strength lbs.	Maximum Allowable Load lbs.	Maximum Allowable Roller Load lbs/roller	Approx. Weight lbs./ft.	Number of Links per 10 ft.
				D	L ₁	L ₂	RIV.	L ₁ +L ₂ COT.	Thickness T	Height H					
C2042D	1.00	.625	.312	.156	.325	.392	.650	.717	.060	.472	3,700	100	44	0.33	120
C2052D	1.25	.750	.375	.200	.406	.472	.812	.878	.080	.591	6,100	154	66	0.57	96
C2062HD	1.50	.875	.500	.234	.573	.652	1.146	1.225	.125	.677	9,000	231	110	0.98	80
C2082HD	2.00	1.125	.625	.312	.720	.823	1.440	1.543	.156	.906	15,400	397	200	1.77	60
C2102HD	2.50	1.562	.750	.375	.830	.980	1.660	1.810	.187	1.150	24,000	573	286	2.44	48
C2042SSD	1.00	.625	.312	.156	.325	.392	.650	.717	.060	.472	2,600	100	44	0.33	120
C2052SSD	1.25	.750	.375	.200	.406	.472	.812	.878	.080	.591	4,400	154	66	0.57	96
C2062HSSD	1.50	.875	.500	.234	.573	.652	1.146	1.225	.125	.677	6,200	231	110	0.98	80
C2082HSSD	2.00	1.125	.625	.312	.720	.823	1.440	1.543	.156	.906	11,400	397	200	1.77	60
C2102HSSD	2.50	1.562	.750	.375	.858	.965	1.716	1.823	.187	1.126	13,200	573	286	2.52	48

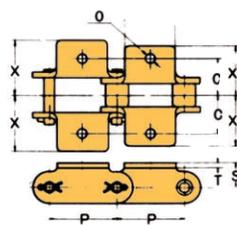
n Attachments



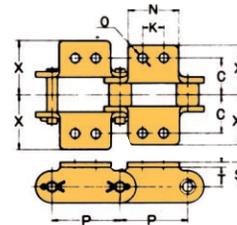
A-1 Attachment



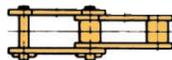
A-2 Attachment



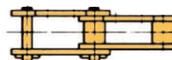
K-1 Attachment



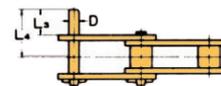
K-2 Attachment



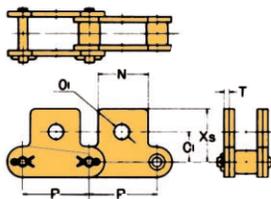
SA-1 Attachment



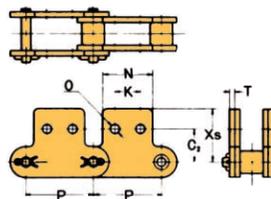
SA-2 Attachment



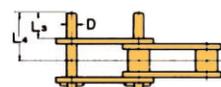
D-1 Attachment



SK-1 Attachment



SK-2 Attachment

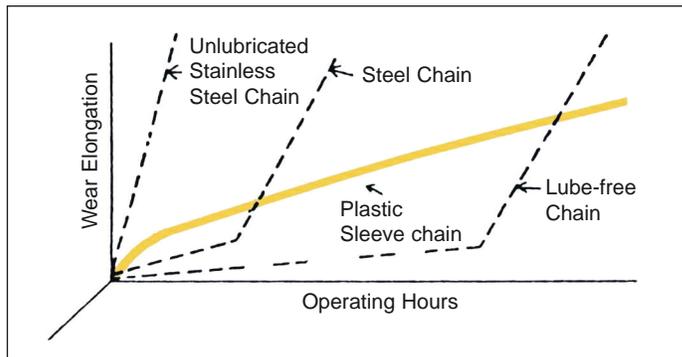
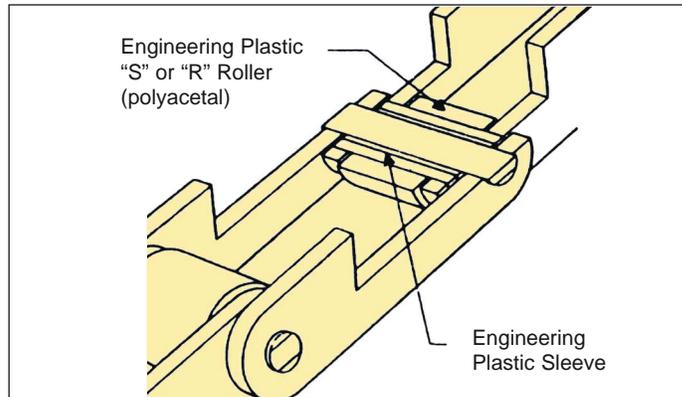


D-3 Attachment

TSUBAKI Base Chain No.	Pitch															Additional Weight Per Att. (lbs.)			
	P	C	C ₁	C ₂	K	N	O	O ₁	S	T	X	X ₂	X ₅	D	L ₃	L ₄	A, SA Att.	K, SK att.	D Att
C2042D	1.00	.500	.437	.535	.374	.752	.142	.205	.358	.060	.760	.693	.780	.156	.374	.659	.0066	.0132	.0022
C2052D	1.25	.626	.563	.626	.469	.937	.205	.268	.437	.080	.953	.866	.969	.200	.469	.827	.0132	.0264	.0044
C2062HD	1.50	.844	.689	.752	.563	1.126	.205	.343	.579	.125	1.240	1.110	1.205	.234	.563	1.081	.0374	.0748	.0066
C2082HD	2.00	1.094	.874	1.000	.752	1.500	.268	.406	.752	.156	1.602	1.441	1.594	.312	.752	1.398	.0704	.1408	.0154
C2102HD	2.50	1.312	1.125	1.250	.938	1.875	.323	.516	.922	.187	1.950	1.650	1.984	.375	.837	1.687	.1320	.2640	.0264

Note: 1) Spring clip type connecting links will be provided for C2042-D ~ C2062H-D. 2) Attachments are also available for stainless steel chain.

Plastic Sleeve Chain



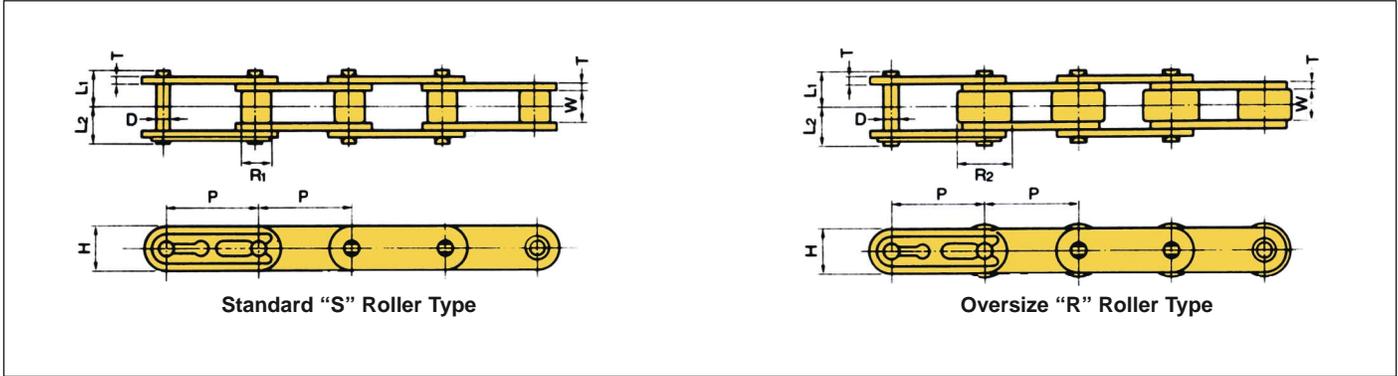
The main characteristic of this chain is that it has an engineering plastic sleeve between the pin and bushing. The engineering plastic roller is also available in combination with the engineering plastic sleeve.

1. The use of self lubricating engineering plastic sleeves eliminates the need for lubrication.
2. Excellent wear resistance ensures long life.
3. As no metal dust is generated from contact between the engineering plastic parts and the steel parts, your environment and equipment are kept clean. When using the stainless steel chain series, corrosion resistance is also added.
4. The use of engineering plastic rollers results in significant weight reduction compared to all stainless steel chain, ("S" roller type : 15% less, "R" roller type : 40% less).
5. With the use of engineering plastic sleeves and rollers, quiet operation is ensured (7 ~ 10 dB lower than stainless steel chain).
6. RS40, RS50 and RS60 with plastic sleeves are available upon request. Contact Tsubaki for details.



Standard Series : Engineering plastic roller and sleeve, other components steel.

Stainless Steel Series : Engineering plastic roller and sleeve, other components 304 stainless steel.



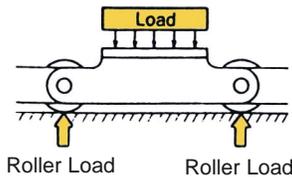
TSUBAKI Base Chain No.		Chain Pitch P	Width Between Inner Link Plates W	Roller Diameter		Link Plate		Maximum Allowed Tension lbs.	Allowed Roller Load lbs./roller		Approx. Weight lbs./ft.	
				"S" Roller R ₁	"R" Roller R ₂	Width H	Thickness T		Plastic "R" Roller	Plastic "S" Roller	Plastic "R" Roller	Plastic "S" Roller
CS2040	CS2042(D)	1.000	.312	.312	.625	.472	.060	100	44	4	.336	.296
CS2050	CS2052(D)	1.250	.375	.400	.750	.591	.080	154	66	7	.544	.511
CS2060	CS2062(D)	1.500	.500	.469	.875	.677	.125	231	110	11	.974	.914

Note: 1. Attachment chains are also available. 2. Stainless Steel chain is also available.
3. Dimensions of chains and attachments are the same as those for standard double pitch chains.

1. Allowable Roller Load

Allowable load that can be supported by one roller (without lubrication):

Chain size	Plastic "R" Roller	Plastic "S" Roller
CS2040	44	4
CS2050	66	7
CS2060	110	11



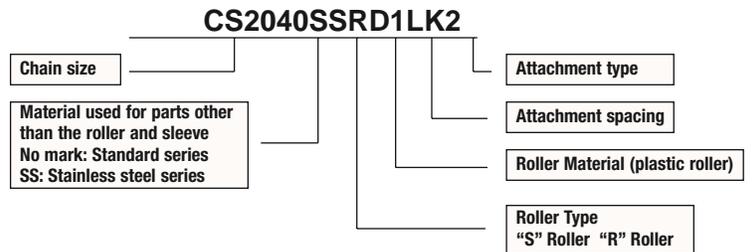
2. Coefficient of rolling friction between chain and guide (without lubrication):

Table 2 Coefficient of Rolling Friction

Roller Type	Coefficient of Friction
Plastic "R" Roller	.08
Plastic "S" Roller	.12

- 3. Maximum Chain Speed: less than 230 ft./min.
- 4. Ambient Temperature Range: -14°F ~ 176°F
- 5. When the chain will be exposed to chemicals, please consult Tsubaki.

n Model Identification



TSUBAKI STANDARD ATTACHMENT CHAIN

Conveyor Lambda[®]Chain

Maintenance-free Conveyor Chain

- Save time and money
- Lube-free
- Long wear life

LAMBDA[®] Conveyor Chain means real savings for your operation

- Reduce maintenance costs.
- Eliminate product contamination.
- Reduce downtime.
- Increase sprocket life.

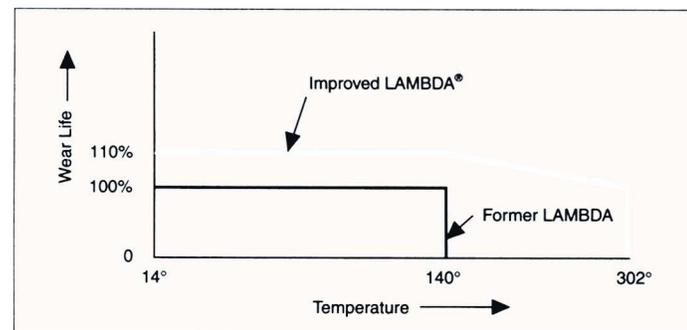
LAMBDA Conveyor Chain is ideal for clean applications, where machines and conveyed materials must be free from contact with oil, or when lubrication is difficult. If product contamination is a concern, if lubrication is difficult, or if you simply want to reduce maintenance costs, choose LAMBDA Chain from Tsubaki.

Select the LAMBDA Chain that's right for your operation

Standard LAMBDA Conveyor Chain works in temperatures up to 302°F, with a wide range of sizes. And we've developed a whole new line – LAMBDA II – for ultra-high performance.

Improved, Long-Lasting Standard LAMBDA Conveyor Chains

- Cost-effective, maintenance-free conveyor chain for your applications.
- A variety of attachments to meet your needs.
- Operates in temperatures up to 302°F.

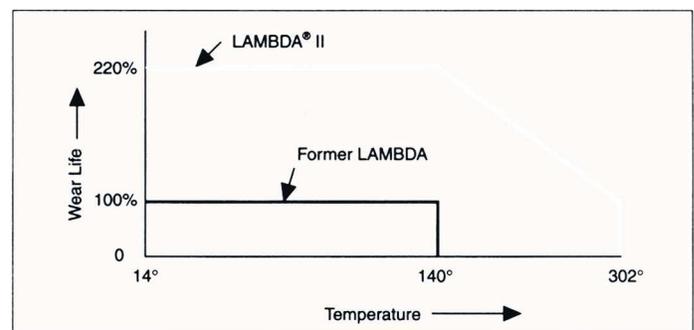


Unique Patented Design

NEW!

LAMBDA II Conveyor Chains

- For ultimate performance.
- Outlasts Standard LAMBDA up to twice as long in temperatures as high as 140°F.
- Ideal for lube-free environments.



Single Pitch Conveyor LAMBDA®
Double Pitch Conveyor LAMBDA

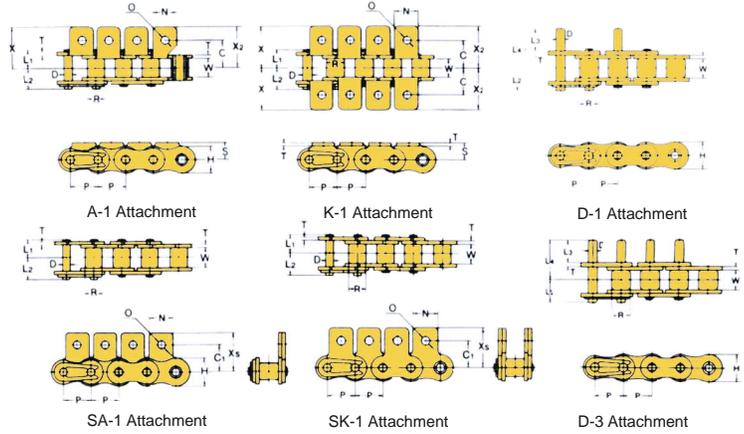
- Cost-effective oil-free conveyor chain for your operation.
- Operates in temperatures up to 302°F

Nickel-Plated Single Pitch Conveyor LAMBDA
Nickel-Plated Double Pitch Conveyor LAMBDA

- Operates in temperatures up to 302°F.
- Ideal for mildly corrosive environments.
- Long-lasting and lube-free.

Single Pitch Conveyor LAMBDA II
Double Pitch Conveyor LAMBDA II

- Outlasts Standard LAMBDA up to twice as long in temperatures as high as 140°F.
- Ideal for tough, lube-free applications.



Single Pitch Conveyor LAMBDA®

All dimensions are in inches unless otherwise indicated.

Standard	Chain Number		Pitch P	Width Between Roller					From Pin Head to C.L. L ₁	From Pin End to C.L. L ₂	Average Tensile Strength (lbs.)	Maximum Allowable Load (lbs.)	Approx. Weight (lbs/ft)
	Nickel-Plated	LAMBDA II		Roller Dia. R	Link Plates W	Link Plates Thickness T	Link Plates Height H	Link Plates Dia. D					
RSC40-LAMBDA	RSC40NP-LAMBDA	RSCT40-LAMBDA	.500	.312	.312	.060	.472	.156	.325	.392	3,530	595	0.43
RSC50-LAMBDA	RSC50NP-LAMBDA	RSCT50-LAMBDA	.625	.400	.375	.080	.591	.200	.406	.472	5,730	970	0.70
RSC60-LAMBDA	RSC60NP-LAMBDA	RSCT60-LAMBDA	.750	.469	.500	.094	.713	.234	.506	.581	8,380	1,410	1.03
RSC80-LAMBDA	RSC80NP-LAMBDA	RSCT80-LAMBDA	1.000	.625	.625	.125	.949	.312	.640	.758	14,300	2,400	1.79
RSC100-LAMBDA	RSC100NP-LAMBDA	RSCT100-LAMBDA	1.250	.750	.750	.157	1.185	.375	.778	.900	22,500	3,840	2.69

Standard	Chain Number		Attachment Dimensions											Additional Weight per Attachment (lbs.)			
	Nickel-Plated	LAMBDA II	P	C	C ₁	N	O	S	X	X ₂	X _s	L ₃	L ₄	D	A&SA Att.	K&SK Att.	D Att.
RSC40-LAMBDA	RSC40NP-LAMBDA	RSCT40-LAMBDA	.500	.500	.500	.375	.141	.315	.701	.701	.685	.375	.661	.156	.004	.008	.002
RSC50-LAMBDA	RSC50NP-LAMBDA	RSCT50-LAMBDA	.625	.625	.625	.500	.205	.406	.922	.922	.906	.469	.827	.200	.006	.013	.004
RSC60-LAMBDA	RSC60NP-LAMBDA	RSCT60-LAMBDA	.750	.750	.719	.625	.205	.469	1.110	1.110	1.057	.563	1.018	.234	.015	.030	.006
RSC80-LAMBDA	RSC80NP-LAMBDA	RSCT80-LAMBDA	1.000	1.000	.969	.752	.268	.625	1.441	1.441	1.396	.752	1.335	.312	.028	.057	.154
RSC100-LAMBDA	RSC100NP-LAMBDA	RSCT100-LAMBDA	1.250	1.250	1.252	1.000	.343	.780	1.768	1.768	1.732	.937	1.644	.375	.057	.114	.264

- Notes:
1. Conveyor LAMBDA should not be used in drive applications. It is designed for conveyor applications where the speeds are generally lower and the center distances are longer than those found in drive applications. Conveyor series LAMBDA has the same dimensions and the same working load as our standard attachment chain. All link plates have the same thickness as standard.
 2. Drive and conveyor LAMBDA chains cannot be intercoupled.
 3. LAMBDA II roller link plates are nickel-plated for easy identification.
 4. Connecting links for RSC80-LAMBDA to RSC100-LAMBDA, RSC80NP-LAMBDA to RSC100NP-LAMBDA, and RSCT80-LAMBDA to RSCT100-LAMBDA have cottered pins.

TSUBAKI STANDARD ATTACHMENT CHAIN

Double Pitch Conveyor LAMBDA®

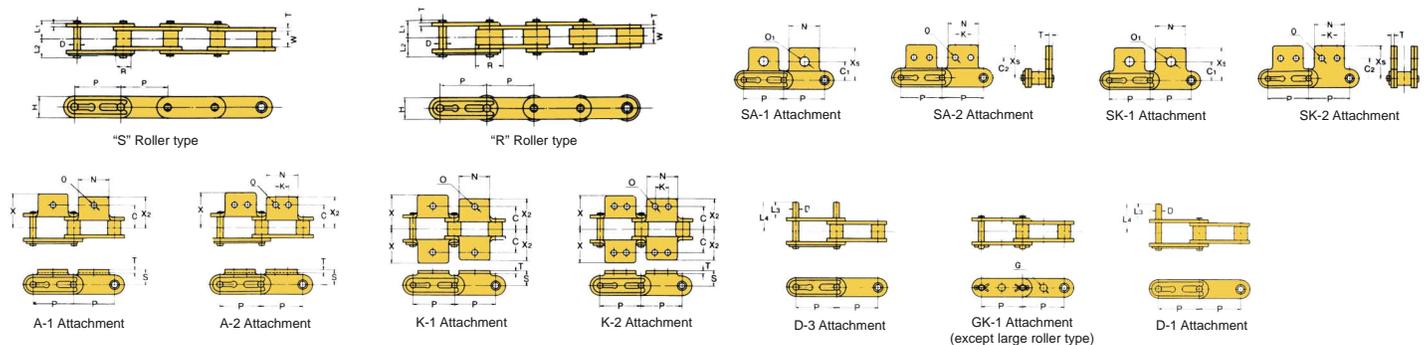
All dimensions are in inches unless otherwise indicated.

Standard	Chain Number		Pitch P	Roller Dia.		Width Between Roller Link Plates W	Pin			Link Plate	
	Nickel-Plated	LAMBDA II		"S" Roller R ₁	"R" Roller R ₂		Dia. D	Length. L ₁	L ₂	Thickness T	Height H
C2040-LAMBDA	C2040NP-LAMBDA	CT2040-LAMBDA	1.000	.312	.625	.312	.156	.325	.392	.060	.472
C2050-LAMBDA	C2050NP-LAMBDA	CT2050-LAMBDA	1.250	.400	.750	.375	.200	.406	.472	.080	.591
C2060H-LAMBDA	C2060HNP-LAMBDA	CT2060H-LAMBDA	1.500	.469	.875	.500	.234	.573	.652	.125	.677
C2080H-LAMBDA	C2080HNP-LAMBDA	CT2080H-LAMBDA	2.000	.625	1.125	.625	.312	.720	.823	.156	.906
C2100H-LAMBDA	C2100HNP-LAMBDA	CT2100H-LAMBDA	2.500	.750	1.562	.750	.375	.858	.964	.187	1.125

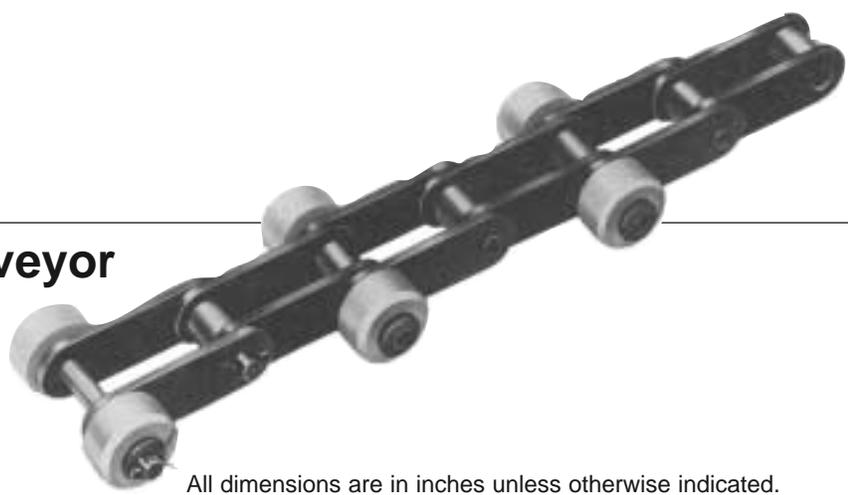
Standard	Chain No.		Attachment Dimensions															
	Nickel-Plated	LAMBDA II	C	C ₁	C ₂	K	N	O	O ₁	S	T	X	X ₂	X _S	D	L ₃	L ₄	G
C2040-LAMBDA	C2040NP-LAMBDA	CT2040-LAMBDA	.500	.437	.535	.374	.752	.142	.205	.358	.060	.760	.693	.780	.156	.374	.663	.161
C2050-LAMBDA	C2050NP-LAMBDA	CT2050-LAMBDA	.626	.563	.626	.469	.937	.205	.268	.437	.080	.953	.866	.969	.200	.469	.833	.201
C2060H-LAMBDA	C2060HNP-LAMBDA	CT2060H-LAMBDA	.844	.689	.752	.563	1.126	.205	.343	.579	.125	1.240	1.110	1.205	.234	.563	1.083	.240
C2080H-LAMBDA	C2080HNP-LAMBDA	CT2080H-LAMBDA	1.094	.874	1.000	.752	1.500	.268	.406	.752	.156	1.602	1.441	1.594	.312	.752	1.401	.319
C2100H-LAMBDA	C2100HNP-LAMBDA	CT2100H-LAMBDA	1.312	1.125	1.250	.938	1.874	.323	.516	.922	.187	1.950	1.768	1.984	.375	.937	1.709	.398

Standard	Chain Number		Average Tensile Strength (lbs.)	Maximum Allowable Load (lbs.)	Approx. Weight (lbs./ft.)		Additional weight per attachment (lbs.)		
	Nickel-Plated	LAMBDA II			"S" Roller	"R" Roller	A&SA Att.	K&SK Att.	D. Att.
C2040-LAMBDA	C2040NP-LAMBDA	CT2040-LAMBDA	3,530	595	0.34	0.58	.006	.013	.002
C2050-LAMBDA	C2050NP-LAMBDA	CT2050-LAMBDA	5,730	970	0.56	0.87	.013	.026	.004
C2060H-LAMBDA	C2060HNP-LAMBDA	CT2060H-LAMBDA	8,380	1,410	1.01	1.47	.037	.074	.006
C2080H-LAMBDA	C2080HNP-LAMBDA	CT2080H-LAMBDA	14,300	2,400	1.62	2.37	.070	.140	.015
C2100H-LAMBDA	C2100HNP-LAMBDA	CT2100H-LAMBDA	22,500	3,840	2.38	3.91	.132	.264	.026

- Notes:
- Conveyor LAMBDA should not be used in drive applications. It is designed for conveyor applications where the speeds are generally lower and the center distances are longer than those found in drive applications. Conveyor series LAMBDA has the same dimensions and the same working load as our standard attachment chain. All link plates have the same thickness as standard.
 - Drive and conveyor LAMBDA chains cannot be intercoupled.
 - LAMBDA II roller link plates are nickel-plated for easy identification.
 - Connecting links for C2080H-LAMBDA to C2100H-LAMBDA, C2080HNP-LAMBDA to C2100HNP-LAMBDA, and CT2080H-LAMBDA to CT2100H-LAMBDA have cottered pins.



Plastic Outboard Roller Conveyor LAMBDA®



LAMBDA® for accumulating conveyors.

- Lube-free with a low center of gravity.
- Long wear life.

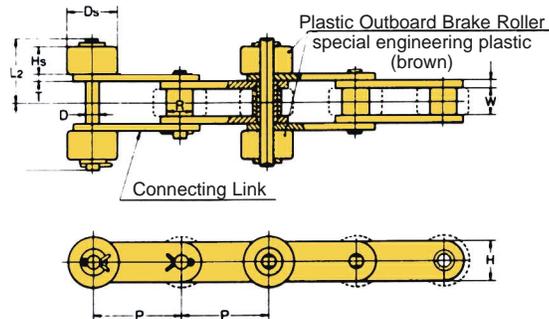
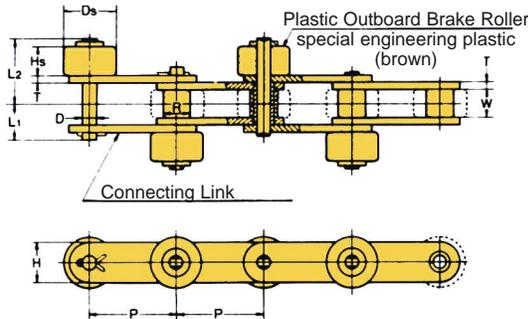
All dimensions are in inches unless otherwise indicated.

Chain No.	Roller Type	Pitch P	Width Between		Link			Pin			Outboard Roller		Approx Weight (lbs./ft.)
			Roller Dia. R	Roller Link Plates W	T	H	D	L ₁	L ₂	L ₃	D _S	H _S	
C2040-LAMBDA-PSR	S	1.00	.313	.313	.059	.472	.156	.380	.705	.760	.625	.307	0.44
C2050-LAMBDA-PSR	S	1.25	.400	.375	.079	.591	.200	.469	.850	.913	.750	.370	0.69
C2060H-LAMBDA-PSR	S	1.50	.469	.500	.126	.677	.234	.667	1.167	1.262	.875	.496	1.21
C2042-LAMBDA-PSR	R	1.00	.625	.313	.059	.472	.156	.380	.909	.965	.906	.512	0.83
C2052-LAMBDA-PSR	R	1.25	.750	.375	.079	.591	.200	.469	.996	1.063	1.063	.512	1.14
C2062H-LAMBDA-PSR	R	1.50	.875	.500	.126	.677	.234	.667	1.183	1.278	1.181	.512	1.77

This diagram shows standard "S" rollers (rollers at chain centre) drawn in solid lines and oversized "R" rollers in dotted lines

Type I (Staggered Installation)

Type II (Crosswise Installation)

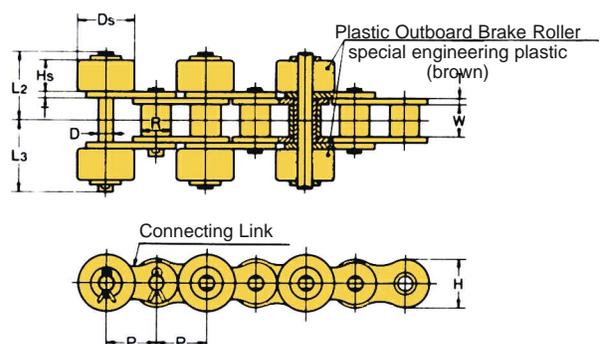
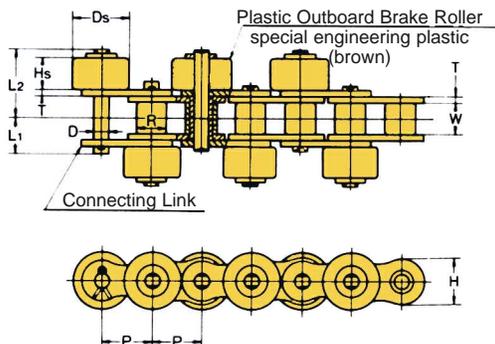


Chain No.	Pitch P	Width Between		Link			Pin			Outboard Roller		Approx. Weight (lbs./ft.)
		Roller Dia. R	Roller Link Plates W	T	H	D	L ₁	L ₂	L ₃	D _S	H _S	
RSC40-LAMBDA-PSR	.500	.313	.313	.059	.472	.156	.380	.705	.760	.625	.307	.63
RSC50-LAMBDA-PSR	.625	.400	.375	.079	.591	.200	.469	.850	.913	.750	.370	.95
RSC60-LAMBDA-PSR	.750	.469	.500	.094	.713	.234	.600	1.100	1.195	.875	.496	1.42

Note: For staggered outboard roller installation, the plastic brake rollers are spaced every third link alternating from right to left. For crosswise outboard roller installation, they are spaced in pairs every sixth link. These configurations are standard.

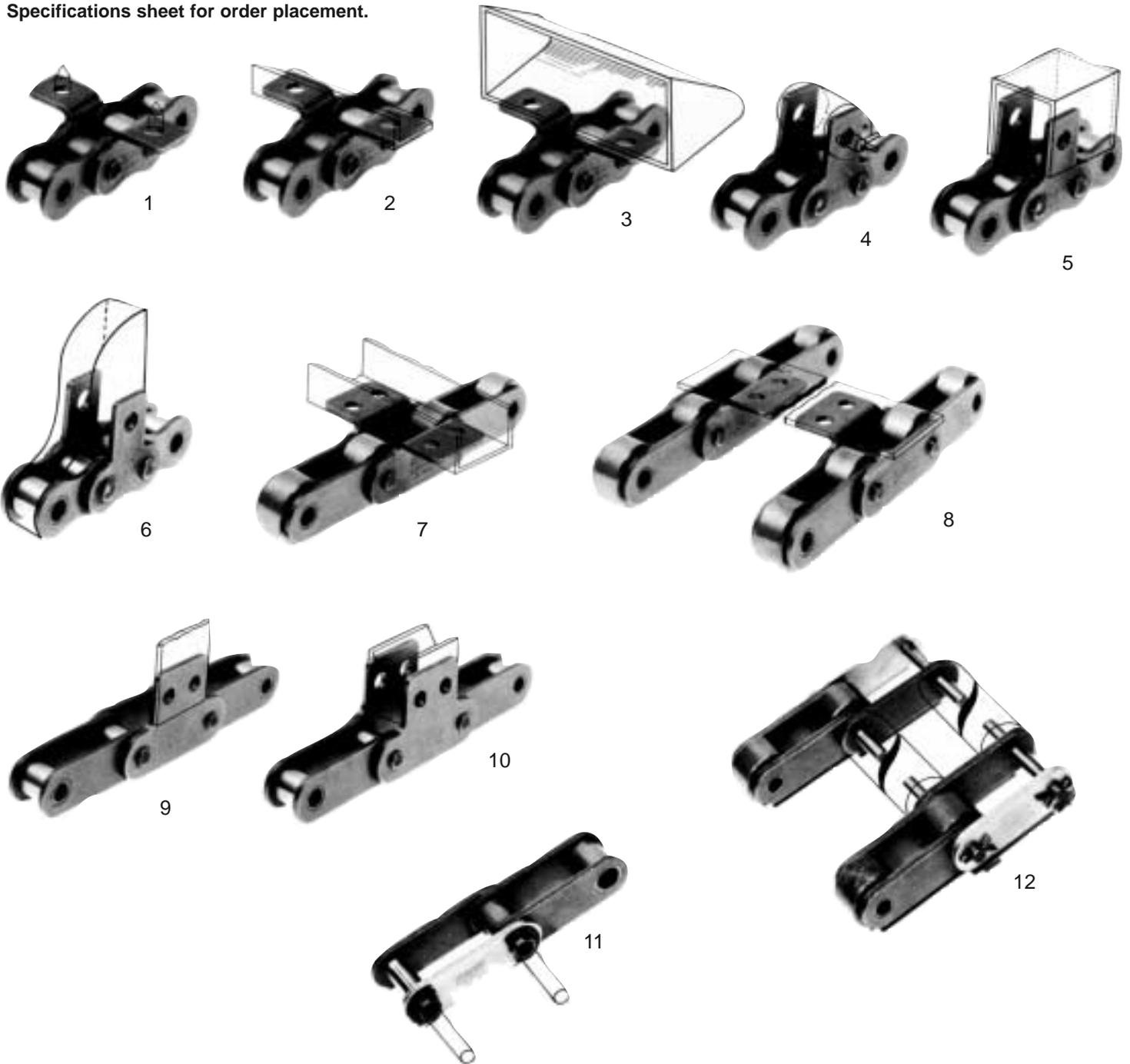
Type I (Staggered Installation)

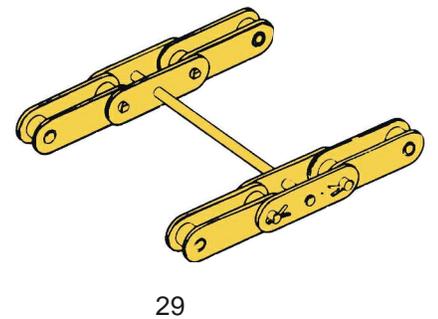
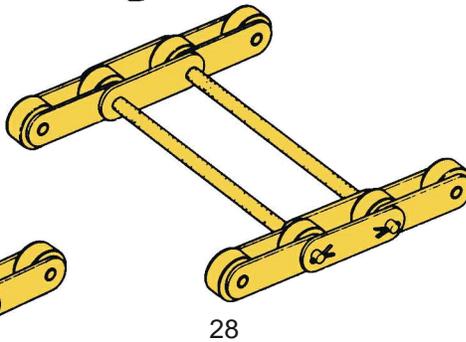
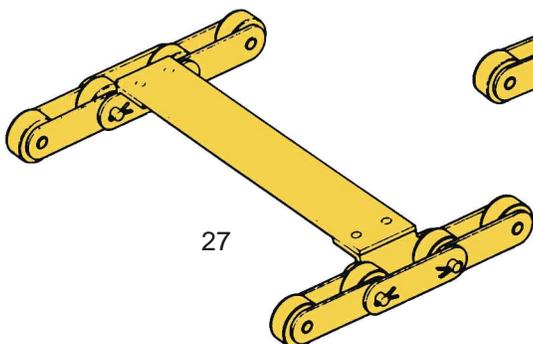
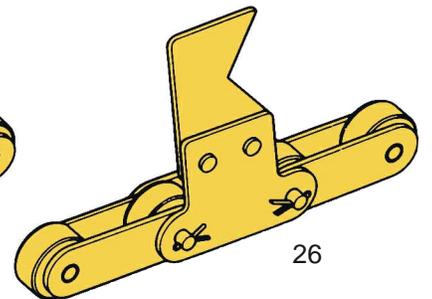
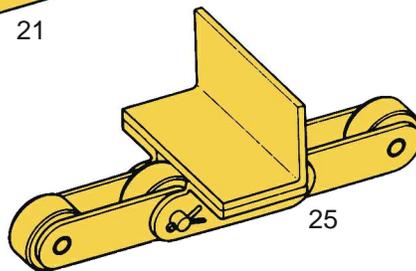
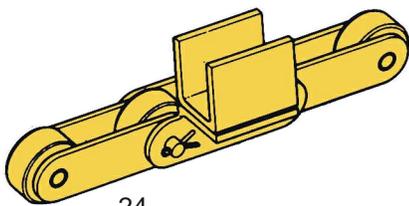
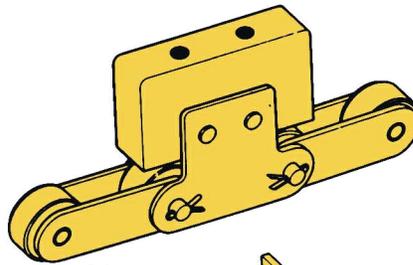
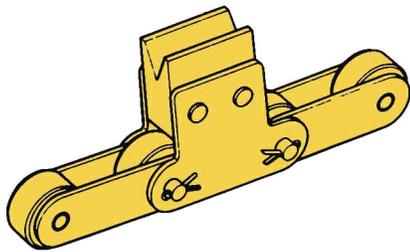
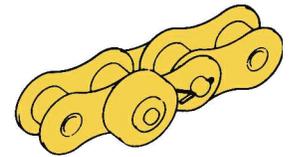
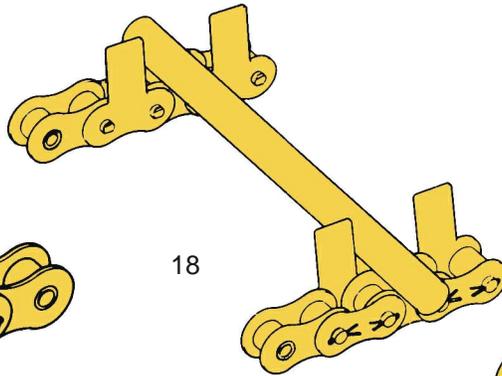
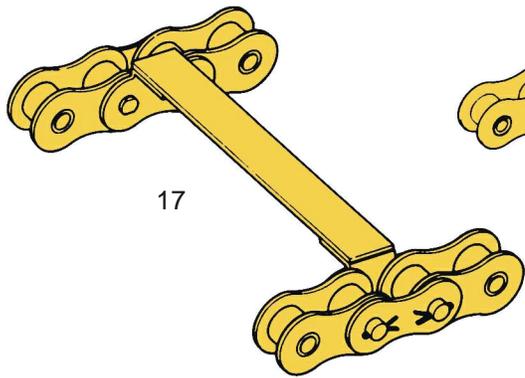
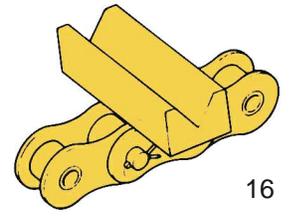
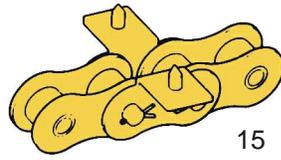
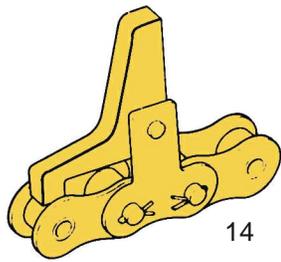
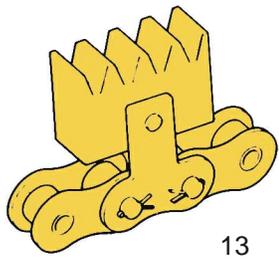
Type II (Crosswise Installation)



Stock Attachments

For economical conveyor design, Tsubaki standard stock attachments are available. Stock attachments are available for pin links, roller links, and connecting links. Please refer to the Attachment Chain Specifications sheet for order placement.





TSUBAKI STANDARD ATTACHMENT CHAIN

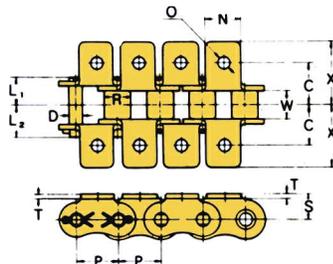
BS/DIN Chain Series (ISO 606)

Dimensions: inch

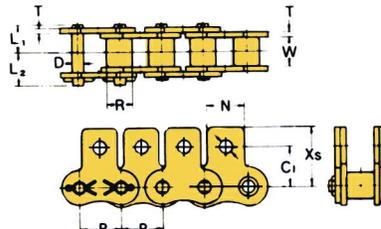
TSUBAKI Chain No.	ISO "B" Number	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Pin			Offset Pin L
					D	L ₁	L ₂	
					RS08B	08B	.500	
RS10B	10B	.625	.400	0.379	0.200	0.370	0.448	0.830
RS12B	12B	.750	.475	0.459	0.225	0.433	0.519	0.976
RS16B	16B	1.000	.625	0.670	0.325	0.704	0.783	1.531

Dimensions: inch

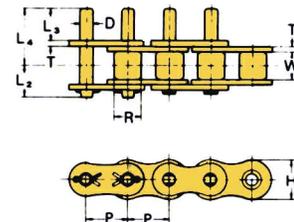
TSUBAKI Chain No.	Link Plate				ISO "B" Tensile Strength lbs.	Minimum Tensile Strength lbs.	Approx. Weight lbs./ft.	Number of Pitched per Unit
	h	H	t	T				
RS08B	0.429	0.464	0.060	0.060	4,000	4,000	0.50	240
RS10B	0.539	0.578	0.060	0.060	5,000	5,000	0.68	192
RS12B	0.633	0.633	0.070	0.070	6,500	6,500	0.90	160
RS16B	0.826	0.826	0.125	0.156	7,500	14,300	1.90	120



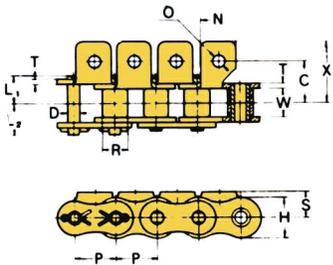
K-1 Attachment



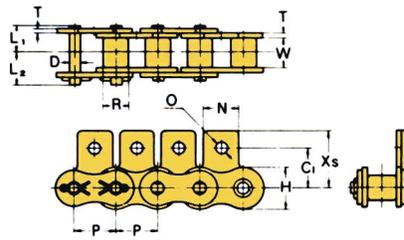
SK-1 Attachment



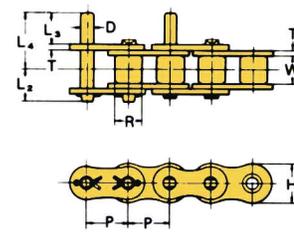
D-3 Attachment



A-1 Attachment



SA-1 Attachment



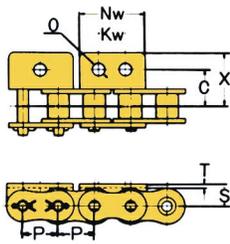
D-1 Attachment

Dimensions: inch

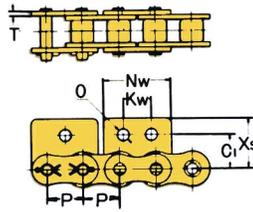
TSUBAKI Chain No.	C	C ₁	N	O	S	X	X _s	D	L ₃	L ₄
RS08B	0.468	0.500	0.448	0.165	0.350	0.750	0.759	0.175	0.374	0.667
RS10B	0.625	0.625	0.500	0.196	0.401	0.875	0.901	0.200	0.468	0.799
RS12B	0.750	0.874	0.649	0.279	0.531	1.175	1.271	0.226	0.562	0.956
RS16B	0.937	0.937	0.948	0.263	0.598	1.470	1.358	0.325	0.751	1.389

BS/DIN Chain Series

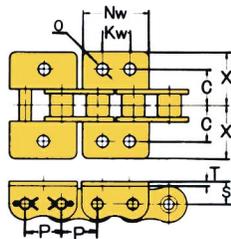
(ISO 606)



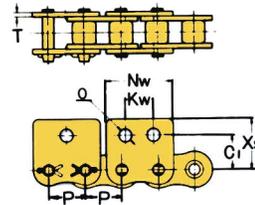
WA-1, WA-2 Attachment



WSA-1, WSA-2 Attachment



WK-1, WK-2 Attachment



WSK-1, WSK-2 Attachment

Dimensions: inch

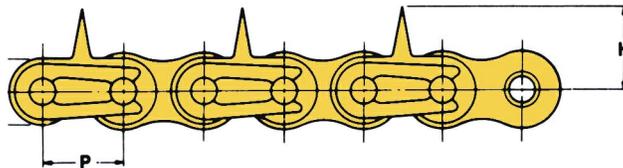
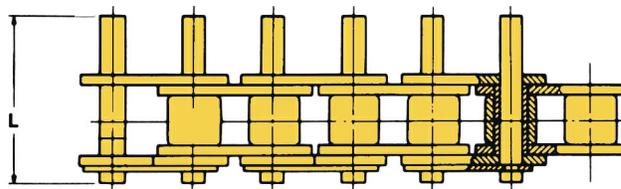
TSUBAKI Chain No.	C	C ₁	O	S	X	X _s	N _w	K _w
RS08B	0.500	0.515	0.192	0.350	0.799	0.814	0.968	0.500
RS10B	0.625	0.653	0.196	0.401	0.899	0.929	1.181	0.625
RS12B	0.687	0.692	0.216	0.448	1.009	1.015	1.370	0.751
RS16B	1.125	1.023	0.318	0.625	1.545	1.444	1.811	1.000

TSUBAKI ATTACHMENT CHAIN FOR SPECIALTY APPLICATIONS

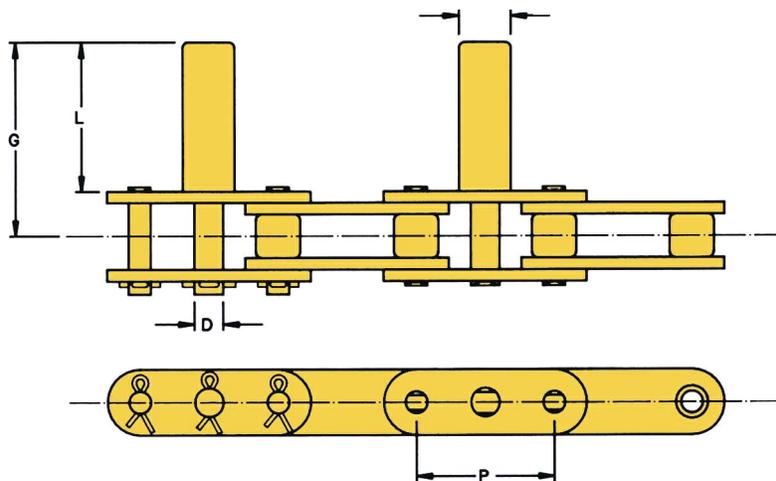
Stock Specialty Attachment Chains

AVAILABLE FOR IMMEDIATE DELIVERY

Tsubaki offers a full line of industry specific specialty chains FROM STOCK. This section illustrates many that are available for immediate delivery from our convenient Service Centers. Other specialty chains are available on a made-to-order basis.

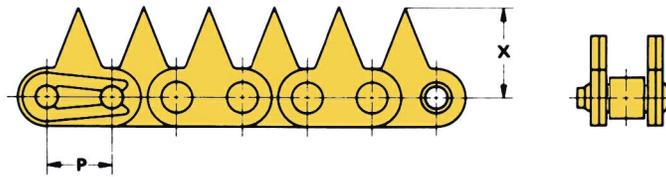


TSUBAKI Description	Pitch P	L	H	Wt. lbs./ft.
50 SPIKE CHAIN	.625	1.298	.688	.8

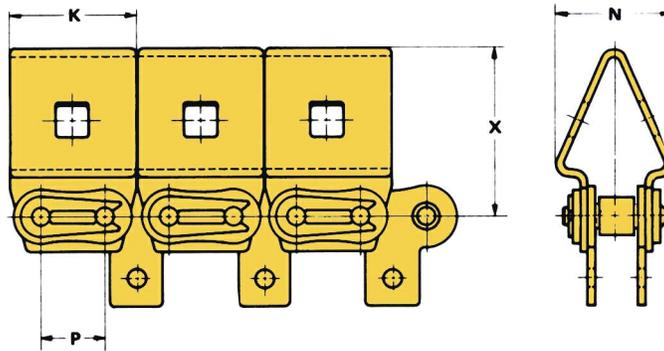


TSUBAKI Description	Pitch P	R	L	G	D	Wt. lbs./ft.
C2060H RIV with D-5 on Pin Link - 1/2 inch pin	1.500	.500	1.625	2.140	.313	1.2
C2060H RIV with D-5 on Pin Link - 9/16 inch pin	1.500	.563	1.625	2.140	.313	1.2

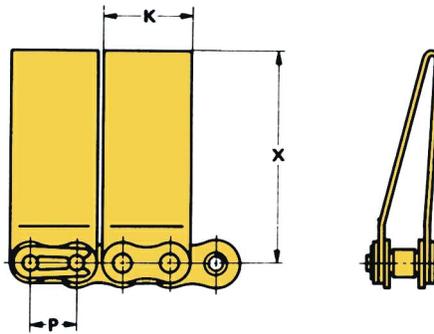
Available from stock in Carbon Steel and 304 Stainless Steel.



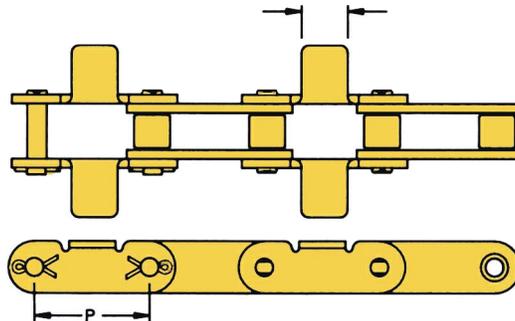
TSUBAKI Description	Pitch P	X	Wt. lbs./ft.
40 SS STICKER (304)	.500	.685	.5



TSUBAKI Description	Pitch P	X	K	N	Wt. lbs./ft.
40 BINDERY	.500	1.354	.988	.858	1.2



TSUBAKI Description	Pitch P	X	K	Wt. lbs./ft.
40 SS TENT - 1	.500	.813	.900	.8
40 SS TENT - 2.5	.500	2.250	.900	.9



TSUBAKI Description	Pitch P	K	Wt. lbs./ft.
C2050CU RIV with special K-O	1.250	.500	.7

TSUBAKI ATTACHMENT CHAIN FOR SPECIALTY APPLICATIONS

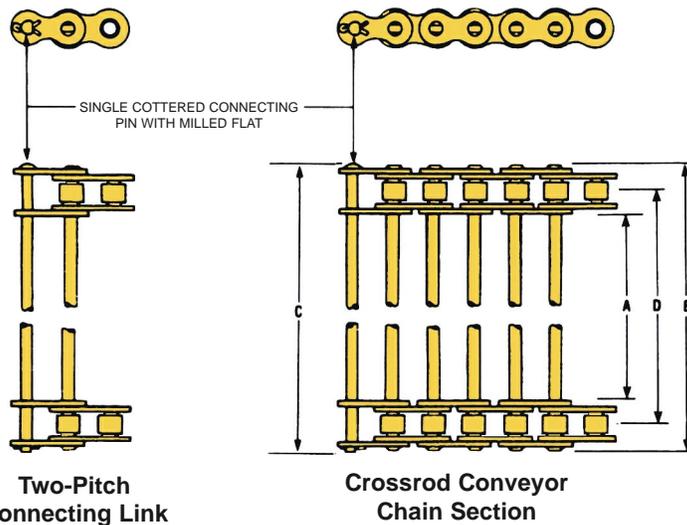
Crossrod Conveyor Chain



Crossrod conveyor chain consists of two parallel strands of standard RS40 or RS50 chains, joined by crossrods on every link. RS40 chain is used for light loads such as conveying bread through coolers, wrappers and slicers. RS50 chain is for heavier loads. When sanitary, noncorrosive qualities are required, crossrods can be stainless steel.

The connecting pins have milled flats and fit into a D-shaped hole in the link plate to prevent pin rotation and give longer life. Chains are furnished in five-foot sections and run on standard ANSI sprockets. Removable two-pitch link sections are available for repair.

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



RS 40 Chain with .500 Pitch, .156" Pin Diameter

Dimensions in inches

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

RS 50 Chain with .625 Pitch, .200" Pin Diameter

Dimensions in inches

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

Single Cottered Connecting Pins

Dimensions in inches

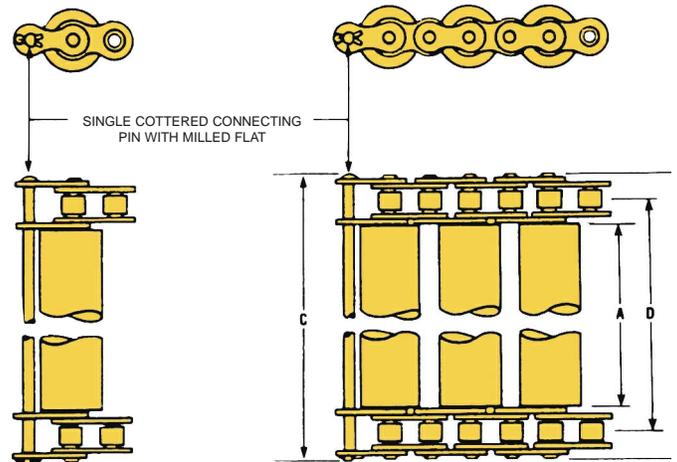
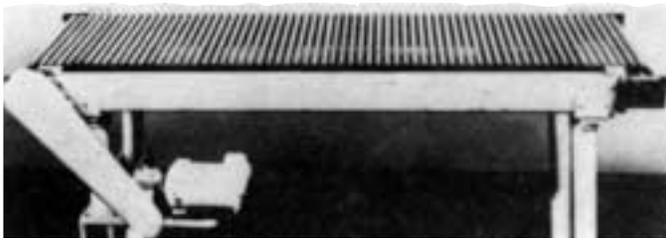
TSUBAKI Chain	RS50	Nominal Width
P329-CP12	P800-CP12	12
P329-CP15	P800-CP15	15
P329-CP18	P800-CP18	18
P329-CP21	P800-CP21	21
P329-CP24	P800-CP24	24
P329-CP30	P800-CP30	30

Two-Pitch Connecting Links

Dimensions in inches

TSUBAKI Chain	RS50	Nominal Width
P329-RS12	P800-RS12	12
P329-RS15	P800-RS15	15
P329-RS18	P800-RS18	18
P329-RS21	P800-RS21	21
P329-RS24	P800-RS24	24
P329-RS30	P800-RS30	30

Live Tubular Roller Chain



Two-Pitch Connecting Link

Live Tubular Roller Conveyor Chain Section

This chain consists of two parallel strands of RS40 chain with 3/4 diameter live tubular rollers on 1 spacing. The chains can be placed at the end or any intermediate point of a line where variations in speed or stoppage of conveyed goods may occur. Placed next to slicing or wrapping machines, they act as accumulators.

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

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

RS 40 Chain with .500 Pitch, .750 Roller Diameter
Dimensions in inches

TSUBAKI Chain Number	Nominal Width	Plate to Width A	Overall Riveted B	From Pin Head to End C	Roller C.L. to C.L. D	Average Weight lbs./ft.
TP329-12	12	11.25	12.44	12.51	11.812	4.3
TP329-15	15	14.25	15.44	15.51	14.812	5.3
TP329-18	18	17.25	18.44	18.51	17.812	6.2
TP329-21	21	20.25	21.44	21.51	20.812	7.2
TP329-24	24	23.25	24.44	24.51	23.812	7.6
TP329-30	30	29.25	30.44	30.51	29.812	9.1

Single Cottered Connecting Pins
Dimensions in inches

TSUBAKI Chain Number	Nominal Width
TP329-CP12	12
TP329-CP15	15
TP329-CP18	18
TP329-CP21	21
TP329-CP24	24
TP329-CP30	30

Two-Pitch Connecting Links
Dimensions in inches

TSUBAKI Chain Number	Nominal Width
TP329-RS12	12
TP329-RS15	15
TP329-RS18	18
TP329-RS21	21
TP329-RS24	24
TP329-RS30	30

TSUBAKI ATTACHMENT CHAIN FOR SPECIALTY APPLICATIONS

Agriculture Attachment Chain

AGRICULTURE ATTACHMENT CHAIN



Roller Link with
A-1
Attachment

Roller Link with
K-1
Attachment

Pin Link with
A-1
Attachment

Pin Link with
K-1
Attachment



Roller Link with
SA-1
Attachment

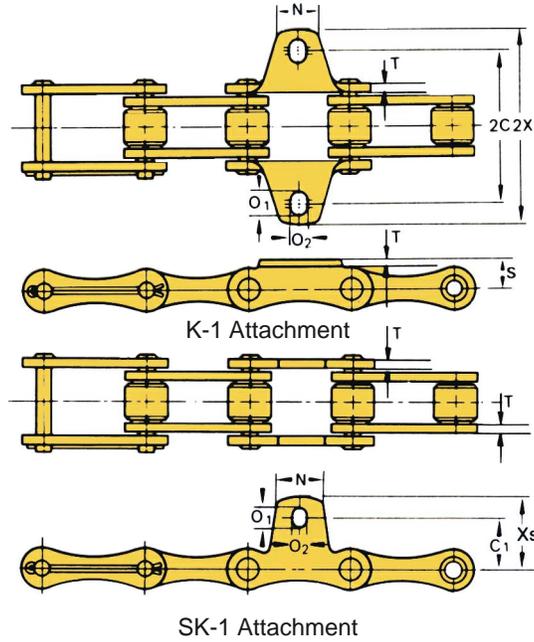
Roller Link with
SK-1
Attachment

Pin Link with
SA-1
Attachment

Pin Link with
SK-1
Attachment

Tsubaki Agriculture Attachment chain is designed specifically for farm equipment. These attachments are built with the same high quality carbon steel as Tsubaki long-lasting drive chain.

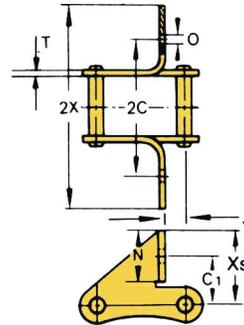
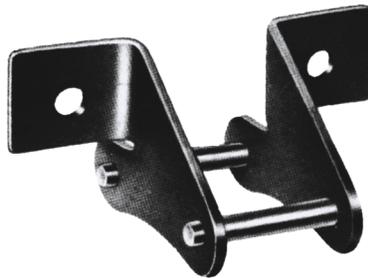
Agriculture Attachment chain is manufactured to industry specifications on a made-to-order basis. Additional attachment styles are available. Please contact Tsubaki for information on the special attachments.



TSUBAKI Chain No.	Pitch P	Attachment									Additional Weight per "A" Attachment lbs./att.
		2C	C ₁	N	O ₁	O ₂	S	T	2X	Xs	
MR32	1.150	1.687	.681	.669	.268	.205	.339	.059	2.358	1.020	.007
MR42	1.375	2.126	.929	.929	.398	.272	.551	.098	2.953	1.346	.029
MR52	1.500	2.311	.870	.630	.335	.272	.449	.098	3.012	1.213	.022
MR55	1.630	2.126	.780	.866	.398	.272	.449	.098	2.913	1.177	.026
MR45	1.630	2.126	.780	.866	.398	.272	.449	.098	2.913	1.177	.022
MR62	1.654	2.626	.969	.945	.520	.272	.449	.098	3.752	1.520	.024

Note: Attachments for CA550 and CA620 are available on a made-to-order basis to suit conveyor and agricultural applications.

"SD" ATTACHMENT PIN LINKS



TSUBAKI Chain No.	Pitch P	Attachment								Additional Weight per "A" Attachment lbs./att.
		2C	C ₁	J	N	O	T	2X	Xs	
MR52	1.150	2.283	.787	.039	.630	.260	.098	3.386	1.102	.040
MR55	1.630	2.283	.787	.039	.630	.260	.098	3.386	1.102	.042
MR45	1.630	2.283	.787	.039	.630	.260	.098	3.386	1.102	.042

Note: When ordering chains with attachments, specify chain number, attachment spacing, and style of attachments (e.g., A-1, K-1, SA-1, SK-1, or SD).

TSUBAKI ATTACHMENT CHAIN FOR SPECIALTY APPLICATIONS

Made-to-Order Specials

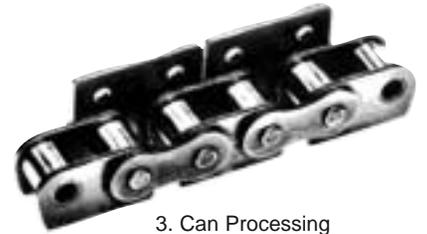
Tsubaki will design and manufacture special attachment chain to your specifications. This section illustrates some of the special chain assemblies that can be supplied on a made-to-order basis.



1. Packaging equipment



2. Special roller chain for coupling



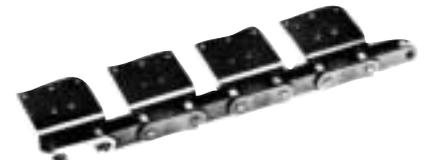
3. Can Processing



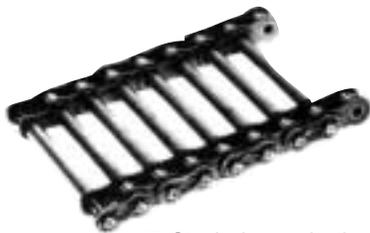
4. Roller conveyor



5. Processing in poultry industry



6. Slat conveyor for electronic industry



7. Steel wire production



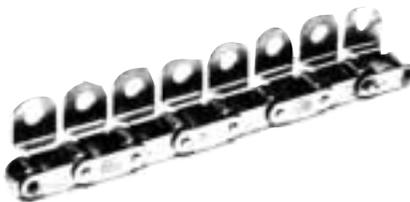
8. Conveying electronic parts



9. Slat conveyors in the food industry



10. Sanitary products processing



11. Conveying capacitors



12. Bar conveyor



13. Book binding



14. Conveying capacitors



15. Water sewage systems

Special attachments will be designed and manufactured as required.
Please specify chain size and details of the required attachment when inquiring.



16. Flow conveyor



17. Wood making machinery



18. Hauling



19. Hard-board processing



20. Packaging process



21. Conveying bottles



22. Conveying small parts, such as miniature motors



23. Plywood machinery



24. Conveying cartons



25. Thermoforming



26. Plywood machinery



27. Poultry processing



28. Packaging equipment



29. Packaging equipment



30. Poultry processing

TSUBAKI ATTACHMENT CHAIN FOR SPECIALTY APPLICATIONS

Special attachments will be designed and manufactured as required.
Please specify chain size and details of the required attachment when inquiring.



31. Cane harvester



32. Confectionary machinery



33. Corn harvester machinery



34. Conveying bottles



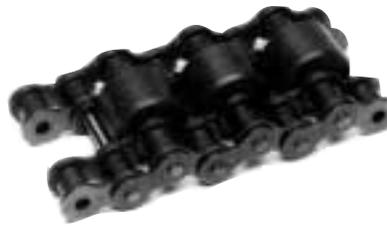
35. Oven chain



36. Smokehouse products processing



37. Mail bag vertical conveyor



38. Free Flow conveyor



39. Paper packaging



40. Dairy products processing

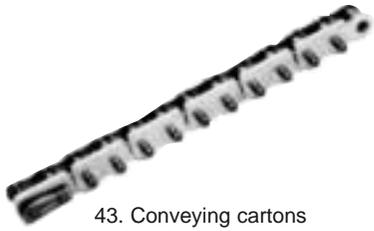


41. Copy machinery



42. Glass forming

Special attachments will be designed and manufactured as required. Please specify chain size and details of the required attachment when inquiring.



43. Conveying cartons



44. Vacuum packaging



45. Conveying electric parts



45. Electric printed circuit boards



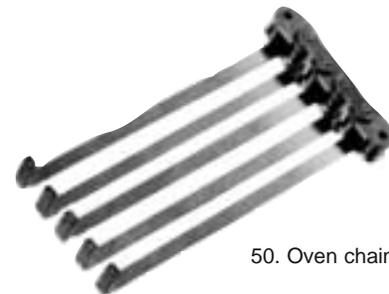
47. Ice scraper



48. Bread cooling



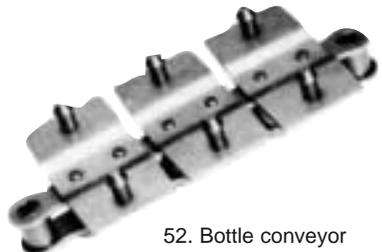
49. Pin oven chain



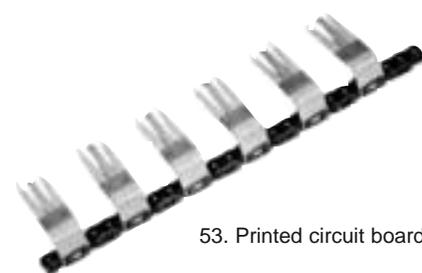
50. Oven chain



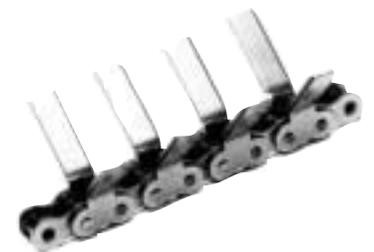
51. Conveying tin plates



52. Bottle conveyor



53. Printed circuit boards



54. Vegetable processing

TSUBAKI ATTACHMENT CHAIN FOR SPECIALTY APPLICATIONS

Special attachments will be designed and manufactured as required.
Please specify chain size and details of the required attachment when inquiring.



55. Printing



56. Book binding



57. Printing

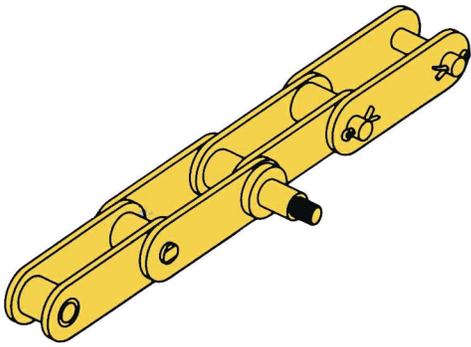


58. Packaging equipment

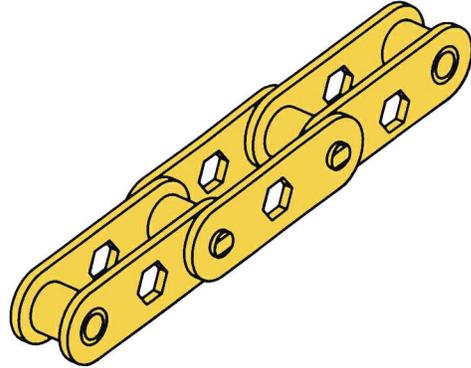


59. Ice cream bar processing

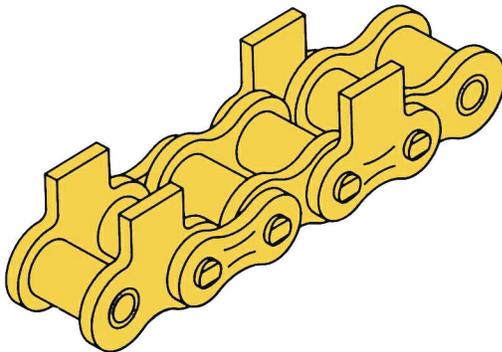
Special attachments will be designed and manufactured as required.
Please specify chain size and details of the required attachment when inquiring.



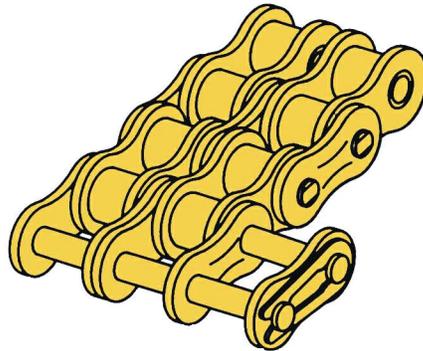
60. Vacuum Packaging Equipment



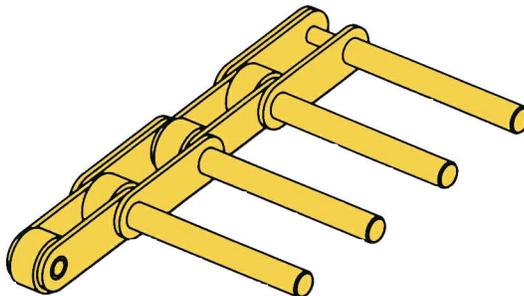
61. Hex Axle Conveyor



62. Food Processing Equipment



63. Packaging Equipment



64. Final Process Conveyor

TSUBAKI ATTACHMENT CHAIN SELECTION GUIDE

SELECTION PROCEDURE

Attachment Chain Selection Guide

In addition Tsubaki ANSI single and double pitch roller chain is widely used for conveyor service. The following procedure is useful for economical and quick chain selection.

- Step 1 : Confirm the operating conditions of the conveyor
- Step 2 : Tentatively select the chain size
- Step 3 : Calculate the design chain tension (actual chain tension)
- Step 4 : Verify the chain selection
- Step 5 : Verify the allowable roller load

Step 1 Confirm the operating conditions of the conveyor

The following information is needed to design a chain conveyor.

- ① Type of conveyor (slat conveyor, bucket elevator, etc.)
- ② Method of chain travel (horizontal, inclined, or vertical conveyor)
- ③ Type, weight, and size of materials to be conveyed
- ④ Weight of materials to be transported per foot of conveyor length
- ⑤ Conveyor speed
- ⑥ Conveyor length
- ⑦ Lubrication
- ⑧ Considerations for special environments

Step 2 Tentatively select chain size

To tentatively select the chain size, estimate the chain tension (T) by the following formula. A chain with an allowable load equal to or over the above calculated chain tension may be tentatively selected.

$$T \text{ (lbs.)} = M_T \times f \times k_1 \text{ (1)}$$

M_T : Total weight of material conveyed (lbs)

f : Coefficient of friction, sliding and/or rolling
(f_1, f_2 of Table I and II)

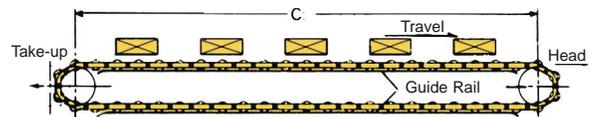
k_1 : Chain speed coefficient (Table III)

Step 3 Calculate chain tension

Next, the chain tension should be calculated using the actual weight of the conveyor chain and material conveyed, as shown below.

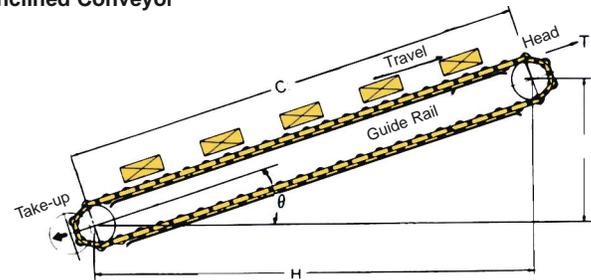
1. Chain rolling

n Horizontal Conveyor



$$T = (M + 2.1w) f_1 C \text{ (2)}$$

n Inclined Conveyor



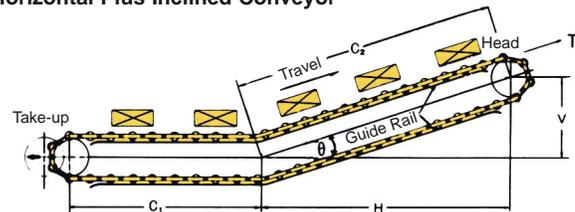
$$T = (M + w) (f_1 C \cos \theta + C \sin \theta) + 1.1w (f_1 C \cos \theta - C \sin \theta) \text{ (3)}$$

When $(f_1 C \cos \theta - C \sin \theta) < 0$. $1.1w (f_1 C \cos \theta - C \sin \theta) = 0$

$$\text{or } T = (M + w) (V + f_1 H) + 1.1w (f_1 H - V) \text{ (4)}$$

When $(f_1 H - V) < 0$. $1.1w (f_1 H - V) = 0$

n Horizontal Plus Inclined Conveyor



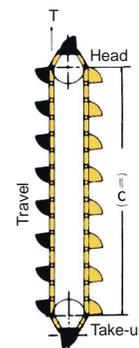
$$T = (M + 2.1w) f_1 C_1 + (M + w) (f_1 C_2 \cos \theta + C_2 \sin \theta) + 1.1w (f_1 C_2 \cos \theta - C_2 \sin \theta) \text{ (5)}$$

When $(f_1 C_2 \cos \theta - C_2 \sin \theta) < 0$. $1.1w (f_1 C_2 \cos \theta - C_2 \sin \theta) = 0$.

$$\text{or } T = (M + 2.1w) f_1 C_1 + (M + w) (V + f_1 H) + 1.1w (f_1 H - V) \text{ (6)}$$

When $(f_1 H - V) < 0$. $1.1w (f_1 H - V) = 0$

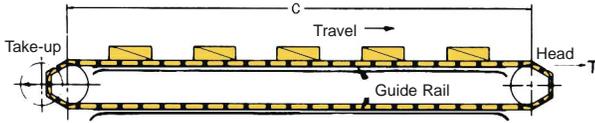
n Vertical Conveyor



$$T = (M + w)V \text{ (7)}$$

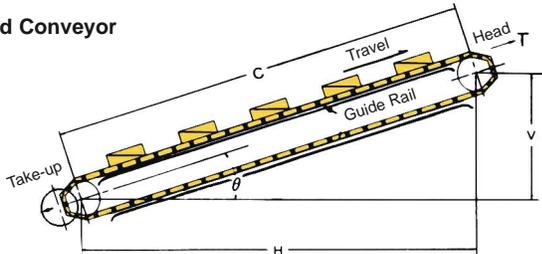
2. Chain sliding

n Horizontal Conveyor



$$T = (M + 2.1w) f_2 C \dots\dots\dots (8)$$

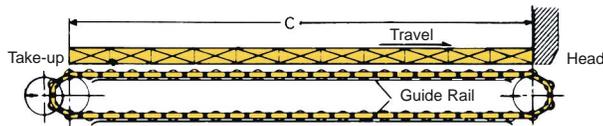
n Inclined Conveyor



$$T = (M + w) (f_2 C \cos \theta + C \sin \theta) + 1.1w (f_2 C \cos \theta - C \sin \theta) \dots\dots\dots (9)$$

When $(f_2 C \cos \theta - C \sin \theta) < 0$, $1.1w (f_2 C \cos \theta - C \sin \theta) = 0$
 or $T = (M + w) (V + f_2 H) + 1.1w (f_2 H - V) \dots\dots\dots (10)$
 When $(f_2 H - V) < 0$, $1.1w (f_2 H - V) = 0$.

n Horizontal Conveyor for Top Roller Chain and Plastic Outboard Roller Chain



$$T = \left\{ (M(f_1 + f_2) + 2.1w \frac{f_1 + f_2}{2}) \right\} C \dots\dots (11)$$

3. Calculate the required power

Calculate the required power to drive the conveyor from the following formula.

n Horizontal and/or Inclined Conveyor

$$HP = \frac{T \cdot S}{33,000 \times \eta} \dots\dots\dots (12)$$

n Vertical Conveyor

$$HP = \frac{M \cdot V \cdot S}{33,000 \times \eta} \dots\dots\dots (13)$$

Where

- T = Chain tension (lbs.)
- w = Weight of chain and attachments per ft. (lbs./ft.)
- M = Weight of material conveyed per ft. (lbs./ft.)
- V = Vertical center distance of conveyor (ft.)
- H = Horizontal center distance of conveyor (ft.)
- C = Center distance between sprocket (ft.)
- f₁ = Coefficient of rolling friction between chain and guide rail (Table I)
- f₂ = Coefficient of sliding friction between chain and guide rail (Table II)
- η = Transmission efficiency
- S = Speed = $\frac{P \cdot N \cdot n}{12}$ (ft./min.)
- P = Chain pitch (inch)
- N = Number of teeth
- n = Sprocket speed (rpm)

Table I : Coefficient of Rolling Friction (f₁)

Type of Roller	Dry	Lubricated
Oversize "R" roller type	0.12	0.08
Standard "S" roller type	0.21	0.14
Top roller type	0.09	0.06

Table II : Coefficient of Sliding Friction (f₂)

Dry	Lubricated
0.3	0.2

Step 4 Verify chain selection

Multiply the chain tension (T) by the chain speed coefficient (k₁) listed in Table III and verify the following formula.

$$T \times k_1 \leq \text{Max. allowable load of the chain} \dots\dots\dots (14)$$

Table III : Chain Speed Coefficient (k₁)

Chain Speed (ft./min)	Speed Factor (K ₁)
0 ~ 50	1.0
50 ~ 100	1.2
100 ~ 160	1.4
160 ~ 230	1.6
230 ~ 300	2.2
300 ~ 360	2.8
360 ~ 400	3.2

When the design chain tensions (T X k₁) is over the allowable load or much less than it, try the same steps again for the next bigger or smaller chain size to select a more suitable chain.

Step 5 Verify the allowable roller load

When the load is carried on the rollers, the total weight of the chain and load per roller should not exceed the allowable roller load shown in Table IV.

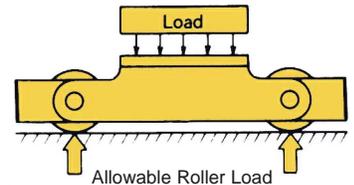


Table IV : Allowable Roller Load

Chain No.	Allowable Roller Load lbs./roller		
	Oversize Roller	Plastic Oversize Roller	Standard Roller
C2040 RS 40	143	44	33
C2050 RS 50	220	66	44
C2060H RS 60	350	110	66
C2080H RS 80	590	198	120
C2100H RS100	880	286	180
C2120H RS120	1,320	-	260
- RS140	-	-	300
C2160H RS160	2,160	-	430

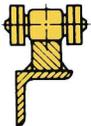
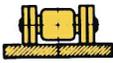
Note: Oversize "R" rollers are available only for double pitch roller chains.

Tsubaki Plus α Alpha, Hi-Tech Attachment chains.

In addition to the attachment chains shown in this general catalogue, there are other attachments such as Tsubaki Plus α Alpha chain. Refer to our catalogue No. 1300 for details.

General Engineering Information

Method of chain travel and type of rollers

Method of Chain Travel	Type of Roller	Features
Chain Rolling (Horizontal or Vertical) 	Oversize "R" roller type <ul style="list-style-type: none"> • Heavy in chain weight • Greater allowable roller load • Less roller wear 	<ul style="list-style-type: none"> • Smooth operation • Less vibration • Lower friction and less power required • Generally used for: conveyor lengths over 35 ft. conveyor speeds over 70 ft./min.
Chain Rolling 	Standard "S" roller type <ul style="list-style-type: none"> • Light weight 	<ul style="list-style-type: none"> • Generally used for : conveyor lengths less than 35 ft. conveyor speeds less than 70 ft./min
Chain Sliding (Double Pitch chain) 	<ul style="list-style-type: none"> • Lower allowable roller load 	<ul style="list-style-type: none"> • Suitable for impact and dirty conditions • Economical • Impact resistant • Greater power required
Double Pitch chain		

Points to consider:

- 1) For long conveyors, use take-up devices to eliminate chain slack.
Take-up stroke = (center distance between sprockets X 0.02) + catenary sag allowance.
- 2) Chain must always be engaged with at least 3 sprocket teeth.
- 3) When two or more strands of conveyor chain operate, all sprocket teeth on the head shaft should be aligned. The chain may be matched at the factory for uniform length and attachment alignment for accurate multiple strand operation.

Considerations for Use in Special Environments

ANSI standard and double pitch conveyor chain can be operated normally in ambient temperatures between 15°F and 140°F without trouble.

When the chain is operated in very low or high temperatures,

or in an abrasive or corrosive atmosphere, the following should be taken into account.

1. Under very low or high temperatures:
chain must be selected in a different manner when it is operated in freezing chambers, cold areas, when it passes through a heat-treatment furnace, or is affected by heat from the material conveyed.

Tsubaki Plus α Alpha, Hi-Tech Attachment chains.

In addition to the attachment chains shown in this general catalogue, we offer a large variety of specialized attachment chains. Refer to our Tsubaki Plus Alpha Catalogue No. 1300 for additional selections.

Temperatures	Chain Selection	Caution
-60° F ~-20° F	<ul style="list-style-type: none"> Under -20°F or lower conditions, ANSI 304 stainless steel chains and 600 series stainless steel chains are suggested. Carbon chains are not suggested. 	(1) Low temperature embrittlement may occur on link plates of carbon steel chain. (2) Freezing of lubricant. (3) Rust due to condensation. (4) Seizure due to freezing.
-20° F ~15° F	The chain should be selected on the basis of the corrected working load, below.	
140° F ~300° F	Special lubrication is required.	
300° F ~480° F	The chain should be selected on the basis of the corrected working load, below. Selection of the next larger pitch chain over the originally selected one is suggested.	(1) Excessive wear due to decrease of hardness of pin and bushing. (2) Poor lubrication due to deterioration of lube.
480°F~	ANSI 304 stainless steel chain and ANSI 600 series stainless steel chain are suggested.	

Table V: Corrected Working Load

Temperature	Corrected Working Load
-20° F ~ -4° F	(Max. allowable load in catalog) x 0.25
- 4° F ~ 15° F	() x 0.3
15° F ~ 300° F	() x 1.0
300° F ~ 390° F	() x 0.75
390° F ~ 480° F	() x 0.5

2. In wet conditions:

When chain is exposed to water, e.g., in a sterilizer or water screen, excessive wear due to insufficient lubrication and rust may shorten chain life. In these cases, a larger chain size provides less bearing pressure and stainless steel or plated chain will provide rust prevention.

3. In corrosive conditions:

When chain is exposed to an acidic or alkaline solution and/or operated in a corrosive atmosphere, excessive wear may occur due to chemical corrosion on the chain parts in addition to mechanical wear.

Hydrogen embrittlement may also occur in an acidic atmosphere. Roller chain is more easily affected by acid than alkali. In special cases, electro-chemical corrosion may occur on the chain due to sea or mine water. Refer to the

table on page A-60 "Corrosion Resistance Guide", for the corrosion resistance of stainless steel.

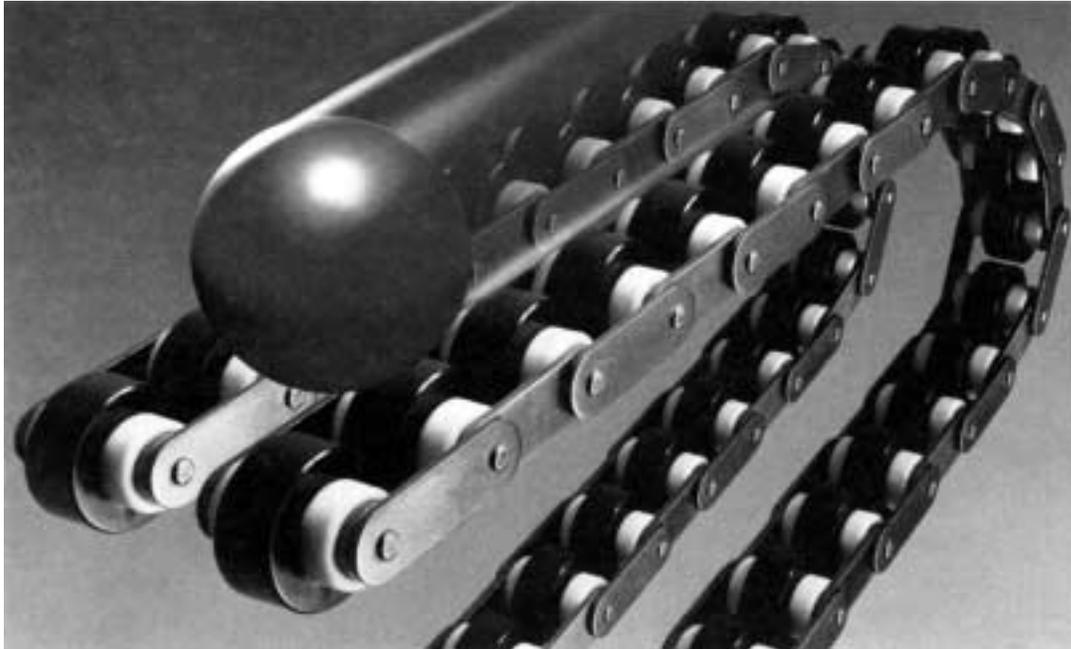
4. In dusty conditions:

When conveyor chain is operated in dusty conditions, i.e., in the presence of coke, metal powder, and sand, etc., the chain wears very quickly because foreign material gets between the parts of the chain and also the engaging surfaces of the sprocket teeth and chain.

In such cases, select a larger chain size to reduce the bearing pressure or choose a chain especially designed for high wear resistance.

The foregoing information is intended to provide general guidelines for conveyor chain selection. Consult with Tsubaki for specific application problems.

Free Flow Chain



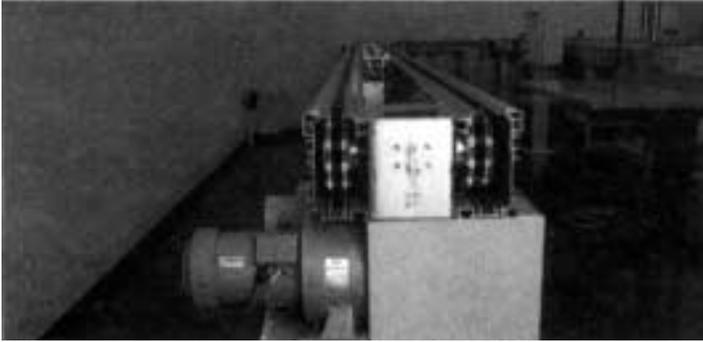
Free Flow Conveyor – this is a conveyor system where the speed of conveyed objects can be freely controlled and stopped at any time and at any position for accumulation or for performing a job at a station without stopping in the conveyor.

A typical application is, for example, an assembly or accumulation conveyor used in the electronics industry to transport consumer products such as TVs, VCRs, and radios, etc. Technical innovation in this field is very fast. To produce hi-tech products quickly, hi-tech assembly lines using quick and accurate chains are necessary.

Tsubaki has developed the most usable and advanced chains for Free Flow conveyors drawing on Tsubaki high technology and long experience as a leader in worldwide chain manufacturing. Tsubaki Free Flow chains have many advantages.

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

n DOUBLE PLUS® CHAIN



Quiet operation is one advantage of using Tsubaki DOUBLE PLUS® chain. Because materials transported on the chain move 2.5 times faster than the chain itself, motor speeds can be reduced cutting down on noise and costs. Safety is ensured by the extra-large, engineering plastic center rollers which allow for installation on a chain cover. The original design of Tsubaki aluminum guide rail is standardized for easy installation. Steel roller DOUBLE PLUS is available for high load or high temperature applications.

n OUTBOARD ROLLER: SIDE AND TOP ROLLER CHAINS



The Outboard series consists of both side and top roller chains. Outboard roller construction makes for a highly compact conveyor system. Since a large number of rollers can be installed, a conveyor can easily be made where small objects are placed directly on the chain. Quick start-up is also possible by ordering a chain with plastic brakes.

n ROLLER TABLE



Line pressure is notably reduced during accumulation because of the low roll-friction coefficient on the plastic rollers (between 0.06 and 0.10). This low roll-friction coefficient protects the conveyed object from damage. In addition, smooth transfer to the next line is ensured by the plastic rollers and special attachments with the same surface height.

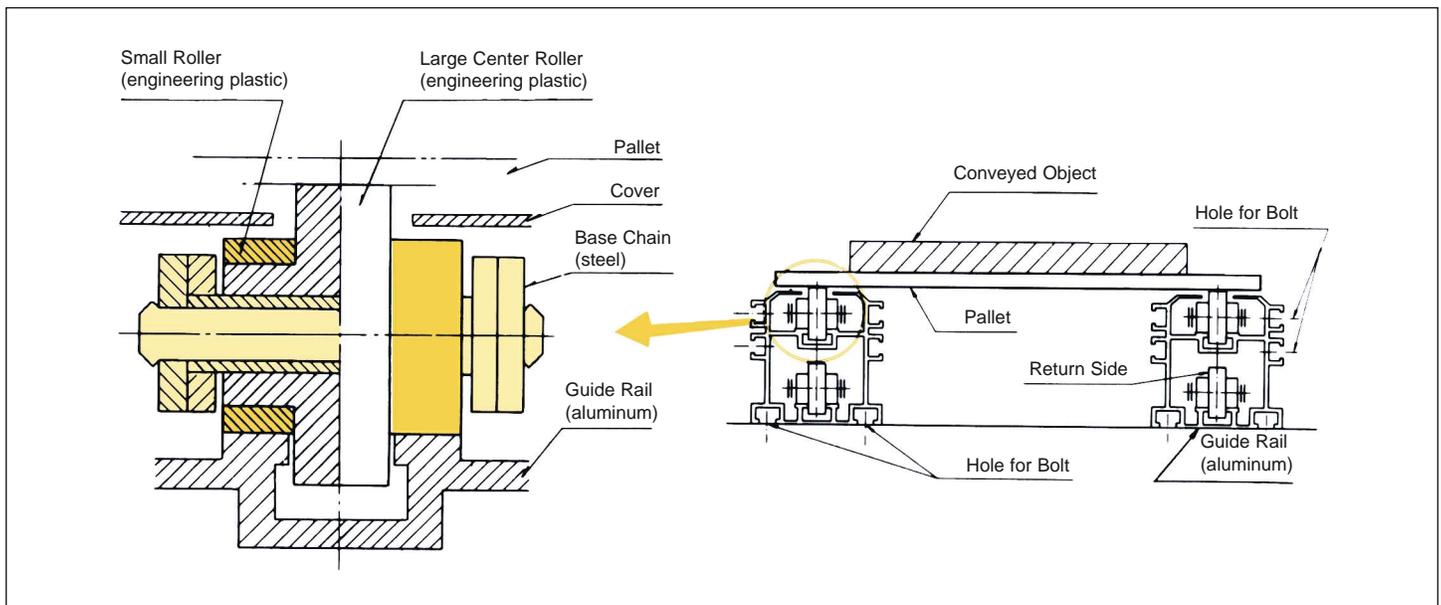
DOUBLE PLUS® Chain

- Quiet
- Safe
- Quick Start Up
- Wide Selection

Guide rails, pallet guides, sprockets for DOUBLE PLUS chain are available



Construction



How the Tsubaki DOUBLE PLUS chain works

• When conveying

Friction between the larger center roller and the small roller allows them to rotate together in unison. The difference in diameter of the two rollers causes the speed of the conveyed object to be approximately **2.5 times** the speed of the chain.

• When Accumulating

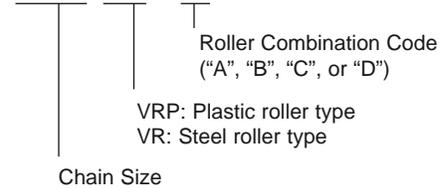
The large roller rotates freely in the opposite direction of the small roller allowing conveyed objects to accumulate. We call this **free flow** conveying.

Different combinations of small and large rollers are possible. Choose between the specifications of "A", "B", "C" and "D" depending on the application.

Small Roller			Regular Type	High Friction Type
			Grey	Off-white
Large Roller			Large Maximum Allowable Tension	Quick Start up Possible
			Regular Type	Brown
Electro-conductive Type	Black	Electro-conductive (Volume Resistivity: $10^3 \Omega \cdot \text{cm}^3$)	C	D

Model Identification

C2040 VRP - A

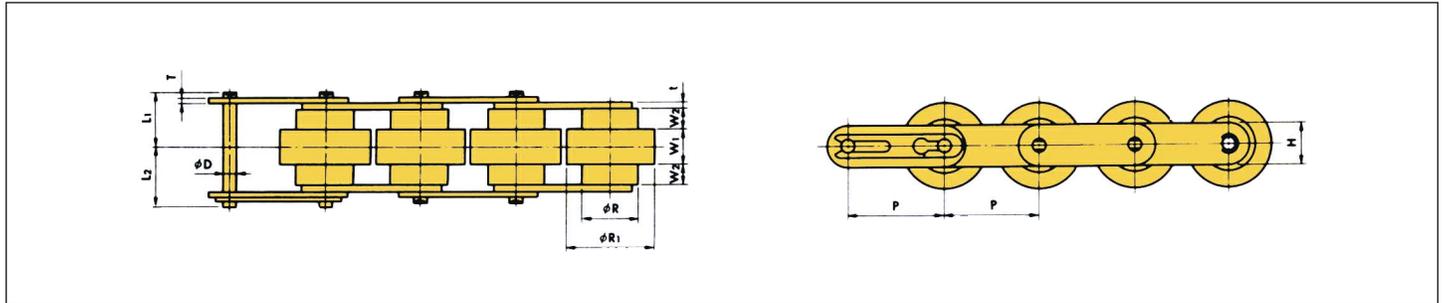


In addition to carbon steel, hard chrome plating, WP® and stainless steel are available

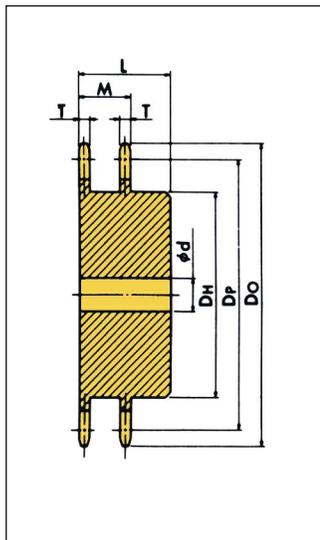
Chain Dimensions

TSUBAKI Chain No.	P	R	R ₁	W ₁	W ₂	t	T	H	D	L ₁	L ₂	Approx Weight lbs./ft.	Approx Weight for steel roller type lbs./ft.
C2030VRP & VR	0.750	.469	.720	.315	.157	.060	.060	.354	.141	.474	.522	.40	.94
C2040VRP & VR	1.000	.625	.969	.406	.224	.080	.060	.472	.156	.622	.669	.67	1.68
C2050VRP & VR	1.250	.750	1.205	.512	.280	.094	.080	.591	.200	.770	.837	.94	2.49
C2060VRP & VR	1.500	.875	1.441	.610	.335	.125	.125	.677	.234	.964	1.04	1.34	3.76
C2080VRP	2.000	1.125	1.890	.787	.591	.156	.156	.906	.312	1.409	1.496	2.62	-

*Steel roller type (VR series) are available to -10°C ~ +150°C (14°F ~ 302° F)



n Sprockets for Tsubaki DOUBLE PLUS® CHAIN

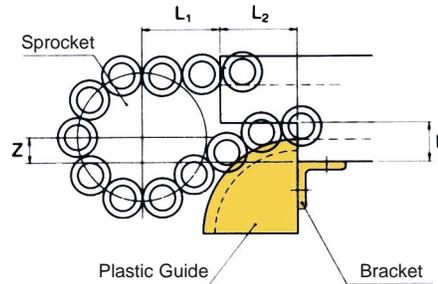
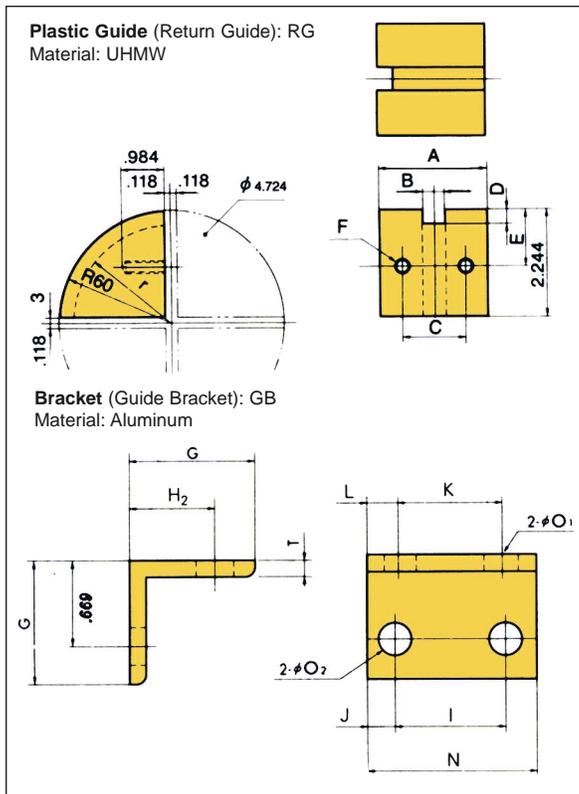


TSUBAKI Sprocket No.	Hub Type	Number of Teeth	Pitch Diameter D _P	Outer Diameter D _O	Tooth Thickness T	Plate Bore Diameter d	Hub		M	Approx Weight lbs./piece
							Diameter D _H	Length L		
C2030VRP-10T	B	10	2.427	2.677	.118	.500	1.457	.984	.602	.44
C2040VRP-10T	B	10	3.236	3.661	.157	.630	2.047	1.575	.803	1.76
C2050VRP-10T	B	10	4.045	4.606	.197	.630	2.598	1.772	1.004	3.31
C2060VRP-10T	B	10	2.854	5.394	.236	.748	3.189	1.969	1.201	5.51
C2080VRP-10T	B	10	6.472	7.360	.472	.906	4.331	2.638	1.870	15.40



DOUBLE PLUS® Plastic Guide and Bracket

■ Plastic Guide and Bracket



Dimensions - inches

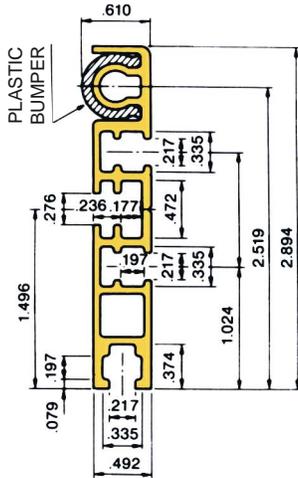
Chain No.	Z	L ₁	L ₂ (Drive)	L ₂ (Driven)	H ₁	A	B	C	D	E	F	r
C2030VRP-RG	.839	1.575	8.268	3.150	.984	1.339	.354	.866	.236	1.220	M6	2.126
C2040VRP-RG	.579	1.969	11.810	3.937	.984	1.969	.472	1.181	.315	1.181	M8	2.047
C2050VRP-RG	.634	2.362	13.390	2.724	1.181	2.205	.591	1.378	.394	1.260	M8	1.969
C2060VRP-RG	.587	2.756	19.930	5.118	1.575	2.362	.709	1.535	.492	1.260	M8	1.870
C2080VRP-RG	.945	3.937	21.650	7.874	2.362	2.756	.906	1.772	.591	1.614	M8	2.559

Chain No.	R	G	H ₂	I	J	K	L	N	O ₁	O ₂	T
C2030VRP	2.362	.984	.709	.866	.236	.807	.264	1.339	.256	.256	.118
C2040VRP	2.362	1.181	.787	1.181	.591	1.752	.303	2.362	.335	.335	.118
C2050VRP	2.362	1.378	.945	1.378	.807	2.185	.402	2.992	.413	.335	.157
C2060VRP	2.362	1.378	.945	1.535	1.083	2.854	.421	3.701	.413	.335	.157
C2080VRP	3.150	1.378	.945	1.772	1.083	2.756	.591	3.937	.413	.335	.157

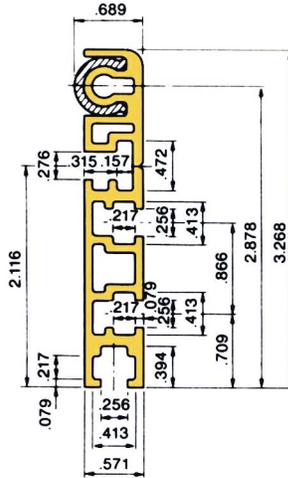
■ **Pallet Guides with Plastic Bumpers**
MATERIAL: ANODIZED ALUMINUM AND PLASTIC

• Please order Pallet Guides (PGR) and Plastic Bumpers, separately

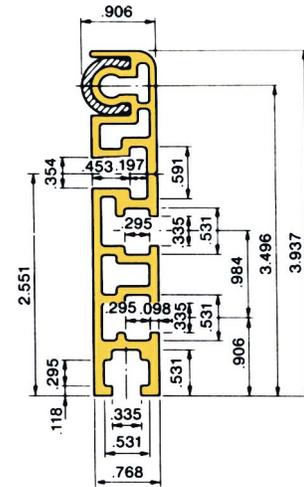
C2030VRP-PGR
 C2030VRP Plastic Bumpers
 • Size: 9.84 ft.
 • Approx. Weight: 65 lbs./ft.



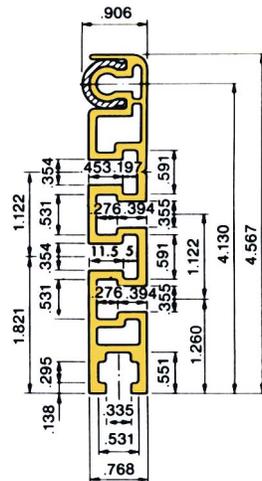
C2040VRP-PGR
 C2040VRP Plastic Bumpers
 • Size: 13.12 ft.
 • Approx. Weight: 1.00 lbs./ft.



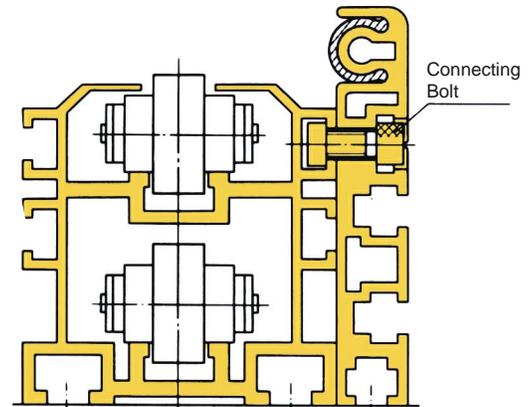
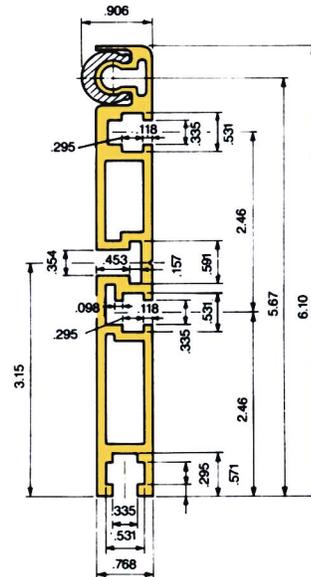
C2050VRP-PGR
 C2050VRP Plastic Bumpers
 • Size: 13.12 ft.
 • Approx. Weight: 1.44 lbs./ft.



C2060VRP-PGR
 C2060VRP Plastic Bumpers
 • Size: 13.12 ft.
 • Approx. Weight: 1.65 lbs./ft.

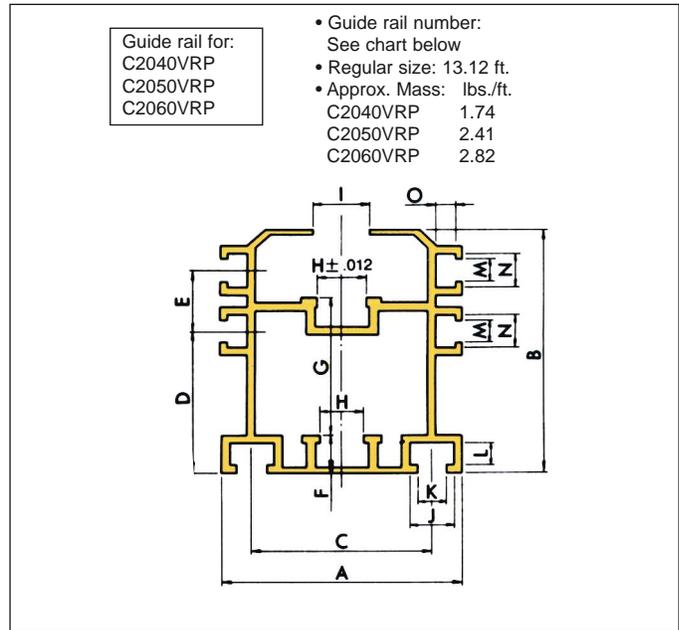
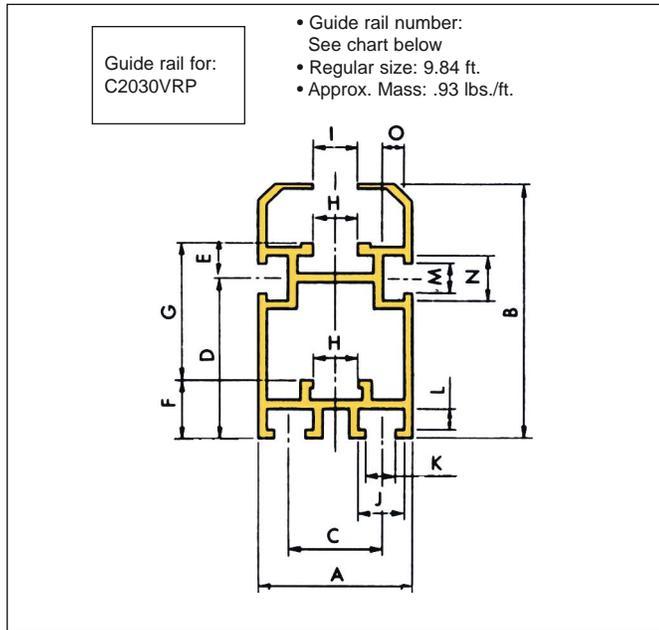


C2080VRP-PGR
 C2080VRP Plastic Bumpers
 • Size: 9.84 ft.
 • Approx. Weight: 2.35 lbs./ft.



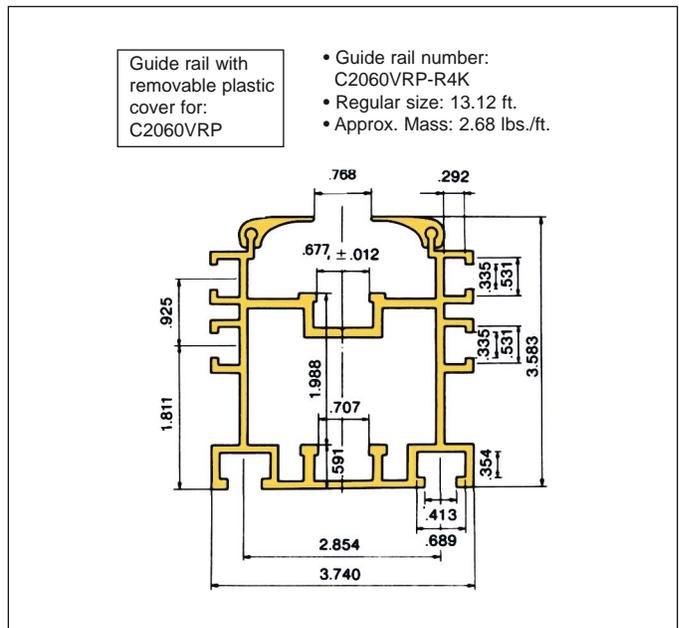
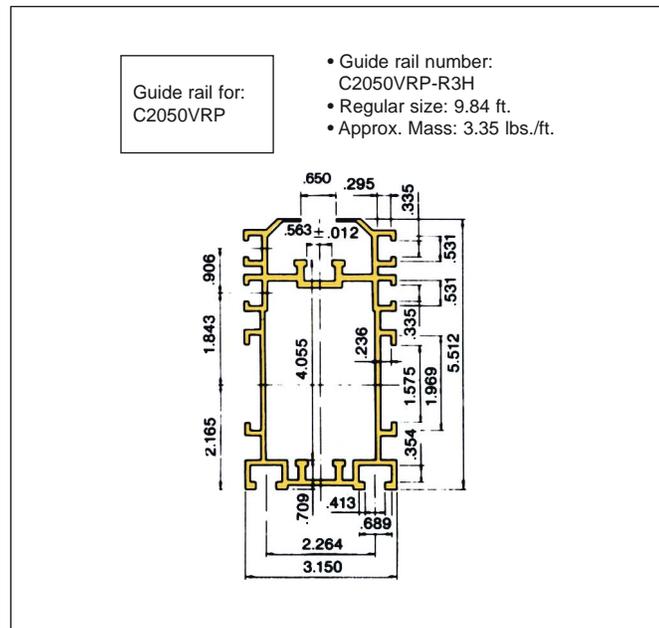
TSUBAKI FREE FLOW CHAIN

■ Guide Rail for Tsubaki DOUBLE PLUS® Chain (Standard Rail) MATERIAL: ANODIZED ALUMINUM



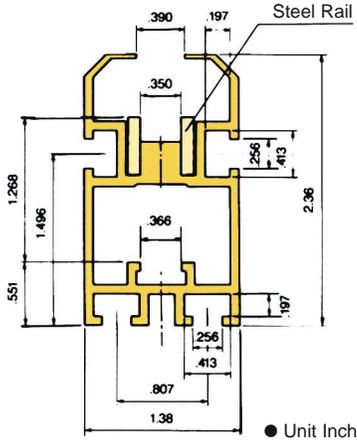
TSUBAKI	Guide Rail No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
C2030VRP-R3L		1.378	2.362	.807	1.496	.323	.551	1.268	.350	.390	.413	.256	.197	.256	.413	.197
C2040VRP-R4L		2.480	2.598	1.752	1.378	.728	.512	1.374	.449	.531	.531	.335	.295	.256	.413	.197
C2050VRP-R4L		3.071	3.150	2.185	1.654	.906	.591	1.693	.563	.650	.689	.413	.354	.335	.531	.295
C2060VRP-R4L		3.740	3.583	2.854	2.018	.925	.591	1.988	.677	.768	.689	.413	.354	.335	.531	.295

(Option Rail) MATERIAL: ANODIZED ALUMINUM

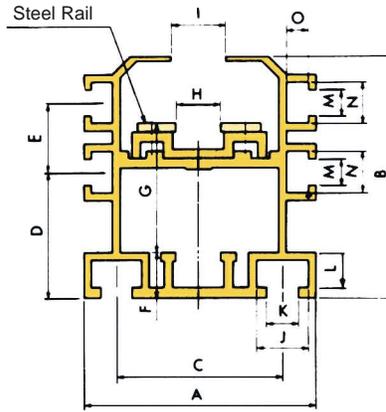


Guide Rail with Steel Rail

Material: Body: Anodized Aluminum



Guide Rail Number: C2030VRP-R3LS
 Regular Size: 9.84 ft
 Approximate Mass: 1.48 lbs./ft.



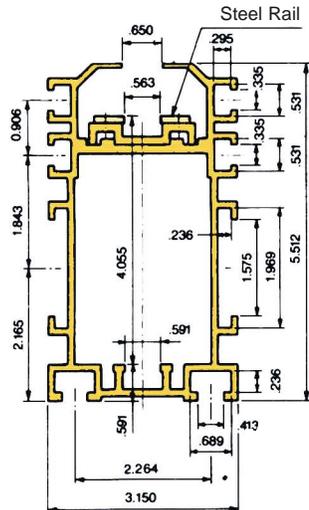
Guide Rail Number: See chart below
 Regular Size: 13.12 ft.

Note: The steel rail is fixed to the body with bolts.

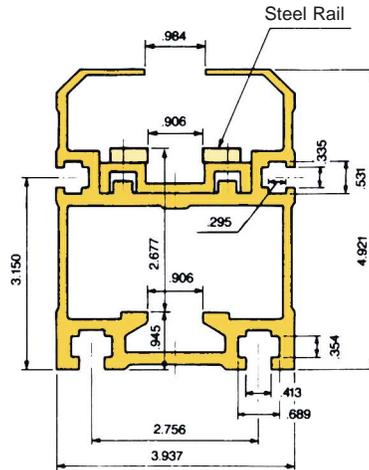
TSUBAKI Guide Rail No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Approx Weight lbs./ft.
C2040VRP-R4LS	2.480	2.598	1.752	.1378	.728	.512	1.374	.449	.531	.531	.335	.295	.256	.413	.197	2.48
C2050VRP-R4LS	3.071	3.150	2.185	1.654	.906	.591	1.693	.563	.650	.689	.413	.354	.335	.531	.295	3.35
C2060VRP-R4LS	3.740	3.583	2.854	2.018	.925	.591	1.988	.677	.768	.689	.413	.354	.335	.531	.295	3.96

Guide Rail with Steel Rail

Material: Body: Anodized Aluminum

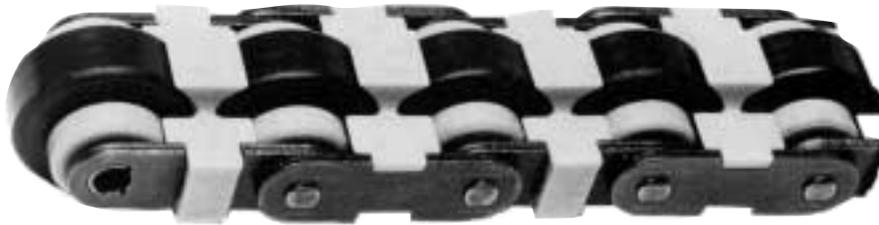


Guide Rail Number: C2050VRP-R3HS
 Regular Size: 9.84 ft
 Approximate Mass: 4.22 lbs./ft.



Guide Rail Number: C2080VRP-R3LS
 Regular Size: 9.84 ft
 Approximate Mass: 6.64 lbs./ft.

DOUBLE PLUS® Chain With Snap Covers



The best solution for preventing jamming.

On conveyor lines, small parts, like nuts and bolts, sometimes fall into the gaps between the guides and rollers. These parts cause the chain to jam when they enter the area between the chain and sprocket. Tsubaki DOUBLE PLUS chain with Snap Covers solves this problem. Using snap covers and new guide rails, the gaps between the rollers and guide rails are minimized. The end result is the elimination of chain jams caused by parts falling into the conveyor.

Chain Dimensions

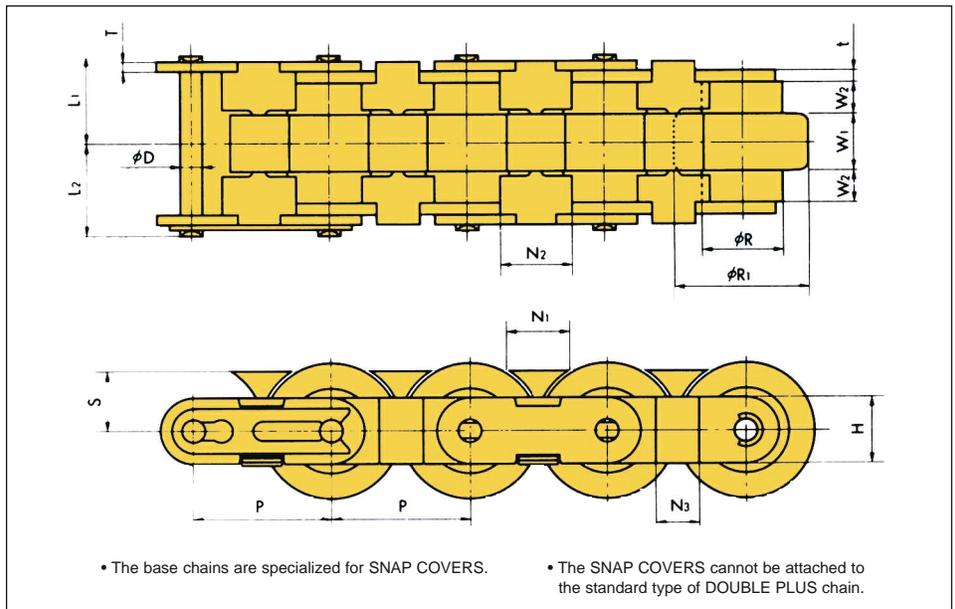
inch

Chain size	P	R	R ₁	W ₁	W ₂
C2030VRP	.750	.469	.720	.315	.157
C2040VRP	1.000	.625	.989	.406	.224
C2050VRP	1.250	.750	1.205	.512	.280
C2060VRP	1.500	.875	1.441	.610	.335

Chain size	t	T	H	D	L ₁
C2030VRP	.060	.060	.354	.141	.474
C2040VRP	.080	.060	.472	.156	.622
C2050VRP	.094	.080	.591	.200	.770
C2060VRP	.125	.125	.677	.235	.965

Chain size	L ₂	S	N ₁	N ₂	N ₃
C2030VRP	.522	.323	.315	.366	.205
C2040VRP	.669	.429	.390	.500	.287
C2050VRP	.837	.528	.492	.665	.394
C2060VRP	1.039	.610	.551	.815	.512

Note: Dimensions of steel roller type (VR) are same as plastic roller type shown in the above tables.

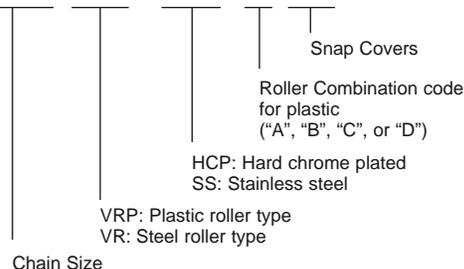


Chain size	Weight
C2030VRP	.400
C2040VRP	.670
C2050VRP	.940
C2060VRP	1.340

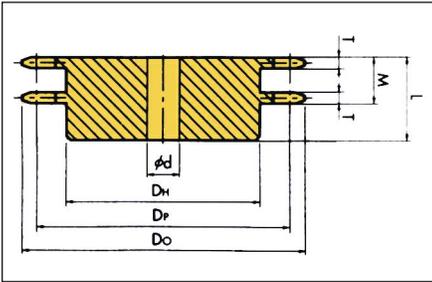
Chain size	Weight
C2030VR	.940
C2040VR	1.680
C2050VR	2.490
C2060VR	3.490

Model Identification

C2040 VRP- □ □ -A-SC



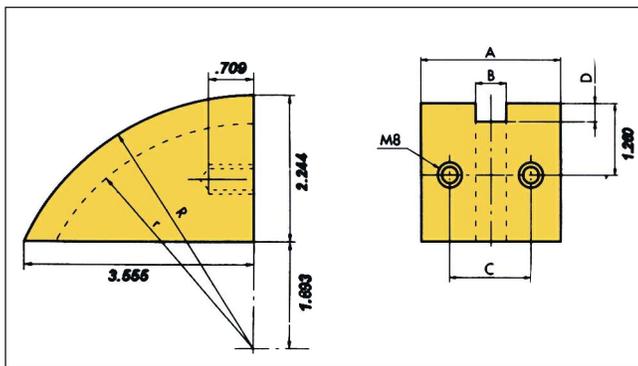
■ Sprockets for Tsubaki DOUBLE PLUS® Chain with Snap Covers



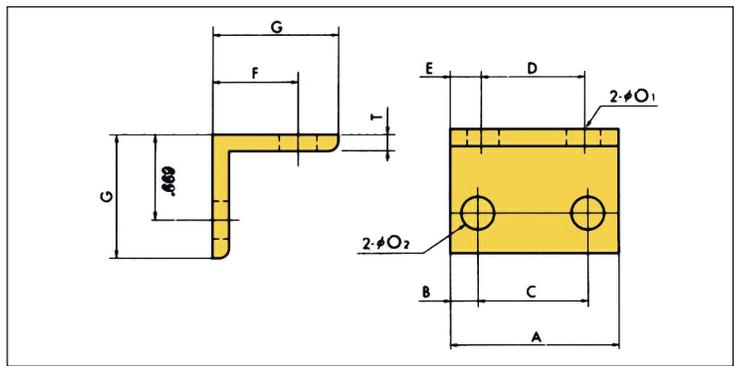
Sprocket size	Type	Number of teeth	Pitch diameter D_p	Outer diameter D_o	Tooth thickness T	Plate bore diameter d	Hub		M	Approx weight lbs./pc.
							Diameter D_h	Length L		
C2030VRP-10T-SC	B	10	2.427	2.480	.118	.500	1.457	.984	.602	.440
C2040VRP-10T-SC	B	10	3.236	3.346	.157	.630	2.047	1.575	.803	1.760
C2050VRP-10T-SC	B	10	4.045	4.213	.197	.630	2.598	1.772	1.003	3.310
C2060VRP-10T-SC	B	10	4.854	5.039	.236	.748	3.189	1.969	1.201	5.510

inch

■ Plastic guide for Tsubaki DOUBLE PLUS Chain with Snap Covers



n Brackets



Return Guide No.	A	B	C	D	r	R
C2050VRP-RG-SC	2.205	.591	1.378	.394	3.543	3.937
C2060VRP-RG-SC	2.362	.709	1.535	.492	3.445	3.937

inch

Bracket No.	A	B	C	D	E	F	G	T	O ₁	O ₂
C2030VRP-GB	1.339	.236	.866	.807	.264	.709	.984	.118	.256	.256
C2040VRP-GB	2.362	.591	1.181	1.752	.303	.787	1.181	.118	.335	.335
C2050VRP-GB	2.992	.807	1.378	2.185	.402	.945	1.378	.157	.413	.335
C2060VRP-GB	3.701	1.083	1.535	2.854	.421	.945	1.378	.157	.413	.335

inch

Installation of Snap Covers:

- 1) No tools are required to install Snap Covers.
- 2) Two types of Snap Covers are required. Both outer link type and inner link type are supplied (Figure 1).
- 3) Install connecting link Snap Covers as shown (Figure 2).

Figure 1

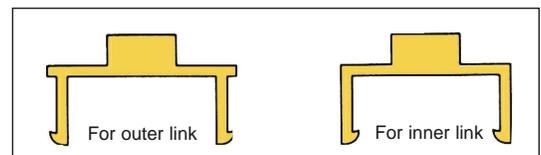
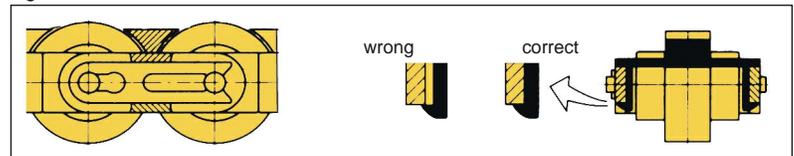


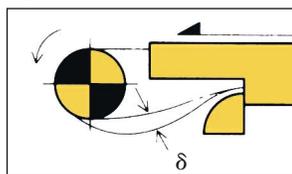
Figure 2



Engineering Information:

- 1) DOUBLE PLUS Snap Cover chain requires special sprockets.
- 2) The chain catenaries given in Table 1 have been shown to reduce the possibility of the chain jamming on the sprocket (Figure 3).
- 3) The back bend radius of Snap Cover chain is greater than that of standard DOUBLE PLUS chain (Figure 4). The special large radius plastic return guides are available from Tsubaki.

Figure 3



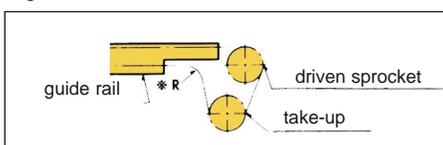
The amount of the chain wrap on the driver sprocket should be more than 130 degrees.

Table 1

For:	Normal δ	Max. δ
C2030	.984	2.953
C2040	1.378	4.134
C2050	1.575	4.724
C2060	1.969	5.906

inch

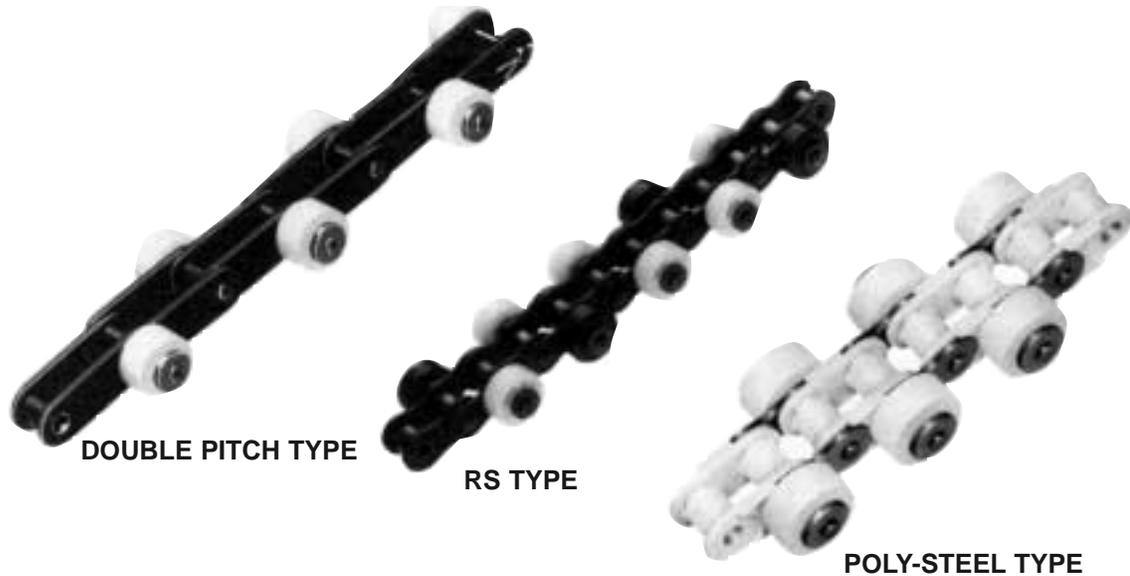
Figure 4



Outboard Roller Chain Series

Side Roller

- Highly compact
- Wide selection
- Quick start up



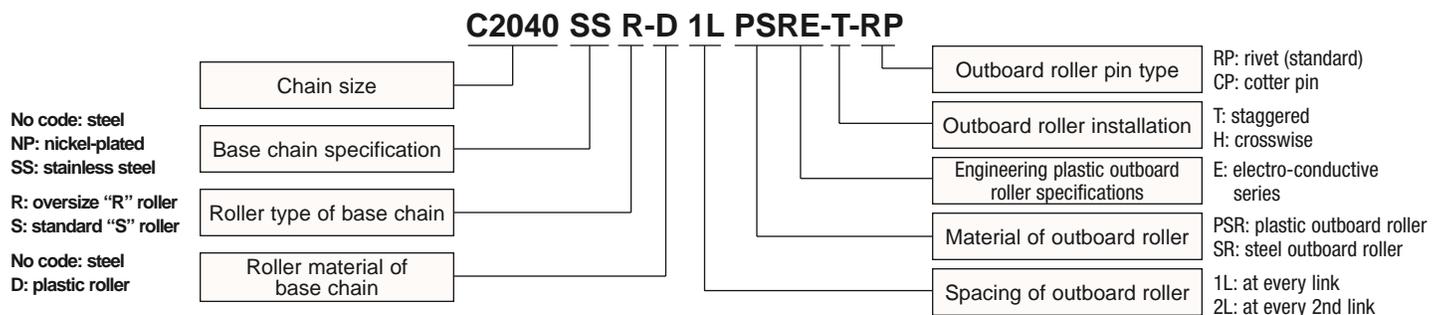
Side Roller Chain Series

Standard Specifications			Variations
Series	Base Chain	Side Roller	Base Chain
Regular Series	<ul style="list-style-type: none"> Carbon steel chain Carbon steel chain with plastic oversize "R" rollers 	<ul style="list-style-type: none"> Carbon steel Engineering plastic (white) Engineering plastic (white) plus Special engineering plastic brake (brown) 	<ul style="list-style-type: none"> Stainless steel Nickel-Plated & WP®
Electro-conductive Series	<ul style="list-style-type: none"> Carbon steel chain Carbon steel chain with plastic oversize "R" rollers 	<ul style="list-style-type: none"> Special engineering plastic (black) Special engineering plastic (black) plus brown 	<ul style="list-style-type: none"> Stainless steel Nickel-Plated & WP®
Poly-steel Series	<ul style="list-style-type: none"> Stainless steel and Engineering plastic (white) 	<ul style="list-style-type: none"> Engineering plastic (white) Engineering plastic (white) plus Special engineering plastic brake (brown) 	<ul style="list-style-type: none"> Chemical Resistant Electro-Conductive
Guide Attachment Series	<ul style="list-style-type: none"> Carbon steel chain Carbon steel chain with plastic oversize "R" rollers 	Can be made with any of the above	<ul style="list-style-type: none"> Stainless steel Nickel-Plated & WP®

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

Model Identification

When ordering, please indicate spacing for installing brakes and guide attachments.



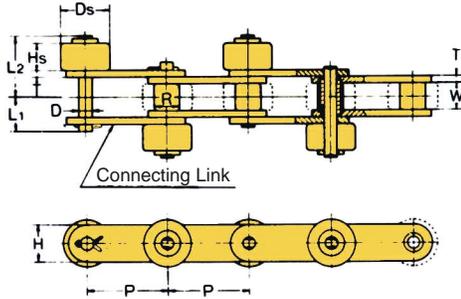
Note: Plastic Brake Outboard Roller must be specific.

■ Regular and electro-conductive series without brake

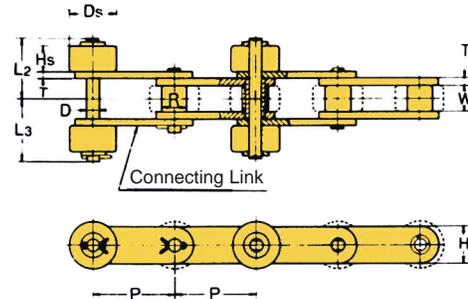
Double Pitch Type

The diagram shows the standard "S" roller (roller at chain center) drawn in solid lines and the oversize "R" roller in dotted lines.

Type I (Staggered Installation)

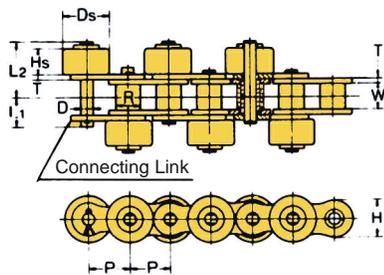


Type II (Crosswise Installation)

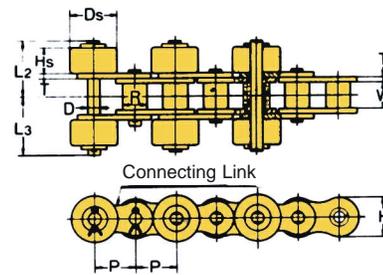


RS Type

Type I (Staggered Installation)



Type II (Crosswise Installation)



Double Pitch Type

TSUBAKI Chain No.		Pitch P	Roller Diameter R	Width Between Roller Link Plates W			Link Plate			Pin			Outboard Roller		Approximate Weight lbs./ft.		
Regular Series	Electro-Conductive Series			T	H	D	L ₁	L ₂	L ₃	D _S	H _S	Carbon steel chain with plastic out- board roller	Plastic roller chain with plastic out- board roller	Carbon steel chain with steel out- board roller			
C2040-PSR	C2040-PSRE	1.00	.312	.312	.060	.472	.156	.380	.705	.760	.625	.307	.44	—	.69		
C2050-PSR	C2050-PSRE	1.25	.400	.375	.080	.591	.200	.469	.850	.913	.750	.370	.69	—	1.03		
C2060H-PSR	C2060H-PSRE	1.50	.469	.500	.125	.677	.234	.667	1.167	1.262	.875	.496	1.21	—	1.72		
C2080H-PSR	C2080H-PSRE	2.00	.625	.625	.156	.906	.312	.825	1.443	1.561	1.125	.622	2.10	—	2.89		
C2100H-PSR	—	2.50	.750	.750	.187	1.126	.375	.965	1.740	1.862	1.563	.748	3.21	—	4.70		
C2042-PSR	C2042-PSRE	1.00	.625	.312	.060	.472	.156	.380	.909	.965	.906	.512	.83	.60	—		
C2052-PSR	C2052-PSRE	1.25	.750	.375	.080	.591	.200	.469	.996	1.063	1.063	.512	1.14	.83	—		
C2062H-PSR	C2062H-PSRE	1.50	.875	.500	.125	.677	.234	.667	1.167	1.262	1.181	.496	1.77	1.30	—		

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

RS Type

TSUBAKI Chain No.		Pitch P	Roller Diameter R	Width Between Roller Link Plates W			Link Plate			Pin			Outboard Roller		Approximate Weight lbs./ft.	
Regular Series	Electro-Conductive Series			T	H	D	L ₁	L ₂	L ₃	D _S	H _S	Plastic Outboard Roller	Steel Outboard Roller			
RS40-PSR	RS40-PSRE	.500	.312	.312	.060	.472	.156	.380	.705	.760	.625	.307	.63	1.12		
RS50-PSR	RS50-PSRE	.625	.400	.375	.080	.591	.200	.469	.850	.913	.750	.370	.95	1.63		
RS60-PSR	RS60-PSRE	.750	.469	.500	.094	.713	.234	.600	1.100	1.195	.875	.496	1.42	2.44		
RS80-PSR	RS80-PSRE	1.000	.625	.625	.125	.949	.312	.758	1.380	1.494	1.125	.622	2.40	3.98		
RS100-PSR	—	1.250	.750	.750	.156	1.185	.375	.900	1.675	1.797	1.563	.748	3.74	6.73		

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

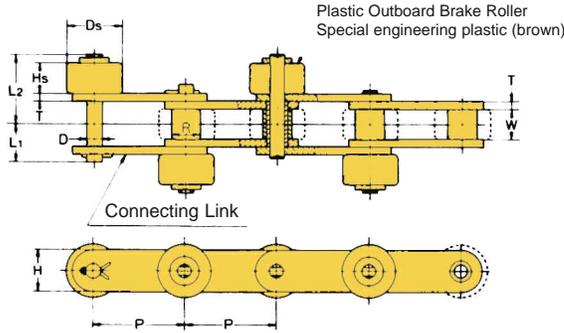
TSUBAKI FREE FLOW CHAIN

■ Regular and electro-conductive series with brake

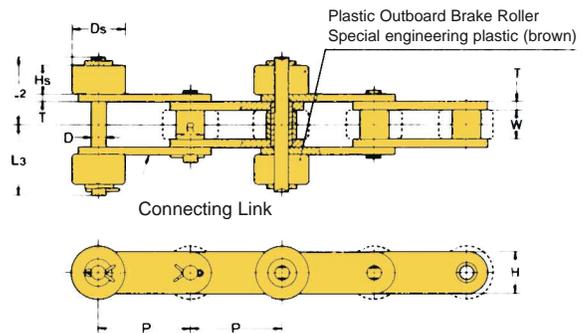
Double Pitch Type

The diagram shows the standard "S" roller (roller at chain center) drawn in solid lines and the oversize "R" roller in dotted lines.

Type I (Staggered Installation)

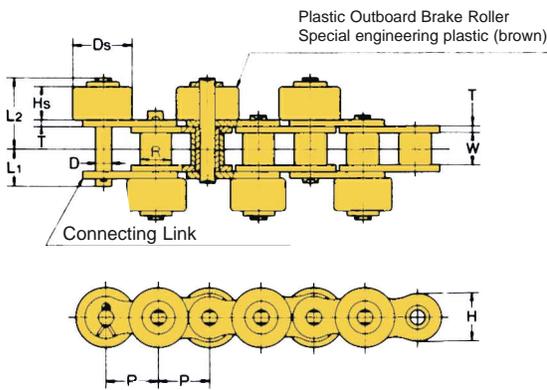


Type II (Crosswise Installation)

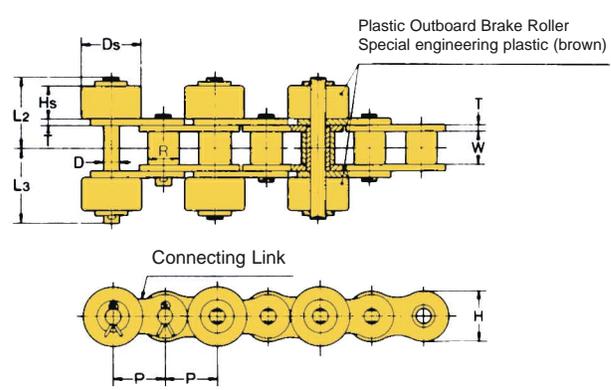


RS Type

Type I (Staggered Installation)



Type II (Crosswise Installation)



Double Pitch Type

TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Link Plate		Pin			Outboard Roller		Approximate Weight lbs./ft.			
				T	H	D	L ₁	L ₂	L ₃	D _s	H _s	Carbon steel chain with plastic out- board roller	Plastic roller chain with plastic out- board roller	Carbon steel chain with steel out- board roller
C2040-PSR	1.000	.312	.312	.060	.472	.156	.380	.705	.780	.625	.307	.44	—	.69
C2050-PSR	1.250	.400	.375	.080	.591	.200	.469	.850	.913	.750	.370	.69	—	1.03
C2060H-PSR	1.500	.469	.500	.125	.677	.234	.667	1.167	1.262	.875	.496	1.21	—	1.72
C2042-PSR	1.000	.625	.312	.060	.472	.156	.380	.909	.965	.906	.512	.83	.60	—
C2052-PSR	1.250	.750	.375	.080	.591	.200	.469	.996	1.063	1.063	.512	1.14	.83	—
C2062H-PSR	1.500	.875	.500	.125	.677	.234	.667	1.167	1.261	1.181	.496	1.77	1.30	—

Note: 1. Weights listed are for staggered outboard roller installation at every link, or crosswise outboard roller installation at every second link.
2. For staggered outboard roller installation, the plastic brake rollers are spaced every third link alternating right side and left side. For crosswise outboard roller installation, they are spaced in pairs every sixth link. These configurations are standard.

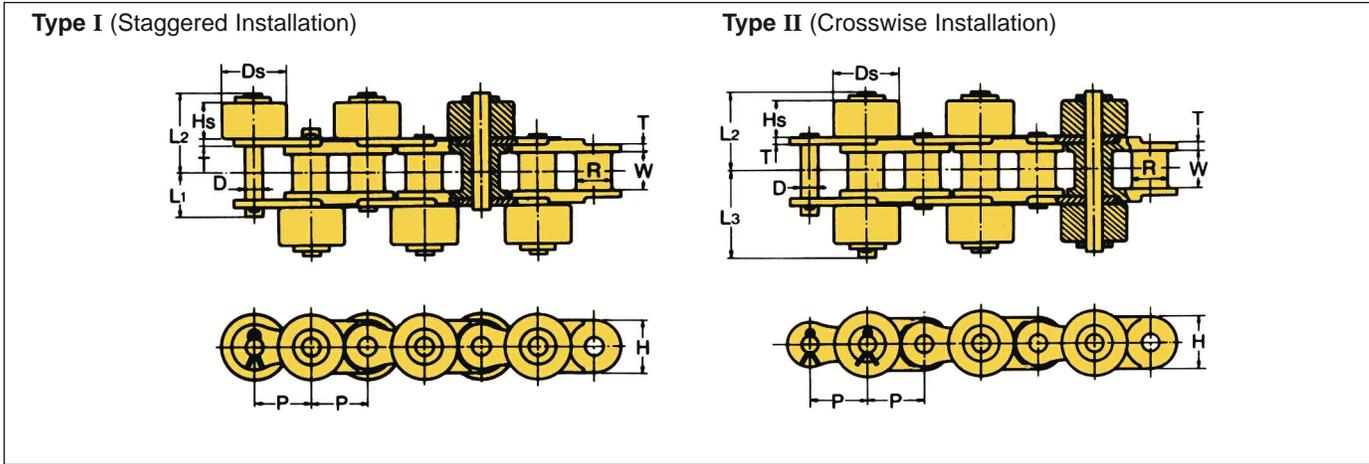
RS Type

TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Link Plate		Pin			Outboard Roller		Approximate Weight lbs./ft.		
				T	H	D	L ₁	L ₂	L ₃	D _s	H _s	Plastic Outboard Roller	Steel Outboard Roller
RS40-PSR	.500	.312	.312	.060	.472	.156	.380	.705	.760	.625	.307	.63	1.12
RS50-PSR	.625	.400	.375	.080	.591	.200	.469	.850	.913	.750	.370	.95	1.63
RS60-PSR	.750	.469	.500	.094	.713	.234	.600	1.100	1.195	.875	.469	1.42	2.44

Note: 1. Weights listed are for staggered outboard roller installation at every link, or crosswise outboard roller installation at every second link.
2. For staggered outboard roller installation, the plastic brake rollers are spaced every third link alternating right side and left side. For crosswise outboard roller installation, they are spaced in pairs every sixth link. These configurations are standard.

■ Poly-Steel Series

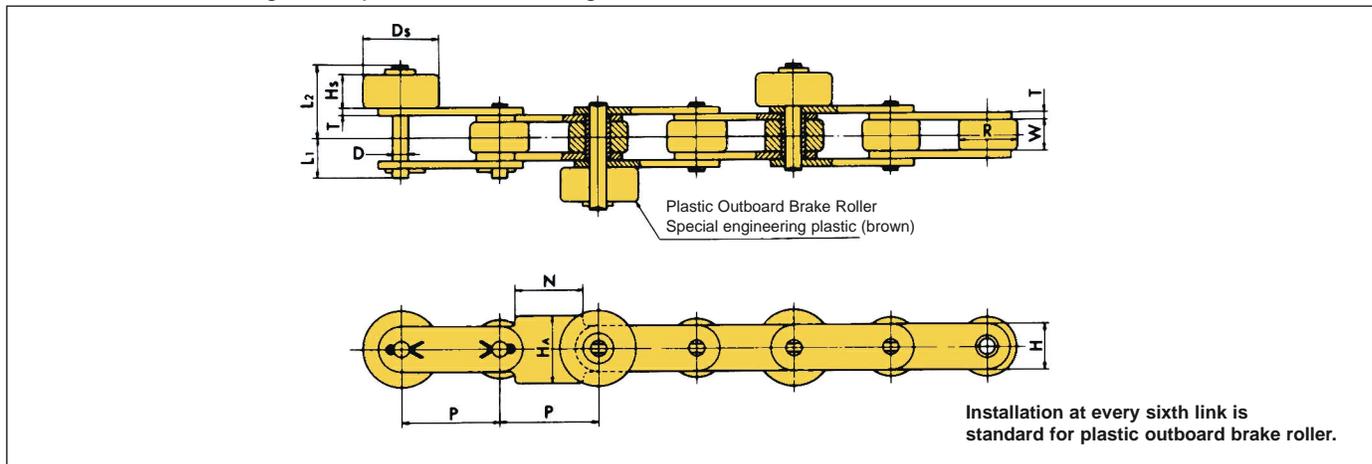
This is a light-weight, low-noise chain. In addition, it is maintenance free since no lubrication is required. Outboard roller construction makes for a highly compact conveyor. The ability to flex backwards adds to this by allowing easy layout on the return side to save space. All parts are made of stainless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



TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Link Plate		Pin			Outboard Roller			Approximate Weight lbs./ft.
				T	H	D	L ₁	L ₂	L ₃	D _s	H _s	
RF40PC-PSR	.500	.312	.312	.060	.472	.156	.380	.705	.760	.625	.307	.46
RF50PC-PSR	.625	.400	.375	.080	.591	.200	.469	.850	.913	.750	.370	.65
RF60PC-PSR	.750	.469	.500	.094	.713	.234	.600	1.100	1.195	.875	.496	.94

■ Guide Attachment Series

The attachment is designed to prevent meandering. Plastic brakes can also be installed.



TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Link Plates W	Link Plate		Pin			Outboard Roller				Approximate Weight lbs./ft.	
				H	T	D	L ₁	L ₂	D _s	H _s	N	HA	Plastic Outboard Roller	Steel Outboard Roller
C2042-SG	1.000	.625	.312	.472	.060	.156	.380	.909	.906	.512	.650	.748	.71	1.15
C2052-SG	1.250	.750	.375	.591	.080	.200	.469	.996	1.063	.512	.787	.945	1.01	1.49
C2062H-SG	1.500	.875	.500	.677	.125	.234	.667	1.167	1.181	.496	1.000	1.063	1.62	2.12

TSUBAKI FREE FLOW CHAIN

Top Roller Chain

Selection of free flow chain should be based upon the conveyor layout and the size of the conveyed load. Load capacities of all free flow chains are given in the engineering section.

Top Roller Chain

Standardized Specifications			Variations
Series	Base Chain	Top Roller	Base Chain
Regular Series	Steel	Steel	Stainless steel Nickel-Plated & WP®
Plastic Top Roller Series	Steel	Engineering plastic	
Plastic Roller Series	Steel + plastic Oversize roller	Engineering plastic	
Double Strand Top Roller Series	Steel	Steel	
Guide Attachment Series	Steel	Steel or engineering plastic	



Single Strand Double Pitch Type (Regular Series, Plastic Top Roller Series, Plastic Roller Series)

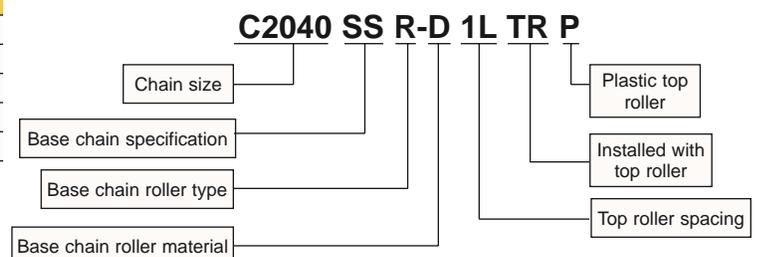
1. Spring clip type connecting links will be provided for C2040 ~ C2060H unless otherwise specified.
2. The dimensions except for roller diameter are the same as both standard roller "S" type and oversize roller "R" type.
3. For even number spacing, top rollers will be fitted on roller link unless otherwise specified.

TSUBAKI Chain No.	Pitch P	Width Between Roller Link Plates W	Roller Diameter R		Pin D	L ₁	L ₂	H	T	Approximate Weight lbs./ft.				
			"S" Roller	"R" Roller						Regular Series		Plastic Top Roller Series		Plastic Roller Chain Series
										"S" Roller	"R" Roller	"S" Roller	"R" Roller	
C2040-TR	1.00	.312	.312	.625	.156	.325	.392	.472	.060	.89	1.14	.61	.85	.62
C2050-TR	1.25	.375	.400	.750	.200	.406	.472	.591	.080	1.37	1.68	.97	1.28	.96
C2060H-TR	1.50	.500	.469	.875	.234	.573	.652	.677	.125	2.47	2.93	1.86	2.33	1.85
C2080H-TR	2.00	.625	.625	1.125	.312	.720	.823	.906	.156	3.80	4.54	2.88	3.63	3.04
C2100H-TR	2.50	.750	.750	1.563	.375	.858	.965	1.126	.187	6.12	7.64	4.37	5.89	4.44

TSUBAKI Chain No.	Attachment Dimensions					
	D _f	C _s	X _s	l ₁	l ₂	d
C2040-TR	.625	.591	.827	.325	.380	.156
C2050-TR	.750	.748	1.043	.406	.469	.200
C2060H-TR	.875	.906	1.244	.573	.667	.234
C2080H-TR	1.125	1.142	1.594	.728	.839	.446
C2100H-TR	1.563	1.394	1.957	.870	1.071	.572

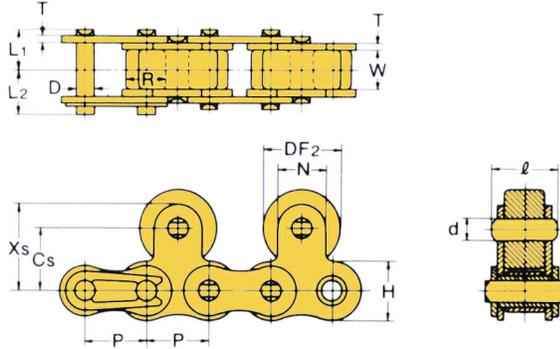
Note: Weights listed apply when top rollers are fitted at every link.

Model Identification

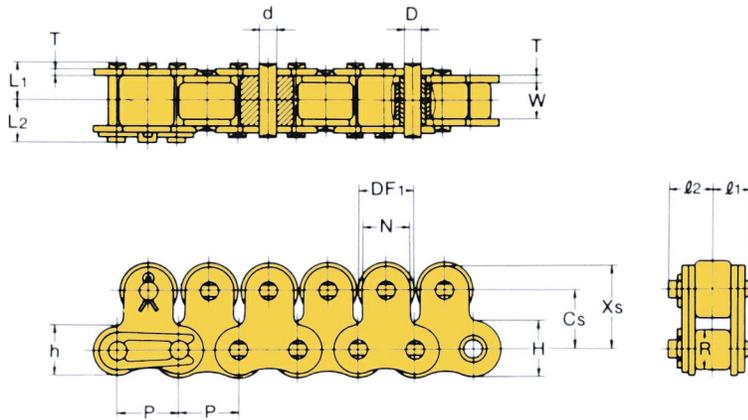


■ Single Strand RS Type (Regular Series, Plastic Top Roller)

When top rollers are spaced more than every second link:



When top rollers are spaced at every link:

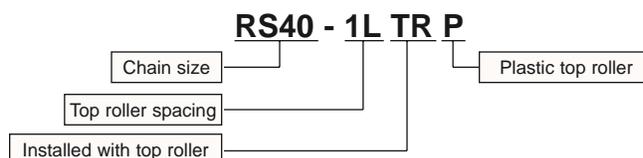


1. Top rollers for regular series are heat-treated. 2. Spring clip type connecting links will be provided for RS40–RS60 unless otherwise specified.

TSUBAKI Chain No.		Pitch P	Width Between Roller Link Plates W		Roller Diameter R	Pin			Link Plate		Approximate Weight lbs./ft.			
Regular Series	Plastic Top Roller Series		DF ₁	DF ₂		D	L ₁	L ₂	H	T	Regular Series		Plastic Top Roller Series	
										At Every Link	At Every Second Link	At Every Link	At Every Second Link	
RS40-TR	RS40-TRP	.500	.312	.312	.156	.325	.392	.472	.060	1.23	.95	.62	.57	
RS50-TR	RS50-TRP	.625	.375	.400	.200	.406	.472	.591	.080	1.61	1.46	1.05	.93	
RS60-TR	RS60-TRP	.750	.500	.469	.234	.506	.581	.713	.094	2.42	2.14	1.55	1.36	
RS80-TR	RS80-TRP	1.000	.625	.625	.312	.640	.758	.949	.125	4.09	3.54	2.62	2.31	
RS100-TR	RS100-TRP	1.250	.750	.750	.375	.778	.900	1.185	.156	6.25	5.95	4.07	3.64	

TSUBAKI Regular Series	Chain No. Plastic Top Roller Series	Attachment Dimensions								
		DF ₁	DF ₂	C _s	N	X _s	l	l ₁	l ₂	d
RS40-TR	RS40-TRP	.433	.625	.500	.374	.687	.520	.325	.380	.156
RS50-TR	RS50-TRP	.591	.750	.625	.500	.876	.638	.406	.469	.200
RS60-TR	RS60-TRP	.709	.875	.720	.626	1.033	.811	.506	.600	.234
RS80-TR	RS80-TRP	.945	1.125	.969	.752	1.344	1.012	.640	.758	.312
RS100-TR	RS100-TRP	1.181	1.563	1.252	1.000	1.752	1.220	.778	.900	.376

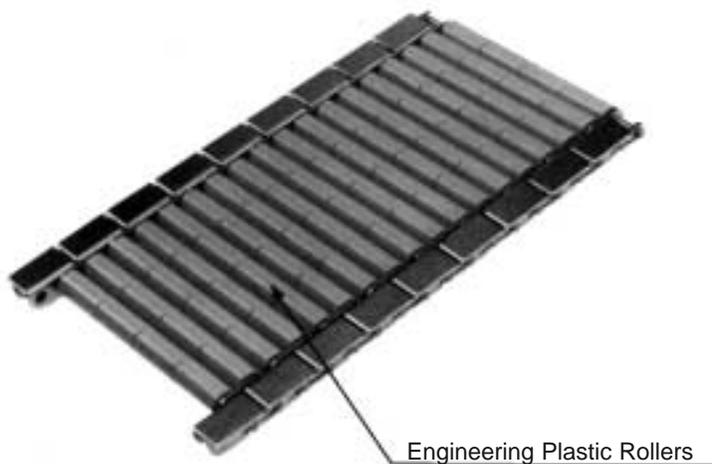
■ Model Identification



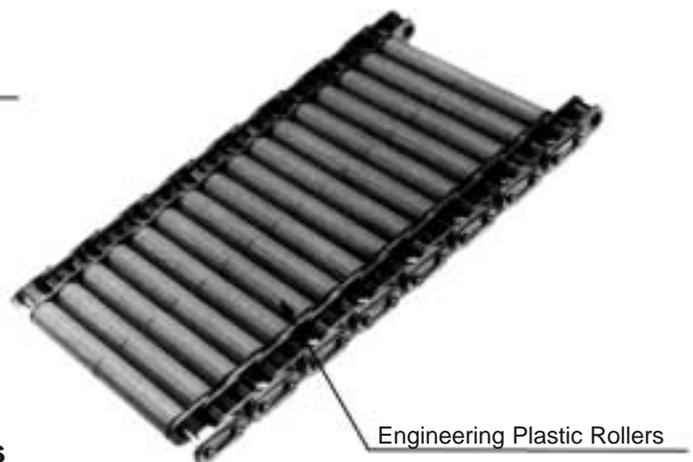
Roller Table

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

U.S. Patent



ST Series

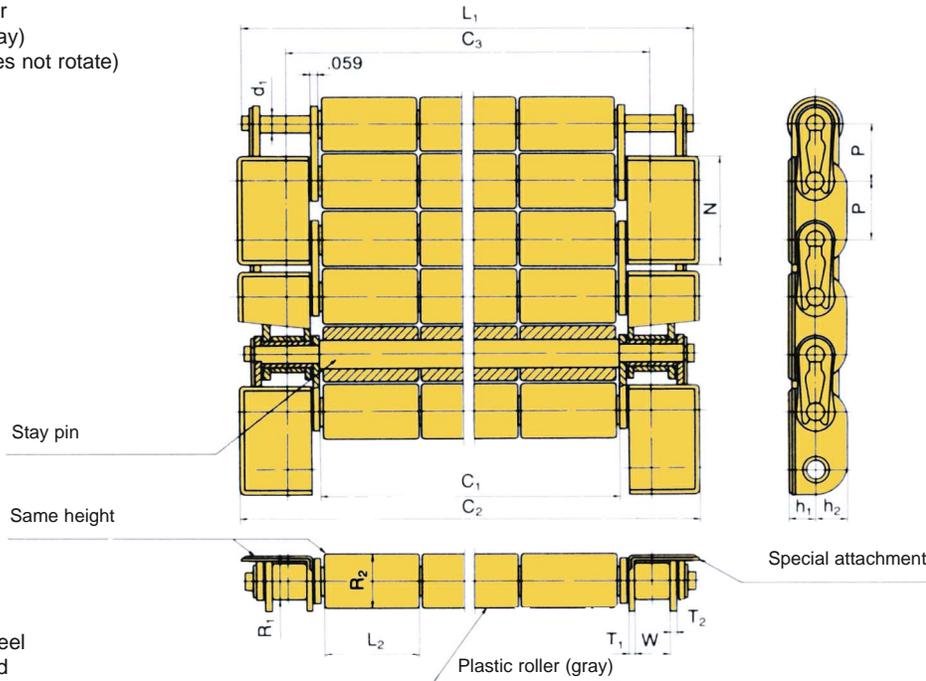


RT Series

■ Roller Table-ST type

U.S. Patent

The special attachment is bent to height of roller
 Plastic roller (gray)
 stay pin (pin does not rotate)



SS: Stainless steel
 NP: nickel-plated

*Maximum allowable conveying load varies depending upon the width of the roller table and the machine length.

■ Common Dimensions

Series	Pitch P	Width Between Roller Link Plates W	Roller Diameter R_1	Attachment Height h_1	Link plate Height h_2	Attachment Width N	Attachment Plate Thickness T_1	Link Plate Thickness T_2	Pin Diameter d_1	Plastic Roller Diameter R_2	Plastic Roller Length L_2	Maximum Allowable Conveying Load lbs./ft. ²
ST400	.500	.313	.313	.224	.276	.961	.047	.059	.154	.472	.984	51
ST500	.625	.375	.400	.280	.335	1.201	.059	.079	.200	.591	.984	72

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

■ Dimensions

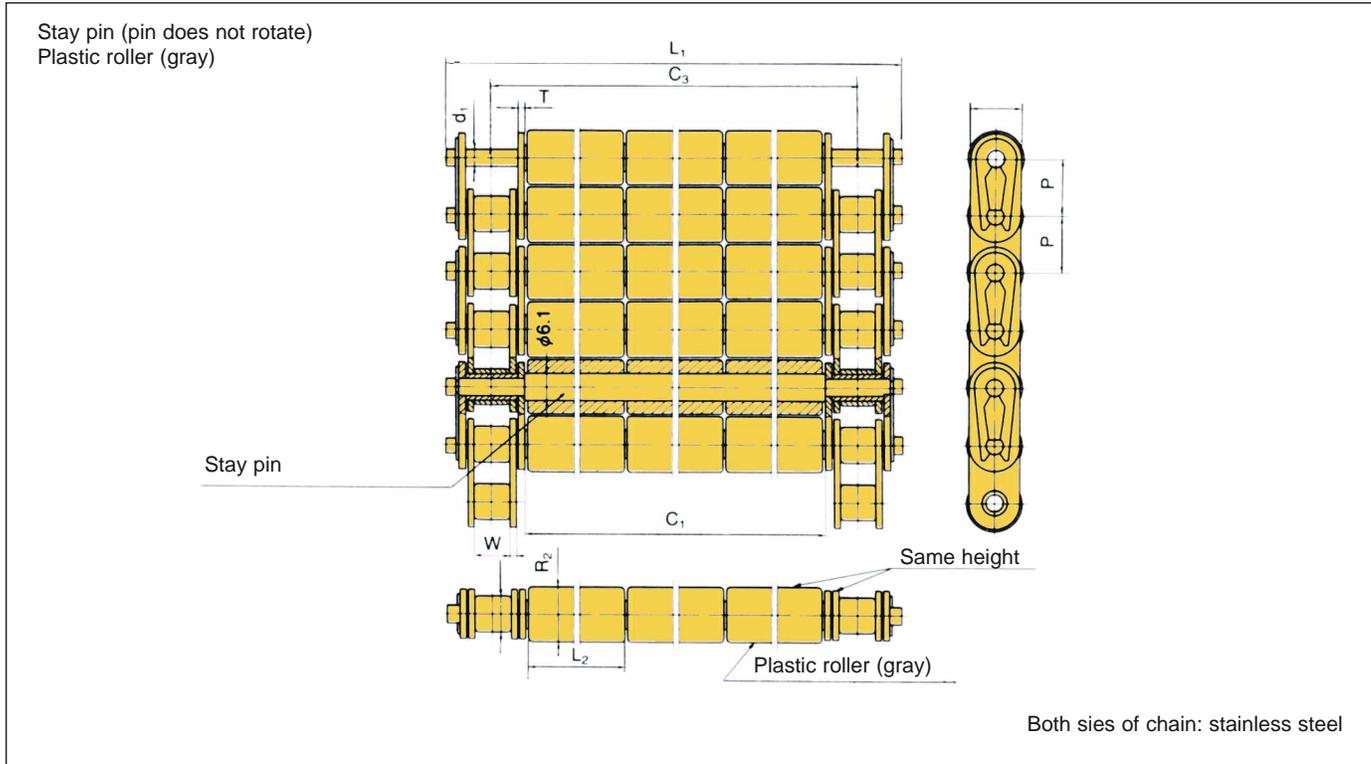
TSUBAKI					
Roller Table No.	Effective Width C_1	Overall Width C_2	Center Distance Between Two Chains C_3	Pin Overall Length L_1	Approximate Weight lbs./ft.
ST404SS	3.984	5.433	4.551	5.339	2.97
ST406SS	5.963	7.402	6.520	7.307	3.88
ST408SS	7.921	9.370	8.488	9.276	4.79
ST410SS	9.890	11.339	10.457	11.244	5.70
ST412SS	11.858	13.307	12.425	13.213	6.60
ST414SS	13.827	15.276	14.393	15.181	7.51
ST416SS	15.795	17.244	16.362	17.150	8.41

■ Dimensions

TSUBAKI					
Roller Table No.	Effective Width C_1	Overall Width C_2	Center Distance Between Two Chains C_3	Pin Overall Length L_1	Approximate Weight lbs./ft.
ST504SS	3.984	5.717	4.685	5.622	4.14
ST506SS	5.953	7.658	6.654	7.591	5.43
ST508SS	7.921	9.654	8.622	9.559	6.64
ST510SS	9.890	11.622	10.591	11.528	7.89
ST512SS	11.858	13.591	12.559	13.496	9.14
ST514SS	13.827	15.559	14.528	15.465	10.39
ST516SS	15.795	17.528	16.496	17.433	11.63
ST518SS	17.764	19.496	18.465	19.402	12.89
ST520SS	19.732	21.465	20.433	21.370	14.14
ST522SS	21.701	23.433	22.402	23.339	15.39
ST524SS	23.669	25.402	24.370	25.307	16.64

TSUBAKI FREE FLOW CHAIN

■ Roller Table – RT Types



TSUBAKI Roller Table No.	Pitch P	Width Between Roller Link Plates W	Roller Diameter R ₁	Link Plate		Pin		Plastic Roller		Effective Width C ₁	Center Distance Between Two Chains C ₃	Maximum Allowable Conveying Load lbs./ft. ²	Approx Weight lbs./ft.
				H	T	d ₁	L ₁	R ₂	L ₂				
RT404SS							5.339			3.984	4.551		2.710
RT408SS	.500	.313	.313	.437	.059	.154	9.276	.480	1.969	7.921	8.488	41	4.540
RT412SS							13.213			11.858	12.425		6.370
RT416SS							17.150			15.795	16.362		8.210
RT504SS							5.622			3.984	4.685		3.900
RT508SS							9.559			7.921	8.622		6.370
RT512SS	.625	.375	.400	.547	.079	.200	13.496	.598	1.969	11.858	12.559	61	8.850
RT516SS							17.433			15.796	16.496		11.350
RT520SS							21.370			19.732	20.433		13.800
RT524SS							25.307			23.669	24.370		16.280
RT604SS							6.047			3.984	4.882		4.520
RT608SS							9.984			7.921	8.819		6.980
RT612SS	.750	.500	.469	.661	.094	.235	13.921	.720	1.969	11.858	12.756	61	9.430
RT616SS							17.858			15.795	16.693		11.880
RT620SS							21.795			19.732	20.630		14.330
RT624SS							25.732			23.669	24.567		16.780

I. Selection Procedure for DOUBLE PLUS®, Outboard Roller and Top Roller Chain

1) Confirmation of operating conditions for free flow conveyor

The following information is needed in order to select an appropriate chain for free flow conveyor:

- ① Material weight, dimension and quantity of the conveyed object (including pallet)
- ② Conveyor speed
- ③ Conveyor length (the length for accumulating and transferring portion respectively)
- ④ Lubrication requirements and environment

2) Tentative selection of chain size

$$T = W_T \times f \times K$$

W_T : Total weight of conveyed object except chain (lbs.)

f : Coefficient of friction $f = f_2 + f_3$ (See Tables 4 and 5 or Table 8)

K : Chain speed coefficient (See Table 6)

Note: In the case where two matched strands are to be operated, the chain's maximum allowable tension (shown in Table 7) should be verified with T/2 to decide the chain type and size.

3) Confirmation of the maximum allowable roller load

The maximum allowable roller load for conveyed objects should not exceed the figures shown in Table 1.

However, maximum allowable roller load for the base chain should be checked using Table 2.

Table 1 Maximum Allowable Roller Load for Conveyed Objects

This is the load at 2 strands for DOUBLE PLUS chain (lbs./ft.)

Chain Type	Type of Guide rail	C2030VRP	C2040VRP	C2050VRP	C2060VRP	C2080VRP
DOUBLE PLUS Chain	Aluminum	26	40	53	67	—
	Aluminum with steel rail	53	80	107	134	201

(lbs./roller)

Chain	Type of Roller for transfer	RS40 C2040	RS50 C2050	RS60 C2060	RS80 C2080	RS100 C2100
Outboard Roller Chain	Plastic outboard roller	11	15	30	55	66
	Steel outboard roller	33	44	66	121	176
Top Roller Chain (Single Strand)	Plastic top roller	11	15	30	55	66
	Steel top roller	33	44	66	121	176

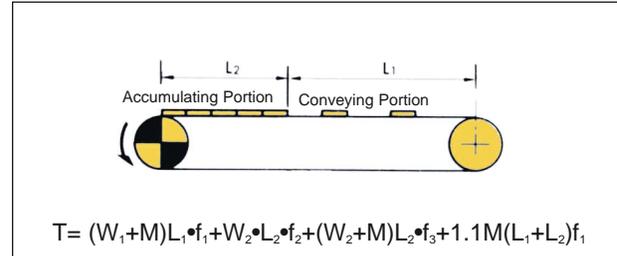
Table 2 Maximum Allowable Roller Load of Base Chain

(lbs./roller)

Type of Roller on Base Chain		RS40 C2040	RS50 C2050	RS60 C2060	RS80 C2080	RS100 C2100
Steel Roller	"S" roller	33	44	66	121	176
	"R" roller	143	220	352	594	880
Plastic Roller	"S" roller	4	7	11	—	—
	"R" roller	44	66	110	198	286
Poly-Steel		4	9	13	—	—

Note: The above figure for Poly-Steel show the maximum allowable load per plastic inner link.

4) Calculation of maximum chain tension (T)



5) Calculation of required power (HP)

$$Hp = \frac{TV}{33,000\eta}$$

P: Maximum number of pallets on conveyor

T: Maximum chain tension (lbs.)

L_2 : Length of accumulating portion (ft.)

W_2 : Weight of conveyed objects in accumulating portion (lbs.ft.)

L_1 : Length of conveying portion (ft.)

W_1 : Weight of conveyed objects in conveying portion (lbs./ft.)

f_1 : Coefficient of friction between chain and rail when conveying

f_2 : Coefficient of friction between chain and conveyed object when accumulating

f_3 : Coefficient of friction between chain and rail when accumulating

M: Weight of chain and slat, etc. (lbs./ft.)

Hp: Required power (Hp)

V: Chain speed (ft./min.)

η : Transmission efficiency of drive unit

L: Length of pallet

Calculate the maximum chain tension (T) with the following formula referring to Tables 3, 4 and 5 (or Table 8).

$$T = (W_1 + M) L_1 f_1 + W_2 L_2 f_2 + (W_2 + M) L_2 f_3 + 1.1 M (L_1 + L_2) f_1$$

In general, free flow conveyor should have two matched strands of chain and in this case, the chain weight should be for two strands of chain. T, calculated with the above formula, is the maximum chain tension for two strands of chain.

Table 3 f₁: Coefficient of Friction between Chain and Rail when Conveying

Chain Type	Type of Roller on Base Chain	Dry	Lubricated
DOUBLE PLUS Chain	Regular and high friction type	0.08	—
	Steel roller	"S" roller	0.21
"R" roller		0.12	0.08
Outboard Roller Chain	Plastic roller	"S" roller	0.12
		"R" roller	0.08
Top Roller Chain	Poly-Steel		0.25
	Steel roller	"S" roller	0.21
		"R" roller	0.12

Note: These factors are for your reference only.

Table 4 f₂: Coefficient of Friction between Chain and Conveyed Object when Accumulating

Chain Type	Type of Roller on Base Chain	Dry	Lubricated
DOUBLE PLUS® Chain	Regular type	0.10	–
	High friction type	0.15	–
Outboard Roller Chain	Plastic outboard roller	0.06	–
	Plastic brake outboard roller	0.10	–
	Steel outboard roller	0.09	0.06
Top Roller chain	Plastic top roller	0.06	–
	Steel top roller	0.09	0.06

Note: These factors are for your reference only.

Table 5 f₃: Coefficient of Friction between Chain and Rail when Accumulating

Chain Type	Type of Roller on Base Chain	Dry	Lubricated
DOUBLE PLUS Chain	Regular type	0.20	–
	High friction type	0.25	–

Note: For all chains except the DOUBLE PLUS Chain, f₃ equals f₁. These factors are for your reference only.

Table 6: Chain Speed Coefficient

Chain Speed ft./min.	Chain Speed Coefficient (k)
0 ~ 50	1.0
50 ~ 100	1.2
100 ~ 160	1.4
160 ~ 230	1.6
230 ~ 300	2.2
300 ~ 360	2.8
360 ~ 400	3.2

Note: These factors are for your reference only.

Suggested chain speed is as follows:

DOUBLE PLUS chain: 50 ft./min. or less

Plastic Outboard Roller Chain: 230 ft./min. or less

Poly-Steel Chain: 230 ft./min. or less

When chain speed exceeds the above, consult Tsubaki.

6) Determination of Chain Size

Multiply the maximum chain tension (T) by the chain speed coefficient (k) listed in Table 6 and verify with the following formula.

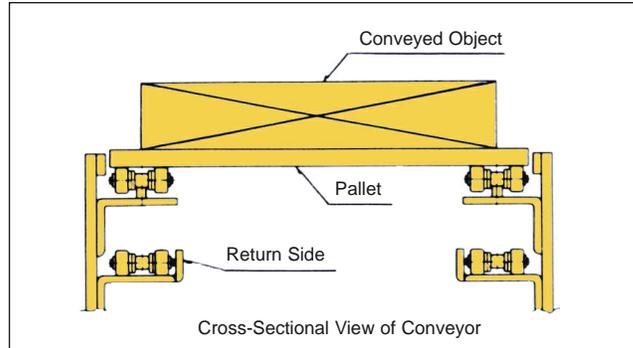
$$T \times K \leq \text{Maximum allowable chain tension}$$

Note: Where there are two matched strands, the maximum chain tension should be T/2.

■ Ambient Temperature Range

Suggested ambient temperature range is between 14°F to 176°F. If the chain will be operated outside of the above range, consult Tsubaki.

■ Use of Chain Guide



- Note: 1) When using plastic brake outboard roller chain, the rollers of the base chain on the return side should be supported by the rail in the same way as the conveying side.
 2) When using Poly-Steel chain with outboard rollers, the guide should support the bottom surface of the links.

Table 7 Maximum Allowable Chain Tension (lbs.)

Chain type	Type of Roller on Base Chain	RF2030	RS40 RF2040	RS50 RF2050	RS60 RF2060	RS80 RF2080	RS100 RF2100
		Regular type	123	200	310	460	1,120
DOUBLE PLUS® Chain	High friction type	62	100	155	230	590	–
	Steel roller type	220	350	550	830	–	–
	Outboard Roller Chain						
Outboard Roller Chain	Steel roller	–	595	970	1,410	2,400	3,835
	Plastic roller	–	100	155	230	400	575
	Poly-Steel	–	100	155	200	–	–
Top Roller Chain (single strand)	Steel roller	–	595	970	1,410	2,400	3,835
	Plastic roller	–	100	155	230	400	575

Table 8 Coefficient of Friction Double Pitch DOUBLE PLUS steel roller & “VR” steel roller

Coefficient of Friction	Double Pitch DOUBLE PLUS steel roller		Large size DOUBLE PLUS	
	Lubrication	Non-lubrication	Lubrication	Non-lubrication
f_1 Coefficient of friction between chain and rail when conveying	0.05	0.05	0.05	0.05
f_2 Coefficient of friction between chain and conveyed object when accumulating	0.10	0.15	0.10	0.15
f_3 Coefficient of friction between chain and rail when accumulating	0.10	0.25	0.05	0.15

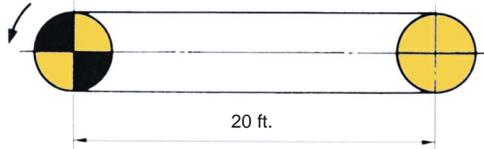
- Note: • These factors are for your reference only.
 • We suggest lubricating steel roller and VR type chains.

TSUBAKI FREE FLOW CHAIN

ENGINEERING INFORMATION

7) Selection Procedure Example for DOUBLE PLUS® Chain

Specifications



Conveyor length: 20 ft.
 Dimensions of conveyed object: 1 ft. x 1 ft.
 Weight of conveyed object: 12.5 lbs./pc.
 Conveyor speed: 100 fpm
 Full conveyor accumulating
 Quantity of conveyed object: 20 pieces
 Chain Speed: 50 fpm
 Dry, in-plant use, normal operating
 temperature (up to 77°F)

(i) Make a tentative selection of the chain size by tension

Using equation 2 on page B-54
 $P = \text{Maximum number of pallets}$
 $P = \text{Conveyor length/pallet length} = (L_1 + L_2)/1$
 $P = 20 / 1 = 20\text{pc}$
 $T = P * \text{Weight of pallet} * f$
 $T = 20 \text{ pc} * 12.5 \text{ lbs./pc.} * .4$
 $T = 100 \text{ lbs.}$
 $T/2 = 100 \text{ lbs./2} = 50 \text{ lbs. (approximate load per strand)}$
 Tentative selection by chain tension:
 C2030VRP
 $T/2 = 50 \text{ lbs. CAPACITY} = 123 \text{ lbs.}$
 C2030VRP can handle the chain tension

(ii) Confirmation of allowable roller load

Using Table 1 on page B-54
 Conveyed object weighs 12.5 lbs./ft.
 Roller load = 12.5 lbs./ft.
 Roller Capacity = 26 lbs./ft.
 C2030VRP can handle the roller load

(iii) Calculation of maximum chain tension

Using equation 4 on page B-54
 $T = (W_1 + M) L_1 \cdot F_1 + (W_2 \cdot L_2 \cdot F_2) + (W_2 + M) L_2 \cdot F_3 + 1.1M (L_1 + L_2) F_2$
 $T = (0 + .6) 0 * .08 + (12.5 * 20 * .1) + (12.5 + 6) 20 * .2 + (1.1 (.6) (20) .1)$
 $= 0 + 25 + 52.4 + 1.32$
 $= 78.72 \text{ lbs.}$
 $T/2 = 39.36 \text{ lbs./str.}$

(iv) Calculation for horsepower

Using equation 5 on page B-54
 Subject to using Gearmotor $\eta = 0.8$

$$HP = \frac{TV}{33,000 \eta}$$

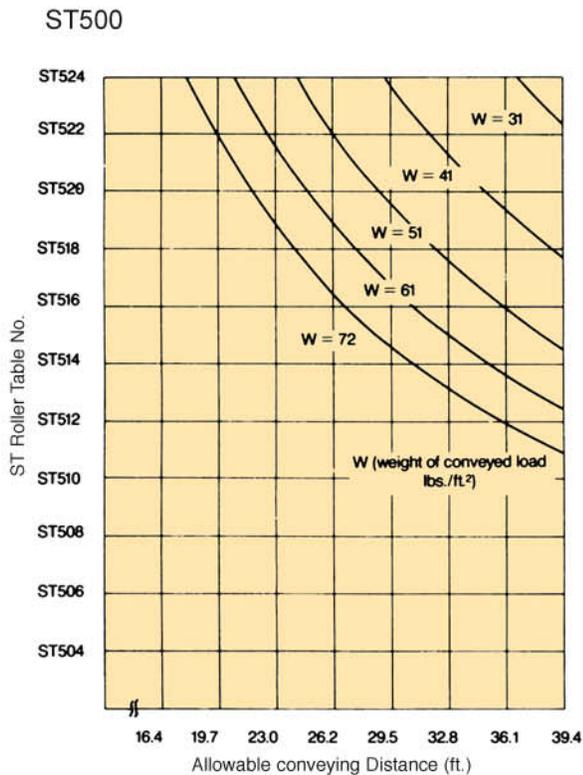
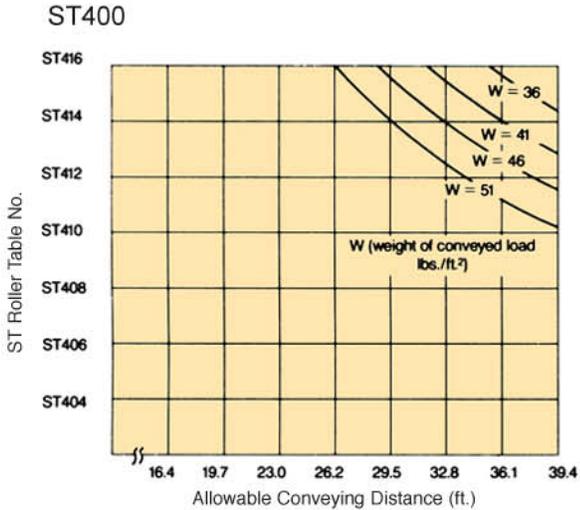
$$HP = \frac{78.72 * 100}{33,000 (.8)}$$

$$= .30 \text{ hp}$$

II. Selection Procedure for Roller Table

Determine The Roller Table Size With The Follow Capability Graphs:

ST Roller Table Conveyor Capability Graph



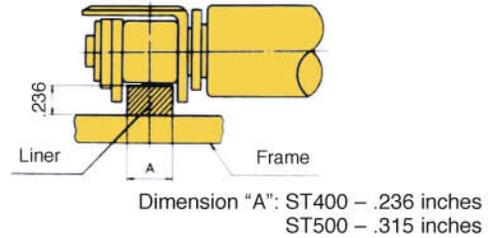
How to use the graph:

If W equals 61 lbs./ft.² and the conveyor length equals 32.8 ft., Roller Table numbers ST514 to ST504 can be used. W [Weight of conveyed load (lbs./ft.²)]

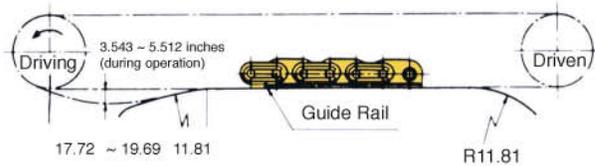
$$W = \frac{\text{Weight of conveyed object (lbs.)}}{\text{Base area of conveyed object (ft.}^2\text{)}}$$

Guide for ST Roller Table

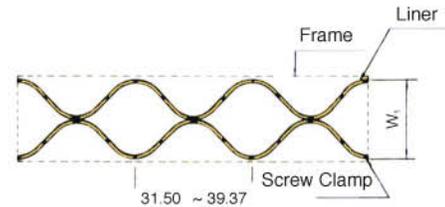
Conveying Side (reference only)



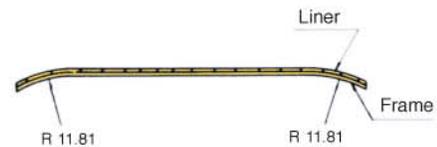
Return Side



1) Top View of Return Side



2) Cross-Sectional View



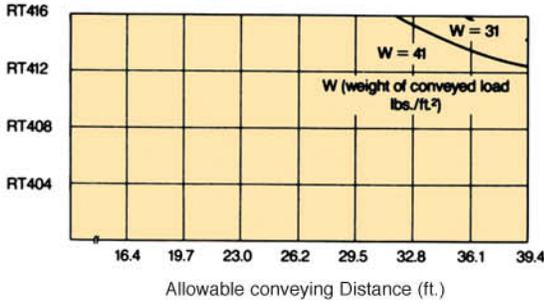
- Liner should be shaped to avoid plastic roller wear.
- Liner width (W₁) should be C₁ (effective width) minus (0.394 inches).
- Material of liner should be high polymer polyethylene.

■ Roller Table speed should not exceed 160 ft./min.

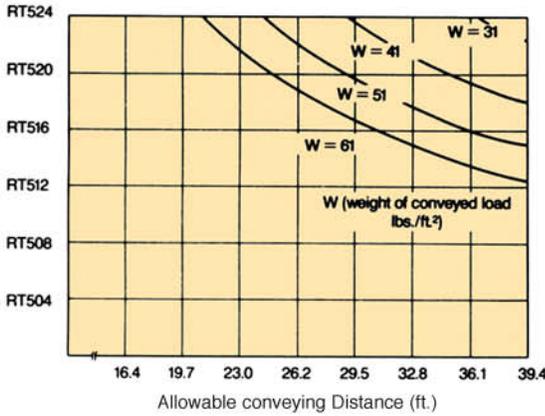
TSUBAKI FREE FLOW CHAIN

RT Roller Table Conveyor Capability Graph

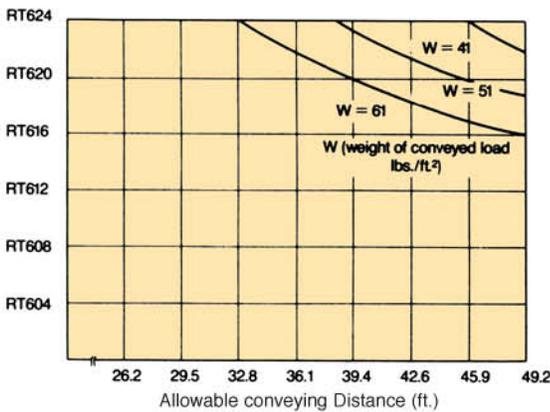
RT400



RT500



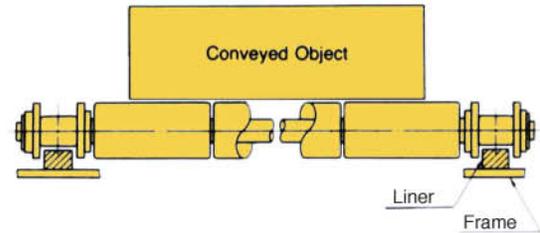
RT600



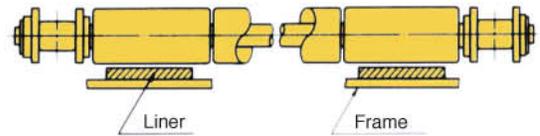
Use these graphs in the same way as for St Roller Table.

Guide for RT Roller Table

■ Conveying Side



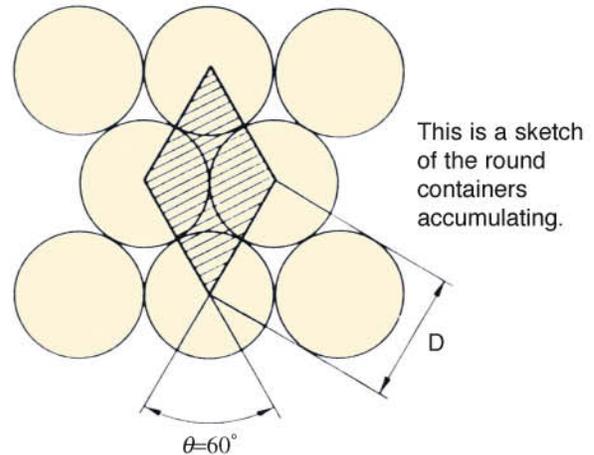
■ Return Side



Note: Material of liner should be high polymer polyethylene.

■ RT Roller Table speed should not exceed 160 ft./min.

How to calculate the carrying capacity (for round containers)

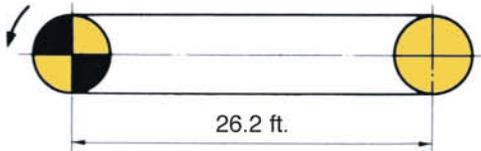


$$W = \frac{\omega \times 1.44 \times 10^2}{D^2 \sin 60^\circ} \text{ (lbs./ft.}^2\text{)}$$

- W: Carrying capacity (lbs./ft.²)
- ω : Weight of material (lbs./p)
- D: Diameter of conveyed material (inch)

Selection Procedure Example

Specifications



Conveyor length: 26.2 ft.
 Weight of conveyed object: 44 lbs.
 Dimensions of conveyed object: 0.98 ft. X 0.66 ft. X 0.33 ft.

Selection

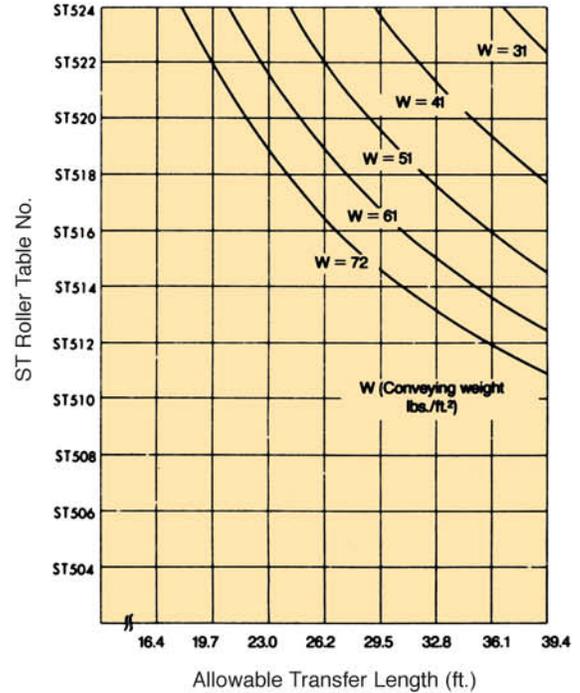
For smooth conveying and to provide "side-through" transfer lines select ST-type.

From the ST-Roller Table conveyor capability graph on page B-58:

$$W = \frac{44}{.98 \times .66} = 68 \text{ lbs./ft.}^2$$

If $W = 68 \text{ lbs./ft.}^2$ and the conveyor length is 26.2 ft., ST504 ~ ST516 Roller Table is the appropriate choice according to the following table.

ST500



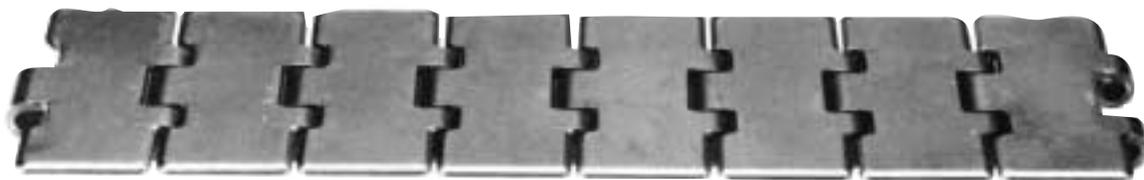
Determine the chain-width (C_1) using the dimension diagram on pages B-52 and B-53.

In this example, ST510SS (NP) Roller Table chain with chain-width (C_1) (9.890) was deemed appropriate for conveyed objects with the above dimensions.

Top Chain

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

Tsubaki Top Chain is available in a wide variety of types, materials and designs to meet the particular needs of every customer.



TS Top Chain Linear Movement

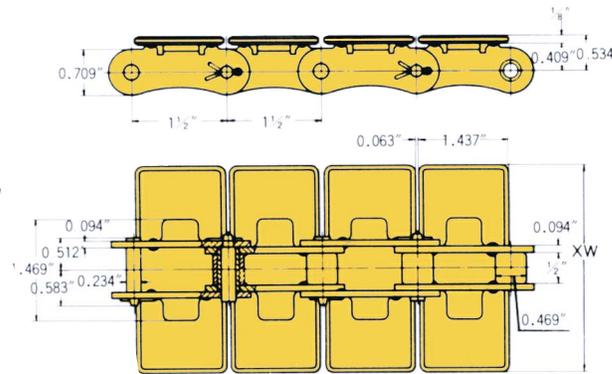
Tsubaki TS Top chain consists of top plates (made of 304 stainless steel) and steel roller chain identical to A2060. The top plates are projection welded to the link plate of the chain. The welded strength provides reliable operation.

TS Top Chain is specially designed for use in packaging, bottling and labeling equipment.

- Installed horizontally over vertical sprockets.
- Chain can be disconnected at any joint for easy installation and maintenance.
- Provides dependable trouble free service.
- Wear resistant.
- Sprockets for C2060 can be used.
- Two types are available, namely, TS-PA and TS-P.

■ TS-PA type

- TS-PA-SS all 304 stainless steel.
- TS-PA-CS carbon steel hardened chain with 304 stainless steel top plate.

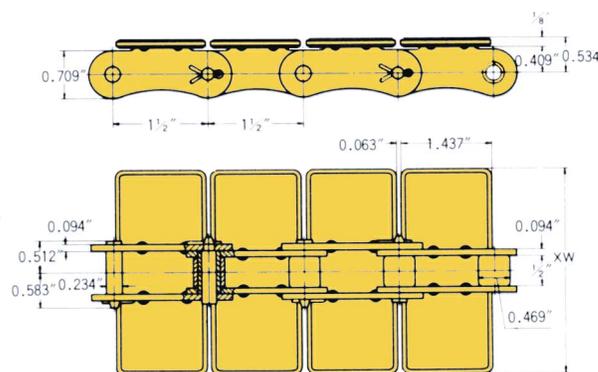


TS-PA

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

■ TS-P type

- TS-P-SS all 304 stainless steel.
- TS-P-CS carbon steel hardened chain with 304 stainless steel top plate.



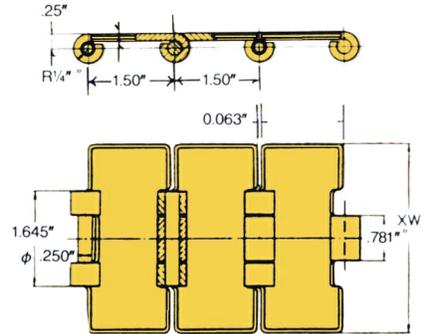
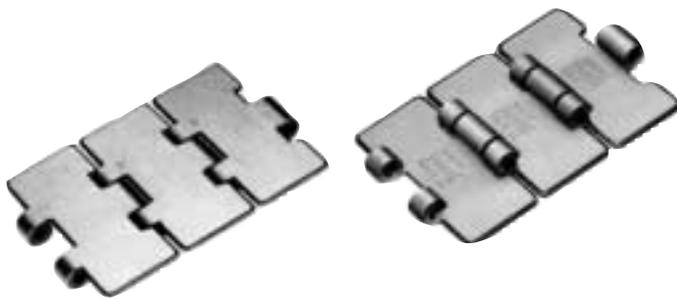
TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.
TS550-P	2.16	1.70
TS635-P	2.50	1.80
TS762-P	3.00	2.00
TS826-P	3.25	2.30
TS950-P	3.74	2.40
TS1016P	4.00	2.60
TS1100-P	4.33	2.70
TS1143P	4.50	2.80
TS1270P	5.00	2.90
TS1524P	6.00	3.40
TS1905P	7.50	4.00

Note: 18 Chrome stainless steel top plates are available. Nickel-plated are also available
Consult Tsubaki for sprocket selection.

TSUBAKI TOP CHAIN

TT Top Chain Linear Movement

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

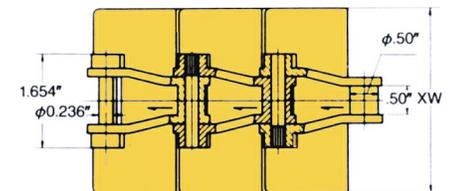
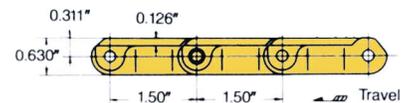


TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.
TT635-SS	2.50	1.50
TT762-SS	3.00	1.70
TT826-SS	3.25	1.80
TT1016-SS	4.00	2.10
TT1143-SS	4.50	2.40
TT1270-SS	5.00	2.60
TT1524-SS	6.00	3.00
TT1905-SS	7.50	3.60

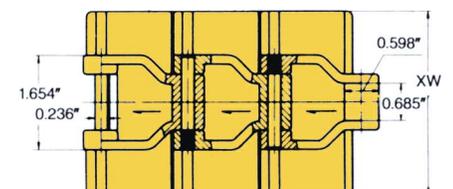
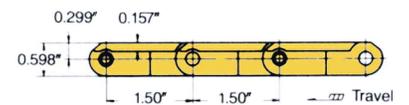
- n TT-N
Top plates are made of 18 chrome stainless steel.
Pins are made of 304 stainless steel.
- n TT-SS
All parts are made of 304 stainless steel.

TP Top Chain Linear Movement

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



TP-II



- TP Type
Top plates are made of polyacetal.
Pins are made of 304 stainless steel.

TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.	Type	Color
TP762	3.00	.54	I	Gray
TP826	3.25	.54	I	
TP1016	4.00	.60	II	
TP1143	4.50	.67	II	
TP1270	5.00	.74	II	

Note: Consult Tsubaki for sprocket selection.

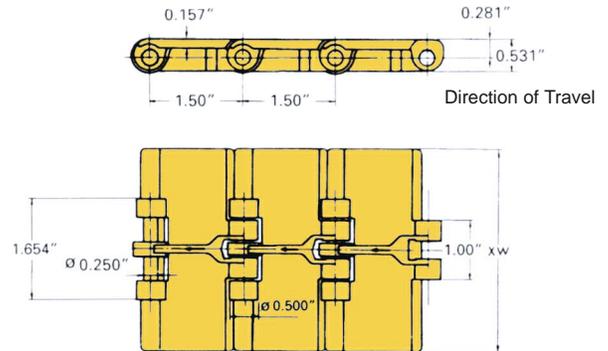
TTP Top Chain Linear Movement

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



■ TTP AND TTPF

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

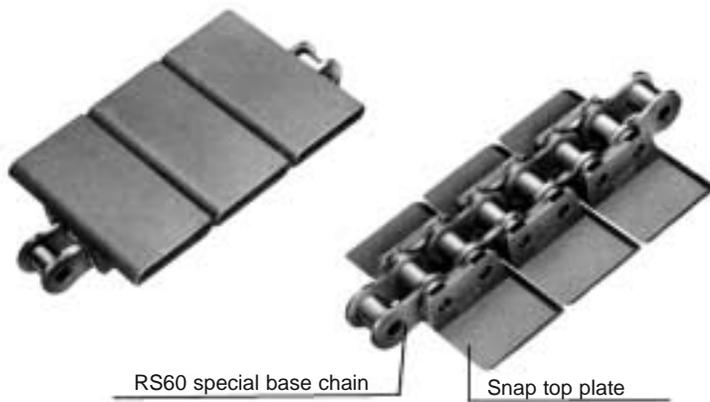


TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.	Color
TTP826 TTPF826	3.25	0.60	TTP: gray TTPF: brown
TTP1143 TTPF1143	4.50	0.67	
TTP1270 TTPF1270	5.00	0.74	
TTP1905 TTPF1905	7.50	0.94	

TN Top Chain Linear Movement

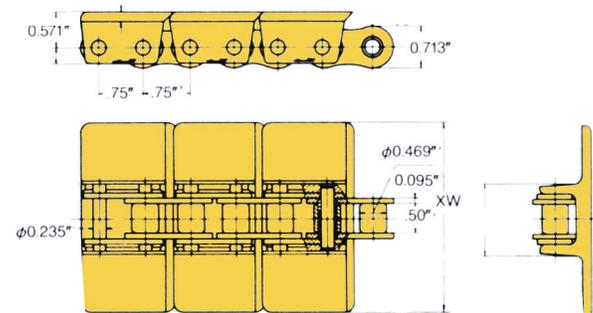
Tsubaki TN Top Chain consists of polyacetal resin top plates snapped onto special chain identical in size to RS60 chain. The chain is available in three types – carbon steel, nickel-plated carbon steel, and 304 stainless steel – to meet any application requirement.

The top plate can be correctly and firmly snapped on to the special pins and the chain without any trouble.



■ TN, TN-NP AND TN-SS

Top plates are Polyacetal.
Chains are carbon steel, nickel-plated and 304 stainless steel.

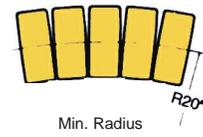
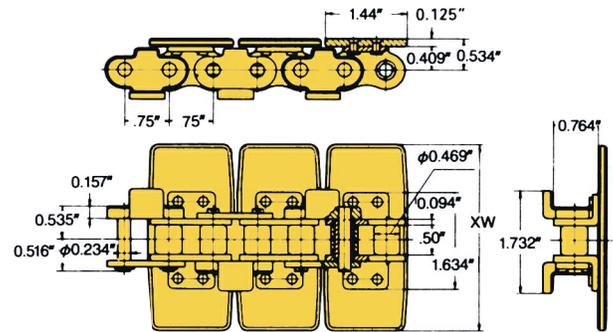


TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.	Color of top plate
TN826	3.25	1.41	Gray
TN1016	4.00	1.48	
TN1143	4.50	1.55	
TN1270	5.00	1.61	
TN1905	7.50	1.88	

Note: Consult Tsubaki for sprocket selection.

TRU Top Chain Curved Movement

Tsubaki TRU Top chain uses a top-plate-riveted RS60 roller chain as its base with special provisions for curving. A float-prevention tab prevents floating at corners to allow the creation of curved conveyors. The same tab may also be used for inclined conveyors to keep the chain in position.

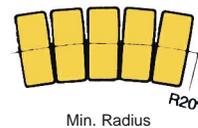
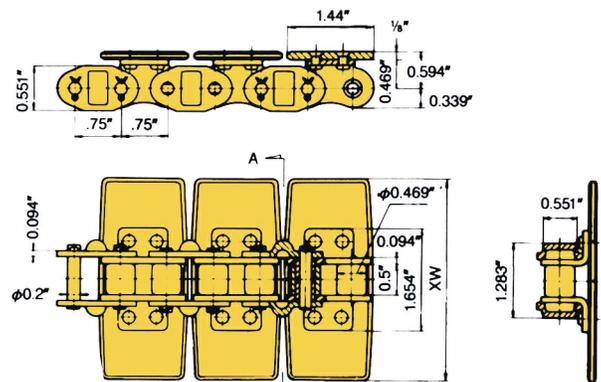
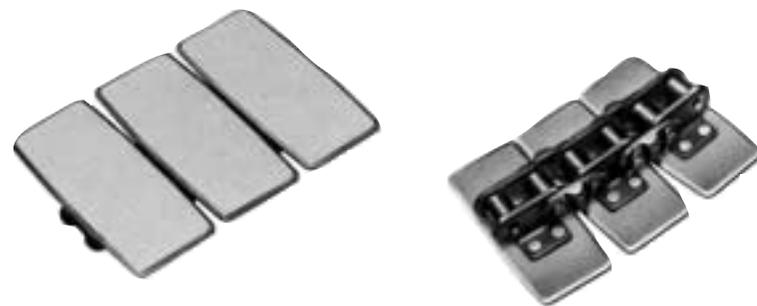


- TRU
Top plates are made of 18 chrome stainless steel.
Chains are carbon steel.
- TRU-SS
All parts are made of 304 stainless steel

TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.
TRU826	3.25	2.80
TRU1143	4.50	3.30
TRU1270	5.00	3.50

TKU Top Chain Curved Movement

Tsubaki TKU Top chain uses top plate riveted RS60 roller chain as its base with special provisions for curving. As the chain has no float-prevention tab, it is suggested that slow and simple curved running be used.



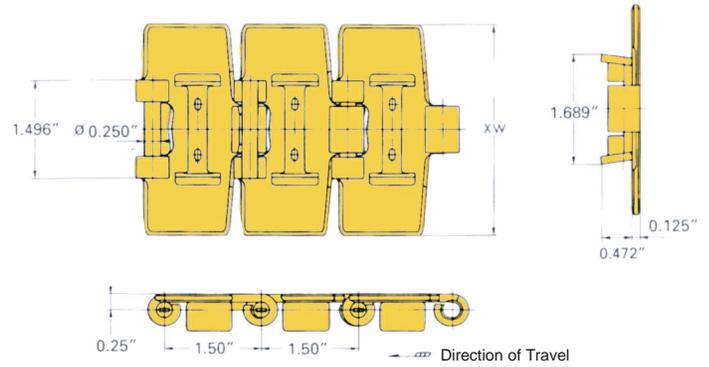
- TKU
Top plates are made of 18 chrome stainless steel.
Chains are carbon steel.

TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.
TKU826	3.25	2.60
TKU1100	4.33	3.00

Note: Consult Tsubaki for sprocket selection.

TTU Top Chain Curved Movement

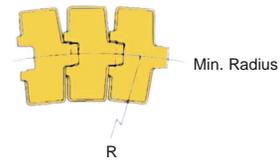
Tsubaki TTU Top chain consists of top plates, connecting pins and guide-plates for float-prevention around curves. All parts are made of 304 stainless steel which ensures strong resistance to rust and clean handling.



■ TTU

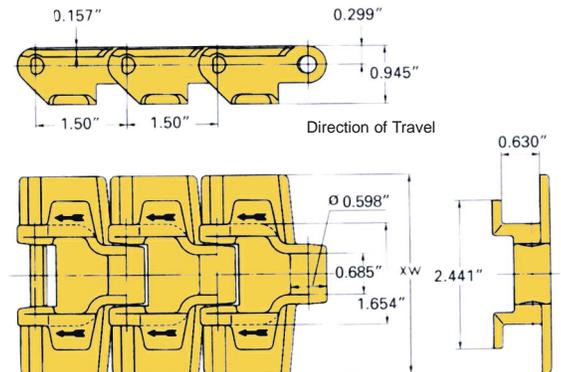
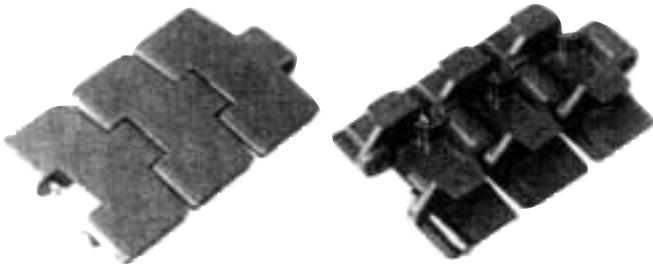
All parts are made of 304 stainless steel.

TSUBAKI Chain No.	Slat Width XW	Minimum Radius R	Approx. Weight lbs./ft.
TTU826	3.25	18	1.88
TTU1143	4.50	18	2.42
TTU1905	7.50	23.6	3.50



TPU Top Chain Curved Movement

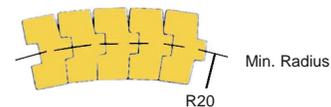
Tsubaki TPU Top chain consists of polyacetal resin top plates fitted with float-prevention tabs and 304 stainless steel pins.



■ TPU

Top plates are made of polyacetal.
Pins are made of 304 stainless steel.

TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.	Color of top plate
TPU826	3.25	.67	Gray

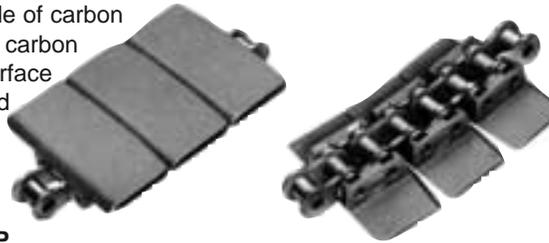


Note: Consult Tsubaki for sprocket selection.

TSUBAKI TOP CHAIN

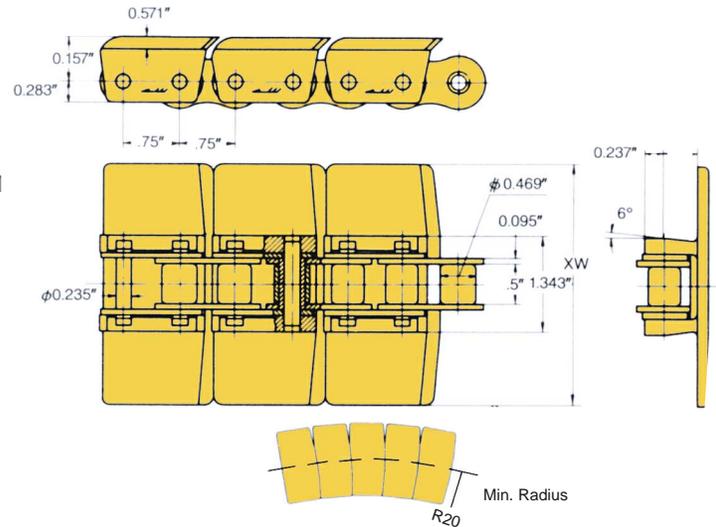
TNU Top Chain Curved Movement

Tsubaki TNU Top chain consists of polyacetal resin top plates snapped onto a special chain the same size as RS60 chain and made of carbon steel or nickel-plated carbon steel. The outside surface of the snap is tapered for float prevention.



- **TNU AND TNU-NP**
Top plates are made of polyacetal.
Chains are carbon steel or nickel-plated.

TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.	Color of top plate
TNU826	3.25	1.48	Gray
TNU1143	4.50	1.55	
TNU1270	5.00	1.68	



TO Top Chain Curved Movement

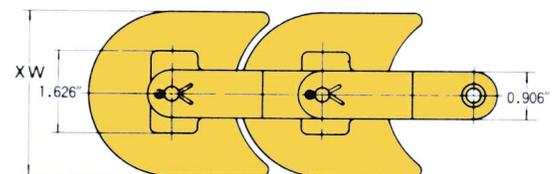
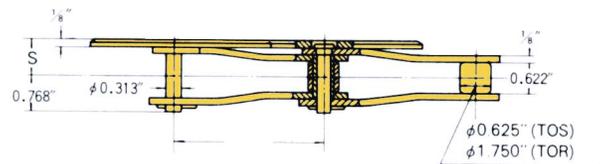
Tsubaki TO Crescent Plate chain is used to convey containers and materials in the bottling and canning industries. It is especially useful when the length of the conveyor must be long and the load factor high.

- Stronger than TS Top Plate chain.
- Can follow any horizontal route.
- The use of multiple drives makes long conveyor lengths possible.
- A turn-table and guide roller are unnecessary on the return side.
- Standard carbon steel chain with 18 chrome stainless steel crescent shaped top plates are provided unless otherwise specified.
- Min. radius of T Crescent Plate chain is 4 inches.



- **TOS**
Top plates are made of 18 chrome stainless steel.
Chain is carbon steel.

TSUBAKI Chain No.	Slat Width XW	S	Approx. Weight lbs./ft.
TOS826	3.25	.705	2.80
TOS1143	4.50	.705	3.20
TOS1778*	7.00	.831	4.20



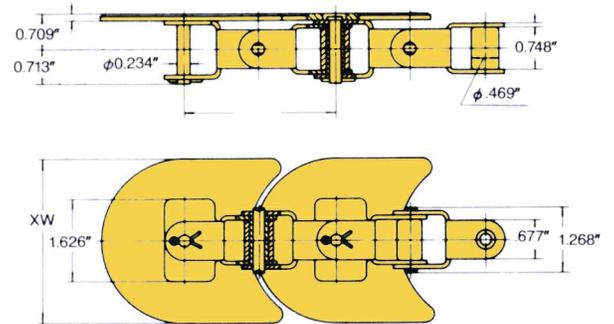
- **TOR**
Top plates are made of 18 chrome stainless steel.
Chain is carbon steel.

TSUBAKI Chain No.	Slat Width XW	S	Approx. Weight lbs./ft.
TOR826	3.25	.705	4.00
TOR1143	4.50	.705	4.60
TOR1778*	7.00	.831	5.40

TU Top Chain Curved Movement

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

- Can follow any horizontal and vertical route.
- Standard carbon steel chain with 18 chrome stainless steel crescent.
- Crescent shaped top plates will be provided unless otherwise specified.



■ TU

Top plates are made of 18 chrome stainless steel.
Chain is carbon steel.

TSUBAKI Chain No.	Slat Width XW	Approx. Weight lbs./ft.
TU826	3.25	2.60
TU1143	4.50	3.00

Note: Consult Tsubaki for sprocket selection.

RS Plastic Chain

“E” Series (Electro-Conductive Series)

The special plastic used in the “E” series is electro conductive and permits electrical charge. These chains are suitable for applications where there is electric noise, electric sparks, or where dust collects due to static electricity. Volume resistivity: $10^6 \Omega \cdot \text{cm}$

“Y” & “SY” Series (Anti-Chemical Series)

The amazing “Y” & “SY” series utilizes an engineering plastic which permits the chain to perform well even where chloride, acid, alkaline, oxidizers and most organic solvents are present. “SY” series is a combination of “Y” series plastic block links and titanium pins and performs well even when exposed to sulfuric and hydrochloric acid.

“K” Series (Heat Resistant Series)

The Tsubaki “K” series is made of a resilient new engineering plastic which can withstand environments where temperatures reach 284°F. In contrast to plastic chains made of conventional plastic, this chain will not lose its valuable properties at high temperatures.



TSUBAKI Chain No.	Pitch	Maximum Allowable Tension lbs.			Ambient Temperature Range °F		Maximum Allowable Chain Speed ft./min.		Coefficient of Sliding Friction
		“E”	“Y” “SY”	“K”	“E” “Y” “SY”	“K”	“E” “Y” “SY” “K”		
RS40P (E, SY, K)	.500	77	55	55	-4 ~176	-4 ~284	197	164	.010
RS60P (E, Y, SY, K)	.750	143	110	110	-4 ~176	-4 ~284	197	164	.010
RS2040P (E, Y, SY, K)	1.000	77	55	55	-4 ~176	-4 ~284	197	164	.010

ENGINEERING INFORMATION

Corrosion Resistance Guide

The corrosion resistance guide given below should be referred to when selecting chains. The table presents Tsubaki laboratory test results at 68°F. Humidity and other conditions should also be considered.

“E”: electro-conductive series. “Y”: anti-chemical series, “K”: heat resistant series, “N”: low noise series

Fluid	Series	“E”, “N”, “K” and Standard	“Y”	Super “Y”	Fluid	Series	“E”, “N”, “K” and Standard	“Y”	Super “Y”
Acetone		○	×	×	Carbon Tetrachloride		△	△	○
Oil (Vegetable)		○	○	○	Nitric Acid (5%)		×	○	○
Vegetable		○	○	○	Vinegar		△	△	△~○
Ammonia		○	△	△	Hypochloride		×	△	○
Sodium Chloride		△	△	○	Potassium Hydroxide		×		○
Hydrochloric Acid		×	×	○	Sodium Hydroxide (20%)		×	○	○
Sea Water		△	○	○	Soap Water		○	○	○
Hydrogen Peroxide		×	○	○	Paraffin		○	○	○
Caustic Soda (25%)		×	○	○	Beer		○	○	○
Gasoline		○	○	○	Fruit Juice		○	○	○
Chloric Acid (10%)		×	△	△	Wine		○	○	○
Formic Acid		×	×	○	Whiskey		○	○	○
Aldehyde Formate		○	○	○	Vegetable Juice		○	○	○
Milk		○	○	○	Iodine		×	×	○
Lactic Acid		○	○	○	Sulfuric Acid		×	×	○
Citric Acid		△	○	○	Phosphoric Acid (10%)		×	△	○
Acetic Acid (5%)		×	○	○	Soda Pop		○	○	○

○: Total resistant △: Partially resistant ×: Not suggested

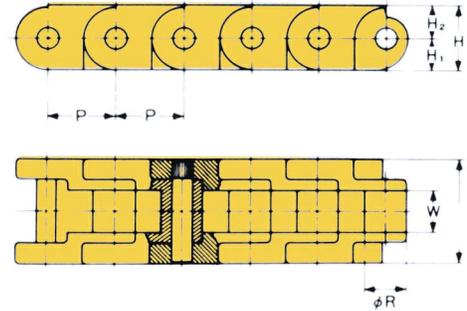
Note: 1. With pins made of titanium, the Super “Y” Series has greater corrosion resistance than the “Y” Series.
2. This table is intended only as a guide and Tsubaki does not take responsibility for mishaps arising from its use.

RS Plastic Chain Linear Movement

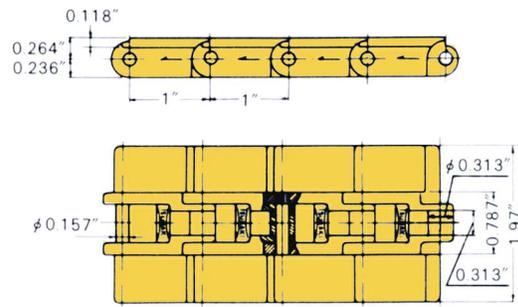
RS Plastic chain consists of polyacetal chain links and 304 stainless steel pins and operates with standard roller chain sprockets. Based on power transmission roller chain, Tsubaki RS-type has a flat top side for power transmission or conveying use.



RS Type



RS Double Pitch Type



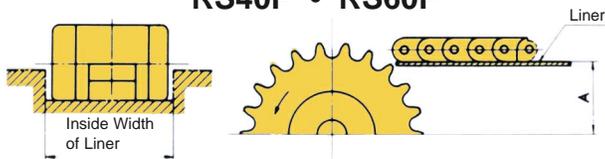
- **RS TYPE** Chain links are made of polyacetal. Pins are made of 304 stainless steel.

TSUBAKI Chain No.	P	R	W	L	H ₁	H ₂	H	Approx. Weight lbs./ft	Color
RS40P	.50	.313	.313	.787	.236	.264	.500	.24	brown
RS60P	.75	.469	.500	1.181	.335	.346	.681	.48	brown

- **RS DOUBLE PITCH TYPE** Chain links are made of polyacetal. Pins are made of 304 stainless steel

TSUBAKI Chain No.	Chain Pitch	Slat Width	Approx. Weight lbs./ft.	Color
RS2040P	1.00	1.97	.28	brown

- **Location of guide rails and sprocket**
RS40P • RS60P



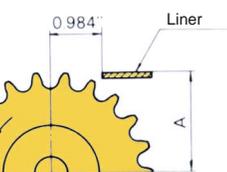
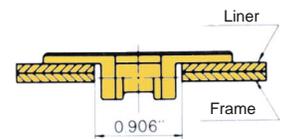
RS40P: 0.906"
RS60P: 1.299"

$$\text{"A" of RS40P} = \frac{\text{Sprocket Pitch Diameter}}{2} - 0.217$$

$$\text{"A" of RS60P} = \frac{\text{Sprocket Pitch Diameter}}{2} - 0.315$$

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

RS 2040P



$$\text{"A"} = \frac{\text{Sprocket Pitch Diameter}}{2} + 0.157$$

Selection and Engineering Information

Chain Type	Materials		Specifications				Feature	Applications	
	Chain/Pin	Top Plate	Max. Allowable Load lbs.	Suggested Max. Speed (ft./min.)		Ambient Temperature °F			
				Lubricated	Dry				
Linear Movement	TS-P	Carbon steel	18 Chrome stainless steel	660	390	200	15 ~350	Type P : Suitable for single strand operation Type SS: Suitable for multi-strand operation and corrosive environment Type CS: Suitable for heavy load operation	Assembly line for bottling or canning, and conveying cartons or other parts.
	TS-SS	304 Stainless steel	304 Stainless steel	231	230	150	-4 ~750		
	TS-CS	Hardened carbon steel		1,100	390	200	15 ~350		
	TT-N	13 Chrome stainless steel hardened	18 Chrome stainless steel	330	330	200	15 ~500	Simple construction, washable, clean handling, and anti-corrosive.	
	TT-SS	304 Stainless steel		484			-4 ~750		
	TP	304 stainless steel	Polyacetal resin	264	330	160	-4 ~170	Self-lubrication, quiet-operation, Anti-corrosive, suitable for transportation of small size goods due to small clearance between top plates.	
	TTP			187					
	TN	Carbon steel	Polyacetal resin	1,628	390	200	15 ~170	Damage-free, quiet operation. Smooth transportation, easy removal of top plate. Easy repair.	
	TN-NP	Nickel-plated Carbon steel							
	TN-SS	304 Stainless steel							
RS-P	304 Stainless steel	Polyacetal resin	40P, 2040P: 99 60P : 198	200	200	-4 ~170	Quiet and trouble-free operation with anti-corrosive protection.	Conveying electronic parts and small items.	
Curved Movement	TRU	Carbon steel	18 Chrome stainless steel	902	330	200	15 ~350	Float-prevention tab allows high speed, complex, and curved transportation.	Curved operation for type TS and TT.
	TRU-SS	304 Stainless steel		231	230	150	-4 ~750		
	TKU	Carbon steel	18 Chrome stainless steel	638	150	150	15 ~350	Easy removal of chain. Used for low speed and simple curved operation.	
	TTU	304 Stainless steel		484	260	160	-4 ~750	Same features as TT. Used for curved operation.	Curved operation for TT.
	TPU	304 Stainless steel	Polyacetal resin	220	260	160	-4 ~170	Same features as TP and TRU.	Curved operation for TP.
	TNU	Carbon steel	Polyacetal resin	902	330	200	15 ~170	Used for simple curved operation. TN type side bow feature.	Curved operation for TN.
	TNU-NP	Nickel-plated carbon steel							
	TO	Carbon steel	18 Chrome stainless steel	660	200	200	15 ~350	Any horizontal curved operation is possible. Min. radius: 4.00 inches. Complex curved operation is available.	Suitable for horizontal curved operations.
	TU			220				Any return such as straight/curved line on horizontal and vertical route is available. Complex curved operation available.	

Top Plate Chain Selection

Follow the procedure below to select top chain and liner that are most economical and suitable for the application.

Step 1: Establish general conveyor conditions

Step 2: Select top plate material

Step 3: Select liner material

Step 4: Determine factors and coefficients

Step 5: Select top plate width

Step 6: Calculate chain tension

Step 7: Determine chain size

Step 1

Establish general conveyor conditions

A) Materials conveyed

- (1) Container material
- (2) Weight
- (3) Dimensions

B) Conveyor arrangement

- (1) Straight or curved movement
- (2) Conveyor length
- (3) Layout
- (4) Space limitations

C) Other conditions

- (1) Conveyor capacity

(2) Interval

(3) Conveyor speed

(4) Lubrication requirements

(5) Material conveyance regularity

D) Environment

(1) Temperature

(2) The presence of corrosive chemical substances (See Table I)

(3) Existence of wear causing agents, such as glass, paint, metal, powder, or sand.

Table I must be referred to when selecting chain and liner materials to be used with top chain. The table shows the results of lab tests at 68°F. It is to be used for reference only and does not state or imply any warranty conditions whatsoever.

Humidity and other conditions must also be considered.

Table I: Corrosion Resistance to Various Fluids

Fluid	Steel	Stainless Steel				Ultra-high Polymer Polyethylene
		Polyacetal	304	18 Chrome	13 Chrome	
Acetone	×	○	○	○	○	○
Oils (vegetable and mineral)	○	○	○	○	○	○
Alcohol	○	○	○	○	○	○
Aqueous ammonia	Δ	○	○	○	○	○
Sodium chloride	×	○	Δ	Δ	×	○
Hydrochloric acid (2%)	×	×	×	×	×	×
Sea water	×	Δ	Δ	×	×	○
Hydrogen peroxide	×	×	○	○	Δ	○
Caustic soda (25%)	×	×	○	○	○	○
Gasoline	○	○	○	○	○	Δ
Formic acid	×	×	×	×	×	○
Formic acid aldehyde	○	○	○	○	○	○
Milk	○	○	○	○	○	○
Lactic acid	×	○	○	×	×	○
Citric acid	×	Δ	○	Δ	Δ	○
Acetic acid (5%)	×	×	○	○	×	○
Carbon tetrachloride	Δ	○	Δ	Δ	Δ	Δ
Nitric acid (5%)	×	×	○	○	Δ	Δ
Rice vinegar (5%)	×	○	Δ	Δ	×	○
Hypochlorite soda	×	×	×	×	×	○
Soapy water	Δ	○	○	○	○	○
Paraffin	○	○	○	○	○	○
Beer	○	○	○	○	○	○
Fruit juice	×	○	○	Δ	Δ	○
Wine	○	○	○	○	○	○
Whiskey	○	○	○	○	○	○
Benzene	○	○	○	○	○	Δ
Water	×	○	○	○	○	○
Vegetable juice	Δ	○	○	○	○	○
Iodine	×	×	×	×	×	×
Sulfuric acid	×	×	×	×	×	×
Phosphoric acid	×	×	Δ	×	×	○
Soft drinks	○	○	○	○	○	○

○: Totally resistant Δ: Partially resistant ×: Not suggested

Step 2 Select top plate material

Top plate material must be selected according to the type of goods to be moved.

Table II: Plate Material Selection Guide

Material Conveyed	Top Plate Material	Dry		Lubricated	
		Abrasive Atmosphere			
		No	Yes	No	Yes
Tin cans, aluminum cans, and metal containers (beer cans, soft drink cans and other cans having metal tops and bottoms, and fiber sides).	Polyacetal	○	×	○	
Industrial parts (machine parts, dies, castings, forgings, metals, bearings, bolts, nuts, etc.)	Stainless Steel		○		○
Plastics and plastic covered containers and paper containers (for milk products such as milk, cheese, ice cream and confectionery, includes containers with paper boards and paper bottoms such as those for soap and cereal).	Polyacetal		×		
	Stainless Steel	○	○	○	○
Glass jars, glass products and ceramics (for spirits, foods, pharmaceuticals and cosmetics).	Polyacetal		×		×
	Stainless Steel	○	○	○	○

○ Suggested □ Good □ Limited use × Not suggested

Step 3 Select liner material

The appropriate liner material must be selected from the top plate materials listed under step 2.

Table III: Liner Material Selection Guide

Top Plate Material (chain type)	Liner Material	Dry		Lubricated	
		Abrasive Atmosphere			
		No	Yes	No	Yes
Stainless steel (TS and TT for straight running TRU, TKU, TO and TU for curved movement).	Stainless Steel				
	Steel		○		○
	Super-high-polymer polyethylene	○	×	○	
Polyacetal (TP, TTP, TN and RS-P for linear movement. TPU and TNU for curved movement).	Stainless Steel			○	○
	Steel	○	○		
	Super-high-polymer polyethylene		×		

○ Suggested □ Good □ Limited use × Not suggested

TSUBAKI TOP CHAIN

Step 4 Determine factors and coefficients (f_2 , f_3 , k_2 , k_3)

Table IV: Coefficient of Friction (f_2) between Top Plate and Liner

Top Plate Material	Lubrication	Coefficient of Dynamic Friction of Liner Material		
		Stainless Steel	Steel	Ultra High Polymer Polyethylene
Stainless Steel	Dry	0.35	0.35	0.25
	Lubrication by soapy water	0.20	0.20	0.15
	Oil Lubrication	0.20	0.20	0.15
Polyacetal	Dry	0.25	0.25	0.25
	Lubrication by soapy water	0.15	0.15	0.15

Table V: Coefficient of Friction (f_3) between Material Conveyed and Top Plate

Material Conveyed	Lubrication	Coefficient of Dynamic Friction of Top Plate Material	
		Stainless Steel	Polyacetal
Plastic and paper containers and film packages.	Dry	0.30	0.25
	Lubrication by soapy water	0.20	0.10
Cans (with metal tops and bottoms)	Dry	0.35	0.25
	Lubrication by soapy water	0.20	0.15
Bottles and ceramics	Dry	0.30	0.40
	Lubrication by soapy water	0.20	0.20
Industrial parts (metal)	Dry	0.35	0.25
	Oil Lubrication	0.20	0.15

Table VI: Angle Factor (k_2) and Length Factor (k_3)

Turning Angle	Length Factor (k_3)	Angle Factor (k_2)			
		TPU and TNU Chains		TRU and TKU Chains	
		Dry	Lubricated	Dry	Lubricated
30°	0.5	1.15	1.10	1.20	1.10
60°	1.0	1.30	1.15	1.45	1.25
90°	1.6	1.50	1.25	1.75	1.35
120°	2.1	1.70	1.35	2.10	1.50
150°	2.6	1.90	1.50	2.50	1.70
180°	3.1	2.20	1.60	3.00	1.85

k_2 and k_3 factors are to be used for curved movement except for TO and TU type.

$$k_3 = \pi \times \text{Turning Angle} / 180^\circ$$

Step 5 Select top plate width

Generally, the top plate must be wider than the material conveyed. When materials are very wide and none of the top plate widths are satisfactory, top plates of the same width may be used in multi-strand arrangement. Top plates of different widths can be used together, but this is not desirable since the tension on the chains will be uneven.

Step 6 Calculate chain tension (T)

1) Linear movement

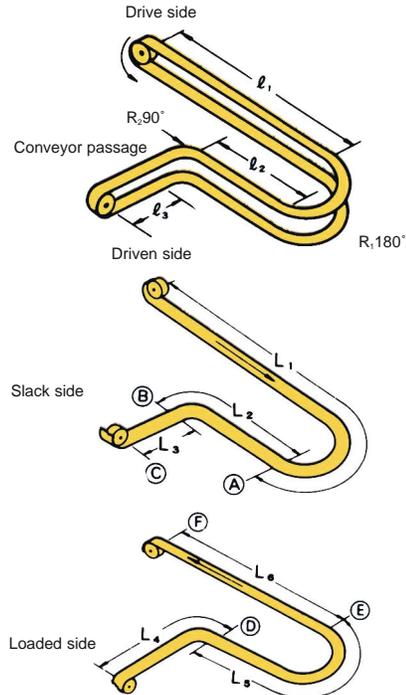
(TS, TT, TP, TN, TTP and RS-P chains)

$$T = (M + 2.1 w) Lf_2 + ML f_3 \dots \dots \dots \text{Formula 1}$$

2) Curved movement

(TRU, TKU, TPU, TNU and TTU chains)

The chain tension for curved movement is calculated similarly to that for linear movement. The tension at corners, however, is compensated for by angle factor (k_2) and length factor (k_3). Calculations are shown below for the illustrated examples.



The tension on the chain at each part ABC . . . F must be calculated. The tension at F is the greatest acting on the chain.

$$T = T_F \dots \dots \dots \text{Formula 2}$$

Slack side:

Chain tension at A : T_A

$$T_A = L_1 w f_2 k_2, \quad L_1 = \frac{1}{2} + R_1 k_3 \quad (k_2 \text{ and } k_3 \text{ at } 180^\circ)$$

Chain tension at B : T_B

$$T_B = \{T_A + L_2 w f_2\} k_2, \quad L_2 = \frac{1}{2} + R_2 k_3 \quad (k_2 \text{ and } k_3 \text{ at } 90^\circ)$$

Chain tension at C : T_C

$$T_C = T_B + L_3 w f_2, \quad L_3 = \frac{1}{2}$$

Loaded side :

Chain tension at D : T_D

$$T_D = \{T_C + (M + w) L_4 f_2 + ML_4 f_3\} k_2, \quad L_4 = \frac{1}{2} + R_2 k_3 \quad (k_2 \text{ and } k_3 \text{ at } 90^\circ)$$

Chain tension at E : T_E

$$T_E = \{T_D + (M + w) L_5 f_2 + ML_5 f_3\} k_2, \quad L_5 = \frac{1}{2} + R_1 k_3 \quad (k_2 \text{ and } k_3 \text{ at } 180^\circ)$$

Chain tension at F : T_F

$$T_F = T_E + (M + w) L_6 f_2 + ML_6 f_3$$

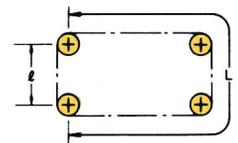
3) TO and TU chains

Calculations for chain selection vary according to their usage and arrangement. A sample calculation is given below for the arrangement shown on the right.

$$T = (M + w) Lf_2 + w f_2 + ML f_3 \dots \dots \dots \text{Formula 3}$$

4) Calculation of power required

$$HP = \frac{TS}{33,000 \times \eta} \dots \dots \dots \text{Formula 4}$$



Step 7 Determine chain size

Multiply the maximum chain tension (T) by the speed coefficient (k₁) taken from Table VII and verify that the following equation is satisfied.

$$T \times k_1 \leq \text{Chain maximum allowable load}$$

..... Formula 5

When the maximum allowable load is insufficient, it can be corrected by using top plates with narrower width and increasing the number of chain strands, or by splitting into many short conveyors.

Table VII: Speed Coefficient (k₁)

Chain Speed (ft./min.)	Speed Factor (k ₁)
0 ~ 50	1.0
50 ~ 100	1.2
100 ~ 160	1.4
160 ~ 230	1.6
230 ~ 300	2.2
300 ~ 360	2.8
360 ~ 400	3.2

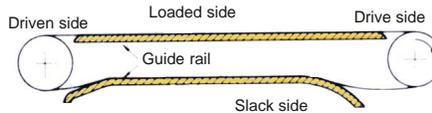
- T : Chain tension (lbs.)
- M : Weight of material conveyed per ft. (lbs./ft.)
- w : Chain weight (lbs./ft.)
- L : Center distance between sprockets (ft.)
- l : Distance not loaded (ft.)
- L' : Distance of the material sliding on the chain for storage (L =0 when items and chain are not slipping)
- f₂ : Coefficient of friction between the top plate and liner (See Table IV)
- f₃ : Coefficient of friction between goods moved and top plate (See Table V)
- k₁ : Speed coefficient (See Table VII)
- k₂ : Angle factor (See Table VI)
- k₃ : Length factor (See Table VI)
- R : Radius at corner (ft.)
- S : Chain speed (ft./min.)
- η : Mechanical transmission efficiency for drive unit
- HP : Power required

Conveyor design

The layout of a conveyor varies with the type of chain used. A typical layout is shown below. Goods should be conveyed on the tension side of the chain, and the slack (return) side should be supported by guide rails with sloped ends to prevent chain vibration and conveyor pulsation.

2-1 Guide rail

The guide rail consists of the conveyor frame and liner. The liner sides with the top chain to minimize frictional resistance and wear so the chains are protected and driving power can be minimized.

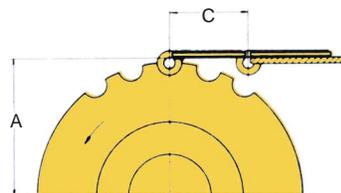


2-2 Location of guide rails and sprocket

When the chain engages with the sprocket, the chain itself moves up and down slightly due to the polygonal effect of the sprocket. Therefore, the guide rail on the loaded side must be positioned so that the chain is horizontal when at the highest level. Guide rail installation dimension (A) is determined from the following equation.

$$A = \frac{\text{pitch diameter of sprocket}}{2} + B \text{ (inch)}$$

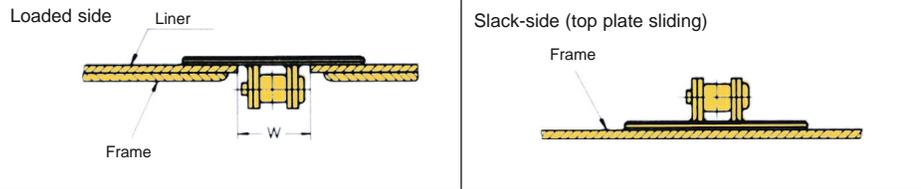
Chain Type	B	C
TR • TRU • TKU • TN • TNU	.433	1.496
TT, TTU	.157	
TP-I	.197	
TP-II • TPU, TTP, TTPF	.157	



Note: Please refer to page B-69 for the RS Plastic chain.

Guide Rail Inside Width

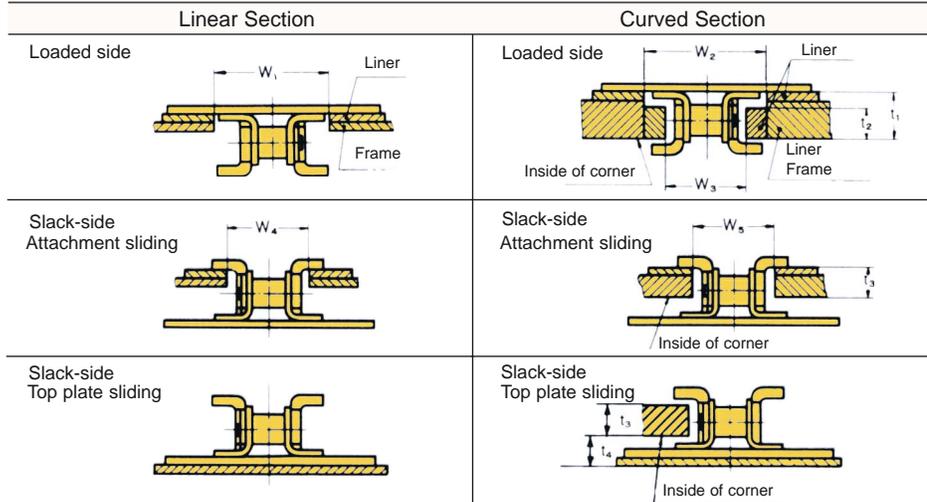
Linear Movement Chain



Note: TS-P type chains are shown in this illustration. Other chain types can also be used.

Chain Type	W	Chain Type	W
TS-P	1.300	TP	1.772
TS-SS & CS	1.594	TTP	1.772
TT	1.772	TN	1.496

Curved Movement Chain

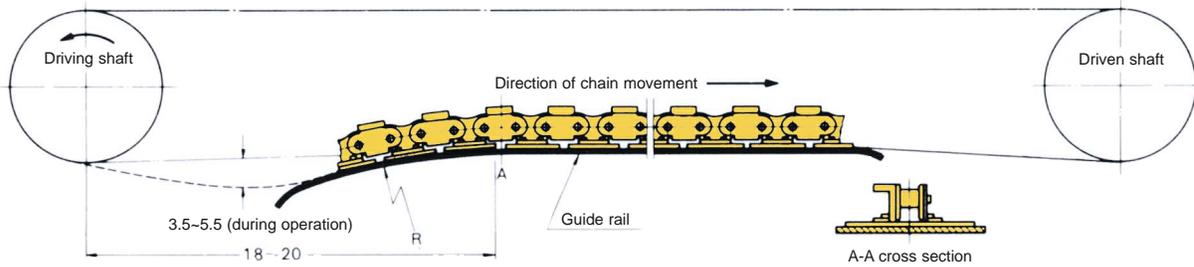


Note: TRU chains are shown in the illustration. Other chain types can also be used.

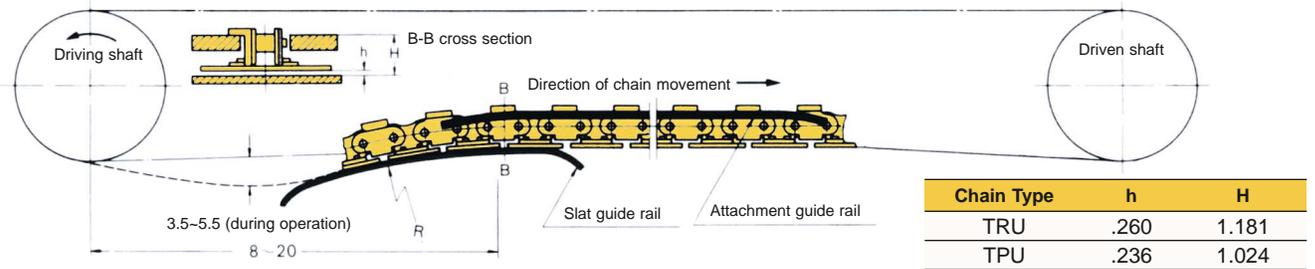
Chain Type	W_1	W_2	W_3	t_1	t_2	W_4	W_5	t_3
TRU	1.752	1.890	1.220	.689	.472	1.220	1.220	.472
TPU	1.772	1.772	1.772	.472	.472	1.890	1.890	.472
TNU	1.496	1.496	1.496	.709	.709	-	-	-
TO	1.752	-	-	-	-	-	-	-
TU	1.752	-	-	-	-	-	-	-
TKU	1.772	1.890	1.417	.748	.531	-	-	-
TTU	1.654	-	-	-	-	1.654	-	-

2-3 Slack side guide rail arrangement

Top plate sliding (applicable for all top chains)



Attachment sliding (TRU type)

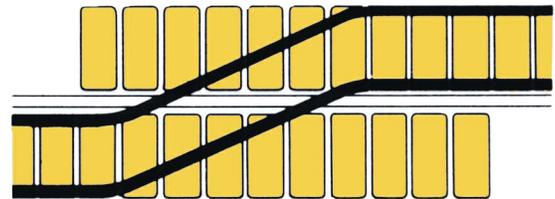


- (1) Slack of 3.5 ~ 5.5 inches (during operation) is needed under the drive sprocket.
- (2) Engagement angle must be more than 150° between the drive sprocket and the chain.
- (3) The radius R (inches) of the guide rail must be larger than the radius of chain back-bend given in the table below.

Radius of Chain Back-bend

Type	Back-bend Radius (in.)	Type	Back-bend Radius (in.)
TS	13	RS2040P	18
TRU•TKU	12	TP•TTP•TPU	2
TT	7	TN•TNU	4
RS40P	5	TTU	2
RS60P	18		

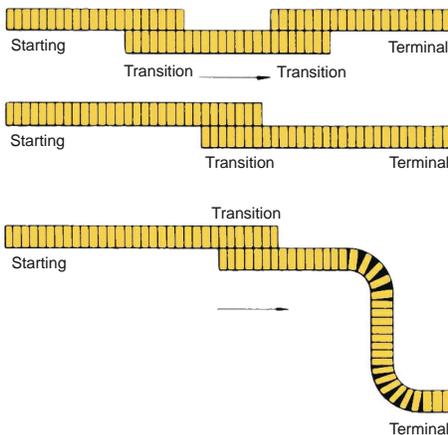
Locations of the chain and the guide rail are very important for a smooth transition between conveyors. Two parallel chains must be positioned at the same height, or the output chain must be positioned slightly higher than the receiving chain. The guide rail must be shaped such that transition of goods can be accomplished smoothly.



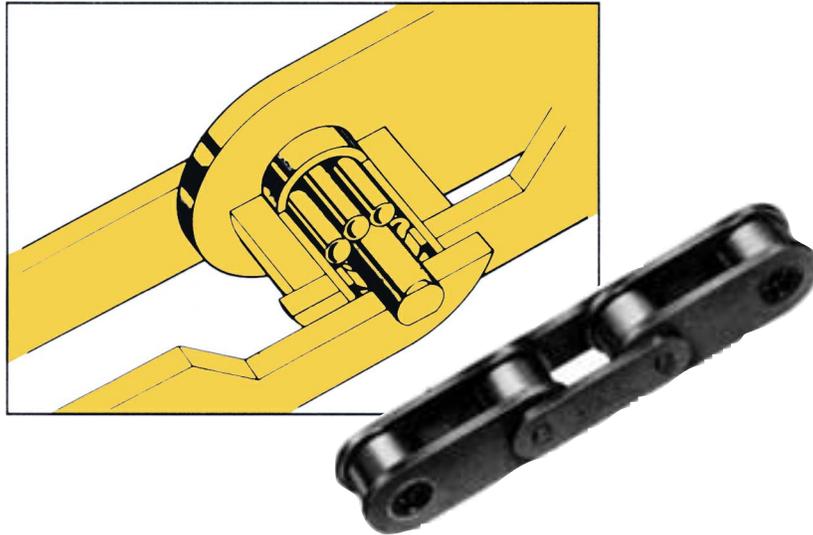
- (4) Guide rails must have sloped ends to prevent interference with the chain.

2-4 Connection of additional conveyors

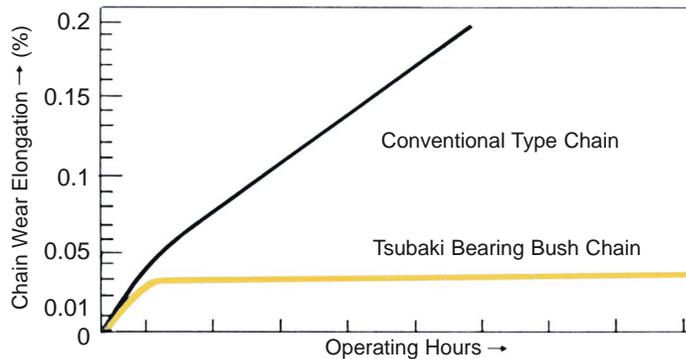
If a conveyor is too long, the chain tension will increase and chain strength will not be sufficient. In such cases, additional conveyors should be used.



Bearing Bush Chain



Wear Resistance Comparison - Without Lubrication

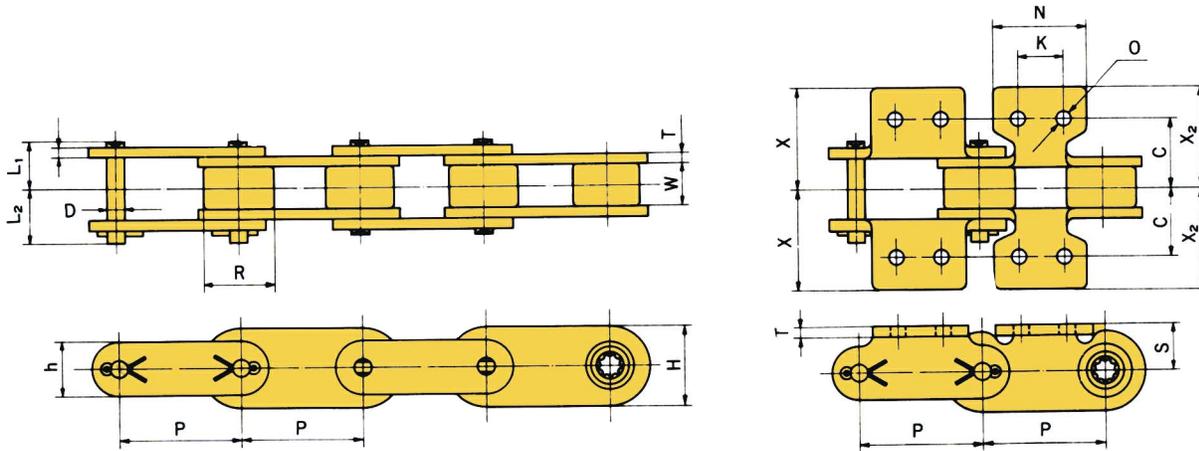


Tsubaki Bearing Bush chain virtually eliminates initial stretch. With needle bearings placed between the pin and bushing, Bearing Bush chain offers excellent wearlife without lubrication.

Major dimensions of the chain and attachments are the same as our ANSI standard double pitch conveyor chains. Tsubaki Bearing Bush chain works perfectly with standard over-sized roller sprockets.

Bearing Bush chain is suggested for precision applications requiring accurate positioning of the conveyed material.

DOUBLE PITCH CHAIN SERIES



TSUBAKI Chain No.	Pitch P	Roller Diameter R	Width Between Roller Plates w	Link Plate			Pin		Maximum Allowable Load lbs.	Allowable Roller Load lbs./roller	Approx. Weight lbs./ft.	
	T	H	h	D	L ₁	L ₂						
CN2042	1.000	.625	.312	.060	.689	.473	.156	.325	.380	176	33	.66
CN2052	1.250	.750	.375	.080	.827	.591	.200	.406	.472	287	44	1.16
CN2062H	1.500	.875	.500	.125	1.024	.677	.234	.573	.667	396	66	1.72
CN2082H	2.000	1.125	.625	.156	1.378	.906	.312	.720	.823	660	121	2.60

TSUBAKI Chain No.	Attachment							Additional Weight per Attachment lbs.	
	S	C	X	N	K	T	O	A-2 Att.	K-2 Att.
CN2042	.358	.500	.760	.752	.374	.060	.142	.0066	.0132
CN2052	.437	.626	.953	.937	.469	.080	.204	.0132	.0265
CN2062H	.579	.844	1.240	1.126	.563	.125	.205	.0374	.0748
CN2082H	.752	1.094	1.602	1.500	.752	.156	.268	.0704	.1408

- Note:
- 1) Spring clip type connecting links will be provided for CN2042 ~ CN2062H.
 - 2) Offset links are not available.
 - 3) SS Series (SUS304) is also available.
 - 4) Link plates can be nickel-plated.

ATC Chain

ATC (Automatic Tool Changers) chain is widely employed in Machining Centers because of its economy, efficiency and functional versatility.

Advantages of ATC Chain

1 A high degree of layout freedom

The high degree of layout freedom possible with chain type ATC allows for efficient use of space.

2 Space saving

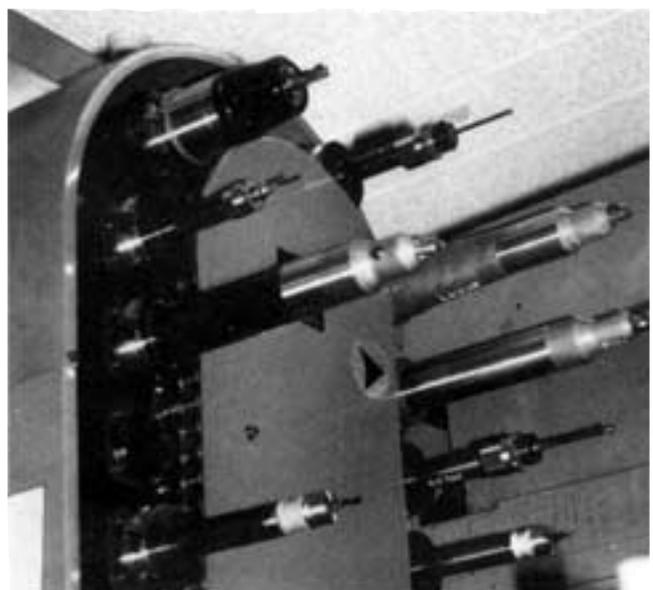
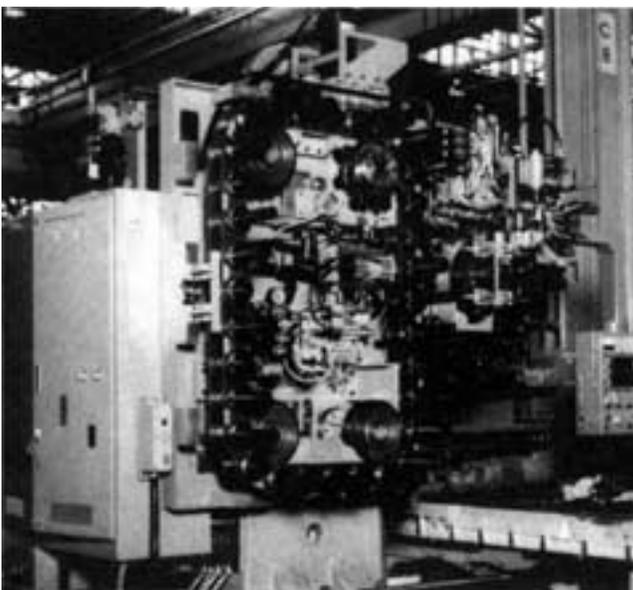
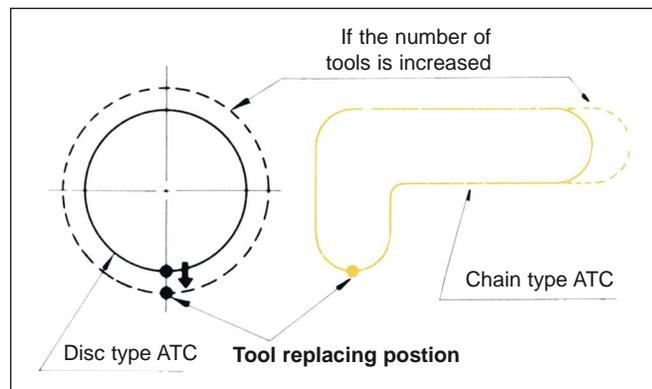
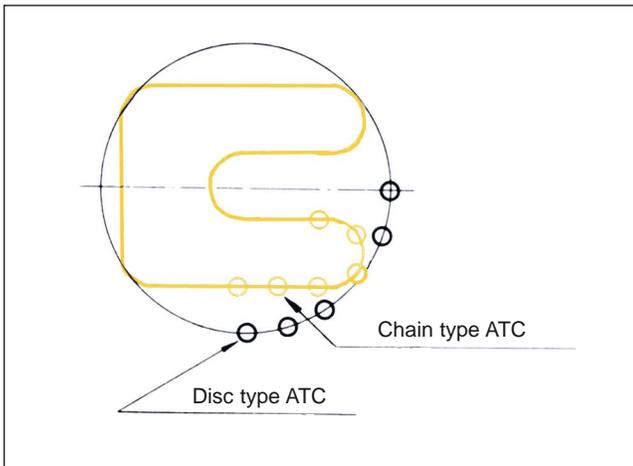
Chain type ATC can handle up to 50% more tools than disc types in the same space.

3 Economical and efficient

As more tools can be contained in the chain type than in the disc type, chain type ATC can be made lighter and has higher performance.

4 Easy standardization of design

Simply by lengthening the chain, the number of tools can be increased, but unlike the disc type this does not change the tool replacing position. This versatility lets you standardize on chain.



HP-T type

The HP-T series is the hollow pin type chain complete with tool holder. Since the chain can bend backward, freedom of layout is exceptional, and a large number of tools can be held in a small space. Tools are held on the pitch line of the chain providing extra stability.

Hollow pin type chain is also available upon request, and can be supplied with plastic pots.

HP-T and HP type

HP-T



SK type

The stay pin series (SK02, SK04) resists lateral loads on the chain, and the side roller series (SK03, SK04) prevents tools from tilting and facilitates their positioning. The chain can be supplied fitted with plastic pots.

SK01 (Standard)



SK02 (with stay pin)



SK03 (with side roller)



SK04 (with stay pin and side roller)



SK-W type

The SK-W series is a wider version of the SK type, and is suitable for long and heavy tools. The chain can be supplied with plastic pots.

SK1W-SK4W (wide type)



SK1W



SK2W



SK3W



SK4W

Availability

Chain type	Tool pitch								
	3	3.543	3.75	3.937	4.5	5	5.118	5.25	5.512
HP-T		○		○			○		○
SK type	SK01		○		○			○	
	SK02			○		○		○	
	SK03			○		○		○	
	SK04			○		○		○	
SK-W type	SK1W				○			○	
	SK2W	○			○	○		○	
	SK3W				○			○	
	SK4W	○			○	○		○	
HP		○		○			○		○
Taper Shank No.	40			50					

○ : Available

Note: Shank No. 45 and 60 are also available upon request. Consult Tsubaki.

HP-T Type

ATC CHAIN HP-T TYPE WITH TOOL HOLDER

HP-T type ATC chain is based on the HP type with steel tool holder. The inner diameter of the pin is tapered and a retaining function is installed on the pin.

Economical: Additional installation of the tool holder is not necessary.

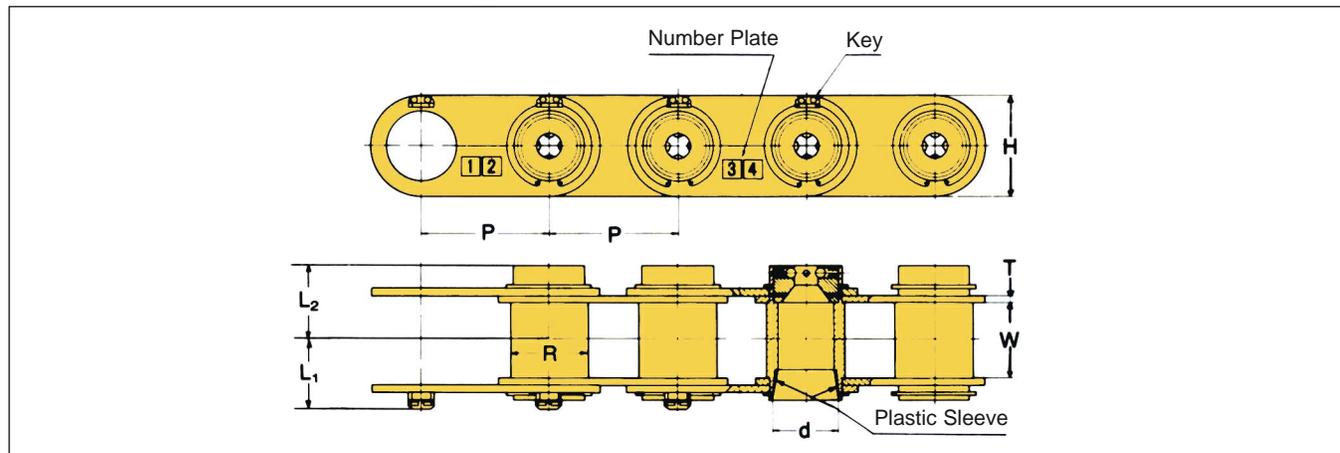
Accurate holding: As the tool holder is combined with the chain, backlash is reduced.

Compactness: Pin outer diameter and link plate width are smaller than those of HP type.

1) Tsubaki standardized ATC chain is designed with pull stud, key, number plate and plastic sleeve.

*An engineering plastic sleeve is fitted to prevent contact with the metal taper parts and protect the shank from being scratched.

2) Attachment chains other than the listed ATC chain line-up are also available to satisfy your special requirements.



TSUBAKI Chain Type	Shank No.	P	R	W	T	H	d	L ₁			L ₂		Chain Weight lbs./pot	Extracting Force lbs.
								MAS	ISO (A)	ANSI CAT	MAS	ISO (A)		
HP-T	40	3.543	2.362	2.362	0.157	3.288	1.750	1.722	1.693	1.693	2.073	2.244	1.811	4.20
		3.937												4.40
	50	5.118	3.228	3.228	0.248	4.252	2.750	2.427	2.421	2.569	3.242	3.051	2.628	8.40
		5.512												8.60
		6.299												9.00

Note: 1. If the extracting force required is large, please consult Tsubaki.
 2. Chain weight less pot shows for MAS standard.
 3. Chain pitches different from those above are also available.
 4. The minimum chain pitch that can be manufactured is:
 Shank No. 40: P = 3.543 inch
 Shank No. 50: P = 4.921 inch

5. Refer to page B-85 for key and number plate dimensions.
 6. Shanks No. 45 and 60 are also available upon request.

Safety device for HP-T type chain (optional)

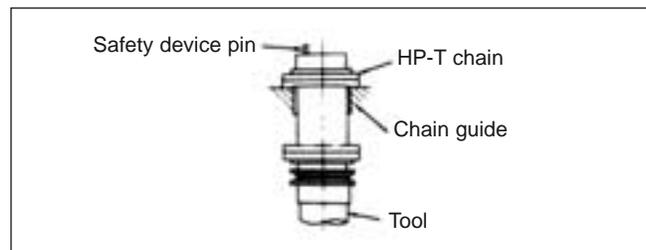
In the case of horizontal drive HP-T type chain (with tools vertically suspended), we can provide the tool holder with an optional safety device.

The safety device prevents the tool from falling out of the tool holder during operation.

Note:

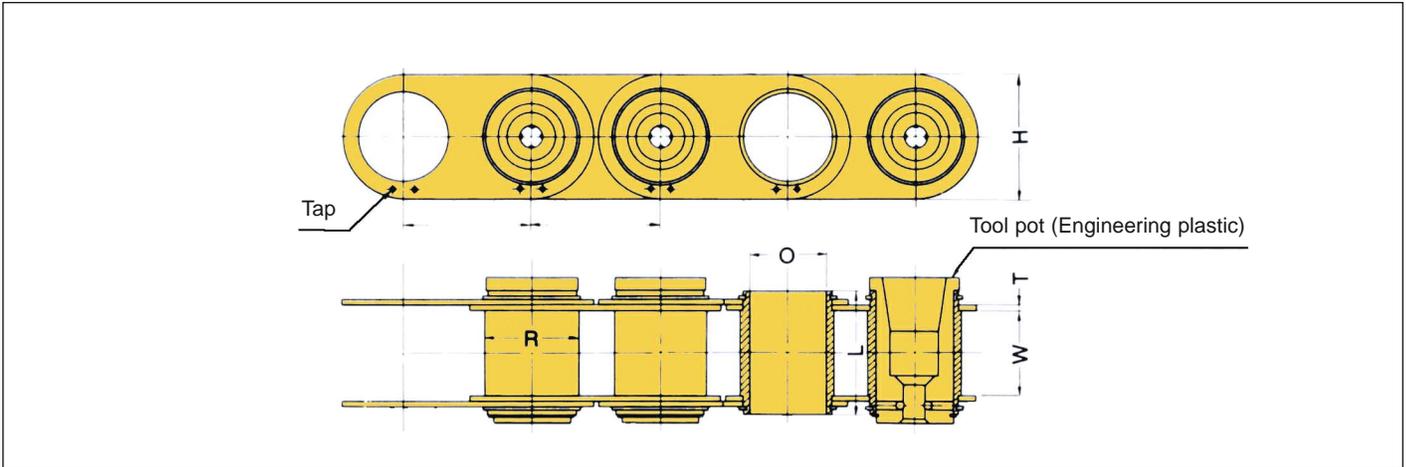
The safety device is not available for Shank No. 40. Instead, we suggest using a higher tool extraction force.

Pushing the safety device pin by the cylinder easily releases the tool from the retention knob by spring force.



HP Type

Hollow pin type chain is available upon request, and can be supplied fitted with plastic pots.

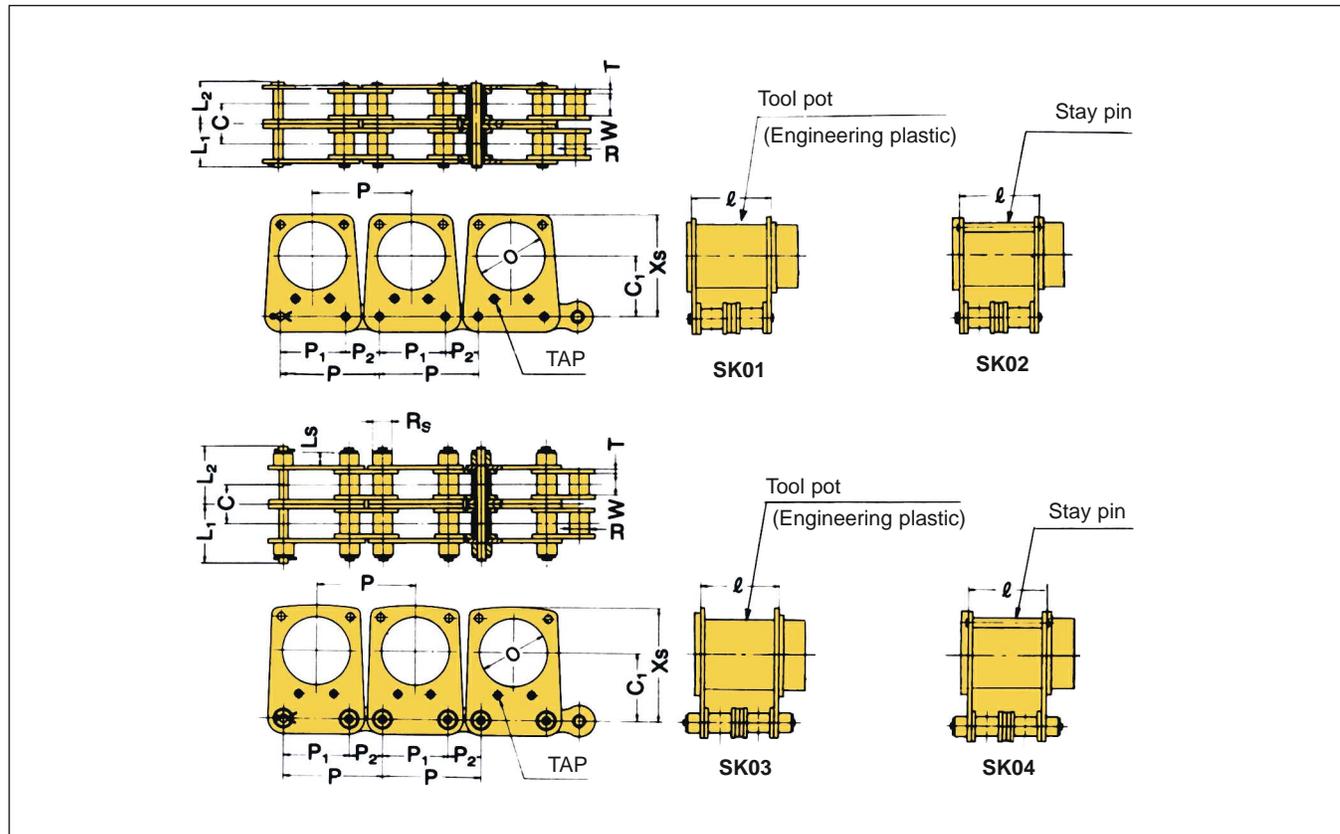


TSUBAKI										
Chain Type	Shank No.	P	O	L	H	W	R	T	Chain Weight lbs./pot	Additional Weight/Plastic Tool Pot lbs./pot
HP	40	3.543	2.165	3.406	3.465	2.362	2.677	0.157	2.6	0.6
		3.937							2.9	
	50	5.118	3.071	4.823	4.724	3.268	3.622	0.248	6.8	1.8
		5.512							7.3	
		6.299							7.7	

Note: The dimension of HP type is different from HP-T type chain. Refer to page B-85 for the key and number plate dimensions. Shanks No. 45 and 60 are also available upon request.

SK Type

SK Type Tool Holder chain utilizes roller chain components and specially configured side plates.
SK Type ATC chain works with standard sprockets.

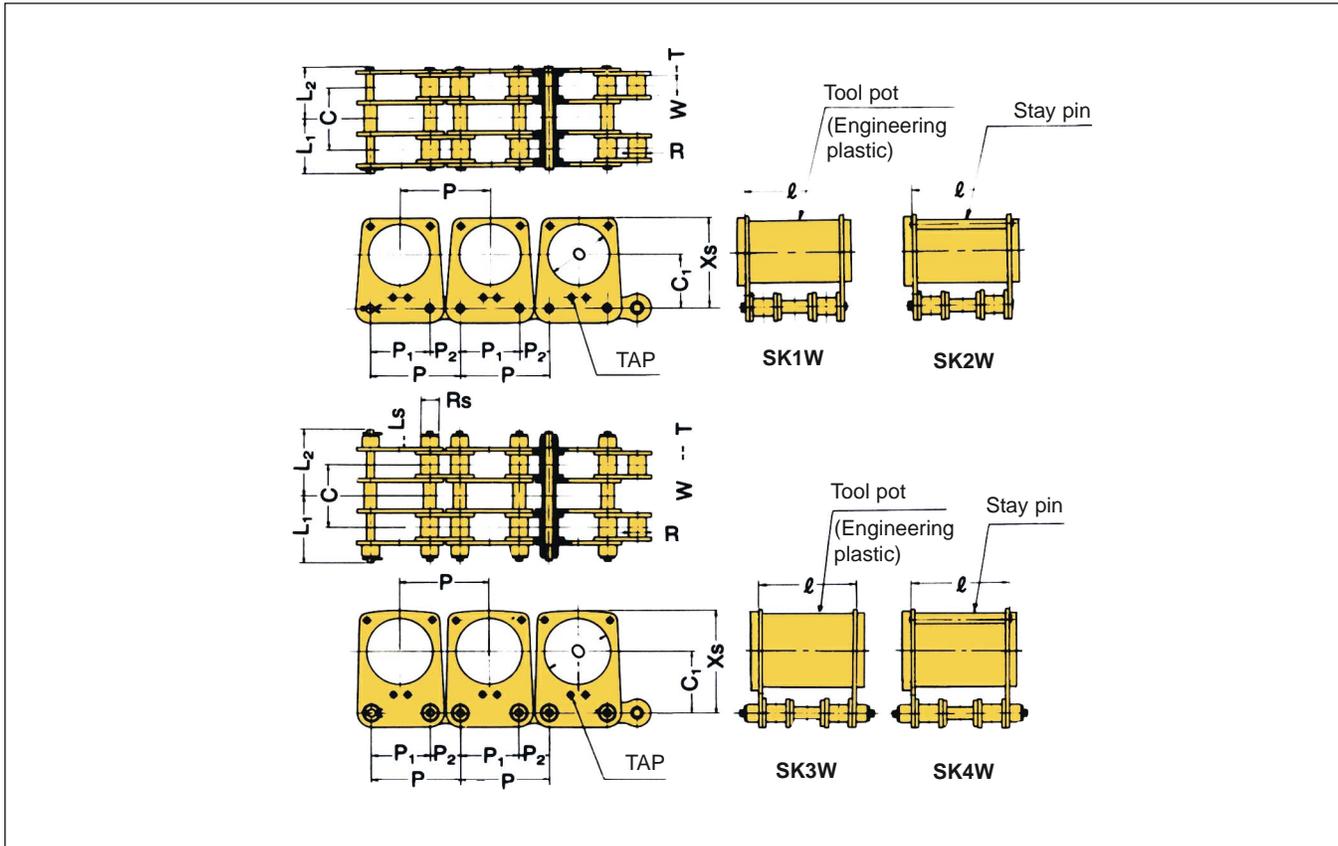


TSUBAKI Chain Type	Shank No.	P	P ₁	P ₂	O	C ₁	l	X _s	L ₁	L ₂	C	W	R	T	R _s	L _s	Chain Weight lbs./pot
SK01	40	3.75	2.50	1.25	2.165	2.087	2.819	3.622	1.606	1.543	1.409	0.75	0.75	0.157	-	-	2.20
	50	4.50	3.00	1.50	3.071	2.689	3.575	4.539	2.031	1.925	1.787	1.00	0.875	0.187	-	-	3.50
		5.25	3.50	1.75		3.150	3.850	5.236	2.110	2.213	1.925		1.00	0.220	-	-	5.50
SK02	40	3.75	2.50	1.25	2.165	2.087	2.819	3.622	1.606	1.543	1.409	0.75	0.75	0.157	-	-	2.20
	50	4.50	3.00	1.50	3.071	2.689	3.575	4.539	2.031	1.925	1.787	1.00	0.275	0.189	-	-	3.70
		5.25	3.50	1.75		3.150	3.850	5.236	2.110	2.213	1.925		1.00	0.220	-	-	5.70
SK03	40	3.75	2.50	1.25	2.165	2.087	2.817	3.622	2.096	1.974	1.409	0.75	0.75	0.157	0.75	0.370	2.20
	50	4.50	3.00	1.50	3.071	3.150	3.575	5.217	2.563	2.563	1.787	1.00	0.875	0.187	0.875	0.496	3.70
		5.25	3.50	1.75			3.850	5.236	2.697	2.697	1.925		1.00	0.270			5.70
SK04	40	3.75	2.50	1.25	2.165	2.087	2.819	3.622	2.096	1.974	1.409	0.75	0.75	0.157	0.75	0.370	2.40
	50	4.50	3.00	1.50	3.071	3.150	3.575	3.217	2.563	2.563	1.787	1.00	0.875	0.189	0.875	0.496	4.00
		5.25	3.50	1.75			3.850	5.236	2.697	2.697	1.925		1.00	0.220			3.70

Note: Refer to page B-85 for the key and number plate dimensions.
Shanks No. 45 and 60 are available upon request.

SK-W Type

SK-W type ATC chain is a wider version of the SK type and is designed for heavier and longer tools. The added width provides increased stability.

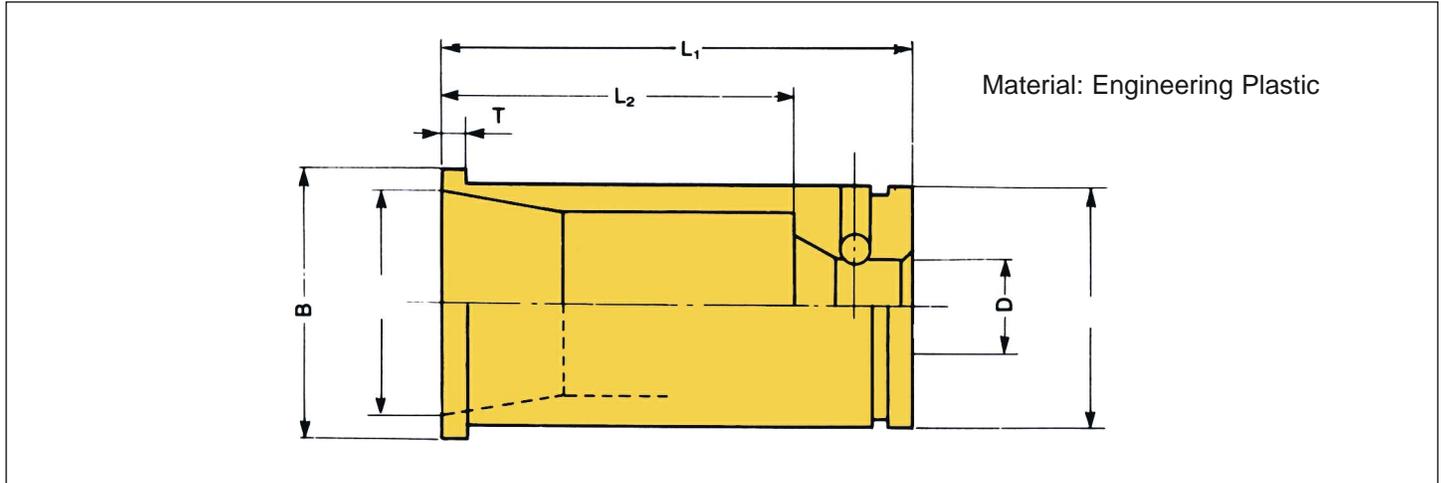


TSUBAKI																	
Chain Type	Shank No.	P	P ₁	P ₂	O	C ₁	l	X _s	L ₁	L ₂	C	W	R	T	R _s	L _s	Chain Weight lbs./pot
SK1W	50	4.50	3.00	1.50	3.071	2.689	4.823	4.539	2.661	2.551	3.035	1.00	0.875	0.189	-	-	3.50
		5.25	3.50	1.75		3.150		5.236	2.697	2.598	2.898		1.00	0.189	-	-	5.70
SK2W	40	3.00	2.00	1.00	2.165	2.087	3.248	3.622	1.807	1.744	2.074	0.625	0.625	0.126	-	-	1.50
		4.50	3.00	1.50		2.689		4.539	2.661	2.551	3.035	1.00	0.875	0.189	-	-	3.70
	50	5.00	2.50	2.50	3.071	3.150	4.823	5.366	7.606	2.555	3.283	0.75	0.75	0.189	-	-	2.60
SK3W	50	4.50	3.00	1.50	3.071	3.150	4.823	5.217	3.185	3.185	3.035	1.00	0.875	0.189	0.875	0.496	4.00
		5.25	3.50	1.75		3.150		5.236			2.898		1.00	0.220			5.90
	40	3.00	2.00	1.00	2.165	2.087	3.284	3.622	2.276	2.276	2.094	0.625	0.625	0.126	0.75	0.370	1.80
SK4W	50	4.50	3.00	1.50	3.071	3.150	4.823	5.217	3.185	3.185	3.035	1.00	0.875	0.189	0.875	0.496	4.20
		5.00	2.50	2.50				5.366			3.283		0.75	0.75			0.189
	50	5.75	3.50	1.75	5.236	2.890	1.00	1.00	0.220	5.90							

Note: Refer to page B-85 for the key and number plate dimensions.
Shanks No. 45 and 60 are available upon request. Consult Tsubaki.

ATC Chain Options

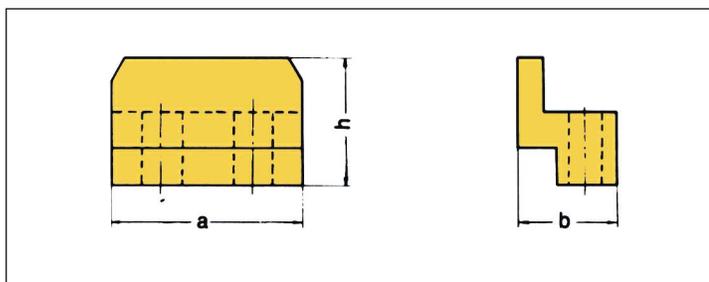
Tool Pot (for SK, SK-W, HP types)



TSUBAKI Shank No.	Retention Knob	A	B	C	D	L ₁	L ₂	T	Weight lbs.	Extracting Force lbs.
40	MAS ISO, ANSI, CAT	1.750	2.559	2.165	$\frac{0.614}{0.768}$	4.016	$\frac{2.717}{2.835}$	0.394	0.6	33-55
50	MAS ISO, ANSI, CAT	2.750	3.307	3.071	$\frac{0.929}{1.165}$	6.102	$\frac{4.488}{4.252}$	0.252	1.5 1.8	55-77

Note: If the extracting force required exceeds those listed, consult Tsubaki. Shanks No. 45 and 60 are available.

Key (for all types)

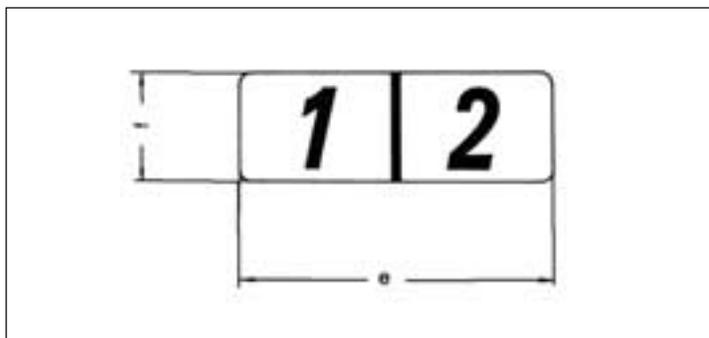


Shank No.	a	b	h
40	0.606	0.472	0.520
50	0.965	0.520	0.669

Note: Shanks No. 45 and 60 are available.

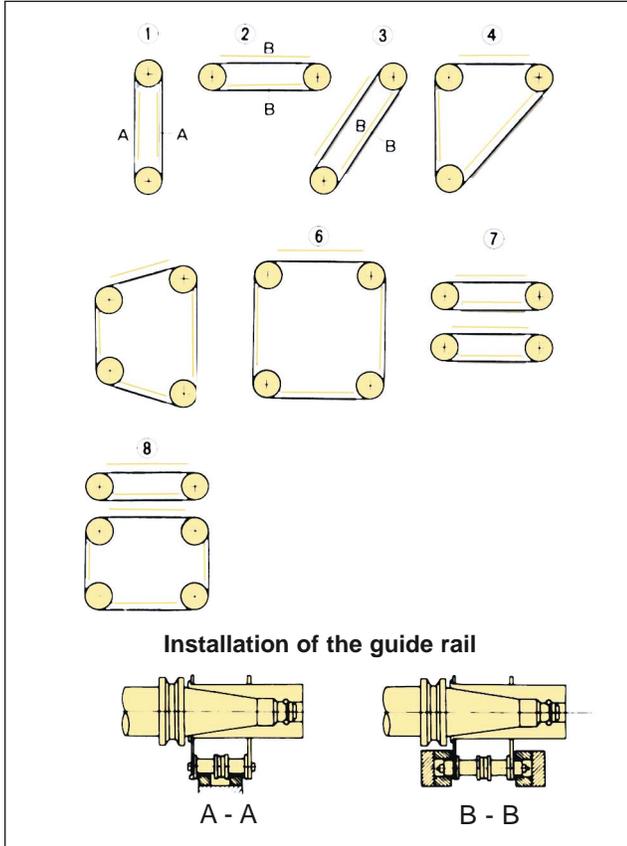
Shank No.	e	f
40	1.968	0.591
50	2.205	0.787

Number plate (for all types)

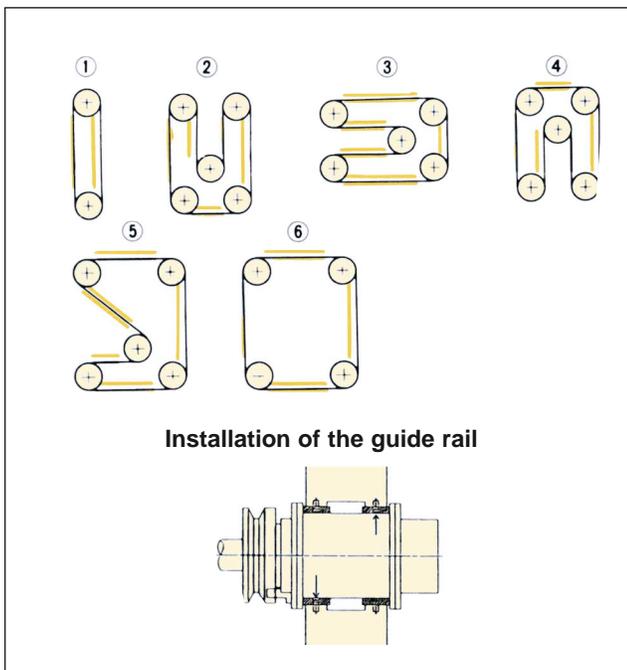


MATERIAL: ALUMINUM
Note: Shanks No. 45 and 60 are the same size as shank No. 50.

1. Guide Applications

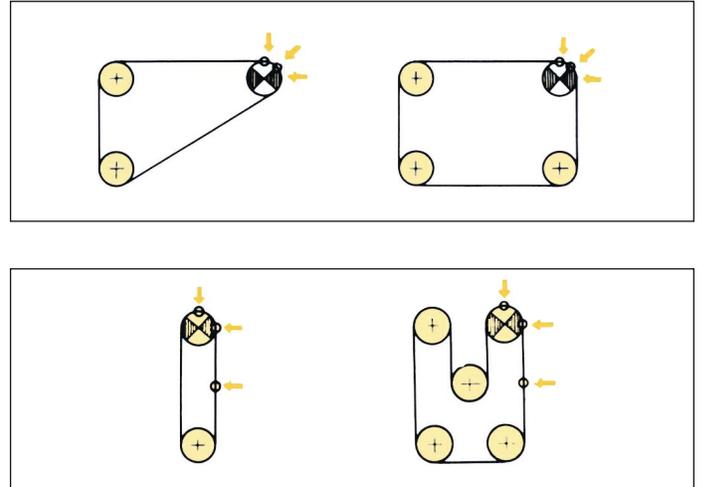


n HP-T Chains



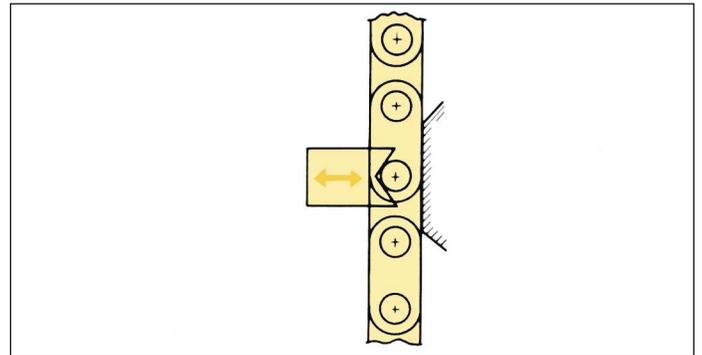
2. Positions for Picking Up Tools

The best position to pick up a tool is at the drive sprocket, especially in the case of SK type ATC chain.



3. Picking Up Tools with the Clamping Method

Clamping equipment is necessary for HP-T and HP type ATC chain.



4. Initial Chain Tension

Please apply initial tension up to 1/2 of the working load of the ATC chain and adjust the chain tension to avoid chain vibration.

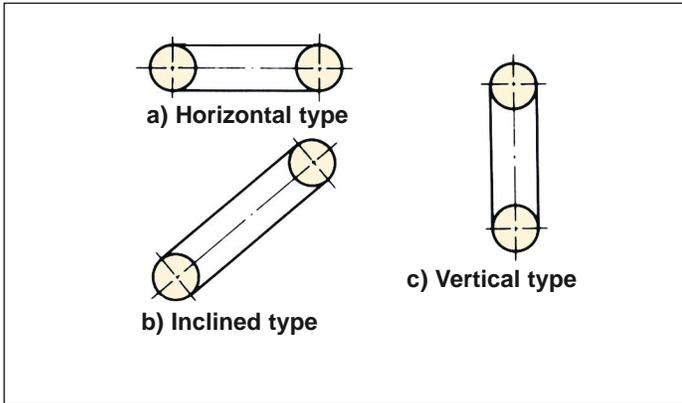
5. Chain Tension and Driving Power

1) Please refer to table below:

Chain layout	Chain tension	Driving power
a) Horizontal	Low	High
b) Inclined	Medium	Medium
c) Vertical	High	Low

2) Tool layout and driving power:

Layout should be designed for optimal tool balance to reduce the driving power required and the chain tension.

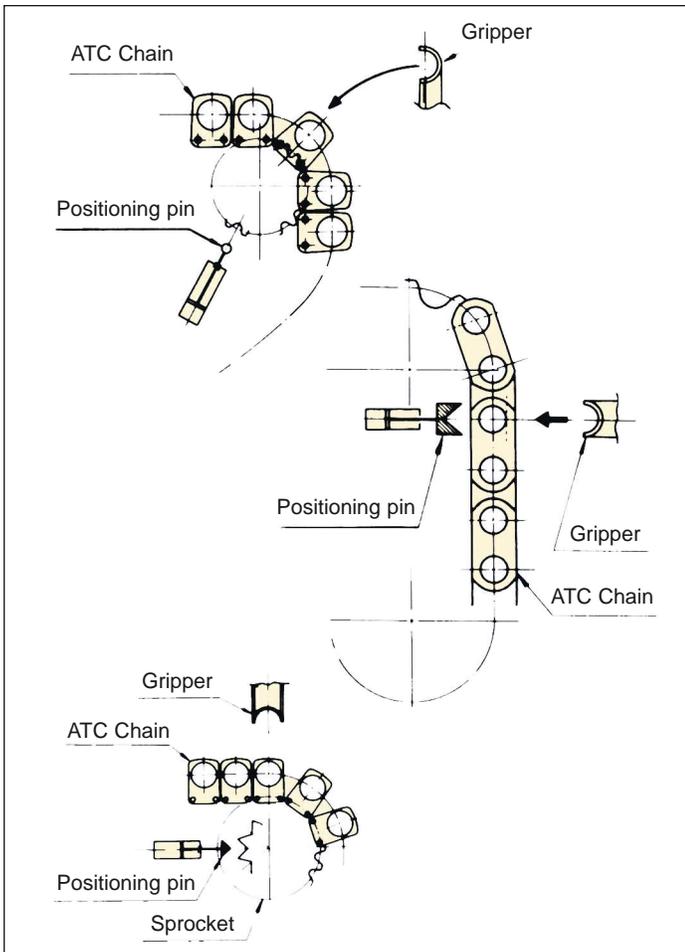


6. Tool Weight and Chain Type

Please check:

- 1) Thrust load when picking up or setting tools into the pot.
- 2) Eccentric load due to overhang of the tools.

7. Tool Gripping Method



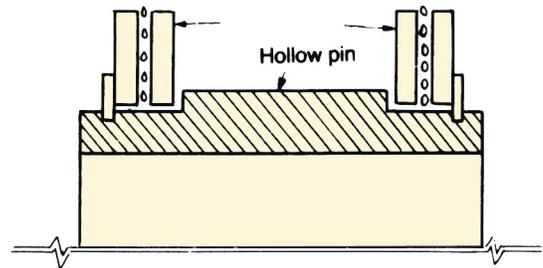
8. ATC Chain Lubrication

Because precision is essential, lubrication is very important for ATC chain. Proper lubrication forms an oil film which reduces chain wear, chain friction, and noise. The chain lubrication should be maintained as follows:

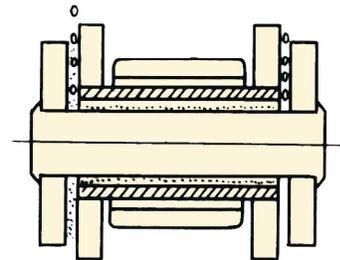
1) Lubrication Points

Lubrication should be applied and maintained between the chain link plates and the bearing area. Apply the lubricant manually or automatically using a drip lubrication system.

1. HP-T type ATC chain



2. SK type ATC chain



2) Lubricant Selection

General purpose oil is acceptable for lubrication, but the higher the quality the better. If the viscosity of the lubricant is too low, it will leak away and have to be replaced often and if the viscosity is too high, it will not reach the critical parts, and the lubrication will not be effective.

The following lubricants are suggested:

Lubrication oil: Mobile SAE #30 ~ 40 machine oil or equivalent.

Frequency and amount of lubrication:

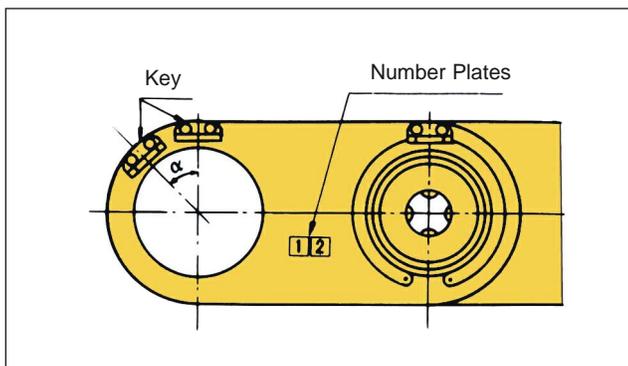
Ensure that the bearing portion is always moist with lubricant. The amount of lubricant should be enough to ensure that lubricant reaches all critical points. If the tools are heavily used or the number of bending cycles of the chain is very high, increase the frequency of lubrication.

9. Specification

We will manufacture ATC chain in exact accordance with your specifications. When making an inquiry please supply as much information as is possible. We need the following information to quote your ATC chain.

1) ATC chain

1. Tool shank size
Tool shank number: #25, 30, 35, 40, 45, 50, 60
Standard code: MAS, ANSI (CAT), ISO (DIN)
If a tool other than the above is used, please send us a drawing of the tool.
2. Retention knob
Standard Code: MAS, ISO-A, ISO-B, ANSI
If a tool other than the above is used, please send us a drawing of the retention knob.
3. Number of tools to be used with the chain: (pcs.)
4. Maximum weight of the tool: (lbs.)
5. Key installation angle (determined by the tool keyway)
Please specify the keyway position or angle α of the tool as shown below.



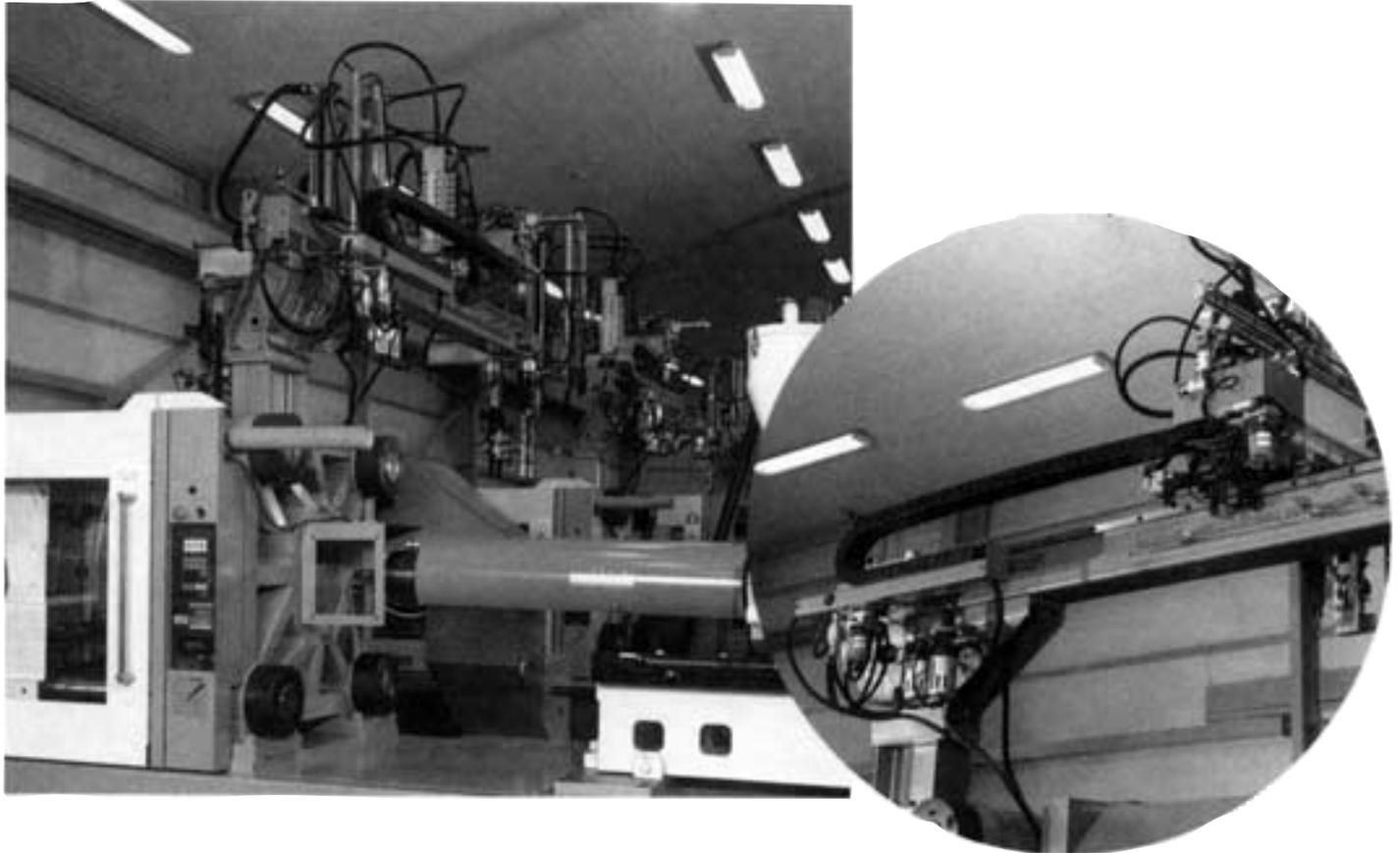
6. Number plate position
Indicate the position and direction of the number plates and the order of numbers required.

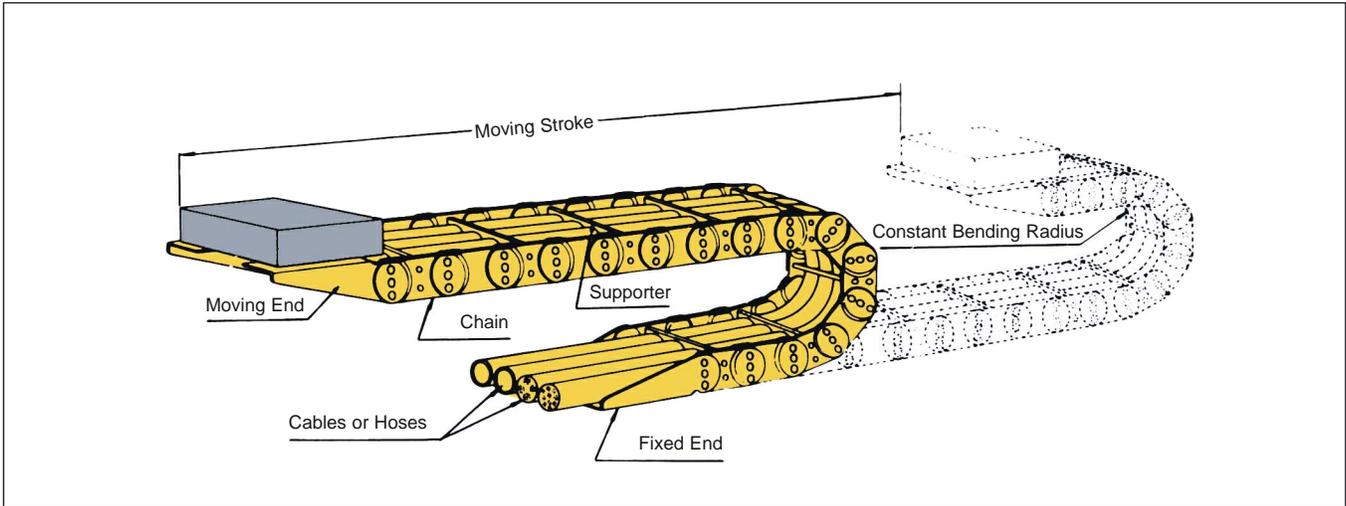
2) Sprocket

1. Type of ATC chain to be used such as HP-T, SK, SKW, HP, Special type.
2. Number of teeth
In the case of SK or SKW types, please indicate clearly the actual number of teeth or the working number of teeth.
3. Please supply us with information regarding the shaft bore dimensions, boss shape etc., and all other information necessary for manufacturing.
4. Induction hardened teeth
We suggest using sprockets with hardened teeth.

Cableveyor

Tsubaki Cableveyor provides protection for power supply cables and hoses supporting them for smoother, controlled movement on machines of all types. Cableveyor is used in a wide variety of applications, including industrial robots, tooling machines and machines for food, woodworking, steel and electronic industries. Safe, reliable and durable, Cableveyor enables cables or hoses to be bent without breakage, ripping, twisting, or accidental power stoppage.





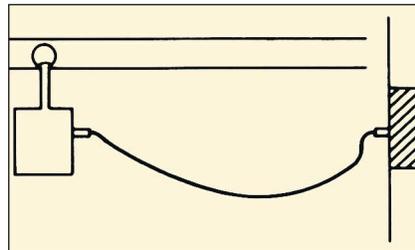
A superior support installation for cables and hoses:

Tsubaki Cableveyor is superior when compared with other systems such as the curtain, winder or wiredrum. Unlike conventional systems, the smooth running Cableveyor allows for greater efficiency and increases the working life of cables and hoses.

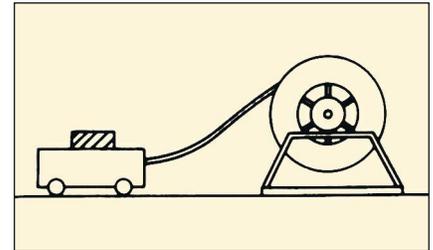
Why Tsubaki Cableveyor outperforms conventional types:

- No damage will occur to the cables or hoses.
- Cables and hoses move in a circular motion and are protected by a supporter.
- The hoses and cables move smoothly in a circular motion. As a result, frequent movement will have no effect on oil pressure, nor will there be any breaks in the electrical current.
- Our Cableveyor conserves space and has the ability to simultaneously manage the supply of electric power, oil pressure and air, for example.

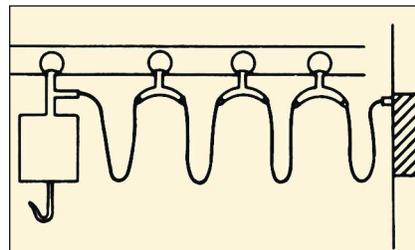
Conventional Cable Retrieval Systems



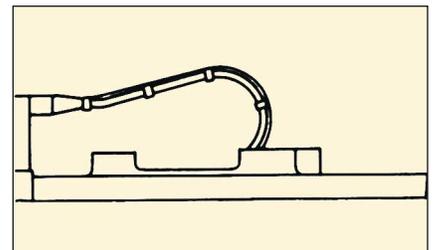
Unsupported Style



Roll-in Style



Curtain Style



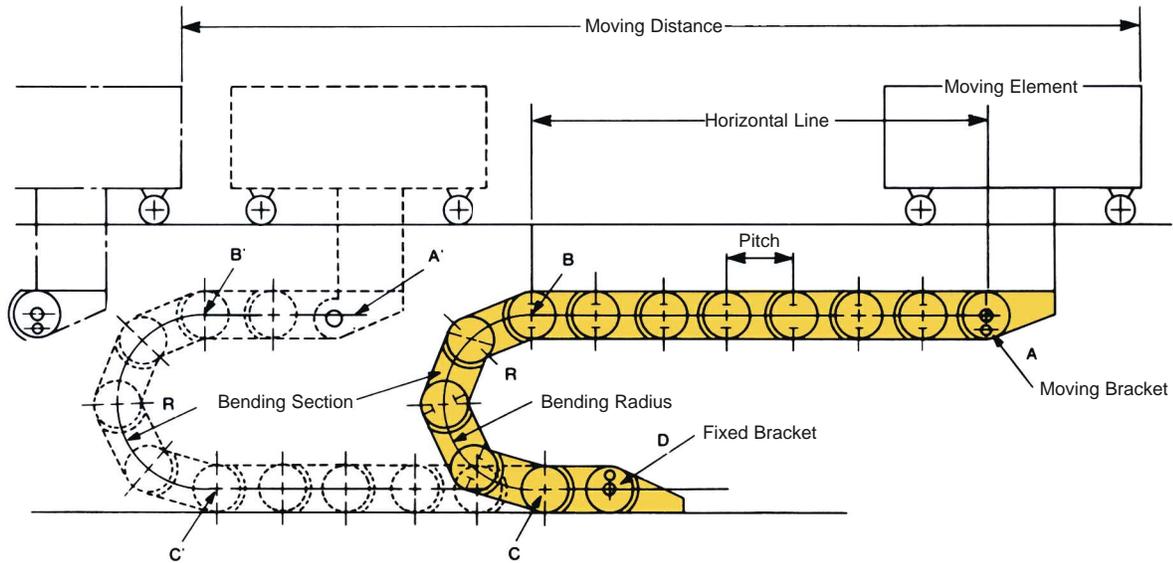
Winder Style

Driving Mechanism

Cableveyor is installed as shown in the picture below. Within the moving distance, it is able to move freely. The element to be moved is attached to one end of the Cableveyor (A) and the other end to where the cables or hoses are inserted (D).

A horizontal axis is always maintained between (A) and (B). The bending radius of the Cableveyor remains constant even when in motion. The diagram below shows this as the Cableveyor moves from A to A' while bending evenly (R).

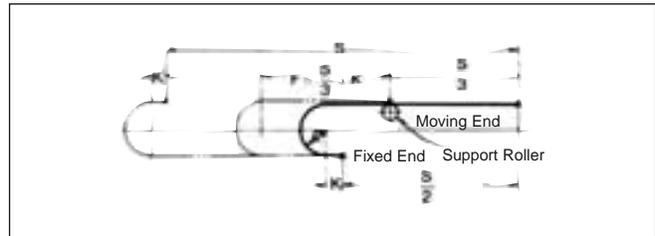
A constant bending radius with straight, horizontal movement provides efficiency and smooth operation.



MOVING DISTANCE AND THE SUPPORT ROLLER

The straight distance normally traveled by the Cableveyor is referred to as the "freespan". The length of the freespan is determined by the weight of the cables or hoses. If half the distance the machine needs to move is over the freespan capacity, supporting equipment such as a support roller may be used to increase the length of travel. The support roller enables the freespan distance to be extended beyond the original distance.

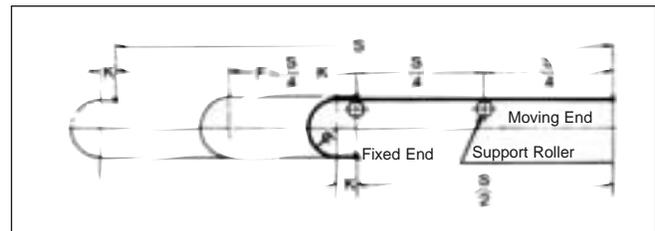
With one support roller, the allowable freespan can be increased up to three times the moving distance.



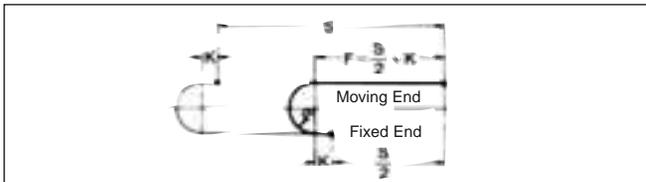
INSTALLATION

- S: Moving stroke
- K: Margin length
- F: Freespan

With two support rollers, the allowable freespan can be increased up to four times the moving distance.



Without support roller



Note: Use of three support rollers or more is not economical. For support roller dimensions please see pages B-94 and B-95.

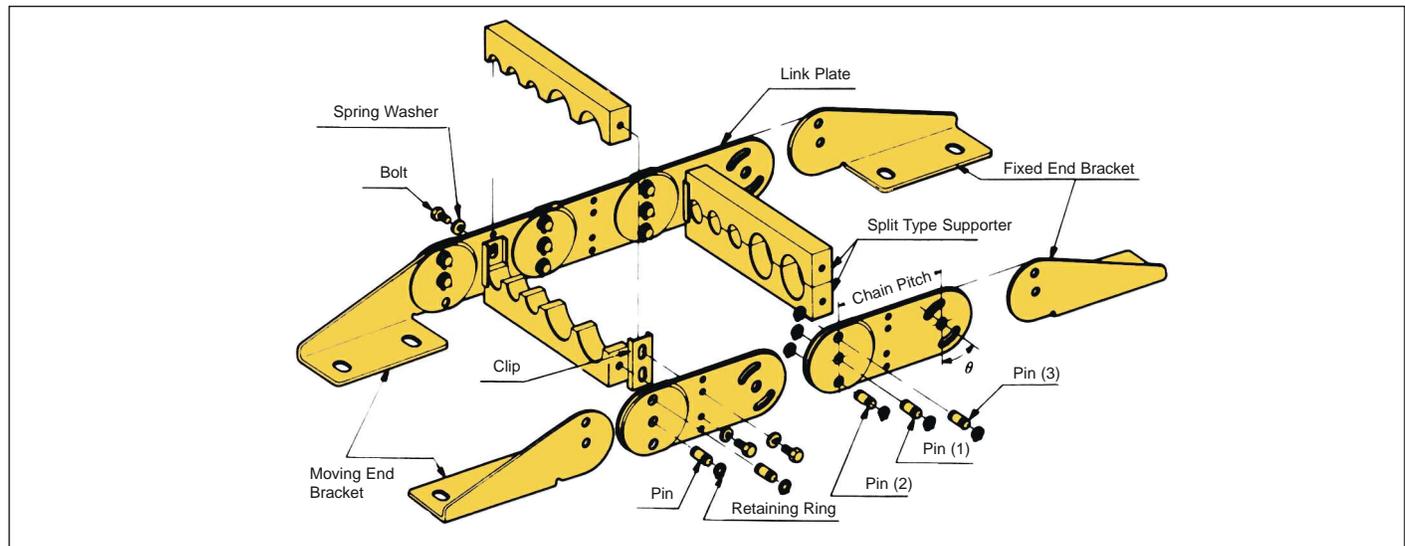
		TK TYPE				H TYPE
Chain No.	Size	TK070	TK095	TK130	TK180	H250
	Bending Radius (R)	2.95	4.92	7.87	9.84	13.78
		3.54	5.71	9.84	11.81	17.72
		4.92	7.87	11.81	15.75	23.62
		5.71	9.84	15.75	19.69	29.53
		11.81		23.62	27.56	
Chain Pitch	(inch)	2.76	3.74	5.12	7.09	9.84
Maximum Distance of The Freespan	(ft.)	11.48	14.76	19.68	26.25	37.73
Maximum Moving Stroke (ft.)	No Support Rollers	21.98	28.54	38.06	51.51	72.18
	Support Roller In One Position	33.14	42.65	57.09	77.10	108.27
	Support Roller In Two Positions	43.96	57.09	76.11	103.02	144.36
Maximum Cable/Hose (Diameter)	(inch)	1.06	1.81	2.36	3.15	4.33
Maximum Cable/Hose Weight	(lbs./ft.)	33.60	40.32	47.04	53.76	67.20
Maximum Chain Speed	(ft./min.)	196.85				
Chain Weight	(lbs./ft.)	4.03	5.38	11.42	14.11	26.88
Operating Temperature	(°F)	-12° ~ 302°				
Operating Conditions	Indoor					
Material	Chain	Steel (with Zinc)				
	Supporter	Aluminum				
	Brackets	Steel (with Zinc)				

TK Cableveyor

CONSTRUCTION AND FEATURES

TK Cableveyor is constructed of steel chain with aluminum supporters to give high strength and durability for diverse applications. The holes of the supporters are made to fit the cables or hoses precisely. These cableveyors are very versatile and can fit most industrial machines.

TK Type



TK TYPE OVAL CABLEVEYOR

- TK-type Cableveyor has been designed to protect workers from accidents by utilizing specially shaped link plates. This link plate design has solved the problems that may occur due to crevices between link plates.

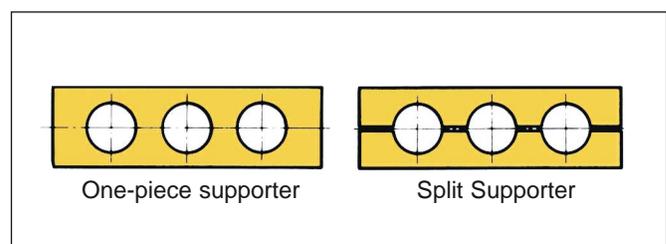


- All link plates are offset type. The pins at the moving connection are through hardened by an induction heat-treatment to provide high abrasion and deformation resistance. TK-type Cableveyor is also effective against side force damage.
- Proper size holes will be made to your specifications. The holes on the stays are made to fit the diameter of the cables or hoses.
- By using the correct size holes in the stays, cables and hoses will be very steady and well protected.

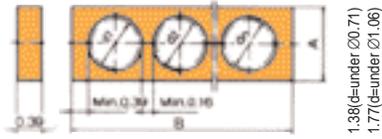


SUPPORTERS

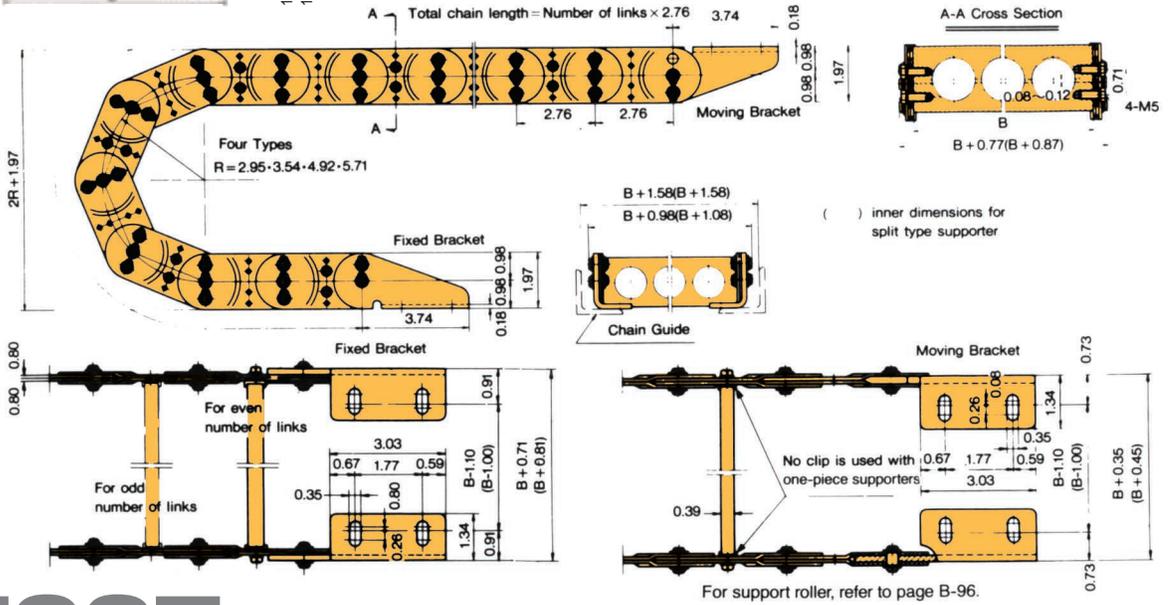
There are two types of supporters for TK type Cableveyor, a one-piece supporter and a split supporter. The split supporter is very convenient for long moving strokes, if an odd shaped attachment is used on the cables or hoses, or if a large number of cables or hoses must be installed.



TK070

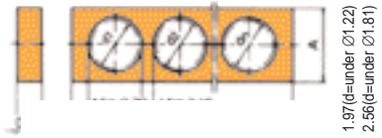


Cable/hose Maximum Outer Diameter	Dimension A	Dimension B									
		2.36	3.15	3.94	4.92	5.91	7.87	9.84	11.81	13.78	
Ø0.71	1.38	○	○	○	○	○	○	○	○	○	○
Ø1.06	1.77	○	○	○	○	○	○	○	○	○	○

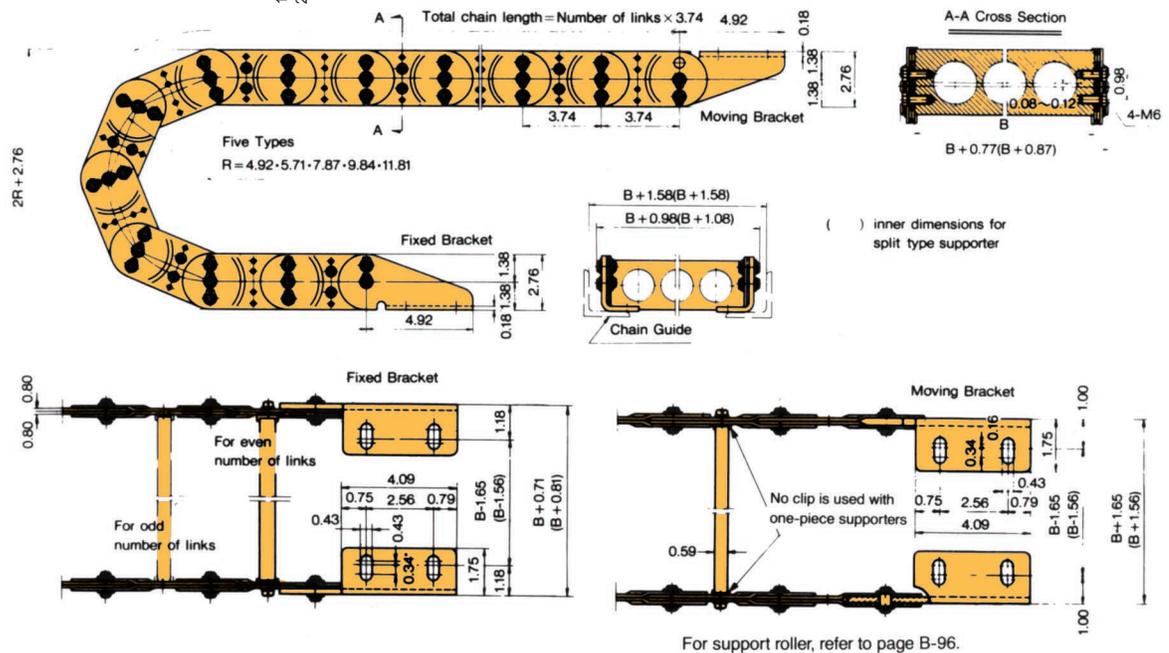


TK095

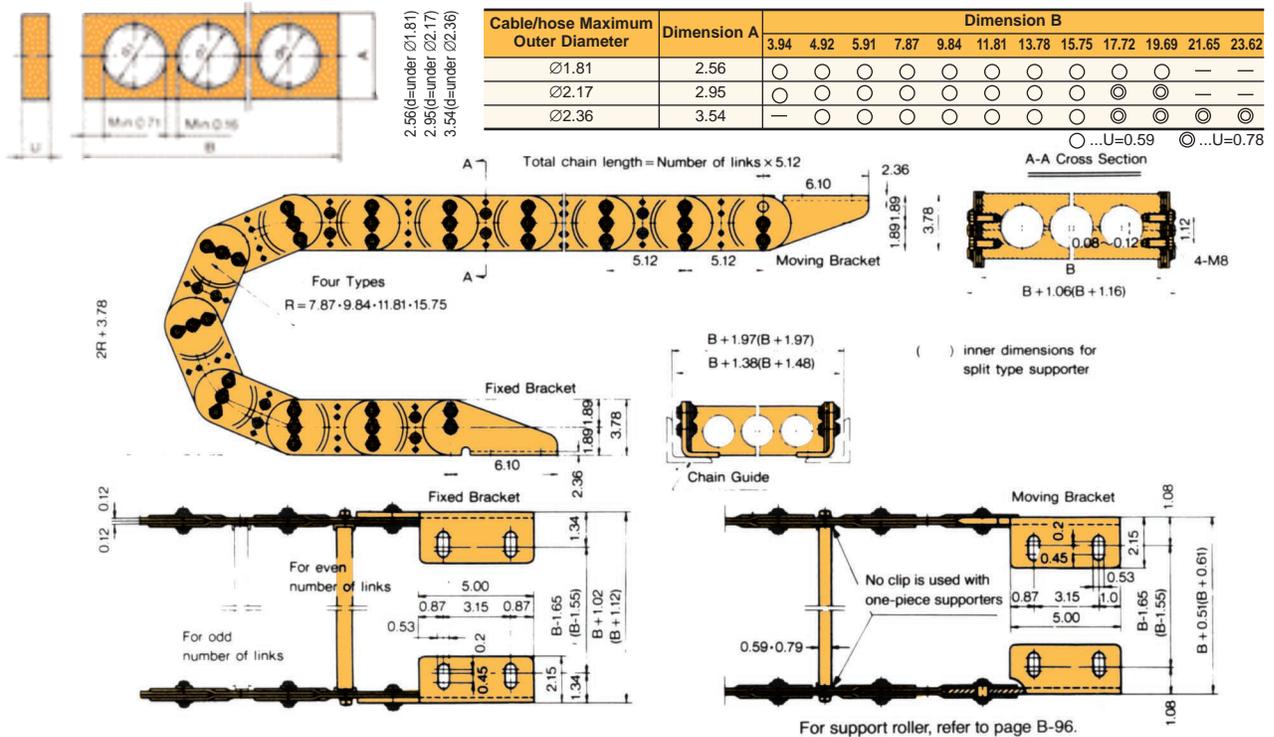
DIMENSIONS FOR STANDARD SUPPORTER



Cable/hose Maximum Outer Diameter	Dimension A	Dimension B										
		3.15	3.94	4.92	5.91	7.87	9.84	11.81	13.78	15.75	17.72	19.67
Ø1.22	1.97	○	○	○	○	○	○	○	○	○	○	○
Ø1.81	2.56	○	○	○	○	○	○	○	○	○	○	○

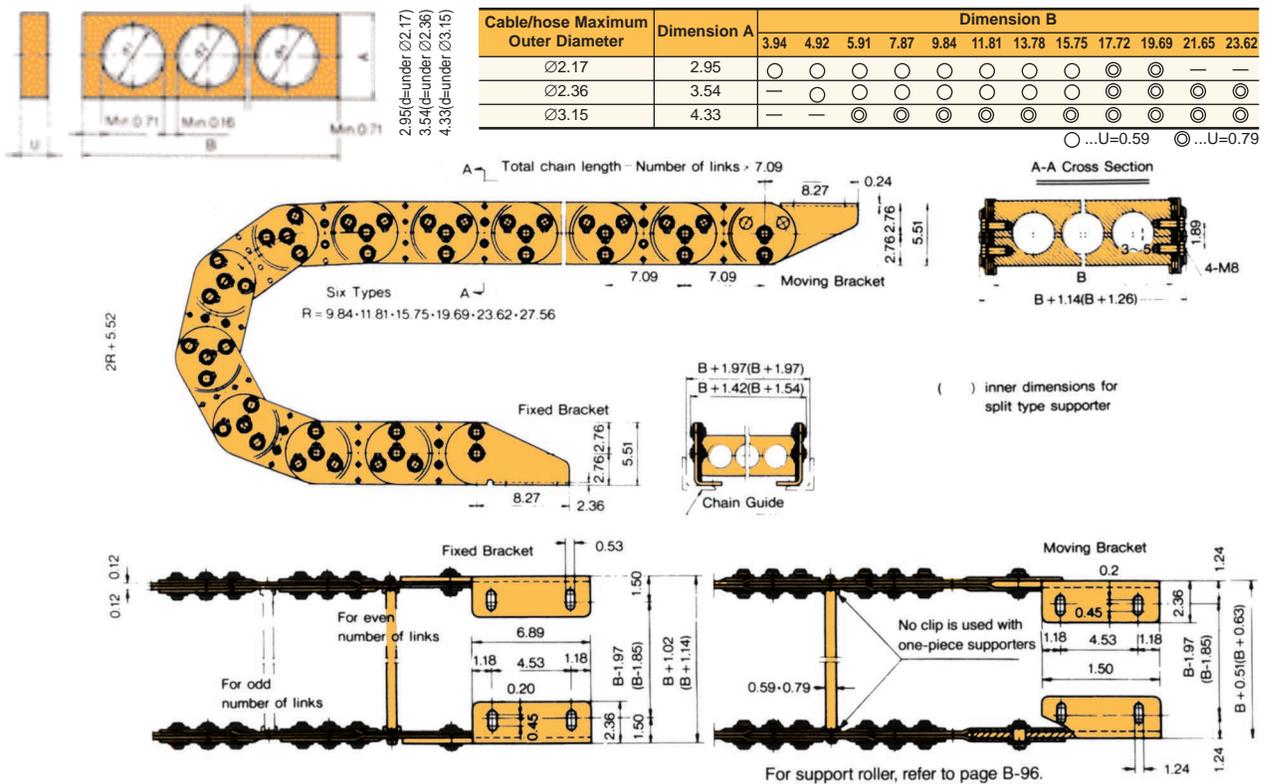


TKI30

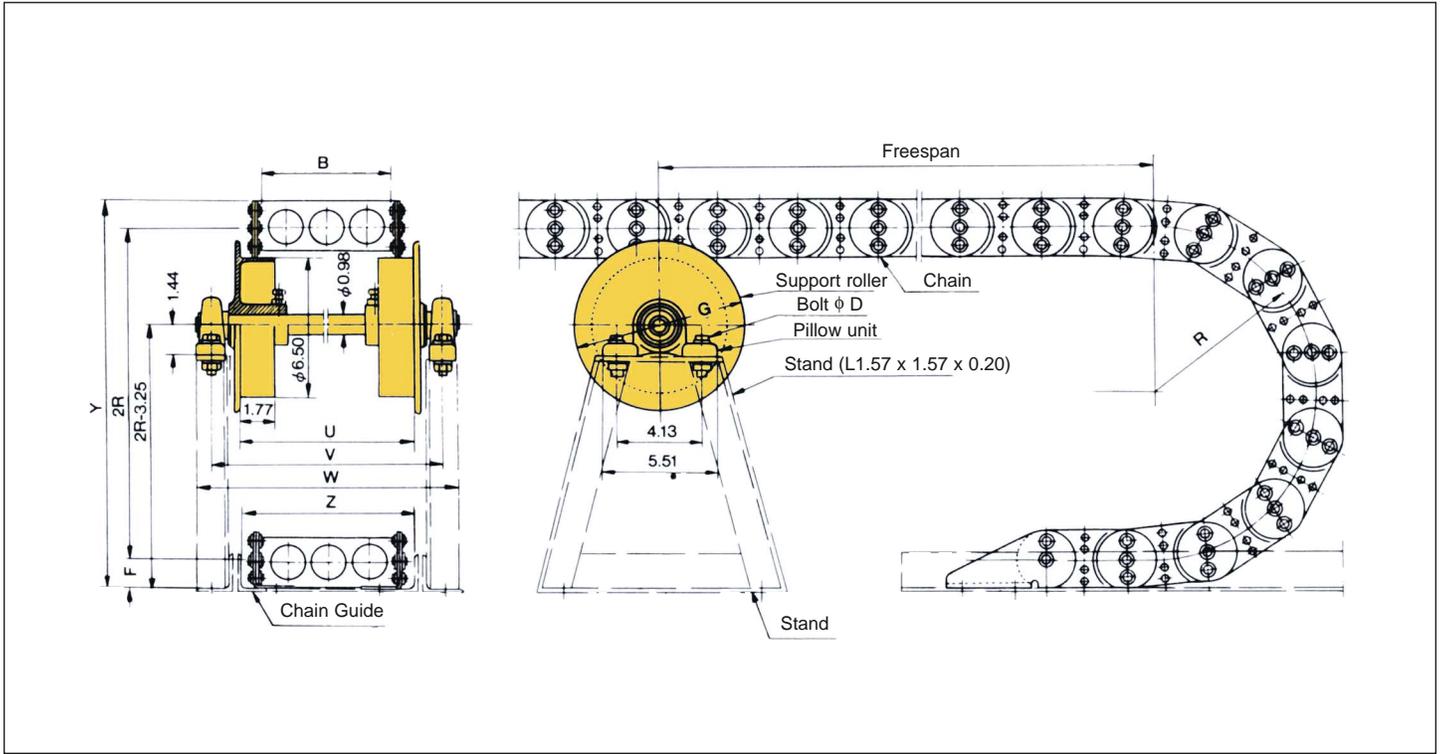


TKI80

DIMENSIONS FOR STANDARD SUPPORTER



TK TYPE SUPPORT ROLLER DIMENSIONS



Dimensions in inch

Appropriate Chain Size	Minimum Supporter Width B	Minimum Bending Radius R	d	G	M	N	U	V	W
TK070	3.15	4.92	0.98	8.07	5.51	4.13	B+1.77	B+4.53	B+6.02
TK095				11.22			B+2.17	B+4.92	B+6.42
TK130	3.94	7.87							
TK180	4.92	9.84							

Dimensions in inch

Appropriate Chain Size	L	F	X	Y	Z	Bolt Size D
TK070	1.77	0.98	1.44	2R+1.20	B+1.57	M0.47
TK095		1.38		2R+2.76		
TK130		1.89		2R+3.78	B+1.97	
TK180		2.76		2R+5.51		

1. Support rollers are available for TK070 with R75 and R90. Your order will be custom made.
2. The location of the stand for the Cableveyor depends on its usage. When ordering a stand, please advise us accordingly.
3. In order to determine space requirements for installation of the Cableveyor, please refer to page B-100.
4. When setting up the support roller, be careful to ensure that the roller's flanges are parallel.

Selection

STEP 1. Specifications

When selecting the correct Cableveyor, several things must be taken into consideration. The following data must be known for proper selection.

1. Application conditions.
2. Moving stroke (ft.)
3. Moving speed (ft./min.)
4. Number and external diameters of the cables/hoses to be installed.
5. Total weight of the cable/hoses. (lbs./ft.)
(In the case of hoses, the weight of the carrying element such as oil, water, etc., should be included.)
6. Allowable bending radius of cables and hoses (inch).
This is determined from the intended function.

STEP 2. Determining the moving stroke and bending radius

The tentative selection of Cableveyor and the support roller is made as follows. Determine the approximate radius with the capability graph (page B-98). This graph is based on the distance of the moving stroke and the weight of the cables and hoses.

1. Estimate the distance of the moving stroke when a support roller is not being used. If the moving stroke is too long, use a support roller. Note that in some cases, it is more efficient not to install one.
2. Determine the bending radius of the cables or hoses.

Allowable bending radius (Actual bending radius) < Standard chain bending radius (R).

Regarding the bending radius of the cables or hoses, refer to the calculations below.

- In the case of cables,
Allowable bending radius \geq external diameter X 6
- In the case of hoses,
Allowable bending radius \geq external diameter X 9

STEP 3. Adjusting the moving stroke

The length of moving stroke must be adjusted if used under the circumstances listed in the Service Factor Table below.

Length of moving stroke X service factor = adjusted moving stroke

For selection purposes, use the adjusted moving stroke length with the capability graph.

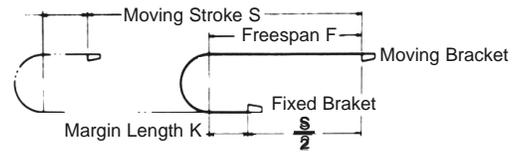
Service Factor Table

Operating Conditions	Installation suggestion	Service Factor
Frequent starting and stopping	Sometimes support rollers or guides are needed to prevent the chain from falling.	1.5
Sudden starts and stops with large vibrations	Use a large bending radius to decrease frequent vibrations caused by multiple-angle movements of the chain.	2

STEP 4. Calculation of the number of chain links

$$l = \frac{S}{2} + \pi R + 2K$$

Margin length for each chain size (K)



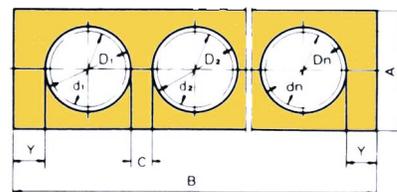
Chain Size	K (at least)
TK070	4.13
TK095	5.71
TK130	7.68
TK180	10.63

STEP 5. Standard Supporter Selection

1. TK TYPE

1. Dimension (A): The size of the supporter may be chosen from the reference table for each chain size. (maximum cable/hose diameter)
 $B = Y + D_1 + C + D_2 + C + \dots + D_n + Y$
 $B \geq B$
2. Dimension (B): B = Calculated maximum supporter width
 B = Standard supporter width as chosen from the table
 $D = d \times 1.1$, but $D-d \geq 0.08$ inch
 $C \geq 0.16$ inch
 Y = Refer to the below table
3. Number of supporters (N): Supporters should be installed at every 2nd pitch.
 When chain link number (l)
 is even, number of supporters is, $n = \frac{l}{2}$
 When chain link number (l)
 is odd, number of supporters is, $n = \frac{l-1}{2}$

SUPPORTER CHOICE TABLE



Chain Size	min (Y)
TK070	0.39
TK095	0.59
TK130	0.71
TK180	0.71
H250	0.98

STEP 6. Freespan confirmation

$$K' = \frac{P \times \ell - \left(\frac{S}{2} + \pi R \right)}{2}$$

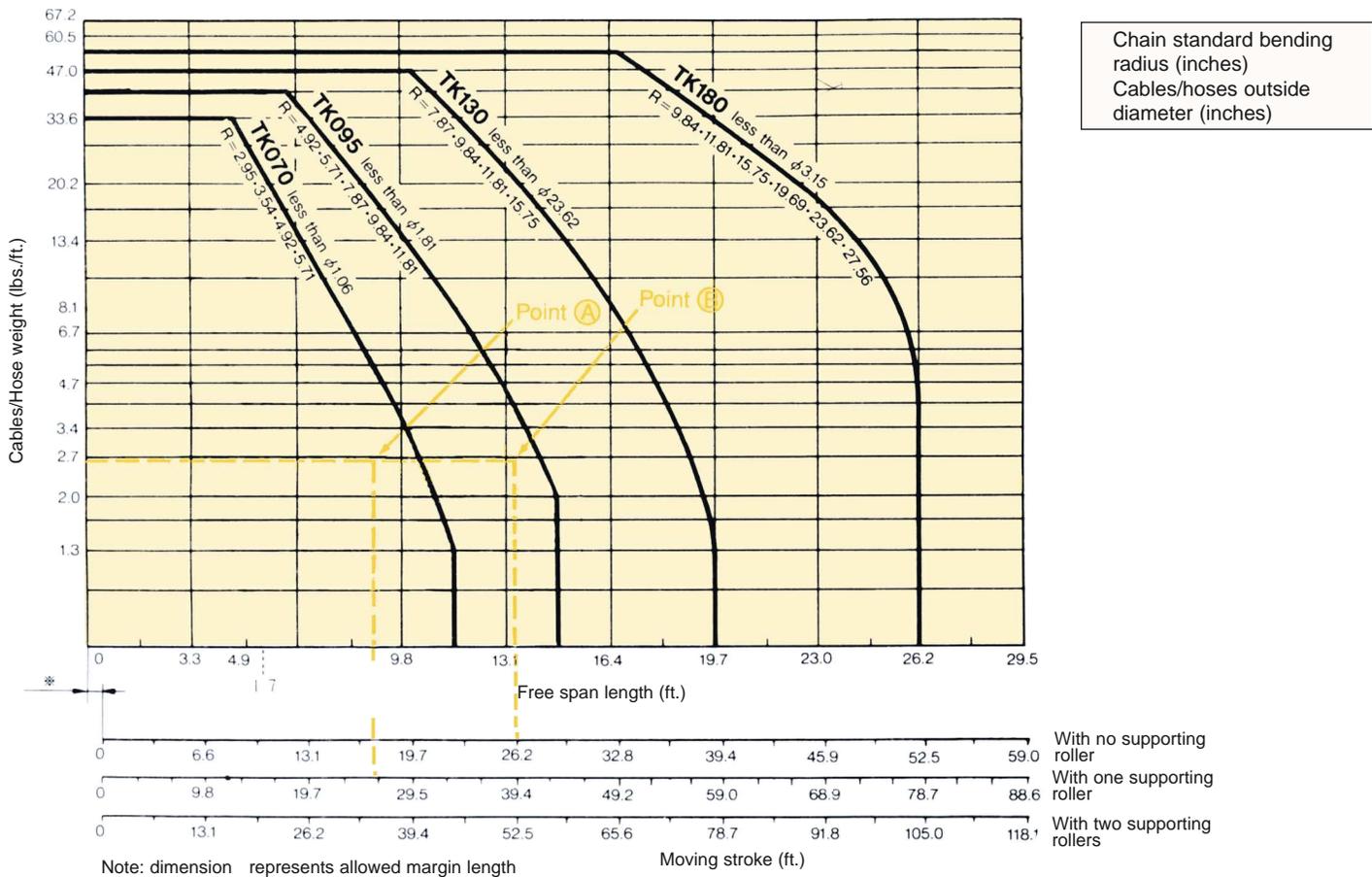
Freespan without support roller $F_0 = \frac{S}{2} + K$

Freespan with one support roller $F_1 = \frac{S}{3} + K$

Freespan with two support rollers $F_2 = \frac{S}{4} + K$

The values of F_0 , F_1 , F_2 must not exceed the maximum freespan from the capability graph below. If it does, a larger chain size must be chosen or more support rollers added, but only up to a maximum of two.

Capability Graph



How to use the capability graph

For the TK095, if the weight of the cables or hoses is 4.03 lbs./ft., the moving strokes are:
 25.6 ft. with no support roller
 38.4 ft. with one support roller
 51.2 ft. with two support rollers

There are five different bending radii of the chain standardized at 4.92, 5.71, 7.87, 9.84, 11.81 inches. Maximum hole diameter is 1.81 inches.

Example

Weight of the cables or hoses: 2.69 lbs./ft.
 Allowable bending radius of cables or hoses: 7.48 inches
 External diameter of the biggest cable or hose: ϕ 11.81 inches.
 Moving stroke: 26.25 ft.

With no support roller:

The intersection of the cable weight axis (2.75 lbs./ft.) and the freespan length axis (26.25 ft.) at point A is within the range of TK095. Therefore, it can use a bending radius within 78.74 inch and satisfy the diameter of the cable or hose.

With one support roller:

The intersection at point B is within the range of TK070, but the allowable bending radius of cables or hoses is more than the allowable bending radius of the cableveyor. The diameter of the hoses or cables is bigger than that which is on the chart. Therefore, it does not satisfy the requirement.

SAMPLE SELECTION

Example

1. SituationIndoor, normal temperatures
2. Moving stroke29.5 ft.
3. Number and external diameter of the cables or hoses
cables ϕ 1.73 X 2, oil hoses ϕ 1.42 X 2
4. Weight at installationcables 2.01 lbs./ft. X 2, oil hoses
.1.34 lbs./ft. X 2, total weight 6.7 lbs./ft.
5. Allowable bending radius
.cable 10.63 inches, oil hoses 10.24 inches
6. The cables or hoses will be set horizontally on one line.
- 7 The fixed bracket will be in the middle of the length of travel.
8. Speed of travel100 ft./min.
9. Vibrationsnone

STEP 1. Specifications

See STEP 1 of the SELECTION outline (page B-97).

STEP 2. Tentative selection

From the capability graph on page B-98, TK130 would satisfy what is required since it has no supporting roller, and since the moving stroke is 29.5 ft. (length of travel) and 6.7 lbs./ft/ for cable and hose weight.

STEP 3. Selection of the bending radius

R11.81 and R15.35 will satisfy the requirement for a larger than allowable bending radius (10.63 inches).

STEP 4. Calculation of the number of chain links

Once the chain size has tentatively been referred to, the number of chain links may be calculated according to the following equation.

$$l = \frac{\frac{S}{2} + \pi R + 15.35}{5.12} = \frac{\frac{354}{2} + 11.81\pi + 15.35}{5.12} = 44.9 \text{ links}$$

The fraction is rounded off to $l = 45$ Links

STEP 5. Freespan confirmation

Freespan F (without support rollers) is confirmed by adding the margin length (K) + S/2).

$$K = \frac{130 \times 45 \text{ links} - \left(\frac{354}{2} + 300 \pi\right)}{2} = 8.03 \text{ inches}$$

$$F_0 = \frac{S}{2} + K + \frac{354}{2} + 8.03 = 85.20 \text{ inches}$$

From the capability graph on page B-98 a freespan of up to 17.22 ft. is approved for a cable/hose weight of 6.72 lbs./ft. Since $F_0 = 15.43$ ft. is less than 17.22 ft., the TK130, R11.81 chain size is the most suitable. If $F_0 > 17.22$ ft., a larger chain size should be used - TK180, R11.81, for example.

STEP 6. Standard supporter selection

Supporter hole diameter may be calculated by the following equation, where $D \geq 1.1d$ and where D is rounded off to the nearest even whole number, making the diameter ϕ 1.89 X 2, ϕ 1.58 X 2.

The supporter length B is –

$$B = \Sigma D + \Sigma C + \text{Min}.36 \quad (C = \text{Min}.1.42)$$

$$B = \{(1.89 \times 2) + (1.58 \times 2)\} + (0.16 \times 3) + 1.42 = 8.82 \text{ inch.}$$

The supporter dimension table shows that a supporter of this size fits cables/hoses of 1.73 inches the best. When deciding on the supporter dimensions, the next largest size appearing on the table must be chosen when the calculated figure does not appear. For example, a value of 8.82 would take the next bigger figure on the table, or 0.98. As the supporter length B' becomes greater the spaces between holes (C) must also increase to maintain balance.

STEP 7. Amount of supporters needed.

$$n = \frac{l - 1}{2} = \frac{45 - 1}{2} = 22 \text{ pieces} \quad \text{Where: } l = \text{Number of chain links}$$

$$n = \text{Number of supporters}$$

STEP 8. Cableveyor choice

Chain: TK130, R11.81

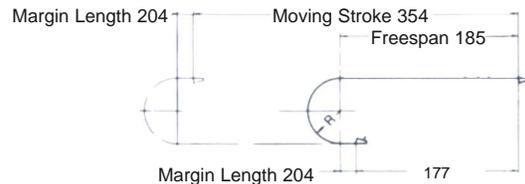
Assembly: 45 links + brackets at both ends

Supporter size: 2.56 X 9.84 (split type)

Supporter hole diameter: $D_1 = \phi$ 1.89, $D_2 = \phi$ 1.89, $D_3 = \phi$ 1.58 $D_4 = \phi$ 1.58

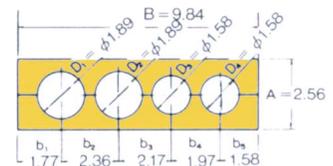
Supporter hole pitch: $b_1 = 1.77$, $b_2 = 2.36$, $b_3 = 2.17$, $b_4 = 1.97$, $b_5 = 1.58$

SAMPLE LAYOUT

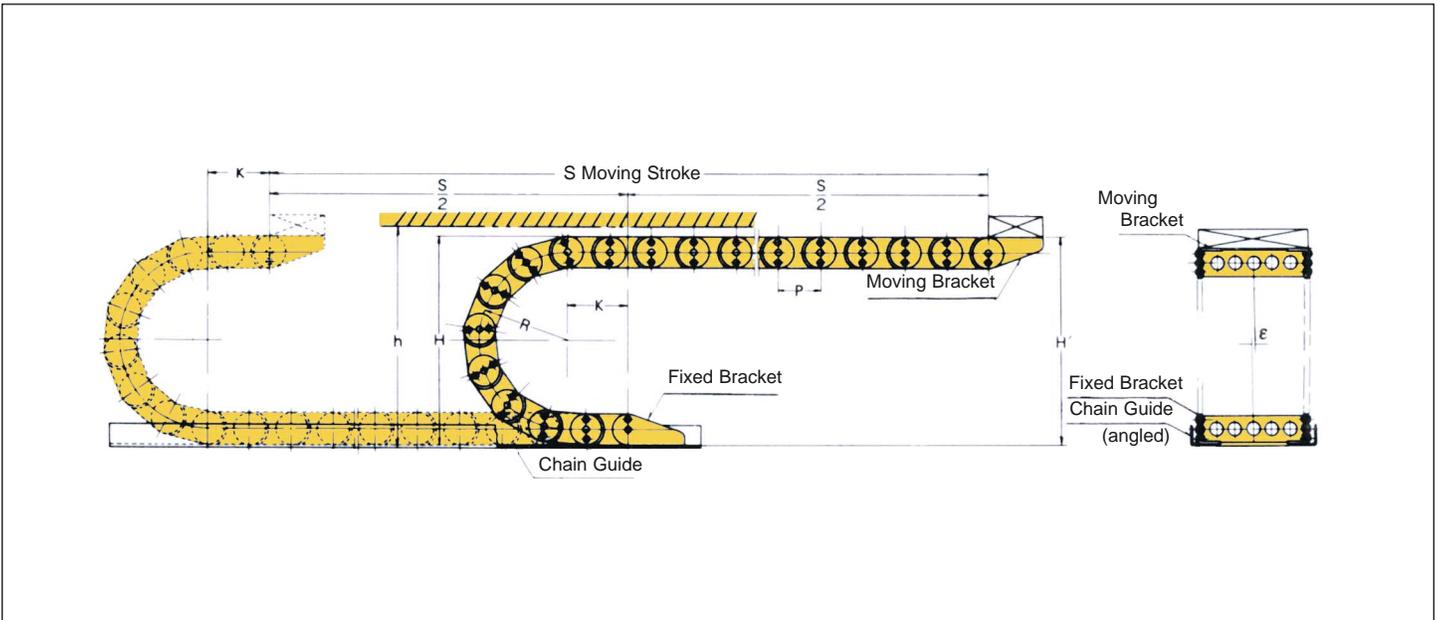


SUPPORTER CHOICE TABLE

Hole Diameter	D ₁	D ₂	D ₃	D ₄	
	1.89	1.89	1.58	1.58	
Hole Pitch	b ₁	b ₂	b ₃	b ₄	b ₅
	1.77	2.36	2.17	1.97	1.58



INSTRUCTIONS FOR HANDLING AND ORDERING CABLEVEYOR



- (1) A chain guide is necessary for Cableveyor. An angled steel plate is best.
- (2) Installation height of the moving bracket (H) and tolerance for the center of the fixed and moving brackets (E) should be set according to the table below.

Dimension in inch

Chain Size	E (max.)	H
TK070	0.16	H + 0.40
TK095	0.24	
TK130	0.31	
TK180	0.39	

- (3) Under normal circumstances, lubrication is not necessary. However, for corrosive conditions, a lubricant should be used for protection.
- (4) Since the TK types do not bend at the bracket chain joint, a minimum extension margin of 1.5 pitches (K on the diagram above) should be adhered to. If this extension margin is difficult to comply with, only one pin should be used in the center of the moving bracket. In addition, if the unit is operated at speeds of 65 ft./min. or more, the location of the moving bracket and fixed bracket should be switched. Two pins should be used with the moving bracket and only one pin (in the center) with the fixed bracket.
- (5) If the TK split-type supporter must be detached, care should be taken to reassemble the supporter in the same way with the corresponding marks on each half of the supporter properly aligned with each other.

- (6) When detaching and reassembling supporters, make sure that the chain is kept horizontal. If not, the chain will not move in a straight line.
- (7) Check that bolts and other hardware are tight when assembling and when operating, since they may become loose through operational vibration.
- (8) Do not put heavy objects or allow people to sit on the chain, as this will result in chain damage.
- (9) Note that the chain will sag in its unloaded condition as it is designed to straighten out by its own weight when attached.

Notes on Fitting Cables or Hose into the Cableveyor

- (1) The end of the cable/hose should have an extension margin to insure that no damage occurs between the cable/hose and its attachment. Usually, this amounts to six times the hose diameter.
- (2) The minimum cable/hose length necessary is given by the following equation:

$$L = \{(chain\ pitch \times link\ number) + cable/hose\ length\ from\ chain\ to\ its\ attachment\} \times 1.015.$$

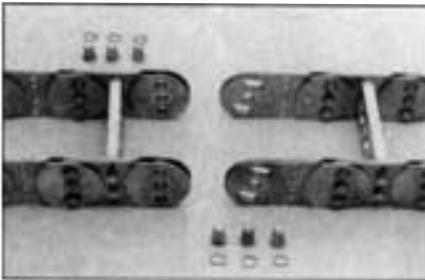
Note, however, that the hose's internal pressure causes a slight reduction in hose length. This should be considered when attaching hoses.

Instructions for Handling and Ordering Cableveyor

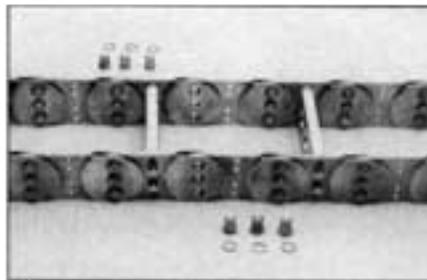
TK Type is packed and shipped in pre-fixed lengths for convenience, secure packing and easy transportation. Assembly is easy and can be done quickly without special tools.

ASSEMBLY AND CHAIN CONNECTION

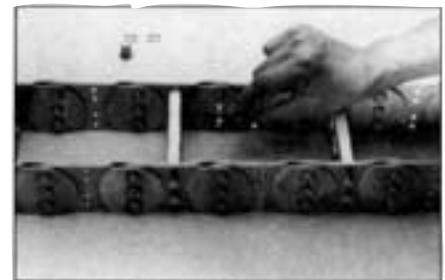
TK Type



Lay the outer side of the chain facing down.



Align the holes on both sides of the chain.



Insert the pin and lock in place with the retaining ring.

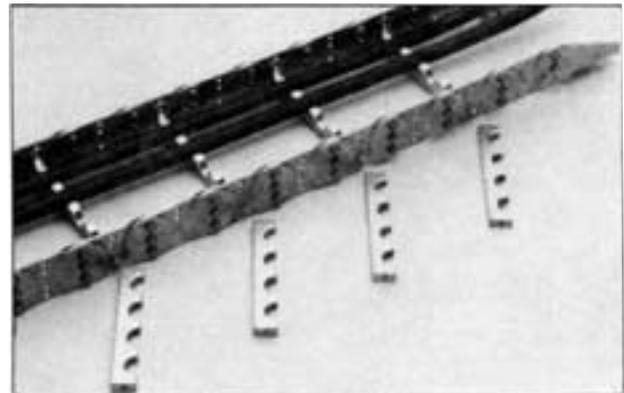
INSERTING THE CABLES AND HOSES

TK split supporter

Take off the inner side of the supporter. If the supporter is difficult to remove, loosen the side bolts of the other supporter. Next, place the cables/hoses on the grooves. The inner supporter can then be put back and the supporter bolts loosely tightened. Do not firmly tighten the bolts until all the supporters have been reattached and the Cableveyor has been placed according to the photo for adjusting and final assembly.

TK one-piece supporter

The cables/hoses may be inserted from the moving or fixed end. After the cables or hoses have been inserted and the supporters replaced, tighten the supporter bolts completely. Be careful that the Cableveyor chain is not twisted. Tighten bolts evenly, keeping the Cableveyor straight. Check that the bolts have not come loose during handling and assembly.



Let us know your specifications according to the tables below. We will manufacture a suitable chain, custom made for your needs. For easier assessment, fill out this table at the places marked.

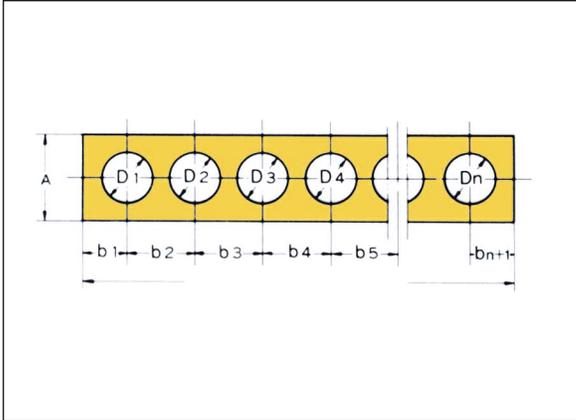
Specification Information Table

Machine to be used		
Moving Stroke (S)	<input type="text"/>	inches
Movement speed	<input type="text"/>	ft./min.
Frequency of use	<input type="text"/>	times/day
Cable + Hose weight	<input type="text"/>	lbs./ft.
Cable + Hose allowable bending radius	<input type="text"/>	inches
Operating conditions (atmosphere, etc.)		

Chain size	TK <input type="text"/>	R <input type="text"/>
Moving or fixed bracket type		
Chain length	<input type="text"/> (Links + Brackets) X	<input type="text"/> Sets
Kind of supporter if TK Type		(split or one piece)
Supporter width	<input type="text"/>	X <input type="text"/>
Supporter hole diameter		Refer to the table below.
Number of supporters	<input type="text"/>	

**Information about TK Type Supporter Holes
Supporter Hole Diameter and Pitch**

Example



	D ₁	D ₂	D ₃	D ₄	
Hole Diameter	1.50	1.50	1.06	1.77	
Hole Pitch	b ₁	b ₂	b ₃	b ₄	b ₅
	1.58	1.50	5.91	1.77	

TK-Type A-A Cross Section (For A-A cross section, please refer to chain dimensions.)

Hole Diameter	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄
Hole Pitch	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	b ₇	b ₈	b ₉	b ₁₀	b ₁₂	b ₁₃	b ₁₄	b ₁₅



WARNING

USE CARE TO PREVENT INJURY COMPLY WITH THE FOLLOWING TO AVOID SERIOUS PERSONAL INJURY

1. Guards must be provided on all chain and sprocket installations in accordance with provisions of ANSI/ASME B15.1 – 1996 “Safety Standards for Mechanical Power Transmission Apparatus,” and ANSI/ASME B20.1 – 1996 “Safety Standards for Conveyors and Related Equipment,” or other applicable safety standards. When revisions of these standards are published, the updated edition shall apply.
2. Always lock out power switch before installing, removing, lubricating or servicing a chain system.
3. When connecting or disconnecting chain:
 - a. Eye protection is required. Wear safety glasses, protective clothing, gloves and safety shoes.
 - b. Support the chain to prevent uncontrolled movement of chain and parts.
 - c. Use of pressing equipment is recommended. Tools must be in good condition and properly used.
 - d. Determine correct direction for pin/rivet removal or insertion.

Revision 5/94