BECHTEL

Conveyor chains

There are two types of conveyor chains:

- √ Drop forged chain
- √ Double drag link chain according to :
  DIN 8165-FV and 8167-M
- √ Sprockets
- √ Plastic scrapers
- √ Plastic profiles
- √ Accessories
- √ Calculations conveyor chain

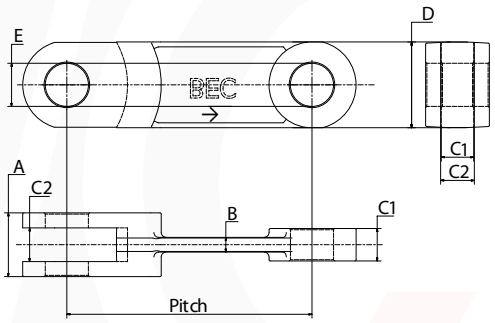
Bechtel supplies different versions of both types and can deliver the optimum conveyor chain for any purpose.

The chains can be equipped with plastic, welded, or bent scrapers (or a combination).

Supplier of spare parts for the international bulkhandling industry

Drop forged chain

The drop forged chains supplied by Bechtel are made of heat treated high grade alloy steel. These links can be equipped with plastic or steel scrapers. The following table shows various types of drop forged chains, together with the respective breaking loads and core/surface hardness.



Bechtel drop forged chain (Sizes in mm)

Pitch	A	B	C1	C2	D	E	Breaking loads available ex stock	
							58 HRC case hardened	40 HRC hardened
102	32	10	14	15	36	18	150 kN	
102	27	11	12	13	36	16		170 kN
102	28	8	12	13	36	14	130 kN	180 kN
102	24	6	8	9	36	14	100 kN	
125	36	10	15	16	36	16		140 kN
142	42	13	19	20	50	25	250 kN	350 kN
142	54	16	25	26	50	25	300 kN	380 kN
142	62	15	29	30	50	25	350 kN	600 kN
150	36	13	15	16	50	25		200 kN
150	36	13	15	16	50	25		300 kN
150	36	13	15	16	50	25		400 kN
160	42	13	20	21	46	20		300 kN
160	50	14	25	26	50	25	300 kN	380 kN
175	62	15	29	30	50	25		600 kN
200	68	18	30	31	60	30	500 kN	
200	70	24	30	31	60	30		700 N
250	70	20	30	33	70	32		750 N
260	70	20	30	33	70	32	600 kN	

Chain material: 20MnCr5, 42CrMo4, V2A, V4A, 1.4713. The breaking load depends on the respective material.

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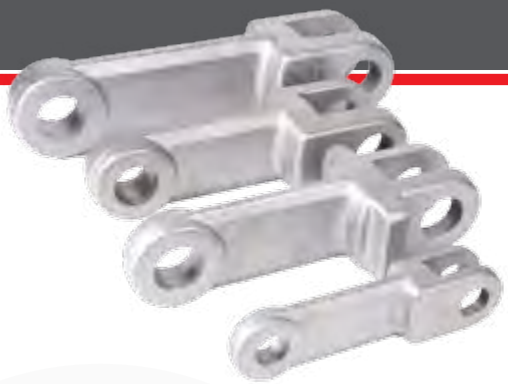
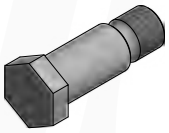


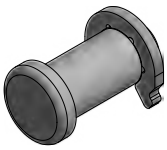
Pins

Pins for drop forged chains are available in material:
16MnCr5, 42CrMo4i, 1.4034i, 1.4122i, 1.4462, 1.4713. Other materials on request.

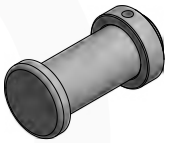
circlip



hex pin with thread



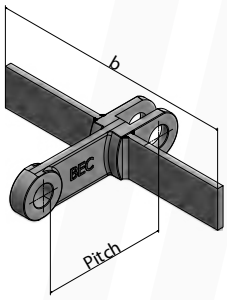
head pin with circlip



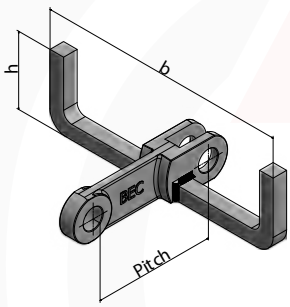
head pin with
collar and dowel pin

Example of scrapers

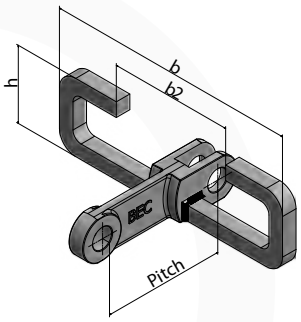
Bechtel can supply all kinds of scrapers. Whether it is horizontal, inclined or vertical transport, there is a special version for every type of transport and a solution for every capacity. Below you will find a number of examples of steel scrapers and plastic flights.



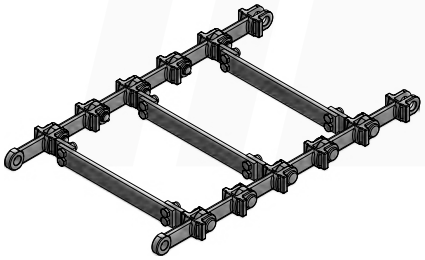
Horizontal trans-
port



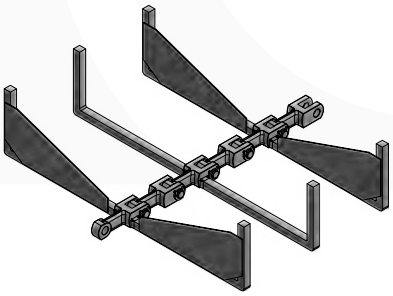
"U" scraper for
inclined transport



"O" scraper
for vertical transport



Double drop forged
chain scraper



"U" scraper with
welded plates

Easy to (dis)assemble
plastic flights

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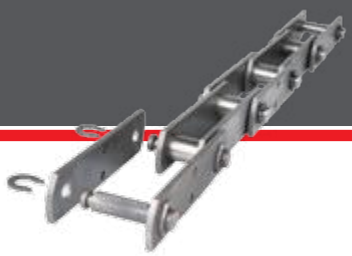

DIN chains - ex stock

Bechtel does not recommend an “own” type of chain. Capacity, type of bulk material, situation on site, and price / quality ratio determine the advice of our technicians. That is why Bechtel stocks a large number of double drag link chains and sprockets in various sizes.

These chains can be custom-made, with a short delivery time, with plastic flights and/or steel welded scrapers. The standard pins are fitted with a circlip (unless otherwise stated). An overview of the chains available from stock can be found in the table below.

Bechtel double drag link chain (Sizes in mm)				
Pitch	Inner	Bush / Pin	Plates	Breaking load
(p)	Width (b1)	Diameter (d1/d2)	(h x s)	kN
80	22	**18 / 12	30 x 4	63
80	25	20 / 14	35 x 5	90
80	25	*20 / 14	35 x 6	110
80	25	*20 / 14	35 x 8	110
80	30	22 / 16	40 x 6	112
80	35	30 / 20	50 x 8	180
100	22	18 / 12	30 x 4	63
100	25	20 / 14	35 x 5	90
125	25	20 / 14	35 x 5	90
125	30	22 / 16	40 x 6	112
125	32	**21 / 15	40 x 6	112
125	30	26 / 18	45 x 6	140
125	35	26 / 18	45 x 6	140
125	30	30 / 20	50 x 8	180
125	45	30 / 20	50 x 8	180
150	30	22 / 16	50 x 6	112
150	52	25 / 18	50 x 6	140
150	45	30 / 20	50 x 8	180
150	55	36 / 26	50 x 8	250
160	30	30 / 20	50 x 8	180
160	37	**25 / 18	50 x 7	160
160	45	30 / 20	50 x 8	180
160	55	36 / 26	60 x 10	250

*Split pins ** Riveted

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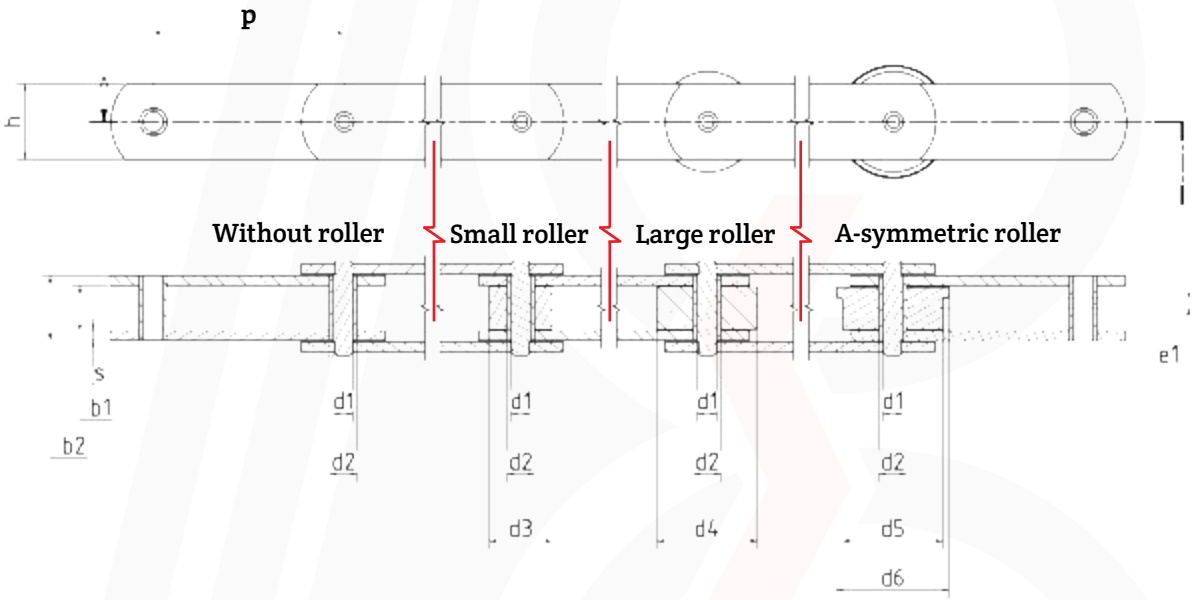
Drag link chain - DIN 8165

Double drag link chains according to DIN 8165 (FV) and DIN 8167 (M) are available with connecting pins in a circlip, split pin and riveted version. The steel scrapers can be L-shape bent, welded and / or bolted with plastic profiles. It is also possible to attache special Bechtel plastic scrapers on every outside link. The chains can also be fitted with rollers. Delivery in different materials, (inductive) hardened is possible on request.



DIN 8165 - FV - Double drag link chain (Sizes in mm)

Braking laod in kN	63	90	112	140	180	250	315	400	500	630
Inner width (b1)	22	25	30	35	45	55	65	70	80	90
Bush Ø (d2)	18	20	22	26	30	36	42	44	50	56
Pin Ø (d1)	12	14	16	18	20	26	30	32	36	42
Plate height (h)	30	35	40	45	50	60	70	70	80	100
Plate thickness (s)	4	5	6	6	8	8	10	12	12	12
Small roller (d3)	26	30	32	36	42	50	60	60	70	80
Large roller (d4)	40	48	55	60	70	80	90	100	110	120
A-symmetric(d5/d6)	50/60	63/73	72/87	80/95	100/120	125/145	140/170	150/185	160/195	170/210
Angle acc. DIN	30x4	40x5	40x6	50x7	50x7	65x7	70x9	70x11	80x12	100x12
Bearing area	3,7	5,0	6,8	8,6	12,3	18,7	25,8	30,7	38,2	48,7

Available in pitch (p): 40 - 50 - 63 - 80 - 100 - 125 - 135 -150 - 160 - 200 - 250 mm.
Other sizes and materials are available on request.

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Drag link chain DIN 8167 - M

DIN 8167 - M - Double drag link chain (parameters in mm)									
Breaking load in kN	56	80	112	160	224	315	450	630	900
Inner width (b1)	24	28	32	37	43	48	56	66	78
Bush Ø (d2)	15	18	21	25	30	36	42	50	60
Pin Ø (d1)	10	12	15	18	21	25	30	36	44
Plate height (h)	30	35	40	50	60	70	80	100	120
Plate thickness (s)	4	5	6	7	8	10	12	14	16
Small roller (d3)	21	25	30	36	42	50	60	70	85
Large roller (d4)	42	50	60	70	85	100	120	140	170
A-symmetric (d5/d6)	42/50	50/60	60/70	70/85	85/100	100/120	120/140	140/170	170/210
Angle acc. DIN	40x4	40x4	50x6	50x6	60x8	70x9	70x9	100x12	120x15
Bearing area	3,30	4,68	6,75	9,36	12,60	17,50	24,60	34,56	49,28

Available in pitch (p): 40 - 50 - 63 - 80 - 100 - 125 - 135 -150 - 160 - 200 - 250 mm.
Other sizes and materials are available on request.

Pins

Pins are available various executions and in materials:
16MnCr5, 42CrMo4i, 1.4034i, 1.4122i, 1.4462, 1.4713. Other materials on request.

Circlips

Split pins

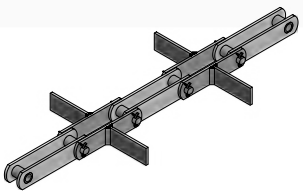
Riveted

Split pin - head pin

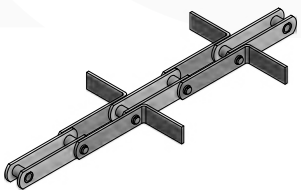
Examples of double drag link chain with scrapers

Double drag link chain can be produced in various executions. Outer links can be bent in L-shape scrapers or provided with plastic flights. Internal and external links can be provided with welded scrapers. Of course, a combination is possible.

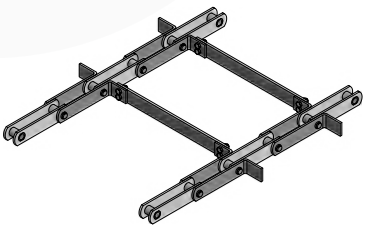
With plastic scrapers



T-shape welded



L-shape bended



Double strand with cross bar

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Sprockets for drag link chain

Sprockets are with or without teeth (return sprockets) and wear-resistant due to the hardening on the teeth. These sprockets have a symmetrical hub and are divisible, making them easy to (dis) assemble. The following versions are available ex stock. Different dimensions are possible on request.

Sprockets for double drag link chain available ex stock (parameters in mm)

Pitch	Inner width	Bush-Ø	Pitch Ø (p x n)		
			6 teeth	8 teeth	7 teeth
63	22	18	126,00	164,63	-
80	22	18	160,00	209,05	-
100	22	18	200,00	261,31	-
125	25 / 30 / 35 / 45	20 / 26 / 30	250,00	326,64	-
150	30 / 45	22 / 30	-	-	345,71
160	30 / 45	30	320,00	418,10	-

Pitch Ø

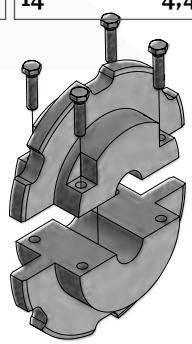
z = number of teeth, n = factor

Pitch-Ø (in mm) = chain pitch x n

Outer-Ø sprocket = Pitch-Ø + Bush-Ø of the chain x factor 0,6

z	n	z	n	z	n	z	n	z	n
6	2,0000	9	2,9238	12	3,8637	15	4,8097	18	5,7588
7	2,3048	10	3,2361	13	4,1786	16	5,1258	19	6,0755
8	2,6131	11	3,5495	14	4,4940	17	5,4422	20	6,3925

Divided sprocket for easy assembly.



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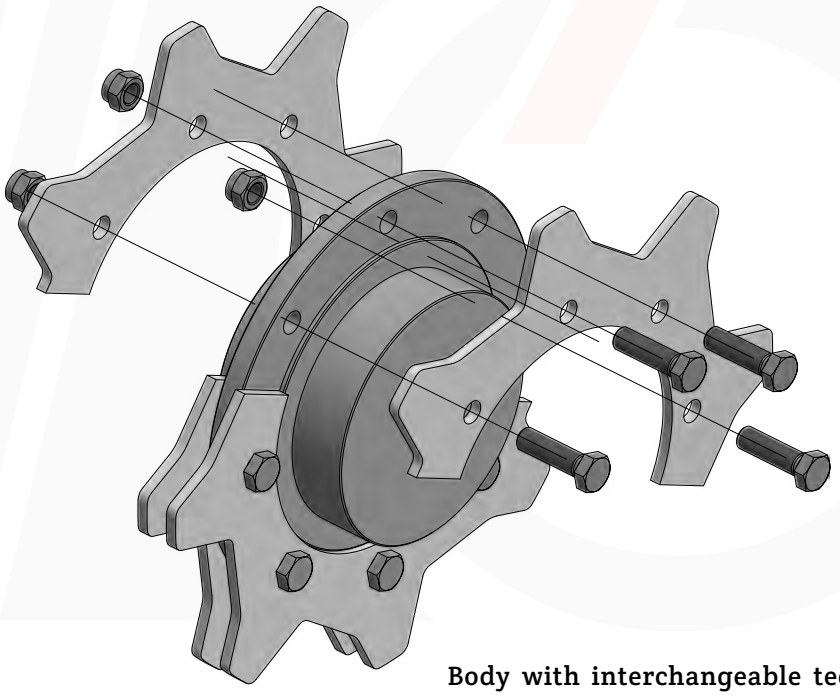
Sprocket drop forged chain

Sprockets for drop forged chain consist of a body with symmetrical hub and interchangeable teeth segments. This has the advantage that, when the sprockets wear out, only the wear-resistant teeth segments need to be replaced. Sprockets can be made to your specifications on request. The following versions are available ex stock.

Sprockets for drop forged chain available ex stock (parameters in mm)

Pitch	Pitch Ø / number of segments per complete set				
	6 teeth	7 teeth	8 teeth	9 teeth	10 teeth
102	Ø 204,00 / 4	Ø 235,09 / 4	Ø 265,49 / 4	Ø 298,23 / 4	Ø 330,08 / 4
125	Ø 250,00 / 4	Ø 288,10 / 4	Ø 326,64 / 4	Ø 365,48 / 4	Ø 404,51 / 4
142	Ø 284,00 / 4	Ø 327,28 / 4	Ø 371,06 / 8	Ø 415,18 / 6	Ø 459,52 / 4
150	Ø 300,00 / 6	Ø 345,71 / 4	Ø 391,97 / 8	Ø 438,57 / 4	Ø 485,42 / 10
160	Ø 320,00 / 4	Ø 368,76 / 4	Ø 418,10 / 8	Ø 467,81 / 4	Ø 517,77 / 4
200	Ø 400,00 / 4	Ø 460,95 / 4	Ø 522,62 / 8	Ø 584,76 / 4	Ø 647,21 / 4



Body with interchangeable teeth segments. (8 teeth)

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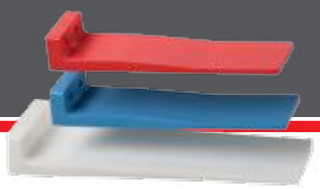


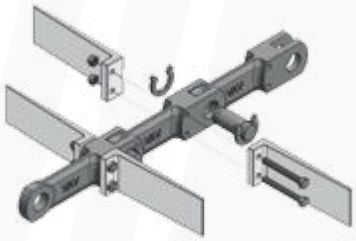
Plastic flights

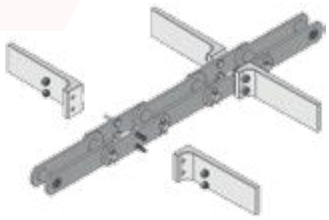
Bechtel plastic flights are made of flexible and durable nylon. Because the chain runs on the plastic flights, there is no steel on steel contact. This is energy-saving, noise-reducing and cost-saving. In addition, they are easy to (dis) assemble and wear/guiding rails become unnecessary. There are several types available: the standard Nylon, heat resistant Zytel, Fiberglass reinforced, FDA quality and a detectable version.

Characteristics of plastic scrapers

Type	Nylon	Glass reinforced	FDA-Quality	Zytel	Detectable
Colour	white	white	white	red	blue
Noise reducing	√ √	√	√ √	√ √	√ √
Flexible (will bend back)	√ √		√ √	√	√ √
Detectable					√ √
FDA Quality			√ √		√ √
°C - resistance	-20 / +70	-20 / +70	-20 / +70	+80 / +110	-20 / +70

√ = suitable, √ √ = very suitable





Plastic scrapers (parameters in mm)

Length x height	Cc. distance of the fixing holes	Drop forged chain Pitch*	Double drag link chain Plates*
117 x 45	20	102 125, 160	35x5
137 x 45	20	102, 125, 160	35x5
180 x 45	20	102, 125, 160	35x5
162 x 55	25	-	45x6, 40x6
112 x 58	30	142, 150	50x6, 50x8
162 x 58	30	142, 150	50x6, 50x8
212 x 58	30	142, 150	50x6, 50x8
262 x 58	30	142, 150	50x6, 50x8
300 x 58	30	142, 150	50x6, 50x8

* Bechtel chain ex stock

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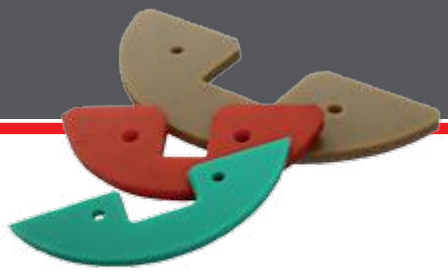
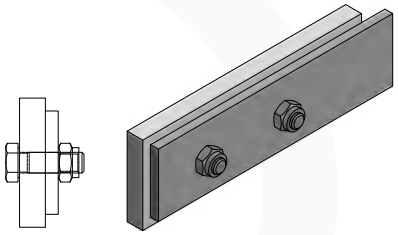


Plastic profiles

Plastic profiles can be produced in various types of materials, such as: PE (polyethylene), Nylon or PU (polyurethane). These can be used as a scraper or as a flight. The profiles can be custom-made. Below a number of examples.

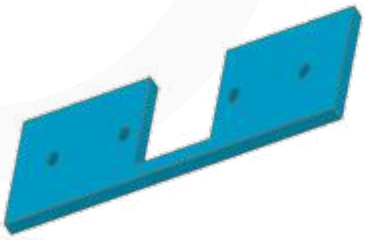
Profile A

Profile A - Plastic flight assembled on the steel scraper.



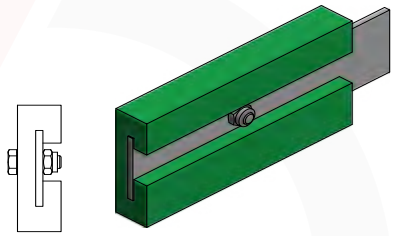
Profile Bridge

The “bridge” profile is assembled on the steel scrapers. The plastic runs under the chain and ensures less residue.



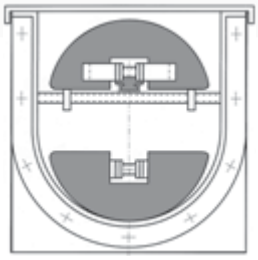
Profile C

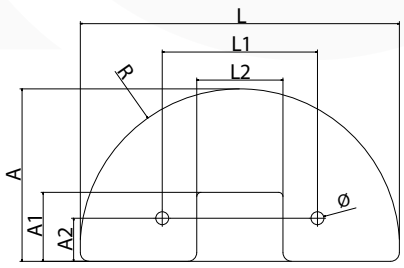
Profile C - Plastic scraper which can be pushed over the steel scrapers



“Half moon” profile

The so-called “half-moon” profile is assembled on the steel scrapers.





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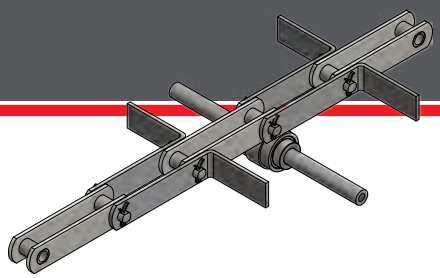
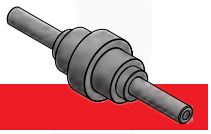


Accessories

Bechtel supplies different spare parts for Chain Conveyor. To ensure short delivery times, Bechtel always has the components in raw material on stock. The customization and the advice is our daily business, in which we would like to support you.

Idlers

Bechtel supplies idlers according to your specifications. The idlers can be made of plastic (for example PE1000 or Nylon) or steel (optional hardened). The idlers can be equipped with ball bearings. The axe can be fitted with internal or external thread.



Idler in plastic or steel (parameters in mm)

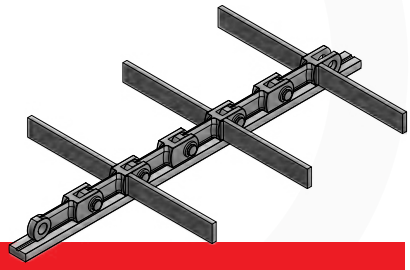
Inner width chain	Roller Ø	Shaft Ø	Internal thread
25	50/60	20	M10x25
30	50/60	20	M10x25
35	50/60	20	M10x25
45	60/70	20	M10x25

Return buckets for chain

Bechtel supplies return buckets in pressed and welded versions. You can use our standard edition or get a customized version according to you specifications.

Wear-guiding rails

Wear-guiding rails for drop forged chain are available in Manganese steel (X120Mn12). The rails are provided with a guiding groove, for the ideal guidance of the drop forged chain.



Wear-guiding rails from material X120Mn12 (1.3401)

Size (mm)	Length (meter)	Delivery	Weight (kg/m)
35 x 10	2,95 - 3,10	ex stock	2,60
50 x 10	2,95 - 3,20	ex stock	3,75
50 x 20	2,95 - 3,20		7,67
60 x 10	2,95 - 3,20	ex stock	4,54
70 x 10	2,95 - 3,20		5,32
70 x 20	2,95 - 3,20	ex stock	10,81

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Chain calculations

Conveyor chain calculations

Chain speed in m/sec (v)

$$v = \frac{z \times t \times n}{60.000}$$

v	=	chain speed in m per sec
z	=	number of teeth
t	=	chain pitch (mm)
n	=	rotations per minute

Conveyor chain calculations

Capacity in kg per hour (Q)

$$Q = A \times v \times 3600 \text{ sec.}$$

Q	=	capacity in m3 per hour
A	=	trough width x layer height in m2
v	=	chain speed in m per sec

Conveyor chain calculations

Material weight on the chain in kg (mass1)

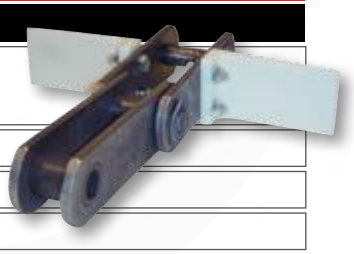
$$\text{Mass-1} = \frac{\text{tons per hour} \times \text{distance in meters}}{v \times 3{,}6}$$

Mass-1	=	material weight on the chain in kg
v	=	chain speed in m per sec

Conveyor chain calculations

Power in Kw (P)

$$P = \frac{(v \times \text{mass-1} \times \mu 1 + \text{mass-2} \times \mu 2) \times 9{,}81}{1.000}$$



P	=	power in Kw
v	=	chain speed in m per sec
mass-1	=	material weight on the chain in kg
μ1	=	friction between steel and the product (for a smooth-running product ca. 1,15)
mass-2	=	total chain weight in kg
μ2	=	friction between the steel bottom and the chain (for steel pushers approx. 0,25 and for plastic pushers approx. 0,15)

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