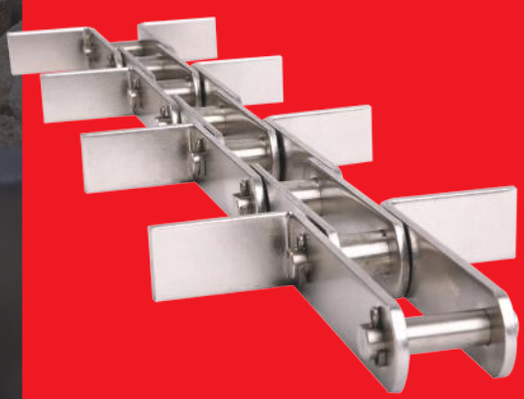
BECHTEL

Components for bulk handling since 1989

Conveyor chains

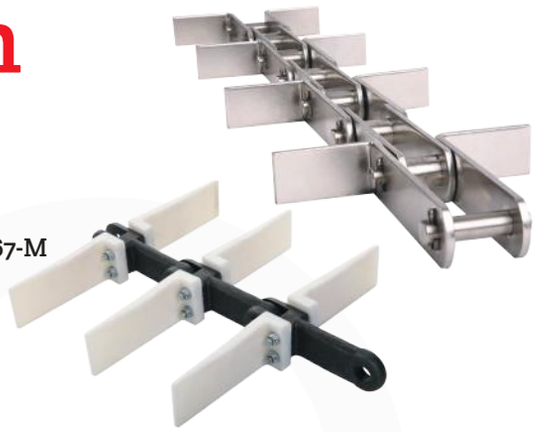


Elevator parts

Screw conveyor parts

Supplier of spare parts for the international bulk handling industry

Delivery program



Conveyor chains

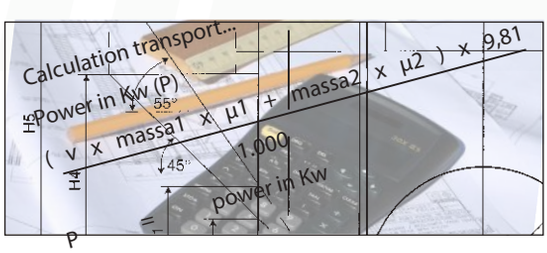
- √ Drop forged chain
- √ Double drag link chain according to DIN 8165-FV and 8167-M
- √ Sprockets
- √ Plastic scrapers
- √ Plastic profiles
- √ Accessories

Elevator parts

- √ Elevator belting (DIN 22102 - 22104)
  - SBR, NBR, NBR-ACN, flame retardant K-Atex, FDA, PVC
- √ Bucket bolts according to DIN 15237
- √ Pulleys
- √ Belt fasteners
- √ Elevator buckets
  - (Super) Claus elevator buckets
  - Elevator buckets type D and M
  - Columbus elevator buckets
  - Plate steel elevator buckets (DIN 15231 - 15234)
  - CC-S, Atlas and Monocast GSM elevator buckets
  - Elevator buckets type BE

Screw segments

- √ Auger segments
- √ Endless spirals
- √ Shaftless spirals
- √ Mix spirals
- √ Adjustable hanging bearings
- √ Pallets



Calculations

- √ Conveyor chains
- √ Elevators
- √ Screw conveyors
- √ Specific weights

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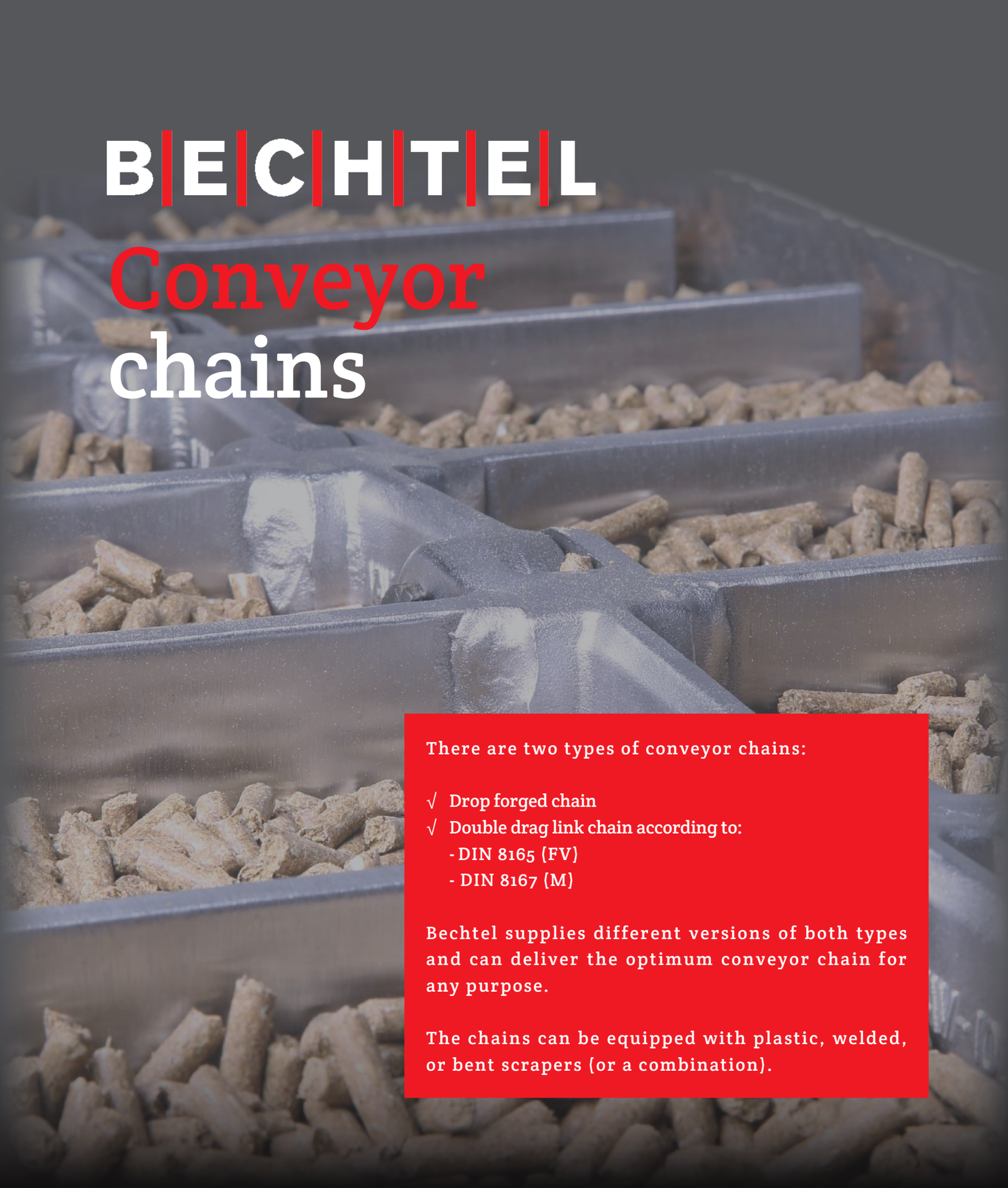
BECHTEL Conveyor chains



There are two types of conveyor chains:

√ Drop forged chain
√ Double drag link chain according to:
- DIN 8165 (FV)
- DIN 8167 (M)

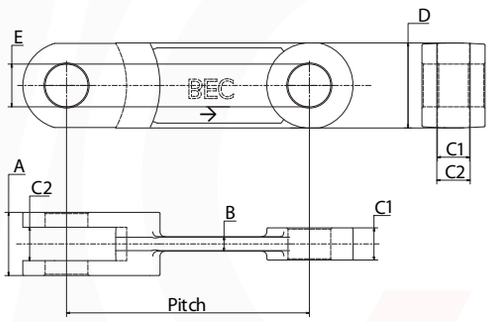
Bechtel supplies different versions of both types and can deliver the optimum conveyor chain for any purpose.

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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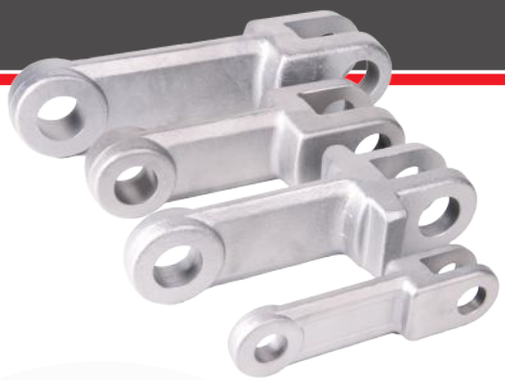
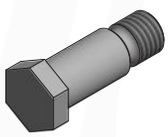


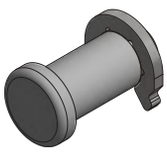
Pins

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

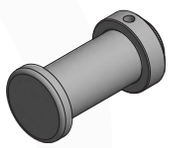
circlip



hex pin with thread



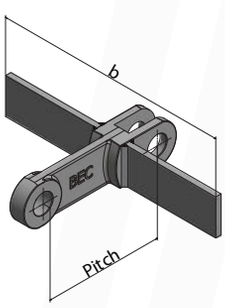
head pin with circlip



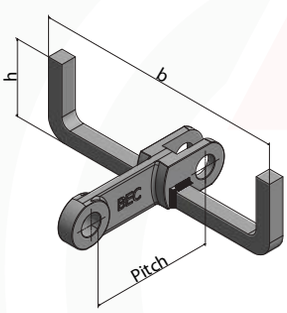
head pin with
collar and dowel pin

Example of scrapers

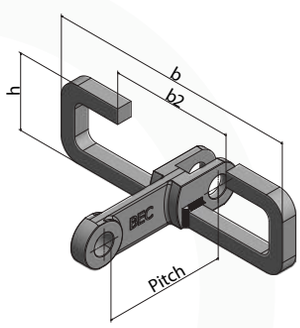
Bechtel can supply all kinds of scrapers. Whether it is horizontal, inclined or vertical transport, there is a special version for every type of transport and a solution for every capacity. Below you will find a number of examples of steel scrapers and plastic flights.



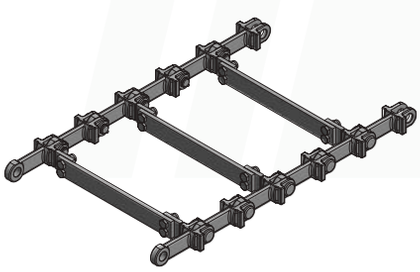
Horizontal trans-
port



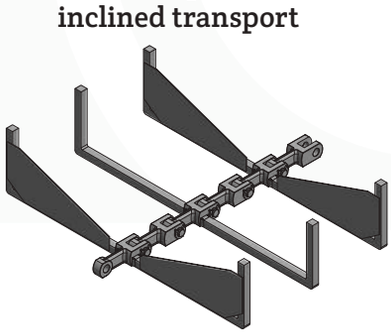
"U" scraper for
inclined transport



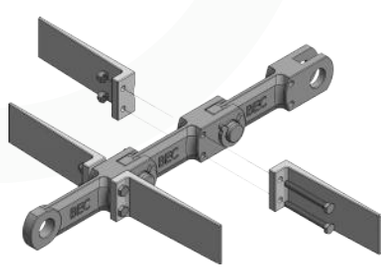
"O" scraper
for vertical transport



Double drop forged
chain scraper



"U" scraper with
welded plates



Easy to (dis)assemble
plastic flights

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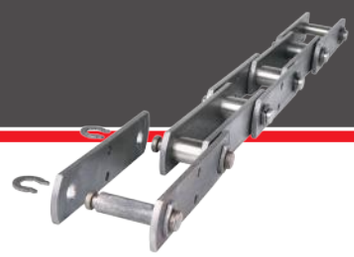

DIN chains - ex stock

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 8	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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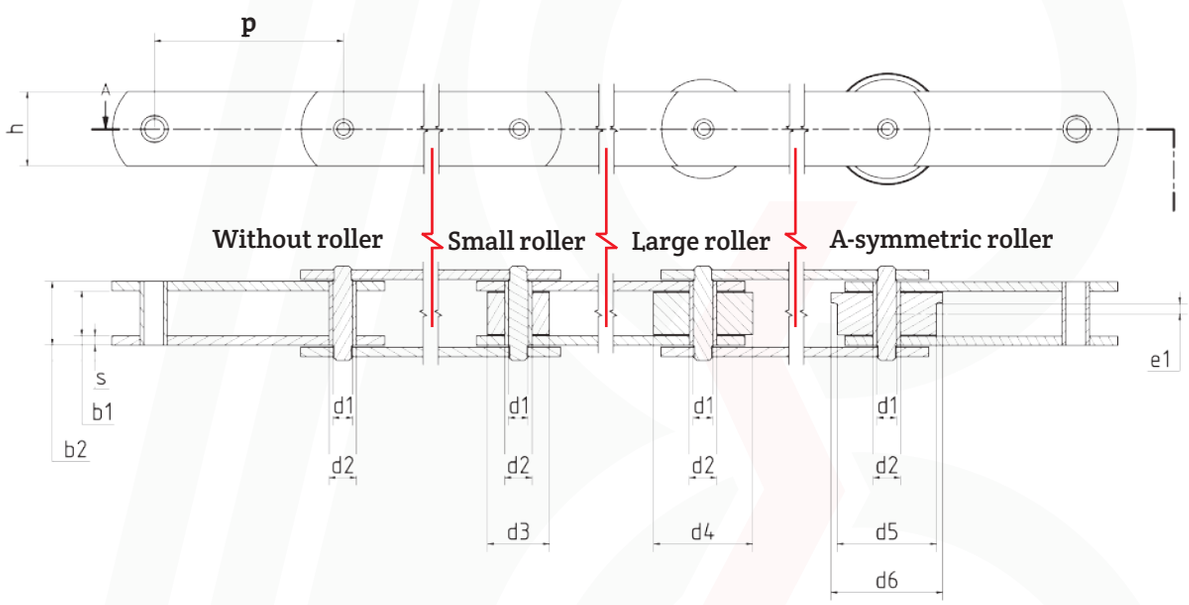
Drag link chain - DIN 8165

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

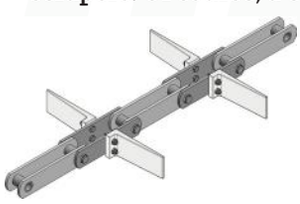
Split pins

Riveted

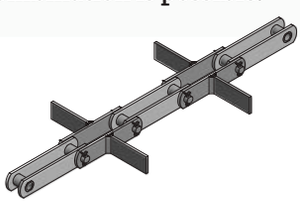
Split pin - head pin

Examples of double drag link chain with scrapers

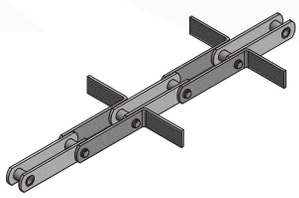
Double drag link chain can be produced in various executions. Outer links can be bent in L-shape scrapers or provided with plastic flights. Internal and external links can be provided with welded scrapers. Of course, a combination is possible.



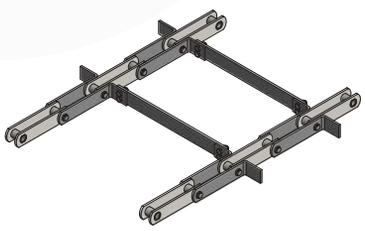
With plastic scrapers



T-shape welded



L-shape bended



Double strand with cross bar

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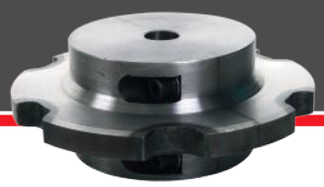


Sprockets for drag link chain

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

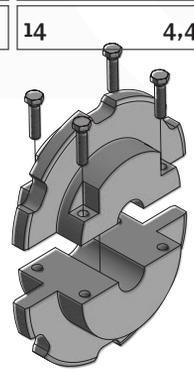
z = number of teeth, n = factor

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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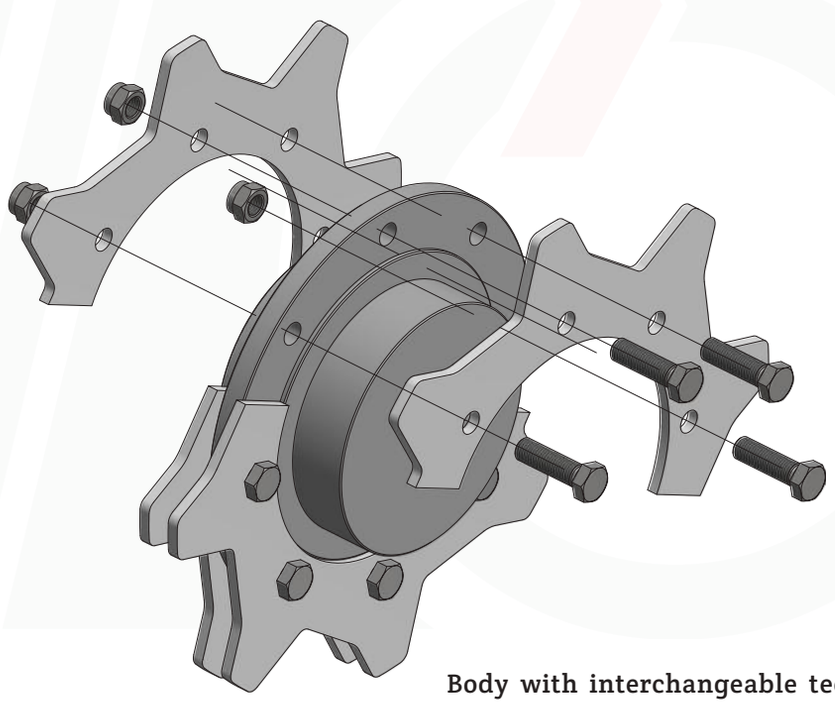
Sprocket drop forged chain

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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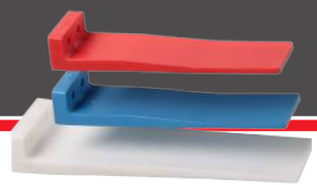


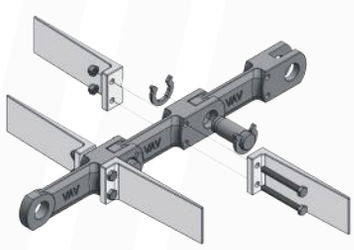
Plastic flights

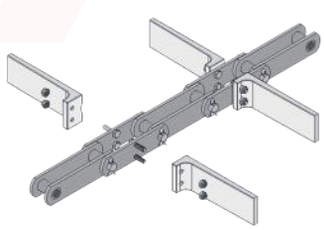
Bechtel plastic flights are made of flexible and durable nylon. Because the chain runs on the plastic flights, there is no steel on steel contact. This is energy-saving, noise-reducing and cost-saving. In addition, they are easy to (dis) assemble and wear/guiding rails become unnecessary. There are several 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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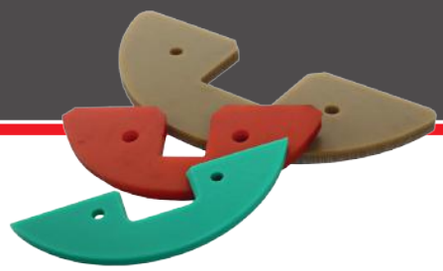
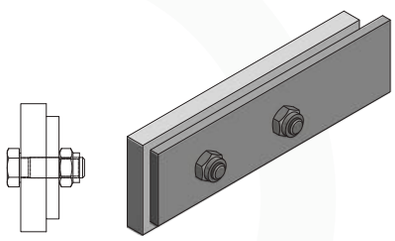


Plastic profiles

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.

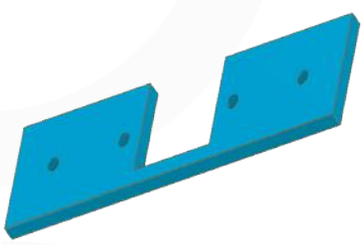
Profile A

Profile A - Plastic flight assembled on the steel scraper.



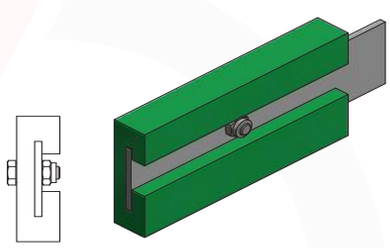
Profile Bridge

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



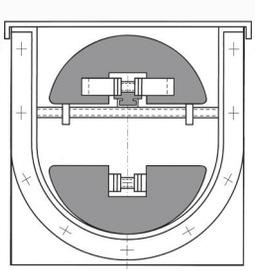
Profile C

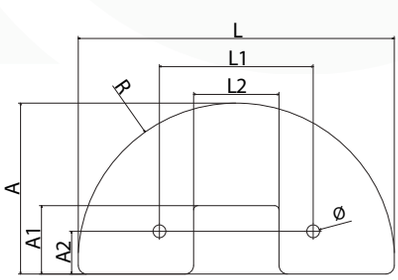
Profile C - Plastic scraper which can be pushed over the steel scrapers



“Half moon” profile

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





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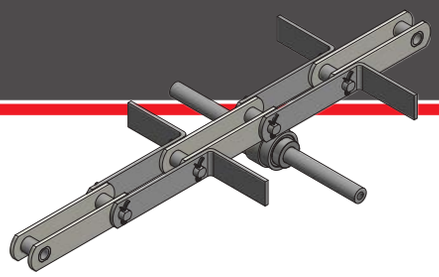
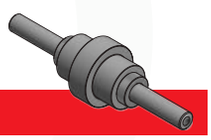


Accessories

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)

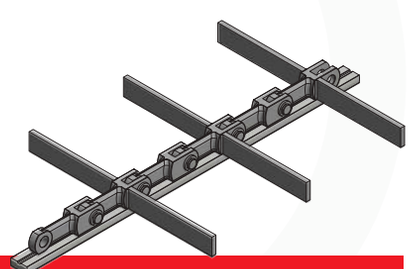
Inner width chain	Roller Ø	Shaft Ø	Internal thread
25	50/60	20	M10x25
30	50/60	20	M10x25
35	50/60	20	M10x25
45	60/70	20	M10x25

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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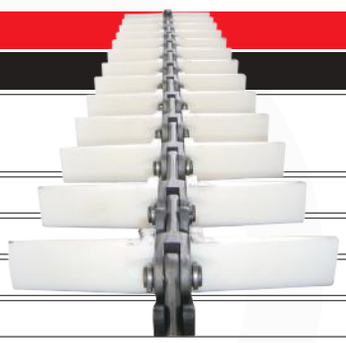
Chain calculations

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)

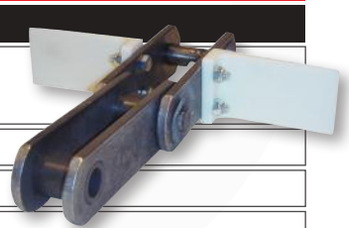
$$\text{Mass-1} = \frac{\text{tons per hour} \times \text{distance in meters}}{v \times 3{,}6}$$

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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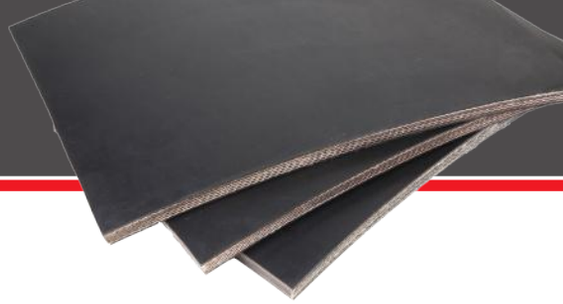
BECHTEL Elevator parts

Bechtel supplies various components for elevators:

- √ Elevator belting made of rubber or PVC
- √ Bucket bolts (DIN 15237)
- √ Pulleys
- √ Belt fasteners and belt clamps
- √ Various types of elevator buckets

Besides, our expertise in this field is available to you. The technicians at Bechtel are happy to advise you about your capacity calculations.

Supplier of spare parts for the international bulkhandling industry



SBR elevator belting

SBR elevator belts are anti-static. The plies are polyester interwoven with nylon layers. The belt is made out of SBR (Styrene Butadiene Rubber).

The covers make it possible that the elevator bolt head will fit and countersunk perfectly. These belts are available in several breaking loads and thicknesses.

SBR (Styrene Butadiene Rubber) covers are high abrasion resistant. This belt quality is suitable to transport products with a low fat, oil and acid content.

Ideal for industrial purposes such as: sand, gravel, glass cullets and dry bulk powders. Also for agro bulk industry. For example grain and cereals.

In addition, there are special temperature resistant elevator belts suitable for tempertures up to a maximum of 180 °C. Also flame retardant belts in accordance with DIN 22103 are available on demand.

Belts are cut and punched according to customers specifications.

Technical specifications

SBR	
Production requirement acc.	DIN 22102 & 22104
Anti-static acc.	ISO 284
Pre stretched plies	Nylon / Polyester
Maximum elongation	1,5%
Covers	SBR 60 ± 5° Shore A
Breaking load covers	>= 20 N/mm
Abrasion	<= 150 mm^3
Density of covers	1,20 +/- 0,3 $gram/cm^3$
Temperature resistance	-25 till +70 °C

SBR elevator belting

Type of belt	Breaking load	Nr. of inserts	Covers	Thickness	Weight/m^2	Pulley Ø *
400/3	400 kg/cm^2	3	1+1 mm	5 mm	6,6 kg	315 mm
400/3	400 kg/cm^2	3	2+2 mm	7 mm	7,8 kg	315 mm
500/4	500 kg/cm^2	4	1+1 mm	6 mm	7,8 kg	400 mm
500/4	500 kg/cm^2	4	2+2 mm	8 mm	9,0 kg	400 mm
630/4	630 kg/cm^2	4	1+1 mm	7 mm	9,0 kg	500 mm
630/4	630 kg/cm^2	4	2+2 mm	9 mm	10,2 kg	500 mm
800/5	800 kg/cm^2	5	1+1 mm	8 mm	10,8 kg	630 mm
800/5	800 kg/cm^2	5	2+2 mm	10 mm	11,4 kg	630 mm
1000/5	1.000 kg/cm^2	5	1+1 mm	8 mm	12,0 kg	800 mm
1000/5	1.000 kg/cm^2	5	2+2 mm	10 mm	12,6 kg	800 mm
1250/5	1.250 kg/cm^2	5	2+2 mm	12 mm	14,4 kg	1.000 mm

* Recomended minimal pulley diameter (60 - 100% use of breaking load).

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NBR elevator belting

NBR elevator belts are anti-static. The plies are polyester interwoven with nylon layers.
The belt is made out of NBR (Nitrile Butadiene Rubber). The covers make it possible that the elevator bolt head will fit and countersunk perfectly. These belts are available in several breaking loads and thicknesses.

NBR (Nitrile Butadiene Rubber) covers are suitable for transporting products with a higher fat, oil content and a limited acid content.

Ideal for the feedmill industry and raw materials intake such as sunflower seeds, fish meal, tapioca and mais. But also for polluted glass cullets.

Belts are cut and punched according to customers specifications.

Technical specifications

NBR	
Production requirement acc. DIN 22102 and 22104	
Anti-static acc.	ISO 284
Pre stretched plies	Nylon / Polyester
Maximum elongation	1,5%
Covers	NBR 60 ± 5° Shore A
Breaking load covers	>= 15 N/mm
Abrasion	<= 180 mm^3
Density of covers	1,20 +/- 0,3 $gram/cm^3$
Temperature resistance	-25 till +100 peak 120 °C

NBR elevator belting

Type of belt	Breaking load	Nr. of inserts	Covers	Thickness	Weight/m^2	Pulley Ø *
400/3	400 kg/cm^2	3	1+1 mm	5 mm	6,6 kg	315 mm
400/3	400 kg/cm^2	3	2+2 mm	7 mm	7,8 kg	315 mm
500/4	500 kg/cm^2	4	1+1 mm	6 mm	7,8 kg	400 mm
500/4	500 kg/cm^2	4	2+2 mm	8 mm	9,0 kg	400 mm
630/4	630 kg/cm^2	4	1+1 mm	7 mm	9,0 kg	500 mm
630/4	630 kg/cm2	4	1,5+1,5 mm	7 mm	9,5 kg	500 mm
630/4	630 kg/cm^2	4	2+2 mm	9 mm	10,2 kg	500 mm
800/4	800 kg/cm2	4	2+2 mm	8 mm	11,0 kg	630 mm
800/5	800 kg/cm^2	5	1+1 mm	8 mm	10,8 kg	630 mm
800/5	800 kg/cm^2	5	2+2 mm	10 mm	11,4 kg	630 mm
1000/5	1.000 kg/cm^2	5	1+1 mm	8 mm	12,0 kg	800 mm
1000/5	1.000 kg/cm^2	5	2+2 mm	10 mm	12,6 kg	800 mm
1250/5	1.250 kg/cm^2	5	2+2 mm	12 mm	14,4 kg	1.000 mm

* Recomended minimal pulley diameter (60 - 100% use of breaking load).

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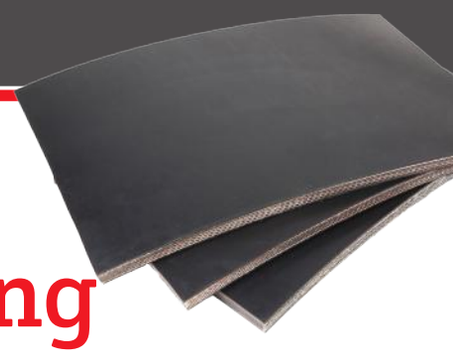

NBR-ACN elevator belting

NBR-ACN elevator belts are anti-static. The plies are polyester interwoven with nylon layers. The belt is made out of NBR, (Nitrile Butadiene Rubber) with a high content of ACN (ACryl-Nitril).

The covers make it possible that the elevator bolt head will fit and countersunk perfectly. These belts are available in several breaking loads and thicknesses.

NBR (Nitrile Butadiene Rubber) with a high content of Acryl-Nitril covers are suitable for transporting products with a higher fat, oil and acid content. Often used in feedmill industry where hot oil products and molasses are processed.

Belts are cut and punched according to customers specifications.

Technical specifications	
NBR-ACN	
Production requirement acc. DIN 22102 and 22104	
Anti-static acc.	ISO 284
Pre stretched plies	Nylon / Polyester
Maximum elongation	1,5%
Covers	NBR-ACN 60 ± 5° Shore A
Breaking load covers	>= 12 N/mm
Abrasion	<= 200 mm^3
Density of covers	1,20 +/- 0,3 gram/cm^3
Temperature resistance	-25 till +100 peak 120 °C
Swelling	Max 3% (IRM903 oil, 20 °C, 21 days)

NBR-ACN elevator belting

Type of belt	Breaking load	Nr. of inserts	Covers	Thickness	Weight/m^2	Pulley Ø *
630/4	630 kg/cm^2	4	2+2 mm	9 mm	10,2 kg	500 mm
800/5	800 kg/cm^2	5	2+2 mm	10 mm	11,4 kg	630 mm
1000/5	1.000 kg/cm^2	5	2+2 mm	10 mm	12,6 kg	800 mm

* Recomended minimal pulley diameter (60 - 100% use of breaking load).

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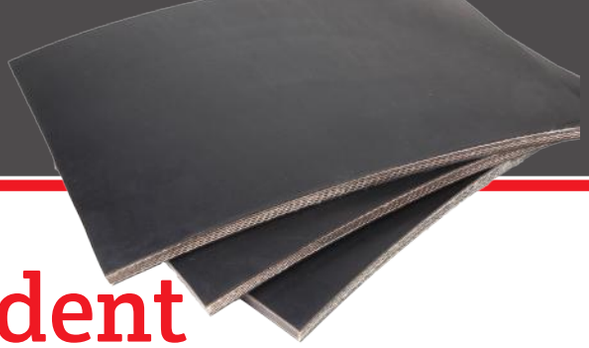

K-Atex flame retardent

K-Atex elevator belts are similar to NBR belting but flame retardent according to ISO 340. The plies are polyester interwoven with Nylon layers. The belt is made out of NBR (Nitrile Butadiene Rubber) and is anti static according to DIN284.

Thanks to a special addition in the rubber, this belt is also flame-retardant (ISO 340). The covers make it possible that the elevator bolt head will fit and countersunk perfectly. These belts are available in several breaking loads and thicknesses.

NBR (Nitrile Butadiene Rubber) covers are suitable for transporting products with a higher fat, oil content and a limited acid content. Ideal for the feedmill industry and raw materials intake such as sunflower seeds, fish meal, tapioca and mais. But also for polluted glass cullets.

Belts are cut and punched according to customers specifications.

Technical specifications	
K-Atex flame retardent (ISO 340)	
Production requirement acc. DIN 22102 and 22104	
Anti-static acc.	ISO 284
K-Atex flame retardent acc.	ISO 340
Pre stretched plies	Nylon / Polyester
Elongation	max. 1,5%
Covers	NBR K-Atex 65 ± 5° Shore A
Breaking load covers	>= 15 N/mm
Abrasion	<= 180 mm^3
Density of covers	1,20 +/- 0,3 g/cm^3
Temp.resistance	-25 till +100 peak 120 °C

K-Atex flame retardent

Type of belt	Breaking load	Nr. of inserts	Covers	Thickness	Weight/m^2	Pulley Ø *
630/4	630 kg/cm^2	4	2+2 mm	9 mm	10,2 kg	500 mm
800/5	800 kg/cm^2	5	2+2 mm	10 mm	11,4 kg	630 mm

* Recomended minimal pulley diameter (60 - 100% use of breaking load).

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FDA rubber elevator belting

FDA white rubber elevator belts are anti-static. The plies are polyester interwoven with nylon layers. The belt is made out of FDA white rubber, according to ISO284.

The covers make it possible that the elevator bolt head will fit and countersunk perfectly. These belts are available in several breaking loads and thicknesses.

FDA white rubber covers are oil and fat resistant and suitable for the food industry.

Belts are cut and punched according to customers specifications.

Technical specifications	
FDA	
Production requirement acc. DIN 22102 and 22104	
Anti-static acc.	ISO 284
Pre stretched plies	Nylon / Polyester
Maximum elongation	1,5%
Covers	FDA 70 ± 5° Shore A
Breaking load covers	>= 11 N/mm
Abrasion	<= 200 mm^3
Density of covers	1,20 +/- 0,3 gram/cm^3
Temperature resistance	-25 till +80 °C

FDA Elevator belting

Type of belt	Breaking load	Nr. of inserts	Covers	Thickness	Weight/m^2	Pulley Ø *
500/4	500 kg/cm^2	4	1,5+1,5 mm	7 mm	8,4 kg	400 mm
630/4	630 kg/cm^2	4	1,5+1,5 mm	8 mm	9,6 kg	500 mm
800/4	800 kg/cm^2	4	2 + 2 mm	9 mm	13,5 kg	630 mm

* Recomended minimal pulley diameter (60 - 100% use of breaking load).

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PVC elevator belting

PVC elevator belts are anti-static. This belt is fulley synthetic and suitable for the food industry according to FDA-EU standards.

These belts are available in different kinds of breaking loads and thicknesses.

PVC (PolyVinylChloride) elevator belts are oil and fat resistant and suitable for the food industry. Belts are cut and punched according to customers specifications.

Technical specifications

PVC	
Production requirement acc.	FDA-EU standards
Anti-static acc.	ISO 284
Pre stretched plies	Polyester
Elongation	max. 1,5%
Covers	PVC 73 ± 5° Shore A
Density of covers	1,20 ± 0,3 gram/cm^3
Temperature resistance	-15 till +80 peak 100 °C

PVC elevator belting

Type of belt	Breaking load	Nr. of inserts	Covers	Thickness	Weight/m^2	Pulley Ø *
315/3	300kg/cm²	3	1,5+0,7 mm	5,2 mm	7,7 kg	250 mm
650/3	650 kg/cm²	3	1,5+0,7 mm	6,8 mm	9,6 kg	400 mm
900/3	900 kg/cm²	3	1,5+0,7 mm	8,7 mm	11,2 kg	500 mm

* Recomended minimal pulley diameter (60 - 100% use of breaking load).

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Bucket bolts

DIN 15237 bucket bolts

Elevator bucket bolts in accordance to DIN 15237 are available in M7, M8, M10, and M12, zinc plated or in stainless steel (A2/A4).

Bucket bolts in accordance to DIN 15237 (in mm)

Bolt-Ø	Length	Head -Ø
M 7	20 - 25 - 30 - 35	24
M 8	20 - 25 - 30 - 35 - 40 - 45 - 50 - 60 - 70	28
M 10	25 - 30 - 35 - 40 - 45 - 50 - 55 - 60 - 70	35
M 12	25 - 30 - 35 - 40 - 45 - 50 - 55 - 60 - 65 - 70	42

Elevator bucket bolts

Small head bucket bolts are available in M6, M7, and M8, zinc plated or in stainless steel.

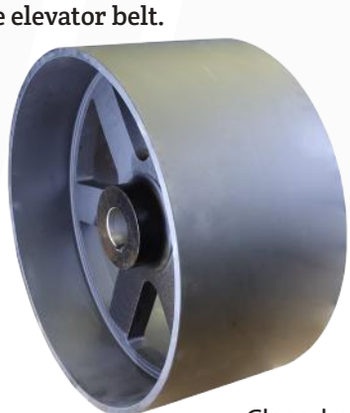
Small head bucket bolts (in mm)

Bolt-Ø	Length	Head -Ø
M 6	15 - 20 - 25 - 30	18
M 7	15 - 17 - 20 - 25 - 30 - 35	21
M 8	20 - 25 - 30 - 35	24

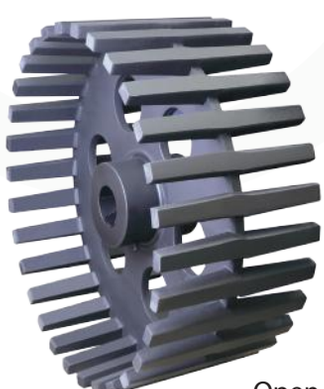
Besides, both versions are standard available in material 4.6, with standard nuts, (nyloc) locknuts, flat or domed washers. Material 6.8 and 8.8 are also available on your request. Special version like Allen key, “Fang” or “Norway” bolts are also available.

Belt pulley

Bechtel supplies both closed and open pulleys, according to your specifications. Made from cast iron or steel. These pulleys are shaped in accordance with DIN 111, for better alignment of your elevator belt. In addition, the pulleys can also be provided with a diamond-shaped rubber lagging, for a better adhesion of the elevator belt.



Closed pulley



Open pulley

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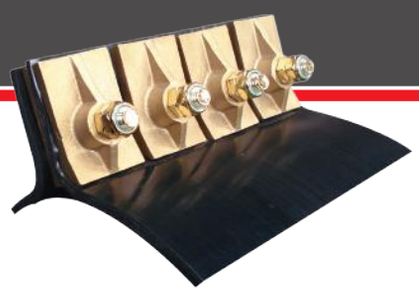
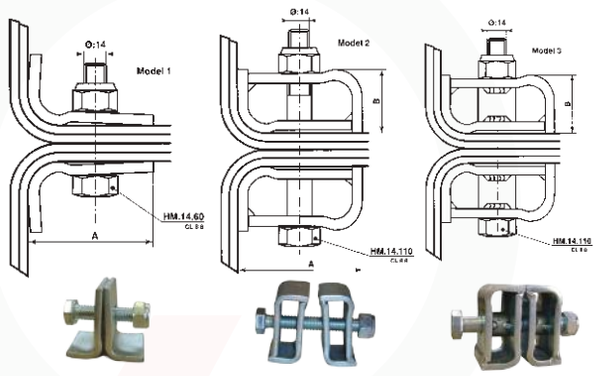


Belt fasteners

Bechtel also supplies the necessary belt fasteners for the assembly of the elevator belts. In various different versions, suitable for all kinds of belts.

Belt fastener models 1, 2 and 3

Parameters models 1, 2 and 3 (in mm)			
	A	B	max. belt load
Model 1	62	32	400 kg/cm
Model 2	68	32	800 kg/cm
Model 3	68	32	1.250 kg/cm



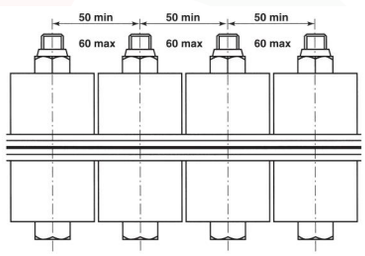
Belt fasteners, Speedy model

3-part belt fastener made of cast iron or bronze, standard width 50 mm, suitable for maximum belt loads of 800 kg/cm.

Speedy type belt fasteners

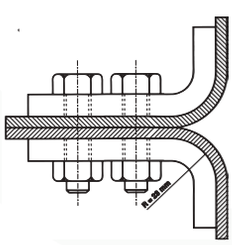
Assembly

Example of the assembly of 4 belt fasteners for belt widths between 200 and 230 mm. The distance between the belt fasteners may be somewhere between 0 and 10 mm.

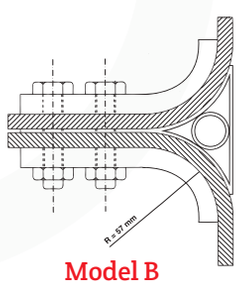


Belt clamps

Belt clamps offer an alternative to the belt fasteners. They are manufactured to your specifications. Two models are available.



Model A



Model B

Model A:

For light to average applications.

Model B:

Belt clamps with a wedge-shaped adaptor to guide the belt over the pulley in conjunction with more demanding applications.

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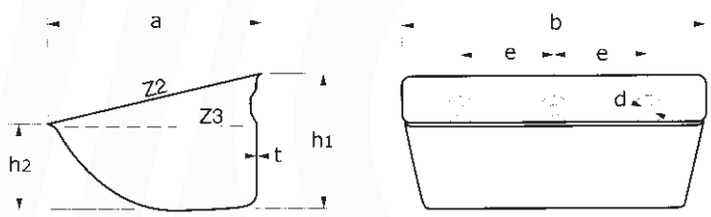
Claus elevator buckets

Claus elevator buckets made of pressed steel (ST37 or stainless steel) are suitable for a variety of different products. The relatively low rear height (h1) of the buckets allows a considerable bucket density (buckets per meter). The low rear height and the relatively large projection guarantee that the Claus bucket easily ejects its product even at high belt speeds. This makes it possible to attain a higher capacity.



Claus elevator buckets made of steel/stainless steel (parameters in mm)

Type	Size/weight						Volume		Holes			Max.
	b	a	h1	h2	t	Kg	Z2	Z3	d	e	no.	bckts/m
C100	106	89	62	36	0,9	0,12	0,29	0,19	8,5	50	2	15,00
C120	126	100	72	49	0,9	0,21	0,55	0,40	8,5	67	2	13,00
C130	138	114	80	54	1,5	0,35	0,61	0,46	8,5	70	2	12,00
C140	145	115	86	49	1,5	0,37	0,85	0,65	9,0	86	2	11,00
C160	165	125	90	59	1,5	0,50	1,15	0,85	8,5	101	2	10,50
C180	185	140	92	56	1,5	0,53	1,29	0,90	8,5	100	2	10,50
C200	205	140	100	67	1,5	0,71	1,75	1,25	11,0	131	2	9,50
C230	238	165	108	68	2,0	1,01	2,25	1,80	11,0	120	2	9,00
C250	255	151	107	70	2,0	1,14	2,60	1,95	11,0	77	3	9,00
C280	289	165	108	68	2,0	1,32	2,91	2,30	11,0	80	3	9,00
C300 x 190	308	190	129	68	2,0	1,43	4,46	3,00	11,0	100	3	7,50
C300 x 215	310	217	140	86	2,0	2,05	5,50	4,00	11,0	100	3	7,14
C330	340	214	130	81	2,0	2,09	5,51	3,92	11,0	120	3	7,14
C350	360	188	134	87	2,0	2,25	5,75	4,40	11,0	90	4	7,14
C370	381	214	130	82	2,0	2,38	6,18	5,10	11,0	90	4	7,14
C400	410	198	142	93	2,0	2,58	7,00	5,00	13,0	100	4	7,00
C450	464	214	130	82	2,5	3,40	8,00	5,59	11,0	90	5	7,14
C500	512	223	160	104	2,5	3,78	11,00	8,00	13,0	100	5	6,00

Z2 = gross volume in liters, Z3 = net volume in liters.

Claus elevator buckets are also available in thicknesses (t) of 2.5 and 3.0 mm.

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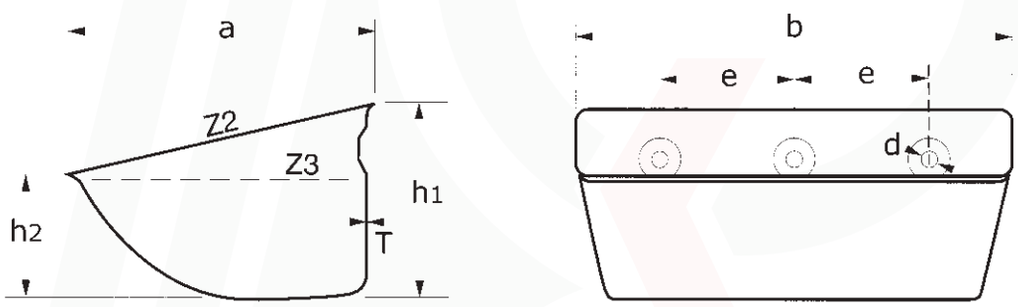
Plastic Claus buckets

Bechtel supplies plastic Claus elevator buckets made of PEHD or nylon ex stock. Besides, PU and zytel are also available. Plastic elevator buckets lend themselves particularly well to the transport of wet, stikky or fatty products. Another advantage is that plastic elevator buckets do not strike a spark even if the belt is misaligned. The PEHD is temperature resistant up to 70 °C. Nylon elevator bucket is temperature resistant up to 90 °C.



Claus elevator buckets made of plastic (parameters in mm)

Type	Size/weight					Volume			Holes			Max.
	b	a	h1	h2	t	Kg-PE	Z2	Z3	d	e	no.	bckts/m
C100 x 90 HDP	109	90	62	39	4,0	0,06	0,30	0,20	8,5	50	2	14,28
C130 x 120 HDP	140	121	81	54	4,7	0,13	0,65	0,50	8,5	70	2	11,11
C150 x 110 HDP	159	113	78	51	5,2	0,17	0,66	0,51	9,0	89	2	12,00
C180 x 140 HDP	190	146	94	56	6,0	0,22	1,25	0,96	9,0	100	2	10,50
C225 x 140 HDP	235	140	94	60	6,0	0,34	1,68	1,29	9,0	120	2	10,50
C230 x 170 HDP	240	173	110	70	6,0	0,43	2,43	1,83	11,0	120	2	9,00
C280 x 170 HDP	290	173	113	72	6,0	0,50	3,00	2,30	11,0	80	3	9,00
C300 x 180 HDP	314	181	124	81	6,0	0,58	4,25	3,15	9,0	100	3	8,13
C330 x 215 HDP	342	220	141	92	8,5	0,93	5,60	4,43	11,0	120	3	7 ,14
C350 x 180 HDP	367	181	130	85	7,0	0,79	5,00	3,65	9,0	90	4	8,13
C370 x 215 HDP	380	218	141	90	9,0	1,07	5,84	4,24	11,0	90	4	7,14

Z2 = gross volume in liters, Z3 = net volume in liters.

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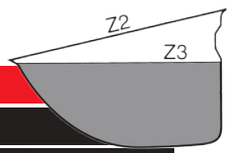
Claus capacity table (Z3)



Net capacity table for steel Claus in m3/h (Z3)

Type	Pro-	Bucket	Number	Belt speed in m/sec								
	jection	volume	bckts/m	1,00	1,50	1,70	1,90	2,20	2,50	2,80	3,15	3,50
C100	88	0,19 L	10	6,84	10,26	11,63	13,00	15,05	17,10	19,15	21,55	23,94
			15	10,26	15,39	17,44	19,49	22,57	25,65	28,73	32,32	35,91
C120	100	0,40 L	9	12,96	19,44	22,03	24,62	28,51	32,40	36,29	40,82	45,36
			13	18,72	28,08	31,82	35,57	41,18	46,80	52,42	58,97	65,52
C130	114	0,46 L	9	14,90	22,36	25,34	28,32	32,79	37,26	41,73	46,95	52,16
			12	19,87	29,81	33,78	37,76	43,72	49,68	55,64	62,60	69,55
C140	115	0,65 L	8	18,72	28,08	31,82	35,57	41,18	46,80	52,42	58,97	65,52
			12	28,08	42,12	47,74	53,35	61,78	70,20	78,62	88,45	98,28
C160	125	0,85 L	8	24,48	36,72	41,62	46,51	53,86	61,20	68,54	77,11	85,68
			10,5	32,13	48,20	54,62	61,05	70,69	80,33	89,96	101,21	112,46
C180	140	0,90 L	8	25,92	38,88	44,06	49,25	57,02	64,80	72,58	81,65	90,72
			10,5	34,02	51,03	57,83	64,64	74,84	85,05	95,26	107,16	119,07
C200	140	1,25 L	6	27,00	40,50	45,90	51,30	59,40	67,50	75,60	85,05	94,50
			9,5	42,75	64,13	72,68	81,23	94,05	106,88	119,70	134,66	149,63
C230	165	1,80 L	6	38,88	58,32	66,10	73,87	85,54	97,20	108,86	122,47	136,08
			9	58,32	87,48	99,14	110,81	128,30	145,80	163,30	183,71	204,12
C250	151	1,95 L	6	42,12	63,18	71,60	80,03	92,66	105,30	117,94	132,68	147,42
			9	63,18	94,77	107,41	120,04	139,00	157,95	176,90	199,02	221,13
C280	165	2,30 L	6	49,68	74,52	84,46	94,39	109,30	124,20	139,10	156,49	173,88
			9	74,52	111,78	126,68	141,59	163,94	186,30	208,66	234,74	260,82
C300	190	3,00 L	6	64,80	97,20	110,16	123,12	142,56	162,00	181,44	204,12	226,80
			8,13	87,80	131,71	149,27	166,83	193,17	219,51	245,85	276,58	307,31
C300	217	4,00 L	6	86,40	129,60	146,88	164,16	190,08	216,00	241,92	272,16	302,40
			7,14	102,82	154,22	174,79	195,35	226,20	257,04	287,88	323,87	359,86
C330	214	3,92 L	4	56,45	84,67	95,96	107,25	124,19	141,12	158,05	177,81	197,57
			7,14	100,76	151,14	171,29	191,44	221,67	251,90	282,13	317,39	352,66
C350	188	4,40 L	5	79,20	118,80	134,64	150,48	174,24	198,00	221,76	249,48	277,20
			7,14	113,10	169,65	192,27	214,89	248,81	282,74	316,67	356,26	395,84
C370	214	5,10 L	4	73,44	110,16	124,85	139,54	161,57	183,60	205,63	231,34	257,04
			7,14	131,09	196,64	222,85	249,07	288,40	327,73	367,05	412,93	458,82
C400	198	5,00 L	5	90,00	135,00	153,00	171,00	198,00	225,00	252,00	283,50	315,00
			7	126,00	189,00	214,20	239,40	277,20	315,00	352,80	396,90	441,00
C450	214	5,59 L	4	80,50	120,74	136,84	152,94	177,09	201,24	225,39	253,56	281,74
			7,14	143,69	215,53	244,27	273,00	316,11	359,21	402,32	452,61	502,90
C500	223	8,00 L	4	115,20	172,80	195,84	218,88	253,44	288,00	322,56	362,88	403,20
			6	172,80	259,20	293,76	328,32	380,16	432,00	483,84	544,32	604,80

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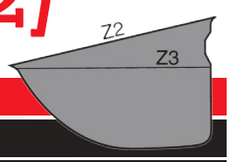
Claus capacity table (Z2)



Gross capacity table for steel Claus in m3/h (Z2)

Type	Pro-	Bucket	Number	Belt speed in m/sec								
	jection	vol. (L)	bckts/m	1,00	1,50	1,70	1,90	2,20	2,50	2,80	3,15	3,50
C100	88	0,29	10	10,44	15,66	17,75	19,84	22,97	26,10	29,23	32,89	36,54
			15	15,66	23,49	26,62	29,75	34,45	39,15	43,85	49,33	54,81
C120	100	0,55	9	17,82	26,73	30,29	33,86	39,20	44,55	49,90	56,13	62,37
			13	25,74	38,61	43,76	48,91	56,63	64,35	72,07	81,08	90,09
C130	114	0,61	9	19,76	29,65	33,60	37,55	43,48	49,41	55,34	62,26	69,17
			12	26,35	39,53	44,80	50,07	57,97	65,88	73,79	83,01	92,23
C140	115	0,85	8	24,48	36,72	41,62	46,51	53,86	61,20	68,54	77,11	85,68
			12	36,72	55,08	62,42	69,77	80,78	91,80	102,82	115,67	128,52
C160	125	1,15	8	33,12	49,68	56,30	62,93	72,86	82,80	92,74	104,33	115,92
			10,5	43,47	65,21	73,90	82,59	95,63	108,68	121,72	136,93	152,15
C180	140	1,29	8	37,15	55,73	63,16	70,59	81,73	92,88	104,03	117,03	130,03
			10,5	48,76	73,14	82,90	92,65	107,28	121,91	136,53	153,60	170,67
C200	140	1,75	6	37,80	56,70	64,26	71,82	83,16	94,50	105,84	119,07	132,30
			9,5	59,85	89,78	101,75	113,72	131,67	149,63	167,58	188,53	209,48
C230	165	2,25	6	48,60	72,90	82,62	92,34	106,92	121,50	136,08	153,09	170,10
			9	72,90	109,35	123,93	138,51	160,38	182,25	204,12	229,64	255,15
C250	151	2,60	6	56,16	84,24	95,47	106,70	123,55	140,40	157,25	176,90	196,56
			9	84,24	126,36	143,21	160,06	185,33	210,60	235,87	265,36	294,84
C280	165	2,91	6	62,86	94,28	106,86	119,43	138,28	157,14	176,00	198,00	220,00
			9	94,28	141,43	160,28	179,14	207,42	235,71	264,00	296,99	329,99
C300	190	4,46	6	96,34	144,50	163,77	183,04	211,94	240,84	269,74	303,46	337,18
			8,13	130,54	195,80	221,91	248,02	287,18	326,34	365,50	411,19	456,87
C300	217	5,50	6	118,80	178,20	201,96	225,72	261,36	297,00	332,64	374,22	415,80
			7,14	141,37	212,06	240,33	268,61	311,02	353,43	395,84	445,32	494,80
C330	214	5,51	4	79,34	119,02	134,88	150,75	174,56	198,36	222,16	249,93	277,70
			7,14	141,63	212,44	240,77	269,10	311,58	354,07	396,56	446,13	495,70
C350	188	5,75	5	103,50	155,25	175,95	196,65	227,70	258,75	289,80	326,03	362,25
			7,14	147,80	221,70	251,26	280,82	325,16	369,50	413,83	465,56	517,29
C370	214	6,18	4	88,99	133,49	151,29	169,08	195,78	222,48	249,18	280,32	311,47
			7,14	158,85	238,28	270,05	301,82	349,47	397,13	444,78	500,38	555,98
C400	198	7,00	5	126,00	189,00	214,20	239,40	277,20	315,00	352,80	396,90	441,00
			7	176,40	264,60	299,88	335,16	388,08	441,00	493,92	555,66	617,40
C450	214	8,00	4	115,20	172,80	195,84	218,88	253,44	288,00	322,56	362,88	403,20
			7,14	205,63	308,45	349,57	390,70	452,39	514,08	575,77	647,74	719,71
C500	223	11,00	4	158,40	237,60	269,28	300,96	348,48	396,00	443,52	498,96	554,40
			6	237,60	356,40	403,92	451,44	522,72	594,00	665,28	748,44	831,60

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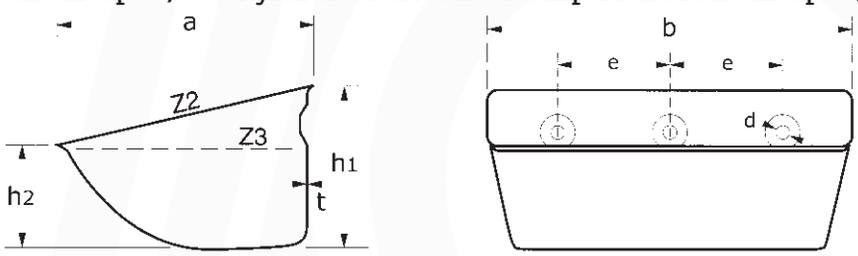
Super Claus plastic

The Super Claus buckets are deeper than the 'regular' Claus buckets, although they are equally suitable for elevators with higher belt speeds. This elevator bucket lends itself particularly well to light-weight and/or wet materials. Bechtel supplies the Super Claus in pressed mild steel, stainless steel, PEHD or Nylon. Materials PU and Zytel or with a customized hole pattern are available on request. The PHED is temperature resistant up to 70 °C. Nylon elevator bucket is temperature resistant up to 90 °C.



Super Claus elevator buckets made of plastic PEHD/Nylon (parameters in mm)

Type	Size /Weight					PE	Nylon	Volume		Holes			Max.
	b	a	h1	h2	t	kg	kg	Z2	Z3	dØ	e	Nr	Bckt/m
SPC80 x 80	90	85	63	43	4	0,08	0,09	0,24	0,18	9,0	43	2	15,00
SPC100 x 90	110	100	67	44	5	0,11	0,13	0,38	0,29	9,0	50	2	14,00
SPC120 x 100	129	110	80	55	5	0,15	0,18	0,59	0,46	9,0	67	2	12,00
SPC130 x 120	135	120	85	57	5	0,19	0,23	0,70	0,54	9,0	70	2	11,00
SPC130 x 130	146	130	90	60	5	0,21	0,25	0,87	0,65	9,0	70	2	10,80
SPC140 x 120	145	120	90	62	5	0,18	0,22	0,80	0,61	8,5	70	2	10,80
SPC160 x 140	172	152	113	78	6	0,34	0,40	1,58	1,22	9,0	100	2	8,60
SPC180 x 140	187	150	112	77	6	0,30	0,36	1,75	1,37	9,0	100	2	8,60
SPC200 x 150	205	150	112	75	6	0,35	0,42	1,82	1,39	9,0	100	2	8,60
SPC200 x 160	210	158	115	79	7	0,39	0,46	2,09	1,61	9,0	100	2	8,50
SPC230 x 170	240	175	138	93	7	0,61	0,73	3,06	2,40	11,0	120	2	7,00
SPC240 x 165	250	170	132	93	7	0,54	0,64	3,10	2,40	11,0	120	2	7,40
SPC280 x 165	293	170	132	95	7	0,67	0,79	3,75	3,00	11,0	80	3	7,40
SPC280 x 170	282	175	138	97	7	0,67	0,80	3,76	2,96	11,0	80	3	7,00
SPC280 x 180	290	185	140	97	7	0,84	1,00	4,20	3,30	11,0	80	3	7,00
SPC300 x 150	305	152	115	80	7	0,65	0,77	2,89	2,24	9,0	102	3	8,50
SPC300 x 180	316	185	140	97	8	0,85	1,01	4,60	3,60	11,0	100	3	7,00
SPC300 x 215	318	220	168	117	9	1,18	1,40	6,60	5,20	11,0	100	3	5,88
SPC330 x 180	347	185	140	97	8	0,90	1,07	5,00	4,00	11,0	120	3	7,00
SPC330 x 215	343	220	168	117	9	1,30	1,55	7,10	5,73	11,0	120	3	5,88
SPC350 x 180	367	186	140	97	9	1,12	1,33	5,25	4,10	11,0	120	3	7,00
SPC350 x 215	368	220	168	117	9	1,38	1,64	7,75	6,12	11,0	120	3	5,88
SPC370 x 215	390	220	168	117	9	1,45	1,72	8,15	6,42	11,0	90	4	5,88
SPC400 x 215	420	220	168	117	9	1,54	1,83	8,80	7,00	11,0	100	4	5,88
SPC450 x 215	470	220	165	115	9	1,56	2,06	9,70	7,70	11,0	90	5	5,88
SPC500 x 215	525	220	168	117	9	1,84	2,19	11,25	9,00	11,0	100	5	5,88

Z2 = gross volume in liters, Z3 = net volume in liters.

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Super Claus Stahl

Super Starco elevator buckets in mild steel/stainless steel (parameters in mm)												
Type	Size / Weight						Volume (L)		Holes			Max.
	b	a	h1	h2	t	Kg	Z2	Z3	d	e	Nr	Bckts/m
SPC80 x 80	85	80	58	39	1,0	0,11	0,21	0,18	8,0	43	2	15,00
SPC100 x 90	106	89	66	45	1,0	0,12	0,33	0,25	8,5	50	2	14,00
SPC100 x 100	105	97	78	46	1,0	0,18	0,42	0,29	8,5	50	2	12,00
SPC120 x 100	125	105	77	53	1,0	0,22	0,58	0,44	8,0	67	2	12,00
SPC130 x 120	138	120	90	62	1,2	0,30	0,83	0,65	8,5	70	2	10,50
SPC140 x 110	146	112	91	40	1,5	0,43	0,76	0,41	8,5	70	2	10,50
SPC140 x 120	146	120	90	62	1,5	0,40	0,87	0,65	8,5	70	2	10,50
SPC160 x 125	166	125	112	78	1,5	0,55	1,44	1,20	8,5	100	2	8,60
SPC180 x 140	187	147	112	78	1,5	0,61	1,75	1,35	8,5	100	2	8,60
SPC200 x 150	205	150	112	77	1,5	0,77	2,00	1,53	9,0	100	2	8,60
SPC200 x 180	204	182	140	98	2,0	1,28	2,84	2,17	11,0	110	2	7,00
SPC230 x 160B	233	160	122	85	1,5	0,86	2,72	2,05	10,5	120	2	8,00
SPC230 x 170	235	170	132	93	2,0	1,40	3,09	2,40	11,0	120	2	7,00
SPC240 x 160C	247	165	130	92	2,0	1,35	3,03	2,37	10,5	120	2	7,40
SPC250 x 215	257	215	162	113	2,0	1,86	5,30	4,10	11,0	85	3	5,88
SPC260 x 165	262	165	130	92	2,0	1,38	3,28	2,55	10,5	77	3	7,40
SPC260 x 180	270	188	140	96	2,0	2,00	4,10	3,20	11,0	80	3	7,00
SPC280 x 165	289	167	132	93	2,0	1,55	3,78	2,95	10,5	80	3	7,40
SPC280 x 180	290	185	140	97	2,0	1,70	4,40	3,30	11,0	80	3	7,00
SPC280 x 215	294	215	163	114	2,0	2,18	6,04	4,70	11,0	80	3	5,88
SPC300 x 165B	308	165	135	94	2,0	1,65	3,88	2,90	11,0	100	3	7,20
SPC300 x 180B	308	182	140	95	2,0	1,80	4,50	3,50	11,0	100	3	7,00
SPC300 x 215	310	220	163	112	2,0	2,32	6,70	5,20	11,0	100	3	5,88
SPC330 x 165	340	165	135	97	2,0	1,90	4,40	3,50	11,0	120	3	7,20
SPC330 x 180	340	182	140	98	2,0	2,00	5,20	4,00	11,0	120	3	7,00
SPC330 x 215	340	215	163	112	2,5	2,97	7,20	5,65	11,0	120	3	5,88
SPC350 x 165B	360	165	135	94	2,0	2,12	4,50	3,65	11,0	120	3	7,20
SPC350 x 180	362	182	140	98	2,0	2,10	5,40	4,20	11,0	120	3	7,00
SPC350 x 215	362	215	163	112	2,5	3,23	7,60	5,86	11,0	120	3	5,88
SPC370 x 180	385	195	140	95	2,5	2,80	6,40	4,90	11,0	90	4	7,00
SPC370 x 215	381	215	163	112	2,5	3,32	8,10	6,30	11,0	90	4	5,88
SPC440 x 215	450	225	165	113	2,5	3,92	9,83	7,44	11,0	110	4	5,88
SPC450 x 215	464	215	163	113	2,5	4,00	9,95	7,90	11,0	90	5	5,88
SPC470 x 215	480	225	165	113	2,5	4,14	10,56	8,06	11,0	120	4	5,88
SPC500 x 215	515	215	163	113	2,5	4,28	11,25	8,80	11,0	100	5	5,88
SPC630 x 215	640	220	164	113	3,0	7,40	14,29	10,92	11,0	90	7	5,88

Z2 = gross volume in liters, Z3 = net volume in liters.

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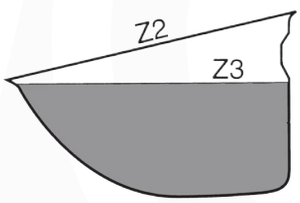
Super Starco capacity table (Z3)

The following capacity table is based on the maximum number of buckets per meter and a net volume in liters of the elevator bucket, resulting in a capacity in m3 per hour.



Net Starco capacity table in m3/hour (Z3)

Type	Number	Net (Z3)	Belt speed in m/sec.					
	bckts/m	volume	1	1,9	2,2	2,5	2,8	3,3
SPC100 x 90	14,00	0,25 L	12,60	23,94	27,72	31,50	35,28	41,58
SPC130 x 120	10,50	0,65 L	24,57	46,68	54,05	61,43	68,80	81,08
SPC160 x 125	8,60	1,20 L	37,15	70,59	81,73	92,88	104,03	122,60
SPC180 x 140	8,60	1,35 L	41,80	79,41	91,95	104,49	117,03	137,93
SPC200 x 150	8,60	1,53 L	47,37	90,00	104,21	118,42	132,63	156,32
SPC230 x 160	8,00	2,05 L	59,04	112,18	129,89	147,60	165,31	194,83
SPC240 x 160	7,40	2,37 L	63,14	119,96	138,90	157,84	176,78	208,35
SPC260 x 165	7,40	2,55 L	67,93	129,07	149,45	169,83	190,21	224,18
SPC280 x 165	7,40	2,95 L	78,59	149,32	172,89	196,47	220,05	259,34
SPC300 x 165	7,20	2,90 L	75,17	142,82	165,37	187,92	210,47	248,05
SPC300 x 180	7,00	3,50 L	88,20	167,58	194,04	220,50	246,96	291,06
SPC300 x 215	5,88	5,20 L	110,07	209,14	242,16	275,18	308,21	363,24
SPC330 x 215	5,88	5,65 L	119,60	227,24	263,12	299,00	334,88	394,68
SPC350 x 165	7,20	3,65 L	94,61	179,76	208,14	236,52	264,90	312,21
SPC370 x 215	5,88	6,30 L	133,36	253,38	293,39	333,40	373,40	440,08
SPC450 x 215	5,88	7,90 L	167,23	317,73	367,90	418,07	468,24	551,85
SPC500 x 215	5,88	8,80 L	186,28	353,93	409,81	465,70	521,58	614,72

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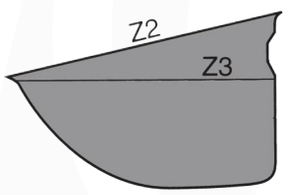
Super Starco capacity table (Z2)

The following capacity table is based on the maximum number of buckets per meter and a gross volume in liters of the elevator bucket, resulting in a capacity in m3 per hour.



Gross Super Starco capacity table (Zone 2)

Type	number	gross(Z2)	Belt speed in m/sec.					
	buckets/m	volume	1	1,9	2,2	2,5	2,8	3,3
SPC100 x 90	14,00	0,33 L	16,63	31,60	36,59	41,58	46,57	54,89
SPC130 x 120	10,50	0,83 L	31,37	59,61	69,02	78,44	87,85	103,53
SPC160 x 125	8,60	1,44 L	44,58	84,71	98,08	111,46	124,83	147,12
SPC180 x 140	8,60	1,75 L	54,18	102,94	119,20	135,45	151,70	178,79
SPC200 x 150	8,60	2,00 L	61,92	117,65	136,22	154,80	173,38	204,34
SPC230 x 160	8,00	2,72 L	78,34	148,84	172,34	195,84	219,34	258,51
SPC240 x 160	7,40	3,03 L	80,72	153,37	177,58	201,80	226,01	266,37
SPC260 x 165	7,40	3,28 L	87,38	166,02	192,23	218,45	244,66	288,35
SPC280 x 165	7,40	3,78 L	100,70	191,33	221,54	251,75	281,96	332,31
SPC300 x 165	7,20	3,88 L	100,57	191,08	221,25	251,42	281,59	331,88
SPC300 x 180	7,00	4,50 L	113,40	215,46	249,48	283,50	317,52	374,22
SPC300 x 215	5,88	6,70 L	141,83	269,47	312,02	354,56	397,11	468,02
SPC330 x 215	5,88	7,20 L	152,41	289,58	335,30	381,02	426,75	502,95
SPC350 x 165	7,20	4,50 L	116,64	221,62	256,61	291,60	326,59	384,91
SPC370 x 215	5,88	8,10 L	171,46	325,78	377,21	428,65	480,09	565,82
SPC450 x 215	5,88	9,95 L	210,62	400,18	463,37	526,55	589,74	695,05
SPC500 x 215	5,88	11,25 L	238,14	452,47	523,91	595,35	666,79	785,86

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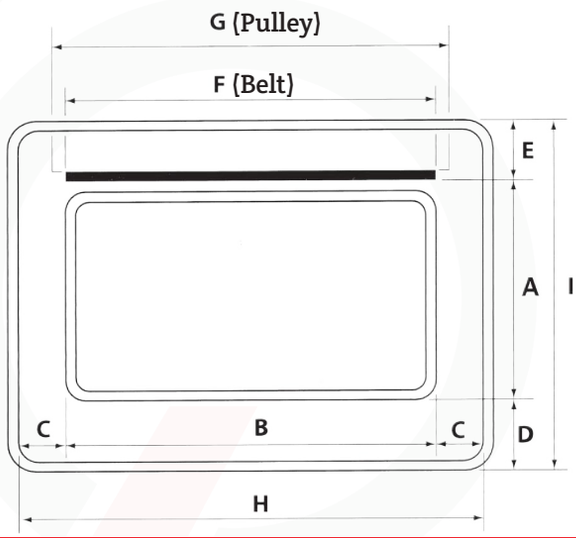
Basic size Claus

The following tables show the basic sizes of elevators with Claus resp. Super Claus elevator buckets.
These sizes are minimum parameters.



Elevator shaft sizes for steel Starco elevator buckets*

Type	A	B	C	D	E	F	G	H	I
100	89	106	40	35	40	120	140	200	163
120	100	126	40	40	42	140	160	220	182
130	114	138	40	40	45	150	170	230	199
140	115	145	40	40	45	160	180	240	200
160	125	165	40	40	45	180	200	245	210
180	140	185	40	40	45	200	220	280	235
200	140	205	40	40	55	220	240	300	235
230	165	238	45	50	55	250	270	340	270
250	151	255	45	50	55	270	290	3.60	256
280	165	289	45	50	55	300	320	390	270
300	190	310	45	50	55	320	340	430	295
330	214	340	70	70	70	350	420	490	354
350	188	360	70	70	70	380	450	520	328
370	214	381	70	70	70	400	470	540	354
400	198	410	70	70	70	450	500	590	338
450	214	464	70	70	70	500	570	640	354

*These are guidelines for a steel Starco elevator bucket including intermediate dimensions.
The sizes C to F can also be used for plastic Starco and / or Super Starco elevator buckets.

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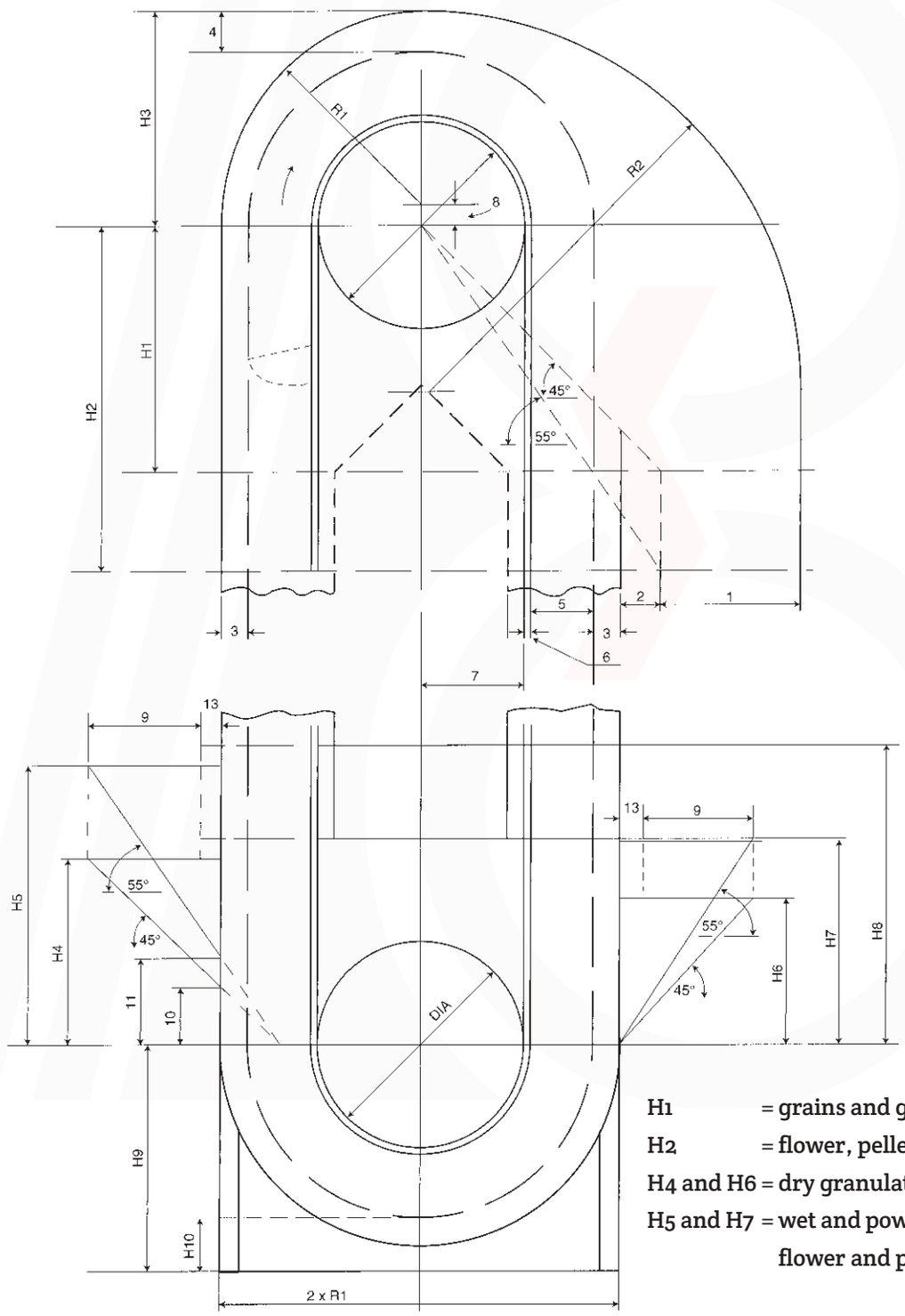
Basic size Claus

Basic parameters of an elevator with Claus resp. Super Claus elevator buckets. The elevator head and foot sizes may be calculated using the mentioned equations and tables. For lifting heights between 31 and 70 meters, parameter 3 must be increased by 1/3.



H1 = grains and granules
H2 = flower, pellets, and powders
H4 and H6 = dry granulates
H5 and H7 = wet and powder products, flower and pellets.

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Basic size Claus

The elevator head and foot sizes may be calculated using the following equations. The next page shows the corresponding elevator drawing.

Basic sizes for the elevator head and foot with Claus resp. Super Claus elevator buckets

Elevator head sizes		
7	=	$\frac{\text{Pulley diameter}}{2}$
R1	=	3 + 5 + 6 + 7
R2	=	R1 + 1 + 2
H1	=	R1 + 2
H2	=	1,43 x (R1 + 2)
8	=	7 + 6 + 5 + 4 - R1
H3	=	8 + R1

H4	=	9 + 13 + 10
H5	=	1,43 x (9 + 13) + 11
H6	=	9 + 13
H7	=	1,43 x (9 + 13)
H8	= 1)	50 mm + H4 or H5
	2)	7 + 2/3 of the pulley diameter + 25mm (The highest number of 1 or 2 is to be used)
H9	=	50 mm + 7 + 6 + 5 + 1/3 of the pulley diameter to be added
H10	=	50 mm + 1/3 pulley diameter under

Sizes of the elevator head and foot for steel elevator buckets (parameters in mm)

Steel	1	2	3	4	5	6	9	10	11	12	13
C100- 90	250	100	40	100	89	8	200	85	110	40	50
C130-120	250	100	40	100	120	8	200	100	125	45	50
C140-120	300	100	40	100	120	8	250	100	125	45	50
C160-140	350	100	45	100	147	8	300	115	140	45	50
C180-140	400	100	45	100	147	8	350	115	140	45	50
C200-150	400	100	50	125	150	8	350	125	150	55	50
C230-160	450	100	50	125	165	10	400	130	160	55	50
C240-160	450	125	50	125	165	10	400	130	160	55	50
C260-165	500	125	50	130	165	10	450	130	160	55	50
C280-165	500	125	50	130	165	10	450	130	160	55	50
C300-165	500	125	50	150	165	10	450	130	160	55	50
C350-165	500	125	50	150	165	10	450	130	160	55	50
C300-180	550	125	50	150	182	10	500	140	170	55	50
C300-215	700	150	70	180	215	10	650	170	200	70	50
C330-215	700	150	70	180	215	10	650	170	200	70	60
C350-215	700	150	70	180	215	10	650	170	200	70	60
C370-215	750	150	70	180	215	10	700	170	200	70	60
C450-215	850	150	70	180	215	10	800	170	200	70	60

Sizes of the elevator head and foot for plastic elevator buckets (parameters in mm)

Plastic	1	2	3	4	5	6	9	10	11	12	13
C100-90	250	100	40	100	90	8	200	85	110	45	50
C130-120	250	100	40	100	121	8	200	100	125	45	50
C140-120	300	100	40	100	120	8	250	100	125	45	50
C150-110	350	100	45	100	113	8	300	115	140	45	50
C180-140	400	100	45	100	146	8	350	115	140	45	50
CPC200-150	400	100	50	125	150	8	350	125	150	55	50
C225-140	450	100	50	125	140	10	400	115	140	55	50
C230-170	450	100	50	125	173	10	400	130	160	55	50
C280-170	500	100	50	130	173	10	450	130	160	55	50
C300-180	550	125	50	150	181	10	500	140	170	55	50
C350-180	600	125	50	150	181	10	550	140	170	55	50
C330-215	700	150	70	180	222	10	650	170	200	70	60
C370-215	750	150	70	180	218	10	700	170	200	70	60

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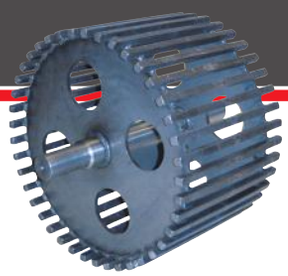

Pulleys for Claus

The following table shows the pulley diameters for the Claus bucket type. The table also lists the corresponding minimum and maximum belt speeds for Claus buckets.

Pulleys for Claus elevator buckets (parameters in mm)			
Type Claus	Pulley diameter	Minimum speed (m/s)	Maximum speed (m/s)
C100 - C120	250	1,45	3,05
	300	1,58	3,32
C130 - C140	300	1,42	3,00
	400	1,61	3,39
C160 - C200	400	1,50	3,15
	500	1,62	3,41
	630	1,76	3,70
	750	1,86	3,91
	800	1,89	3,98
	900	1,96	4,11
	1.000	2,00	4,21
C230 - C300	500	1,53	3,22
	630	1,67	3,52
	750	1,77	3,73
	800	1,80	3,80
	900	1,88	3,94
	1.000	1,92	4,04
	1.250	2,03	4,27
	1.500	2,12	4,45
	1.800	2,20	4,60
C330 - C370	630	1,53	3,22
	750	1,64	3,44
	800	1,67	3,52
	900	1,75	3,68
	1.000	1,80	3,80
	1.250	1,93	4,05
	1.500	2,00	4,24
	1.800	2,10	4,40
	2.000	2,14	4,50
C330 - C630	800	1,56	3,28
	900	1,63	3,43
	1.000	1,70	3,57
	1.250	1,82	3,84
	1.500	1,92	4,04
	1.800	2,00	4,23
	2.000	2,06	4,33
	2.500	2,15	4,52

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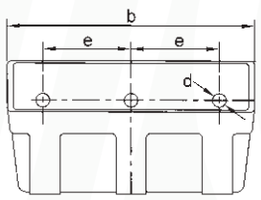
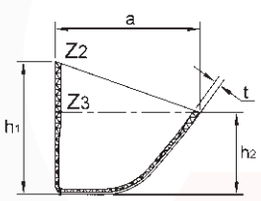
D type plastic buckets

This durable elevator bucket has standard reinforcements on front lip and side walls. This version also has a large volume. The D-type buckets are robust and thus highly suitable for raw materials as well as other industrial applications. Available in HDPE and nylon.





Plastic elevator buckets type D (parameters in mm)

Type		Size/weight						Volume		Max.
		b	a	h1	h2	t	Kg PE	Z2	Z3	bckts/m
D	4 x 3	107	81	75	51	5,00	0,078	0,32	0,25	10,0
D	5 x 4	133	113	106	65	6,50	0,165	0,85	0,59	7,0
D	6 x 4	159	108	103	67	6,50	0,185	0,87	0,65	7,2
D	7 x 4	184	108	103	67	6,50	0,205	1,04	0,75	7,2
D	6 x 5	168	140	130	80	6,50	0,320	1,48	1,10	5,7
D	7 x 5	192	140	130	80	6,50	0,355	1,73	1,20	5,7
D	8 x 5	211	140	130	80	6,50	0,385	1,92	1,41	5,7
D	8 x 6	211	168	154	95	7,50	0,530	2,83	2,08	4,9
D	9 x 5	237	140	130	80	7,00	0,475	2,41	1,75	5,7
D	9 x 6	237	168	154	95	7,25	0,560	3,23	2,34	4,9
D	10 x 6	266	168	154	95	7,25	0,588	3,62	2,58	4,9
D	11 x 5	289	140	130	80	7,00	0,540	2,75	2,01	5,7
D	11 x 6	287	168	154	95	7,25	0,645	4,01	2,83	4,9
D	12 x 6	313	168	154	95	7,50	0,760	4,44	3,16	4,9
D	13 x 6	338	168	154	95	7,25	0,735	4,74	3,44	4,9
D	11 x 7	287	197	180	114	8,00	0,935	5,39	3,95	4,2
D	12 x 7	326	197	180	127	8,00	1,010	5,81	4,35	4,2
D	13 x 7	343	197	180	127	8,00	1,130	6,52	5,07	4,2
D	14 x 7	373	197	180	114	8,00	1,110	6,90	5,22	4,2
D	15 x 7	392	197	180	127	9,00	1,305	7,61	6,07	4,2
D	16 x 7	427	197	180	127	9,00	1,230	7,94	6,32	4,2
D	12 x 8	331	222	206	143	10,00	1,445	7,45	5,77	3,6
D	14 x 8	378	222	206	143	10,00	1,550	8,76	6,87	3,6
D	15 x 8	392	222	206	143	10,00	1,555	9,47	7,94	3,6
D	16 x 8	434	222	206	143	10,00	1,740	10,38	8,10	3,6
D	18 x 8	473	222	206	143	10,00	1,895	11,50	9,07	3,6
D	20 x 8	520	225	210	150	10,50	2,230	13,11	10,60	3,6

Z2 = gross volume in liters, Z3 = net volume in liters.

These elevator buckets have no holes, but those may be drilled according to the client's specifications.

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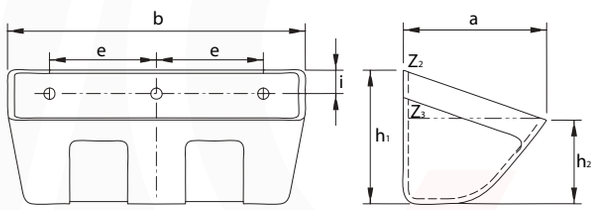
M type plastic buckets

This durable elevator bucket has standard reinforcements on front lip and side walls. This version also has a large volume. The M-type buckets have a optimum discharge level and larger capacity. Ideal for agricultural use. Available in HDPE and nylon.



Plastic elevator buckets type D (parameters in mm)

Type	Size/weight						Volume		Max.
	b	a	h1	h2	t	Kg PE	Z2	Z3	bckts/m
M4 x 3	105	95	67	45	5	0,080	0,33	0,25	14,00
M5 x 4	138	120	90	52	6	0,160	0,70	0,50	11,00
M7 x 5	186	150	110	85	6	0,290	1,75	1,35	8,60
M8 x 5	215	155	110	80	6	0,310	1,98	1,58	8,60
M9 x 6	250	168	132	93	7	0,500	3,00	2,30	7,40
M11 x 5	285	150	110	85	7	0,440	2,60	2,20	8,60
M11 x 6	290	168	132	100	7	0,630	3,50	2,70	7,40
M12 x 8	315	225	168	125	8	1,000	6,50	5,00	5,88
M13 x 8	340	225	168	125	8	1,050	7,10	5,40	5,88
M15 x 8	384	225	168	125	9	1,310	8,10	6,20	5,88
M18 x 8	458	225	168	125	9	1,495	9,80	7,50	5,88
M20 x 8	519	225	168	125	9	1,785	10,76	8,60	5,88

Z2 = gross volume in liters, Z3 = net volume in liters.

These elevator buckets have no holes, but those may be drilled according to the client's specifications.

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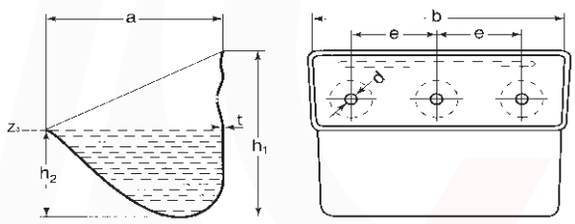
Steel Columbus buckets

The steel Columbus buckets (comparable to DIN15232) are pressed out of one piece, seamless, and are available in ST 37 as well as stainless steel. These buckets are normally equipped with recessed holes. Buckets with other types of holes, or without any holes, are available on demand.



Steel Columbus elevator buckets (parameters in mm)											
Type	Size/weight						Volume	Holes			Max.
	b	a	h1	h2	t	Kg	Z3	d	e	no.	bckts/m
Columbus 80 x 1	80	75	80	40	1,0	0,125	0,16	8,0	43	2	10,00
Columbus 90 x 1	90	80	85	45	1,0	0,155	0,22	8,0	46	2	9,00
Columbus 100 x 1	100	90	91	48	1,0	0,180	0,27	8,0	58	2	8,50
Columbus 110 x 1	110	95	95	50	1,0	0,210	0,32	8,0	64	2	8,00
Columbus 120 x 1	120	100	105	55	1,0	0,250	0,42	8,0	67	2	8,00
Columbus 130 x 1	130	105	110	58	1,0	0,300	0,50	8,0	78	2	7,00
Columbus 140 x 1	140	115	117	63	1,0	0,330	0,63	8,0	86	2	6,50
Columbus 150 x 1	150	125	123	66	1,0	0,360	0,77	8,0	87	2	6,00
Columbus 160 x 1,5	160	125	126	70	1,5	0,570	0,89	8,0	101	2	5,50
Columbus 180 x 1,5	180	130	130	76	1,5	0,670	1,05	9,0	110	2	5,50
Columbus 200 x 1,5	200	140	145	88	1,5	0,840	1,45	9,0	131	2	5,00
Columbus 225 x 1,5	225	145	153	90	1,5	1,010	1,83	9,0	70	3	5,00
Columbus 225 x 2	225	145	153	90	2,0	1,300	1,83	9,0	70	3	5,00
Columbus 250 x 1,5	250	150	158	92	1,5	1,120	2,11	9,0	77	3	5,00
Columbus 250 x 2	250	150	158	92	2,0	1,460	2,11	9,0	77	3	5,00
Columbus 300 x 1,5	300	155	160	95	1,5	1,350	2,84	9,0	104	3	4,50
Columbus 300 x 2	300	155	160	95	2,0	1,740	2,84	9,0	104	3	4,50
Columbus 350 x 1,5	350	180	190	100	1,5	2,000	4,03	11,0	90	4	4,00
Columbus 350 x 2	350	180	190	100	2,0	2,350	4,03	11,0	90	4	4,00
Columbus 400 x 2	400	200	212	112	2,0	3,350	5,60	11,0	100	4	3,00
Columbus 500 x 3	500	224	236	125	3,0	7,200	9,00	14,0	100	5	3,00

Z3 = net volume in liters

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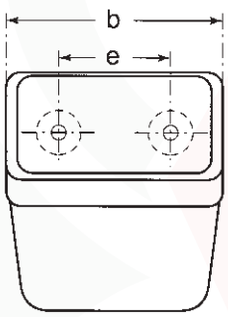
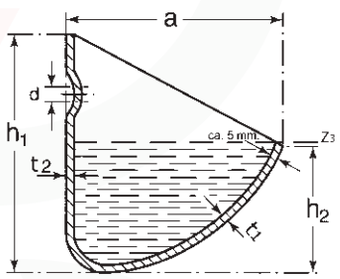
Plastic Columbus buckets

Plastic Columbus elevator buckets, suitable for the transport of wet and sticky materials, are available in two varieties. The white polypropylene version is temperature resistant up to 60 °C. The green nylon plastic Columbus elevator bucket is temperature resistant up to 90 °C. The following table shows the standard sizes of plastic Columbus elevator buckets.





Polypropylene (white) Columbus elevator buckets (parameters in mm)

Type	Size/weight					Volume	Holes			Max.
	b	a	h1	h2	t1 - t2	Kg^{PP}	Z3	d	e	no.	bckts/m
Columbus 80	85	78	79	42	2,0 - 2,0	0,032	0,13	8,0	45	2	10,00
Columbus 100	106	93	96	50	2,0 - 2,0	0,058	0,25	8,0	48	2	8,00
Columbus 120	120	106	104	50	2,5 - 2,5	0,082	0,35	8,0	63	2	8,00
Columbus 140	145	115	120	60	2,5 - 2,5	0,116	0,55	8,0	80	2	6,50
Columbus 160	170	130	135	75	3,0 - 3,0	0,158	0,85	8,0	96	2	5,50
Columbus 180	190	135	140	75	3,0 - 3,0	0,194	1,10	8,0	104	2	5,50
Columbus 200	215	145	145	75	3,0 - 4,0	0,250	1,25	10,0	118	2	5,00
Columbus 250	265	170	168	80	3,5 - 4,0	0,368	2,10	10,0	77	3	4,00
Columbus 315	327	193	196	104	4,0 - 5,0	0,628	3,35	11,0	110	3	4,00

Z3 = net volume in liters

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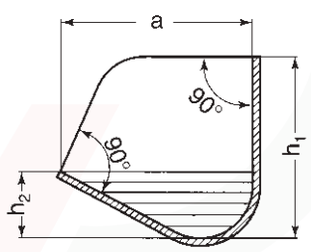
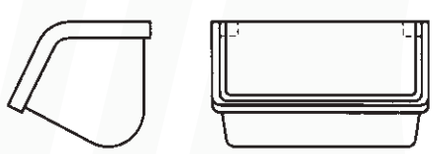
Plate steel elevator buckets

The plate steel elevator buckets come either in a deep or a shallow version. Completely in accordance with DIN 15231, 15232, 15233, and 15234. The correct bucket is selected depending on the product, fine or crude material.These buckets are available in a pressed or welded version and feature recessed holes. Bechtel offers you a selection of various different materials, such as: S235JR, S355J2G3, Hardox 400/500, Creusabro 4800 / 1.3401, Stainless steel 1.4301 / 1.4404 / 1.4571.

The net volumes listed in the tables correspond to the shaded areas in the drawing, if the backside is vertical.



Bucket with front lip reinforcement



Bucket with trilateral edge reinforcement

Plate steel elevator buckets may be strengthened even further with a welded edge reinforcement. Options include a front lip reinforcement or a tri-lateral edge reinforcement.

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Plate steel elevator buckets

DIN 15231

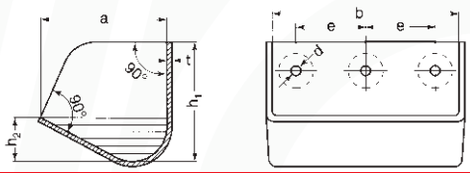

Plate steel elevator buckets in a welded version in accordance with DIN 15231 (parameters in mm)

Shallow buckets, suitable for light-weight goods, such as flower etc.

Type	Size/weight						Volume	Holes			Max.
	b	a	h1	h2	t*	Kg	Z3	d	e	no.	bckts/m
80 x t	80	75	67	24	1,5	0,22	0,10	7,0	40	2	8,00
100 x t	100	90	80	28	1,5	0,33	0,16	7,0	50	2	6,50
125 x t	125	106	95	34	1,5	0,48	0,28	9,5	63	2	5,50
160 x t	160	125	112	40	1,5	0,70	0,50	9,5	80	2	4,50
180 x t	180	135	120	42	1,5	0,80	0,65	11,5	125	2	4,50
200 x t	200	140	125	45	1,5	0,95	0,80	11,5	125	2	4,00
250 x t	250	160	140	50	1,5	1,30	1,25	11,5	80	3	4,00
315 x t	315	180	160	56	1,5	1,80	1,93	11,5	112	3	3,00
400 x t	400	200	180	63	2,0	3,25	3,15	11,5	100	4	3,00
500 x t	500	224	200	71	3,0	6,60	4,84	14,0	100	5	3,00

Z3 = net volume in liters

t* = various different plate thicknesses are possible.

DIN 15232

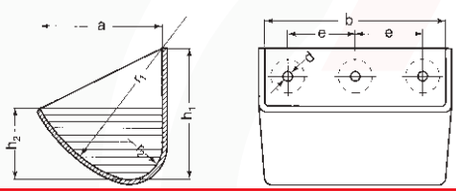

Plate steel elevator buckets in a welded version in accordance with DIN 15232 (parameters in mm)

Deep buckets, suitable for grainy goods, such as grains and seeds, etc.

Type	Size/weight						Volume	Holes			Max.
	b	a	h1	h2	t*	Kg	Z3	d	e	no.	bckts/m
80 x 1	80	75	80	43	1,5	0,24	0,17	7,0	40	2	10,00
100 x t	100	90	95	50	1,5	0,36	0,30	7,0	50	2	8,50
125 x t	125	106	112	60	1,5	0,51	0,53	9,5	63	2	7,00
160 x t	160	125	132	71	1,5	0,75	0,90	9,5	80	2	5,50
180 x t	180	130	140	75	1,5	1,00	1,14	11,5	125	2	5,00
200 x t	200	140	150	80	1,5	1,20	1,40	11,5	125	2	5,00
250 x t	250	160	170	90	1,5	1,40	2,24	11,5	80	3	5,00
315 x t	315	180	190	100	2,0	2,60	3,55	11,5	112	3	4,00
400 x t	400	200	212	112	2,0	3,55	5,60	11,5	100	4	3,00
500 x t	500	224	236	125	3,0	7,20	9,00	14,0	100	5	3,00
630 x t	630	250	265	140	3,0	13,00	14,00	14,0	100	6	2,50
800 x 4	800	280	300	160	4,0	22,20	23,30	14,0	200	7	2,50

Z3 = net volume in liters

t* = various different plate thicknesses are possible.

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Plate steel elevator buckets

DIN 15233

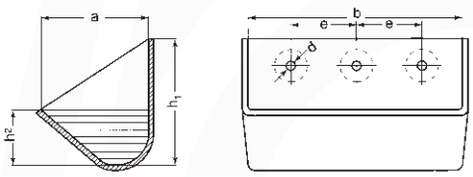

Plate steel elevator buckets in a welded or a pressed version in accordance with DIN 15233 (parameters in mm))

Medium deep buckets, suitable for sticky goods, such as sugar, etc.

Type	Size/weight						Volume	Holes			Max.
	b	a	h1	h2	t*	Kg	Z3	d	e	no.	bckts/m
160 x 140 x t	160	140	160	63	2,0	1,23	0,95	9,5	80	2	4,50
160 x 160 x t	160	160	180	71	2,0	1,44	1,20	9,5	80	2	4,00
200 x 160 x t	200	160	180	71	2,0	1,65	1,50	11,5	125	2	4,00
250 x 180 x t	250	180	200	80	2,0	2,25	2,40	11,5	80	3	4,00
250 x 200 x t	250	200	224	90	2,0	2,63	3,00	11,5	80	3	3,50
315 x 200 x t	315	200	224	90	3,0	4,55	3,75	11,5	112	3	3,50
400 x 224 x t	400	224	250	100	3,0	6,10	5,90	11,5	100	4	3,00
500 x 250 x t	500	250	280	112	4,0	11,50	9,30	14,0	100	5	3,00
630 x 280 x t	630	280	315	125	4,0	16,10	14,60	14,0	100	6	2,50
800 x 315 x t	800	315	355	140	5,0	27,50	23,30	14,0	200	7	2,50
1000 x 355 x t	1000	355	400	160	5,0	38,20	37,60	14,0	200	9	2,00

Z3 = net volume in liters

t* = various different plate thicknesses are possible.

DIN 15234

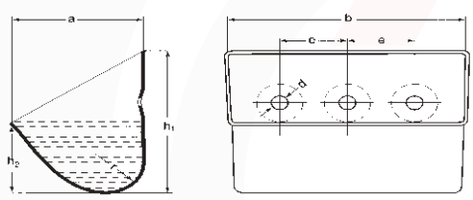

Plate steel elevator buckets in a welded version in accordance with DIN 15234 (parameters in mm)

Deep buckets, suitable for heavy goods, such as cokes, sand, glass, etc.

Type	Size/weight						Volume	Holes			Max.
	b	a	h1	h2	t*	Kg	Z3	d	e	no.	bckts/m
160 x 140 x t	160	140	180	95	2,0	1,38	1,50	9,5	80	2	4,00
160 x 160 x t	160	160	200	106	2,0	1,59	1,90	9,5	80	2	4,00
200 x 160 x t	200	160	200	106	2,0	1,85	2,40	11,5	125	2	4,00
250 x 180 x t	250	180	224	118	2,0	2,49	3,70	11,5	80	3	3,50
250 x 200 x t	250	200	250	132	3,0	4,36	4,60	11,5	80	3	3,00
315 x 200 x t	315	200	250	132	3,0	5,09	5,80	11,5	112	3	3,00
400 x 224 x t	400	224	280	150	3,0	7,03	9,40	11,5	100	4	3,00
500 x 250 x t	500	250	315	170	4,0	12,80	14,90	14,0	100	5	2,50
630 x 280 x t	630	280	355	190	4,0	17,60	23,50	14,0	100	6	2,50
800 x 315 x t	800	315	400	212	5,0	30,60	37,30	14,0	200	7	2,00
1.000 x 355 x t	1.000	355	450	236	5,0	42,00	58,30	14,0	200	9	2,00

Z3 = net volume in liters

t* = various different plate thicknesses are possible.

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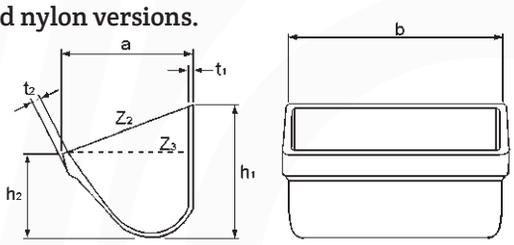
CC-S elevator buckets

The CC-S type is a high-capacity elevator bucket. This bucket, with its extra-thick walls, is exceptionally durable. Available in HDPE and nylon versions.



CC-S elevator buckets (parameters in mm)

Type	Size/weight							Volume		Max.
	b	a	h1	h2	t	t2	Kg	Z2	Z3	bckts/m
CC-S 3x2	85	64	53	35	4,5	6,0	0,05	0,15	0,11	15,75
CC-S 4x3	112	89	78	54	5,0	7,0	0,11	0,39	0,31	11,25
CC-S 5x4	135	115	103	72	5,0	7,5	0,20	0,80	0,58	8,75
CC-S 6x4	161	115	103	72	5,0	7,5	0,23	0,96	0,74	8,75
CC-S 7x4	186	115	103	72	5,0	7,5	0,26	1,13	0,87	8,75
CC-S 6x5	163	141	131	93	6,0	10,5	0,37	1,48	1,15	7,15
CC-S 7x5	189	141	131	93	6,0	10,5	0,41	1,74	1,35	7,15
CC-S 8x5	214	141	131	93	6,0	10,5	0,45	2,00	1,56	7,15
CC-S 9x5	240	141	131	93	6,0	10,5	0,50	2,22	1,71	7,15
CC-S 10x5	265	141	131	93	6,0	10,5	0,54	2,53	1,97	7,15
CC-S 11x5	290	141	131	93	6,0	10,5	0,59	2,78	2,17	7,15
CC-S 12x5	316	141	131	93	6,0	10,5	0,62	3,05	2,38	7,15
CC-S 8x6	213	169	154	109	6,0	12,5	0,56	2,76	2,10	6,00
CC-S 9x6	239	169	154	109	6,0	12,5	0,64	2,95	2,35	6,00
CC-S 10x6	264	169	154	109	6,0	12,5	0,68	3,38	2,75	6,00
CC-S 11x6	289	169	154	109	6,0	12,5	0,72	3,85	3,10	6,00
CC-S 12x6	315	169	154	109	6,0	12,5	0,78	4,30	3,30	6,00
CC-S 13x6	340	169	154	109	6,0	12,5	0,84	4,60	3,60	6,00
CC-S 14x6	365	169	154	109	6,0	12,5	0,90	5,05	3,95	6,00
CC-S 10x7	273	200	180	127	8,0	14,0	1,05	5,12	3,96	5,25
CC-S 11x7	299	200	180	127	8,0	14,0	1,10	5,50	4,30	5,15
CC-S 12x7	324	200	180	127	8,0	14,0	1,20	6,18	4,79	5,25
CC-S 13x7	350	200	180	127	8,0	14,0	1,28	6,71	5,20	5,25
CC-S 14x7	375	200	180	127	8,0	14,0	1,37	7,25	5,62	5,25
CC-S 15x7	400	200	180	127	8,6	14,0	1,45	7,76	6,03	5,25
CC-S 16x7	426	200	180	127	8,0	14,0	1,53	8,30	6,44	5,25
CC-S 10x8	275	228	210	149	10,0	15,0	1,44	6,66	5,19	4,60
CC-S 11x8	300	228	210	149	10,0	15,0	1,55	7,35	5,73	4,60
CC-S 12x8	326	228	210	149	10,0	15,0	1,66	8,07	6,29	4,60
CC-S 13x8	351	228	210	149	10,0	15,0	1,76	8,75	6,83	4,60
CC-S 14x8	377	228	210	149	10,0	15,0	1,88	9,47	7,40	4,60
CC-S 15x8	402	228	210	149	10,0	15,0	1,97	10,16	7,94	4,60
CC-S 16x8	427	228	210	149	10,0	15,0	2,05	10,85	8,48	4,60
CC-S 18x8	479	228	210	149	10,0	15,0	2,30	12,28	9,61	4,60
CC-S 20x8	529	228	210	149	10,0	15,0	2,50	13,65	10,70	4,60

Z2 = gross volume in liters, Z3 = net volume in liters.

These elevator buckets have no holes, but those may be drilled according to the client's specifications.

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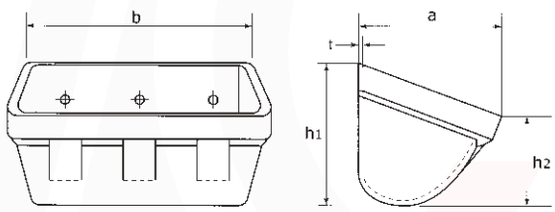
Atlas elevator buckets

The Atlas industrial elevator buckets, injected into a mold, are made of a very tough and non-abrasive nylon. These buckets are temperature resistant between - 40 °C and + 110 °C. Besides, the Atlas elevator buckets have a trilateral edge reinforcement.



Atlas elevator buckets (parameters in mm)									
Type	Size/weight						Volume		Max.
	b	a	h1	h2	t	Kg	Z2	Z3	bckts/m
AA54TN	134	105	105	74	7,0	0,23	0,74	0,57	7,0
AA64TN	160	105	105	74	7,0	0,27	0,89	0,68	7,0
AA74TN	184	105	105	74	7,0	0,30	1,07	0,84	7,0
AA75TN	180	130	134	93	8,0	0,44	1,55	1,26	5,7
AA85TN	206	130	134	93	8,0	0,50	1,83	1,47	5,7
AA95TN	232	130	134	93	8,0	0,54	2,00	1,66	5,7
AA96TN	238	156	156	108	8,5	0,67	2,80	2,17	5,0
AA106TN	264	156	156	108	8,5	0,73	3,14	2,43	5,0
AA116TN	290	156	156	108	8,5	0,77	3,43	2,68	5,0
AA126TN	320	165	160	108	8,5	0,95	4,10	3,08	5,0
AA127TN/S	305	178	178	98	7,0	0,92	4,10	2,95	4,5
AA127TN	314	180	180	125	9,0	1,13	5,25	4,00	4,5
AA147TN	365	180	180	125	9,0	1,25	6,30	4,89	4,5
AA148TN	365	206	206	142	11,0	1,94	7,60	5,76	4,0
AA168TN	416	206	206	142	12,5	2,10	8,85	6,66	4,0
AA188TN	460	206	206	142	12,5	2,38	10,15	7,66	4,0
AA1810TN	460	258	258	168	12,5	3,60	14,80	11,0	3,0
Atlas elevator buckets black nylon (parameters in mm)									
AD300	361	202	215	111	14,0	1,70	6,75	4,13	3,8
AD400	424	247	286	156	11,0	2,75	14,33	9,00	3,0
AD500	524	274	321	176	12,0	5,03	23,20	15,70	2,7
AD630	654	306	363	198	12,0	8,25	36,00	23,40	2,5

Z2 = gross volume in liters, Z3 = net volume in liters.

The material thickness “t” was measured on the backside of the bucket.

These elevator buckets have no holes, but holes may be drilled according to the customer’s specifications.

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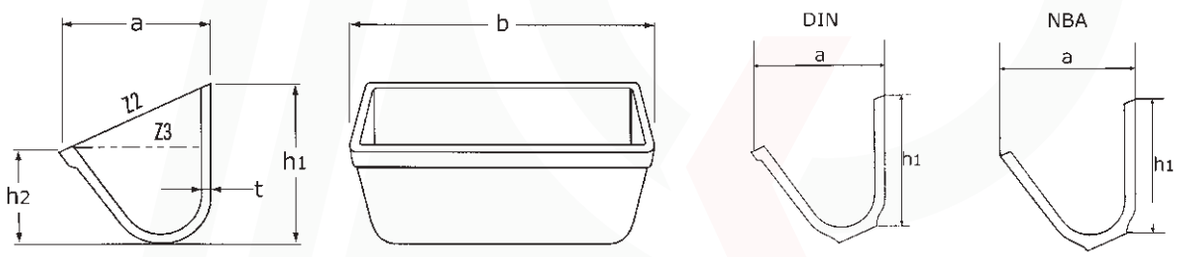
Monocast GSM buckets

Monocast GSM elevator buckets are nylon cast, also containing molybdenum disulfide as an additive. The deep elevator bucket lends itself perfectly to the upward conveyance of glass, shards of glass, cement, sand, and other abrasive products. Two types of these abrasion-resistant elevator buckets are available:

√ NBA series without edge reinforcement
√ DIN series with edge reinforcement, in accordance with DIN 15234.



Monocast GSM elevator buckets NBA series (parameters in mm)									
Type	Size/weight						Volume		Max.
	b	a	h1	h2	t	KG	Z2	Z3	bckts/m
NBA 8	206	111	127	73	8,0	0,59	1,20	0,98	5,6
NBA 10	254	123	141	82	8,0	0,79	1,85	1,44	5,2
NBA 12	318	167	164	93	8,0	1,13	4,50	2,70	5,0
NBA 14	362	179	190	109	8,0	1,53	6,10	4,00	4,1
NBA 15	370	206	223	131	8,0	1,80	8,57	5,76	3,6
NBA 16	413	210	203	113	8,0	1,81	9,30	5,60	4,0
NBA 18	457	198	229	143	8,0	2,50	11,10	7,50	3,5

Monocast GSM elevator buckets DIN series (parameters in mm)									
Type	Size/weight						Volume		Max.
	B	A	H1	H2	T	KG	Z2	Z3	bckts/m
DIN 200/160	224	178	209	109	8,0	1,25	3,65	2,23	4,0
DIN 250/180	274	199	233	121	8,0	1,59	5,60	3,54	3,6
DIN 315/200	339	219	260	135	8,0	2,38	9,90	5,39	3,3
DIN 400/225	426	244	291	153	8,0	3,18	15,20	9,05	3,0
DIN 500/250	526	269	328	176	8,0	4,20	23,92	14,38	2,7
DIN 630/280	656	301	364	193	8,0	5,44	37,20	22,70	2,5
DIN 800/315	830	330	400	212	8,0	9,20	59,00	38,00	2,2
DIN1000/355	1.035	375	450	236	8,0	15,00	95,00	60,00	2,0

Z2 = gross volume in liters, Z3 = net volume in liters.

These elevator buckets have no holes, but those may be drilled according to the client's specifications.

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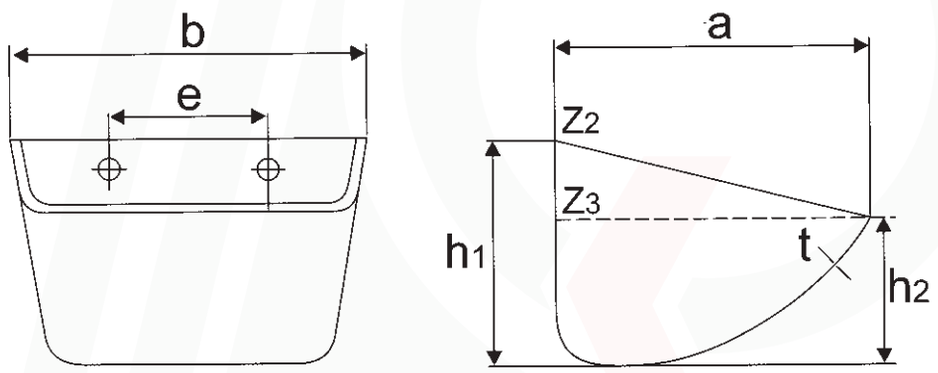
BE type plastic buckets

This durable medium-deep elevator bucket has a large volume and considerable projection. This gives the BE elevator bucket a high capacity. The plastic BE elevator buckets are available in HDPE and nylon.



BE type plastic elevator buckets (parameters in mm)

Type	Size/weight						Volume		Holes			Max.
	b	a	h1	h2	t	Kg	Z2	Z3	d	e	no.	bckts/m
BE130 x 120	138	120	91	59	3,9	0,104	0,80	0,61	7,0	60	2	8,0
BE190 x 140	190	145	115	66	5,8	0,285	1,60	1,20	9,0	100	2	6,0
BE230 x 140	235	140	110	78	6,5	0,335	1,90	1,49	9,0	120	2	6,0
BE240 x 170	248	178	120	82	7,0	0,480	2,60	2,18	9,0	120	2	7,0
BE260 x 160	260	167	144	56	6,0	0,510	2,20	1,25	9,0	80	3	7,0
BE280 x 140	286	140	103	50	6,0	0,373	2,05	1,32	9,0	90	3	8,0
BE280 x 160	290	167	108	55	6,0	0,440	2,50	1,38	9,0	90	3	8,0
BE280 x 170	290	178	120	78	6,0	0,460	3,35	2,50	9,0	90	3	7,0
BE280 x 240	289	244	166	120	6,0	1,020	6,40	5,60	9,0	100	3	4,0
BE330 x 250	339	259	170	110	7,5	1,160	8,50	6,55	9,0	85	4	5,0
BE380 x 230	382	230	165	110	7,6	1,120	8,00	6,00	9,0	100	4	5,0
BE390 x 170	393	170	130	80	7,0	0,750	5,00	3,25	9,0	100	4	6,0
BE440 x 230	447	230	165	110	8,7	1,455	9,20	7,30	9,0	90	5	5,0
BE470 x 230	475	230	164	110	8,3	1,405	10,00	8,10	9,0	95	5	5,0
BE470 x 260	470	260	170	113	9,5	1,710	11,50	9,40	9,0	95	5	5,0
BE560 x 260	569	260	170	114	8,5	1,970	15,00	11,75	11,0	115	5	5,0

Z2 = gross volume in liters, Z3 = net volume in liters.

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B|E|C|H|T|E|L Screw conveyors

Spiral conveyors may be used for horizontal, inclined as well as vertical conveyor purposes covering short distances.

Bechtel supplies a series of components for these purposes, made of various different materials.

- √ Screw conveyor segments
- √ Endless spirals
- √ Shaftless spirals
- √ Mix spirals
- √ Adjustable hanging bearings
- √ Pallets

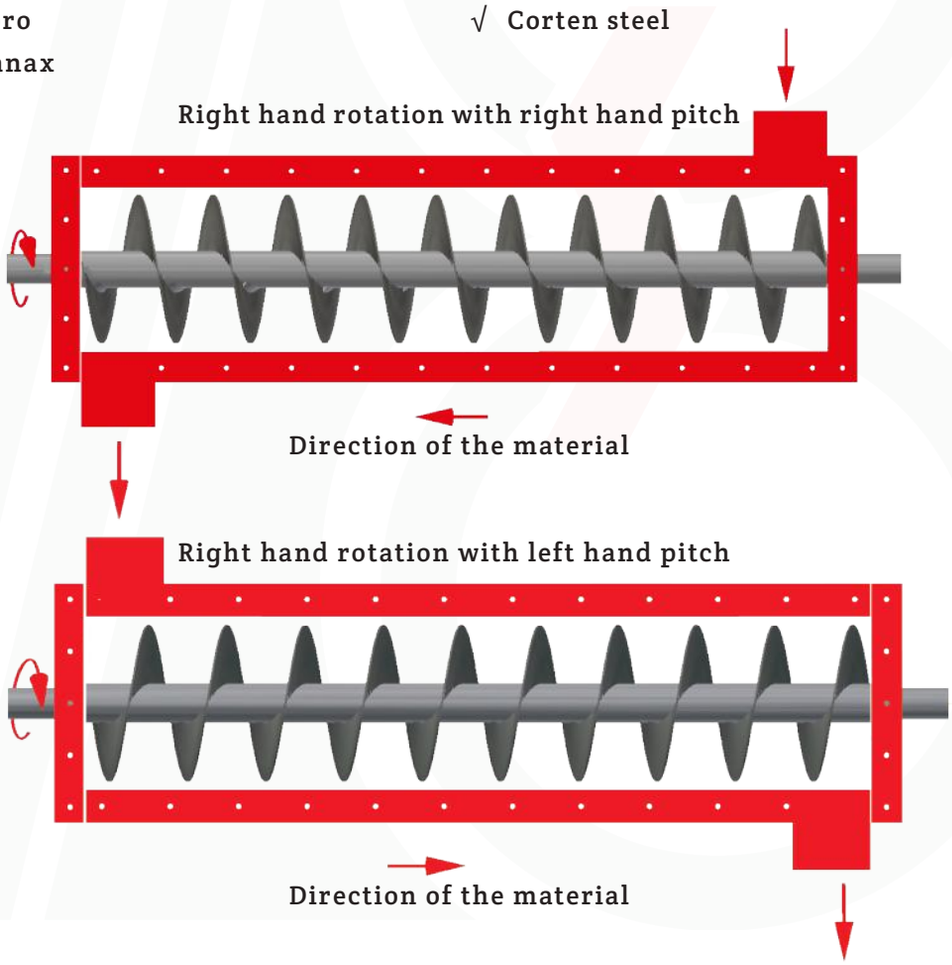
Supplier of spare parts for the international bulkhandling industry

Auger segments

Screw conveyor segments are manufactured to your specifications with a tollerance according to DIN 15261. They are available with an outer diameter between 30 mm and 3.000 mm; the material thickness is between 2 and 40 mm. Any desired pitch is possible. Below please find an example of a screw conveyor segment with a right and a left pitch.

Available in various types of steel such as:

- √ S235JRG2
- √ S355JRG3
- √ HARDOX 400
- √ HARDOX 500
- √ Creusabro
- √ Semi Manax
- √ Stainless steel 304
- √ Stainless steel 316
- √ Stainless steel 316Ti
- √ Stainless steel 316 L
- √ Corten steel



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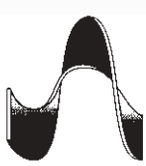
Endless spirals

Endless spirals are rolled out of one single piece. In lengths of 3.000 mm and made of the following materials: S235JRG2 and stainless steel 304, with a left or a right pitch. Due to the rolling process, the thickness of the material at the inner diameter is twice the thickness as on the outside.

Special designs according to customer specifications are possible on request. The following table shows the standard sizes of endless spirals.

Endless spirals (parameters in mm)			
outer diameter	inner diameter	pitch	blade thickness
			inside / outside
80 ± 3	17,2 + 3	80 ± 8	2,5 / 1,2
90 ± 3	25,0 + 3	90 ± 8	2,5 / 1,3
100 ± 3	33,7 + 3	100 ± 10	2,5 / 1,3
120 ± 3	33,7 + 3	120 ± 10	2,5 / 1,3
125 ± 3	33,7 + 3	125 ± 10	2,5 / 1,3
140 ± 3	42,4 + 3	140 ± 10	2,5 / 1,3
150 ± 3	48,3 + 3	150 ± 10	3,0 / 1,6
160 ± 3	48,3 + 3	160 ± 10	3,0 / 1,6
180 ± 3	48,3 + 3	180 ± 10	3,0 / 1,5
180 ± 3	48,3 + 3	180 ± 10	6,0 / 3,0
200 ± 3	48,3 + 3	200 ± 10	3,5 / 1,7
200 ± 3	48,3 + 3	200 ± 10	6,0 / 2,8
200 ± 3	60,3 + 3	200 ± 10	6,0 / 2,8
250 ± 3	60,3 + 3	250 ± 10	4,0 / 2,0
250 ± 3	60,3 + 3	250 ± 10	6,0 / 3,0
300 ± 4	76,1 + 4	300 ± 15	5,0 / 2,5
315 ± 4	76,1 + 4	315 ± 15	5,0 / 2,5
350 ± 4	88,9 + 4	350 ± 15	5,0 / 2,5
400 ± 4	101,6 + 4	400 ± 15	8,0 / 4,0

Additional diameters, shaft sizes, or material thicknesses are available on demand.



Right hand pitch

Left hand pitch

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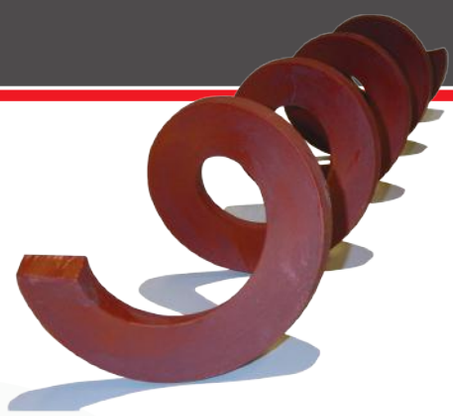

Shaftless spirals

Bechtel supplies shaftless spirals in various lengths (material S355J2G3 or Stainless steel 304). Any desired size between Ø 80 and Ø 700 mm is available in single, double, triple and full sheet versions. Spirals can be used for horizontal, inclined or vertical transport. Suitable for wet, fibrous and sticky material. Bechtel also supplies auxiliary spirals in various sizes. The table below shows the standard sizes of shaftless spirals. Other sizes are available on request.

Shaftless spirals (parameters in mm)

outer diameter	pitch	material height & thickness	Inner spiral
190	140	50 x 20	
190	190	50 x 20	
240	190	60 x 25	30 x 20
240	240	60 x 25	30 x 20
280	220	60 x 25	40 x 20
280	320	60 x 25	40 x 20
320	250	70 x 25	50 x 20
320	320	70 x 25	50 x 20
380	330	70 x 25	50 x 20
380	380	70 x 25	50 x 20
460	360	80 x 25	60 x 20
460	440	80 x 25	60 x 20
530	420	80 x 30	70 x 25
530	530	80 x 30	70 x 25
600	450	80 x 30	80 x 25
600	600	80 x 30	80 x 25

Additional diameters, shaft sizes, or material thicknesses are available on demand.

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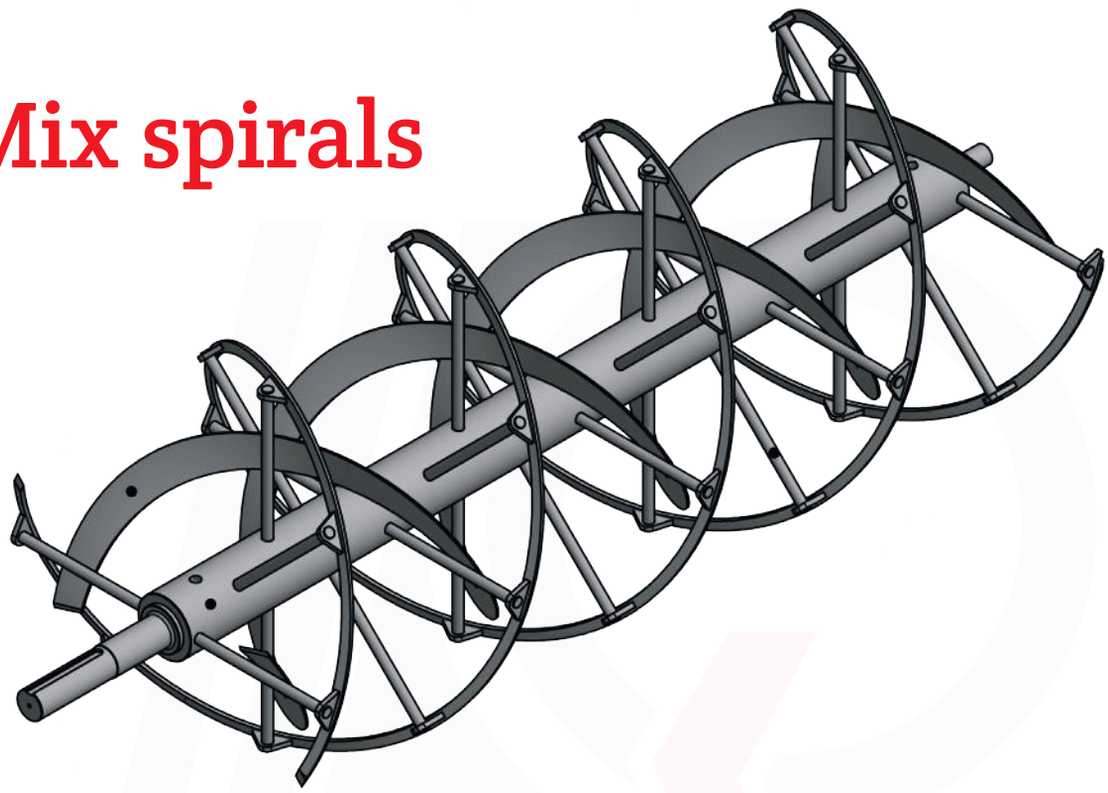
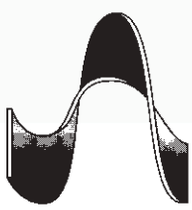
Mix spirals



Mix spirals can be made of sheet material (the following steels):

- √ S235JRG2
- √ S355JRG3
- √ Hardox
- √ Stainless steel

The outer diameter can be produced up to 3.000 mm. Larger diameters are also possible; these are supplied in 180° or 90° segments.



Right hand pitch

Left hand pitch

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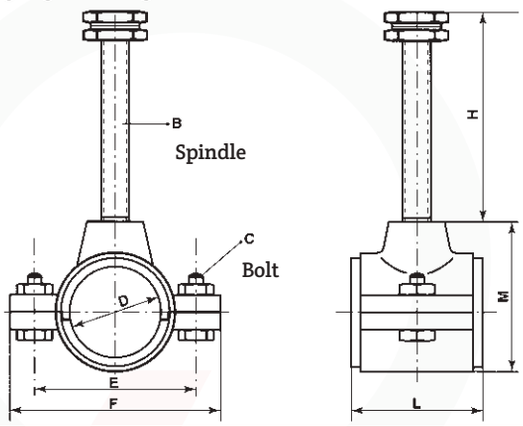
Adjustable hanging bearings

Adjustable hanging bearings from Bechtel are available from stock in shaft sizes 40, 50 and 60 mm. Larger shaft sizes are also available on request. The hanging bearings are made of cast iron, bronze or stainless steel.

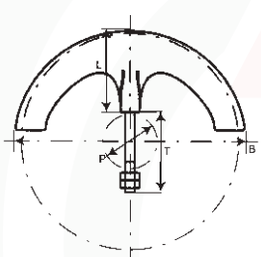
Available with inserts of Nylon, bronze, Teflon, PTFE or acetal. Complete with spindle M24 with a length of 165 - 320 mm. These spindles are equipped with a lubricating channel Ø8 mm with a connection for 1/4 „gas. A galvanized version as standard, but also available in stainless steel.



Adjustable hanging bearings (parameters in mm)

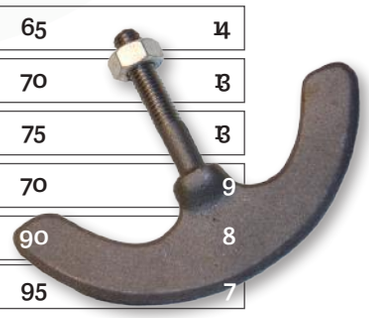
D	F	E	L	M	H	B	C	weight
40	100	70	70	90	135	M 24	M10 x 45	1,9
50	125	94	75	110	200	M 24	M12 x 50	3,3
60	150	120	85	128	240	M 24	M16 x 65	5,0

Palets



Pallets (parameters in mm)

Type	Pallet width	Pallet height	pipe Ø	thread	tapping length	number
		(B)	(L)	(P)	(T)	per meter
100	96	34	43	M 10	45	17
125	128	38	43	M 10	55	17
150	150	55	43	M 10	65	14
180	181	60	50	M 12	70	13
200	215	70	50	M 12	75	13
250	265	95	60	M 14	70	9
300	318	115	60	M 16	90	8
400	407	155	70	M 16	95	7



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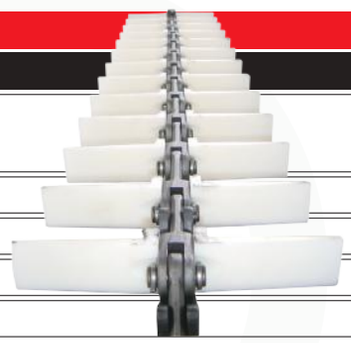
Chain calculations

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)

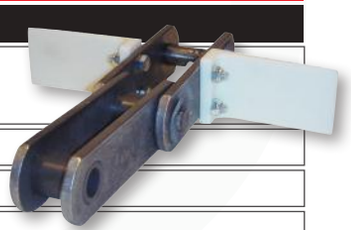
$$\text{Mass-1} = \frac{\text{tons per hour} \times \text{distance in meters}}{v \times 3{,}6}$$

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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Sprocket calculations

PITCH DIAMETER

z = number of teeth, n = chain pitch — Pitch diameter (in mm) = n x pitch of the chain

z	n	z	n	z	n	z	n	z	n
6	2,0000	46	14,6537	86	27,3807	126	40,1112	166	52,8426
7	2,3048	47	14,9717	87	27,6990	127	40,4295	167	53,1609
8	2,6131	48	15,2898	88	28,0172	128	40,7478	168	53,4792
9	2,9238	49	15,6079	89	28,3355	129	41,0660	169	53,7975
10	3,2361	50	15,9260	90	28,6537	130	41,3843	170	54,1158
11	3,5495	51	16,2441	91	28,9720	131	41,7026	171	54,4341
12	3,8637	52	16,5622	92	29,2902	132	42,0290	172	54,7524
13	4,1786	53	16,8803	93	29,6084	133	42,3392	173	55,0707
14	4,4940	54	17,1984	94	29,9267	134	42,6574	174	55,3889
15	4,8097	55	17,5166	95	30,2449	135	42,9757	175	55,7072
16	5,1258	56	17,8347	96	30,5632	136	43,2940	176	56,0255
17	5,4422	57	18,1529	97	30,8815	137	43,6123	177	56,3438
18	5,7588	58	18,4710	98	31,1997	138	43,9306	178	56,6621
19	6,0755	59	18,7892	99	31,5180	139	44,2488	179	56,9804
20	6,3925	60	19,1073	100	31,8362	140	44,5671	180	57,2987
21	6,7095	61	19,4255	101	32,1545	141	44,8854	181	57,6170
22	7,0267	62	19,7437	102	32,4727	142	45,2037	182	57,9353
23	7,3439	63	20,0619	103	32,7910	143	45,5220	183	58,2536
24	7,6613	64	20,3800	104	33,1093	144	45,8402	184	58,5719
25	7,9787	65	20,6982	105	33,4275	145	46,1585	185	58,8902
26	8,2962	66	21,0164	106	33,7458	146	46,4768	186	59,2085
27	8,6138	67	21,3346	107	34,0641	147	45,7951	187	59,5267
28	8,9314	68	21,6528	108	34,3823	148	47,1134	188	59,8450
29	9,2491	69	21,9710	109	34,7006	149	47,4317	189	60,1634
30	9,5668	70	22,2892	110	35,0188	150	47,7500	190	60,4817
31	9,8845	71	22,6074	111	35,3371	151	48,0683	191	60,7999
32	10,2023	72	22,9256	112	35,6554	152	48,3865	192	61,1182
33	10,5201	73	23,2438	113	35,9737	153	48,7048	193	61,4366
34	10,8380	74	23,5620	114	36,2919	154	49,0231	194	61,7549
35	11,1558	75	23,8802	115	36,6102	155	49,3414	195	62,0732
36	11,4737	76	24,1984	116	36,9285	156	49,6597	196	62,3915
37	11,7916	77	24,5167	117	37,2467	157	49,9780	197	62,7097
38	12,1096	78	24,8349	118	37,565	158	50,2963	198	63,0279
39	12,4275	79	25,1531	119	37,8833	159	50,6146	199	63,3464
40	12,7455	80	25,4713	120	38,2015	160	50,9329	200	63,6646
41	13,0635	81	25,7896	121	38,5198	161	51,2511	201	63,9829
42	13,3815	82	26,1078	122	38,8381	162	51,5694	202	64,3012
43	13,6995	83	26,426	123	39,1564	163	51,8877	203	64,6195
44	14,0176	84	26,7443	124	39,4746	164	52,2060	204	64,9378
45	14,3356	85	27,0625	125	39,7929	165	52,5243	205	65,2562

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Elevator calculations

Elevator calculations

Belt speed in m/sec (v)

$$v = \frac{\text{Diameter pulley (m)} \times 3{,}14 \times \text{Rotations per minute}}{60}$$

v	=	belt speed in m per sec

Elevator calculations

Capacity in kg per hour (Q)

$$Q = a \times V \times sg \times v \times 3600 \text{ sec.}$$

Q	=	capacity in kg per hour
a	=	buckets per meter
V	=	bucket volume in liters
sg	=	specific weight of the material (see table)
v	=	belt speed in m per sec (see above equation)

Elevator calculations

Power in Kw (P)

$$P = \frac{Q \times H \times 9{,}81}{3600 \text{ sec.}}$$

P	=	power in Kw
Q	=	capacity in 1000 kg per hour
H	=	conveying height in meters
g	=	gravity 9.81 m/sec2

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Calculations for Screw conveyors

Calculations for screw conveyors

Screw conveyor speed in m per sec

$$v = \frac{\text{Screw diameter (in meters)} \times 3{,}14 \times \text{Rotations per minute}}{60}$$

v	=	speed in m per sec

Calculations for screw conveyors

Capacity in m^2 per hour (Q)

$$Q\ (m^3/h) = 47{,}1 \times \{D^2 - d^2\} \times s \times n \times i$$

Capacity in kg per hour (Q)

$$Q\ (kg/h) = 47{,}1 \times \{D^2 - d^2\} \times s \times n \times i \times sg$$

D	=	screw outside diameter in meter
d	=	screw inner diameter in meter
s	=	pitch in meter
n	=	rotations per minute
sg	=	specific weight of the material (kg/m^3)
i	=	degree of trough filling (eg. 30%: i=0,3)

Calculations for screw conveyors

Power in Kw (P)

$$P = \frac{Q \times L \times K}{3600 \times 102}$$

P	=	power in Kw
Q	=	capacity in 1000 kg per hour
L	=	conveyor screw length (m)
K	=	friction coefficient

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Specific weights

The following specific weights (sw) are frequently used for calculations in conjunction with elevators, screw conveyors, and chain conveyors.

Specific weight (in g/cm3)					
product	sw				
aloin	1,700	earth	1,600	peat	0,410
aluminum	2,800	egg powder	0,250	peat mulch	0,230
amaril	4,000			pit coal	0,860
anthracite	1,700	fish meal	0,900	potatoes, in bulk	0,800
asbestos	2,800	flax seed	0,720	pulp	1,100
ash	0,900	flower, loose	0,500		
		fly ash	1,000	resin	1,070
baking powder	0,900			rye, in bulk	0,780
barley, in bulk	0,690	gaged mortar	1,900		
basalt	3,000	grain	0,750	salt	1,100
bauxite	2,550	granite	2,800	sand	1,600
bitumen	1,500	graphite	2,300	sandstone	2,500
blast furnace slag	2,800			sawdust	0,600
boiler slag	1,000	hard rock	2,700	shale	2,800
brick	1,500	hay	0,120	shingle	1,650
broken stone	1,700	hemp fibers	1,500	soda, heavy	0,900
bronze	8,800	hops	0,560	straw	0,045
brown coal	0,780			sugar	1,600
buckwheat, in bulk	0,810	kitchen salt	2,160		
				talc	2,700
cement	1,600	lime, caustic	1,300	turnips, in bulk	0,650
cement root	2,100	lime mortars	1,700		
chalk	2,600	lime stone	2,800	wheat, in bulk	0,800
charcoal	0,400	lime, slaked	1,400	wool	1,320
clay	1,600	linseed, broken	0,500		
clinkers	2,000	loam	1,600		
coffee, green	0,510				
cokes	0,600	marble	2,700		
concrete	2,400				
cork	0,350	oats, in bulk	0,500		
corn	0,750	ore, crude	2,200		
cottonseeds	0,400	ore, fine	2,800		
domestic waste	0,700				

The above-mentioned specific weights are measured in dry condition.

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General terms of conditions

1. General

1.1These terms and conditions are applicable to all agreements and offers for the supply of goods.

1.2Any agreements that deviate from these terms and conditions bind us only if we have explicitly confirmed them in writing.

1.3General terms and conditions (of purchase) of our client do not apply, unless we have explicitly confirmed this in writing.

2. Offers

2.1All our offers are without obligation and, based on the written information provided to us by our client at the time of the request, are valid for 14 days, unless indicated otherwise.

2.2Unless indicated otherwise, all prices are exclusive of turnover tax.

2.3Deviations from offers made only bind us if we have explicitly confirmed or approved them in writing.

2.4A received order is binding for us, unless we notify the client that the order has not been accepted within 14 days of receipt.

3. Delivery

3.1The time given for the delivery of goods and execution of work is an estimate only.

3.2The contractor reserves the right to deliver instructions in parts and to invoice these partial deliveries separately.

3.3The terms and conditions of delivery are: - ex works, unless stated otherwise.

4.Force majeure

4.1Force majeure is taken to mean: every circumstance beyond our control which temporarily or permanently prevents performance of the agreement.

4.2In particular, force majeure is taken to mean, to the extent not already included in paragraph 4.1, war, imminent war, civil war, riots, industrial strikes, transport problems, fire and other serious disruptions at our company or that of our suppliers.

4.3In the event of force majeure we are, at our discretion, entitled to extend the delivery term of the goods by the length of the force majeure event, or to dissolve the agreement, insofar as not yet executed.

5. Payment

5.1Unless agreed otherwise in writing, payment of the agreed price will be effected within 30 days of the invoice date.

5.2All payments are to be made at the offices of the contractor or into an account to be allocated by the contractor, without any reduction or set-off.

5.3In the event that the client fails to pay within the agreed terms, he is regarded to be in default by operation of law and the contractor, without any notice of default being required, is entitled to charge the client interest with effect from the due date, at a percentage of 3 points above the statutory interest as it applies in the Netherlands, as referred to in Sections 6:119a and 6:120, subsection 2 of the Netherlands Civil Code and also all judicial and extrajudicial costs that relate to the collection of his claim.

6.Retention of title

6.1After delivery, the delivered goods remain the property of the contractor until the client has fulfilled all his obligations ensuing from the relevant agreement.

7. Warranty

7.1 Goods delivered by us comply with generally accepted requirements as well as with the technical descriptions in the offer and order confirmation for one year following the delivery thereof.

7.2 Any defects that are subject to the warranty described in paragraph 1 will be dealt with by repairing or replacing the defective part in question.

7.3 Minor deviations that may show usual tolerances concerning composition and/or sizing are not considered defects and are therefore permitted.

7.2All warranty obligations lapse in the event that:

-the goods have been subsequently processed or changed without prior consent;

-the goods are not maintained properly and in the customary manner;

-The delivered goods have been used improperly or not in accordance with their intended purpose.

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General terms of conditions

8. Liability

8.1. Our liablility shall be limited to repairing or replacing a defective part as shown in the warranty stipulations described in article 7. Except in the case of intent or gross negligence on the part of the contractor, the contractor can therefore not be held liable for damage as a result of faults in or to goods sold, both at the client and third parties.

8.2 The following do not qualify for compensation:

- Damage to the client's machinery and property. The client may wish to take out insurance against this kind of damage.
- Indirect damage such as business interruption losses, loss of production, lost profits, transport costs and travel and subsistence expenses. The client may wish to take out insurance against this kind of damage.
- Damage to property in the care, custody or control of, but not owned by the insured, which is understood to mean damage caused during the execution of the work to goods that are being processed or that are in the vicinity of the place where work is carried out. The client may wish to take out insurance against this kind of damage.
-Damage as a result of intent or wilful recklessness by auxiliary staff or non-managerial subordinates of the client.

9.Complaints

9.1.Complaints must be made within eight days of receiving the goods, or within the same term, after a fault can reasonably be discovered, but always within six months of the invoice date.

9.2.Complaints must be made in writing only.

9.3.When the term referred to in paragraph 1 of this article is exceeded, the right to complain lapses.

10.Cancellation

10.1 When the agreement is cancelled by the client for whatever reason, the contract reserves the right to demand compliance.

10.2 If the contractor accepts the cancellation, he is entitled to charge the client for all costs incurred to date.

10.3. Returned goods are accepted only after the written approval from the contractor and they are credited according to value. Among other things, this value depends on whether the returned items are still held in stock.

11.Suspension and dissolution

11.1 In the event that the client fails to fulfil his obligations ensuing from the agreement concluded, or fails to do so properly or in time, or if there is good reason to believe he will fail, as well as in the case of the bankruptcy or a moratorium of the client, or when his business is discontinued, sold or liquidated, the contractor is entitled to suspend the execution of the agreement with a reasonable term, or to dissolve the agreement.

11.2 The claim for that part of the agreement that has already been executed, as well as the damage resulting from the suspension or dissolution will be immediately due and payable to the contractor.

12.Applicable law/disputes

12.1 All agreements entered into by the contractor are governed by Dutch law only.

12.2All disputes ensuing from agreements concluded by the contractor, insofar as possible by virtue or the relevant statutory provisions, will, to the exclusion of any other authority fall under the jurisdiction of the competent court in the town or city where the contractor has his registered office.

12.3 Notwithstanding the provisions in paragraph 2, the contractor reserves the right to bring a dispute ensuing from the agreement to the competent court in the town or city where the contractor has his registered office.

12.4 The applicability of the Vienna Sales Convention (C.I.S.G.) is explicitly excluded.

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