



BEUMER
technology in motion

CONVEYING TECHNOLOGY
LOADING TECHNOLOGY
PALLETIZING TECHNOLOGY
PACKAGING TECHNOLOGY
SORTATION AND
DISTRIBUTION SYSTEMS



BEUMER
high capacity belt bucket elevators

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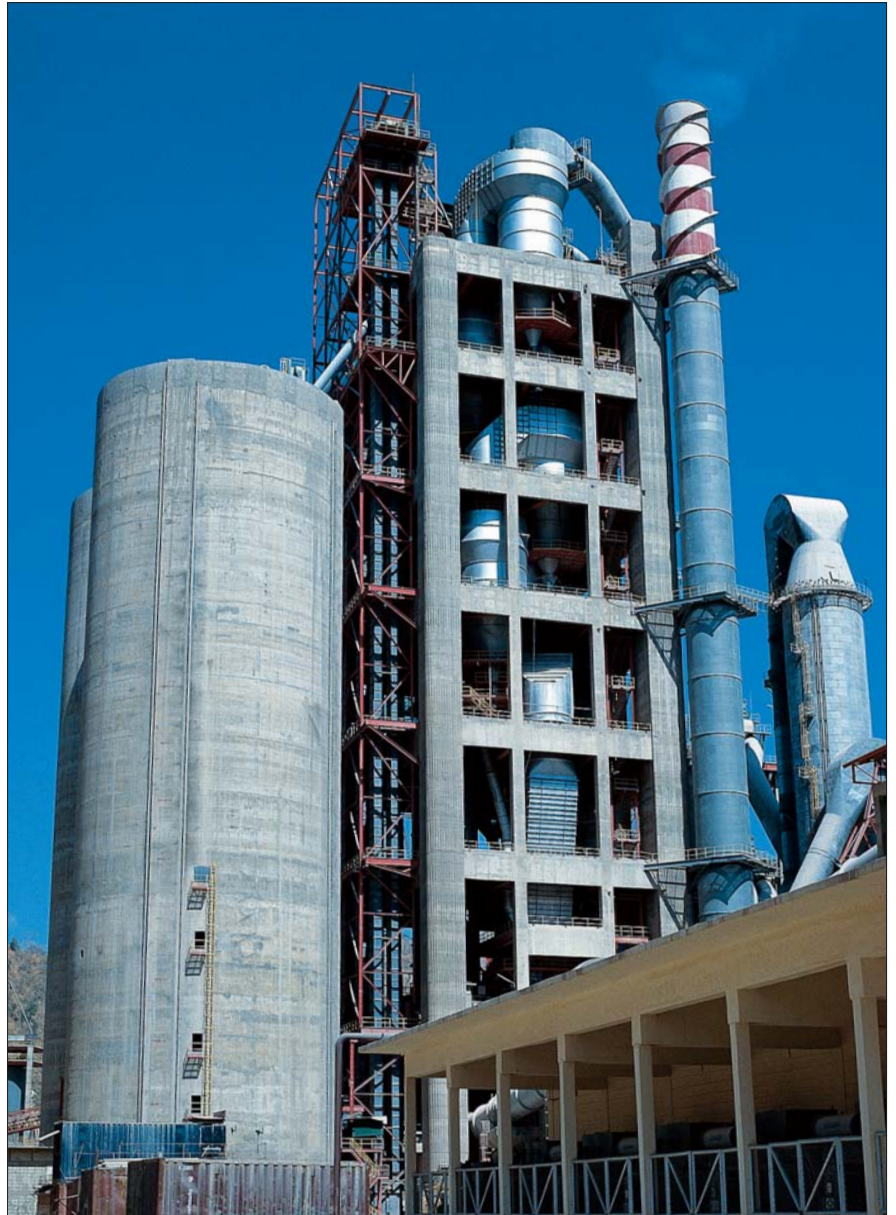
Quality and tradition

BEUMER has established a leading market position for the supply of bucket elevators and has done pioneer work in the field of high capacity bucket elevators. With the development of high quality, patented steel cable belts, their endless connection methods and the appropriate bucket mountings, the conditions were created for today's generation of high capacity belt bucket elevators with heights above 150 m, which are capable of handling material flows of 1,700 m³/h and over.

Chain bucket elevators as well as belt bucket elevators have proven their reliability in thousands of applications during operations under the most difficult and even extreme conditions. For difficult and specific requirements, special bucket elevators are available.

Bucket elevators

Bucket elevators for the mechanical, vertical transportation of materials have become a crucial link in the production process in many industrial sectors. Actual industrial requirements have led to the development of high capacity bucket elevators with belts or chains as traction elements, which have allowed BEUMER to decisively influence the technology of the designs which are in operation today. This is proven by the large number of industrial installations as well as the implementation of specialized applications for extreme requirements. The BEUMER technology has paved the way for the largest bucket elevators in the world. Thousands of supplied installations as well as a large number of satis-



fied customers give evidence of belt and chain bucket elevators being an economical and reliable conveying method.

High capacity belt bucket elevators

The specific conditions of the individual applications are decisive for the type of the traction element to

be used. Belt bucket elevators are mainly used for the transport of high capacity flows of powdery and fine products at long center distances. High capacity belt bucket elevators are a reliable conveying means that ensures a high degree of availability and a long service life.



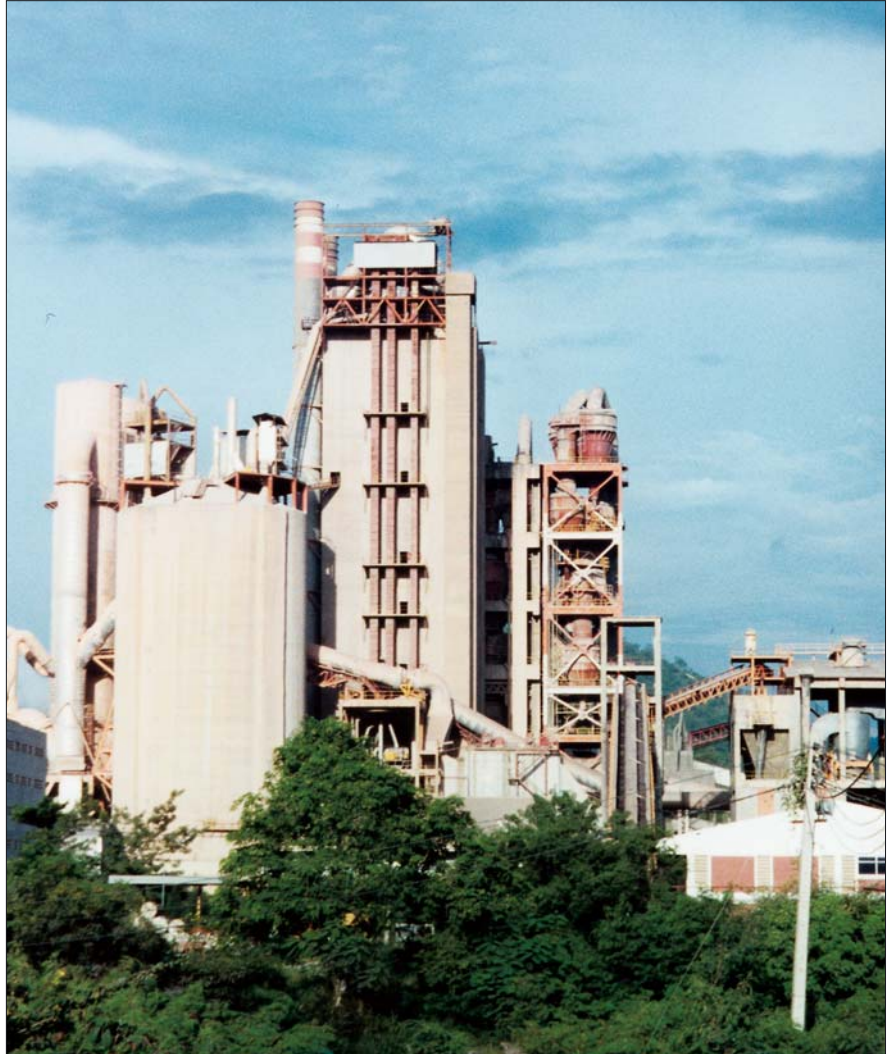
BEUMER technology – the reliable solution of your transport duties

BEUMER high capacity belt bucket elevators with steel-reinforced belts as traction elements are especially suited for the transport of fine materials.

In many industrial sectors, BEUMER high capacity bucket elevators are used for the vertical transport of bulk materials.

Thanks to the low energy consumption of mechanical conveyors, which is many times lower than that of pneumatic conveyors, high capacity belt bucket elevators are in operation all over the world. Examples of this would be in feeding silos, as well as preheaters for kilns in the cement industry.

The users of the BEUMER technology benefit from low operating costs, a high reliability and a long service life of their machines, thus strengthening their competitive position.



Conveying capacities of more than 1,700 m³/h and center distances over 150 m are possible

If a belt is used as the traction carrier and the bucket spacing is optimized, conveying speeds can be achieved which permit transport volumes of more than 1,700 m³/h. Bucket widths ranging between 160 mm and 2,000 mm are available to achieve the required transport volumes up to the maximum.

Conveying heights over 150 m

The belts are reinforced with steel wires, which are arranged in a special way, so that center distances in excess of 150 m are possible. Depending on the combination of conveying rate and bucket filling level, belts are available with appropriate strengths that can be used, taking into account the required safety factors.

Long service life

The special connection between the bucket and belt reduces the wear of the belt to a minimum, thus avoiding the tearing out of the bucket during operation thereby ensuring a long service life and profitable operation of the machine.

Maximum reliability of operation

The proven machine components of the BEUMER bucket elevator technology are the basis of a high reliability and a trouble-free operation.



The bucket elevator head

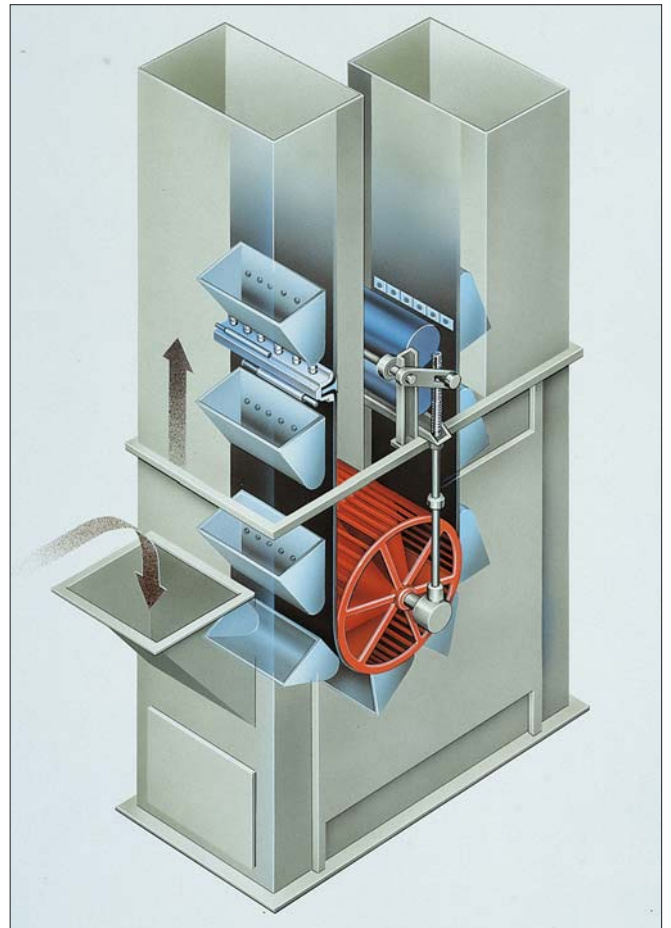
Besides the housing construction, the bucket elevator head consists of the following functional groups: the drive pulley, the drive unit, the material discharge with discharge plate and the dedusting connection.

The power transmission at the drive pulley takes place through friction between the pulley and the belt. By the use of rubber lagging (segmented), the friction factor between belt and pulley can be increased.

The belt tracking is automatically controlled by the crowned face of the drive pulley. For capacities as low as 15 kW, the drive unit is furnished with a hydrodynamic coupling to reduce starting power consumption and as an overload protection and an inching drive.

An adjustable discharge plate in the discharge area minimizes the carryover and fallback of material. For inspection and maintenance works, appropriate service doors are located in suitable places in the bucket elevator housing.

A platform can be arranged all around the bucket elevator head as an option, in order to permit the access to all machine parts.



The bucket elevator boot

In the bucket elevator boot, the material is fed via the inlet chute directly into the buckets. Material missing the target is scooped out of the bucket elevator boot. The gravity type parallel tensioning device ensures perfect belt tracking and acts as a guide between belt and return pulley.

The tension pulley is designed as a bar drum. Trickling material is removed by a double cone, which is arranged in the bar drum. In this way, circulating material cannot be caught between the belt and the pulley and belt damage is avoided.



BEUMER high capacity belt bucket elevators

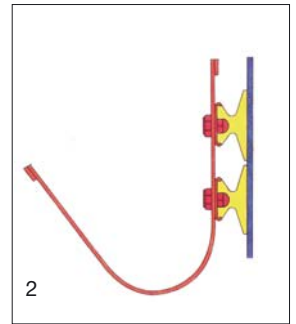
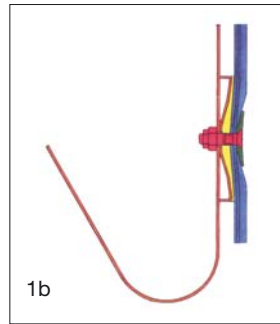
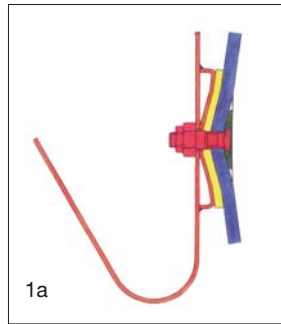
The bucket mounting

Depending on the material size, two different types of bucket connections are used for BEUMER high capacity belt bucket elevators, i.e. the mounting with split segments (pictures 1a and 1b) and the rubber-batten mounting (picture 2). If the buckets are connected with bucket screw mountings, they are frequently torn out and for this reason, this type of connection is not used.

The material size is a criterion for the selection of the mounting type. The segment mounting is used for sizes of up to 25 mm. For sizes ranging between 25 and 60 mm, the rubber-batten mounting developed by BEUMER is used (for temperatures of up to 70 °C).

The segments form a closed strip on the bucket back side, so that all forces acting on the belt are equally distributed to the steel wires embedded in the belt, thus making it impossible for the buckets to be torn out of the belt.

An intermediate rubber plate in the bucket mounting area provides the wear protection of the belt.

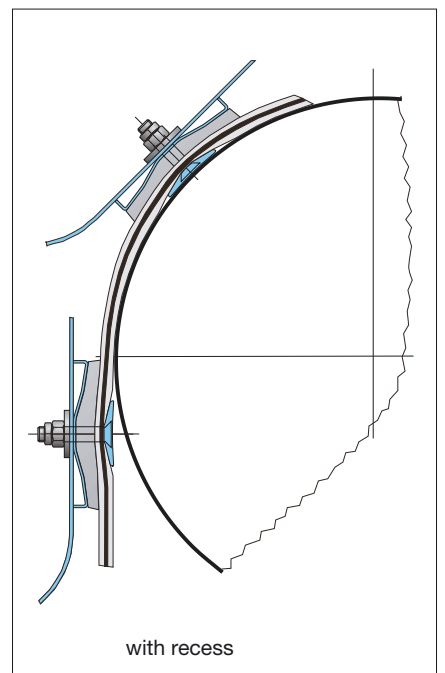
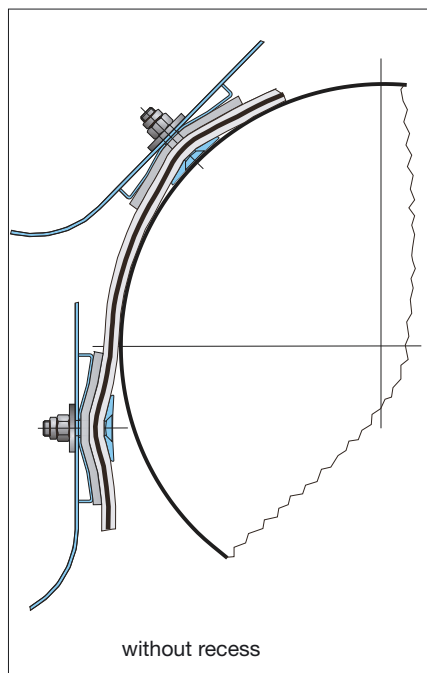


The segments on the back side of the belt are inserted with the belt and the rubber plate into the shaped plate of the bucket back wall, so that the belt is perfectly configured to the diameter of the drive pulley.

For high belt traction forces, the contact side of the belt is provided with recesses.

These recesses, in connection with a profiled rubber plate between belt and bucket, ensure that the belt is guided without deflections in the bucket mounting area.

In this way, tension peaks leading to additional strains on the traction carriers are avoided.



BEUMER technology – the reliable solution of your transport duties

The technical features of the traction carrier

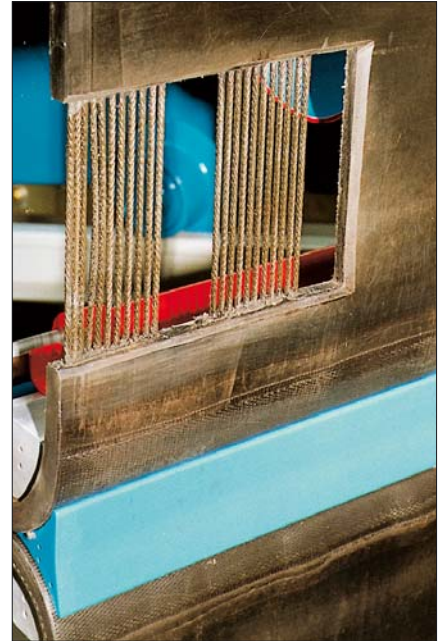
The steel wire belts used for BEUMER high capacity belt bucket elevators, have some special features that give them special advantages.

Thanks to its low weight in proportion to its breaking strength, the belt as traction carrier has a key function in the realization of center distances greater than 150 m.

The arrangement of the steel wires embedded in the belt with cable-free zones in the bucket bolting areas is a crucial feature.

The special steel wire arrangement in the belt makes it possible that the buckets are connected to the belt without inflicting any damage or separation of the steel wires.

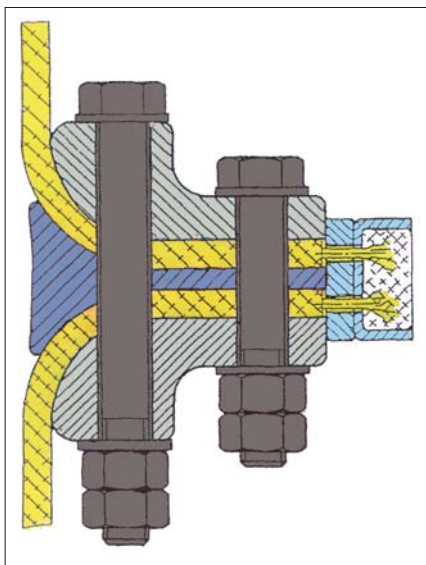
Textile fabric layers on both sides of the steel wires, along with the continuous segments of the bucket mountings, give the belt an extremely good diagonal stiffness. All belts are provided with temperature-resistant top layers. For smaller scale requirements, such as smaller center distances and material temperatures below 80 °C, the use of textile belts is applicable.



demonstration model

BEUMER belt clamping connection for steel wire belts

In order to connect the bucket elevator belt ends permanently and safely, we developed the BEUMER



belt clamping connection. As shown on the cross section, the belt is clamped by means of bolts between a steel wedge and two aluminum clamping jaws. The number of bolts depends on the belt width.

The exposed and spliced cable ends are also cast with a soldering metal. At the points of contact with the clamping jaws, the belt ends are reinforced with additional layers of belting material.

For belt bucket elevators with large center distances, a monitoring switch is installed at the belt clamping connection, which permanently controls the seat of the clamping screws.

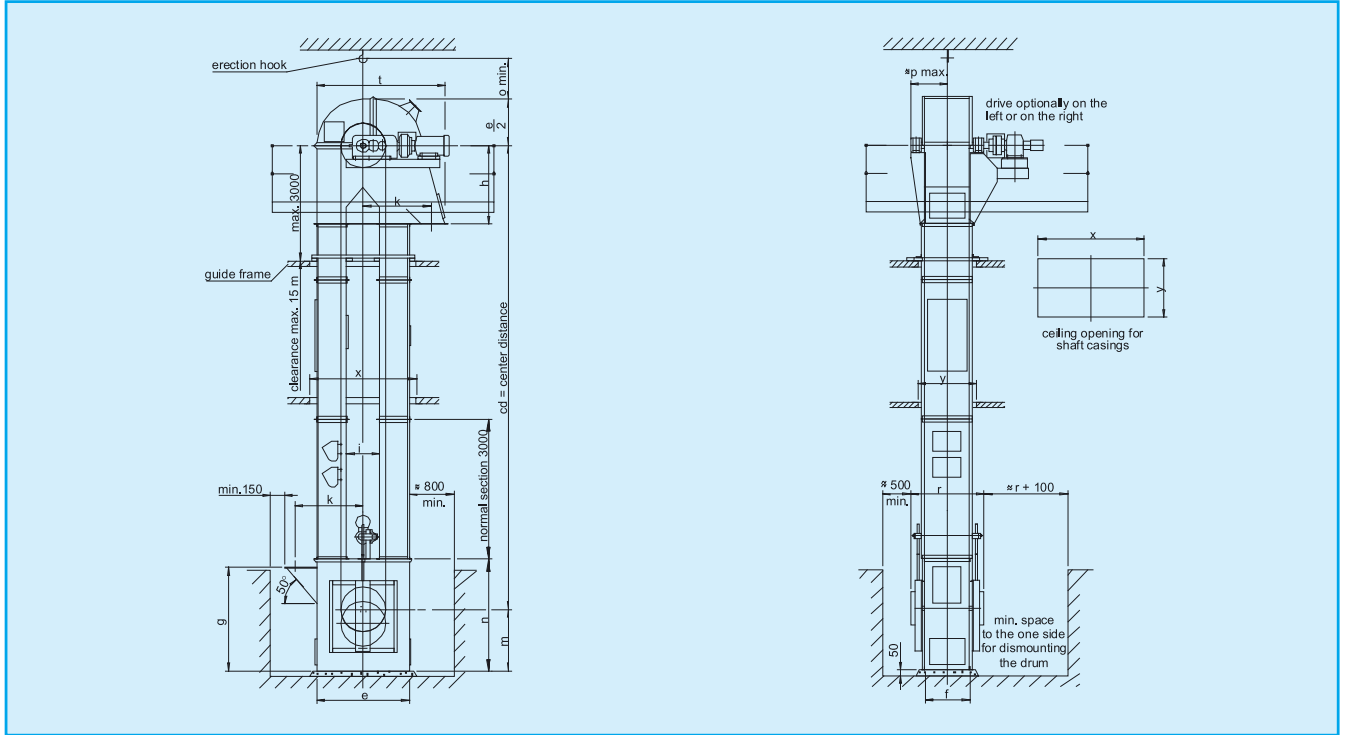
Thanks to the safety switch developed by BEUMER, this control takes place without any wear using reliable contactless technology. The standard design of our high capacity belt bucket elevators

utilizes the following monitoring devices:

- belt off-track switch
- material level switch in the bucket elevator boot
- motion detector / slip control
- safety switch for the belt clamping connection
- thermal switch at the fluid coupling as overload protection
- speed control at the coupling for the maintenance drive (inching drive)



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Technical Data

Bucket width Normal design	AA = center distance	mm	160	200	250	315	400	500	630	800	1.000	1.250	1.400	1.600	1.800	2.000
			2x700		2x800	2x900	2x1000									
e	Length of boot housing	mm	1.040	1.080	1.280	1.350	1.500	1.650	1.850	2.100	2.500	2.500	2.500	2.500	2.500	2.500
f	Width of boot housing	mm	400	450	500	550	700	800	930	1.100	1.350	1.600	1.800	2.000	2.200	2.400
g	Inlet height above floor level	mm	1.320	1.320	1.400	1.500	1.650	1.850	1.950	2.200	2.350	2.350	2.350	2.350	2.350	2.350
h	Height of drive pulley above shaft casing	mm	900	900	1.000	1.120	1.250	1.400	1.600	1.800	2.000	2.000	2.000	2.000	2.000	2.000
i	Distance between shaft casings	mm	340	340	480	480	500	590	650	760	1.000	1.000	1.000	1.000	1.000	1.000
k	Distance flange center – bucket elevator center	mm	770	790	915	950	1.100	1.220	1.350	1.550	1.750	1.750	1.750	1.750	1.750	1.750
m	Height of tension pulley shaft	mm	750	750	900	920	1.000	1.100	1.250	1.350	1.550	1.550	1.550	1.550	1.550	1.550
n	Height of boot housing	mm	1.400	1.400	1.500	1.600	1.800	2.000	2.120	2.360	2.500	2.500	2.500	2.500	2.500	2.500
o	Space requirements above bucket elevator head	mm	800	800	800	800	900	900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
p	Space requirements beside bucket elevator head	mm	365	420	465	530	625	675	790	920	1.055	1.200	1.330	1.430	1.530	1.630
r	Overall width of bucket elevator boot	mm	1.000	1.050	1.100	1.152	1.322	1.422	1.616	1.786	2.076	2.326	2.566	2.766	2.966	3.166
x	Ceiling opening	mm	1.300	1.300	1.500	1.600	1.750	1.900	2.150	2.400	2.800	2.800	2.800	2.800	2.800	2.800
y	For the shaft casings	mm	650	700	750	800	950	1.050	1.200	1.400	1.650	1.900	2.100	2.300	2.500	2.700

Bucket width HC design	AA = center distance	mm	500	630	800	1.000	1.250	1.400	1.600	1.800	2.000
			2x700		2x800	2x900	2x1000				
e	Length of boot housing	mm	2.100	2.100	2.500	2.500	2.500	2.500	2.500	2.500	2.500
f	Width of boot housing	mm	800	930	1.150	1.350	1.600	1.800	2.000	2.200	2.400
g	Inlet height above floor level	mm	2.200	2.200	2.350	2.350	2.350	2.350	2.350	2.350	2.350
h	Height of drive pulley above shaft casing	mm	1.800	1.800	2.000	2.000	2.000	2.000	2.000	2.000	2.000
i	Distance between shaft casings	mm	760	760	1.000	1.000	1.000	1.000	1.000	1.000	1.000
k	Distance flange center – bucket elevator center	mm	1.550	1.550	1.750	1.750	1.750	1.750	1.750	1.750	1.750
m	Height of tension pulley shaft	mm	1.350	1.350	1.550	1.550	1.550	1.550	1.550	1.550	1.550
n	Height of boot housing	mm	2.360	2.360	2.500	2.500	2.500	2.500	2.500	2.500	2.500
o	Space requirements above bucket elevator head	mm	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
p	Space requirements beside bucket elevator head	mm	770	835	955	1.055	1.200	1.330	1.430	1.530	1.630
r	Overall width of bucket elevator boot	mm	1.466	1.620	1.875	2.076	2.326	2.566	2.766	2.966	3.166
x	Ceiling opening	mm	2.400	2.400	2.800	2.800	2.800	2.800	2.800	2.800	2.800
y	For the shaft casings	mm	1.050	1.200	1.450	1.650	1.900	2.100	2.300	2.500	2.700



The BEUMER high capacity belt bucket elevator technology is based on experiences with the supply and installation of more than 2,000 bucket elevators that are in operation all over the world. The use of a solid and proven technology in connection with safety and monitoring devices and

high quality materials, make the BEUMER high capacity belt bucket elevator a highly reliable system for customers in all sectors of industry. The continuous BEUMER research and development program ensures their ability to meet and handle any future demands arising in the market.

If requested by the customer, the BEUMER service offers service contracts for the bucket elevator, in order to ensure a preventative maintenance program and trouble-free continuous operation. The reliable technology of the BEUMER high capacity bucket elevator will meet your demands.

Criteria for the selection of a high capacity belt bucket elevator

Center distance	With steel cable belts up to 150 m and over			
Temperature	Belt quality „extra“		Belt quality „super“	
	Cont. up to 100 °C	Max. up to 120 °C	Cont. up to 120 °C	Max. up to 140 °C
	Belt top layer quality up to 150 °C		Belt top layer quality up to 200 °C	
Conveying capacity	Depending on the bucket width up to 1,700 m ³ /h (also refer to the table of volume streams)			
Material size	0 - 25 mm ⇒ segment mounting		0 - 60 mm ⇒ rubber-batten mounting	
	Note: For fine materials, the HC construction series can be used as well. Bigger bucket sizes are used for this construction series, so that increased throughput capacities are possible.			

Table of volume streams for high capacity belt bucket elevators

Filling φ	Bucket width in mm														
	I _v	160	200	250	315	400	500	630	800	1000	1250	1400	1600	1800	2000
100%	m ³ /h	43	59	95	135	206	296	468	661	932	1165	1316	1491	1677	1864
75%	m ³ /h	32	44	71	101	155	222	351	496	699	874	987	1118	1258	1398

Table of volume streams for high capacity belt bucket elevators, HC construction series (for cement, raw meal, etc.)

Filling φ	Bucket width in mm														
	I _v	160	200	250	315	400	500	630	800	1000	1250	1400	1600	1800	2000
100%	m ³ /h	-	-	-	-	-	411	579	937	1173	1466	1642	1876	2110	2345
75%	m ³ /h	-	-	-	-	-	308	434	703	880	1100	1231	1407	1583	1759



The information contained in this brochure merely serves as a non-binding description of our products and is without guarantee. Binding information, in particular relating to capacity data and suitability for specific applications, can only be provided within the framework of concrete inquiries.

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