

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
- ✓ Calculations for screw conveyors

**Supplier of spare parts for the international
bulkhandling industry**

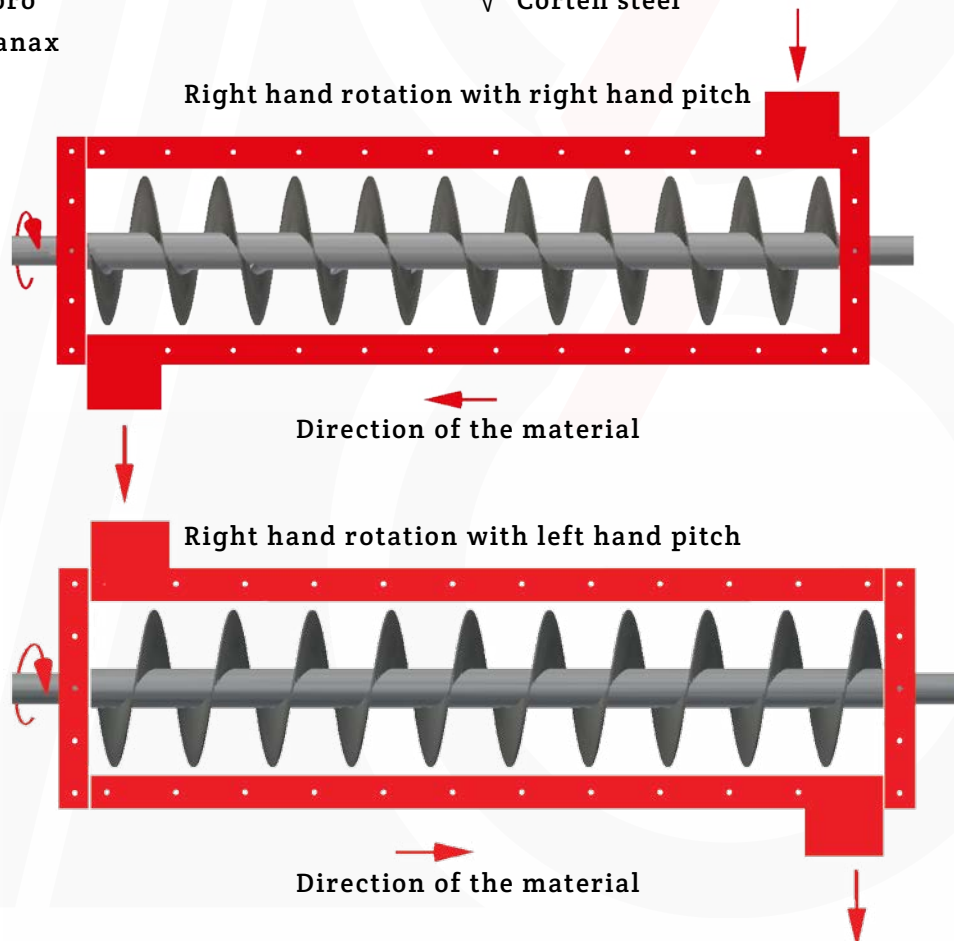


Auger segments

Screw conveyor segments are manufactured to your specifications with a tolerance 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





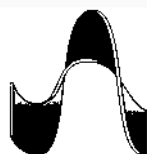
Endless spirals

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

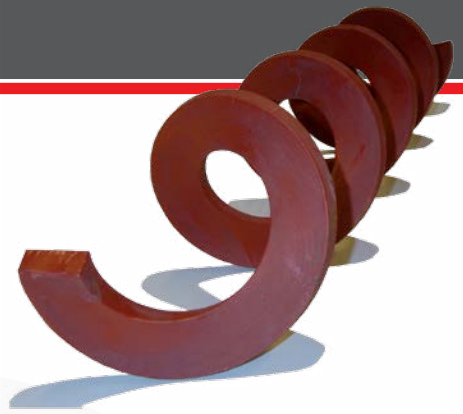
Additional diameters, shaft sizes, or material thicknesses are available on demand.



Right hand pitch



Left hand pitch



Shaftless spirals

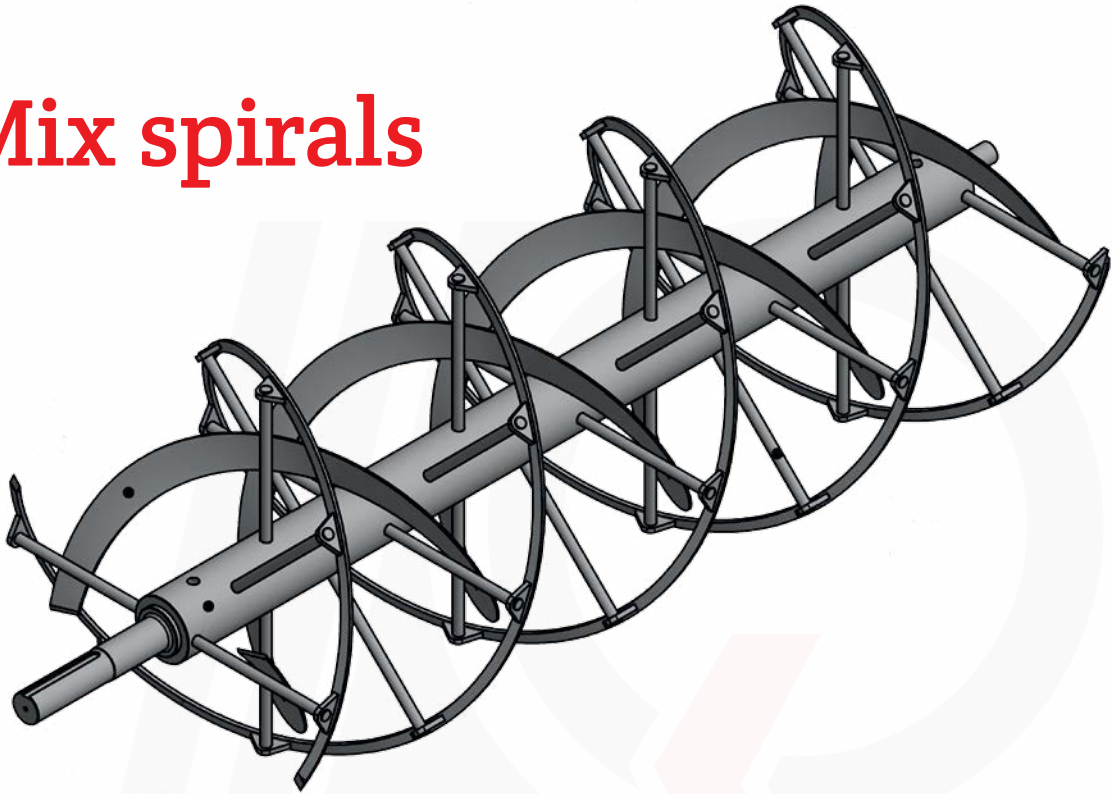
Bechtel supplies shaftless spirals in various lengths (material S355J2G3 or Stainless steel 304). Any desired size between Ø 80 and Ø 700 mm is available in single, double, triple and full sheet versions. Spirals can be used for horizontal, inclined or vertical transport. Suitable for wet, fibrous and 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.

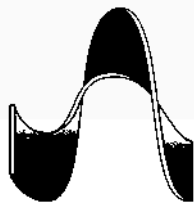
Mix spirals



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



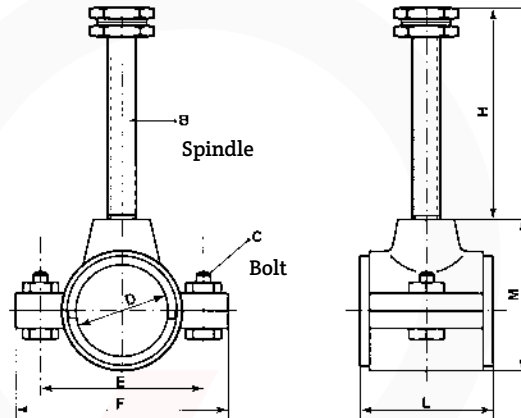
Left hand pitch



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.

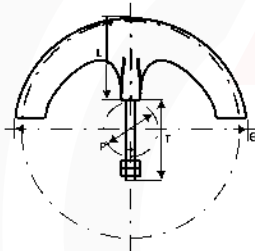
Available with inserts of Nylon, bronze, Teflon, PTFE or acetal. Complete with spindle M24 with a length of 165 - 320 mm. These spindles are equipped with a lubricating channel Ø8 mm with a connection for 1/4 „gas. A galvanized version as standard, but also available in stainless steel.



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



Palets (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



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)

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

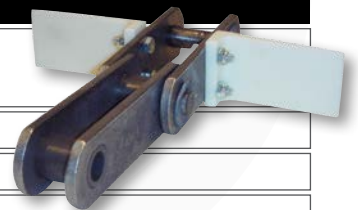
Mass-1	=	material weight on the chain in kg
v	=	chain speed in m per sec

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
μ_1	=	friction between steel and the product (for a smooth-running product ca. 1,15)
mass-2	=	total chain weight in kg
μ_2	=	friction between the steel bottom and the chain (for steel pushers approx. 0,25 and for plastic pushers approx. 0,15)





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 m³ per hour (Q)

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

Capacity in kg per hour (Q)

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

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/m³)

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

