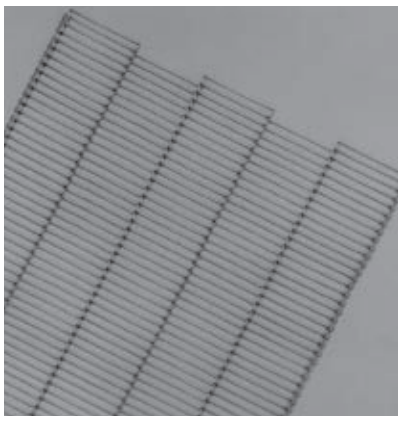
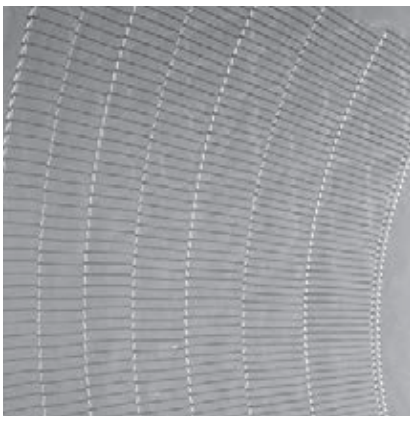
GRZK
Enrober Belts



Belt for straight conveyors



Belt for curve conveyor

Sprockets

GRZK enrober belts are used in many industries. The belts have a light weight single layer construction and are positively driven by sprockets. The belts have an open structure (70 - 85 % open) and are frequently used in cooling, baking, draying, heating, decorating, battering and packing machines for light products.

GRZK enrober belts are made of stainless steel wire of spring wire. Wire diameters varies from 0,9 until 2,8 mm. Pitches from 4 mm until 19,05 mm, and belt widths from 10 mm until 3 metre. Esfo has a big range of standard dimensions, but can make all the (non standard) dimensions too because of the multi adjustable production machinery. Belts executed with single loop (most common) or double looped edges for special occasions.

GRZK enrober belts can be made for straight conveyors and for curve conveyors.

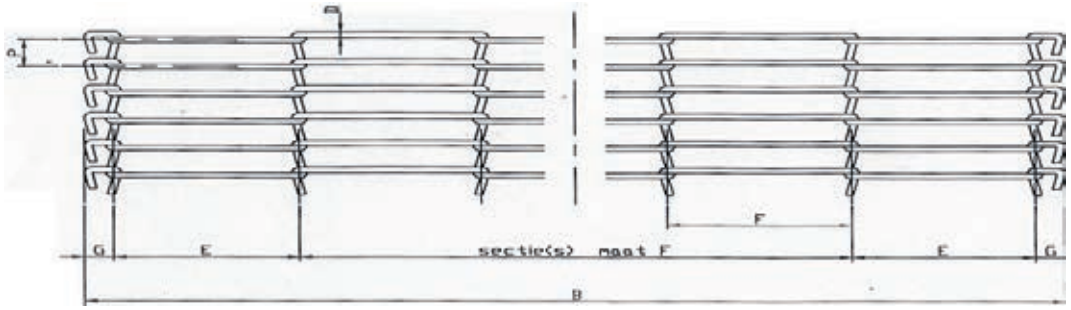
GRZK enrober belts can be equipped with little cams, or with special formed internal wire to carry the product on a special way. The very small 'chains' are used in spreader conveyors.

GRZK enrober belts are normally driven by toothed sprockets, made of (stainless) steel or plastic. These sprockets are made to fit the belt and are adapted to the diameter you wish. The number of teeth is free to choose and can be made for every new or existing conveyor. Esfo has for a number of belts sprockets on stock.

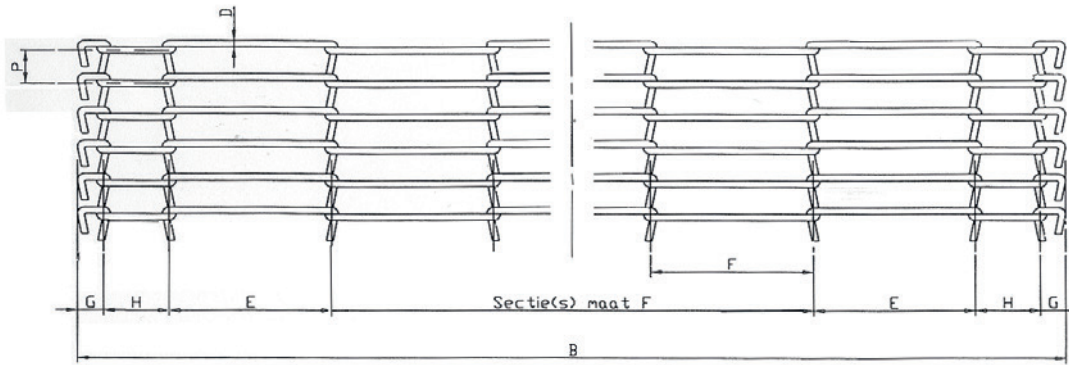
GRZK enrober belts are often used in conveyors for the food industry for the production of:

-snacks	*-fish*	*-pizzas*	*-vegetables*
-bread, pastry	*-meat*	*-candy*	*- (small) potatoes*
-biscuits	*-chocolate*	*-nuts and fruits*	

GRZK enrober belts are used on other industries to convey products like little parcels in *packing* and *plasticization* machinery.



GRZK *With* ***single*** *looped edges*



GRZK *with* ***double*** *looped edges*

GRZK enrober belt is made from pre shaped wires with the same form, weaving together. The drawings as showed above give the standard execution of a single looped edge belt (most common) and a drawing of the double looped edge (only small pitches, and wire diameter from 0,9 until 1,2 mm) belt for straight conveyors. The belt is determined by the pitch (P) de wire diameter (D), the number of the spaces and the dimensions of these spaces (E and F). The looped edge (G) is determined by the wire diameter. The width of the belt is free to choose.

The number of spaces is always odd, and is determined by the width of the belt. The strength of the belt is given by the number of spaces. The space length is limited and normally between the 35 and 90 mm. The table below shows the preferable pitches (P) with the possible wire diameters (D1-D5) and its average belt weights (M1-M5)

Pitch (mm)	Wire Diameter (mm)					Average Belt Weight (kg/m2)				
P:	D1	D2	D3	D4	D5	M1	M2	M3	M4	M5
4.0	**0.9**	**1.0**	1.2			1.2	1.5	2.1		
4.24	**0.9**	**1.0**	1.2			1.3	1.6	2.0		
5.0	0.9	**1.0**	**1.2**			1.1	1.4	2		
5.5	0.9	**1.0,**	**1.2**	**1.25**		1.3	1.8	2.0	2.2	
5.64	0.9	**1.0**	**1.2**	**1.25**		1.3	1.8	2.0	2.2	
6.0	1.0	**1.2**	**1.25**	**1.4**		1.2	1.7	2.0	2.7	
6.35	1.0	**1.2**	**1.25**	**1.4**		1.1	1.6	2.0	2.7	
6.4	1.0	**1.2**	**1.25**	**1.4**	**1.6**	1.1	1.6	2.0	2.7	3.3
7.26	1.2	**1.25**	**1.4**	**1.6**		1.5	1.6	1.9	2.5	
9.0	1.4	**1.6**	**1.8**			1.8	2.4	3.1		
11.3	1.6	**1.8**	**2.0**			1.6	2.0	2.5		
12.7	**1.8**	**2.35**				2.2	3.6			
20.0	**2.35**	**2.8**				2.6	3.7			

The bolt pitches and diameters are preferable.
All the pitch dimensions in between the preferable pitches are possible too.

Next table gives a view of the minimum and maximum sizes of the spaces (E,F), belt width (B) and the looped edge(s) (G,H). The minimum and maximum sizes are determined by the wire diameter (D).

D: Wire Diameter(mm)	E,F Width of te spaces (mm) min.	max.	G Single loop (mm) normal	'wide'	H Double loop (mm) min	max	B Belt width (mm) min	max
0,9	20	90	4,85		6	20	50	2000
1.0	20	90	5,0		6	20	50	2500
1,2	25	150	5,3		7	20	50	2000
1.25	20	150	5,4	7,7	7	20	50	2500
1,4	40	150	7,6		10	20	60	3000
1.6	40	150	8,25	10,7	15	20	70	3000
1,8	55	150	8,6	10,6	15	20	80	4000
2,0	55	150	9,2		-	-	80	4000
2,35	65	150	11,35	14,35	-	-	90	4000
2,8	80	150	11,6		-	-	100	4000

Note 1: The dimensions E and F are almost always the same. It is possible to vary in different dimensions, or give the belt a certain pattern, using smaller and bigger openings.
Note 2: The Belt thickness is approx. 2,5 x the wire diameter.

Because ***GRZK***-enrober belts are mainly used to convey little light products, the pitch of the belt mostly will be determined by the product size, necessary transfer rollers and process conditions.

Next table gives an impression of the allowable tensile and velocity of the enrober belt.
The strength of an enrober belt is mainly determined by the diameter of the wire and the number of spaces.

Pitch (mm) P:	Wire Diameter (mm) D1	D2	D3	D4	D5	Max. allowable force each space (N) Fm1	Fm2	Fm3	Fm4	Fm5	Max. velocity (m/min) V1	V2	V3	V4	V5
4.0	**0.9**	**1.0**	1.2			15	25	40			5	10	12.5		
4.24	**0.9**	**1.0**	1.2			15	25	40			5	10	12.5		
5.0	0.9	**1.0**	**1.2**			15	25	40	45		5	10	12.5	12.5	
5.5	0.9	**1.0**	**1.2**	**1.25**		15	25	40	45		5	10	12.5	12.5	
5.64	0.9	**1.0**	**1.2**	**1.25**		15	25	40	45		5	10	12.5	12.5	
6.0	1.0	**1.2**	**1.25**	**1.4**		25	40	45	55		10	12.5	12.5	15	
6.35	1.0	**1.2**	**1.25**	**1.4**		25	40	45	55		10	12.5	12.5	15	
6.4	1.0	**1.2**	**1.25**	**1.4**	**1.6**	25	40	45	55	70	10	12.5	12.5	15	20
7.26	1.2	**1.25**	**1.4**	**1.6**		40	45	55	70		12.5	12.5	15	20	
9.0	1.4	**1.6**	**1.8**			55	70	85			15	20	25		
11.3	1.6	**1.8**	**2.0**			70	85	110			20	25	25		
12.7	**1.8**	**2.35**				85	140				20	25			
20.0	**2.35**	**2.8**				140	200				20	20			

.
The life-time of an enrober belt also will be determined by the product, the process and the number and material of the support profiles.

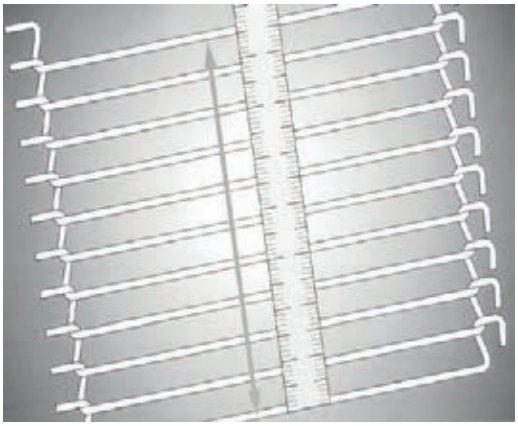
Messung:

Die Teilung (P) ist extrem wichtig. Die Drähte müssen genau in die Öffnungen des Kettenrads eingreifen.

Bei einem Austausch muss die Teilung genau vermessen werden. Normalerweise misst man 10 Teilungen in der Länge des Gurts (von Draht 1 bis Draht 11).

Die gemessene Länge muss nur durch 10 geteilt werden und ergibt dann die Größe in Zehntelmillimetern.

Beim Messen muss der Gurt leicht gespannt werden (nicht dehnen); die Messung muss in der Nähe der Knoten und nicht mitten im Zwischenraum erfolgen, um möglichst genau zu sein.

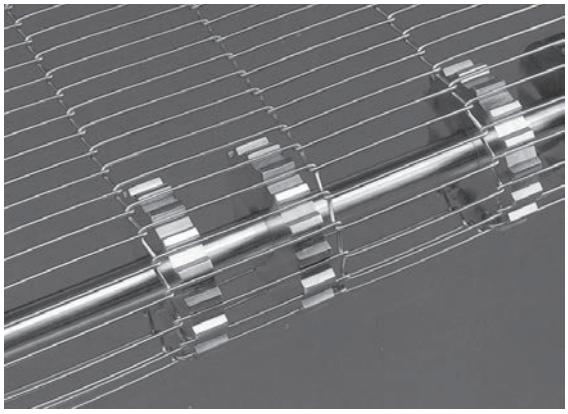


Materialien:

GRZK Stabgeflechtbänder bestehen aus erstklassigen Materialien mit hoher Zugfestigkeit:

- Aisi 301 Edelstahl, Werkstoff 1.4310. (normale Korrosionsbeständigkeit, normale Verwendung, Nahrungsmittelindustrie)
- Aisi 316 Edelstahl, Werkstoff 1.4401 oder Aisi 316 Ti, Werkstoff 1.4571 (besonders beständig gegen aggressive Chemikalien, Säuren oder Chloride)
- Federdraht (Stahl, hohe Zugfestigkeit, kleine Drahtdurchmesser)

Usually the ***GRZK***-enrober belt is driven by one shaft of teethed sprockets. The other (reversing) shafts are plane or have plane rollers. A properly set up support, (reversing) shafts and driving shafts will keep the belt in a straight line.



The dimensions of the driving sprockets depend on the preferred number of teeth, outside diameter and or shaft bore specifications. The sprockets are tailor made and have usually a width of 14 mm.
Two driving sprockets are mounted to drive the belt in every odd spacing.

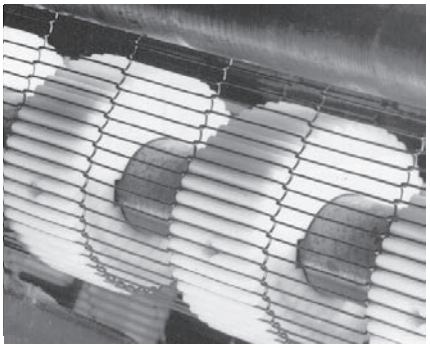
The free space between the sprocket and the knots of the belt is to be advised for 5 mm.

Sprockets are made from plastic (polyacetal, polyamide) or stainless steel.

It is possible to drive the belt too with sprockets filling an entire spacing.

Further more the drive shaft can be executed as a driving drum with the same width as the belt.

For special needs, please contact us, to make a tailor made design.

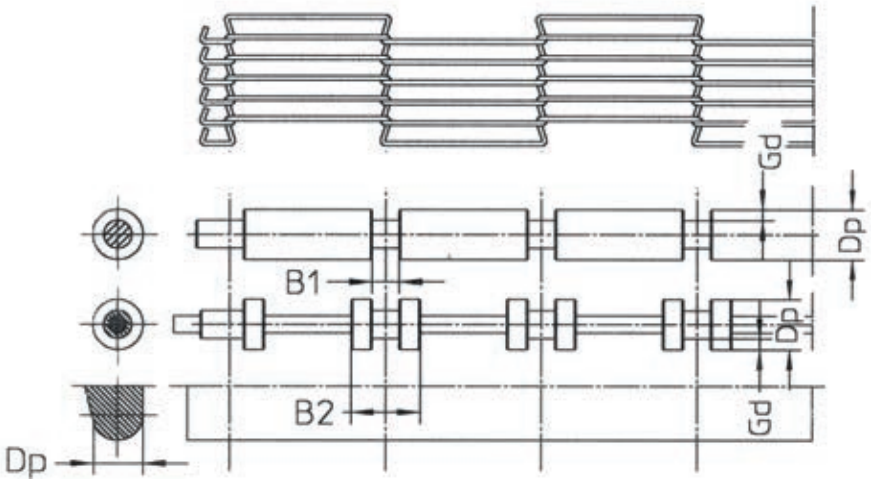


P: Pitch Belt	Z1: number of teeth	D1: pitch diam.	Z2: Number of teeth	D2: pitch diam.
(mm)		(mm)		(mm)
4.0	35	44,6	53	67,5
4.24	34	45,9	50	67,5
5.0	29	46,2	42	66,9
5.5	26	45,6	38	66,6
5.64	26	46,9	38	68,4
6.0	24	46,0	35	66,9
6.35	22	44,6	35	70,8
6.4	22	44,9	35	71,4
7.26	20	46,4	29	67,1
9.0	16	46,1	24	68,95
11.3	13	47,2	19	68,65
12.7	11	45,1	17	69,1

The table at the left shows an example of diameters and number of teeth.

GRZK-enrober belt has a product side and a non product side. The product side is flat. The knots are on the non product side. The product side has a small minimum turning radius (sprockets, take over rollers, positive bending). The turning radius of the non product side has a bigger turning radius (reverse or negative bending of the belt)

The figure below gives three executions of take over rollers/shafts for positive bending of the enrober belt.

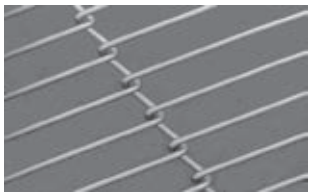


Enrober Belt

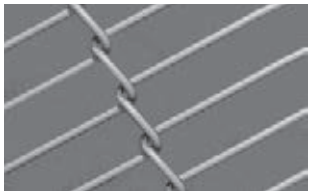
Figure 1:
-A returning or non returning shaft
-non returning shaft with turning rollers

Figure 2:
Shaft with turning rollers

Figure 3:
Solid plastic edge



Product side of GRZK is flat

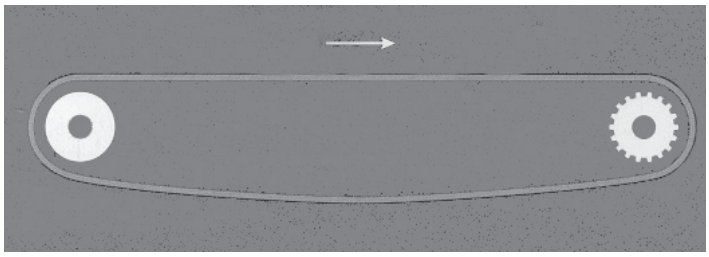


The knots of the belt are at the non product side.

	positive bending		negative bending		
	Dp:	Gd:	B1	Dn:	
P: Pitch (mm)	minimum roller diam. (mm)	(mm)	(mm)	diameter minimum (mm)	diameter nominal (mm)
4.0	12	3	6	20	35
4.24	12	3	6	20	35
5.0	14	3,5	6	22	40
5.5	14	3.5	6	22	40
5.64	14	3.5	6	22	40
6.0	16	4	6	25	45
6.35	16	4	6	30	50
6.4	16	4	8	30	50
7.26	18	4	8	35	60
9.0	24	5,5	8	40	70
11.3	28	6,5	8	45	90
12.7x1.8	30	6,5	8	50	100
12.7x2.3	38	6.5	8	70	100
20.3	55	7	10	90	140

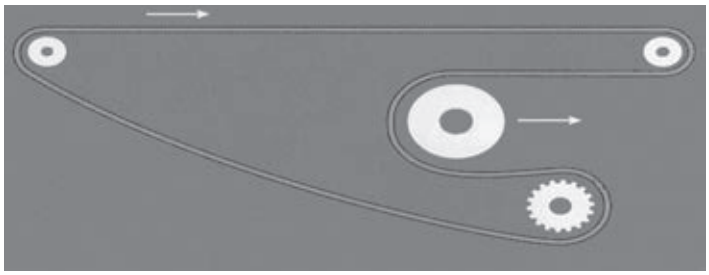
Table above gives the minimum positive bending diameter (Dp) and negative bending diameter (Dn) related to the pitch of the belt.

Note: These little take over diameters are not to be advised for long conveyors and or bigger product loads. Using a bigger diameter gives a better life time.



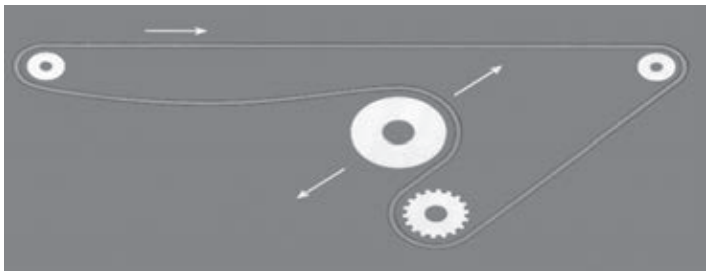
Execution 1:

Driving shaft and idle rollers



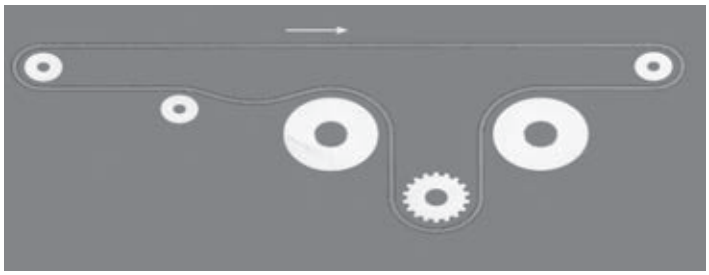
Execution 2:

Two times mesh rollers, one negative bending, one driving shaft.



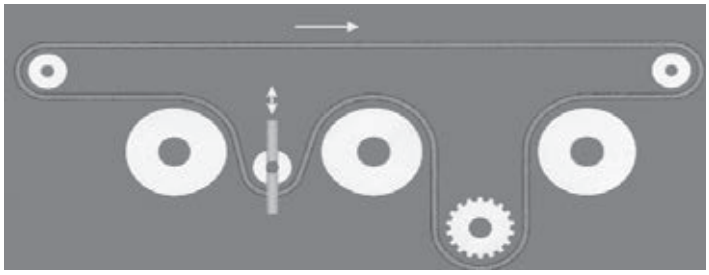
Execution 3:

Like execution 2.



Execution 4:

Two times negative bending, one driving shaft, two mesh rollers



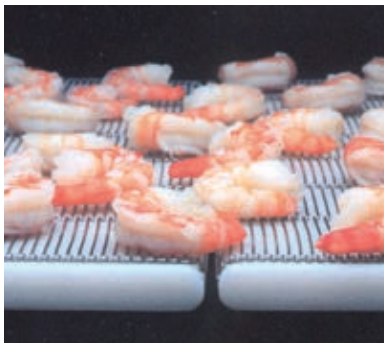
Execution 5:

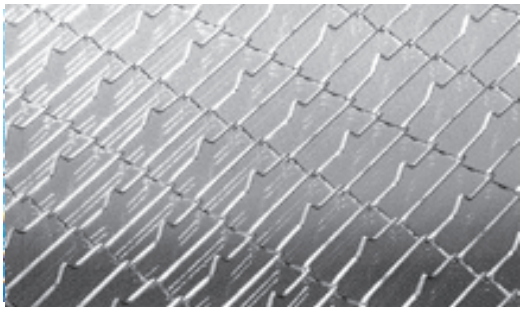
See execution 3, but with extra gravity tension roller.

The number of support of the **GRZK** enrober belt will be determined by on the process and the product load. The position is normally between the knots of the belt. In case of a big load, every spacing needs a support. In case of normal and light product load every 2nd or 3rd spacing a support profile.

For proper running it is advised that at the support is always needed at the spaces at the left and right side. Another possibility is to support the entire belt with a plastic sheet. The returning past can be supported by rollers or by support profile. By the selection of support profiles, sprockets and rollers, be aware not to tension the belt.

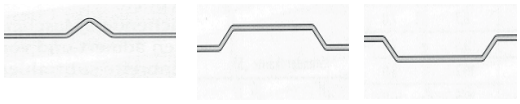
For processes up to 70-80 degrees C, it is common to use plastic support. For higher temperatures the enrober belts are normally supported by Stainless Steel. (e.g. baking ovens).





GRZK-enrober belt can be executed with cams. Execution and patern can be choosen.

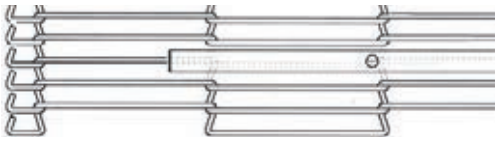
Cams to be used as a product support or product guidance. Cams normally in light enrober belts.



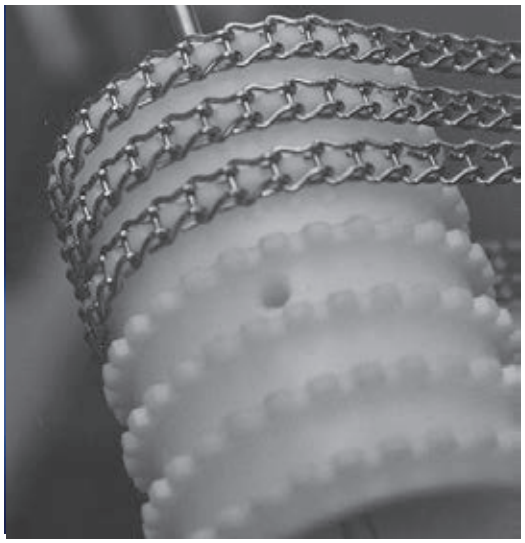
Cam type 1 Cam type 2 Cam type 3

The cam types 1 until 3 are the most common.

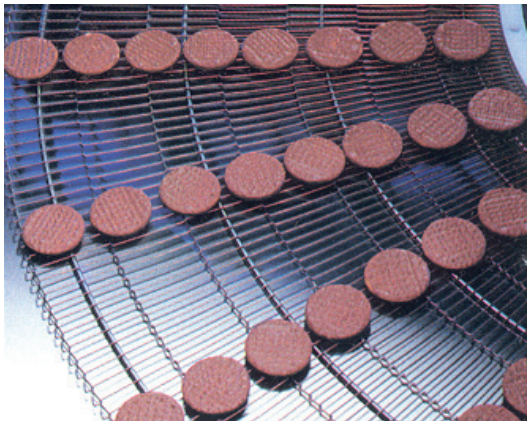
For very delicat products cam type 2/3 can
Nor only executed upwards or down wards, but in the same level as the belt too

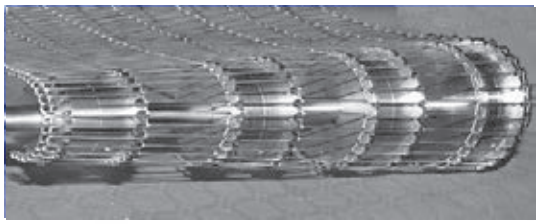


It's possible to execute the belt with separate flights



The enrober chain is very small. It has a pitch of 7,2 mm and a width of 9 mm. It is used in spreader conveyors.





Das GRZK-Stabgeflechtband kann auch als Kurvenband ausgeführt werden.

Normal sind Kurven von 30 bis 180 Grad.

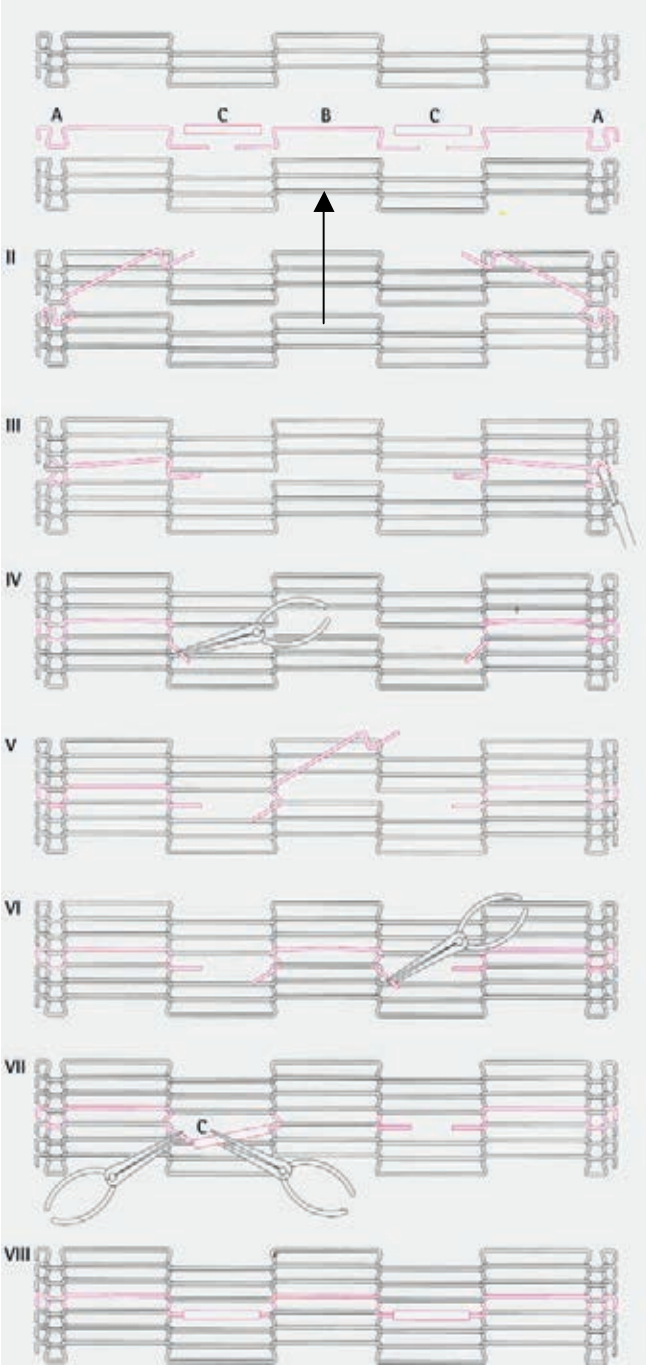
Der Band-Innenradius ist festgelegt. Der Gurt hat innen eine kleinere und außen eine größere Teilung. ist klein, die Teilung auf der Außenseite

Übernahmerollen haben einen Durchmesser von mindestens 40 mm.

Die Ausführung des ***GRZK*** -Bandes wird durch seine konische Bauweise bestimmt, es ist nur in bestimmten Größen erhältlich (siehe unten).

Innen-radius (mm)	Gurt-breite (mm)	Draht-durchm. (mm)	Teilung Innen radius (mm)	Teilung Außen radius (mm)
406	254	1,8	8,8	16,3
406	406	1,8	8,8	16,3
406	610	1,8	8,8	18
406	864	1,8	8,8	19
406	1092	1,8	8,8	19
600	800	1,4	6,2	10,5
900	800	1,6	6,2	8,5
623	812	2,0	9,5	16,2
500	700	1,8	7,8	13

Weitere Informationen zu den GRZK-Kurvenförderern entnehmen Sie bitte unserer Sonderbroschüre.

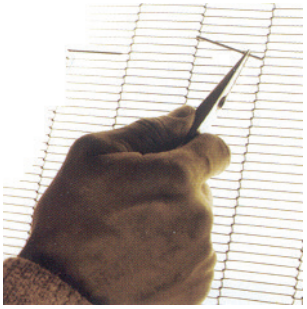


I
Remove a wire out of the belt.

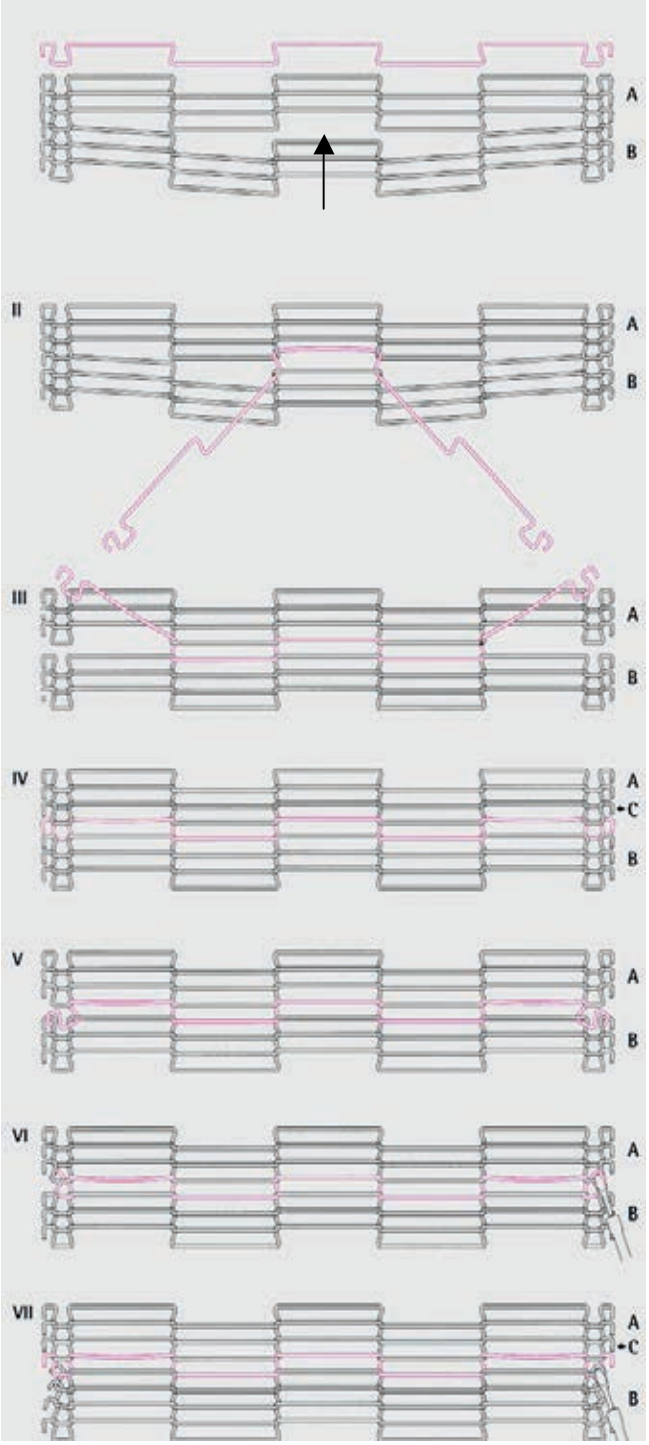
Cut the wire. Use the spaces which are not driven by the sprockets.

II
Bring both belt ends together, and start with the outside loops.

III + IV +V + VI
Hinge the parts of the belt with aid of common tooling.



VII + VIII
Place the wire ends in the tubes and force the tubes tight. Reshape the connection wire if necessary.



I
Remove a wire from the belt.
Use this wire as a connection wire.

Bring the belt ends A and B together.

For wide belt, connect temporary the outside loops together.

II
Start weaving the connection wire from the middle towards the left side and towards the right side.

III
Continue part II. Disconnect the temporary connection at the outside belt.

Connect the spaces and end with the single or double loop at the sides.

IV
Disconnect loop C.

For single looped belts see step VII

V
Connect the inside loop

VI
Connect the outside loop (B).

VII
Connect outside loop (C).