EN

Ammeraal Beltech
Innovation & Service in Belting

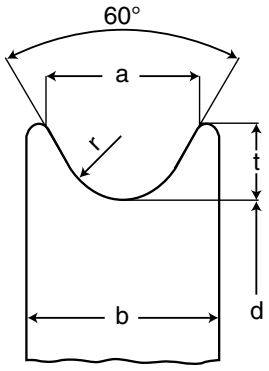
Installation of Solicord Belts

uni chains

www.ammeraalbeltech.com

Installation of Solicord Belts

Pulleys for round belts

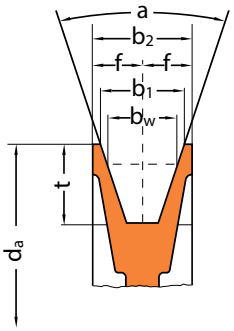


Recommended pulley dimensions – dimensions in mm

Belt Ø	2	3	4	4.8	5	6	6.3	7	8	9.5	10	12	12.5	15	18	20
a	4.5	5.5	7	8	8	10	10	11	12	14.5	15	18	18.5	23	28	30
b	6.5	8	10	12	12	14	14	15	16	19	19	22	23.0	27	32	36
t	2.5	3	3.5	4	4	5	5	5.5	6	7	7.5	9	9	12	14	15
r	1.4	1.9	2.5	3	3	3.5	3.5	4	4.5	5.5	5.5	6.5	7	8	9.5	11

Please select the appropriate minimum pulley diameter according to the datasheets. The best qualified materials for pulleys are steel, high-alloyed steel, aluminum or Polyamid when it comes to plastic. Please keep in mind the low friction coefficient μ when using plastic material.

Pulleys for V- belts



For Solicord Belts V-belts according to DIN 2215 / ISO 4184 pulleys for V-belts according to DIN 2217 / ISO 4183 have to be used.

Profile acc.to DIN 2215	6	8	10	13	17	22	32
Global Standard acc. to ISO 4184	Y	M	Z	A	B	C	D
Upper width b (mm)	6	8	10	13	17	22	32
Height h (mm)	4	5	6	8	11	14	20
Lower width u (mm)	3.3	4.55	5.9	7.5	9.4	12.35	18.25
Pulley angle	< 36-38°						
Groove width b1	6	8	10	13	17	22	32
	--> depending on how much the profile should stick out above the upper pulley edge						
Groove depth t (mm)	h +1.0 to +1.5 mm						

Note

In the field it is common to see round belts being run in V-belt pulleys. You need to know that this is not a perfect combination regarding geometry and that it is always recommended to use round belt pulleys instead.

The disadvantage of this "combination" is a typical wear in the belt flank where the belt is in contact with the pulley. There is also a risk that the round belt will be clamped by the V-shape of the pulley and thus stick in the V-shape. This often can lead to additional belt elongation causing the belt to skip or wobble. Under such conditions you will experience reduced lifetime of your Solicord Belt. If you decide to use V-belt pulleys anyhow please choose a V-belt pulley design that allows the round belt also to touch the bottom of the pulley groove to minimize problems.

Regarding selection of pulley material we recommend in general to use for the drive pulleys steel or aluminum to have good grip with the TPU/TPE belts. Then you have the best conditions to transmit maximum power to drive the belt. Please note that non-coated aluminum pulleys can lead to a discolouring of the belts. For supporting and deflection pulleys and supporting or guide rails we recommend using low friction materials like PE or HDPE to minimize friction.

You can find values for the coefficient of friction in the table below.

Pulley for round belts and V-belts

Drive pulley and deflection pulley.
The drive pulley and deflection pulley should be designed according to DIN 2217.

Please choose the minimum pulley diameters according to the values listed in tables. We have selected an appropriate shore hardness for conveying at low speeds (one Meter per second).

It is recommended to always place the drive pulley when possible at the head of the conveyor so the product is pulled through the system.

"What impact has the pulley diameter on the belt?"

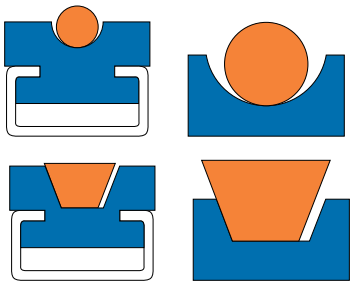
The pulley diameter has a major impact on the lifetime of a belt. The minimum pulley diameters or larger as specified in the datasheets should be applied.

If the pulley diameter is too small this always reduces lifetime considerably due to resulting extreme bending cycles leading to early material fatigue. The specified minimum pulley diameters always refer to a 180° wrap. The wrap angle indicates by how many degrees the belt will be guided around the pulley and thus has contact with the pulley.

Sliderbeds and connectors

Sliderbeds and supporting rollers.
Grooved pulleys, supporting rolls and sliderbeds are recommended to keep the belting in position to carry the load. When guiding V belts, the V belt groove should be designed so that the belt is being supported on the bottom of the groove and is only allowed to touch one side of the groove at a time to avoid jamming.

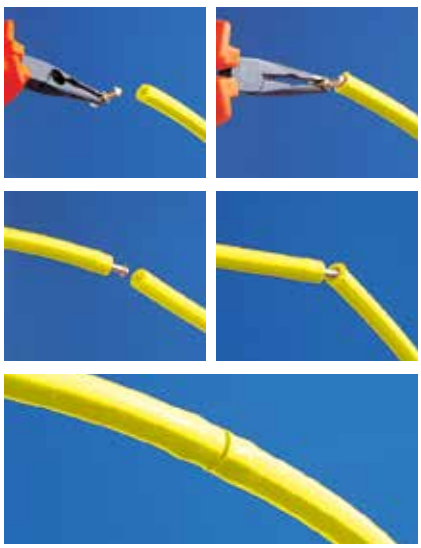
The diameter and number of the required supporting rolls depends on the length of the conveyor as well as on the weight and dimensions of the goods to be conveyed. Supporting sliderbeds with a smooth surface can be grooved to support transport belts. The dimensions of the groove should be such to prevent the belt from jamming. The sliderbeds should be made of materials with good sliding qualities (PE – HDPE). If you are looking for a supplier please contact us, we can give you a recommendation.



Fitting connectors for hollow round belts

Hollow round belts should be welded just like solid belts. In the case of a breakdown, fitting connectors can be used for a quick repair, until the belt can be welded once again. Another advantage is the flexibility of the belt for small pulley diameters. The hollow round belts can be connected via metal connectors, as shown in the picture. Hollow rounds belts with connectors can also be used in many applications when the belts are not subject to heavy loads or high speeds. In these cases this type of joining represents a good alternative to the welded joint (Make sure that the minimum pulley diameter and the pulley form are correct). When applying the metal nipple, special care has to be taken not to damage the belt with the sharp metal edges. This would reduce the tensile strength of the joint. Therefore we recommend the use of pointed pliers.

ATTENTION:
Wear gloves, risk of injury.

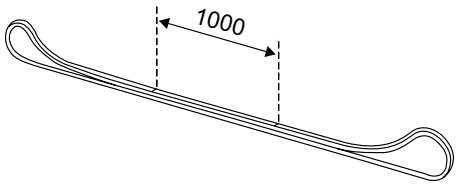


Fitting connectors for quick repairs

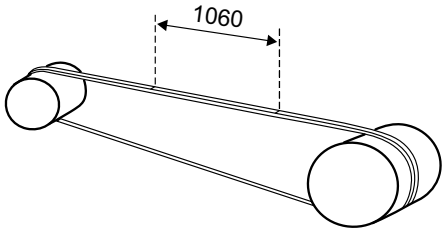
Pretension and tensioning devices

Pretension

Suitable pretension of TPU or TPE belts is required to ensure functional operation.
Check the datasheet of your specific Solicord Belt.



Prior to joining the belt, place it on a flat surface and mark two lines 1000 mm apart (for shorter belts, the distance can be reduced to 100 mm).



Mount the belt on the pulleys and tension it to increase the distance between the two marks. Elongate the belt until the distance reaches the requested value according to the marks. At a pretension of e.g. 6%, the marks have to be 1060 mm apart. Have the belt make some evolutions and check the elongation again. If necessary adjust the belt elongation.

„How does the pretension of a belt impact its lifetime?"

The proper pre-tensioning of the belt is just as critical for belt performance as selecting the right belt and the right splicing system. For the recommended pretension please refer to the product tables of each belt in our Solicord delivery program.

What are the effects of wrong pretension? Too low pretension results in slippage of the belt which generates excessive heat. This causes belt deformation, heavy abrasion, breaking and jumping out of the pulley.

Too high pretension may cause damage to pulleys, shafts and bearings. The belt permanently is over-tensioned and will prematurely fail due to material fatigue and formation of cracks. Furthermore the belt loses its (material) resilience.

Tensioning devices

A variety of tensioning devices can be used to accommodate the different amounts of stretch in belts or to make the instillation process easier. In addition, for reinforced belts or belts with little pretension required, we recommend the use of take-up systems permanently installed on the conveyor system. Please follow our recommended pretention for each belt to reduce premature wear and failure on our bearings.

Common ways to properly tension a belt are listed below:

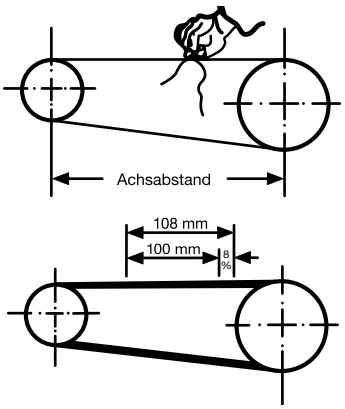
- cut the belt to a shorter length than the measured length of the conveyor system
- use a take up pulley or a deflection pulley with a counter weight or a mechanical screw movement
- the drive motor is moved in slotted mounting holes via an adjustment screw
- tensioning sled (the drive motor is mounted on rails and is moved by its own weight or by a screw mechanism).
- tensioning jack (the motor with the drive pulley is mounted on a turnable rocker. If the drive motor is running in the specified direction the backwards engine torque tensiones the belt automatically)

The right positioning of tensioning pulleys is essential for the lifetime and functionality of a belt. The tensioning pulleys always should be located in the return strand right after the drive pulley.

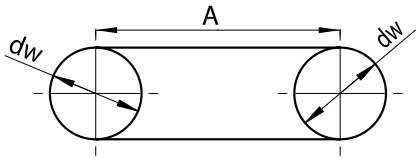
Calculation of belt length

Working out the correct belt length

Use a string or steel tape to make measurements after reducing take-up (if installed) to the minimum. Distance between pulleys should remain fixed. To obtain good driving strength and good belt life, the belt pretension should be 1 to 8%, depending on the belt type. For the adviced pretention, please consult the datasheet of your particular belt. To verify pretension on an installed belt, apply two marks with a pen separated by 100 mm on the belt when it is free from tension. The increase of space between the marks after mounting the belt provides a measure of the pretension in percent.



Calculation of belt length



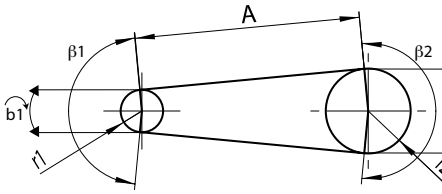
L_{f1}

Calculation formulas

L_{f1} = dw x ϖ + 2 x A

dw = effective diameter (position of the neutral axxis of belt)
A = center distance for round belts:
dw = bottom of groove + diameter of belt

The recommended pretension has to be considered in addition!



L_{f2}

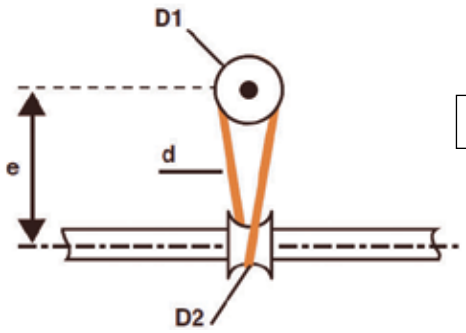
L_{f2} = b1w + b2w + 2 x A

$b1w = \frac{\varpi}{180°} x\ r1w \times b1$

$b2w = \frac{\varpi}{180°} x\ r2w \times b2$

bw = radian measure at effective radius
rw = effective radius (position of the neutral axxis of belt)
A = center distance for round belts:
rw = radius at bottom of groove + half belt diameter

The recommended pretension has to be considered in addition!



L_{f2}

Lineshaft Conveyor Belts (semi-crossed)

$Lf3 = [(D1 + d) + (D2 + d)] \times \varpi / 2 + 2 \times \sqrt{[(D1+d)2 / 4 + e2]}$

D1: pulley diameter at bottom of groove
D2: inner diameter of diabolo roller
d: diameter of belt
e: center distance

The recommended pretension has to be considered in addition!

Quick reference for V-Belts

Profile according to DIN 2215		6	8	10	13	17	22	32
Profile according to ISO 4184		Y	M	Z	A	B	C	D
Upper width b (mm)		6	8	10	13	17	22	32
Height h (mm)		4	5	6	8	11	14	20
Lower width u (mm)		3.3	4.55	5.9	7.5	9.4	12.35	18.25
Calculation of the belt length La and Lw if the inner length Li is determined or known	**La = Li**	+25	+31	+38	+50	+69	+88	+126
	La = La	+10	+12	+16	+20	+29	+30	+51
	Lw = Li	+15	+19	+22	+30	+40	+58	+75
	Lw = La	-10	-12	-16	-20	-29	-30	-51

Adhesion factors and profile dimensions

Table for values of the coefficient of friction μ

Material type	Aluminium	Steel	Glass	Wood (veneer)	PE (Polyethylene)	HDPE (High density polyethylene)
PU 65 A	0.90	0.70	0.60	0.80	0.40	0.35
PU 75 A	0.85	0.70	0.50	0.70	0.40	0.35
PU 80 A	0.80	0.65	0.45	0.65	0.35	0.30
PU 85 A	0.75	0.60	0.40	0.60	0.30	0.25
PU 90 A	0.70	0.50	0.30	0.45	0.30	0.25
PU 95 A	0.65	0.45	0.25	0.40	0.25	0.20
Polyester TPE 40 D	0.70	0.50	0.30	0.45	0.30	0.25
Polyester TPE 55 D	0.45	0.35	0.30	0.35	0.15	0.10
Polyester TPE 63 D	0.45	0.35	0.30	0.35	0.15	0.10

Recommended max. belt speed

Recommended max. belt speed m/s	Belts used as conveyor belt	Belt used as drive belt
PU 75 A	1.5 m/s	10 m/s
PU 80 A	1.5 m/s	10 m/s
PU 85 A	2.0 m/s	15 m/s
PU 90 A	2.0 m/s	15 m/s
Polyester 55 D	2.5 m/s	20 m/s

Calculation:

$$v = \frac{dw \times n_1}{19100}$$

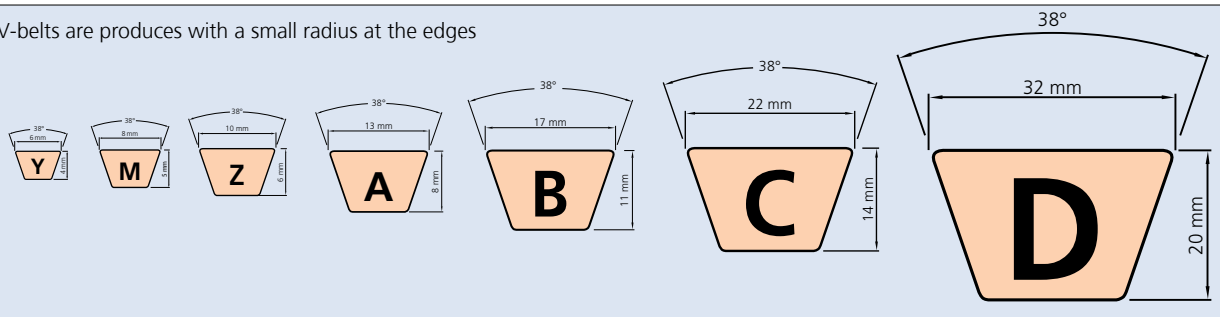
v = belt speed (m / s)

n_1 = speed of smaller pulley (min. –1)

dw = effective diameter of smaller pulley (mm)

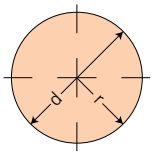
V-belt dimensions according to DIN 2215 and ISO 4184

All V-belts are produces with a small radius at the edges

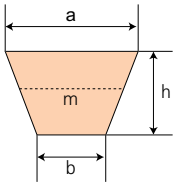


Profile acc.to ISO 4184	6	8	10	13	17	22	32
Weltstandard nach ISO	Y	M	Z	A	B	C	D
Upper width b (mm)	6	8	10	13	17	22	32
Height h (mm)	4	5	6	8	11	14	20
Lower width u (mm)	3.3	4.55	5.9	7.5	9.4	12.35	18.25

Calculation of the belt cross section:



$$A_{cm^2} = \frac{p}{4} \times d^2 \approx 0{,}785 \times d^2$$



$$A_{cm^2} = \frac{a+b}{2} \times h = m \times h$$

$$m = \frac{a+b}{2}$$

Production tolerances

Production tolerances Solicord Belts

Description	Dimension		Tolerance	
Round belts	**mm**	**in**	**≈ mm**	**in**
Type PU 75 A/80 A	Ø 2 -Ø8	(Ø 5/64 - 5/16)	± 0.2	(± 1/128)
Type PU 75 A/80 A	Ø 9 - Ø 15	(Ø 45/128 - 19/32)	± 0.3	-
Type PU 85 A/90 A/95 A	Ø 2 - Ø 8	(Ø 5/64 - 5/16)	± 0.2	(± 1/128)
Type PU 85 A/90 A/95 A	Ø 9 - Ø 15)	(Ø 45/128 - 19/32)	± 0.3	-
Type PU 85 A/90 A/95 A	Ø 18 - Ø 20	(Ø 3/4 - 25/32)	± 0,5	(± 1/64)
Type Polyester TPE 40 D/55 D	Ø 3 - Ø 8	(Ø 1/8 - 5/16)	± 0,2	(± 1/128)
Type Polyester TPE 40 D/55 D	Ø 9 - Ø 15	(Ø 45/128 - 19/32)	± 0,3	-
Type Polyester TPE 63 D	Ø 6,3, Ø 9,5, Ø 12,5	(Ø 1/4 - 3/8 - 1/2)	± 0,3	-

Round belts can be produced on request in "-" or "+"-tolerance.

Description	Dimension mm	(ISO)	Tolerance ≈ mm	
V-belt DIN 2215			**0-width**	**height**
Type PU 65 A	6 - 8 - 10 - 13 - 17 - 22	(Y - M - Z - A - B - C)	- 0.5	+ 0.5
Type PU 75 A	6 - 8 - 10 - 13 - 17 - 22 - 32	(Y - M - Z - A - B - C - D)	- 0.5	+ 0.5
Type PU 80 A	6 - 8 - 10 - 13 - 17 - 22 - 32	(Y - M - Z - A - B - C - D)	- 0.5	+ 0.5
Type PU 85 A	6 - 8 - 10 - 13 - 17 - 22 - 32	(Y - M - Z - A - B - C - D)	- 0.5	+ 0.5
Type PU 90 A	8 - 10 - 13 - 17 - 22 - 32	(M - Z - A - B - C - D)	- 0.5	+ 0.5
Type Polyester TPE 40 D	8 - 10 - 13 - 17 - 22	(M - Z - A - B - C)	- 0.5	+ 0.5
Type Polyester TPE 55 D	8 - 10 - 13 - 17 - 22	(M - Z - A - B - C)	- 0.5	+ 0.5

Productions tolerances for tailoring

Production lengths (lf)	Production tolerance
150 - 1000 mm	± 2 mm
1001 - 4000 mm	± 3 mm
4001 - 10000 mm	± 5 mm
over 10000	± 10 mm

Contact us if more strict tolerances are required!

Local Contacts

Australia
T +61 3 9555 7922
info-au@ammeraalbeltech.com
www.rydell.com.au

Austria
T +43 171728 133
info-de@ammeraalbeltech.com
www.ammeraalbeltech.at

Belgium
T +32 2 466 03 00
info-be@ammeraalbeltech.com
www.ammeraalbeltech.be

Canada
T +1 905 890 1311
info-ca@ammeraalbeltech.com
www.ammeraalbeltech.com

Chile
T +56 2 233 12900
info-cl@ammeraalbeltech.com
www.ammeraalbeltech.cl

China
T +86 512 8287 2709
info-cn@ammeraalbeltech.com
www.ammeraalbeltech.com.cn

Czech Republic
T +420 567 117 211
info-cz@ammeraalbeltech.com
www.ammeraalbeltech.cz

Denmark
T + 45 7572 3100
info-dk@ammeraalbeltech.com
www.unichains.com

Finland
T +358 207 911 400
info-fi@ammeraalbeltech.com
www.ammeraalbeltech.fi

France
T +33 3 20 90 36 00
info-fr@ammeraalbeltech.com
www.ammeraalbeltech.fr

Germany
T +49 4152 937-0
info-de@ammeraalbeltech.com
www.ammeraalbeltech.de

Hungary
T +36 30 311 6099
info-hu@ammeraalbeltech.com
www.ammeraalbeltech.hu

India
T +91 44 265 34 244
info-in@ammeraalbeltech.com
www.ammeraalbeltech.com

Italy
T +39 051 660 60 06
info-it@ammeraalbeltech.com
www.ammeraalbeltech.it

Luxembourg
T +352 26 48 38 56
info-lu@ammeraalbeltech.com
www.ammeraal-beltech.lu

Malaysia
T +60 3 806 188 49
info-my@ammeraalbeltech.com
www.ammeraalbeltech.com

Netherlands
T +31 72 57 51212
info-nl@ammeraalbeltech.com
www.ammeraalbeltech.nl

Poland
T +48 32 44 77 179
info-pl@ammeraalbeltech.com
www.ammeraalbeltech.com

Portugal
T +351 22 947 94 40
info-pt@ammeraalbeltech.com
www.ammeraalbeltech.pt

Singapore
T +65 62739767
info-sg@ammeraalbeltech.com
www.ammeraalbeltech.com

Slovakia
T +421 2 55648541-2
info-sk@ammeraalbeltech.com
www.ammeraalbeltech.sk

South Korea
T +82 31 448 3613-7
info-kr@ammeraalbeltech.com
www.ammeraalbeltech.co.kr

Spain
T +34 93 718 3054
info-es@ammeraalbeltech.com
www.ammeraalbeltech.es

Sweden
T +46 44 780 3010
info-se@ammeraalbeltech.com
www.ammeraalbeltech.se

Switzerland
T +41 55 2253 535
info-ch@ammeraalbeltech.com
www.ammeraalbeltech.ch

Thailand
T +66 2 902 2604-13
info-th@ammeraalbeltech.com
www.ammeraalbeltech.com

United Kingdom
T +44 1992 500550
info-uk@ammeraalbeltech.com
www.ammeraalbeltech.co.uk

United States
T +1 847 673 6720
info-us@ammeraalbeltech.com
www.ammeraalbeltech.com

Vietnam
T +84 8 376 562 05
info-vn@ammeraalbeltech.com
www.ammeraalbeltech.com.vn

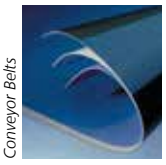
Global Headquarters:

Ammeraal Beltech Holding B.V.
P.O. Box 38
1700 AA Heerhugowaard
The Netherlands

T +31 (0)72 575 1212
F +31 (0)72 571 6455

info@ammeraalbeltech.com
www.ammeraalbeltech.com

Expert advice, quality solutions and local service for all your belting needs


Conveyor Belts


Timing Belts


Seamless Belts


Transmission Belts


Modular Belts


Fabrication & service

... and 150 more service contact points at www.ammeraalbeltech.com

Date: 07.2016