Coating variations as part of the base belt

Polyamide fabric PAZ, PAR, PAZ / PAR

Polyamide (PA) fabric serves for the friction and noise minimisation in the case of thermoplastic timing belts optibelt ALPHA LINEAR / V and optibelt ALPHA FLEX.

As part of the timing belt, the polyamide fabric in these product groups can run in as well during the moulding on the teeth of the shaping wheel. Green polyamide fabric is shown on Figure 1.3.4 on the teeth. This design is called PAZ.

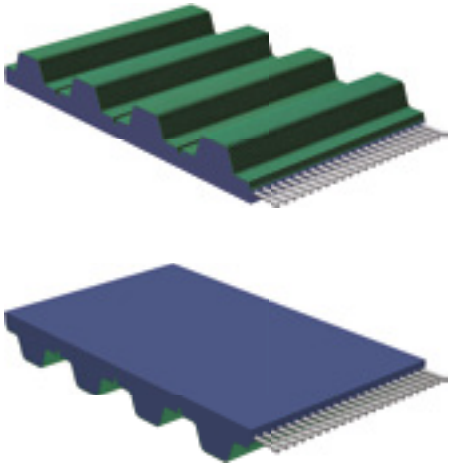


Figure 1.3.4: Polyamide fabric on the tooth system, PAZ

In Figure 1.3.5, green polyamide fabric is shown on the smooth top surface – called PAR – of an optibelt ALPHA LINEAR timing belt. This polyamide fabric also runs in during the moulding process, however, here on the top surface.

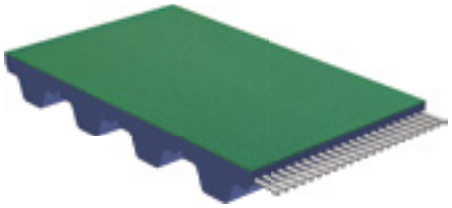


Figure 1.3.5: Polyamide fabric on the top surface, PAR

Accordingly, the optibelt ALPHA LINEAR / V timing belts can also be manufactured with polyamide fabric on both sides
– abbreviation PAZ / PAR – see Figure 1.3.6.

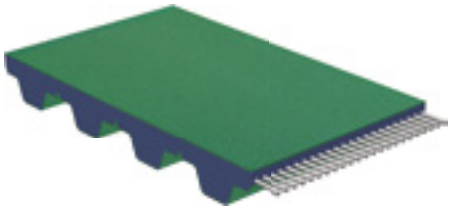


Figure 1.3.6: Polyamide fabric on the tooth system and on the top surface, PAZ / PAR

The smooth top surface of an optibelt ALPHA FLEX cannot be equipped with polyamide fabric during production. This generally applies also to teeth on the top surface. Double profile, thermoplastic timing belts can be delivered as shown in Figure 1.3.7 only in the PAZ design.
The polyamide fabric is addressed in detail in Chapter 6.1.
Table 1.2.1 shows an overview of the production possibilities of polyamide fabric as an integral part of the base belt depending on the product groups.

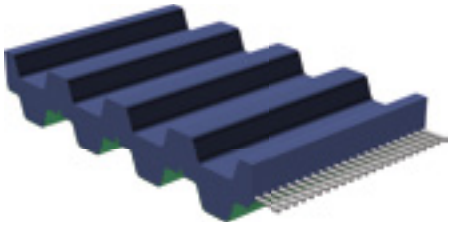


Figure 1.3.7: Polyamide fabric on one toothed side of a double toothed belt

Reinforced top surface

For conveying purposes, optibelt ALPHA V, ALPHA FLEX and ALPHA SRP can be directly produced with a reinforced top surface of polyurethane, see Figure 1.3.8. This is the simplest and hence the most cost-efficient variation among the coated belt designs of the thermoplastic polyurethane timing belts.
In the case of the cast optibelt ALPHA SRP, which is described in Chapter 6.3, the reinforced polyurethane top surface can also have hardnesses that differ from the hardness of the base belt.

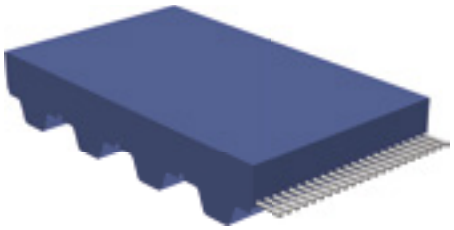


Figure 1.3.8: Polyurethane timing belt of the reinforced top surface design

T2, PU-Smart and APL plus

Open-ended optibelt ALPHA LINEAR timing belts can be equipped on the top surface during production directly with the

- smooth polyurethane coating T2, see Figure 1.3.9 or the
- profiled PU coating, longitudinal groove fine, see Figure in Subchapter 6.2,
- foamed coating PU-Smart, see Figure 1.3.10,
- smooth polyvinyl chloride coating APL plus, see Figure 5.2.5,

and further materials and designs and welded together with the coating to an endless optibelt ALPHA V. Subsequent coating is hence not necessary. As a result, these belt designs can generally be offered at a lower price than subsequently coated ALPHA V SPECIAL timing belts.
The coatings mentioned here and the large number of subsequently applied coatings for any base belt group beyond polyurethane timing belts are described in Chapter 6.2.

Figure 1.3.9: Polyurethane timing belt with T2 coating

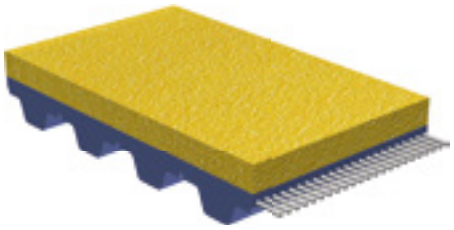


Figure 1.3.10: Polyurethane timing belt with coating PU-Smart

Cleats as integral part of the base belt

In the same way as the tooth design on the top surface of double profile, cast ALPHA TORQUE timing belts and ALPHA POWER, individually designed cleats can be moulded together with the belt teeth on the top surface in the case of the optibelt ALPHA SRP. The Figure 1.3.11 shows the example of a possible cleat design.
In the case of the optibelt ALPHA SRP, the polyurethane cleat can alternatively also be manufactured in hardnesses that differ from the hardness of the base belt. Further details are given in Chapter 6.5.

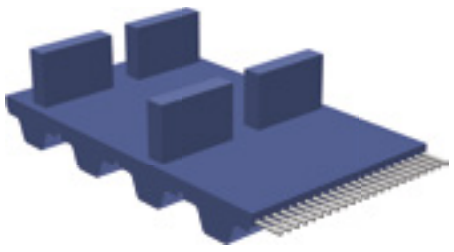


Figure 1.3.11: Polyurethane timing belt with cleats of polyurethane

5.2 Variations

As an alternative to flanges at the side of the pulleys and/or U-shaped flanks of a support rail at the sides, the lateral guidance of an optibelt ALPHA V conveyor belt can also be achieved by a V-guide on the tooth side. Track timing belts require correspondingly adjusted timing belt pulleys and support rails with keyway. Flanges or flanks that are too high for the transport tasks are not necessary.
Subsequently welded-in V-guides of an optibelt ALPHA V SPECIAL can be positioned in any arrangement over the width regarding number and position. In contrast to these V-guides, integrated V-guides are arranged centrally over the width and notched for a smaller minimum pulley diameter. As the subsequent welding of the V-guide is not necessary, optibelt ALPHA V track timing belts can be offered at comparatively lower prices.

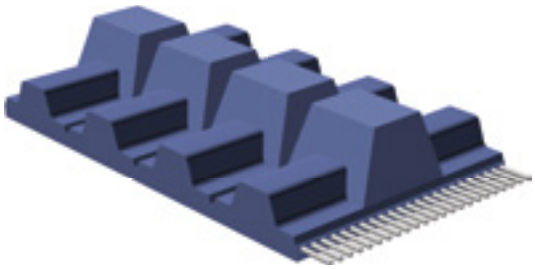


Figure 5.2.1: Polyurethane track timing belt with moulded V-guide

For conveying purposes, optibelt ALPHA V timing belts can be directly produced with a reinforced top surface of polyurethane, see Figure 5.2.2. This is the simplest and hence the most cost-efficient variation on among the coated belt designs of the thermoplastic polyurethane timing belts.

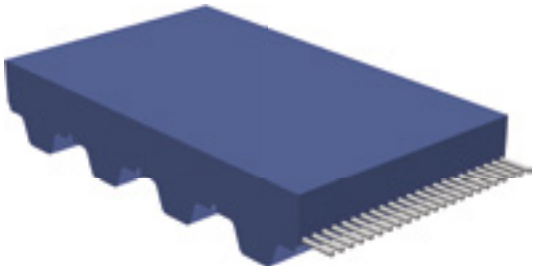


Figure 5.2.2: Polyurethane timing belt of the reinforced top surface design

Table 5.2.1: Product groups, lengths, profiles and features

optibelt ALPHA V welded, endless	
Minimum length Lengths	400 mm – 1200 mm in indexing steps
Imperial profile T profile TK profile AT profile ATK profile HTD profile Flat belt	XL, L, H, XH T5, T10, T20, TT5 T5K6, T10K6, T10K13 AT5, AT10, AT20 AT5K6, AT10K6, AT10K13 5M, 8M, 14M, 14ML F2, F2.5, F3, FL3
Standard colour	white
Standard hardness	92 Shore A
Standard tension cord [1]	steel aramid
PA tooth side, PAZ PA top surface, PAR	+ optional + optional
Special hardness	65, 85 Shore A
Special colour	e. g. black, blue, on request according to RAL No.
Minimum quantity for special hardness, colour	from 200 metres with max. production width
Special tension cord [1] see Chapter 1.5	highly flexible steel stainless steel
Without sleeve nose	T10, optional
PU (FDA): Hardness, colour	85 Shore A, blue, optionally transparent

[1] Aramid and special cords for each profile on request

For the cast optibelt ALPHA SRP timing belt, which is described in Subchapter 6.3, the reinforced polyurethane top surface can alternatively also be designed in hardnesses that differ from the base belt.

Open-ended optibelt ALPHA LINEAR timing belts can be equipped on the belt top surface during production directly with the

- smooth polyurethane coating T2, see Figure 5.2.3 or the
- profiled PU coating, longitudinal fine groove, see Figure in Subchapter 6.2,
- foamed coating PU-Smart, see Figure 5.2.4 or the
- smooth PVC coating APL plus, see Figure 5.2.5,

and welded together with the coating to an endless optibelt ALPHA V.
Subsequent coating is hence not necessary. As a result, these belt design can generally be offered at a lower price than subsequently coated ALPHA V SPECIAL timing belts.
The coatings reinforced top surface, T2, APL plus and PU-Smart can generally be applied on any other base belt, even if the quantities are low.
The features of the above mentioned and subsequently applied coatings for any base belt group beyond polyurethane timing belts are described in Chapter 6.2.

Further details, related to the weldable timing belt and flat belt profiles, listed in Table 5.2.1, are included in Subchapter 1.4.

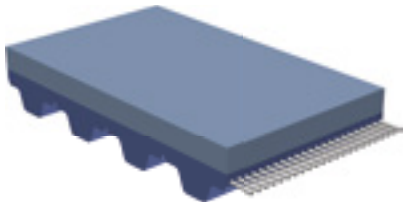


Figure 5.2.3: Polyurethane timing belt with T2 coating, transparent

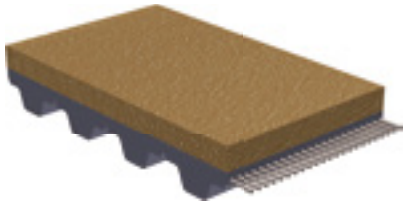


Figure 5.2.4: Polyurethane timing belt with coating PU-Smart brown

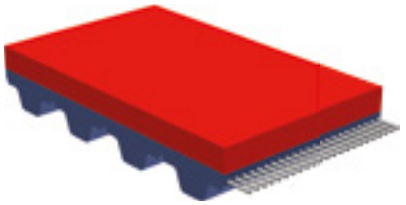


Figure 5.2.5: Polyurethane timing belt with PVC coating APL plus, red

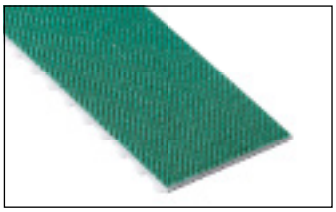
5.3 Timing Belt Pre-selection

Selection of tooth system

The available profiles of the product group ALPHA LINEAR (except ATL profiles) are generally also suitable for use in transport drives and can be welded to optibelt ALPHA V. For the selection of the timing belts, the characteristics of the different timing belt profiles and the pertaining timing belt pulleys should be considered, depending on the transport task. Major characteristics are, for example, the level of the load e.g. by heavy transport goods, ambient conditions such as the contamination through dust and special requirements regarding the positioning accuracy.

6 COATINGS, CLEATS AND ADJUSTMENTS

6.1 POLYAMIDE FABRIC COATING

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
	**PA fabric, green, polyamide** s –* 0.5** Ø –* 25**	Density: not specified Degree of grip	–20 °C ... + 100 °C Abrasion resistance

* PAR and/or PAZ is directly applied during the production of the base belts; the PA fabric is therefore included in the belt contour and does not build up on the tooth side or the top surface; the minimum pulley diameters indicated for each profile are applicable.
No EU food compliance / FDA for standard PAZ/PAR
PAZ: on the tooth side on transport belts with support rail and take-off conveyors with pressure bar; polyethylene support rails are only recommended for low and medium loads; for higher loads, steel is recommended.
PAR: on the top surface for accumulating conveyors; in the case of a relative movement: suitable for smooth transport goods surfaces; less suitable for structured or profiled transport goods surfaces.

** PAR subsequently: if required, subsequent application possible
The oil, fat and general chemicals resistance corresponds approximately to that of the thermoplastic base material; see Table 6.1.1 for guide values for the coefficients of friction; price index: *A, ** D

	**PA fabric, antistatic, anthracite** s –* 0.5** Ø –* 25**	Density: not specified Degree of grip	–20 °C ... + 100 °C Abrasion resistance

*/** see PA fabric, green; for *: Timing belts only in PAZ / PAR design with antistatic characteristics according to Standard 9563; standard for the T5 profile with an overall thickness of 2.55 mm; no EU food compliance / FDA; price index: C

Table 6.1.1 indicates guide values for the coefficients of friction. Depending on the portion of the static or sliding friction of the load, the corresponding coefficient of friction should be considered. The coefficients of friction apply to the new belts, dry operating conditions and can deviate depending on the belt speed and the connected heat development, the heat dissipation and the surface properties of the friction material. The indicated upper and lower limits of the sliding coefficient of friction are related to the belt speeds of 0.1 to 1.0 m/s.
Depending on the contamination, level of wear or special ambient influences, considerable deviations from the guide values have to be expected.

Table 6.1.1: Guide values for friction coefficients

Friction materials	Guide values for friction coefficients			
	Polyurethane		Polyamide fabric	
	Static friction μ_0	Sliding friction μ	Static friction μ_0	Sliding friction μ
Steel	0.7	0.4 ... 0.7	0.5	0.2 ... 0.5
Aluminium	0.6	0.4 ... 0.6	0.4	0.2 ... 0.4
Polyethylene	0.5	0.3 ... 0.5	0.3	0.2 ... 0.3
Glass, smooth	1.0	0.7*... 1,0*	0.5	0.3 ... 0.5
Wood, in fibre direction	0.6	0.4 ... 0.6	0.4	0.2 ... 0.4

* Polyamide fabric is recommended for mainly sliding applications.

Pre-selection for coatings of polyurethane (PU), rubber and polyvinyl chloride (PVC)

Table 6.2.1: Pre-selection of the coating features depending on transport goods and conditions

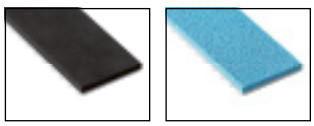
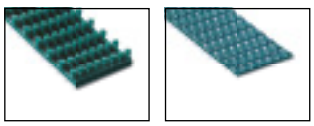
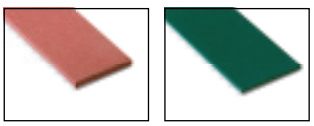
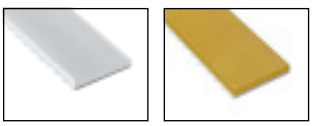
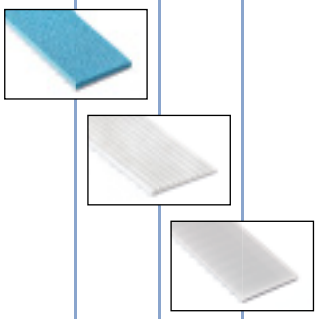
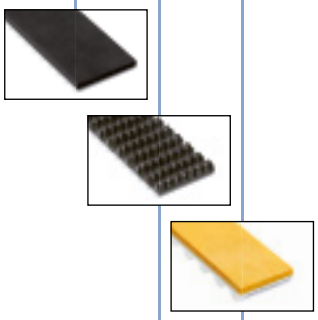
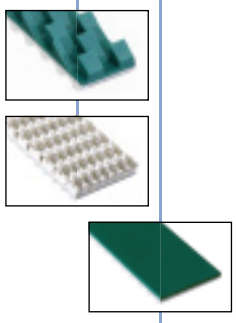
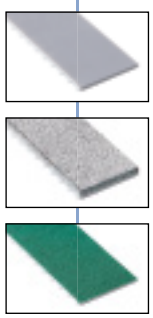
Transport goods features recommended possible ~~not recommended~~			
Low, ~~medium~~, ~~high~~ weight	Low, medium, ~~high~~ weight	Low, medium, ~~high~~ weight	Low, medium, high weight
Smooth, structured, profiled area	Smooth, structured, profiled area	Smooth, structured, profiled area	Smooth, structured, profiled area
Dry, wet, dusty	Dry, wet, dusty	Dry, wet, dusty	Dry, ~~wet~~, ~~dusty~~
Impact sensitive, resistant	Impact sensitive, resistant	Impact sensitive, resistant	~~Impact sensitive~~, resistant
Transport goods			
↕	↕	↕	↕
Coating			
Foam	**Profiled** or structured	**Smooth** or slightly structured	
Porol, cell rubber Sylomer, polyurethane	Supergrip, PVC Minigrip, PVC	Linatex, rubber PVC petrol blue	PU foil Polythan, PU
			
Soft, fine-pored surface	Medium hardness, profiled or structured	Medium hardness, slightly structured or smooth	High hardness, smooth surface
≈ 300 kg/m³	≈ 50 Shore A	≈ 50 Shore A	≈ 80 Shore A
With relative movement high abrasion	With relative movement high abrasion	With relative movement medium abrasion	With relative movement low abrasion
Coating			

Table 6.2.2: Material and surface properties of coatings

Foam	Profiled or structured	Smooth or slightly structured	Foam / Profiled / Smooth
Polyurethane (PU)			
– Sylomer R (see Fig.) – Sylomer L – Celloflex – Sylomer M – PU-Smart – PU 06	– PU longitudinal groove (see Fig.) – Pointed cone, FDA – PU longitudinal groove fine – PU Spike profile, FDA	– PU foil 65 Shore A – Polythan D15 – Polythan D44 – PU foil blue, FDA – PU foil 85 Shore A – T2 (see Fig.) – PU foil 92 Shore A – Reinforced top surface	
Rubber			
– EPDM – Porol (see Fig.)	– Supergrip black (see Fig.) – Supergrip blue	– RP 400 (see Fig.) – Linatex – Linaplus FGL, FDA – Correx beige – NG red – Linatrile – Elastomer green	
	Polyvinyl chloride (PVC)		
	– PVC shark tooth (see Fig.) – PVC longitudinal groove – Supergrip petrol blue – Supergrip green – PVC cleats, FDA – Minigrip petrol blue – Minigrip green – Pebbles rounded cone, FDA – Supergrip white, FDA (see Fig.) – PVC fishbone pattern, FDA – PVC saw tooth, FDA – PVC triangular profile, FDA	– PVC foil green – PVC foil blue, FDA – PVC foil white, FDA – APL plus – PVC foil petrol blue (see Fig.)	
	Special/PA fabric		
	– PTFE (see Fig.) – TT60 – Para fleece – Chrome leather (see Fig.) – Viton – PA fabric (see Fig.) – PA fabric antistatic		

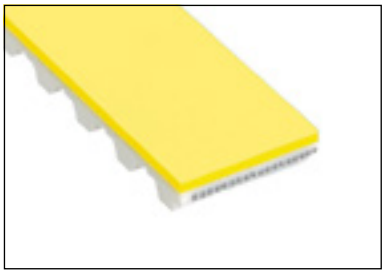
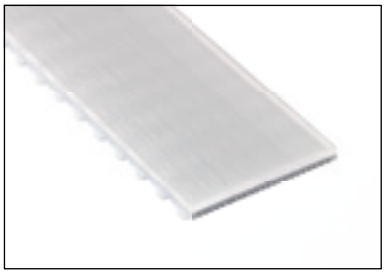
Coating material polyurethane (PU)

Smooth polyurethane coatings are mainly used as wear protection, since they exhibit the highest cutting resistance and abrasion strength compared to other coating materials. The coefficient of friction does not change or changes only slightly in relation to a polyurethane base belt.
Polyurethane foils can be welded on optibelt ALPHA LINEAR / V and ALPHA FLEX in addition to adhesion as a subsequent production process. Polyurethane foils can also be applied on optibelt ALPHA LINEAR timing belts by extrusion.
The profiled polyurethane foil PU longitudinal groove prevents the adherence of smooth transport goods, e.g. flat glass, particularly in the case of moisture through linear support.
Polyurethane foams with a low density are primarily used for shock absorption when placing sensitive parts.
Foamed polyurethane coatings with a high density are highly suitable for mechanical processing, e.g. recesses to hold the transport goods. Due to the open-pored structure soft polyurethane foams exhibit a low abrasion strength.

Table 6.2.3: Polyurethane coatings, known characteristics and applications

PU	Physical and chemical properties	Rubber	PVC
+/–*	Polyurethane elastomer has a medium degree of grip; *high grip through adhesion on smooth, clean friction partners	+ +	+
+ +	PU foams for light, impact sensitive parts; profiled and smooth PU surfaces for low to heavy transport weights	+	+
+/–	The temperature resistance does not include low or high temperatures and corresponds with the polyurethane timing belts	+ +	+
+ +	Polyurethane elastomer does not stain during the relative movements; smooth PU exhibits a high abrasion strength and very good cutting resistance	+/–	+
+ +	The oil, fat and general chemicals resistance is the highest compared with other coatings; partly EU food compliance / FDA	+/–	+ +
Application areas	Wear and cutting protection with smooth polyurethane coating; transport or discharge conveyors in all areas of conveying technology; partly with EU food compliance / FDA		

++ excellent to very good, + good, +/– satisfactory to sufficient, – deficient to insufficient

Foam	Profiled or structured	Smooth or slightly structured
e. g. PU-Smart	e. g. PU longitudinal groove	e. g. T2
		

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
Foam			

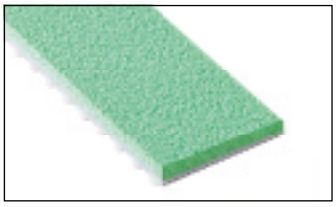
Sylomer R, blue, PU foam

s	6.0	12.0				
Ø	120	240				

≈ 220 kg/m³ | −30 °C ... + 70 °C

Degree of grip | Abrasion resistance

Hardness: ≈ 10 Shore A; high dynamic load capacity; conveyance of lightweight, fragile parts; discharge conveyors with low loads; e.g. in the paper and textile industry; for top pressure belts; price index: C, D



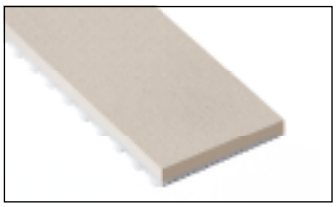
Sylomer L, green, PU foam

s	6.0	12.0	15.0	20.0	25.0
Ø	120	240	300	400	500

≈ 300 kg/m³ | −30 °C ... + 70 °C

Degree of grip | Abrasion resistance

Hardness: ≈ 15 Shore A; widely-used; same application as Sylomer R, blue, but increased hardness; price index: D



Celloflex, beige, microcell PU

s	2.0	3.0	4.0	5.0	6.0	8.0
Ø	40	60	70	90	110	140

≈ 350 kg/m³ | −30 °C ... + 60 °C

Degree of grip | Abrasion resistance

Widely-used; also known asfoam with medium hardness, for extremely high dynamic load capacity and good abrasion resistance; e.g. for foils, textiles and packaging; price index: B - D

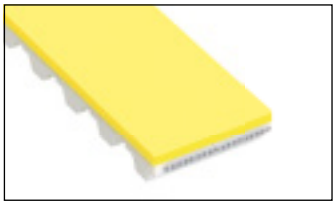
Sylomer M, brown, PU foam

s	6.0	12.0				
Ø	120	240				

≈ 400 kg/m³ | −30 °C ... + 70 °C

Degree of grip | Abrasion resistance

Hardness: ≈ 22 Shore A; same application as Sylomer R, blue, but greater hardness as Sylomer L, green; price index: D, E



PU-Smart, fine-pored PU

s	2.0	3.0	6.0	8.0	10.0	12.0
Ø	60	70	120	160	200	240

≈ 50 Shore A | −10 °C ... + 60 °C

Degree of grip | Abrasion resistance

Same application areas as PU 06, but lower-priced; a little less abrasion-resistant than PU 06; unlike PU 06 this coating can be extruded as a standard coating directly onto the optibelt ALPHA LINEAR AT10 in 3 mm thickness; further profiles on request; ALPHA V together with the coating and hence without joint, even with greater lengths; e.g. for use in paper and glass industry; good mechanical processing capabilities, e.g. cutting of pockets for vacuum transport; price index: C - E

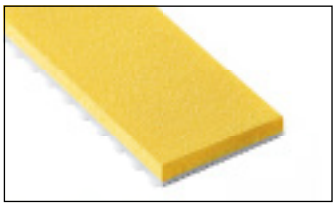
6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

COATING MATERIAL POLYURETHANE (PU)

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance

Foam



PU 06, yellow, fine-pored PU

s	2.0	3.0	5.0	6.0	8.0	10.0
Ø	60	70	100	120	160	200

≈ 55 Shore A

Degree of grip

−10 °C ... +60 °C

Abrasion resistance

Widely-used; foam with high abrasion resistance; e.g. in paper and glass industry; easy mechanical processing, e.g. cutting of pockets for vacuum transport; alternatively without joint in a spraying process for short and medium length ranges; price index: D, E

Profiled or structured

PU longitudinal groove, transparent, PU

s	2.0
Ø	60

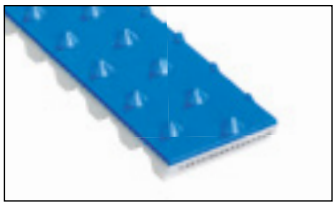
≈ 65 Shore A

Degree of grip

−20 °C ... +60 °C

Abrasion resistance

V-shaped ribs with slightly rounded end; pitch approx. 2.3 mm; reduced adherence of smooth and dry transport goods, e.g. flat glass; draining of liquids possible; price index: C



Pointed cone, blue, polyurethane (FDA)

s	2.5
Ø	30

≈ 65 Shore A

Degree of grip

−20 °C ... +60 °C

Abrasion resistance

EU food compliance / FDA; e.g. conveyance of frozen food; for narrow belts only single-row profiles with pointed cones; line distance between the cones approx. 8.5 mm; cone height approx. 2.0 mm; coneØ approx. 3.5 mm; design variation in white colour; price index: E

PU longitudinal groove fine, transparent, PU

s	3.5
Ø	70

≈ 85 Shore A

Degree of grip

−10 °C ... +70 °C

Abrasion resistance

V-shaped ribs with trapezoidal end; pitch approx. 2 mm; reduced adherence of smooth and dry transport goods, e.g. flat glass; draining of liquids possible; in contrast to PU longitudinal groove 65 Shore A, this coating is directly extruded on the optibelt ALPHA LINEAR as standard supply; welding on ALPHA V together with the coating without joint; continuously adhesive; profiles and further hardnesses on request; price index: A

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

COATING MATERIAL POLYURETHANE (PU)

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance

Profiled or structured

PU spike profile, beige, PU (FDA)

s	5.3					
Ø	60					

≈ 95 Shore A

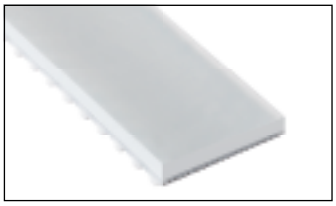
Degree of grip

−20 °C ... + 60 °C

Abrasion resistance

EU food compliance / FDA; e.g. for the conveyance of frozen food; for narrow belts only single-row profiles with pointed profiles; row distance approx. 8.5 mm; pointed, rounded cone; cone height approx. 4.0 mm; cone Ø approx. 3.3 mm; total height 5.3 mm; price index: E

Smooth or slightly structured



PU foil 65 Shore A, transparent, PU

s	2.0	3.0	4.0			
Ø	60	80	100			

≈ 65 Shore A

Degree of grip

−20 °C ... + 60 °C

Abrasion resistance

Strongly adhesive for smooth, dry surfaces; e.g. for the conveyance of glass; due to possible indentation less suitable for the conveyance of light goods such as foils, see also PU foil 85 Shore A; price index: D

Polythan D15, transparent/yellowish, PU

s	2.0	3.0	5.0			
Ø	60	80	120			

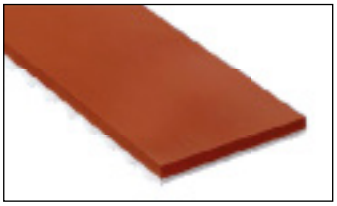
≈ 70 Shore A

Degree of grip

−15 °C ... + 70 °C

Abrasion resistance

Also known as "Festvulkollan"; despite low hardness and high dynamic load capacity it has high abrasion resistance and high tear resistance; e.g. for applications such as discharge belts; price index: C - E



Polythan D44, transparent/brownish, PU

s	2.0	3.0	5.0			
Ø	60	80	120			

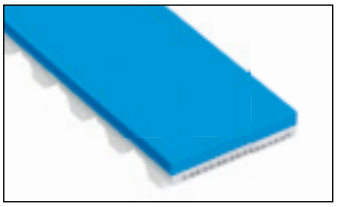
≈ 72 Shore A

Degree of grip

−10 °C ... + 60 °C

Abrasion resistance

Characteristics similar to Polythan D15, however, lower tear resistance; price index: A - D



PU foil blue, polyurethane (FDA)

s	2.0	3.0				
Ø	60	80				

≈ 85 Shore A

Degree of grip

−10 °C ... + 70 °C

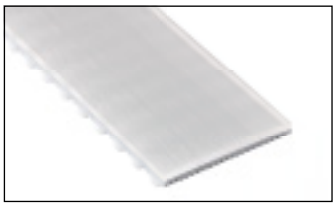
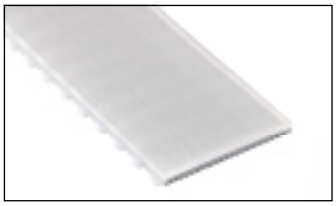
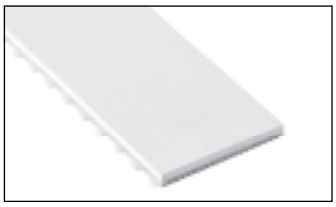
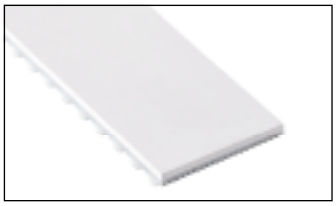
Abrasion resistance

PU basic material EU food compliant / FDA; also for use in the pharmaceutical industry; compared with other smooth FDA materials strong hardness and abrasion resistance; price index: C, D

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

COATING MATERIAL POLYURETHANE (PU)

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density	Temperature resistance
		Degree of grip	Abrasion resistance
Smooth or slightly structured			
	**PU foil 85 Shore A, transparent, PU** s: 2.0 / 3.0 / 4.0 Ø: 60 / 80 / 100	≈ 85 Shore A Degree of grip	−10 °C ... +70 °C Abrasion resistance
Widely-used; particularly suitable for heavy, sharp-edged conveyed goods, e.g. in sheet metal and glass processing; a bit less adhesive than PU foil 65 Shore A; also see T2; price index: C, D			
	**T2, transparent, PU** s: 2.0 (T/AT10, H) Ø: 60	≈ 85 Shore A Degree of grip	−10 °C ... +70 °C Abrasion resistance
T2: 2 mm height, 85 Shore A; in contrast to PU foil 85 Shore A, this coating can be extruded directly onto the optibelt ALPHA LINEAR T10, AT10 or H; joined to ALPHA V with coating by welding process possible; further profiles, heights and hardness ranges on request; price index: A			
	**PU foil 92 Shore A, white, polyurethane** s: 2.0 / 3.0 / 4.0[1] Ø: 80 / 100 / 120	≈ 92 Shore A Degree of grip	−20 °C ... +70 °C Abrasion resistance
Compound identical to optibelt ALPHA LINEAR / V; same application as PU foil 85 Shore A, however reduced degree of grip and improved abrasion resistance; price index: C, D			
	**Reinforced top surface, white, polyurethane** s: 1.3 (T/AT5) / 2.5 (T/AT10) Ø: 35 / 80	≈ 92 Shore A Degree of grip	−20 °C ... +70 °C Abrasion resistance
Compound identical to optibelt ALPHA LINEAR / V; same application as PU foil 85 Shore A, however reduced degree of grip and improved abrasion resistance; in contrast to the PU foil 92 Shore A the reinforced top surface is part of the base belt for the profiles T5 / AT5, s = 1.3 mm, T10 / AT10, s = 2.5 mm; welding to ALPHA V without joint, continuously adhesive; further profiles, heights and hardnesses as well as optibelt ALPHA FLEX on request; price index: A			

[1] Coatings of this thickness: no standard stock keeping
Further coating thicknesses and polyurethane designs on request; preselection see Table 6.2.1; characteristics and applications see Table 6.2.3; assumptions: "degree of grip" with slightly structured transport goods, "abrasion resistance" with relative movement; price index: A (low price) to E (high price), related to the smallest and largest standard thickness

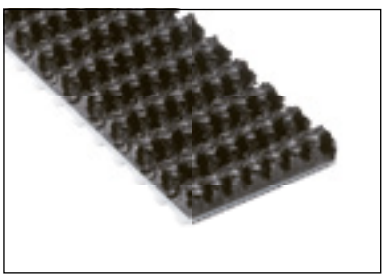
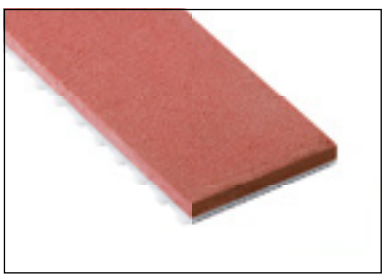
Coating material rubber

Rubber coatings achieve, in comparison to other coatings of the same density or hardness, the highest coefficients of friction under dry conditions and also under wet conditions. This is usually accompanied with a lower abrasion strength.
Depending on the material composition of the rubber, lower or higher temperatures can be covered in contrast to other coating materials. The fluorinated rubber Viton resistant to high temperatures is listed in the following subchapter under "Coatings for special requirements". The material composition also significantly determines the resistance to oils, greases and other chemicals which does, however, not reach the resistances of polyurethane and polyvinyl chloride.
The rubber coating Supergrip black improves, due to its profiling, the already good degree of grip even more for light transport goods. This applies also to rubber foams which are particularly used in light, sensitive transport goods.

Table 6.2.4: Rubber coatings, characteristics and applications

Rubber	Physical and chemical properties	PU	PVC
+ +	Rubber exhibits the comparatively highest coefficient of friction and the best degree of grip under dry and wet conditions.	+/–	+
+	Foams for light, impact sensitive parts; profiled and smooth rubber surfaces for low to medium transport weights	+ +	+
+ +	In contrast to many other coating materials, low or high temperatures can be covered.	+/–	+
+/–	In the case of relative movements rubber can slightly mark; it exhibits a medium abrasion and a high cutting strength.	+ +	+
+/–	The oil, grease and general chemicals resistance is rather low; improved with NBR; one coating EU food compliant / FDA	+ +	+ +
Application areas	For all transport goods, e.g. wood, cardboard, metal, glass, building materials etc., with up to medium requirements for cleanliness and freedom of streaks on the surfaces due to the partly visible abrasion; less applicable for high requirements regarding cleanliness and chemical resistance and hardly applicable in the food industry, exception: Linaplus FGL		

++ excellent to very good, + good, +/– satisfactory to sufficient, – deficient to insufficient

Foam	**Profiled** or structured	**Smooth** or slightly structured
e. g. Porol	e. g. Supergrip black	e. g. Linatex
		

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

COATING MATERIAL RUBBER

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance

Foam

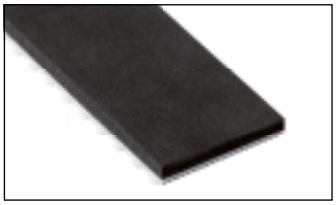
EPDM, black, synthetic rubber

s	2[1]	3[1]	4[1]	5[1]	6[1]
Ø	40	40	50	60	80

≈ 175 kg/m³ | −20 °C ... +120 °C

Degree of grip | Abrasion resistance

EPDM: Ethylene-Propylene-Polymerase; foam, e.g. for hot glass or metal products; improved chemicals and ageing resistance; improved abrasion resistance; no improved oil and grease resistance compared to natural rubber; price index: C, D



Porol, black, cell rubber

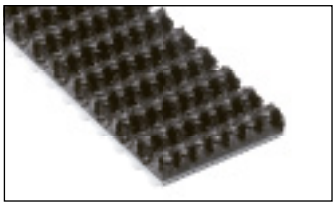
s	5	12	15
Ø	60	150	200

≈ 190 kg/m³ | −40 °C ... +70 °C

Degree of grip | Abrasion resistance

Widely-used; closed pored; e.g. for textile and paper industry; for height adjustments in combination with a further thin, elastic protective coating such as Linatex; price index: A - C

Profiled or structured



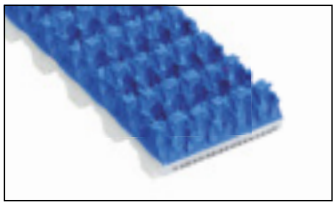
Supergrip black, rubber

s	3.0
Ø	60

≈ 70 Shore A | −20 °C ... +70 °C

Degree of grip | Abrasion resistance

Used for slight height compensation; low shock absorption capabilities and slight relative movement due to profile design possible; improved degree of grip even in case of moisture and dirt; e.g. for the conveying of sharp-edged stones or of flat glass in high vacuum applications, when e.g. PVC might shrink; price index: C



Supergrip blue, nitrile rubber

s	3.0
Ø	60

≈ 71 Shore A | −18 °C ... +121 °C

Degree of grip | Abrasion resistance

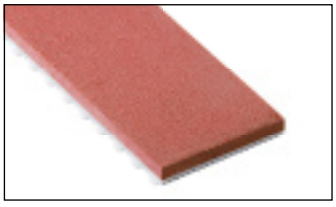
Characteristics similar to Supergrip black; improved temperature, oil, grease and ageing resistance compared to natural rubber; e.g. for the conveying of packaged food; price index: E

[1] Coatings of this thickness: no standard stock keeping

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

COATING MATERIAL RUBBER

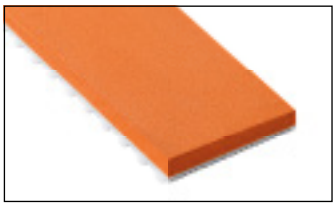
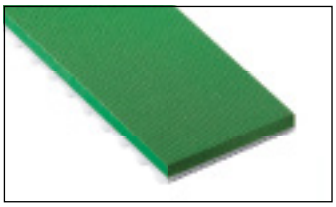
Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density	Temperature resistance
		Degree of grip	Abrasion resistance
Smooth or slightly structured			
	**RP 400, yellow, natural rubber** s: 2.0 | 3.0 | 5.0 | 6.0 | 8.0[1] | 10.0 Ø: 40 | 60 | 100 | 130 | 180 | 220	≈ 35 Shore A Degree of grip	−10 °C ... + 80 °C Abrasion resistance
Fine fabric structure; characteristics similar to Linatex, however higher abrasion resistance; use e.g. in cable pulling systems; price index: B - D			
	**Linatex, red, natural rubber** s: 1.5 | 2.4 | 3.2 | 5.0 | 6.4 | 8.0 Ø: 30 | 50 | 65 | 100 | 140 | 180	≈ 38 Shore A Degree of grip	−40 °C ... + 70 °C Abrasion resistance
Very widely-used; universally applicable, further improved degree of grip possible due to optionally ground surface; under moist conditions best coefficient of friction; applications e.g. as discharger belts, for use in a vacuum or for the conveyance of wet flat glass; price index: B - E			
	**Linaplus FGL, white, natural rubber (FDA)** s: 2.0 | 3.0 | 6.0 Ø: 50 | 65 | 130	≈ 38 Shore A Degree of grip	−40 °C ... + 70 °C Abrasion resistance
EU food compliance / FDA; conveyance of e.g. wet and/or pressure-sensitive food; price index: C			
	**Correx beige, natural rubber** s: 4.0 | 6.0 | 10.0 Ø: 80 | 130 | 220	≈ 40 Shore A Degree of grip	−35 °C ... + 60 °C Abrasion resistance
Universally applicable; characteristics similar to Linatex; layers of adhesives may be visible in the mitred joints area; e.g. for the conveyance of aluminium profiles; price index: C, D			
	**NG red, natural rubber** s: 1.6 | 2.0 | 3.0 | 5.0 | 6.0 | 8.0 Ø: 30 | 40 | 60 | 100 | 140 | 180	≈ 40 Shore A Degree of grip	−40 °C ... + 70 °C Abrasion resistance
NG = natural rubber; fine fabric structure; low-priced wear protection with low degree of grip under moist and wet conditions and again poorer processing capability compared to Linatex; price index: A - D			

[1] Coatings of this thickness: no standard stock keeping

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

COATING MATERIAL RUBBER

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density	Temperature resistance
		Degree of grip	Abrasion resistance
Smooth or slightly structured			
	**Linatrile, orange, polymer NBR** s 3.0 | 6.0 | 10.0 Ø 65 | 140 | 220	≈ 55 Shore A Degree of grip	−20 °C ... + 110 °C Abrasion resistance
NBR: Nitrile Butadiene Rubber; improved temperature, oil, grease and ageing resistance compared to natural rubber; comparably good mechanical processing capability; e. g. vacuum transport of oil-covered sheets; price index: D			
	**Elastomer green, rubber** s 2.0 Ø 60	≈ 70 Shore A Degree of grip	−20 °C ... + 80 °C Abrasion resistance
Fine fabric structure; high cut resistance; for the conveyance of e.g. uncoated wood, sharp-edged cardboard packaging or light, sharp-edged stones; price index: E			

[1] Coatings of this thickness: no standard stock keeping
Further coating thicknesses and rubber designs on request; preselection see Table 6.2.1; characteristics and applications see Table 6.2.4; assumptions: "degree of grip" with slightly structured transport goods, "abrasion resistance" with relative movement; price index: A (low price) to E (high price), related to the smallest and largest standard thickness

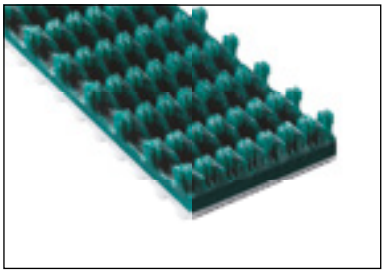
Coating material polyvinyl chloride (PVC)

Polyvinyl chloride foils exhibit a good to very good chemical resistance and a high coefficient of friction which, however does not achieve the values of rubber coatings. PVC foils with smooth surfaces have an adhesive effect and are preferred for the foil transport. Since the abrasion resistance is good as well, PVC coatings can be applied in many areas. EU food compliant / FDA versions allow the application in the food industry.
The profiled PVC coatings exhibit better degrees of grip than smooth foils. Also the EU food compliant / FDA versions are therefore offered in different profiles.

Table 6.2.5: Polyvinyl chloride coatings, characteristics and applications

PVC	Physical and chemical properties	Rubber	PU
+	Polyvinyl chloride thermoplastic exhibits a comparatively medium to high degree of grip.	+ +	+/–
+	Profiled to smooth PVC for low to medium transport weights; no PVC foams	+	+ +
+	The temperature resistance does not cover low temperatures, but high temperatures.	+ +	+/–
+	Non marking in the case of relative movements; high abrasion and medium cutting strength.	+/–	+ +
+ +	The oil, grease and general chemicals resistance is high; comparatively biggest portion of EU food compliant / FDA coatings	+/–	+ +
Application areas	For high requirements regarding chemical resistance or cleanliness for e.g. foils, textiles, paper; partly EU food compliance / FDA; profiled designs especially under wet and moist conditions; not or less applicable for impact sensitive or heavy, sharp-edged transport goods		

++ excellent to very good, + good, +/– satisfactory to sufficient, – deficient to insufficient

Foam	Profiled or structured	Smooth or slightly structured
–	e. g. Supergrip green	e. g. PVC foil white
–		

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

POLYVINYL CHLORIDE (PVC) COATING MATERIAL

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
Profiled or structured			

PVC shark tooth, petrol blue, PVC

s 6.0
Ø 55

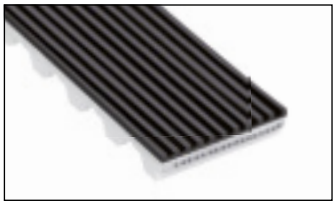
≈ 35 Shore A

Degree of grip

−15 °C ... +110 °C

Abrasion resistance

The degree of grip depends on the direction of conveyance: heavily profiled goods conveyed contrary to the direction of the tooth, smooth or slightly structured goods in direction of the tooth due to the close attachment to the transport good; good compensation of height tolerances of the goods conveyed especially at discharge belts, e.g. for the conveyance of bottles; price index: D



PVC longitudinal groove, black, PVC

s 2.0
Ø 30

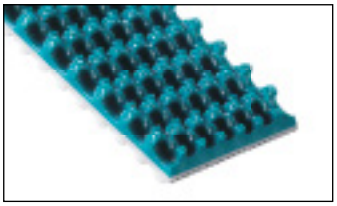
≈ 35 Shore A

Degree of grip

−20 °C ... +70 °C

Abrasion resistance

V-shaped ribs with flat tops; improved degree of grip under dusty conditions, draining of liquids possible; price index: B



Supergrip petrol blue, polyvinyl chloride

s 3.0
Ø 60

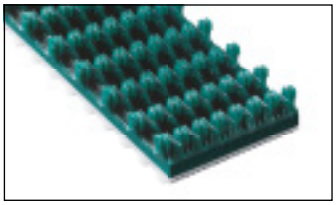
≈ 40 Shore A

Degree of grip

−10 °C ... +90 °C

Abrasion resistance

Common/widely-used; applicable for slight height compensation, low shock absorption capabilities and slight relative motion possible; improved degree of grip even in case of moisture and dirt; e.g. for the timber, glass and packaging industries; price index: A



Supergrip green, polyvinyl chloride

s 3.0
Ø 60

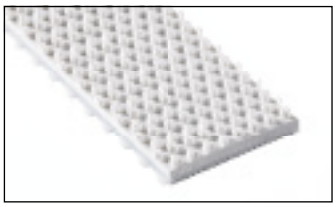
≈ 40 Shore A

Degree of grip

−10 °C ... +90 °C

Abrasion resistance

Characteristics and application areas same as Supergrip petrol blue; slightly more flexible due to larger distance between the cleats; price index: C



PVC cleats, white, PVC (FDA)

s 1.5
Ø 60

≈ 60 Shore A

Degree of grip

−15 °C ... +90 °C

Abrasion resistance

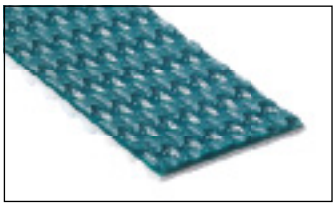
EU food compliant / FDA; thin profile for improved degree of grip even under moist conditions; conveyance of packages in the food industry; price index: C

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

POLYVINYL CHLORIDE (PVC) COATING MATERIAL

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
Profiled or structured			



Minigrip petrol blue, polyvinyl chloride

s 1.0
Ø 30

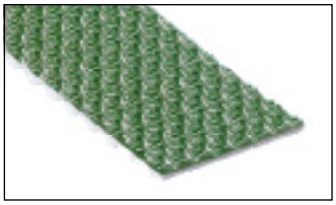
≈ 60 Shore A

Degree of grip

−10 °C ... + 110 °C

Abrasion resistance

Thin profile for improved degree of grip even under moist or dusty conditions; reduces sticking of smooth and dry conveyed goods; e.g. flat glass; price index: C



Minigrip green, polyvinyl chloride

s 1.0
Ø 30

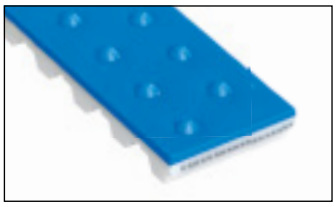
≈ 65 Shore A

Degree of grip

−10 °C ... + 110 °C

Abrasion resistance

Characteristics and application areas as Minigrip petrol blue; price index: B



Pebbles rounded cone, blue, PVC (FDA)

s 2.5
Ø 30

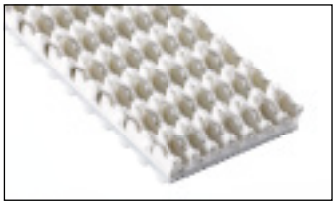
≈ 65 Shore A

Degree of grip

−20 °C ... + 60 °C

Abrasion resistance

EU food compliant / FDA; e.g. for the conveyance of sausage and cheese; for narrow belts only single-row profiles with rounded cones; line distance approx. 8.5 mm; cone height approx. 1 mm; cone Ø approx. 3.5 mm; further design version in colour white; price index: E



Supergrip white, PVC (FDA)

s 3.0
Ø 60

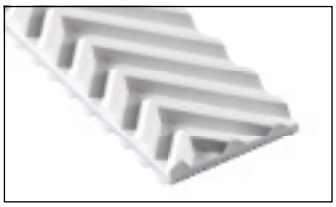
≈ 65 Shore A

Degree of grip

−10 °C ... + 100 °C

Abrasion resistance

EU food compliant / FDA; characteristics same as Supergrip petrol blue; profile same as Supergrip green, however less flexible; e.g. for the conveyance of food; price index: D



PVC fishbone pattern, white, PVC (FDA)

s 3.0
Ø 60

≈ 65 Shore A

Degree of grip

−15 °C ... + 90 °C

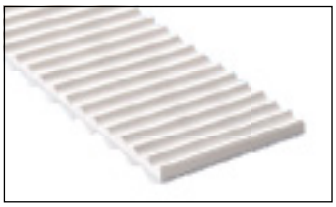
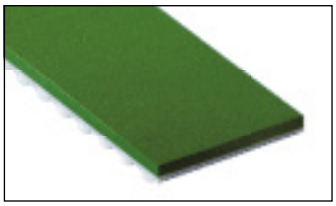
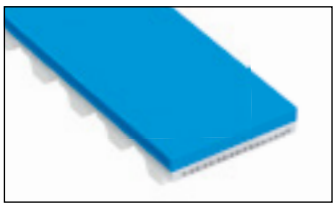
Abrasion resistance

EU food compliant / FDA; distinct profile, here without runlet for improved degree of grip under wet conditions; small belts may only have a single row with the diagonal-cut profile; version with runlet on request; for the conveyance e.g. of wet flat glass; price index: E

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

POLYVINYL CHLORIDE (PVC) COATING MATERIAL

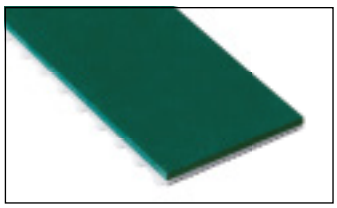
Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
Profiled or structured			
	**PVC saw tooth, white, PVC (FDA)** s 3.0 Ø 60	≈ 65 Shore A Degree of grip	−15 °C ... +90 °C Abrasion resistance
EU food compliant / FDA; distinct profile for improved degree of grip even under moist and wet conditions; line contact; price index: D			
	**PVC triangular profile, white, PVC (FDA)** s 3.0 Ø 60	≈ 65 Shore A Degree of grip	−15 °C ... +90 °C Abrasion resistance
EU food compliant / FDA; medium size profile for improved degree of grip even under moist conditions; line contact; price index: D			
Smooth or slightly structured			
	**PVC foil green, polyvinyl chloride** s 2.0 Ø 60	≈ 65 Shore A Degree of grip	−15 °C ... +90 °C Abrasion resistance
Characteristics and application areas same as PVC foil petrol blue, however slightly more oil and grease resistant; price index: C			
	**PVC foil blue, PVC (FDA)** s 3.0 Ø 80	≈ 65 Shore A Degree of grip	−20 °C ... +100 °C Abrasion resistance
EU food compliant / FDA; medium conveyance loads; further characteristics same as PVC foil petrol blue; price index: D			
	**PVC foil white, PVC (FDA)** s 2.0 3.0 Ø 60 80	≈ 65 Shore A Degree of grip	−20 °C ... +100 °C Abrasion resistance
EU food compliant / FDA; medium conveyance loads; further characteristics same as PVC foil petrol blue; price index: B - D			

[1] Coatings of this thickness: no standard stock keeping

6 COATINGS, CLEATS AND ADJUSTMENTS

6.2 SUBSEQUENTLY APPLIED COATINGS

POLYVINYL CHLORIDE (PVC) COATING MATERIAL

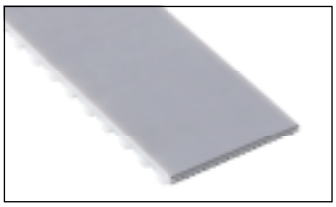
Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density	Temperature resistance
		Degree of grip	Abrasion resistance
Smooth or slightly structured			
	**APL plus, red, elastic PVC** s 2.0 3.0 Ø 60 80	≈ 65 Shore A Degree of grip	−20 °C ... + 100 °C Abrasion resistance
In contrast to other PVC foils, this coating is applied as a standard directly in the production process on the optibelt ALPHA LINEAR; welding to ALPHA V together with the coating possible without joint; continuously adhesive; simple and low-cost transport coating; profiles and further heights on request; price index: A			
	**PVC foil petrol blue, polyvinyl chloride** s 1.0 Ø 30	≈ 75 Shore A Degree of grip	−15 °C ... + 90 °C Abrasion resistance
Due to its very smooth surface good adhesion characteristics, e.g. for the conveyance of paper and foils; conveyance of wood and plastics; packaging industry; discharge belts with medium load; price index: A			

[1] Coatings of this thickness: no standard stock keeping
Further coating thicknesses and PVC designs on request; preselection see Table 6.2.1; characteristics and applications see Table 6.2.5; assumptions: "degree of grip" with slightly structured transport goods, "abrasion resistance" with relative movement; price index: A (low price) to E (high price), related to the smallest and largest standard thickness

Coatings for special requirements

The following coating materials considerably extend the application areas of coated conveyor belts through individual extraordinary characteristics, which cannot be achieved by belts with PA, PU, rubber or PVC coatings.

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
Smooth or slightly structured			



PTFE, grey, polytetrafluorethylene

s	0.3
Ø	200

Hardness: n/a

Degree of grip

Temperature resistance: –20 °C ... + 110 °C

Abrasion resistance

Non-adhesive, e.g. for parts with fresh glue on the surface; high temperature and oil resistance for heated conveyed goods; but lower temperature resistance of the basic belt and the adhesive do not allow higher temperatures: Beware of short contact and cooling periods; very low degree of grip; sensitive surface, therefore relative motions have to be avoided; the open joint increases the minimum pulley diameter; price index: C, D

TT60, grey, polyester fibre

s	3.0
Ø	120

Hardness: n/a

Degree of grip

Temperature resistance: –10 °C ... + 120 °C

Abrasion resistance

Antistatic characteristics for electronic parts; high temperature resistance for the conveyance of heated goods; but lower temperature resistance of the basic belt and the adhesive do not allow higher temperatures: Beware of short contact and cooling periods; price index: D

Para fleece, beige, polyester fibre

s	2.0
Ø	120

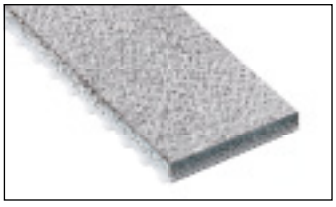
Hardness: n/a

Degree of grip

Temperature resistance: –10 °C ... + 130 °C

Abrasion resistance

Conveyance of polished surfaces; high temperature resistance for the conveyance of heated goods; but lower temperature resistance of the basic belt and the adhesive do not allow higher temperatures: Beware of short contact and cooling periods; price index: C



Chrome leather, grey, natural leather

s	2.0	3.0
Ø	80	100

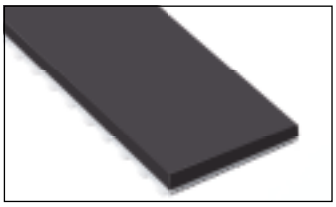
Hardness: n/a

Degree of grip

Temperature resistance: 0 °C ... + 60 °C

Abrasion resistance

Roughened, thus soft surface; good cutting resistance, high oil and grease resistance, also good degree of grip characteristics; e.g. for sharp-edged, oiled or greased parts; price index: C, D

Picture of the coating	Designation, colour, material Standard thickness s [mm] Minimum pulley Ø [mm]	Hardness or density Degree of grip	Temperature resistance Abrasion resistance
Smooth or slightly structured			
	**Viton, black, fluorinated rubber** s 2.0[1] 3.0[1] Ø 80 100	≈ 75 Shore A Degree of grip	–10 °C ... + 275 °C Abrasion resistance

Extremely high temperature and oil resistance for the conveyance of heated goods; e.g. applications in solar cell production; but lower temperature resistance of the basic belt and the adhesive do not allow higher temperatures: Beware of short contact and cooling periods; price index: E

[1] Coatings of this thickness: no standard stock keeping
Further coating thicknesses and materials on request; preselection see Table 6.2.1;
price index: A (low price) to E (high price), related to the smallest and largest standard thickness