

## MATERIAL DESCRIPTION

- POLYETHYLENE** Thermal plastic with a weight mass of approx. 0.92. grams/cm<sup>3</sup>.  
☐ Suitable for use in cold areas.  
Temperature range from -73C to +66C.  
High chemical resistance.  
FDA approved.  
Tough yet flexible material with a high impact strength.
- POLYETHYLENE PLUS** Thermal plastic with a weight mass off approx. 0.92 grams/cm<sup>3</sup>.  
☐ Suitable for use for medium temperature areas.  
Temperature range from -20 C to +80C.  
High chemical resistance.  
FDA approved.  
Same characteristics as polyethylene, with a 30% larger tensile strength as well as a reduced impact strength.
- POLYPROPYLENE** Thermal plastic with a weight mass of approx. 0.92 grams/cm<sup>3</sup>.  
☐ Suitable for use in higher temperature areas.  
Temperature range from +5C to +100C.  
High chemical resistance.  
FDA approved.  
A strong material with a medium tensile strength, low impact strength at low temperatures.
- POLYPROPYLENE with 10% TALCUM** Thermal plastic with a weight mass of approx. 0.98 grams/cm<sup>3</sup>.  
☐ Suitable for use in high temperature areas.  
temperature range from +40C to 130C.  
High chemical resistance.  
FDA approved.  
Medium tensile strength, low impact strength at low temperatures.
- POLTPROPYLENE with 30% GLASS** Thermal plastic with a weight mass of approx. 1.14 grams/cm<sup>3</sup>.  
☐ Suitable for use in high temperature areas.  
Temperature range from +50C to +150C.  
High chemical resistance.  
A strong and consistently stable material. Extremely high tensile strength, but gives a larger friction between the support and the belt. Low impact strength at low temperatures.

- POLYPROPYLENE ANTISTATIC**  Thermal plastic with a weight mass of approx. 0/98 grams/cm<sup>3</sup>.  
 Suitable for use in areas requiring electrical diversion.  
 Temperature range from +5C to +100C.  
 High chemical resistance.  
 Tensile strength as normal polypropylene.
- POLYACETAL (POM)**  Thermal plastic wuth a weight mass of approx. 1.4 grams/cm<sup>3</sup>.  
 Suitable for use in both warm and cold areas.  
 Temperature range from -43C to +95C.  
 Has a limited resistance to certain chemicals.FDA approved.  
 Consistently stable material with a high tensile strength.  
 Low friction between belt and support.  
 Low impact resistance at low temperatures.
- POLYACETAL ANTISTATIC**  Thermal plastic with a weight mass of approx. 1.4 grams/cm<sup>3</sup>.  
 Suitable for use in areas requiring electrical diversion.  
 Temperature range from -43C to +95C.  
 Other characterisitics, are the same as polyacetal.
- NYLON 6**  Thermal plastic with a weight mass of approx. 1.08 grams/cm<sup>3</sup>.  
 Suitable for use in both warm and cold areas.  
 Temperature range from -45C to +110C.  
 High chemical resistance. Not suitable in damp areas at high temperatures.  
 FDA approved.  
 Tough yet flexible material with a high tensile strength as well as a high impact strength.
- NYLON 6.6**  Thermal plastic with a weight mass of approx. 1.1 grams/cm<sup>3</sup>.  
 Suitable for use in both warm and cold areas.  
 Temperature range from -45C to +150C.  
 High chemical resistance, tough not suitable for use in very damp areas at high temperatures.  
 Tough yet flexible material with a high tensile strength as well as a high impact strength.

- NYLON ANTISTATIC** Thermal plastic with a weight mass of approx. 1.1 grams/cm<sup>3</sup>.
- Suitable for use where electrical diversion is required.
  - Temperature range from -45C to +110C.
  - High chemical resistance. Not suitable in wet areas.
  - Tough yet flexible material with a high tensile strength as well as a high impact strength.
- FIRE RETARDING POLYPROPYLENE** □ Thermal plastic with a weight mass of approx. 0.98 grams /cm<sup>3</sup>.
- Suitable for use in fire hazard areas, as in microwave ovens and the like.
  - Temperature range from +5C to +120C.
  - High chemical resistance.
  - Flammability VO (3, 2 mm)
  - FDA approved.
  - Strong material with medium tensile strength. Low impact strength at low temperatures.
- FRICTION MATERIAL** Thermal plastic with a weight mass of approx. 1.14 grams/cm<sup>3</sup>.
- Suitable for use in both warm and cold areas.
  - Temperature range from -25C to +80C.
  - High chemical resistance.
  - FDA approved.
  - Soft material with high friction, low tensile strength.
  - Suitable to put on the surface of PE and PP belts.
  - Used for belts with slight inclination.
- SILICONE & TEFLON MATERIAL** An additive added to polyethylene and polypropylene.
- This material prevents products from freezing or sticking to the belt.
  - FDA approved.
  - The characteristics of the basic material are not changed essentially.

## THERMAL EXPANSION/CONTRACTION

All types of materials change dimensions when the temperature changes. Therefore you have to take this into consideration, when calculating a belt's dimension and frame construction.

Below are the relevant factors for calculating a NGB conveyor belt.

### MATERIAL EXTENSION/CONTRACTION

Material		Extension/contraction mm/m/C
<b>Belt</b>		
Polypropylene	PP	0.12
Polyethylene	PE	0.22
Polyacetal	POM	0.09
<b>Sliding profile</b>		
U and V profile	PE 1000	0.14
<b>Frame material</b>		
Aluminium		0.02
Stainless steel		0.01

**FORMULA**

$$E = L \times (T2 - T1) \times K$$

$$C = L \times (T2 - T1) \times K$$

E = Extension (mm)  
 C = Contraction (mm)  
 L = Length/width of belt ( m)  
 T1 = Normal temperature (21 C)  
 T2 = Working temperature  
 K = Coefficient

**EXAMPLE** 17 MT. long 1345 mm wide PP Normal temp.21C Working temp. 85C.

Length:  $E = 17 \times (85 - 21) \times 0.12$   
 $E = 130.56 \text{ mm}$

Width:  $E = 1.345 \times (85 - 21) \times 0.12$   
 $E = 10.33 \text{ mm}$

### SERVICE FACTOR (SF)

No load starts & load applied gradually	1.0
Frequent starts under load, more than 1/hr	+0.2
Belt speed greater than 30 mtr./min.	+0.2
Elevating conveyors	+0.4
Pusher conveyors	+0.2

### COEFFICIENT OF START-UP FRICTION BETWEEN WEARSTRIP AND BELT

Wearstrip material	Belt material							
	Polypropylene				Polyethylene		Acetal POM	
	Smooth		Abrasive		Smooth		Smooth	
	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
PEHD	0.09	0.11	-	-	-	-	0.08	0.09
Steel	0.26	0.26	0.31	0.31	0.14	0.15	0.18	0.19

### COEFFICIENT OF FRICTION BETWEEN PRODUCT AND BELT

Material	Polypropylene		Polyethylene		Acetal POM	
	Smooth		Smooth		Smooth	
	Wet	Dry	Wet	Dry	Wet	Dry
Glass	0.18	0.19	0.08	0.09	0.13	0.14
Metal	0.26	0.32	0.10	0.13	0.19	0.20
Plastic	0.11	0.17	0.08	0.08	0.13	0.15
Cardboard	-	0.21	-	0.15	-	0.13

## THE CHEMICAL RESISTANCE OF PLASTIC MATERIALS

The values in the following tables are guideline values. Factors such as filling material, temperatures, concentrations, stress, stress time etc. can alter these values dramatically. Therefore no guarantee can be given for the correctness of said values. The values are valid at an ambient temperature of 20°C, and unless otherwise stated, with strong concentrations.

### PLASTIC MATERIAL

Vehicle	%	POM	PE	PP
Acetaldehyde	40	+	+	+
Acetic acid	10	+/-	+	+
Acetic acid	80	-	+	+
Acetone	100	+	+	+
Alcohol		+	+	+
Allyl alcohol	100	+	+	+
Aluminium chloride	10	+	+	+
Ammonia water	10	+	+	+
Ammonium chloride		+	+	+
Aniline	100	+	+	+
Benzene	100	+	+	-
Benzyl alcohol	100	+	+	+
Boiled salt- cf. sodium chloride				
Boracic acid	10	+	+	+
Bromine acid	50	-	+	+
Batanol	100	+	+	+
Butyl acetate	100	+	+	-
Calcium carbonate		+	+	+
Calcium chloride - aqueous	10	+	+	+
Calcium chloride - with sprit	20	+	+	+
Calcium hydroxide		+	+	+
Calcium carbonate - Carbon dioxide		+	+	+
Caustic potash soln	10	+	+	+
Caustic potash soln	50	+	+	+
Cellulose acetate		+	+	+
Citric acid	10	+	+	+
Chalk cf. - carbon disulphide	100	+	+	+
Chlorine gas	100	-	+	-
Chlorine water		-	+	+
Chloro-benzene	100	+	+	+
Chloroform	100	-	-	+
Chrome acid	10	-	-	+

### EXPLANATION OF SYMBOLS

#### + resistant

None or only negligible in weight (<0.5%)  
No changes in mechanical characteristics.

#### +/- qualified resistance

After a period of time, significant changes in weight and mass (0.5 — 5.0%).  
Possible discoloration and reduction in strength and ductility.  
Qualified usability, though only when dealing with simple material requirements.

#### - inconstant

It is rapidly subjected to serious attack, and changes in weight and mass (>5%), and critical in strength and ductility. Not recommended for use.

#### % concentration

If value is given it is because no test results are available from our suppliers.

Vehicle	%	POM	PE	PP
Copper chloride		+	+	+
Copper sulphate		+	+	+
Diesel fuel	100	+	+	+
Dioxane	100	+/-	+	+/-
Di —vinyl chloride	100	+	-	+
Edible oil		+	+	+
Ethyl acetate	100	+	+	+
Ethyl alcohol	96	+	+	+
Ethyl ether	100	+	+	+
Formaldehyde - fluorine, dry		-	-	-
Freon 11		+	+	-
Freon 12			+	-
Freon 22			+	-
Freon 113			+	-
Glycerol	90	+	+	+
Heptane	100	+	+	+
Hexane	100	+	+	+
Hydrargyrum	100	+	+	+
Hydrochloric acid	10	-	+	+
Hydrochloride acid	2	-	+	+
Hydrofluoric acid	40	-	+	+
Hydrogen peroxide	0.5	+	+	+
Hydrogen peroxide	1	+	+	+
Hydrogen peroxide	3	+	+	+
Hydrogen peroxide	10	+	+	+
Hydrogen peroxide	30		+	+
Hydrogen sulphide	2	-	+	+
Iodine/iodine - pot.- iron - 111 - chloride		+	+	+
Isopropanol	90	+	+	+
Kerosene	100	+	+	+
Lactic acid	10	+	+	+
Leaching solution - 0.1% free chlorine		-	+	+
Lead sugar		+	+	+
Liquid butane		+	+	+
Magbesium chloride - aqueous	10	+	+	+
Manganese sulphate	10	+	+	+
Mercury chloride - aqueous	5	+	+	+
Methanol	98	+	+	+
Metal acetate	100	+	+	+
Methyl ethyl ketone	100	+	+	+
Methylene chloride	100	-	+	+

Vehicle	%	POM	PE	PP
Mineral oil	100	+	+	+
Nitric acid	10	-	+	+
Nitric acid - concentrated	65	-	+	-
Nitrobenzene	100	+	+	+
Oleic acid - concentrated	40	+	+	+
Oleic acid	10	-	+	+
Ozone		-	+	+
Petrol		+	+	+
Phenol, melted	100	-	+	+
Phenol, aqueous	10	-	+	+
Phosphoric acid	10	+	+	+
Phosphoric acid - concentrated	80	-	+	+
Potassium	10	+	+	+
Pot. Bichromate	5		+	+
Pot. Permanganate	1	+	+	+
Salt cake - CF sodium sulphate				
Sea water	100	+	+	+
Silicone oil		+	+	+
Soap solution	1	+	+	+
Soda ive, aqueous	50	+	+	+
Soda ive, aqueous	10	+	+	+
Soda - cf. sodium carbon				
Sodium bisulphate				
Sodium carbonate	10	-	+	+
Sodium hydroxide - cf/ soda ive	10	+	+	+
Sodium sulphate				
Solution	10	+	+	+
Sulpher dioxide	3		+	+
Sulphric acid		+	+	+
Sulpuric acid	98	-	-	-
Sulphuric fuming	10	+	+	+
Terachlorocarbon		-	-	-
Tetraline	100	+	-	-
Thionyl chloride	100	+	+	+
Toluene	100	+	-	-
Trichloroethylene	100	+	+	+
Vinyl benzene	100	+	-	+
Water, cold	100	+	+	+
Wine		+	+	+
Wax , melted		+	+	+