

POLYETHYLENE (PE): Thermal plastic with specific gravity approximately 0,92 gr.\cm3.
 Suitable for use in cold enviroment.
 Temperature range from -73 up to +66 Celcius degrees.
 High chemical resistance.
 FDA approved.
 Stiff but also flexible material with high impact strength

POLYPROPELENE (PP) Thermal plastic with specific gravity approximately 0,92 gr.\cm3.
 Suitable for use in higher temperatures.
 Temperature range from +5 up to +100 Celcius degrees.
 High chemical resistance.
 FDA approved.
 Stiff material with medium intense strength and low impact strength in low temperatures.

PTV Thermal plastic with specific gravity approximately 1.15 gr.\cm3, (self-immersed in water).
 Suitable for use in high temperatures.
 Temperature range from +40 up to +130 Celcius degrees
 Low chemical resistance.
 Stiff material with medium intense strength and low impact strength in low temperatures.

PGT Thermal plastic with specific gravity approximately 1.16 gr.\cm3, (self-immersed in water).
 Suitable for use in high temperatures.
 Temperature range from +50 up to +150 Celcius degrees.
 Great chemical resistance.
 Strong and stiff material. Excellent impact strength, but with high friction between supports and belt.
 Low impact strength in low temperatures.

POLYPROPELENE GLASS-FORCED (PPGF) Thermal plastic with specific gravity approximately 1,14 gr.\cm3.
 Suitable for use in high temperatures.
 Temperature range from +50 up to +150 Celcius degrees.
 Great chemical resistance.
 Strong and stiff material. Excellent impact strength, but with high friction between support and belt.
 Low impact strength in low temperatures.

POLYPROPELENE ANTISTATIC (PPAN) Thermal plastic with specific gravity approximately 0,98 gr.\cm3.
 Suitable for use where static buid up must be dissipated.
 Temperature range from +5 up to +100 Celcius degrees.
 Great chemical resistance.
 The impact strength matches this of plain polypropelene.

POLYPROPELENE FLAME RETARDANT (PPAF)

Thermal plastic with specific gravity approximately 0,98 gr.\cm3.
 Suitable for use in environment with high temperature, as microwave ovens etc.
 Temperature range from +5 up to +120 Celcius degrees.
 High chemical resistance.
 Flame resistant VO (3,2 mm.)
 FDA approved.
 Stiff material with medium endurance and low impact strength in low temperatures.

ACETAL (AC)

Thermal plastic with specific gravity approximately 1,4 gr.\cm3.
 Suitable for use in high and low temperature.
 Temperature range from -43 up to +95 Celcius degrees.
 Low resistance in certain chemicals.
 FDA approved.
 Consistent stiff material with high intense strength.
 Low friction between the belt and support.
 Low impact strength in low temperatures.

ACETAL ANTISTATIC (ACAN)

Thermal plastic with specific gravity approximately 1,4 gr.\cm3.
 Suitable for use where static buid up must be dissipated.
 Temperature range from -43 up to +95 Celcius degrees.
 Low resistance in certain chemicals.
 FDA approved.
 Consistent stiff material with high intense strength.
 Low friction between the belt and support.
 Low impact strength in low temperatures.

NYLON 6 (PA6)

Thermal plastic with specific gravity approximately 1,08 gr.\cm3.
 Suitable for use in high and low temperature.
 Temperature range from -45 up to +110 Celcius degrees.
 High chemical resistance.
 Is not suitable for use in environment with humidity in high temperature.
 FDA approved.
 Strong but flexible material, with excellent intense and impat strength.

NYLON 6 GLASS-FORCED (PAGF)

Thermal plastic with specific gravity approximately 1,22 gr.\cm3.
 Suitable for use in high and low temperature.
 Temperature range from -30 up to +110 Celcius degrees.
 High chemical resistance.
 Is not suitable for use in environment with humidity in high temperature.
 Strong and uncheangable material, with excellent intense and impat strength.

MATERIAL'S RESISTANCE IN CHEMICALS:

The values in the following charts are indicative.

Factors like the material's filling, temperature, concentration and elasticity can alter the following values significantly.

Thus, no guarantee can be given for the correctness of the mentioned values.

These values are valid in temperature 20 Celsius degrees.

Symbols explanation:

+ Resistance

Καμία ή πολύ μικρή αλλοίωση σε βάρος (<0,5%).

Καμία αλλαγή στα μηχανικά χαρακτηριστικά.

+/- Duration in time

After some time significant changes in weight and mass (0,5-5).

Possible strength and flexibility reduce.

Extensive use only in simple uses of materials.

- Unsuitability

Significant and fast denaturation in weight, mass (>5%), significant denaturation in strength and flexibility.

Not advisable to use.

% Consentration

If value is given is because no test result from material's suppliers is available.

CHEMICALS	%	PP	PE	AC
Acetaldehyde	40	+	+	+
Acetic acid	10	+	+	+/-
Acetic acid	80	+	+	-
Acetone	100	+	+	+
Alcohol		+	+	+
Allyl alcohol	10	+	+	+
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	+	-	-
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		-	-	-
Freon11		-	+	+

EXPANSION & CONTRACTION IN MATERIALS:

All the objects (plastic or metallic) change their dimensions, according to the environment temperature in which they function.

To calculate the dimensions of a belt and the metallic construction of a conveyor, the following should be calculated:

MATERIALS	EXPANSION & CONTRACTION IN mm/m/C FACTOR
BELT'S MATERIALS	
POLYPROPELENE (PP)	0,12
POLYETHYLENE (PE)	0,22
ACETAL (AC)	0,09
POLYETHELENE WEAR STRIPS	
WEAR STRIP HDPE	0,22
WEAR STRIP UHMW PE1000	0,14
CONVEYOR'S MATERIALS	
ALUMINUM	0,02
STAINLESS STEEL	0,01

CALCULATION TYPE
$E = Ax(TW - TN) \times S$
$C = Ax(TW - TN) \times S$
E=EXPANSION (mm)
C=CONTRACTION (mm)
A=LENGTH or WIDTH OF BELT (m)
TN=NORMAL TEMPERATURE (+22°C)
TW=FUNCTIONING TEMPERATURE
S=RATE

Claculation example of the expansion of a conveyor belt, made of Polypropelene, with dimensions 10 m (10,000 mm) length and 1,1 m (1.100mm) width, which functions in enviroment with temperature +90°C.

LENGTH: $E = 10 \times [(+90) - (+22)] \times 0,12$
 $E = 81,6 \text{ mm}$

WIDTH: $E = 1,1 \times [(+90) - (+22)] \times 0,12$
 $E = 9 \text{ mm}$

Calculation example of the contraction of a conveyor belt, made of Polyethylene, with dimensions 10 m (10,000 mm) length and 1,1 m (1.100mm) width, which functions in environment with temperature -60°C.

LENGTH: $C = 10 \times [(-60) - (+22)] \times 0,12$
 $C = 98,4 \text{ mm}$

WIDTH: $C = 1,1 \times [(-60) - (+22)] \times 0,12$
 $C = 11 \text{ mm}$

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CHEMICAL SPECIFICATIONS

CHEMICALS	%	PP	PE	AC
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	+	+	-
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	+	+	+

CHEMICALS	%	PP	PE	AC
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 carbonate				
Sodium bisulphate	10	+	+	-
Sodium carbonate	10	+	+	+
Sodium hydroxide- cf/soda ive				
Sodium sulphate	10	+	+	+
Solution	3	+	+	
Sulpher dioxide		+	+	+
Sulphric acid	98	-	-	-
Sulphric acid	10	+	+	+
Sulphuric fuming		-	-	-
Terachlorocarbon	100	-	-	+
Tetraline	100	+	+	+
Thionyl chloride	100	-	-	+
Toluene	100	+	+	+
Trichloroethylene	100	+	-	+
Vinyl benzene	100	+	+	+
Water, cold		+	+	+
Wine		+	+	+
Wax, melted		+	+	+

MATERIA'S FRICTION FACTOR RATE:

To keep your conveyor belts in the best possible condition, for the longest possible time, you should consider the damages that occur on the materials, due to frictions.

SERVICE FACTOR

START WITHOUT LOAD	1,0
START WITH LOAD WITH FREQUENCY BIGGER THAN 1/HR	+0,2
BELT'S SPEED BIGGER THAN 30m/min	+0.2
ESCALATORS	+0,4
PRODUCT CONVEYOR BELTS	+0,2

FRICTION FACTOR RATE BETWEEN BELT AND WEAR STRIP

WEAR STRIP'S MATERIAL	BELT'S MATERIAL					
	POLYPROPELENE (PP)		POLYETHELENE (PE)		ACETAL (AC)	
	DRY	LIQUID	DRY	LIQUID	DRY	LIQUID
HDPE	0,11	0,09	-	-	0,09	0,08
STAINLESS STEEL	0,26	0,26	0,15	0,14	0,19	0,18

FRICTION FACTOR RATE BETWEEN BELT AND CONVEYED PRODUCT

PRODUCT'S MATERIAL	BELT'S MATERIAL					
	POLPROPELENE (PP)		POLYETHELENE (PE)		ACETAL (AC)	
	DRY	LIQUID	DRY	LIQUID	DRY	LIQUID
GLASS	0,19	0,18	0,09	0,08	0,14	0,13
METAL	0,32	0,26	0,13	0,10	0,20	0,19
PLASTIC	0,17	0,11	0,08	0,08	0,15	0,13
CARTON	0,21	-	0,15	-	0,13	-