Technical reference

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A. Materials

Aluminium profiles

Aluminium is very resistant to corrosion in most environments because of the thin natural oxide layer formed on the metal surface when it is exposed to oxygen. The layer is hard and tight, and adheres well. In spite of its limited thickness (0,01 µm) it prevents further oxidation. Under unfavourable conditions, however, corrosion will take place. Normally, this will only affect appearance.

Material specifications

Alloy .... EN-AW 6060-T6
Density .... 2700 kg/m^3
Linear expansion.............................. 23 × 10^{-6}/ °C
Modulus of elasticity.......................... 70 000 N/mm^2
Shear modulus .... 27 000 N/mm^2

Tensile strength
Yield point R_p ($\sigma_{0,2}$)......................... 170 N/mm^2
Ultimate strength R_m (σ_B)................ 215 N/mm^2
Anodization layer thickness............. 10 µm

Section cuts are not anodized, unless otherwise specified.

Compatible with most common chemicals

FlexLink´s conveyor components can withstand lengthy contact with most chemicals used in normal workshop environments. It is, however, necessary to avoid acids with pH lower than 4, bases with pH above 9, and lengthy exposure to chlorinated hydrocarbons such as trichloroethylene.

The following tables specify the resistance of the materials used in FlexLink´s components to various chemicals. For some chemicals, the reactions depend on concentration and form of the chemical. A higher concentration of an acid will cause more swelling of the material subjected to it. Also, the liquid form of a gas results in more brisk reactions.

Legend

1 indicates very high resistance, whereas 4 indicates an unsuitable combination. "–" means that no data is available.

Acids

Chemical agent	POM	PA	PA-PE	PVDF	HDPE	UHMW-PE	PEBAX	Alum
Acetic acid	3	4	4	1	3	1	–	2
Benzoic acid	3	4	4	1	1	1	–	4
Boric acid	3	2	2	1	1	1	–	2
Citric acid	3	2	2	1	2	1	–	2
Chromic acid	4	4	4	1	1	1	–	3
Hydrofluoric acid	4	4	4	1	1	1	–	4
Hydrochloric acid	4	4	4	1	1	1	–	3
Hydrocyanic acid	4	4	4	1	2	1	–	1
Nitric acid	4	4	4	1	4	1	–	3
Oleic acid	3	2	2	1	3	1	–	1
Oxalic acid	4	2	2	1	1	1	–	2
Perchlorid acid	4	4	4	1	1	1	–	3
Phosphoric acid	4	4	4	1	1	1	–	3
Phtalic acid	4	2	2	1	1	1	–	–
Sulphuric acid	4	4	4	1	2	1	1	3
Tannic acid	3	–	–	1	1	1	–	–
Tartaric acid	3	2	2	1	1	1	–	1

Basic compounds

Chemical agent	POM	PA	PA-PE	PVDF	HDPE	UHMW-PE	PEBAX	Alum
Ammonia (solution)	1	2	2	1	1	1	–	2
Calcium hydroxide	1	2	2	1	1	1	–	4
Caustic soda	1	2	2	1	1	1	1	3
Potassium hydroxide	1	2	2	1	1	1	–	4

Gases

Chemical agent	POM	PA	PA-PE	PVDF	HDPE	UHMW-PE	PEBAX	Alum
Carbon dioxide	3	1	1	1	1	1	–	1
Carbon monoxide	2	1	1	1	1	1	–	1
Chlorine (dry)	2	4	4	1	3	3	–	1
Chlorine (wet)	4	4	4	1	4	4	–	4
Hydrogen sulphide	3	1	1	1	2	1	–	1
Sulphur dioxide (dry)	2	3	3	1	2	1	–	1
Sulphur dioxide (wet)	4	4	4	1	2	1	–	3

Organic compounds and solvents

Chemical agent	POM	PA	PA-PE	PVDF	HDPE	UHMW-PE	PEBAX	Alum
Acetone	1	1	1	1	4	1	3	1
Aniline	2	3	3	1	3	1	–	1
Benzene	1	2	2	1	4	4	3	1
Benzine	2	2	2	1	3	3	–	1
Butyl alcohol	2	2	2	1	2	1	–	1
Carbon disulphide	1	2	2	1	3	3	–	1
Carbon tetrachloride	1	1	1	1	3	3	–	2
Chlorobenzene	1	1	1	1	4	4	–	–
Chloroform	1	3	3	1	4	4	–	–
Ethyl acetate	1	2	2	1	2	1	–	1
Ethyl alcohol	1	2	2	1	1	1	–	1
Ethylic ether	1	2	2	1	4	3	–	1
Formalin	2	2	2	1	1	1	–	1
Heptane	2	1	1	1	2	2	–	–
Methyl alcohol	1	2	2	1	1	1	–	2
Methyl ethyl ketone	1	1	1	1	4	2	4	2
Nitrobenzene	2	2	2	1	3	2	–	1
Phenol	3	4	4	1	2	1	–	1
Toluene	1	2	2	1	4	4	–	–
White spirit	–	2	2	2	4	4	–	–

Salts

Chemical agent	POM	PA	PA-PE	PVDF	HDPE	UHMW-PE	PEBAX	Alum
Acid salts	2	3	3	1	1	1	–	–
Basic salts	1	2	2	1	1	1	–	–
Neutral salts	1	2	2	1	1	1	–	–
Potassium bicarbonate	2	2	2	1	2	1	–	1
Potassium permanganate	2	4	4	1	2	1	–	1
Sodium cyanide	2	2	2	1	2	1	–	4
Sodium hypochlorite	3	4	4	1	2	1	–	4

Chemical test

If you are doubtful about whether our materials will withstand your special environment, you should perform a chemical test. The following procedure, which tests the absorption of the material by measuring the swelling, is suitable for plastic materials. It should be performed at two temperatures, 20 °C and 60 °C. The 60 °C test represents long term exposure at room temperature.

1 Put a sample of the material into the chemical solution.

2 Measure the change in weight and length after 1, 2, 4, and 7 days in the solution. If the relative change of weight, length, or other geometric change exceeds 1 %, the test is considered negative, i.e. the chemical is not compatible with the material.

Static electricity

Low conductivity

The standard plastic materials used for conveyors all have low electrical conductivity. This means that static electricity can build up on the conveyor. If the chain runs on plastic slide rails, no inherent discharge path exists for the static electricity.

When a conveyor is running under normal operating conditions but without products, the following static build-up can be measured:

At the drive unit .... 2000–2500 V
At the idler end unit .... 400–500 V
At a wheel bend .... 400–500 V
At a straight section .... 300–400 V

Depending on the shape and material, a product running on the conveyor can also build up static electricity. The worst case is with accumulated products. Discharge is normally taking place when the products are transferred to or from the conveyor.

In static sensitive applications, a number of measures can be taken to reduce the risk of excessive static charges.

1 Ensure that the relative humidity is minimum 40 %.

2 Install static discharge wipers immediately before sensitive points on the conveyor.

Components for static sensitive environments

Some FlexLink chains, slide rail, and guide rail cover can be ordered in carbon loaded or ISD versions. The carbon loaded material has high conductivity whereas the ISD material is dissipative.

Contact your FlexLink Systems representative for additional information.

Run-in period

Two to three weeks are usually enough as a run-in period. During this time, the conveyor should be cleaned a couple of times, to remove dust. After run-in, wear will be minimal, unless particles from the product or process reach the conveyor continuously.

Chain elongation

Especially during the run-in period, and if the load is heavy, the conveyor chain will slowly increase in length. This effect will be most obvious for long conveyors. After continuous operation for two weeks, it is often possible to remove a couple of chain links. After this period, we recommend a check every 3–6 months.

Ultra-violet light

The plastic material used in the conveyor chain will deteriorate slowly if exposed to strong ultra-violet radiation from industrial UV sources.

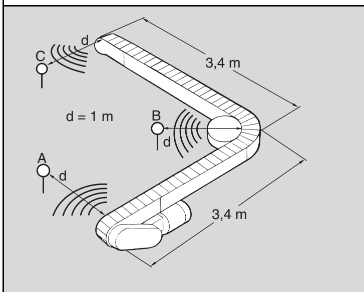
B. Conveyor noise level

Introduction

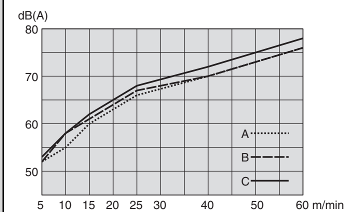
The noise generated by the conveyor chain will decrease after a few days of operation. Generally, a higher speed will result in a higher noise level, though still less than the general noise in a factory environment. At high speeds, large-radius plain bends are quieter than wheel bends. The actual noise level depends on several factors: the product on the conveyor, the installation premises, surrounding equipment, and the conveyor layout and dimensions

Typical noise levels for a conveyor with an end drive unit are shown in the following tables. The noise level was measured at three points for each conveyor type, at a distance of 1 m from drive unit (**A**), bend (**B**), and idler end unit (**C**), at the same level as the top of the conveyor.

Conveyor with wheel bend

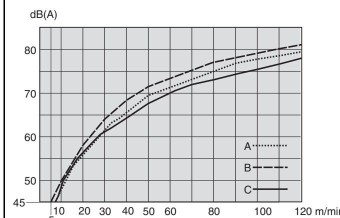


XS conveyor (Speed 5-60 m/min)



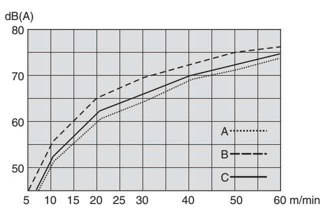
XSEB ... HL/HR, XSBH 90R150, XSEJ 200

X65 conveyor (Speed 5-120 m/min)



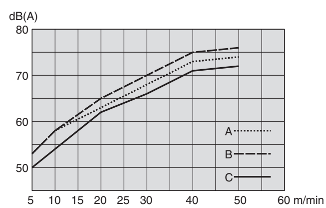
XLEB A65 ... HL/HR, XLBH 90A65R150, XLEJ A65

X85 conveyor (Speed 5-60 m/min)



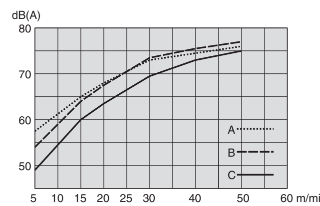
XBEB...HNLP, XBBH 90A85R160 and XBEJ A85

XH conveyor (Speed 5-50 m/min)



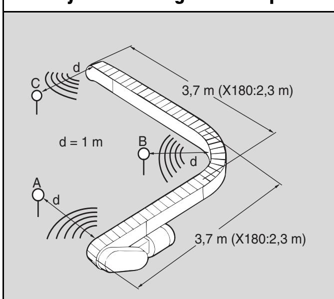
XHEB ... HL/HR, XHBH 90R170, XHEJ 325

XK conveyor (Speed 5-50 m/min)

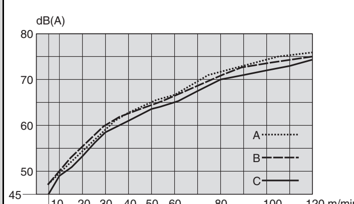


XKEB ... L/R, XKBH 90R200, XKEJ 350

Conveyor with large radius plain bend

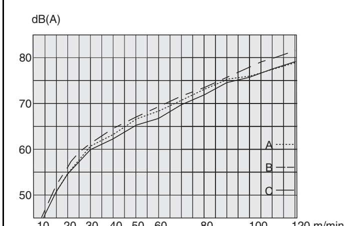


X65 conveyor (Speed 5-120 m/min)



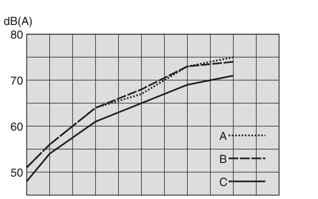
XLEB A65 ... HL/HR, XLBP 90A65R10, XLEJ A65

X85 conveyor (Speed 5-120 m/min)



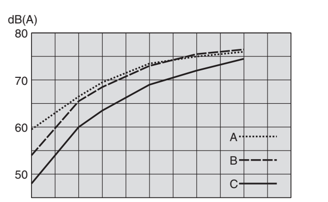
XBEB...HNLP, XBBP 90A85R5 , XBEJ A85

XH conveyor (Speed 5-50 m/min)



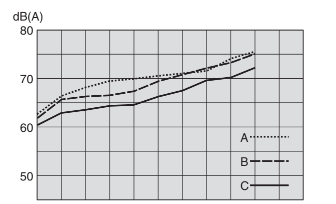
XHEB ... HL/HR, XHBP 90R1000, XHEJ 325

XK conveyor (Speed 5-50 m/min)



XKEB ... L/R, XKBP 90R1000, XKEJ 350

X180/X300 conveyor (Speed 5-50 m/min)



XBEB A180, XBBP 90A180R10, XBEJ A180