

Advanced Materials

Arathane[®] XW 949-1	100	pbw
Arathane[®] HY 5610	50	pbw

Polyurethane, halogen free, unfilled casting system for processing and curing at room temperature. Flexible polyurethane system for pressure sensitive devices.

Application Pressure sensitive devices, modules, proximity switches.

Processing methods Casting
Manually or with automatic mixing and dosing equipment .

Key Properties Excellent dielectric properties.
Good thermal shock resistance.
Low glass transition temperature.

Product Data (Guideline Values)

Arathane® XW 949-1 Blue

Polyol, unfilled.

Viscosity at 20 °C	ISO 2555	mPa*s	4000 – 7000*
Specific Gravity at 25 °C	ISO 2811	g/cm ³	0.91
Appearance	Visual		Blue liquid*

Arathane® HY 5610

Isocyanate.

Viscosity at 25 °C	PU / VIS-1	mPa*s	80 – 120*
Specific gravity at 25 °C	ISO 2811	g/cm ³	1.23
Appearance	Visual		Brown liquid*

*Specified range

Processing Data (Guideline Values)

Mix Ratio

		Parts by weight	Parts by volume
XW 949-1 Blue	Polyol	100	100
HY 5610	Isocyanate	50	37

Gel Time, Viscosity and Curing

Mix Viscosity at 25°C	XW 949-1 / HY 5610	Rheomat	mPa*s	1800
Gel time at 25°	XW 949-1 / HY 5610	Gelnorm	min	50
Pot life at 25°C (Time to reach 5000 mPa*s)	XW 949-1 / HY 5610	Rheomat	min	17
Minimum Curing Cycle	24 hours at RT or 6 hours at 80°C			

Processing and Storage (Guideline Values)

Preparation

XW 949-1 contains a coloring paste, which tend to separate over time. It is therefore recommended to carefully homogenize the complete contents of the container before use.

In the storage vessels of the production equipment, the unfilled products should be stirred up from time to time to avoid separation of the coloring paste and irregular metering.

Mixing and Casting

Polyol and Isocyanate are mixed according to the specified mix ratio using preferably a two component metering and mixing machine. Degassing of the components or mixture is recommended.

Casting under vacuum is preferred, especially for sophisticated devices or if optimal dielectric properties are required.

Curing

To determine whether crosslinking has been carried to completion and the final properties are optimal, it is necessary to carry out relevant measurements on the actual object or to measure the glass transition temperature. Arathane Polyurethane casting systems are designed for curing at ambient temperatures, minimum curing time is 24 hours at room temperature. Cure time can be reduced by curing at elevated temperatures.

Storage Conditions

Store the components in a dry place according to the storage conditions stated on the label in tightly sealed original containers. Under these conditions, the shelf life will correspond to the expiry date stated on the label. After this date, the product may be processed only after reanalysis. Partly emptied containers should be tightly closed immediately after use.

HY 5610 must be protected from moisture. Storage tanks should be blanketed with dry air or nitrogen. Storage at temperatures above 50°C is not recommended, since this can lead to the formation of insoluble solids and also the viscosity build-up increases on extended storage. Storage at low temperature is not recommended because it may lead to some crystallisation. Crystallised material must be melted out immediately by short time heating.

For information on waste disposal and hazardous products of decomposition in the event of a fire, refer to the Material Safety Data Sheets (MSDS) for these particular products.

Mechanical and Physical Properties (Guideline Values)

Determined on standard test specimen at 23°C. Cured for 24h/RT + 6h/80°C.

Glass transition temperature	ISO 6721	°C	- 62
Tensile strength	ISO 527	MPa	4.3
Elongation at break	ISO 527	%	37
Elastic Modulus	ISO 527	MPa	16.5
Flexural Strength	ISO 178	MPa	2.5
Flexural Strain	ISO 178	%	27
Flexural Modulus	ISO 178	MPa	10.5
Coefficient of thermal expansion (20 – 80°C)	ISO 11359-2	ppm/K	163
Thermal conductivity	ISO 8894-1	W/mK	0.19
Hardness	DIN 53505	Shore A / D	70 / 20
Water absorption	ISO 62/80		
1 day at 23°C		% by wt.	0.33
10 days at 23°C			0.20
30 min at 100°C			0.41

Electrical Properties (Guideline Values)

Determined on standard test specimen at 23°C. Cured for 24h/RT + 6h/80°C.

Dielectric strength (2.9 mm specimen)	IEC 60243-1	kV/mm	26.1
Dielectric loss factor (tan δ , 50Hz, 25°C)	IEC 60250	%	1.0
Dielectric constant (ϵ_r , 50Hz, 25°C)	IEC 60250		2.9
Volume resistivity (ρ , 25°C)	IEC 60093	Ω cm	4.9×10^{15}
Electrolytic corrosion	IEC 60426	Grade	A/1
Tracking resistance	IEC 112/79	CTI	> 600

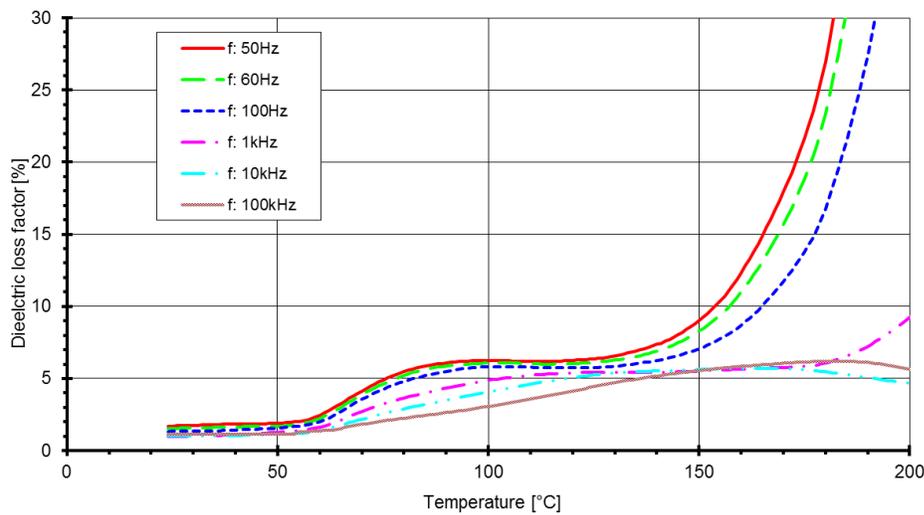


Figure 5.1: Dielectric loss factor $f(T,v)$, IEC 60250

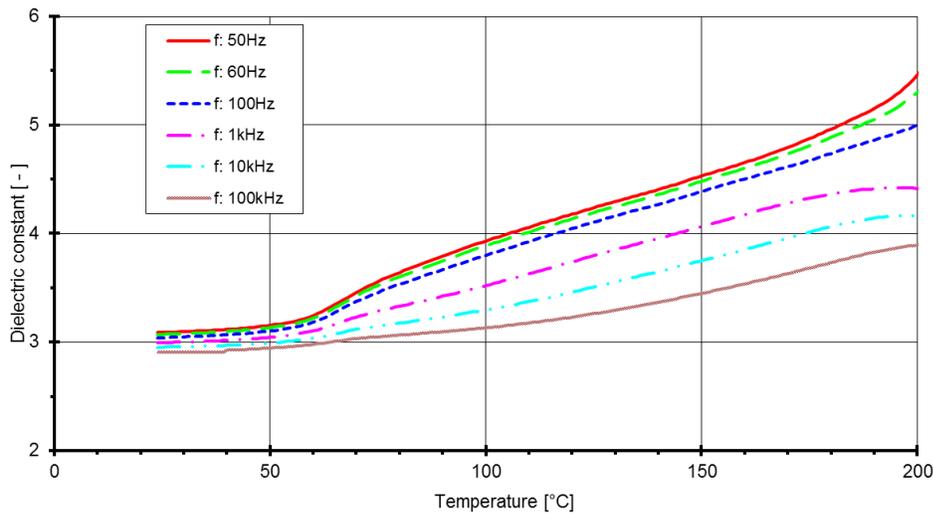


Figure 5.2: Dielectric constant $f(T,v)$, IEC 60250

Legal Notice

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