HUNTSMAN

Arathane® Polyurethane Casting System

Arathane® CW 5631	Polyol		100	pbw
Arathane® HY 5610	Isocyanate		25	pbw

Thermal Class F casting and impregnating system for high temperature applications
Processing and curing at room temperature.

Application

Transformers, filters, capacitors etc.

Processing methods

Casting / Impregnating.
Manually or with automatic mixing and dosing equipment.

Key Properties

High thermal endurance.
Excellent flow properties.
Good thermal conductivity.
Non abrasive casting system.
Good thermal shock resistance.
Flammability: UL 94 V-0 (6 mm).
NF F 16 – 102 classified
Suitable for Explosion-proof - castings.

Edition
Replaces Edition

November 2004
May 2004

Product Data (Guideline Values)

Arathane® CW 5631
Polyol, containing mineral filler

Viscosity at 25°C	ISO 2555	mPa*s	10000
Specific Gravity at 25°C	ISO 1675	g/cm³	1.48
Flash point	ISO 1523	°C	> 150
As supplied form	Black liquid.		

Arathane® HY 5610
Isocyanate

Viscosity at 25°C	ISO 2555	mPa*s	90
Specific Gravity at 25°C	ISO 1675	g/cm³	1.23
Flash point	ISO 1523	°C	> 200
As supplied form	Brown liquid.		

Processing Data (Guideline Values)

Mix Ratio

		Parts by weight	Parts by volume
CW 5631	Polyol	100	100
HY 5610	Isocyanate	25	30

Gel Time, Viscosity and Curing

Mix Viscosity at 25°C	CW 5631 / HY 5610	Rheomat	mPa*s	3000
Gel time at 25°C	CW 5631 / HY 5610	Gelnorm	min	60
Pot life (Time to reach 5000 mPa*s)	CW 5631 / HY 5610	Rheomat	min	14
Minimum Curing Cycle		24 hours at RT or 6 hours at 80°C		

Processing and Storage (Guideline Values)

Preparation

CW 5631 contains fillers, which tend to settle 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 pre-filled products should be stirred up from time to time to avoid sedimentation and irregular metering.

Mixing

Brief degassing of the mix under 2 – 10 mbar vacuum improves the mixture homogeneity and enhances the dielectric properties of the castings. Mixing of the components can be done at room temperature, heating of the polyol is not 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. Different gel and cure cycles in the customer's manufacturing process could lead to a different degree of crosslinking and thus a different glass transition temperature.

Storage Conditions

Store the components in a dry place at RT, 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 recommeded, since this can lead to the formation of insoluble solids and also the viscosity buid-up increases on extended storage. Storage at low temperature is not recommeded 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		47
Shear modulus	ISO 6721	MPa		1260
Max. service temperature	IEC 60085			Class F
Relative temperature index	IEC 60216	RTI		159
Tensile modulus	ISO 527	MPa		2100
Tensile strength	ISO 527	MPa		30
Elongation at break	ISO 527	%		6
Flexural Modulus	ISO 178	MPa		2300
Flexural Strength	ISO 178	MPa		53
Thermal linear coefficient	ISO 11359-2			
Alpha 1 Alpha 2		ppm/K		70 135
Thermal conductivity	ISO 8894-1	W/mK		0.6
Hardness	DIN 53505	Shore D		80
Glow-wire test (850°C)	IEC 60695-2-11		VDE 0471	passed
Flammability	UL 94			V-0 (6 mm)
	ISO 1210			passed
Railway rolling stock – fire behaviour	NF F 16-102		Class	I 3 / F 1
Water absorption	ISO 62/80			
1 day at 23°C 10 days at 23°C 30 min at 100°C		% by wt.		0.1 0.28 0.3

Electrical Properties (Guideline Values)

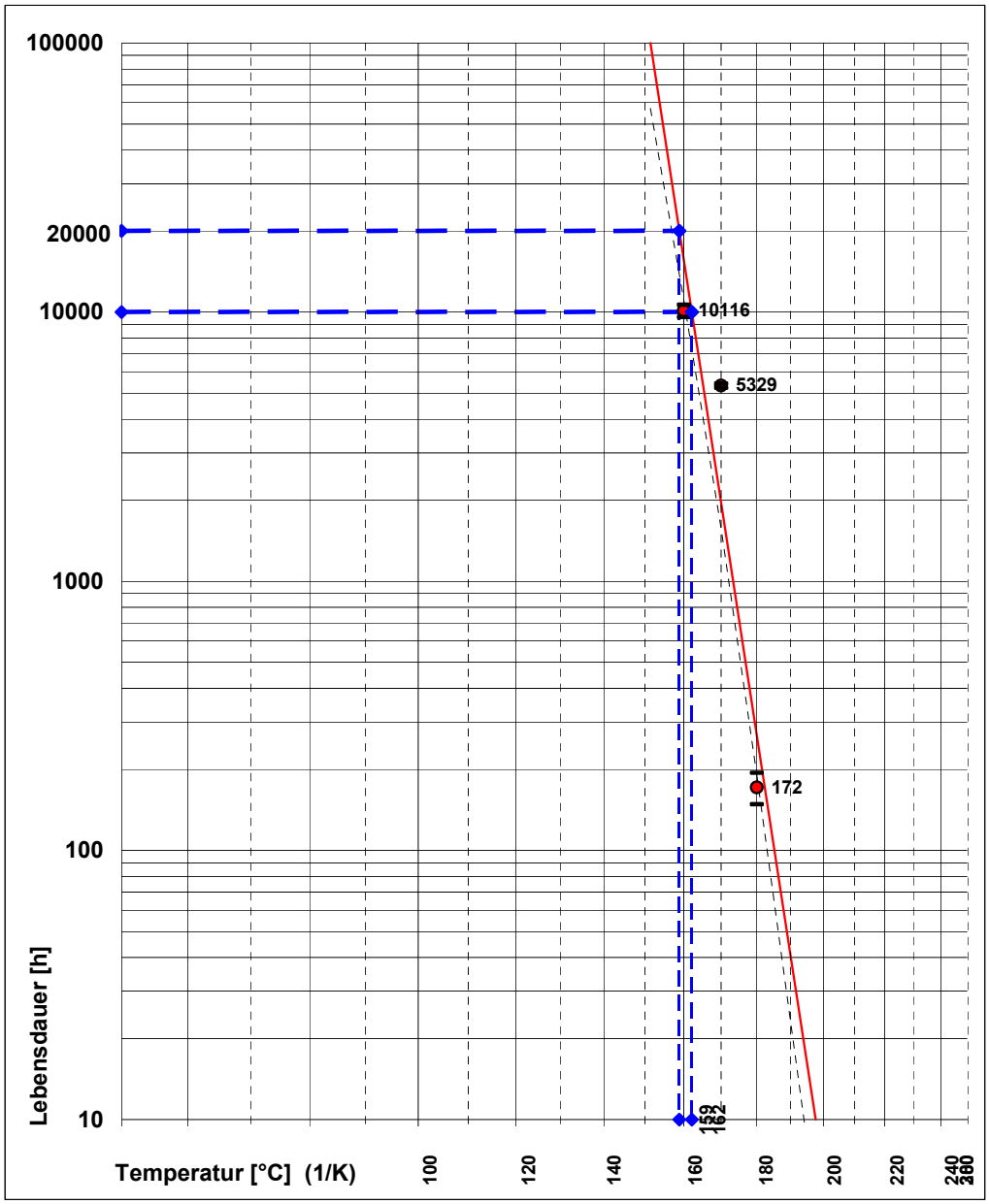
Determined on standard test specimen at 23°C. Cured for 24h/RT + 6h/80°C

Dielectric strength (2 mm specimen)	IEC 60243-1	kV/mm	29
Dielectric strength; 4 kV @ 140 °C	EN 50 028	sec	> 300; passed
Dielectric loss factor (tan δ, 50Hz, 25°C)	IEC 60250	%	3
Dielectric constant (εr, 50Hz, 25°C)	IEC 60250		4.5
Volume resistivity (ρ, 25°C)	IEC 60093	Ω cm	7×10^{14}
Tracking resistance	IEC 60112	grade	CTI > 600 <1
Electrolytic corrosion	IEC 60426	grade	A/1

Thermal Endurance Profile IEC 60216 (Guideline Values)

System tested: CW 5631 / HY 5610

Investigated Property:	Flexural strength (ISO 178)	
Selected end point:	50% of initial value (60.9 Mpa)	
T I g :	**159**	**159 / 165 (164.14)**
H I C g :	**3**	
Statistical test variables:	CHI²=	22.60
	F=	1904.17
- - - - - - - :	Lower 95% confidence curve /	TC: 157°C
Comments:		
	160°C extrapolated up to 400 days	



Industrial hygiene

Mandatory and recommended industrial hygiene procedures should be followed whenever our products are being handled and processed. For additional information please consult the corresponding Safety Data Sheets and the brochure "Hygienic precautions for handling plastics products".

Handling Precautions

Safety precautions at workplace:	
protective clothing	Yes.
gloves	Essential.
arm protectors	Recommended when skin contact likely.
goggles/safety glasses	Yes.
respirator/dust mask	Recommended.
Skin protection:	
before starting work	Apply barrier cream to exposed skin.
after washing	Apply barrier or nourishing cream.
Cleaning of contaminated skin	Dab off with absorbent paper, wash with warm water and alkali-free soap, then dry with disposable towels. Do not use solvents.
Clean shop requirements	Cover workbenches, etc. with light coloured paper. Use disposable beakers, etc.
Disposal of spillage	Soak up with sawdust or cotton waste and deposit in plastic-lined bin.
Ventilation:	
of workshop	Renew air 3 to 5 times an hour.
of workplace	Exhaust fans. Operatives should avoid inhaling vapors.

First Aid

Contamination of the **eyes** by resin, hardener or casting mix should be treated immediately by flushing with clean, running water for 10 to 15 minutes. A doctor should then be consulted.
Material smeared or splashed on the **skin** should be dabbed off, and the contaminated area then washed and treated with a cleansing cream (see above). A doctor should be consulted in the event of severe irritation or burns. Contaminated clothing should be changed immediately.
Anyone taken ill after **inhaling** vapours should be moved out of doors immediately. In all cases of doubt call for medical assistance.

Note

Arathane® is a registered trademark of Huntsman LLC or an affiliate thereof in one or more countries, but not all countries.

Huntsman LLC
®Registered trademark

APPROVED TO ISO 9000 ff