Vantico Ltd

Electrical Insulation Materials

HUNTSMAN

Arathane™ Polyurethane Casting System

CW 5631 Polyol	**100**	**100**	**pbw**
HY 5611 Isocyanate	**25**	**---**	**pbw**
XB 5610 Isocyanate	**---**	**25**	**pbw**

Thermal Class F casting and impregnating system for high temperature applications
Processing and curing at room temperature.
Flame retardant polyurethane system without softening agent.

Applications

Very high temperature applications with self extinguishing behavior

Processing methods

Casting / Impregnating
Manually or with automatic mixing and dosing equipment

Properties

High thermal endurance
Excellent thermal conductivity
Non abrasive casting system
Flammability: UL 94 approval (V-0 for 6 mm thick layer)

Edition: **July 2003**
Replaces Edition: September 2002

Product data

(guideline values)

CW 5631 **Polyol** (Standard, containing mineral filler)

Viscosity	at 25°C	Brookfield	mPa s	11000
Specific gravity	at 25°C	DIN 53217	g/cm³	1.48
Flash point		DIN 51758	°C	>150

As supplied form	Black liquid
Hazardous decomposition products	Carbon monoxide, carbon dioxide and other toxic gases and vapors if burned
Disposal	Regular procedures approved by national and/or local authorities

HY 5611 **Isocyanate**

Viscosity	at 25°C	Brookfield	mPa s	110
Specific gravity	at 25°C	DIN 53217	g/cm³	1.23
Flash point		DIN 51758	°C	>200

As supplied form	Brown liquid
Hazardous decomposition products	Carbon monoxide, carbon dioxide and other toxic gases and vapors if burned
Disposal	Regular procedures approved by national and/or local authorities

XB 5610 **Isocyanate**

Viscosity	at 25°C	Brookfield	mPas	100
Specific gravity	at 25°C	DIN 53217	g/cm³	1.23
Flash point		DIN 51758	°C	>200

As supplied	Brown liquid
Hazardous decomposition products	Carbon monoxide, carbon dioxide and other toxic gases and vapours if burned
Disposal	Regular procedures approved by national and/or local authorities

Storage

Store the components in a dry place at 18-25°C, 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.
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.

Processing and end properties

Mix ratio

		Parts by weight		Parts by volume	
CW 5631	Polyol	100	100	100	100
HY 5611	Isocyanate	25	--	30	---
XB 5610	Isocyanate	---	25	---	30

Processing data
(guideline values)

Mixed System:

Viscosity at 25°C	Rheometrics D 10s		mPa·s	2300
Gel time at 25°C	(Gelnorm)	min	40 - 60	
Pot life (time to reach 5000 mPas)		min	13	
Minimum Curing cycle		24h at RT or 6h at 80°C		

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.

Mechanical and physical properties
(guideline values)

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

Specific gravity	DIN 55990	g/cm³	1.52
Glass transition temperature	ISO 6721/94	°C	37
Temperature index	IEC 216	°C	159
Tensile strength	ISO 527	MPa	30
Elongation at break	ISO 527	%	6
Flexural strength	ISO 178	MPa	11
Thermal linear coefficient	DIN 53752	ppm/K	140
Thermal conductivity	ISO 8894/90	W/mK	0.6
Shore D hardness	DIN 53505	---	80
Flammability	UL 94	grade	V-0 (6 mm)
Water absorption (specimen: 50×50×4 mm)	ISO 62/80		
1 day at 23°C		% by wt.	0.10
10 days at 23°C		% by wt.	0.28
30 min at 100°C		% by wt.	0.30

Electrical properties
(guideline values)

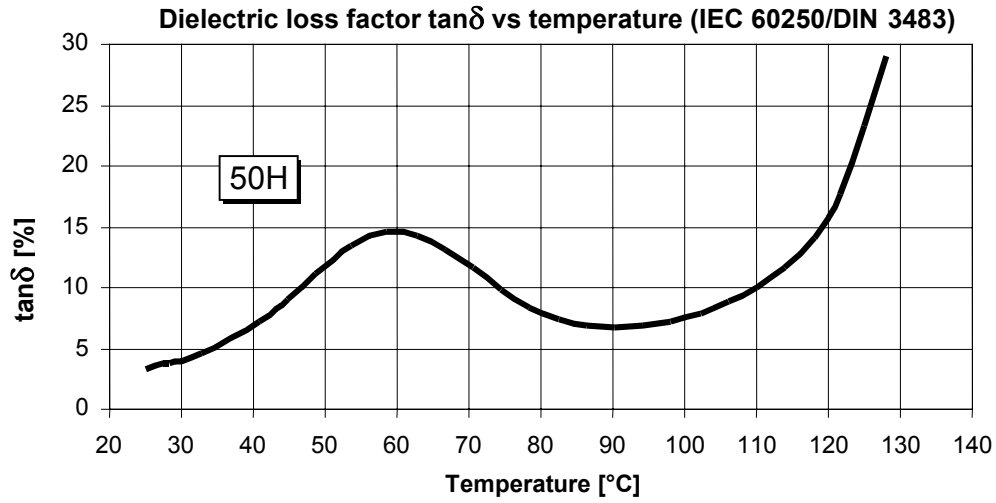
Determined on standard test specimen at 23°C. Cured for 24h/23°C + 6h/80°C

Dielectric strength (specimen 2 mm)	IEC 6243-1	kV/mm	24
Dielectric loss factor (tan δ, 25°C, 50Hz)	IEC 60250	%	2.6
Dielectric constant (ε_r, 25°C, 50Hz)	IEC 60250	---	4.5
Volume resistivity (ρ, 25°C IEC 6093	Ω cm		7.8×10^{14}
Electrolytic corrosion	IEC 60426	grade	A/1

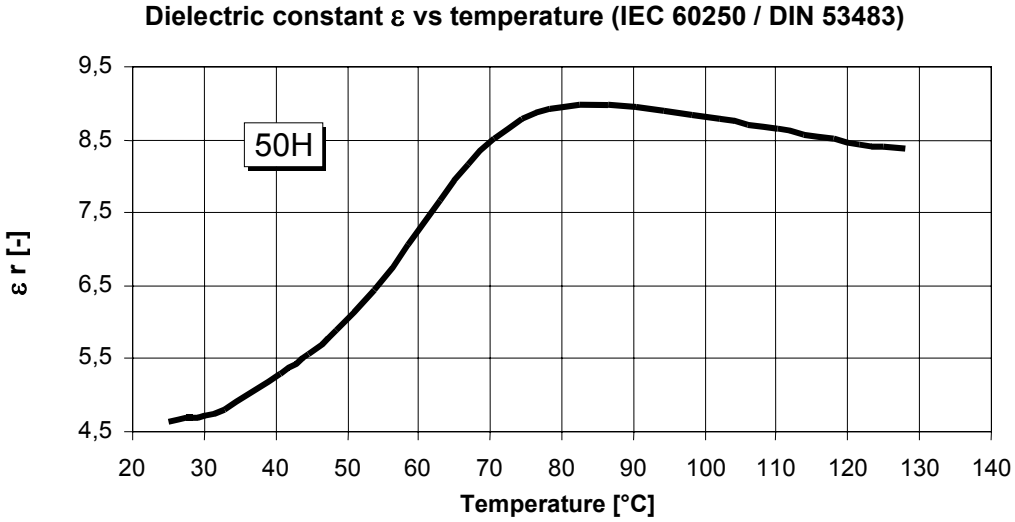
Remarks

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 gelling and cure cycles in the customer's manufacturing process could lead to a different degree of crosslinking and thus a different glass transition temperature.

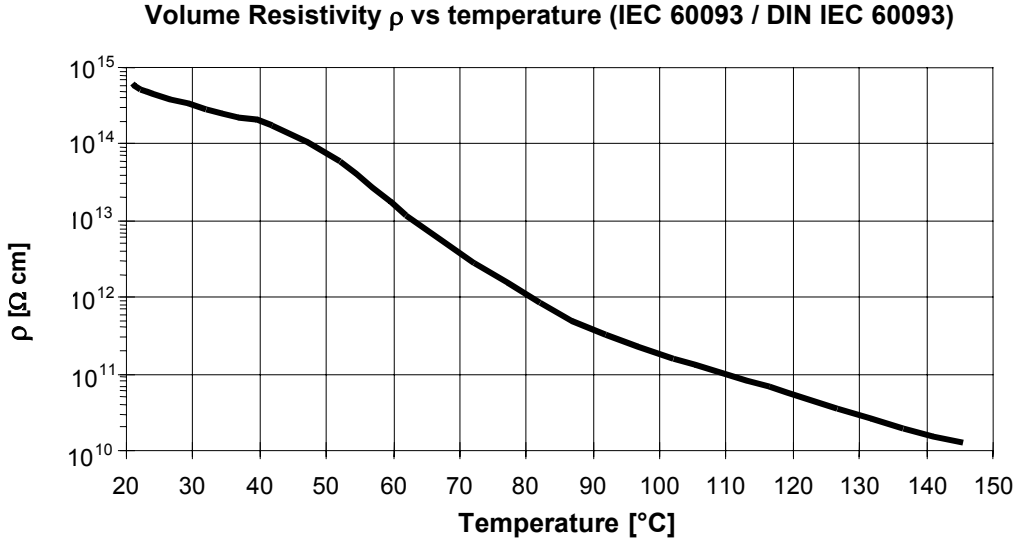
Dielectric loss factor



Dielectric constant



Volume resistivity



System tested :
CW 5631 / XB 5610

Thermal Endurance Profile IEC 60216

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	

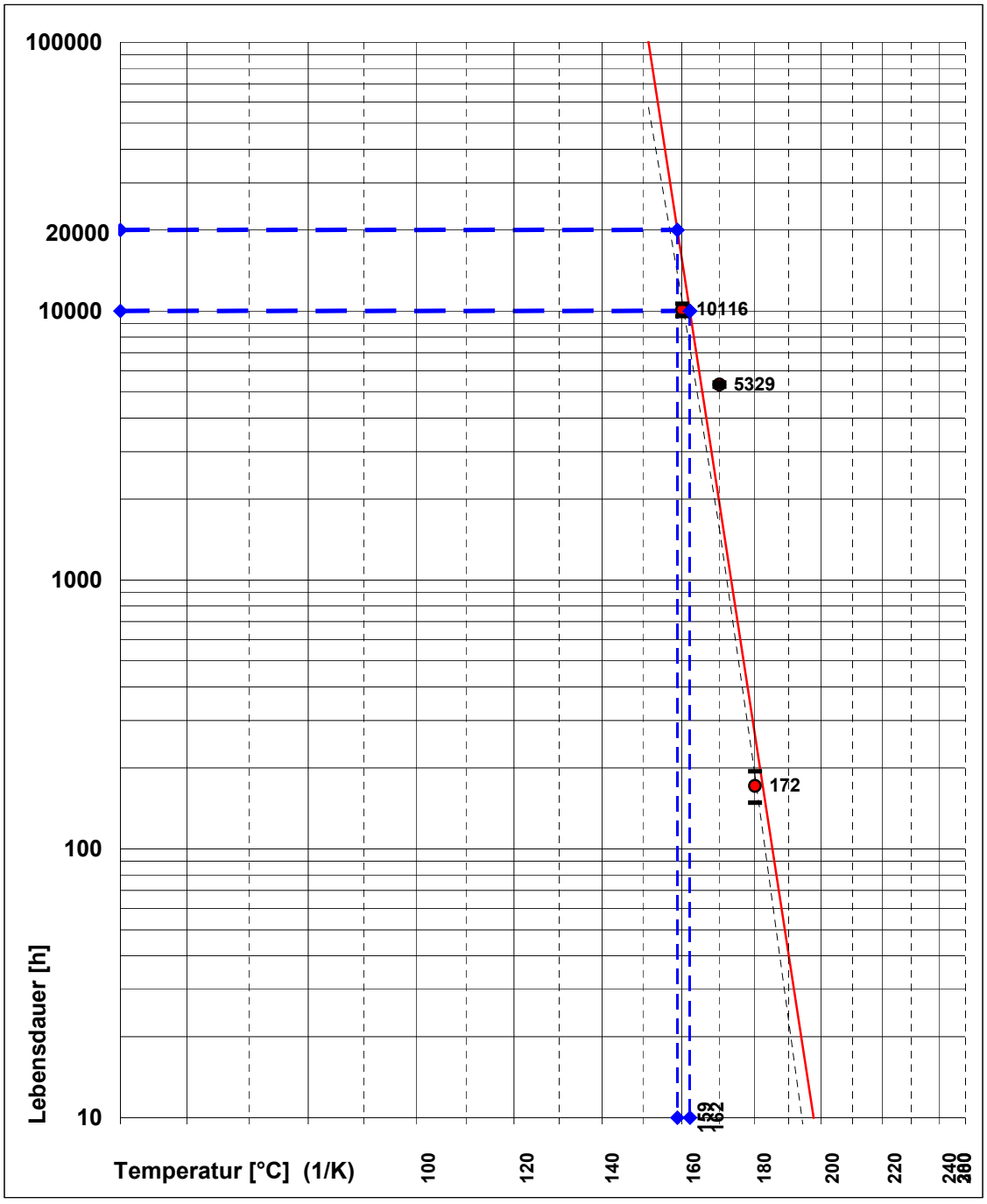


Fig. 7.1

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 of Huntsman (Publ. No. 24264/e).

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
Cleansing 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 colored 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.

Vantico Ltd
Electronic Polymers

All recommendations for use of our products, whether given by us in writing, verbally, or to be implied from results of tests carried out by us are based on the current state of our knowledge. Notwithstanding any such recommendations the Buyer shall remain responsible for satisfying himself that the products as supplied by us are suitable for his intended process or purpose. Since we cannot control the application, use or processing of the products, we cannot accept responsibility therefore. The Buyer shall ensure that the intended use of the products will not infringe any third party's intellectual property rights. We warrant that our products are free from defects in accordance with and subject to our general conditions of supply.