

Advanced Materials

| | | |
|---------------------------------------|------------|------------|
| Arathane[®] CW 5631 | 100 | pbw |
| Arathane[®] HY 5611-1 | 25 | pbw |

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

Application

Transformers, filters, capacitors etc.
Electrical devices working in potentially explosive environment.

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).

Product Data (Guideline Values)

Arathane® CW 5631

Polyol, containing mineral filler.

| | | | |
|---------------------------|----------|-------------------|---------------|
| Viscosity at 25 °C | ISO 3219 | mPa*s | 3400 – 5100* |
| Specific Gravity at 25 °C | ISO 2811 | g/cm ³ | 1.48 |
| Appearance | Visual | | Black liquid* |

Arathane® HY 5611-1

Isocyanate.

| | | | |
|---------------------------|------------|-------------------|---------------|
| Viscosity at 25 °C | PU / VIS-1 | mPa*s | 180 – 240* |
| Specific Gravity at 25 °C | ISO 1675 | g/cm ³ | 1.23 |
| Appearance | Visual | | Brown liquid* |

*Specified range

Processing Data (Guideline Values)

Mix Ratio

| | | Parts by weight | Parts by volume |
|-----------|------------|-----------------|-----------------|
| CW 5631 | Polyol | 100 | 100 |
| HY 5611-1 | Isocyanate | 25 | 30 |

Gel Time, Viscosity and Curing

| | | | | |
|--|-----------------------------------|---------|-------|------|
| Mix Viscosity at 25°C | CW 5631 / HY 5611-1 | Rheomat | mPa*s | 3700 |
| Gel time at 25°C | CW 5631 / HY 5611-1 | Gelnorm | min | 60 |
| Pot life (Time to reach 5000 mPa*s) | CW 5631 / HY 5611-1 | Rheomat | min | 7 |
| 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

The casting mix is best prepared by heating the resin up to 40 – 50 °C before stirring in the hardener.

Brief degassing of the mix under 5 – 10 mbar vacuum improves the mixture homogeneity and enhances the dielectric properties of the castings.

Curing

To determine whether cross-linking 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 cross-linking and thus a different glass transition temperature.

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 5611-1 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 | 47 |
| Shear modulus | ISO 6721 | MPa | 1260 |
| Max. service temperature | IEC 60085 | | Class F |
| 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 | | ppm/K | 70 |
| Alpha 2 | | | 135 |
| Thermal conductivity | ISO 8894-1 | W/mK | 0.6 |
| Hardness | DIN 53505 | Shore D | 80 |
| Flammability | UL 94 | | V-0 (6 mm) |
| Water absorption | ISO 62/80 | | |
| 1 day at 23°C | | % by wt. | 0.1 |
| 10 days at 23°C | | | 0.28 |
| 30 min at 100°C | | | 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 loss factor (tan δ , 50Hz, 25°C) | IEC 60250 | % | 3 |
| Dielectric constant (ϵ_r , 50Hz, 25°C) | IEC 60250 | | 4.5 |
| Volume resistivity (ρ , 25°C) | IEC 60093 | Ω cm | 10^{14} |
| Electrolytic corrosion | IEC 60426 | grade | A/1 |

Legal Notice

Huntsman Advanced Materials

(Switzerland) GmbH
Klybeckstrasse 200
4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11
Fax: +41 (0)61 299 11 12

www.huntsman.com/advanced_materials
Email:
advanced_materials@huntsman.com



Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the user. Specified data are analysed on a regular basis. Data which is described in this document as 'typical' or 'guideline' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

The manufacture of materials is the subject of granted patents and patent applications; freedom to operate patented processes is not implied by this publication. While all the information and recommendations in this publication are, to the best of Huntsman Advanced Material's knowledge, information and belief, accurate at the date of publication, nothing herein is to be construed as a warranty, whether express or implied, including but without limitation, as to merchantability or fitness for a particular purpose. In all cases, it is the responsibility of the user to determine the applicability of such information and recommendations and the suitability of any product for its own particular purpose.

The behaviour of the products referred to in this publication in manufacturing processes and their suitability in any given end-use environment are dependent upon various conditions such as chemical compatibility, temperature, and other variables, which are not known to Huntsman Advanced Materials. It is the responsibility of the user to evaluate the manufacturing circumstances and the final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Advanced Materials containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent on manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

Except where explicitly agreed otherwise, the sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman Advanced Materials LLC or of its affiliated companies including without limitation, Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., Huntsman Advanced Materials (UAE) FZE, Huntsman Advanced Materials (Guangdong) Company Limited, and Huntsman Advanced Materials (Hong Kong) Ltd.

Huntsman Advanced Materials is an international business unit of Huntsman Corporation. Huntsman Advanced Materials trades through Huntsman affiliated companies in different countries including but not limited to Huntsman Advanced Materials LLC in the USA and Huntsman Advanced Materials (Europe) BVBA in Europe.

All trademarks mentioned are either property of or licensed to Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Copyright © 2012 Huntsman Corporation or an affiliate thereof. All rights reserved.