HUNTSMAN

Enriching lives through innovation

Advanced Materials

TECHNICAL DATA SHEET (Provisional)

Araldite® CW 30334 CI Resin 100 pbw
Aradur® HW 30335 CI Hardener 75 pbw

Liquid, prefilled, hot-curing two-component epoxy casting system with high thermal conductivity and excellent thermal shock(-40℃/180℃) crack resistance.

Applications

Encapsulation of motor stators, transformer coils, and devices requiring high thermal conductivity and good thermal shock crack resistance.

Processing Method

Vacuum casting, Vacuum Potting

Key Properties

- High thermal conductivity
- Excellent thermal shock(-40℃/180℃) crack resistance
- Good gap filling performance
- Good thermal resistance
- Excellent mechanical and electrical properties
- Excellent Automatic Transmission Fluid(ATF) resistance

Typical Data*

CW30334 CI resin (Liquid, mineral filled epoxy)

Appearance		Visual		Viscous black liquid
Viscosity	at 60℃	ISO 3219	mPa.s	2000 - 6000
Density	at 25℃	ISO 2811-2	g/cm³	2.20 – 2.30

HW30335 CI hardener (Liquid, mineral filled anhydride hardener)

Appearance		Visual		Viscous white liquid
Viscosity	at 60℃	ISO 3219	mPa.s	1500 - 5500
Density	at 25℃	ISO 2811-2	g/cm³	2.10 – 2.20

Because the hardener is sensitive to moisture. Partly emptied containers must be resealed immediately.

* Typical data are based on Huntsman's test methods. Copies are available upon request.

Mixing Ratio

		Parts by Weight	Parts by Volume
CW30334 CI	Resin	100	100
HW30335 CI	Hardener	75	78

HUNTSMAN

Enriching lives through innovation

Processing

Preparation

CW30334 CI and HW30335 CI contain 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

To facilitate stirring and removal, highly filled components are heated to 60 - 80°C in the original container (e.g. overnight in an oven).
The casting mix the resin component should be homogenized in holding tank A at 70 - 80°C under a vacuum of 1 -5 mbar, the hardener component in holding tank B at 50 - 60°C and a vacuum of 2 - 5 mbar.

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 crosslinking and thus a different glass transition temperature.
It should be noted that certain minimum curing temperatures and time are required to achieve the highest possible crosslinking density in the resin system. The minimum curing temperature for resin system CW30334 CI/HW30335 CI is 120 - 130 °C.

Processing Data

Mixing Viscosity at 60℃	ISO 3219	mPa.s	3000 - 5000
Mixing Viscosity at 80℃	ISO 3219	mPa.s	1200 - 1800
Pot life at 80℃			
(Time to reach 10 000 mPas)	Brookfield	min	210

Gel time at different temperature:

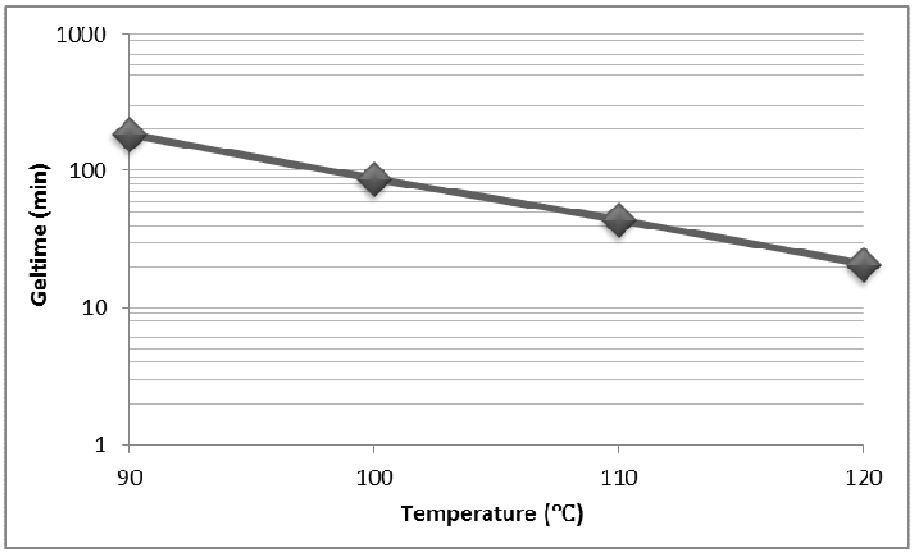

Fig.1:Geltime measured in function of with temperature (Gelnorm Instrument / ISO 9396)

HUNTSMAN

Enriching lives through innovation

Mechanical and Physical Properties

Determined on standard test specimen at 23℃
cured for 2h at 95℃ + 1h *(95-130)℃+ 2h at 130℃

Color of castings			Grey
Tensile strength	ISO 527	MPa	65 - 80
Elongation at break	ISO 527	%	0.5 – 0.8
E-Modulus from tensile test	ISO 527	MPa	15000-18000
Flexural strength	ISO 178	MPa	100-130
Surface strain	ISO 178	%	0.5 – 1.0
E-Modulus from flexural test	ISO 178	MPa	15000-18000
Double Torsion Test	CG 216-0/89		
Critical stress intensity factor (K_{1c})		$MPa.m^{1/2}$	2.9 - 3.2
Specific energy at break (G_{1c})		J/m^2	470 - 570
Glass transition temperature (DSC)	IEC 1006	℃	90 – 105
Coefficient of linear thermal expansion (Below Tg)	ISO 11359-2	ppm / K	22 – 26
Hardness Shore D	ISO 868		85
Thermal conductivity	ISO 8894-1	W/mK	1.1 – 1.2
Density of cured sample	DIN 55990	g/cm³	2.24
Water absorption (specimen: 50×50×4 mm)	ISO 62		
7 day at 25℃		% by wt.	0.07 – 0.10
120 min at 100℃		% by wt.	0.05 – 0.07

Electrical Properties

Determined on standard test specimen at 23℃
cured for 2h at 95℃ + 1h *(95-130)℃+ 2h at 130℃

Breakdown strength(2mm plate)	IEC 60243-1	kV/mm	20 – 26
Volume resistivity at 23℃	IEC 62631	Ω.cm	$1.55 * 10^{15}$
Tracking resistance with test solution A	IEC 60112	CTI	> 600

HUNTSMAN

Enriching lives through innovation

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 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 coloured paper. Use disposable breakers, 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 vapours.
STORAGE	The components have to be stored under dry conditions 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 following reanalysis. Partly emptied containers should be closed tightly immediately after use. For information on waste disposal and hazardous products of decomposition in the event of fire, refer to the Material Safety Data Sheets (MSDS) for these particular products.
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.

HUNTSMAN

Enriching lives through innovation

Legal Notice

Huntsman Advanced Materials
(Guangdong) Company Limited
Flying Geese Mountain Industrial Park,
Shilou Town,
Panyu district, Guangzhou 511447
P.R.China
Tel.: +86-20 3937 7000
Fax: +86-20 8486 5641
Free Hot Line: +86-20 8484 5000

www.huntsmanadmat.cn

Email:

advanced_materials@huntsman.com

Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the buyer. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications.

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 our knowledge, information and belief, accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A REPRESENTATION, WARRANTY OR CONDITION OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT OF ANY THIRD PARTY.

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 in writing otherwise, the sale of product referred to in this publication is subject to the terms and conditions of sale of the Huntsman company from which you purchased the product (or those of the authorised distributor, as the case may be).

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; Huntsman Advanced Materials (Europe) BVBA in Europe; and Huntsman Advanced Materials (Australia) Pty Ltd, Huntsman Advanced Materials (Hong Kong) Ltd, Huntsman Advanced Materials (Guangdong) Company Limited, Huntsman Advanced Materials (India) Pvt Ltd, Huntsman Japan KK, Huntsman Advanced Materials (Singapore) Pte Ltd and Huntsman Advanced Materials (Taiwan) Corporation in Asia Pacific.

ARALDITE® and ARADUR® are registered trademarks of Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.