HUNTSMAN
Enriching lives through innovation

Advanced Materials

Araldite® DBF 100 pbw
Aradur® HY 956 EN 20 pbw

Low viscosity, unfilled epoxy casting resin system, curing at room temperature.
High filler addition possibility.

Application	Encapsulating or potting of low voltage and electronic components.
Processing methods	Casting; vacuum casting.
Key Properties	Good heat resistance. Good resistance to atmospheric and chemical degradation.

Product Data (Guideline Values)

Araldite® DBF
Liquid epoxy resin modified by the addition of a plasticizer.

Viscosity at 25°C	ISO 2555	mPa*s	1350 – 2000*
Specific Gravity at 25°C	ISO 2811	g/cm³	1.15
Appearance	Visual		Clear liquid*
Epoxy content	ISO 3001	Eq/kg	4.20 – 4.35*

Aradur® HY 956 EN
Formulated, low viscosity polyamine hardener.

Viscosity at 25°C	ISO 12058	mPa*s	370 – 470*
Specific Gravity at 25°C	ISO 2811	g/cm³	1.03
Appearance	Visual		Clear, liquid*

*Specified range

Processing Data (Guideline Values)

Mix Ratio

		Parts by weight	Parts by volume
Araldite DBF	Resin	100	100
HY 956 EN	Hardener	20	22

Gel Time, Viscosity and Curing

Mix Viscosity at 25°C	Araldite DBF / HY 956 EN	Rheomat	mPa*s	1800
Mix Viscosity at 40°C				1300
Pot life at 25°C	Araldite DBF / HY956 EN	Time to reach 5000 mPa*s	min	70
		Time to reach 15000 mPa*s	min	120
Pot life at 40°C	Araldite DBF / HY956 EN	Time to reach 5000 mPa*s	min	45
		Time to reach 15000 mPa*s	min	62
Gel time at 40°C	Araldite DBF / HY956 EN	Gelnorm	min	62
Gel time at 60°C		Gelnorm	min	15
Minimum Curing Cycle		24 - 48 hours at RT or 4 h at RT + 4 h at 60°C		

Processing and Storage (Guideline Values)

Mixing

Measure (by weight or volume) the Araldite resin and the hardener. Add the hardener to the Araldite resin; making sure that the required amount of hardener is transferred to the resin. Stir thoroughly until mixing is complete.
Air entrainment during mixing results in pores in the cured resin. Mixing under vacuum or in a metering-mixing machine is the most effective way to prevent air entrainment. Alternatively the static resin – hardener mixture may be deaerated in a vacuum chamber – allowing at least 200 % ullage for the foam to expand.

Curing

The chemical reaction initiated by mixing resin and hardener results in the generation of exothermic heat. The peak temperatures attained are determined by the starting temperature and the size and shape of the casting. Unfilled resin systems are suitable only for manufacturing castings weighing up to about 500 grams. Mineral filler should be added to dissipate heat and damp the exothermic reaction when producing large castings.

There is very little exothermic reaction when producing very small castings or thin layers as the heat generated is rapidly dissipated. Cure is consequently delayed and the surfaces of castings may remain tacky. In such cases an infrared heater or oven at 40°C – 60°C should be used to effect full cure.

When casting thick sections special care is needed to avoid excessive exothermic temperature rise.
Short high-temperature curing schedules should not be used unless preliminary trials with castings manufactured to the specific design, and in the specified moulds, produce no unacceptable exothermic effects.

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.
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 6 hours at RT + 6 hours at 60°C.

Color of casting			Yellow
Density	ISO 1183	g/cm^3	1.1
Glass transition temperature (DSC)	ISO 11357-2	°C	64
Flexural strength	ISO 178	MPa	107
Elongation at break	ISO 178	%	12
Flexural modulus	ISO 178	MPa	2900
Hardness	ISO 868	Shore D	80
Tensile strength	ISO 527	MPa	58
Elongation at break	ISO 527	%	6.4
Tensile modulus	ISO 527	MPa	2880
Impact strength	ISO 179	kJ/m^2	69
Coefficient of linear thermal expansion	ISO 11359-1/99		
α_1 / α_2		10^{-6}/K	79 / 183
Water absorption	ISO 62		
10 day at 23°C		% by wt.	0.63
30 min at 100°C			0.65

Electrical Properties (Guideline Values)

Determined on standard test specimen at 23°C. Cured for 6 hours at RT + 6 hours at 60°C.

Dielectric strength (2 mm specimen)	IEC 60243-1	kV/mm	24
Dielectric loss factor (tan δ, 50Hz, 25°C)	IEC 60250	%	0.8
Dielectric constant (εr, 50Hz, 25°C)	IEC 60250		4.1
Volume resistivity (ρ, 25°C)	IEC 60093	Ω cm	7 x 10^{15}
Tracking resistance	IEC 112/79	CTI	> 600 - 0.4
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.