

# Araldite<sup>®</sup> Casting System

<b>Araldite<sup>®</sup> DBF</b>	<b>Resin</b>	<b>100</b>	<b>pbw</b>
<b>Aradur<sup>®</sup> HY 951</b>	<b>Hardener</b>	<b>10</b>	<b>pbw</b>

**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 mechanical strength.  
Good resistance to atmospheric and chemical degradation.  
Excellent electrical properties

## Product Data (Guideline Values)

### **Araldit 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 1675	g/cm <sup>3</sup>	1.1 – 1.2
Appearance	Visual		Clear liquid
Epoxy content	ISO 3001	Eq/kg	4.20 – 4.35
Flash point	DIN 51758	°C	160

### **Aradur HY 951**

Low viscosity aliphatic amine

Viscosity at 25°C	ISO 12058	mPa*s	10 - 20
Specific Gravity at 20°C	ISO 1675	g/cm <sup>3</sup>	0.98
Appearance	Visual		Clear liquid
Flash point	DIN 51758	°C	110

## Processing Data (Guideline Values)

### Mix Ratio

		Parts by weight	Parts by volume
Araldit DBF	Resin	100	100
HY 951	Hardener	10	12

### Gel Time, Viscosity and Curing

Mix Viscosity at 25°C	Araldit DBF / HY 951	Rheomat	mPa*s	850
Mix Viscosity at 40°C				280
Pot life at 25°C	Araldit DBF / HY 951	Time to reach 5000 mPa*s	min	93
		Time to reach 15000 mPa*s	min	135
Pot life at 40°C	Araldit DBF / HY 951	Time to reach 5000 mPa*s	min	59
		Time to reach 15000 mPa*s	min	76
Gel time at 25°C	Araldit DBF / HY 951	Gelnorm	min	160
Gel time at 40°C		Gelnorm	min	70
Gel time at 60°C		Gelnorm	min	20
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 at room temperature, 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			yellowish
Density	ISO 1183	g/cm <sup>3</sup>	1.19
Glass transition temperature	ISO 6721	°C	67
Shear modulus	ISO 6721	MPa	1230
Hardness	ISO 868	Shore D	85
Tensile strength	ISO 527	MPa	52
Elongation at break	ISO 527	%	11
Tensile modulus	ISO 527	MPa	2800
Thermal linear coefficient of expansion	ISO 11359-2	ppm/K	
Alpha 1		ppm/K	87
Alpha 2			174
Water absorption	ISO 62		
1 day at 23°C		% by wt.	0.16
10 day at 23°C			0.53
30 min at 100°C			0.57

## 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 (3 mm specimen)	IEC 60243-1	kV/mm	25
Dielectric loss factor (tan δ, 50Hz, 25°C)	IEC 60250	%	1.2
Dielectric constant (ε <sub>r</sub> , 50Hz, 25°C)	IEC 60250		4.2
Volume resistivity (ρ, 25°C)	IEC 60093	Ω cm	7 x 10 <sup>15</sup>

# 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

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