HUNTSMAN

Aluminium-Filled Epoxy Casting System

Araldite® **LC 264-1**
Hardeners **HY 956**
LC 234
HY 2954

Applications

The construction of:

- moulds for prototypes and short runs
- structural foam moulds
- vacuum forming moulds
- copy milling models

Processing Methods

Solid or face castings

Features

Selection of hardeners give operating temperatures up to 150^{O}C
Excellent heat transfer
Readily pourable
Easy to machine

Mould Preparation

Non -porous moulds made of Araldite, metal, glass, etc need 2 or 3 coats of Mould Release QZ5111 (**Huntsman Advanced Materials**). When the last coat of QZ5111 has dried it can be polished with a woollen or cotton cloth.

Porous surfaces such as bare timber, plaster etc must be appropriately sealed before the release agent is applied.

Araldite LC 264-1 — **Product Data**

Description		Modified, aluminium filled epoxy resin
As supplied form		Grey thixotropic filled liquid
Viscosity at 25^{o}C	mPa.s	130,000-220,000
Density at 25^{o}C	kg/l	1.70-1.80
Shelf Life at 18 - 25^{o}C		18 months

Hardener HY 956

Description		Modified aliphatic polyamine adduct**. Suitable for manufacturing parts operating up to 60^{o}C**
As supplied form		Clear, light yellow liquid
Viscosity at 25^{o}C	mPa.s	340-470
Density at 25^{o}C	kg/l	1.00-1.05
Shelf Life at 18 - 25^{o}C		24 months

Hardener LC 234

Description		Formulated aliphatic cycloaliphatic amine blend. **Suitable for manufacturing parts operating up to 110^{o}C**
As supplied form		Clear, pale yellow liquid
Viscosity at 25^{o}C	mPa.s	600-1,200
Density at 25^{o}C	kg/l	1.00 - 1.05
Shelf Life at 18 - 25^{o}C		24 months

Hardener HY 2954

Description		Cycloaliphatic diamine **Suitable for manufacturing parts operating up to 150^{o}C**
As supplied form		Clear, light yellow liquid
Viscosity at 25^{o}C	mPa.s	90-150
Density at 25^{o}C	kg/l	0.93-0.96
Shelf Life at 18 - 25^{o}C		48 months

Material Processing

The resin component should be stirred thoroughly before use to redisperse any filler that may have settled out. Mixing of the resin and hardener must be thorough and should be continued until a uniform, homogeneous mix has been achieved. Avoid excessive aeration of the mix.

If fine details are to be reproduced, a thin layer of resin/hardener mix should be applied to the mould surface with a short-bristle brush. The addition of 5-10% of Thixotropic Agent DT 5039 (**Huntsman Advanced Materials**) will prevent resin run off in moulds with steep sides. The casting mix should be applied **BEFORE** this layer has become tack-free.

The resin/hardener mix should be poured slowly down a mould wall or spatula into the lowest point of the mould. This will help to minimise entrapment of air.

Thick castings can be achieved by pouring successive layers providing that the initial layer is allowed to gel prior to pouring the next layer. Take care that the layer onto which fresh material is being poured is still in the gel stage and has not cured.

An alternative method is to make up a backing mix of the resin/hardener and aluminium granules, available from **Huntsman Advanced Materials**.

Curing

Where postcuring is required, the temperature should be raised gradually by 20-30^{o}C/hr to avoid creating internal stresses or inducing warpage. Cooling should be carried out slowly, preferably in the closed, switched off oven.

The curing cycles and Deflection Temperatures quoted in this publication are from laboratory trials on standard test pieces and should be used as a guide only. In practice curing of a part is determined by a number of variables eg size, shape and construction.

It is up to the user to determine a curing cycle best suited for his/her process, however the following steps may be used as a starting point.

- Gel at room temperature. This is essential for large parts and when using Mould Release QZ 5111.

- Process for 2-6 hours at half final cure temperature.

- Process for 2-6 hours at final cure temperature.

NOTE: Final cure temperatures should be at least equal to required maximum service temperature of part.

Properties

Resin/hardener mixture					
Araldite Hardener			LC 264-1 HY 956	LC 264-1 LC 234	LC 264-1 HY 2954
Mix Ratio		Parts by weight	100:10	100:12.5	100:13
Processing Temperature		^{o}C	25	25	25
Initial Mix Viscosity		mPa.s	18,000-23,000	6,000-10,000	5,000-9,000
Usable Life (1kg)		minutes	40-50	60-80	360-480
Demouldable after		hours	12-18 at 25^{o}C	18-24 at 25^{o}C	24-48 at 25^{o}C
After Curing					
Curing Cycle			2 days at 25^{o}C or 14hrs @ 40^{o}C	24hrs at 25^{o}C + 14hrs @ 120^{o}C	16hrs at 25^{o}C +4hrs at 70^{o}C +4hrs at 150^{o}C
Density		kg/l	1.60-1.70	1.65-1.70	1.55-1.65
Shore D hardness	ISO868		85-90	85-90	85-90
Compressive Strength	ISO604	N/mm^{2}	95-105	120-140	115-125
Elastic Modulus in Compression	ISO604	N/mm^{2}	2.5-3.0x10^{3}	5.0-5.5x10^{3}	5.5-6.5x10^{3}
Flexural Strength	ISO178	N/mm^{2}	45-50	65-75	65-75
Elastic Modulus in flexure	ISO178	N/mm^{2}	2.2-2.3x10^{4}	3.0-4.5x10^{4}	3.5-5.0x10^{4}

						Properties cont
	Araldite Hardener			**LC 264-1 HY 956**	**LC 264-1 LC 234**	**LC 264-1 HY 2954**
	Deflection Temperature under load	ISO75	^oC	50-60	100-110	140-150
	Linear Shrinkage		%	0.04-0.08	0.02-0.06	0.02-0.06
	Coefficient of thermal expansion (linear)	W/(m.K)	-1	$16\text{-}24x10^{-6}$	$16\text{-}24x10^{-6}$	$16\text{-}24x10^{-6}$
	Thermal Conductivity	W/(m.K)		0.6-0.7	0.6-0.7	0.6-0.7

	Store the components at 18-25°C, in tightly sealed and dry, if possible, in original containers. Under these conditions, the shelf life will correspond to the date stated on the label. After this date, the product may be processed only following re analysis. 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.	**Storage**
	Any spillages should be cleaned up as they occur. Use dry sand or sawdust to soak up bulk of large spillages, and deposit into waste drums. Clean up small spillages before they set with Eposolve 70 (**Huntsman Advanced Materials**) or warm water and detergent. **CAUTION:** *Eposolve 70 contains Toluene and should only be used in well ventilated areas. Avoid direct skin contact. For further information, refer to the specific instruction sheet..*	**Clean Up**
	Caution Huntsman Advanced Materials Pty Limited products are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, be allowed to come into contact with foodstuffs or food utensils, and measures should also be taken to prevent the uncured materials from coming into contact with skin, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise the use of eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper - not cloth towels - should be used to dry the skin. Adequate ventilation of the working area is recommended. These precautions are described in greater detail in Huntsman Advanced Materials o Pty Limited Publication No. 24264/3/e Hygienic precautions for handling plastic products of Huntsman Advanced Materials Pty Limited and in the Huntsman Advanced Materials Pty Limited Material Safety Data sheets for the individual products. These publications are available on request and should be referred to for fuller information.	**Handling Precautions**
	• If the material enters eyes, flood with water for at least 15 minutes, then consult a doctor. • If skin rashes or allergic responses (such as wheezing, swelling) occur, consult a doctor. • If swallowed, **DO NOT** induce vomiting. Drink copious amounts of water and contact a doctor or the Poisons Information Centre. If more specific information on toxicity and safe handling is required, the following publications are available from Vantico on request. Material Safety Data Sheet	**First Aid**

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