HUNTSMAN

Enriching lives through innovation

Advanced Materials

Araldite® LY 8615
Aradur® 8615

HIGH TEMPERATURE EPOXY SYSTEM

APPLICATIONS

Aerospace composites, tooling

PROPERTIES

- Low viscosity, easy to inject
- Long pot life
- High temperature resistance (over 180°C)

DESCRIPTION

Araldite® LY 8615 / Aradur® 8615 epoxy system is a two-component, low-viscosity material developed for production of advanced **composite parts and moulds** using vacuum-assisted resin transfer molding (VARTM), resin transfer molding (RTM), Seemans Composite Resin Injection Molding Process (SCRIMP℠), and other **infusion** processes. The low mixed viscosity and wet-out properties of Araldite® LY 8615 / Aradur® 8615 epoxy system provide for good processability.

Composites produced with Araldite® LY 8615 / Aradur® 8615 epoxy system can achieve a glass transition temperature of over 180°C following appropriate postcure.

TYPICAL HANDLING PROPERTIES

Property	Araldite® LY 8615/Aradur® 8615	Test Method
Color	Light Amber, Transparent	Visual
Specific Gravity, Resin	1.22	ASTM D-792
Hardener	0.94	
Viscosity at 25°C (mPa.s)		ASTM-D-2393
Resin	1550	
Hardener	120	
Mixed	550	
Gel time at 25°C (hrs)		ASTM-D-2471
For 100 g	18	

MIX RATIO

Araldite® LY 8615 / Aradur® 8615 100:50 by weight

Measure each component accurately (±5%) into clean containers. Thoroughly mix resin and hardener together (minimum of two minutes), scraping container sidewalls, bottom and mixing stick several times to assure an uniform mix.

CURING INSTRUCTIONS

- 24 hrs at 35-40°C, plus 3 hrs at 180°C

or

- 24 hrs at 35-40°C, plus 6 hrs at 120°C, plus 6 hrs at 200°C

unless noted otherwise. Recommend heating rate : 0.3°C/min

NOTE : Other cure schedules may be used to obtain comparable physical properties. Please contact Huntsman Advanced Materials via the internet site www.huntsman.com/advanced_materials/, to discuss your application.

NEAT RESIN

TYPICAL CURED PROPERTIES:

Cured for 24 hrs at 35°C plus 2 hrs at 120°C + 3 hrs at 180°C. Tested at 25°C unless otherwise noted.

	Test Value	Test-Method
Specific Gravity	1.06	ASTM D-792
Hardness, Shore D	87	ASTM D-2240
Ultimate Flexural Strength at 25°C (MPa)	69	ASTM D-790
Flexural Modulus at 25°C (GPa)	2.96	ASTM D-790
Tg by DMA, E' onset, dry (°C)	217	ASTM D-4065
Compressive Strength at 25°C (MPa)	251	ASTM D-695
Compressive Modulus at 25°C (GPa)	2.2	ASTM D-695

COMPOSITE LAMINATES

TYPICAL CURED PROPERTIES:

1. Glass Fiber-Reinforced Composite

Cured for 24 hrs at 35°C plus 2 hrs at 120°C + 3 hrs at 180°C. Tested at 25°C unless otherwise noted.

Composite description:

Fabric Type:	Glass fiber fabric, 8-harness satin, 300 g/m2
Fabric Orientation:	8 plies at 0°
Laminate Resin Content:	32.3%

	Test Value	Test-Method
Hardness, Shore D	92	ASTM D-2240
Ultimate Flexural Strength at 25°C (MPa)	695	ASTM D-790
Flexural Modulus at 25°C (GPa)	42.9	ASTM D-790
Tg by DMA, E' onset, dry (°C)	217	ASTM D-4065
Tg by DMA, E' onset, wet (°C)	189	ASTM D-4065
Water absorption* (%)	0.698	
Ultimate Compressive Strength at 25°C (MPa)	430	ASTM D-695
Compressive Modulus at 25°C (GPa)	77,9	ASTM D-695

* Hot/wet conditioning is 48 hrs in boiling water (98°C to 102°C). Sample weight is measured before and after conditioning and the weight gain is determined. .

2. Carbon Fiber-Reinforced Composite

Cured for 24 hrs at 35-40°C, plus 3 hrs at 180°C

Composite description

Fabric Type:	Carbon fiber fabric, 5-harness satin, 375 g/m2
Cloth Orientation:	6 plies at 0°
Laminate Resin Content:	42% (by volume)

	Test Value	Test-Method
Tg by DMA, E' onset, dry (°C)	192	
ILSS, dry, at 25°C (MPa)	42	ISO 14130

PROCESS FOR MOULDS MANUFACTURING

Step 1 : Preparation of the master model

Clean the model with appropriate cleaning agent.
Use a sealer and a release agent for the treatment of the master model.

Step 2 : Application of the gel coat (Optional)

If use of Gel coat is not needed, go directly to the step 3.

Huntsman advices the use of gel coat Rengel® SW 5200 + Ren® HY 5212 or Ren® HY 5213.

	Rengel® SW5200/ Ren® HY5212	Rengel® SW5200/ Ren® HY5213
Mix ratio by weight	100:20	100:16
Viscosity at 25 °C (mPa.s)	2000	1800
Pot life at 25°C (hrs)	10 (500ml)	4.5 (250 ml)
Time to tack (hrs)	22 - 24	10 - 12

Apply a gel coat layer of min. 0.6 mm with a brush.
When gel coat is tacky go to step 3.

Step 3 : Preparation of infusion lay-up
Apply the fabrics, then the peel-ply, the resin distribution media, the channels and finally the vaccum bag.
Place the infusion channels in order to have a maximum of 1 meter distance between each chanels.

Step 4 : Mixing of Araldite® LY 8615 and Aradur® 8615 and degassing
Mix the resin and hardener based on a ratio by weight of 100:50.
During the mixing, take care to scrape the edges of the container with a spatula to insure good mixing.
Degas the mixed resin during 20 minutes in a vacuum chamber at 5-10 mbars residual pressure.

Step 5 : Infusion at RT

Test to perform before starting the infusion :
Stop the vaccum pump and measure the lost vacuum which should be less than 5 mbars in 10 minutes.
The objective of this test is to be sure the vacuum bag is tight and does not leak.

Step 6 : Cure under vaccum for 24 hrs at 35-40°C

Step 7 : Assembly of backing structure
We recommend to assemble the backing structure before demoulding. The stresses due to demoulding can cause deformation to the tool.
Backing structure can be made of steel or carbon stiffeners.

Step 8 : Demoulding
For demoulding, use a wedge shape plastic part to prevent damaging the tool.

Step 9 : Post-cure
Huntsman recommends a ramp up to 180°C with a heating rate of 0.3°C/min.

STORAGE/ SHELF LIFE :

Araldite® LY 8615 should be stored at temperatures from 2-8°C and Aradur 8615 should be stored at temperatures from 18-40°C in a dry place in their original, sealed containers. Material temperatures should be above 18°C when mixing. After use, tightly reseal containers.

Under these conditions, epoxy resins and hardeners will remain useable for 12 months from date of shipping from Huntsman.

CAUTION :

Huntsman Advanced Materials Americas Inc. maintains up–to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material. Copies of the latest MSDS may be requested by calling our customer service group at 800-367-8793 or emailing your request to advanced_materials@huntsman.com.

FIRST AID !

Eyes and skin: Flush eyes with water for 15 minutes. Contact a physician if irritation persists. Wash skin thoroughly with soap and water. Remove and wash contaminated clothing before reuse.
Inhalation: Remove subject to fresh air.
Swallowing: Dilute by giving water to drink and contact a physician promptly. Never give anything to drink to an unconscious person.

KEEP OUT OF REACH OF CHILDREN

FOR PROFESSIONAL AND INDUSTRIAL USE ONLY

Enriching lives through innovation

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., 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.

Main Office :
Huntsman Advanced Materials (Switzerland) GmbH
Klybeckstrasse 200
4057 BASEL
Switzerland
+41 61 299 1111