

# Aradur™ 840-2

## A Medium Viscosity Standard Polyamidoamine Hardener

<b>General</b>	Aradur 840-2 is a medium viscosity, high amine content hardener. When used to cure Araldite® epoxy resins, it provides excellent flexibility, toughness and good overall chemical resistance.	
<b>Chemical Description</b>	Aradur 840-2 is a medium viscosity polyamide hardener.	
<b>Applications</b>	High solids general purpose industrial coatings Adhesives Marine finishes Flooring Maintenance coatings Castings Potting compounds	
<b>Advantages</b>	Excellent water resistance Good chemical resistance Excellent mechanical properties Excellent corrosion resistance Excellent adhesion Good electrical properties Complies with FDA 21 CFR 175.300	
<b>Typical Properties*</b>	Visual Appearance	Clear, no contamination
	Viscosity @ 40°C, mPa s (cPs)	3,000 - 6,000
	Color, Gardner, max.	10
	Amine Value, mg KOH/g	350 - 400
	H <sup>+</sup> Active Equivalent, g/eq.	70 - 115
	Density, @ 25°C (77°F), g/cm <sup>3</sup> (lb/gal)	0.96 (8.0)
	Flash Point, Closed Cup, °C (°F)	>93 (>200)

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

---

## Starting Formulations

Aradur 840-2 may be used to cure both Araldite liquid epoxy resins and low molecular weight solid epoxy resin solutions either at room or elevated temperatures. The ratio of epoxy resin to polyamide resin will determine the ultimate coating properties. The normal mixing ratio of Aradur 840-2 to epoxy resin is 35 to 60 parts per hundred parts of Araldite GY 6010.

The cure schedule depends upon the total formulation used (i.e., resin, hardener, pigmentation, solvents) and the conditions of application (i.e., temperature, film thickness, etc.). Time varies inversely with temperature. The following is a typical resin/hardener ratio:

<b>Unpigmented Coating</b>	<b>Pounds</b>	<b>Gallons</b>
<b>Part A</b>		
Araldite GY 507 <sup>1</sup>	682.8	71.90
<b>Part B</b>		
Aradur 840-2	227.6	28.10
Total (Parts A&B)	910.4	100.00
<b>Physical Constants (mix)</b>		
Non-volatile content, %	100.0	
Epoxy/hardener weight ratio	100/33	
Weight per gallon @ 25°C, lb/gal	9.1	
Pot life @ 25°C, hr	3.0	
Viscosity @ 25°C, KU	98	
<b>Performance</b>		
Substrate	Steel	
Cure Schedule	7 days @ 25°C, 50% RH	
Film thickness, mils	3.5	
Dry time, 25°C, hr		
set-to-touch	>7:0	
paper free	24.0	
Flexibility, 1/8" mandrel	Pass	
Adhesion	Good	
<b>Chemical Resistance, 25°C (77°F) (continuous immersion)</b>		
Water, 7 days	No effect	
MIBK	Slight film softening	
10% NaOH	No effect	
10% HCl	Few No. 9 blisters	

<sup>1</sup> Modified liquid epoxy resin (EEW = 180 –192 g/eq)

<b>White Gloss Enamel</b>	<b>Pounds</b>	<b>Gallons</b>
<b>Part A</b>		
Araldite GY 6010	543.2	56.00
Titanium Dioxide <sup>1</sup>	517.7	15.16

## Formulations

(continued)

**Part B**

Aradur 840-2	<u>233.6</u>	<u>28.84</u>
Total (Parts A & B)	1294.5	100.00

**Physical Constants (mix)**

Non-volatile content, %	100.0
Epoxy/hardener weight ratio	100/43
Pigment/binder ratio	40/60
Weight per gallon, 25°C	12.9
Pot life, 25°C, hr	1.75
Viscosity, 25°C, cPs	60,000

**Performance**

Substrate	Steel
Cure schedule	7 days @ 25°C, (77°F) and 50% RH
Film thickness, mils	12
Dry time, 25°C, hr	
set-to-touch	1.0
paper free	6.5
Flexibility, 1/8" mandrel	Fail
Adhesion	Good

**Chemical Resistance, 25°C, (continuous immersion)**

Water, 7 days	No effect
MIBK, 3 hrs	No effect
10% NaOH, 7 days	No effect
10%, HCl, 3 hrs	No effect

The use of Aradur 840-2 in a flooring formulation gives overall good chemical resistance and very good mechanical properties.

**Epoxy Flooring**

	<b>Parts by weight</b>
Araldite GY 6010	100
Araldite RD-1	10
Aradur 840-2	45
Accelerator 960-1	2 - 3
Dimethylaminoethanol	3 - 5
Bettle 216-8 <sup>2</sup>	1 - 3
Cure Schedule	7 days at R.T.

<sup>2</sup> American Cyanamid or equal

**Mechanical Properties:**

Shrinkage during cure	0.0008 - 0.0015 in/in
Coefficient of thermal expansion, (x10 <sup>-6</sup> linear/°C)	50
Compressive strength, 25°C, psi	6,000 - 10,000
Tensile strength, 25°C, psi	1,400 - 2,000
Impact strength, ft-lb (1/4" thick specimen on concrete)	9 - 12
Abrasion resistance (in. of thickness loss per 1500 cycles)	0.004 - 0.008
Adhesion	Good

**Formulations**

---

(continued)

**Epoxy Flooring  
Chemical Resistance @ 70°F**

Reagents	
Acetic acid, 5%	P
Aliphatic solvents (mineral spirits)	E
Ammonium hydroxide	
10%	G
30%	F
Boric acid	E
Citric acid, 10%	E
Esters	E
Ethers (Ethyl ether)	F
Chlorinated solvents (Carbon tetrachloride)	F
Formaldehyde, 37%	G
Glycerine	G
Hydrocarbon	E
Hydrochloric acid	
10%	F
37%	F
Acetone	F
Nitric acid, 10%	P
Sulfuric acid, 10%	P
Sodium hydroxide	
10%	G
50%	F
Water (distilled)	E
Calcium chloride, 50% solution	E

E = Excellent - Suitable for long and perhaps permanent immersion

G = Good - Suitable for short immersion or prolonged spillage

F = Fair - Suitable for temporary spillage

P = Poor - Not recommended

---

**FDA Status**

Cured coatings made with this hardener and other approved components meet the requirements of the Food & Drug Administration regulation 21 CFR 175.300, for the safe use as a food-contact surface under the conditions described in this section. Solvents are not covered and must be removed in the final coating.

---

**Packaging & Storage**

Aradur 840-2 is supplied in 400 pound steel drums and has a shelf life of two years when stored at ambient temperature in the original sealed container.

---

**Handling/Safety  
Precautions**

**Warning! Severe eye irritant. May cause dermatitis and sensitization.**

Do not get in eyes.  
Avoid contact with clothing.  
Avoid breathing vapor, mist or spray.  
Harmful if swallowed.  
Wear appropriate equipment to prevent skin contact.  
Promptly remove any clothing that becomes wet and any nonimpervious clothing that becomes contaminated. Wash before re-use.  
Wash thoroughly after handling.  
Use with adequate ventilation.  
Keep container tightly closed when not in use.

**Read Material Safety Data Sheets Before Using.  
For Industrial Use Only.**

---

**First Aid**

**In case of contact:**

**Eyes:** Immediately flush eyes with water for at least 15 minutes. Get medical attention.

**Skin:** Promptly wash with mild soap and water.

**Inhalation:** Remove to fresh air. Give oxygen if breathing is difficult.

**Ingestion:** If conscious, give plenty of water. Get medical attention.

---

**Important**

The following shall supersede any provision in Buyer's forms, letters and papers. **THERE IS NO WARRANTY OR CONDITION, WHETHER EXPRESS OR IMPLIED BY ANY STATUTE OR OTHERWISE, INCLUDING WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, FOR THE PRODUCT OR PRODUCTS REFERRED TO HEREIN. TECHNICAL ADVICE FURNISHED BY THE SELLER SHALL NOT CONSTITUTE A WARRANTY OR CONDITION, STATUTORY OR OTHERWISE, WHICH IS EXPRESSLY DISCLAIMED, ALL SUCH ADVICE BEING GIVEN AND ACCEPTED AT BUYER'S RISK.** While the information contained herein is believed to be accurate, Seller makes no representations as to the reliability of the results or as to the results of Buyer or as inducements to infringe any relevant patent, now or hereafter in existence. Testing for intended use is the sole responsibility of Buyer. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended, or for uses for which implantation within the human body is intended. **UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES FROM ALLEGED NEGLIGENCE, BREACH OF WARRANTY OR CONDITION, STRICT LIABILITY OR ANY OTHER LEGAL THEORY, ARISING OUT OF MANUFACTURE, SALE, USE OR HANDLING OF THE PRODUCT OR PRODUCTS REFERRED TO HEREIN.** The sole remedy of Buyer and the sole liability of Seller for any claims shall be limited to Buyer's purchase price of the product(s) which is the subject of the claim or the amount actually paid for such product(s), whichever is less.

---

**Note**

Araldite® is a registered trademark and Aradur™ is a trademark used and owned by Vantico AG, Basle, Switzerland, and /or companies belonging to the Huntsman Group.

**Vantico Inc.**  
**Advanced Materials**  
281 Fields Lane  
Brewster, New York 10509  
Tel.: (914) 785-3000  
Fax: (914) 785-3472

Aradur™ 840-2  
July, 2003