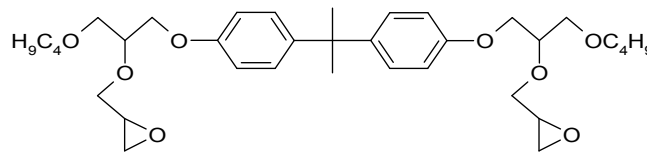


**Advanced Materials****Araldite® PY 4122****A FLEXIBLE EPOXY RESIN****GENERAL**

Araldite® PY 4122 is an unmodified, flexible epoxy resin with excellent chemical resistance and outstanding adhesion properties. The flexibility and toughness imparted by Araldite® PY 4122 result in improved impact resistance. In blends with liquid epoxy resin Araldite® GY 6010, Araldite® PY 4122 improves corrosion and methanol resistance of the resultant coatings.

**CHEMICAL DESCRIPTION**

A unique, internally flexibilized bisphenol A type epoxy resin

**CHEMICAL STRUCTURE****ADVANTAGES**

- Very low viscosity
- Outstanding adhesion properties
- Excellent flexibility and toughness
- Allows high pigment loadings
- Improves methanol resistance
- Excellent abrasion resistance

**APPLICATIONS**

Adhesives and sealants where a high flexibility and toughness is required. Solventless and high solids coatings and linings for a variety of environments, especially where toughness, flexibility, corrosion and abrasion resistance are required. Examples of such applications are:

Chemical processing plants	Adhesives
Oil field pipes	Scrubbers
Ships	Rail cars
Cargo tanks	Refineries
Storage tanks	Flooring
Expansion joints	Coil coatings

Automotive underbody and underhood components

**TYPICAL PROPERTIES\***

Visual Appearance	Clear, no contamination
Color, Gardner, max	5
Epoxy Equivalent, g/eq.	313 - 390
Viscosity @ 25°C (77°F), mPa s (cPs)	700 - 1400
Density @ 25°C (77°F), g/cm <sup>3</sup> (lb/gal.)	1.08 (9.0)
Flash Point, Closed Cup, °C (°F)	>93 (>200)

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

**FORMULATION**

The effect of blending Araldite® PY 4122 with Araldite® GY 6010 on gel time and mechanical properties is illustrated below. All tests were conducted on very high solids systems. Note the longer gel times and markedly improved mechanical properties at increasing proportions of Araldite® PY 4122 in the blend.

**Parts by weight**

<b>Formulation No.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Araldite® GY 6010	100	75	50	25	100	75	50	25
Araldite® PY 4122	-	25	50	75	-	25	50	75
Aradur® 943 <sup>1</sup>	20	18	16	14	-	-	-	-
Aradur® 355 <sup>2</sup>	-	-	-	-	26	23	20	17

**Physical Properties @ 25°C**

Gel time, min	17.5	25	41	70	43	62	129	370
Dust dry, hrs	5.0	5.0	8.0	10.5	5.0	8.5	11.5	*
Through cure, hrs	3.5	4.0	8.5	10.5	4.5	6.0	11.0	*

**Film Properties @ 25°C**

Substrate	Cold rolled steel
Film thickness	6-7 mils
Cure schedule	7 days @ 25°C

Persoz hardness, sec 363	325	207	52	149	89	112	50	
Impact resistance, in-lb								
Direct	2	2	6	>160	<2	8	10	24
Reverse	<2	<2	<2	56	<2	<2	<2	<2

\* Very soft

<sup>1</sup> Huntsman hardener with excellent solvent resistance recommended for high temperature service.

<sup>2</sup> Huntsman hardener recommended for excellent resistance to a great variety of environments and high temperature service.

**FORMULATION  
(CONTINUED)**

Outlined below are compositions of formulations based on Araldite® GY 6010 / Araldite® PY 4122 with Aradur® 265-1. For these formulations are reported wet properties, dry film properties and eight months resistance to immersion in 100% methanol and other environments. It is significant that the resistance to methanol is achieved with Araldite® GY 6010 / Araldite® PY 4122 blends and not with Araldite® GY 6010 alone.

	<b>Parts by weight</b>				
<b>Formulation No.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Araldite® GY 6010	100	90	75	50	25
Araldite® PY 4122	-	10	25	50	75
Aradur® 265-1	50	48	45	39	34
<b>Physical Properties @ 25°C</b>					
Gel time, min	39	45	64	118	289
<b>Dry Time, hrs</b>					
Dust free	3.5	-	4.5	9.0	18.0
Through cure	5.0	-	7.5	8.0	11.0
<b>Film Properties @ 25°C</b>					
Substrate	Cold rolled steel				
Film thickness	6 - 7 mils				
Cure schedule	7 days @ 25°C				
Persoz hardness, sec	319	302	281	215	103
Pencil hardness	2H	F	F	F	F
Adhesion, cross-cut, %	0	50	50-75	90	100
<b>Impact Resistance, in-lb</b>					
Direct	2	4	4	18	58
Reverse	0	<2	0	2	60
<b>Chemical Resistance, @ 25°C</b>					
Substrate	Cold rolled sandblasted steel				
Film thickness	10-12 mils				
Cure schedule	7 days @ 25°C				
Test period	8 months continuous immersion				
<b>Formulation No.</b>	<b>1</b>	<b>2</b>	<b>3</b>		
Distilled Water	None	None	None	None	
NaOH, 50%	None	None	None	None	
H <sub>2</sub> SO <sub>4</sub> , 30%	None	None	None	None	
Xylene	None	None	None	None	
<b>Formulation No.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Resistance to Immersion in 100% Methanol, 4 Months, Number of Blisters</b>					
Vapor phase	Many	None	None	None	None
Liquid phase	Many	Many	Few	None	None

**FORMULATION  
(CONTINUED)**

Outlined below are Thermal and Mechanical properties of formulations based on Araldite® GY 6010 / Araldite® PY 4122 as used with different hardeners. In general Araldite® PY 4122 has a negative effect on the glass transition temperature but improves the toughness of the material.

<b>Formulation No.</b>	<b>1</b>	<b>2</b>	<b>3</b>
Araldite® GY 6010	80	80	80
Araldite® PY 4122	20	20	20
XU 3406 Hardener	26		
Aradur® 5200		20	
Aradur® 917			75
Accelerator DY 070			2
<b>Processing Properties</b>			
Viscosity @ 25°C, cPs	680	4000	1250
<b>Cured Neat Resin Properties</b>			
Cure Schedule, time/°C	6hr/25 +5hr/77	2hr/150 +2hr/180	1.5hr/80 +3hr/150
<b>Glass Transition Temperature</b>			
DMA (Dry), °C	72	127	130
DMA (Wet),* °C	67	116	103
* 2 days boiling water			
<b>Tensile Test</b>			
Tensile Modulus ksi	460	410	429
Tensile Strength ksi	10.2	10.6	12.2
Elongation %	4.8	4.4	5.7
<b>Flexural Test</b>			
Flexural Modulus ksi	425	382	401
Flexural Strength ksi	15.2	15.6	17.1
<b>Toughness</b>			
K <sub>1C</sub> , √in·lb/in <sup>2</sup>	868	511	575
G <sub>1C</sub> , in·lb/in <sup>2</sup>	1.6	0.6	0.7

---

**FDA STATUS**

Araldite® PY 4122 is included in Title 21 Section 175.300 of the Code of Federal Regulations for use as a component in epoxy coatings in contact with dry bulk foods.

---

**STORAGE**

Araldite® PY 4122 is supplied in 440 pound steel drums. This product should be stored in a dry place, in the sealed original container, without exposure to humidity, at temperatures between +2°C and +40°C (+35.6°F and +104°F). Under these storage conditions, the shelf life is 6 years. The product should not be exposed to direct sunlight.

---

**PRECAUTIONARY STATEMENT**

Huntsman Advanced Materials Americas LLC 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.

**First Aid!**

Refer to MSDS as mentioned above.

**KEEP OUT OF REACH OF CHILDREN**

**FOR PROFESSIONAL AND INDUSTRIAL USE ONLY**

---

**IMPORTANT LEGAL NOTICE**

Sales of the product described herein ("Product") are subject to the general terms and conditions of sale of either Huntsman Advanced Materials LLC, or its appropriate affiliate including without limitation Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., or Huntsman Advanced Materials (Hong Kong) Ltd. ("Huntsman"). The following supercedes Buyer's documents.

Huntsman warrants that at the time and place of delivery all Products sold to Buyer shall conform to the specifications provided to Buyer by Huntsman.

While the information and recommendations included in this publication are, to the best of Huntsman's knowledge, accurate as of the date of publication, NOTHING CONTAINED HEREIN (EXCEPT AS SET FORTH ABOVE REGARDING CONFORMANCE WITH SPECIFICATIONS PROVIDED TO BUYER BY HUNTSMAN) IS TO BE CONSTRUED AS A REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS, OR WARRANTIES AS TO QUALITY OR CORRESPONDENCE WITH PRIOR DESCRIPTION OR SAMPLE, AND THE BUYER ASSUMES ALL RISK AND LIABILITY WHATSOEVER RESULTING FROM THE USE OF SUCH PRODUCT, WHETHER USED SINGLY OR IN COMBINATION WITH OTHER SUBSTANCES.

No statements or recommendations made herein are to be construed as a representation about the suitability of any Product for the particular application of Buyer or user or as an inducement to infringe any patent or other intellectual property right. Buyer is responsible to determine the applicability of such information and recommendations and the suitability of any Product for its own particular purpose, and to ensure that its intended use of the Product does not infringe any intellectual property rights.

The Product may be or become hazardous. The Buyer should obtain Material Safety Data Sheets and Technical Data Sheets from Huntsman containing detailed information on Product hazards and toxicity, together with proper shipping, handling and storage procedures for the Product, and should comply with all applicable governmental laws, regulations and standards relating to the handling, use, storage, distribution and disposal of, and exposure to the Product. Buyer shall also take all steps necessary to adequately inform, warn and familiarize its employees, agents, direct and indirect customers and contractors who may handle or be exposed to the Product of all hazards pertaining to and proper procedures for safe handling, use, storage, transportation and disposal of and exposure to the Product, and the containers or equipment in which the Product may be handled, shipped or stored.

Araldite and Aradur are registered trademarks of Huntsman LLC or an affiliate thereof in one or more countries, but not all countries.

© 2006 Huntsman Advanced Materials Americas Inc.

Main Offices :  
**Huntsman Corporation**  
10003 Woodloch Forest Dr.  
The Woodlands  
Texas 77380  
(281) 719-6000

**Huntsman Advanced Technology  
Center**  
8600 Gosling Rd.  
The Woodlands  
Texas 77381  
(281) 719-7400