HUNTSMAN

Enriching lives through innovation

Advanced Materials

Araldite® GY 505 Epoxy Resin

Diethyl Phthalate Modified Bisphenol-A Epoxy Resin

Provisional Data Sheet

Araldite® GY 505 Epoxy Resin

Key properties

- **Does not contain dibutyl phthalate (DBP)**
- **Lower viscosity than dibutyl phthalate-modified epoxy resins**
- **Can be used to improved impact resistance and flexibility in rigid systems**

Description

Araldite® GY 505 epoxy resin is a low viscosity bisphenol-a based resin diluted with diethyl phthalate, a non-reactive plasticizing diluent. It can be used to modify the impact resistance and flexibility properties of a variety of epoxy systems for coatings, encapsulation, potting of electrical components, etc. Its lower viscosity allows for the addition of higher levels of filler to reduce the formulation cost.

Applications

Castings, encapsulation, potting, adhesives solvent-free coatings, modifier for rigid epoxy systems

Regulatory status

Araldite® GY 505 Epoxy Resin is included in:

- Section 175.300 of Title 21 of the Code of Federal Regulations (21 CFR 175.300), for coatings for food contact applications.
- Section 175.105 of Title 21 of the Code of Federal Regulations (21 CFR 175.105), for use in adhesives as components of articles intended for food contact.

Diethyl phthalate is **not** listed on the Substances of Very High Concern (SVHC) list as defined in Article 57 of Regulation (EC) No 1907/2006 (REACH).

Product data*

	Araldite® GY 505 Epoxy Resin
Visual Appearance	Clear, no contamination
Color, Gardner, max.	3
Epoxy Value (eq./kg)	4.20 - 4.35
Epoxy Equivalent Weight (g/eq.)	230 - 238
Viscosity at 25°C (cP)	1350 - 2000
Density at 25°C (g/cm^3, lb/gal)	1.15, 9.6
Flash Point, Closed Cup (°C)	>100

* Product data are based on Huntsman's test methods. Copies are available upon request.

Formulations

Clear Coating Starting Formulation (Parts by Weight)

Formulation No.	**1**	**2**	**3**
Araldite® GY 505 Epoxy Resin	100	100	100
Aradur® 956-2 Epoxy Curing Agent[1]	20	-	-
Aradur® 2965 Epoxy Curing Agent[2]	-	40	-
Aradur® 3208 Epoxy Curing Agent[3]	-	-	32
Mixed Viscosity[4], 25°C (cP)	1400	1000	1300
Gel time[5], 100 g, 23°C (min)	72	63	27
Curing Properties[6] @ 23°C / 50% Relative Humidity			
Tack-free time (hr)	9	4.5	3
Cure-through time (hr)	> 12	9	5
Film Appearance	Blush	Glossy, no blush	Glossy, no blush
Gloss (20° / 60°)[7]	33 / 34	121 / 125	125 / 130
@ 5°C / 50% Relative Humidity			
Tack-free time (hr)	21	15	6
Cure-through time (hr)	> 24	22	18.5
Film Appearance	Blush	Glossy, no blush	Slight blush
Gloss (20° / 60°)[7] (%)	20 / 21	102 / 106	72 / 73

[1] Aliphatic amine-based epoxy curing agent

[2] Cycloaliphatic amine-based epoxy curing agent

[3] Cycloaliphatic amine-based epoxy curing agent

[4] ASTM D4440 (ICI Cone & Plate)

[5] Tested by Gardco® Standard gelation timer, Model GT-S

[6] Tested by Gardner® Circular Drying Time Recorder on a 10 mil wet coating

[7] ASTM D523

Typical Cured Properties

Unless otherwise stated, the data were determined with typical production batches using standard testing methods. They are provided solely as technical information and do not constitute a product specification.

Formulation No.	**1**	**2**	**3**
Araldite® GY 505 Epoxy Resin	100	100	100
Aradur® 956-2 Epoxy Curing Agent[1]	20	-	-
Aradur® 2965 Epoxy Curing Agent[2]	-	40	-
Aradur® 3208 Epoxy Curing Agent[3]	-	-	32
Coating Properties 10-mil, 7 days @ 23°C / 50% Relative Humidity			
Pencil Hardness[8]	4B	F	B
Persoz Hardness[9] (s)	28	76	45
X-Cut Adhesion[10]	4A	3A	5A
Impact Resistance[11] (Direct/Rev.) (in-lb)	10 / 0	44 / 28	66 / 48
Mandrel Bend[12]	Pass 1/4"	Fail 5/8"	Pass 1/8"
Glass Transition Temp.[13], T_g, (°C)	42	57	51
Shore D Hardness, 1/8" thickness[14]			
1 day	87	84	44
3 days	87	84	70
7 days	89	84	80
Time to Water Spot Resistance[15] (hr)	N/A[16]	9.25	4.75
Water Resistance[17], 24 hr cure			
- Initial (Appearance, Gloss @ 20° / 60°)	Blush, 33 / 34	Clear, 135 / 139	Clear, 125 / 130
- Final (Appearance, Gloss @ 20° / 60°)	Blush, 13 / 13	Clear, 130 / 134	Slight blush, 99 / 102
Pull-Off Adhesion[18] (psi) 5-mil wet film on sandblasted concrete	250	>550	>550
Sandblasted Concrete (failure mode)	100% cohesive	100% concrete	100% concrete
Pull-Off Adhesion[18] (psi) 5-mil wet film on sandblasted steel	400	>1000	>1000
Sandblasted Steel (failure mode)	100% cohesive	100% glue failure	No failure

[8] ASTM D3363

[9] ANSI/ISO 1522

[10] ASTM D3359

[11] ASTM D2794

[12] ASTM D522

[13] Determined by Differential Scanning Calorimetry (DSC)

[14] ASTM D2240

[15] Place a droplet of deionized water on coating periodically beginning at the tack-free time and continually throughout the cure cycle. Record the time at which no visible defect is seen on the coating film after evaporation of the droplet.

[16] Test not applicable to systems with low gloss due to blush

[17] Coating applied to glass at 10-mil wet film thickness cured for 24 hr at 23°C/50% rel. hum., then soaked in tap water for 8 hr

[18] ASTM D4541

Mechanical Properties 7 days @ 23°C / 50% Relative Humidity

Formulation No.	**1**	**2**	**3**
Araldite® GY 505 Epoxy Resin	100	100	100
Aradur® 956-2 Epoxy Curing Agent[1]	20	-	-
Aradur® 2965 Epoxy Curing Agent[2]	-	40	-
Aradur® 3208 Epoxy Curing Agent[3]	-	-	32
Flexural Strength[19] (kpsi)	10.3	2.1	N/A[20]
Flexural Modulus[19] (kpsi)	320.4	52.6	N/A[20]
Compressive Strength[21] (kpsi)	10.7	2.4	32.2
Compressive Modulus[21] (kpsi)	616.7	148.2	820.4
Max. Compression Load[21] (lb)	2221.7	530.5	6854.5
Tensile Strength[22] (kpsi)	7.5	2.7	2.2
Tensile Modulus[22] (kpsi)	413.6	141.3	N/A
Tensile Elongation[22] (%)	3	5	6
Heat Deflect. Temp.[23] 66 psi (°C)	42.5	29.5	N/A[20]
Heat Deflect. Temp.[23] 264 psi (°C)	40.7	N/A[20]	N/A[20]

[19] ASTM D790

[20] Too flexible to be determined

[21] ASTM D695 (cylindrical samples)

[22] ASTM D638

[023] ASTM D648

Storage

Araldite® GY 505 epoxy resin should be stored in a dry place and in the sealed original container, at temperatures between 2°C and 40°C (35°F and 104°F). Under these storage conditions the shelf life is 5 years. The product should not be exposed to direct sunlight.

PRECAUTIONARY STATEMENT

Huntsman Advanced Materials Americas 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

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