

## Araldite® 2040 Polyurethane Adhesive

### Product Description

Araldite® 2040 polyurethane adhesive is a general-purpose, two-part system for bonding a wide variety of substrates. The cured material is very flexible. Araldite® 2040 polyurethane adhesive is well suited for bonding polycarbonate and polyamides as well as primed metals.

### Features

- Ideal for bonding plastics
- Low shrinkage
- Good flexibility
- Ideal for thick bondlines
- Gap filling properties

### Typical Properties\*

| Property                     | Araldite® 2040 A | Araldite® 2040 B | Mixed System |
|------------------------------|------------------|------------------|--------------|
| Appearance                   | White            | Black            | Gray paste   |
| Density, g/cm <sup>3</sup>   | 1.1              | 1.2              | ~1.2         |
| Viscosity at 25°C, cP        | ~48,000          | ~50,000          | ~50,000      |
| Pot life at 25°C, 100 g, min | --               | --               | ~15          |

\*Properties are based on Huntsman test methods. Copies are available upon request

### Processing

#### Mix Ratio

| Product                   | Parts by weight | Parts by volume |
|---------------------------|-----------------|-----------------|
| Araldite® 2040 A Resin    | 92              | 100             |
| Araldite® 2040 B Hardener | 100             | 100             |

### Pretreatment

The strength and durability of a bonded joint are dependent on proper treatment of the surfaces to be bonded. At the very least, joint surfaces should be cleaned with a good degreasing agent such as acetone, iso-propanol (for plastics) or other proprietary degreasing agents in order to remove all traces of oil, grease and dirt. Low-grade alcohol, gasoline, or paint thinners should never be used. The strongest and most durable joints are obtained by either mechanically abrading or chemically etching ("pickling") the degreased surfaces. Abrading should be followed by a second degreasing treatment.

Araldite® 2040 structural adhesive is available in cartridges incorporating mixers and can be applied as ready to use adhesive with the aid of the tool recommended by Huntsman Advanced Materials.

### Application of adhesive

The resin/hardener mix may be applied manually or robotically to the pretreated and dry joint surfaces. Huntsman's technical support group can assist the user in the selection of a suitable application method as well as suggest a variety of reputable companies that manufacture and service adhesive dispensing equipment. A layer of adhesive 0.002 to 0.004 in (0.05 to 0.10 mm) thick will normally impart the greatest lap shear strength to the joint. Huntsman stresses that proper adhesive joint design is also critical for a durable bond. The joint components should be assembled and secured in a fixed position as soon as the adhesive has been applied. For more detailed explanations regarding surface preparation and pretreatment, adhesive joint design, and the dual syringe dispensing system, visit [www.araldite2000plus.com](http://www.araldite2000plus.com).

### Equipment Maintenance

All tools should be cleaned with hot water and soap before adhesives residues have had time to cure. The removal of cured residues is a difficult and time-consuming operation. If solvents such as acetone are used for cleaning, operatives should take the appropriate precautions and, in addition, avoid skin and eye contact.

### Cure times to reach minimum shear strength

| Temperature, °F                                                | 50      | 59      | 73      | 104     | 140     | 212     |
|----------------------------------------------------------------|---------|---------|---------|---------|---------|---------|
| Cure time to reach LSS* > 145 psi (1 MPa),<br>hours<br>minutes | 17<br>- | 10<br>- | 6<br>-  | -<br>90 | -<br>45 | -<br>8  |
| Cure time to reach LSS > 1160 psi (8 MPa),<br>hours<br>minutes | 80<br>- | 55<br>- | 35<br>- | 16<br>- | 4<br>-  | -<br>25 |

\*LSS = Lap shear strength

### Typical Physical Properties

Unless otherwise stated, the data were determined with typical production batches using standard test methods. They are typical values only, and do not constitute a product specification.

Unless a different specification is given, the figures below were all determined by testing standard specimens made by lap-jointing 4.5 x 1 x 0.063 in (114 x 25 x 1.6 mm) strips of aluminum alloy. The joint area was 0.5 x 1 in (12.5 x 25 mm) in each case.

Samples were cured at 104°F (40°C) for 16 hours and tested at 23°C, unless noted otherwise.

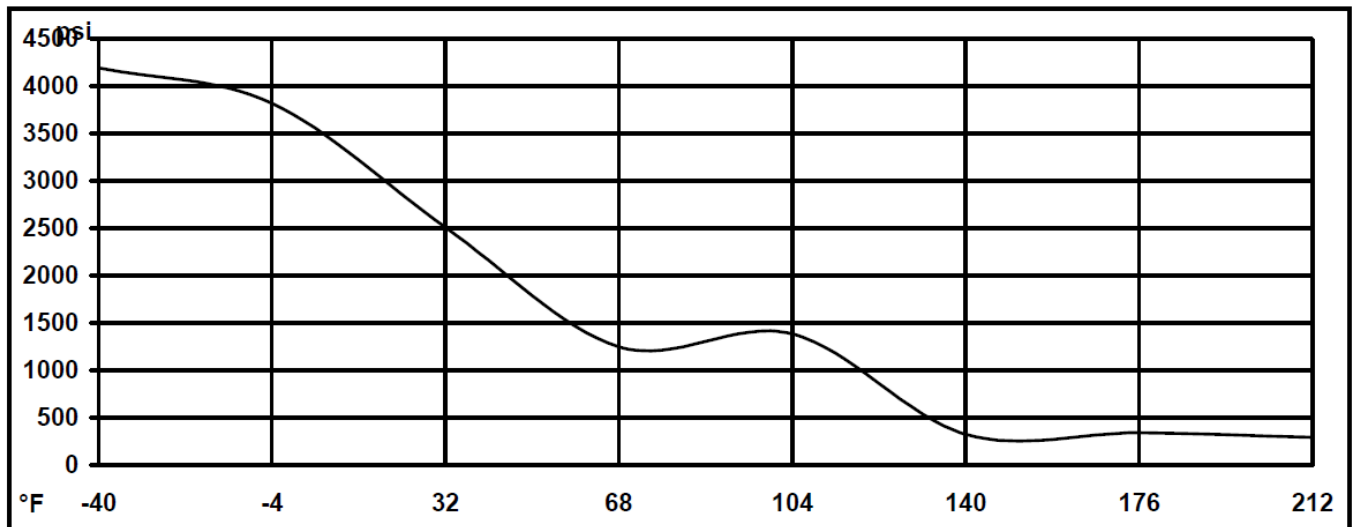
| Property                                                                                                   | Value    |          |          | Test Method |
|------------------------------------------------------------------------------------------------------------|----------|----------|----------|-------------|
| Average lap shear strength, metal-metal joints, sand blasting pre-treatment, psi                           |          |          |          | ISO 4587    |
| Aluminum                                                                                                   | 1,247    |          |          |             |
| Steel 37/11                                                                                                | 1,059    |          |          |             |
| Stainless steel V4A                                                                                        | 1,204    |          |          |             |
| Galvanized steel                                                                                           | 1,001    |          |          |             |
| Copper                                                                                                     | 1,494    |          |          |             |
| Brass                                                                                                      | 1,030    |          |          |             |
| Average lap shear strength, plastic-plastic joints, lightly abrade and alcohol degrease pre-treatment, psi |          |          |          | ISO 4587    |
| GRP                                                                                                        | 1,088    |          |          |             |
| CFRP                                                                                                       | 1,218    |          |          |             |
| SMC                                                                                                        | 769      |          |          |             |
| ABS                                                                                                        | 609      |          |          |             |
| PVC                                                                                                        | 551      |          |          |             |
| PMMA                                                                                                       | 624      |          |          |             |
| Polycarbonate                                                                                              | 740      |          |          |             |
| Polyamides                                                                                                 | 334      |          |          |             |
| Lap shear strength, after immersion in 23°C media, psi                                                     | 30 days  | 60 days  | 90 days  | ISO 4587    |
| As-made value                                                                                              | --       | --       | 1,247    |             |
| IMS                                                                                                        | 160      | 145      | 81       |             |
| Gasoline                                                                                                   | 261      | 232      | 252      |             |
| Ethyl acetate                                                                                              | 58       | 73       | 70       |             |
| Acetic acid, 10%                                                                                           | 29       | 0        | 0        |             |
| Xylene                                                                                                     | 116      | 160      | 103      |             |
| Lubricating oil                                                                                            | 1,378    | 812      | 1,056    |             |
| Paraffin                                                                                                   | 1,465    | 1,711    | 1,178    |             |
| Water at 73°F                                                                                              | 1,276    | 1,233    | 489      |             |
| Water at 140°F                                                                                             | 1,128    | 702      | --       |             |
| Water at 194°F                                                                                             | degraded | degraded | degraded |             |

|                                                        |             |           |
|--------------------------------------------------------|-------------|-----------|
| Lap shear strength, exposure to tropical weather,* psi |             | DIN 50015 |
| As-made value                                          | 1,247       |           |
| 30 days                                                | 470         |           |
| 60 days                                                | 756         |           |
| 90 days                                                | Degraded    |           |
| Lap shear strength, 158°F heat aging, psi              |             |           |
| As-made value                                          | 1,247       | --        |
| 30 days                                                | 2,089       |           |
| 60 days                                                | 2,184       |           |
| 90 days                                                | 1,781       |           |
| Roller peel test, pli (N/mm)                           | 23 (4)      | ISO 4578  |
| Glass transition temperature, Tg, °F (°C)              | 86 (30)     | DMA       |
| Elongation at break, %                                 | 165         | ISO 527   |
| Tensile strength, psi (MPa)                            | 1,305 (9)   | ISO 527   |
| Tensile modulus, psi (MPa)                             | 6,237 (43)  | ISO 527   |
| Thermal cycling, ‡ psi (MPa)                           | 1,146 (7.9) | --        |

\*40/92, DIN 50015; typical average values; test at 23°C. Cured 16 hours at 104°F (40°C).

‡100 cycles of 6 hour duration from -22°F to 158°F; Test carried out using a load cycle frequency of 90 Hz.

**Figure 1. Lap shear strength versus temperature (ISO 4587) (typical average values)**  
Cure: 16 hours at 104°F (40°C)



## Storage

**Araldite® 2040 Adhesive** should be stored in a dry place, in the original sealed containers, at temperatures between 2°C and 40°C (36°F and 104°F). Under these storage conditions, the product has a shelf life of **1 year** (from date of manufacture). The product should not be exposed to direct sunlight.

## Precautionary Statement

Huntsman Advanced Materials Americas LLC maintains up-to-date Safety Data Sheets (SDS) 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 SDS as mentioned above.

**KEEP OUT OF REACH OF CHILDREN**

**FOR PROFESSIONAL AND INDUSTRIAL USE ONLY**

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