



## TECHNICAL INFORMATION

### HARDMAN® Machineable Epoxy DOUBLE/BUBBLE® Yellow Package #04002

#### PRODUCT DESCRIPTION

HARDMAN Machineable Epoxy is a two-component, room temperature cure epoxy system designed as a machineable tooling and/or body-patching adhesive. This epoxy, when set, can be machined, sanded, drilled and tapped. The system displays excellent adhesion to metal, wood and hard plastic tooling. The system contains no solvents and is virtually non-shrinking, making it an excellent gap filler.

HARDMAN Machineable Epoxy is recommended for the following substrates:

| <b>Metal</b>    | <b>Plastic</b> | <b>Other</b> |
|-----------------|----------------|--------------|
| Stainless Steel | Phenolic       | Stone        |
| Aluminum        | Polyester      | Wood         |
|                 | Fiberglass     | Glass        |
|                 |                | China        |
|                 |                | Leather      |

#### TYPICAL USES

HARDMAN Machineable Epoxy can be used for patching and filling voids and scratches in plastic and metal tooling, patterns and furniture.

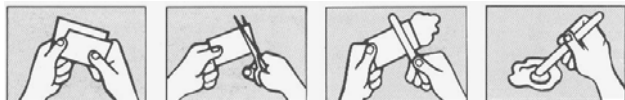
#### PACKAGING

The DOUBLE/BUBBLE package is a handy, dual-pouch, one-shot, job-size packaging concept. It reduces the waste typically associated with the use of larger quantities of two-component adhesives. This unique packaging ensures that DOUBLE/BUBBLE adhesives are always factory fresh and accurately portioned for optimum adhesive performance.

HARDMAN Machineable Epoxy is also available in poly bottles, 1-gallon cans, 5-gallon pails and 55-gallon drums.

#### HOW TO USE

Surface must be clean and dry before application. Remove all chemicals, dirt wax and oil.



**FOLD      SNIP      SQUEEZE      MIX/APPLY**

Fold the DOUBLE/BUBBLE package along the center seal, snip the end, squeeze out the contents, mix thoroughly and apply.

#### TYPICAL UNCURED PROPERTIES

|                          | <b>Part A</b> | <b>Part B</b> | <b>Mixed</b> |
|--------------------------|---------------|---------------|--------------|
| Color                    | Aluminum      | Amber         | Aluminum     |
| Viscosity @ 25 °C, cps.  | 75,000        | 60,000        | 60,000       |
| Weight per Gallon, lbs.  | 12.9          | 9.7           | 12           |
| Specific Gravity @ 25 °C | 1.55          | 1.16          | 1.44         |
| Flash Point, PMCC, °C    | 93            | 121           | ---          |
| Work time, minutes       | ---           | ---           | 25           |
| Tack free time, minutes  | ---           | ---           | 60           |
| Handling Strength, hours | ---           | ---           | 4            |
| Shelf Life, months       | 24            | 24            | ---          |

#### TYPICAL CURED PHYSICAL PROPERTIES

(Tested at 25 °C unless otherwise indicated)

| <b>Test</b>               | <b>Result</b>   |
|---------------------------|-----------------|
| Hardness, Shore D         | 88              |
| Impact Strength, ft.-lbs. | 3.5             |
| Maximum Service Temp.     | 150° C (300 °F) |
| Water Resistance          | Excellent       |

#### Lap Shear Strength (acid-etched aluminum to aluminum)

|                       |         |          |          |         |
|-----------------------|---------|----------|----------|---------|
| Cure Schedule @ 25 °C | 3 hours | 24 hours | 72 hours | 2 weeks |
| Shear Strength, psi   | 500     | 1,500    | 2,350    | 2,400   |

#### Hardness: (cure schedule 7 days @ 25 °C)

|                   |       |       |       |        |        |
|-------------------|-------|-------|-------|--------|--------|
| Test Temperature  | 25 °C | 66 °C | 93 °C | 121 °C | 149 °C |
| Hardness, Shore D | 88    | 80    | 50    | 35     | 30     |

#### TYPICAL CHEMICAL RESISTANCE PROPERTIES

(Tested at 25 °C unless otherwise indicated)

| <b>Total Immersion In:</b>  | <b>Immersion Time, Days</b> | <b>% Weight Gain (Loss)</b> | <b>Comments</b>                             |
|-----------------------------|-----------------------------|-----------------------------|---|
| Water                       | 1                           | 0.20                        |   |
|                             | 8                           | 0.50                        |   |
| Ethyl Alcohol 50% Solution  | 1                           | 1.34                        |   |
|                             | 8                           | 3.40                        |   |
| Hydrochloric Acid (2N)      | 1                           | 2.15                        | Surface discoloration<br>Degradation occurs |
|                             | 8                           | 4.45                        |   |
| Gasoline                    | 1                           | (0.01)                      |   |
|                             | 8                           | 0.02                        |   |
| Sulfuric Acid, 30% Solution | 1                           | 2.58                        | Surface discoloration<br>Degradation occurs |
|                             | 8                           | 11.80                       |   |
| Toluene                     | 1                           | 0.66                        |   |
|                             | 8                           | 2.35                        |   |
| 1,1,1 Trichloroethane       | 1                           | 0.20                        | Specimen softens                            |
|                             | 8                           | 10.93                       |   |
| VM+P Naphtha                | 1                           | (0.02)                      |   |
|                             | 8                           | (0.03)                      |   |

## **STORAGE AND HANDLING**

Store DOUBLE/BUBBLE adhesives at room temperature in a dry environment. Extreme low temperatures may cause crystallization. Extreme high temperatures may degrade the properties.

A wide variety of cleaning solutions are available for cured and uncured epoxies and polyurethanes.

## **SAFETY**

These materials are intended for commercial and industrial use only, and the practices of good housekeeping, safety and cleanliness should be followed before, during and after use.

Although the system contains low volatility materials, care should be taken in handling. Use adequate ventilation in the work area.

These materials may cause dermatitis in susceptible individuals. Keep off skin and out of eyes. In case of accidental skin contact, wash thoroughly with soap and water. In case of eye contact, flush eyes thoroughly with water and consult a physician immediately.

Refer to Material Safety Data Sheet for additional information.

## **ADDITIONAL INFORMATION**

Visit our web site at:

[www.royaladhesives.com](http://www.royaladhesives.com)

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## **NOTE**

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