

EpoPro 2294-A/C

High Temperature Epoxy System

(replaces EpoPro 2294A/B)

Typical Properties

(Not for specification purposes. All tests run at 25°C unless otherwise noted)

Resin / A-side Properties:

Appearance	Visual	Tan paste
Specific Gravity	ASTM-D-1475	1.45 g/cc
Viscosity	ASTM-D-2393	120,000 cP
Flash Point, closed cup	ASTM-D-92	>93°C

Hardener/ C-side Properties:

Appearance	Visual	Light. Amber
Specific Gravity	ASTM-D-1475	1.05 g/cc
Viscosity	ASTM-D-2393	650 cP
Flash Point, closed cup	ASTM-D-92	>93°C

Mix Ratio:

Parts by weight (volume) 100A:10C (100A:14C)

Mixed Properties:

Initial Viscosity at 25°C	ASTM-D-2393	20,000cP
at 65°C		800 cP
Gel-time at 65°C (20 g.)		20 - 45 minutes
Pot life at 25°C (100 g.)		2-3 hours

Recommended Cure Schedules:

2 hours at 65°C + 1 hour at 95°C + 1 hour at 150°C

Please note: any cure schedule selected for use should be confirmed through testing as being appropriate for your particular processing methods and for your intended application.

Cured Properties (cured 2 hrs at 65°C + 2 hrs @ 150°C)

Appearance	Visual	Tan / brown
Specific Gravity	ASTM-D-1475	1.40 g/cc
Shore Hardness	ASTM-D-2240	
At 25°C / 95°C / 150°C		90D / 89D / 86D
Tensile Strength at break	ASTM-D-638	9000psi
Tensile Elongation	ASTM-D-638	1.7%
Flexural strength	ASTM-D-790	11,500 psi
Compressive Strength	ASTM-D-635	18,000 PSI
Cure shrinkage	ASTM-D-2566	0.08% by volume
Glass Transition Temp (Tg)	PERKIN ELMER Appl. CAST #20	132°C
Coefficient of thermal expansion (CTE)	ASTM E-381	
Alpha 1 (< Tg)		48 x 10 ⁻⁶
Alpha 2 (> Tg)		144 x 10 ⁻⁶
Water absorption(24 hrs @25°C)	ASTM-D-570	0.09%
Weight loss (24 hrs @ 150°C)		0.10%
Thermal Conductivity	ASTM D-2214	8 x 10 ⁻⁴ cal/cm-sec-°C
Flammability Rating	UL94HB	1.5 in/min
Arc resistance, seconds	ASTM-D-495	130 seconds
Volume Resistivity @ 25°C	ASTM-D-257	7.0 x 10 ¹⁵ Ω-cm
@ 95°C		9.0 x 10 ¹² Ω-cm
@ 150°C		2.3.0 x 10 ¹⁰ Ω-cm
Dielectric Strength	ASTM-D-149	350 volts/mil
Dielectric Constant @ 25°C	ASTM-D-150	
@60Hz / @1MHz		5.30 / 4.40
Dissipation Factor @ 25°C	ASTM-D-150	
@60Hz / @1MHz		0.023 / 0.033

EpoPro 2294-A/C is a rigid, two-component epoxy system designed for applications requiring good thermal shock resistance and continuous high service temperatures. This system provides excellent mechanical and electrical properties at temperatures up to 175°C.

EpoPro 2294-A/C is sold as a standard tan to light brown colored material, but is available in custom colors by request. The standard colored version can be pigmented to meet most requirements, using the epoxy color pastes sold by SP&S.

Suggested Applications:

- Potting & impregnation of low voltage electronic devices
- Encapsulation of stress-sensitive components such as proximity sensors
- Coating or embedding circuit boards

Benefits:

- Low moisture absorption
- Low shrinkage / low stress on embedded components.
- Excellent mechanical & electrical performance up to 150-175°C

Processing Guidelines:

The EpoPro 2294A resin is a filled epoxy resin that may settle to a small degree during storage or transportation. Agitate the EpoPro 2294A with a paint stirrer, shaker or other appropriate method prior to use to ensure that it is homogenous.

This system can be mixed manually or by using either dynamic or static mixing systems. Whatever method is chosen, be sure to accurately measure both the resin and the hardener prior to mixing them and ensure the correct mix ratio is used.

If mixing manually, mix for at least 2 minutes and be sure to scrape the walls and bottom of the mixing vessel to be sure that all of the material is thoroughly mixed. To ensure a void free casting, vacuum de-air the mixture after thorough mixing. A vacuum of 28 inches of mercury is generally sufficient to remove the vast majority of entrapped air within 5-10 minutes. Large volumes of the mixed system may require longer times under

vacuum or the use of an antifoam additive such as AIROUT or Antifoam AF-4.

If processing in a humid environment, it may be advisable to fully cure within an oven at 65°C in order to prevent vapor absorption that can lead to streaks on the surface of the casting.

Storage Guidelines:

Store this material in a clean, dry environment in its tightly closed original container. These products are not considered especially temperature sensitive, but should ideally be stored at temperatures between 20°C-35°C (68°F-95°F). Storage at lower temperatures could lead to crystallization and may require the application of heat to re-liquefy. Avoid extended exposure to extreme humidity. EpoPro 2294C may absorb moisture if exposed for extended periods leading to a reduction in shelf-life. For best results keep the EpoPro 2294C closed whenever not in immediate use and re-blanket the container with dry nitrogen or another dry inert gas before resealing the container. If the recommended storage conditions are observed the products will have a minimum shelf-life of 12 months from the date of shipment.

Handling Precautions:

Mandatory and recommended industrial hygiene procedures should be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

Exotherm Warning: Like most epoxy systems the EpoPro 2294A/C system produces heat during curing. When large masses of this material are mixed or placed together during curing, significant amounts of heat can be produced. In some circumstances, this exothermic heat could be enough to cause burns or to lead to a breakdown of the epoxy system. (With the potential - in extreme cases -- for the production of black acrid smoke or even flames.) To prevent problems, we do not recommend mixing more than 1-2 gallons (about 10 - 20 lbs.) of this material at one time unless it will be quickly used in such a way as to break up the mass of the system (ex. by application to parts, by spreading it out to bond together components, etc.) or unless precautions are taken to control or protect against any heat generated (ex. by using a cooling system, by protecting users from the heat generated and/or by containing the material in an area where any heat and any vapors given off can be safely handled.) Exotherm is less of a concern for the EpoPro 2294A/C than for many other two part epoxy systems due to its relatively slow reaction speed, but caution is recommended none-the-less when dealing with large masses. Please call us to discuss your application details if you have any questions or concerns about working with this material.

Personal Hygiene:

EpoPro 2294A

CAUTION! May cause eye irritation. Prolonged or repeated skin contact may cause irritation, and may cause skin reaction. Harmful if inhaled. Harmful if swallowed. In accordance with good industrial practice, handle with care and avoid unnecessary personal contact. Avoid contact with eyes and prolonged or repeated skin contact. Do not inhale mists. Use with adequate ventilation. For industrial use only.

EpoPro 2294C

WARNING! Causes eye & skin irritation and possible allergic skin reaction. Harmful if inhaled. Harmful if swallowed. Substance is harmful to liver or kidney if inhaled, swallowed, or absorbed through skin. Prolonged or repeated exposure can cause allergic reaction.

First Aid

In case of contact:

Skin - Wash skin thoroughly with mild soap and water. Remove contaminated clothing and wash before reuse. Discard contaminated shoes and other articles made of leather

Eyes - Flush eyes with plenty of water for 15 minutes and get prompt medical attention.

Inhalation - Remove person to fresh air

Ingestion - Do not induce vomiting. Dilute with plenty of water and contact physician immediately. Never give anything by mouth to an unconscious person

Disclaimer:

IMPORTANT: The following supercedes Buyer's documents. **SELLER / MANUFACTURER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller / Manufacturer be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results presented are based on controlled or laboratory work and must be confirmed by Buyer by testing for its intended conditions of use. 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

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