

Aerospace & Commercial Transportation Division

# 3M™ Matrix Resin 8832

## Product Description

3M™ Matrix Resin 8832 is a two-part, low viscosity, nanoparticle modified Bis-A epoxy curable at low temperatures. 3M Matrix Resin 8832 can be used in filament winding, pultrusion and with typical heated bath processes.

## Suggested Applications

- Pultruded or wound tubes and shafts exposed to normal environmental impacts
- High energy flywheels
- RTM structural parts requiring high toughness and compressive strength

## Benefits

- Longer part life due to improved performance after impact for exposed tubes or shafts, and lower residual stresses in manufactured parts
- Higher torque carrying capacity for rotating tubes and shafts enabling longer, stronger or lighter weight designs
- Enables single piece flywheel designs due to lower CTE and shrinkage during cure; longer part life by reduced microcracking via enhanced fracture toughness
- Enables new RTM part designs with improved performance and/or lighter weight
- 2 year shelf life at room temperature

## Typical Resin Properties (Not for specification purposes)

Property	Test Method	3M™ Matrix Resin 8832*	Typical Epoxy**
Wt % Nanoparticles as mixed*	3M Internal Method	35	0
Density (g/cc)	ASTM D792	1.4	1.2
Viscosity, cP (Resin) @ 77 °F (25 °C)	3M Internal Method	8000	4000
Viscosity, cP (Mixed)* @ 77 °F (25 °C)	3M Internal Method	7100	2000
Epoxy Equivalent Weight (g/eq)	3M Internal Method	416 – 448	174 – 190

## Typical Cured Neat Resin Properties (Not for specification purposes)

Property	Test Method	3M™ Matrix Resin 8832*	Typical Epoxy**
Glass Transition Temperature (T <sub>g</sub> ) (°C) (Tan Delta Peak)	ASTM E1640	135	135
Tensile Modulus (GPa)	ASTM D638	3.8	2.9
Fracture Toughness (MPa · m <sup>0.5</sup> )	ASTM D5045 (Compact Tension Geometry)	1.45	0.73
Barcol Hardness (H <sub>B</sub> )	ASTM D2583	55	33
Linear Shrinkage During Cure (% Reduction)	ASTM D2566	0.34	0.51
Exotherm During Cure ΔH @ 10°C/min (J/g)	ASTM D3418	171	271
Coefficient of Thermal Expansion (μm/m · °C) (-25 – 25°C)	Modified ASTM E831	46	58
Coefficient of Thermal Expansion (μm/m · °C) (25 – 75°C)	Modified ASTM E831	46	57

\*Cured with methyltetrahydrophthalic anhydride at 100:37 Mix Ratio by weight

\*\*Of similar T<sub>g</sub> and cured with similar curing agent

**Note:** This technical information and data should be considered representative or typical only and should not be used for specification purposes.

## Handling/Cure Information

Note: This processing information is general or summary in nature and not intended to replace user's careful consideration of the unique circumstances involved in its use of 3M products.

This product requires a curative for use. Follow cure cycle as recommended by curative supplier. It is acceptable to heat the container (<80°C) to facilitate transferring product for mixing. Reduce temperature appropriately (40°C) before combining with the curative. Product may have undesirable interactions with surface-active additives such as mold releases,

air releasers, de-foamers, pigments, fillers, tougheners, and additives even at low concentrations. It is recommended initially evaluate only the 3M™ Matrix Resin and curative components, eliminating all fillers and additives. Final mixed viscosity depends on many factors including final formulation and temperatures. Consult technical data sheet for information on viscosity of the 3M™ Matrix Resin.

Information on curatives suitable for use with 3M™ Matrix Resin 8832 is available by calling 3M Customer Service at 1-800-235-2376.

## Shipping and Storage

Shelf life is two years from date of manufacture under proper storage conditions. The product should be stored indoors at 70-80°F (21-27°C). Do not freeze. The product should be used as soon as possible after the package is opened and any unused product should be properly sealed with original or similar package.

## Precautionary Information

Refer to Product Label and Safety Data Sheet (SDS) for health and safety information before using this product. For additional health and safety information, please visit [www.3M.com/msds](http://www.3M.com/msds) or call 1-800-364-3577 or (651) 737-6501.

### For Additional Information

In the U.S., call toll free 1-800-235-2376, or fax 1-800-435-3082 or 651-737-2171. For U.S. Military, call 1-866-556-5714. If you are outside of the U.S., please contact your nearest 3M office or one of the following branches:

<b>Australia</b> +61-2-949-89333 tel	<b>Switzerland</b> +41-01-724-9114 tel	<b>Malaysia</b> +60-3-7806-2888 tel	<b>Italy</b> +39-02-7035-3423 tel	<b>Germany</b> +49-02131-14-2344 tel
<b>China</b> +86-21-62753535 tel	<b>Austria</b> +43-01-86686-274 tel	<b>Singapore</b> +65-6450-8888 tel	<b>New Zealand</b> +64-9-477-4040 tel	<b>Japan</b> +81-3-3709-8165 tel
<b>Hong Kong</b> +852-2806-6111 tel	<b>Denmark</b> +45-43-480100 tel	<b>Taiwan</b> 88-62-2704-9011 tel	<b>South Africa</b> +27-11-922-9111 tel	<b>Netherlands</b> +31-71-5-450-272 tel
<b>Korea</b> +82-2-3771-4114 tel	<b>India</b> 1-800-425-3030 tel (inside country only)	<b>Brazil</b> +55-19-3838-7876 tel	<b>Thailand</b> +66-2260-8577 tel	<b>Spain</b> +34-91-321-6000 tel
<b>Philippines</b> +63-2-588-9100 tel		<b>France</b> +33 (0) 810-331-300 tel	<b>Canada</b> 800-410-6880 ext. 6018 tel	<b>United Kingdom</b> +44-845-873-4169 tel

### Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

### Product Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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