3M™ Magnet Bonding Adhesive AU-205

Data Sheet **July 2015**

Product Description	3M™ Magnet Bonding Adhesive AU-205 is a thermosetting modified epoxy structural adhesive in film form with a supporting carrier. The AU-205 film is designed for critical positioning of motor magnets.
Features	• Room temperature stable for 6 months when stored at 23 °C For minimum of 2 year extended shelf life recommended storage at 4° C. • Maintains low tack at room temperature for easy positioning • Single liner aids for productivity in handling • Eliminates two-part adhesive mixing and reduces associated health concerns • Thermally cures at temperatures ranging from 120 °C to 165 °C
Applications	3M™ Magnet Bonding Adhesive AU-205 has low tack at room temperature, making permanent magnets easier to position and reposition, and reduces customer rework. When cured, it provides critical bondline thickness control and consistency. It is vacuum cure compatible. Along with the ease of processing and handling, it has excellent shop open time and extended shelf life. Material is specifically designed to be easily die-cut for unique shape application.
Agency Approvals	For RoHS information, please visit www.3M.com/ROHS

Typical Physical and Electrical Properties

Data not for specifications. Values are typical, not to be considered minimum or maximum. Properties measured at room temperature 23 °C, unless otherwise stated. Samples cured at 165 °C for 60 minutes, unless otherwise stated.

Physical Properties (Test Method)	**Typical Value US units (metric)**
Adhesive Type	Epoxy Structural Adhesive Film
Appearance	Forest Green
Uncured Film Thickness **Final Cured Thickness****	6.5 mil 2.5 mil Cured on Glass Under 50 psi
Temperature Resistance*	155 °C
Cure Type	1-Part Film with Thermal Cure
Overlap Shear Strength at RT (ASTM D-1002)	Full strength at RT = ~5,200 psi See graph for cure time/temperature relationship
Normal Tensile Strength (3M Internal Test Method)	Full strength at RT = ~6,400 psi See graph for measurements at elevated temp.
Overlap Shear Strength at Elevated Temperature (ASTM D-1002)	See graph for measurements at elevated temp.
Overlap Shear Strength w/ Heat Aging (ASTM D-1002)	See graph
Glass Transition Temperature (By DSC)	115 °C
Coefficient of Thermal Expansion (By TMA)	$T<Tg = 63 \times 10^{-6}$ / °C; $T>Tg = 238 \times 10^{-6}$ / °C

* Overlap Shear Strength > 500 psi
** Final cured Thickness Dependent on Surface Roughness of Substrate

Chemical Resistance† **(3M Internal Test Method)**	**Typical Value** **Overlap Shear Strength**
Gasoline (Aging Temp 23 °C)	4,700 psi
Mobil 1 (Aging Temp 80 °C)	5,500 psi
Automatic transmission Fluid (Aging Temp 80 °C)	5,300 psi
Motor Oil (Aging Temp 80 °C)	4,800 psi
Antifreeze (Aging Temp 80 °C)	4,100 psi

† Sample submerged in fluid and aged under temperatures indicated for 1000 hours. Measurements taken 30 minutes after removing from fluid.

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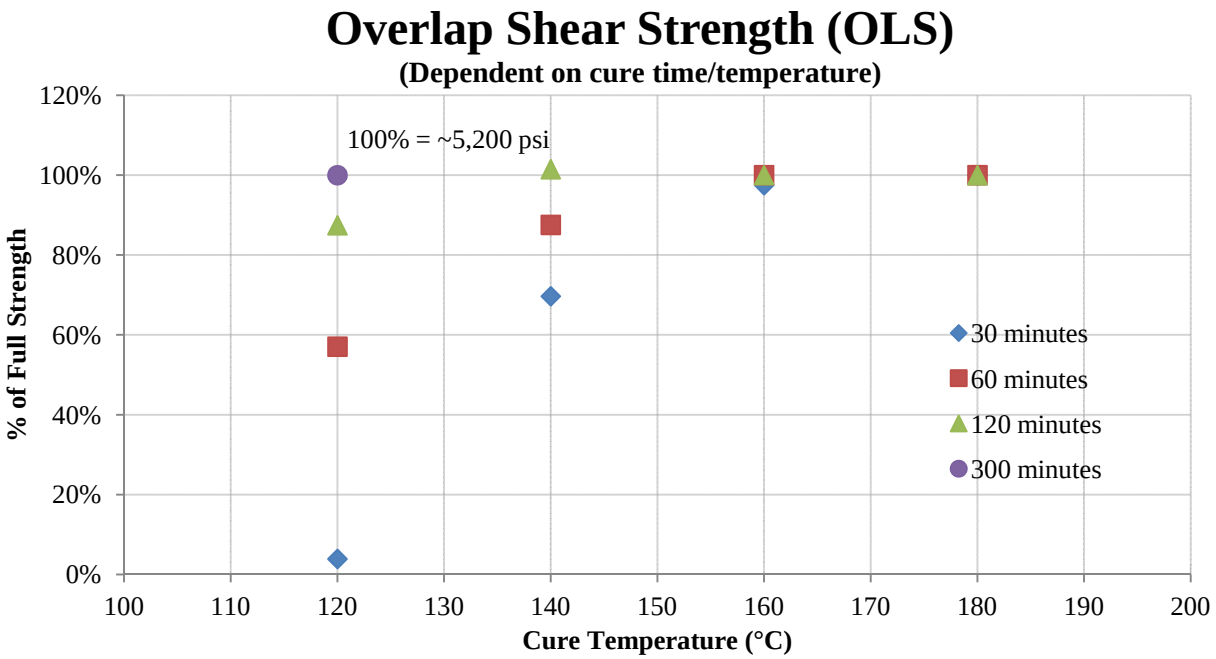
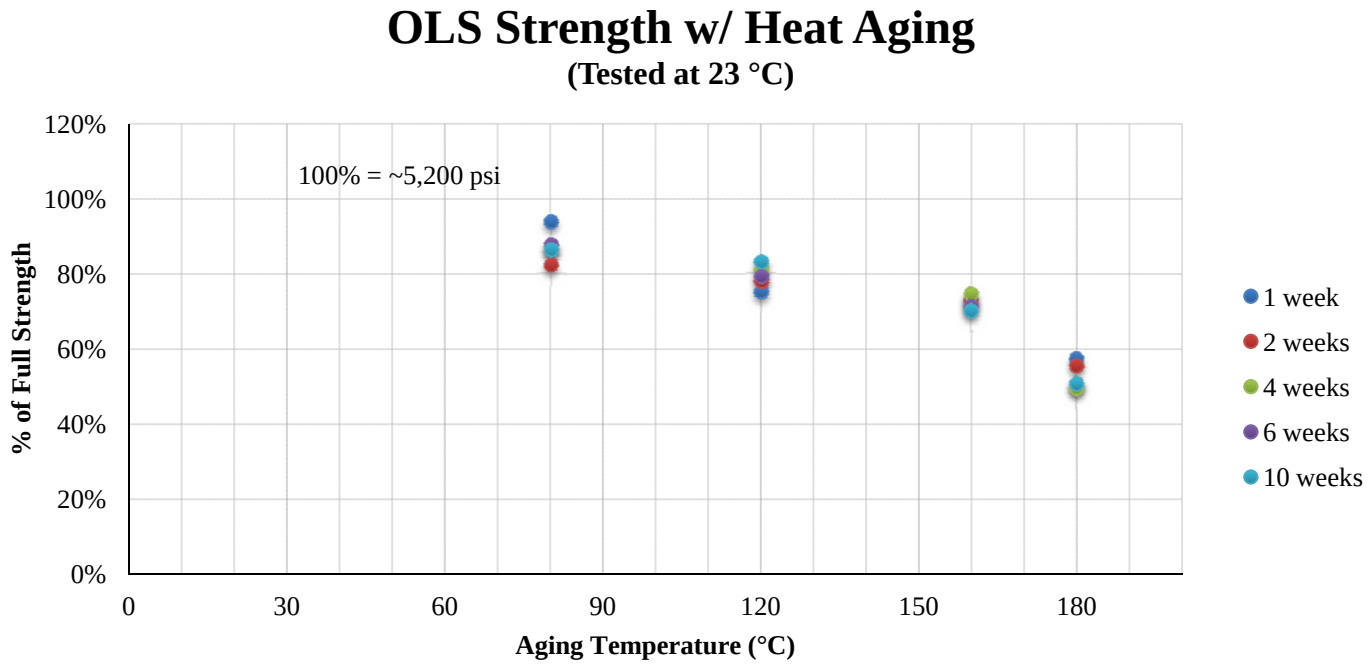


Overlap shear strength performance is dictated by the state of cure of the adhesive system. State of cure is dependent on cure time, temperature, and the heat capacity of the parts and fixtures used for positioning during the cure cycle. Processes with reduced “heat sinks” will have shorter cure times.



For up to 10 weeks of aging at elevated temperature, overlap shear performance measured at room temperature (23 °C) is not significantly affected.

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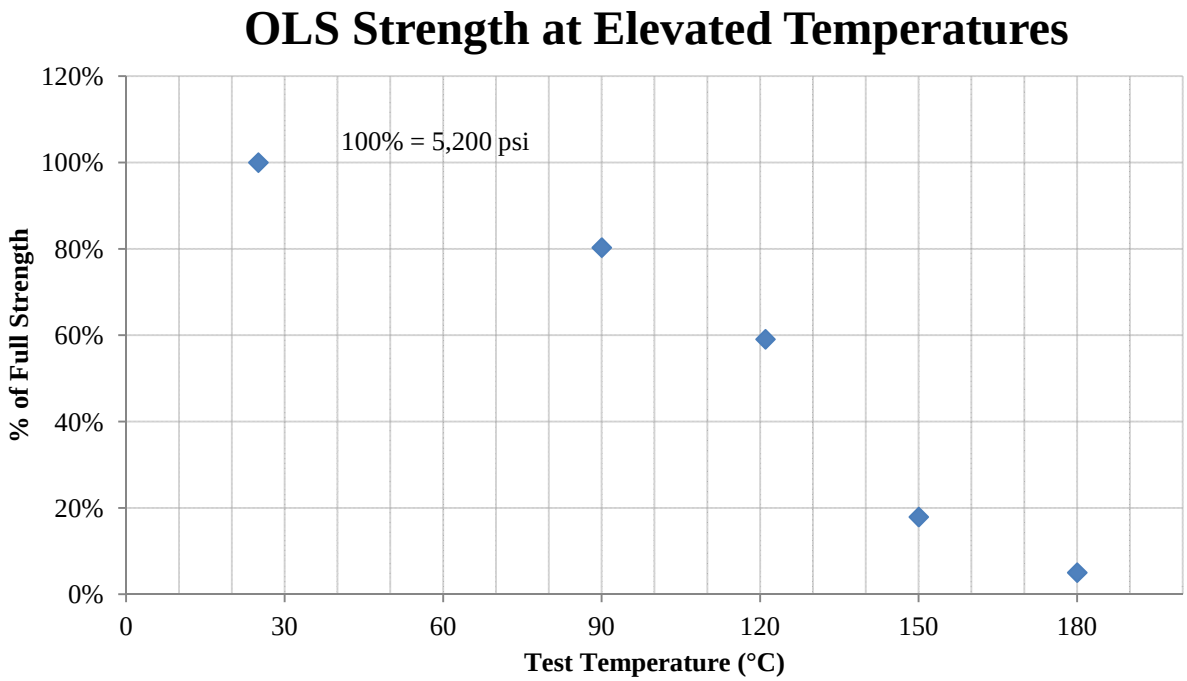
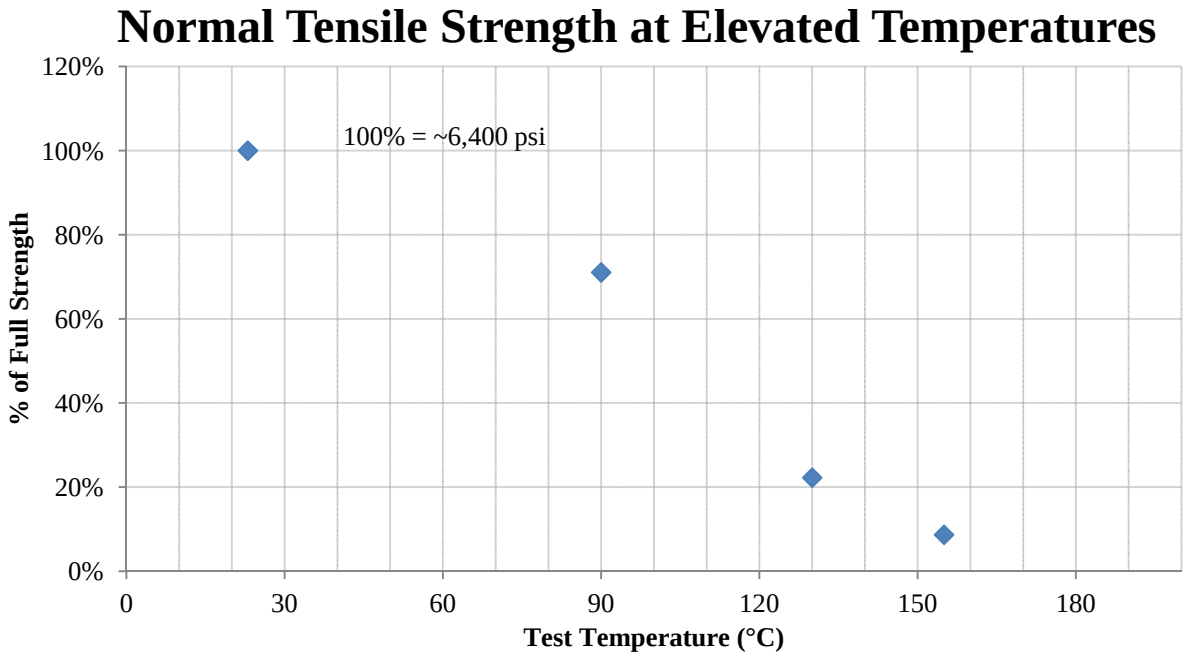


Percentage of full overlap shear strength is reduced when tested at elevated temperatures. Full strength overlap shear strength on steel at room temperature (23 °C) is ~5,200 psi.



Normal tensile strength was measured by bonding together mild steel right circular cylinder rods and pulling apart in the longitudinal direction. Full strength at room temperature (23 °C) is 6,400 psi.

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Installation Techniques	3M™ Magnet Bonding Adhesive AU-205 may be simply placed and adhered to the back side of the permanent magnet. Then, after removing the single liner from the film, the magnet can be placed and adhered to the housing surface. The structural adhesive film maintains low tack at room temperature allowing easy positioning and repositioning. Once all magnets are adhered and aligned, a fixturing device should be used to hold location of magnets with applied pressure (40 psi recommended) during cure process.
Shelf Life & Storage	3M™ Magnet Bonding Adhesive AU-205 has a 6-month shelf life from date of manufacture when stored in a humidity controlled storage 23 °C and <50% relative humidity. Storing at temperatures less than 23 °C will extend shelf life. For minimum of 2 year extended shelf life recommended storage at 4° C. .
Availability	3M™ Magnet Bonding Adhesive AU-205 is available in standard and custom widths and lengths. Please contact your local distributor; available from 3M.com/electrical [Where to Buy] or call 1.800.245.3573.

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