Technical Data Sheet

MA2290

Description

Plexus® MA2290 is a two-part methacrylate adhesive designed for structural bonding of thermoplastic, metal, and composite assemblies. Combined at a 10:1 ratio, Plexus MA2290 is an excellent choice for composite bonding applications in the marine and transportation industries because it requires virtually no surface preparation and can fill Gaps from 0.03 inches to 1.5 inches* (final Gap fill is dependent on laminate thickness and composition). In addition, this product provides a unique combination of excellent fatigue endurance, outstanding impact resistance, and superior toughness. Plexus MA2290 is available in blue or black colors and is supplied in 5-gallon (20-liter) pails, or 50-gallon (200-liter) drums to be dispensed as a non-sagging gel.

Typical Uncured Properties	Part A	Part B
Color	Off-White	Black
Mix Ratio by Volume	10	1
Mix Ratio by Weight	9.30	1.00
Component Density, g/ml	0.98	1.07
Component Viscosity, cP x1000	180 - 120	35 - 80
VOC's during cure, %	< 0.5	
Shelf Life, Months	12 / 9	

Typical Cured Properties	
Peak Exo Time (10g), min	160 - 170
Peak Exo Temp (30g), °F (°C)	195 (91)
Gap Tolerance, in (mm)	0.03 - 1.5 (0.75 - 38)
Hardness, Shore D	73
Tensile Strength, psi (MPa)	2,200 –3,100 (15.2 – 21.2)
Tensile Modulus, kpsi (MPa)	90 – 130 (620 – 896)
Elongation at Break, %	40 - 100

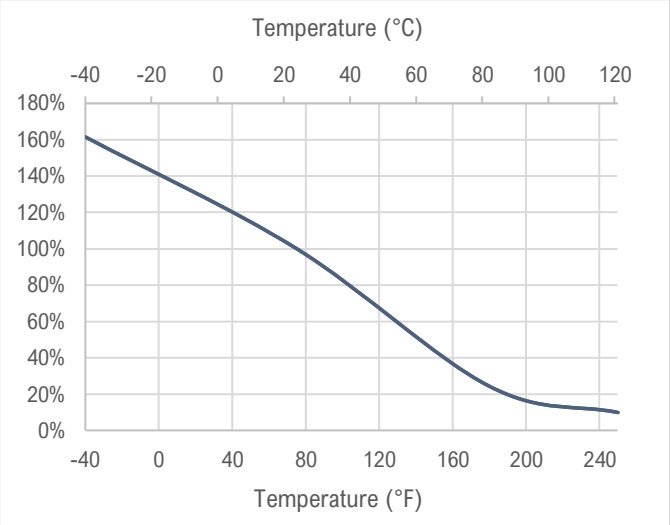
Tensile in accordance with ASTM ISO 527

Cure Profile at Different Temperatures

Temperature	60°F (15.6°C)	75°F (23.9°C)	90°F (32.2°C)
Work Time, min	160 - 175	106	55 - 60
Time to 50 psi (0.3 MPa), min	250 - 255	160 - 165	70 - 75
Time to 500 psi (3.4 MPa), min	270 - 275	180 - 185	75 - 80
Time to 1000 psi (6.9 MPa), min	300 - 305	215 - 220	85 - 90

Strength Retention vs Temperature

(ASTM D1002 on Al 6061)



Substrate	Lap Shear (Typical) ASTM D1002 psi	MPa	Failure Mode
Aluminum	1,858	12.8	CF
FRP	1,480	10.2	SF
Steel	1,450	10.0	SF

SF = Substrate Failure, FT = Fiber Tear, CF = Cohesive Failure, CP = Coating Pull, AF = Adhesive Failure

Application

1. To ensure maximum bond strength, surfaces must be mated within the specified working time.
2. Use sufficient material to fill the joint completely when parts are mated and fixed.
3. Apply adhesive using handheld cartridges or automatic meter/mix/dispense equipment.
4. Load the cartridge into the dispenser and remove the end caps.
5. Attach mixing tip and expel a mixer's length of adhesive.
6. Apply adhesive to substrate and mate the parts within the work time of the adhesive.
7. Fix in position until adhesive reaches sufficient bond strength is achieved.

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Application

Surface Preparation - Plexus adhesives typically require little or no surface preparation, but are dependent on the material and degree of contamination in the bonding area. For optimal performance, ITW PP recommends surfaces to be free of grease, dirt, and other contaminants.

>Plastics and coated metals - wipe with a dry rag or a light solvent may be sufficient.

>Raw metal - wipe with a dry rag or a light solvent may be sufficient.

>Metals may be affected by the degree of oxidation, scaling, fluids or other contaminants.

>Composites - dust free surfaces can be bonded as is or may require light abrasion to remove mold releases, or to increase the surface area.

Other surfaces should have the same considerations. ITW PP recommends customers test to determine the optimal preparation for their materials to ensure suitability.

Recommended Application Temperature

Application of adhesive at temperatures between 65°F (18°C) and 85°F (30°C) will ensure proper cure. Temperatures below 65°F (18°C) or above 85°F (30°C) will slow down or increase cure rate significantly. Temperature affects viscosities of Parts A and B of this adhesive.
To ensure the consistent dispensing of adhesive and activator, material temperature should be held reasonably constant throughout the year.

Clean-Up

Clean up is easiest before the adhesive has cured. Common lab solvents, Citrus terpene or N-methyl pyrrolidone (NMP)-containing cleaners, degreasers, or soap & water can be used for best results. If the adhesive is already cured, careful scraping, followed by wiping with a cleaning agent, may be the most effective method of clean up.

Temperature Resistance

See "Strength Retention vs Temperature" graph on page 1.

Bulk Dispensing of Drums or Pails

Plexus may be applied manually/pneumatically from cartridges or with bulk dispensing equipment. Bulk equipment must be explosion proof. All parts in direct contact with the liquid adhesive and activators should be stainless steel. Avoid contact with brass, carbon steel, copper or copper-containing alloys in all fittings, pumps, etc. Seals and gaskets should be made of Teflon, Teflon-coated PVC foam, ethylene/propylene, or polyethylene. Avoid the use of Viton, BUNA-N, Neoprene, or other elastomers for seals and gaskets. Automation is available from a variety of equipment manufacturers.

Safety & Handling

ITW Performance Polymers (ITW PP) recommends users to follow all recommended safe practices for handling its products. Refer to the product Technical Data Sheet (TDS), Safety Data Sheet (SDS), and label for health and safety information before using this product. Also refer to itwpp.com for additional information and other frequently asked questions.
Note: When mixing large masses of material at one time, a large amount of heat may be generated due to the exothermic reaction created by the rapid-curing of the product. This heat can result in the release of entrapped air, steam, and volatile gases. To prevent this, dispense only enough material for use within the working time of the product and confine gap thickness to no more than its maximum gap fill capability.

Chemical Resistance

Chemical resistance is impacted by direct or indirect contact, frequency, duration of contact, and ambient or solution temperatures.
Excellent Resistance to: Hydrocarbons, acids and bases (pH 3-10), and salt solutions
Susceptible to: Strong polar solvents, strong acids, and bases

Shelf Life & Recommended Storage

Shelf Life is based on continuous storage between 55°F and 77°F (13°C and 25°C). Exposure, intermittent or prolonged exposures above 80°F (27°C) will result in a reduction of shelf life. Exposure above 100ºF (38ºC) can quickly degrade shelf life and should be avoided. Shelf life may be extended by cool storage between 45°F and 65°F (7°C and 18°C). If stored cold, allow product to return to room temperature before using.

Product Use

Industrial Use Only. Many factors beyond ITW PP control and uniquely within user's knowledge and control can affect the performance of this product in any particular application. Given the variety of factors that can affect use and performance, the end user is solely responsible for evaluating any ITW PP product and determining its suitability and fitness for a particular purpose, product design, production, final application, and end result.

Exclusion of Warranties

The Data stated here are typical values and offered in good faith. Given the variety of factors that can affect the use and performance of an ITW PP product, the end user is responsible for evaluating any ITW PP product and determining whether it is fit for purpose and suitable for user's design, production, and final application. Unless an additional Warranty is expressly stated, ITW PP warrants that the ITW PP product meets the applicable ITW PP product specification at the time ITW PP Ships the product. As to the herein described materials and test results, there are no warranties which extend beyond the description on the face hereof. ITW PP MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANT ABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. IF THE ITW PP product does not conform to this warranty, then the sole and exclusive remedy is, at ITW PP's option, replacement of the ITW PP product or refund of the purchase price.

Limitation of Liability

Except where prohibited by law, ITW PP shall not otherwise be liable for loss of damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.

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