



# ES6228

## Metal Bonding Epoxy Adhesive

### DESCRIPTION

ES6228 is a thin paste viscosity epoxy adhesive designed to provide good bonds to metal surfaces. A unique feature of ES6228 is its ability to bond to slightly oily metal surfaces. This is useful in situations where the complete removal of residual mill oil on metal surfaces is not possible. The thin paste consistency of ES6228 wets the metal surface well for good adhesion. This viscosity also provides some gap filling capabilities, so “close fitting” joints are adequate, and matched-metal joints are not required.

ES6228 has a 1 to 1 mix ratio by weight or volume, for easy measuring. The white resin and black hardener combine to a smooth gray system that is easy to mix and apply. The cured material has very good properties, with high bond strength and elongation, for tough, durable assemblies. The Part B1 hardener was developed to provide a faster gel than the standard ES6228 Part B hardener. This combination has a gel time of 25 minutes, and provides cured properties equal to the standard hardener.

### PRODUCT SPECIFICATIONS

	ES6228 Part A	ES6228 Part B	ES6228 Part B1	ASTM Method
Color	White	Black	Black	Visual
Viscosity,	Thin Paste	Thin Paste	Thin Paste	D2392
Specific Gravity, gms./cc	1.32	1.30	1.30	D1475
Mix Ratio	---	100 : 100 By Weight or Volume		PTM&W
Pot Life, 4 fl.oz. Mass @ 77°F	---	2 hours	25 minutes	D2471

### PACKAGING WEIGHTS

	Quart Kit	Gallon Kit	Pail Kit
ES6228 Part A	2.25 lb.	9 lb.	45 lb.
ES6228 Part B or B1	2.25 lb.	9 lb.	45 lb.
Kit	4.5 lb.	18 lb.	90 lb.

### DIRECTIONS FOR USE

**PREPARATION:** All surfaces to be bonded or patched must be free of dirt, oil and grease. The ability of ES6228 to bond to slightly oily surfaces should be considered as “insurance” for a good bond, rather than justification to avoid adequate surface preparation. The better the surface prep, the better the results! Sanding or roughening the area to be bonded increases the surface area and enhances the bond. See PTM&W Bulletin “Guidelines for Metal Surface Preparation” for more information.

**MIXING:** Measure out equal parts of ES6228 A and B or B1, combine, and mix thoroughly until a uniform gray color and consistency is reached. Mix for at least 1 to 2 minutes, scraping the sides and bottom of the container to avoid leaving unmixed material that will cause soft spots in the cured material.

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Inasmuch as PTM&W Industries, Inc. has no control over the use to which others may put the material, it does not guarantee that the same results as those described herein will be obtained. The above data was obtained under laboratory conditions, and to the best of our knowledge is accurate. The information is presented in good faith to assist the user in determining whether our products are suitable for his application. No warranty or representation, however is intended or made, nor is protection from any law or patent to be inferred, and all patent rights are reserved. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. In no event will PTM&W Industries, Inc. be liable for incidental or consequential damages. Buyer's sole and exclusive remedy in such instances shall be limited to replacement of the purchase price.

**DIRECTIONS FOR USE. Continued**

APPLICATION and CURING: Apply mixed material to roughened area of the parts to be bonded. Press surfaces firmly together and let set for 24 hours or more at 75°F. If necessary, place assembly in a jig or other device to prevent movement during initial curing time. Curing time is 24 to 36 hours at 75°F, or 2 hours at 140°F. The material to be bonded may be preheated to accelerate curing time, or very light heat can be applied after the parts have been bonded.

**TYPICAL MECHANICAL PROPERTIES**

	ES6228 A with Part B or B1	ASTM Method
Mix Ratio, By Weight	100 : 100 By Weight or Volume	PTM&W
Color	Gray	Visual
Mixed Viscosity, centipoise	Thin Paste	D2393
Pot Life, 4 fl. Oz. Mass, @77°F	Part B: 2 hours; Part B1: 25 minutes	D2471
Cured Hardness, Shore D	83 Shore D	D2240
Cure Time @ 77°F @ 140°F	24 - 36 hours 2 hours	
Specific Gravity, grams, cc	1.30	D1475
Tensile Strength, psi	9,500 psi	D638
Elongation at Break, %	8 %	
Compressive Strength, psi	12,000 psi	D695
Aluminum to Aluminum Tensile Lap Shear: @ 77°F @ 140°F	3,480 psi 3,150 psi	D1002

**SAFETY and HANDLING**

PTM&W epoxy products are made from raw materials carefully chosen to minimize or even eliminate toxic chemicals, and therefore offer the user high performance products with minimum hazard potential when properly used. Generally, the PTM&W epoxy resins and hardeners will present no handling problems if users exercise care to protect the skin and eyes, and if good ventilation is provided in the work areas. However, breathing of mist or vapors may cause allergenic respiratory reaction, especially in highly sensitive individuals. As such, avoid contact with eyes and skin, and avoid breathing vapors. Wear protective rubber apron, clothing, nitrile rubber gloves, face shield or other items as required to prevent contact with the skin. In case of skin contact, immediately wash with soap and water, followed by a rinse of the area with vinegar, and then a further wash with soap and water. The vinegar will neutralize the hardener and lessen the chances of long term effects. Use goggles, a face shield, safety glasses or other items as required to prevent contact with the eyes. If material gets into the eyes, immediately flush with water for at least 15 minutes and call a physician. Generally, keep the work area as uncluttered and clean as possible, and clean up any minor spills immediately to prevent accidental skin contact at a later time. Keep tools clean and properly stored. Dispose of trash and empty containers properly. Do not use any of these types of products until Material Safety Data Sheets have been read and understood.

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