

## Emergency & Temporary Pipe Repair Guidelines

At Polymeric Engineered Solutions we have developed a range of products which are suitable for the emergency or temporary repair of metallic, plastic and concrete pipe. The repair systems offer a wide range of capabilities to the end user, which allow emergency manual surface preparation repairs to abrasive blast cleaned pipe preparation for long term solutions. The information set out below is meant as a guideline to the many types of pipe repair encountered by site and marine engineers.

### ***Types of surface preparation and substrates that can be repaired using PES metal repair and composite repair systems include -***

#### ***Steel Pipework***

For emergency repairs to steel pipe work the following methods of preparation are normally used –

1. Manual surface preparation using sand paper or wire brush
2. Mechanical surface preparation using rotary wire brush, angle grinder MBX bristle blaster or needle gun

Both methods of surface preparation are compatible with emergency pipe repairs carried out using PES metal repair or composite repair systems, however this lower level of surface preparation will affect the pressure and temperatures the repairs can resist. The maximum pressure a formed steel plate bonded with 101 Power Metal Repair Paste can resist is 100psi.

For longer term pipe repairs we would always recommend that the steel pipe be abrasive blast cleaned to NACE #2 near white metal with 3-4 mil angular anchor (SA2.5, 75 micron) profile. This type of repair will ensure a higher pressure tolerance (up to 300psi) and also better temperature resistance.



#### ***Concrete Pipework***

PES composite pipe repair systems can be applied to concrete pipework which have become porous or suffer from thinning of the pipe wall through external/ internal erosion/ corrosion. The systems and their method of application lend themselves to planned repair rather than emergency repairs.

Surface preparation of the pipe will require as a minimum, mechanical grinding with abrasive blast cleaning as the recommended method of application for longer term repairs.

The main advantages of using PES composite repair systems are –

1. No limits on pipe diameter than can be repaired
2. No limits to pipe length that can be repaired

#### ***Plastic Pipework***

PES composite pipe repair systems can be applied to any plastic pipe system with minimal surface preparation.

The repair systems are capable of bonding to a scarified surface and are ideal for sealing joints in plastic pipework which are prone to movement and ill-fitting seals.

Standard surface preparation would be to use a mechanical sander to abrade the surface of the plastic prior to the application of the 301 Epoxy Resin and Hardener and glass tape.





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## Surface Preparation, Pressure and Temperature Tolerance

Product	Grade	Fabric or plate	Surface Preparation	Pressure Tolerance	Temperature tolerance
101 Power Metal Repair Paste	Paste	Reinforcement tape	Wire brush Sandpaper	50psi	122°F
101 Power Metal Repair Paste	Paste	Formed steel plate	Mechanical – Needle gun, rotary wire brush, angle grinder , MBX bristle blaster	100psi	158°F
101 Power Metal Repair Paste	Paste	Formed steel plate	Abrasive blast clean, minimum NACE #2	300psi	158°F
301 Epoxy Resin and Hardener	Gel	Glass Tape 2 inch to 8 inch	Wire brush Sandpaper	75psi	140°F
301 Epoxy Resin and Hardener	Gel	Glass Tape 2 inch to 8 inch	Mechanical – Needle gun, rotary wire brush, angle grinder , MBX bristle blaster	100psi	158°F
301 Epoxy Resin and Hardener	Gel	Glass Tape 2 inch to 8 inch	Abrasive blast clean, minimum NACE #2	300psi	158°F

## Product Characteristics and Testing

Product	Grade	Usable Life	Touch Dry	Hard Dry	Full load	Dry Temp Resist	Wet Immersed	Volume Capacity
101 Power Metal Repair Paste	Paste	30mins	2hrs	8hrs	2days	302°F	158°F	24cu in/kg
	<b>Compressive Strength ASTM D695</b>		<b>Tensile Shear Adhesion D 1002</b>		<b>Flexural Strength ASTM D790</b>		<b>Hardness Rockwell R ASTM D785</b>	
	(15,300psi) 1075kg/cm <sup>2</sup>		(2630psi) 185kg/cm <sup>2</sup>		(10,000psi) 703kg/cm <sup>2</sup>		100	
301 Epoxy Resin and Hardener	Gel	25mins	2hrs	16hrs	5days	302°F	140°F	53cu.in./kg
	<b>Compressive Strength ASTM D695</b>		<b>Tensile Shear Adhesion D 1002</b>		<b>Flexural Strength ASTM D790</b>			
	(14,700psi) 1034kg/cm <sup>2</sup>		(2100psi) 148kg/cm <sup>2</sup>		(13,000psi) 912kg/cm <sup>2</sup>			