EMSOL® MRP-1100

Technical Data Sheet

HIGH PERFORMANCE MACHINABLE PUTTY

DESCRIPTION

EMSOL® MRP-1100 is a machinable re-build/repair putty for equipment and metal substrates. It is a two-component product that is easy to use with excellent working life. Compatible with a large number of metals, concrete, fiberglass, etc.

TYPICAL APPLICATIONS

- Repair/sealing of metal tanks
- Repair/reconstruction of heat exchangers:
  - Tube Sheets, water boxes, heads, deflectors, flanges
- Repair/reconstruction of Centrifugal, Axial, Vacuum Pumps, etc.:
  - Casings/volutes, impellers, cones, seal seats
- Pipe repair/reconstruction:
  - Perforations, undercuts, low thicknesses, weld beads
- Repair of axles, shafts
- Repair of cracks and porosities

PHYSICAL&MECHANICAL PROPERTIES

Compressive Strength (ASTM D695) ..... 121 MPa (15,000 psi)
Flexural Strength (ASTM D790) ..... 90 MPa (13,000 psi)
Abrasion Resistance (ASTM D4060 @ Cs17 x 1K cycles) 45mg
Coefficient of Thermal Expansion (ASTM C531) ..... ($1.1x10^{-6}$ °F)
Thermal Stability Loss after 48 hours @ 149°C (300°F) ..... 0.3 mg
Adhesion (ASTM D1002) ..... 211 Kg/cm^2 (2,550 psi)
Adhesion (ASTM D4541) ..... 176 Kg/cm^2 (2,550 psi)
Hardness (ASTM D2240) ..... > 80
Density (ASTM C905) ..... 1.7g/cm^3 (14.3 lb/gal
Volatile Organic Compounds ..... 0 g/lt (0 lbs/gal)

CHEMICAL RESISTANCE

Acetic Acid ≤ 10%	Nitric Acid 10%	Aromatic and Aliphatic Solvents
Black Liquor	Nitric Acid 10%*	
Butyl Acetate	Urea	For more information and resistance concentrations see the chemical resistance chart.
Butyl Carbitol Acetate	Phosphoric Acid 15%	
Hydrogen Sulfide Gas	Potassium Hydroxide	
Isopropyl alcohol	Nitric acid ≤ 30%	
Diluted Organic Acids	Sodium Hydroxide	
Sodium Hydroxide ≤ 50%	Sulfates	
White Liquor	Sulfuric acid ≤ 50%	

BENEFITS

- Excellent resistance to corrosion and erosion
- Easy to mix and use
- Excellent working time
- Fast setting (7-10 hrs.)
- Resistant to freezing temperatures
- Resistant to thermal shocks
- 100% solids by volume
- It is not toxic
- Has no offensive odor during application

COLORS

- Component "A": Gray
- Component "B": White
- Finish: matt

PRESENTATIONS

- 4 x 1 Kg kit
- 10 x 1 kg Pack
- 5 x 1 kg kit

THEORICAL COVERAGE

- 0.19 m^2 @ 3mm (2 ft^2 @ 120 mils) per 1 kg unit
- 0.96 m^2 @ 3mm (10.3 ft^2 @ 120 mils) per 5 kg unit

RECOMMENDED FILM THICKNESS

- Minimum ≥ 1.0 mm (40 mils).

MIXING RATIO

By Weight	By Volume
4 : 1	3 : 1

WORKING LIFE

Temperature	Time
4°C (40°F)	80 minutes
24°C (75°F)	50 minutes
33°C (92°F)	30 minutes

CURING TIME

21°C (70°F)

Overcoat:	1.5-2 hrs
Light Loading:	12 hrs
Immersion:	48 hrs
Chemical contact:	5 days

SERVICE TEMPERATURE

Dry:	255°C (490°F)
Spills/Splashes:	145°C (293°F)
Immersion:	90°C (194°F)

SHELF LIFE

- 2 years

SURFACE PREPARATION

Metallic Substrates:

"ONLY APPLY OVER CLEAN, DRY, SOLID/FIRM AND ROUGHENED SURFACES"

1. Clean/remove contamination or dirt with solvent according to the procedure established by the SSPC-SP1 standard (solvent wash). Use a fast-evaporating solvent/degreaser that leaves no residue. Acceptable degreasers such as: Xylene (di-methylbenzene), MEC (methyl-ethyl ketone), Acetone (propanone), Toluene, Isopropyl Alcohol >91%. Decontaminate the surface with a brush and/or lint-free cloth (DO NOT USE TOWN) soaked in degreaser.

2. To obtain the best possible adhesion, prepare the surface using abrasive blasting (grit-blast). Use only angular abrasives such as aluminum oxide, steel slag, copper slag, vitrified carbon, etc. that leave a minimum anchor profile of 75 μm (3 mils). Preparation with hand tools such as emery/grinder, sandpaper and files is acceptable but the degree of adhesion will be lower.

3. Abrasive blasting level must be equivalent to SSPC-SP10 (NACE 2, SA 2.5.) "Near White Metal"

4. Apply the product to the prepared surface before rust forms. If there is a possibility of rust formation prior to product application, contact your EMSOL representative for recommendation of a primer and/or rust inhibitor.

NON-Metallic Surfaces (concrete, fiberglass, etc.):

"ONLY APPLY OVER CLEAN, DRY, SOLID/FIRM AND ROUGHENED SURFACES"

Inspect the surface and make sure it is firm. If the surface is painted, it is recommended to remove the paint until reaching the original substrate. If applied to a painted surface, the adhesion of the product will be limited to the adhesion of the existing paint, so it is critical that it is in good condition and well adhered to the substrate. Existing paints must have an adhesion level > 21 kg/cm2 (300 psi) per ASTM D-4541 test.

Clean the surface with a degreaser or detergent until all dirt/contamination is removed. Use a fast-evaporating solvent/degreaser that leaves no residue. Acceptable degreasers: Xylene (di-methyl-benzene), MEC (methyl-ethyl-ketone), Acetone (propanone), Toluene, Isopropyl Alcohol >91%. Decontaminate the surface with a brush and/or lint-free cloth (DO NOT USE TOWN) soaked in degreaser/solvent.

Concrete surfaces can be prepared with pressure water washing (pressure washer) in conjunction with emulsifying detergents.

Glossy, smooth or painted surfaces should be sanded to a minimum surface roughness comparable to #100 grit sandpaper.

Protect the prepared surface to prevent recontamination or soiling.

PRODUCT MIXING

Empty the contents of component "B" into the container of component "A" and mix until a completely homogeneous color mixture is achieved using the supplied mixing spatula or a "Jiffy" type mixer and drill at low revolutions (300-500 rpm). Avoid incorporating air into the mixture. If the product is cold (< 15°C) it is recommended that it be preheated to a maximum of 30°C to facilitate mixing. Scrape the bottom and sides of the container to ensure complete mixing.

To avoid a reduction in the pot life of the mixture, DO NOT let the product sit in the mixing container, spread it over the application surface or transfer it to a paint tray to prevent it from overheating and your working time will be reduced.

NOTE: If ambient temperature is above 30°C, mix only the appropriate amount of product that application personnel can apply in 20-30 minutes.

PARTIAL MIXING

By Volume: 3 parts "A" to 1 part "B"

By Weight: 4 parts "A" to 1 part "B"

APPLICATION

Initially, vigorously apply a small amount of the mixed product ensuring 100% contact with the prepared surface. Completely fill in roughness and any imperfections in the substrate. Apply the rest of the product until the required thickness or profile is achieved, avoiding trapping air bubbles.

If necessary, EMSOL MRP-1100 can be applied in multiple coats. Make sure additional coats are applied while the previous coat of product is hard but still tacky (maximum overcoat time is 90 to 120 minutes). If the previous coat of product is no longer tacky or the overcoat time has been exceeded, sand the surface lightly until a uniform color is achieved, wipe with a solvent-soaked rag, allow to dry, and apply additional product.

If EMSOL MRP-1100 is to be machined on a lathe, allow the lathe to cure/set a minimum of 10-12 hours @ 21°C or 5-6 hours @ 30°C.

CLEANING

Clean tools immediately with an appropriate solvent or isopropyl alcohol before product hardens.

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