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# Flexible Polyurethane Methyl Methacrylate

Joints, Membrane, and Flexible Mortar

**Epoxy.com Product #6890** 

#### DESCRIPTION

**Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890** is a higher viscosity, 100% reactive, flexible methyl methacrylate polyurethane hybrid resin used as a crack isolation or waterproofing membrane under various Epoxy.com MMA Systems, or as a resilient mortar or joint filler for numerous applications.

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 resists cracking caused by horizontal substrate movement, providing a crack resistant, resilient surface with superior performance in cold temperature environments. Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 offers stress relieving properties for floor slabs showing movement and/or vibration.

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 is excellent for use as an intermediate membrane layer or patching mortar in loading docks and ramps, equipment rooms, large animal rooms, activity rooms, automotive and tooling industry, freezers, coolers, bridge decks, roof decks, pedestrian walkways, parking garages, ship decks, pool liners, pool decks, joint repair, food industry, dairies, beverage industry, and numerous other industries and applications. Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 makes an excellent expansion joint.

## **ADVANTAGES**

- Crack Resistant and Waterproofing Flexibility
- Elongation of 300%
- Reduces Noise Created by Mechanical Vibrations
- May be Applied in Thickness of 1/16"-1/4"
- VOC Compliant (100% Solids), Meets USGBC LEED Requirements

#### CONSIDERATIONS

- For proper performance, follow recommended mixing/application guidelines.
- Concrete must be dry, free of dirt, waxes, curing agents and other foreign materials.
- Do not store outside in direct sunlight, storage temperature must be < 80oF. On or below grade installation must have an efficient vapor barrier under the slab (minimum 10-15 mil).
- Moisture vapor transmission must be less than 3 lbs per ASTM-F-1869 and less than 80% RH per ASTM F-2170 unless Epoxy.com Resin moisture mitigation system is used.

#### COMPOSITION

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 is a 100% reactive methyl methacrylate polyurethane hybrid resin.

#### **COLOR SELECTION**

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 is supplied clear (slight haze). Color packs are available for selected colors. Color pack mix ratio is 1 quart pigment per 5 gallons resin. See Epoxy.com MMA Color Card.

## SURFACE PREPARATION

Surface preparation is the most critical portion of any successful resinous flooring system. All substrates must be properly prepared as outlined in <u>Epoxy.com Surface Preparation Procedures</u>. In addition, All Epoxy.com MMA Flooring Systems require a minimum surface profile of CSP 4-5, as outlined in ICRI Guideline 310.2-1997, formerly named G-03732 (available from www.ICRI.org).

## MIXING AND INSTALLATION

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 is typically used in conjunction with fillers and aggregate and requires the addition of MMA Hardener #695 to start the hardening process. The amount of hardener must be adjusted to the respective surface temperature (see table). At temperatures below 40°F, Epoxy.com 9101 MMA COLD TEMPERATURE ACCELERATOR must be used in addition to the amount of hardener used at the 40°F or 30°F level.

#### Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 Resin Mix Ratios, Pot Life and Hardening/Temperature

Temp. (°F) of Resin, Air & Floor Surface	Hardener by Volume (oz.) Per Gallon of 9800 Resin	Pot Life (min.)	Hardening Time (min.)
+30°F	10 vol. oz.	Approx. 25	Approx. 75
+40°F	9-10 vol. oz.	Approx. 25	Approx. 70
+50°F	8-9 vol. oz.	Approx. 25	Approx. 65
+60°F	6-7 vol. oz.	Approx. 20	Approx. 60
+70°F	5-6 vol. oz.	Approx. 20	Approx. 50
+80°F - 90°F	5* vol. oz.	Approx. 15	Approx. 45

<sup>\*</sup>Do not use less than 5 oz. MMA Hardener #695 by volume.

Consult with Epoxy.com Resin Technical Services if performing mix ratio by weight instead of by volume.

## MMA COLD TEMPERATURE ACCELERATOR Product #696

At temperatures below 40°F, **Cold Temperature Accelerator Product #696** must be used in addition to the amount of hardener used at the 40°F or 30°F level. As a rule of thumb, add about ½ oz by volume per gallon of resin @ 39° to 32°F, up to 2.0 oz by volume per gallon @ -20°F, increasing the quantity gradually in a consistent linear progression as the temperature decreases. VERY IMPORTANT: Cold Temperature Accelerator Product #696 MUST be added to the MMA resin and thoroughly blended BEFORE adding the Epoxy.com #695 MMA HARDENER, or hazardous decomposition may occur (i.e., violent foaming). Epoxy.com 696 MMA COLD TEMPERATURE ACCELERATOR will cause yellowing, it is advised to use pigmented MMA resin versus clear to reduce the appearance of yellowing, darker colors will be less affected than lighter colors.

## POLYURETHANE METHYL METHACRYLATE MEMBRANE SYSTEMS

Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 MEMBRANE SYSTEMS are used for elastomeric decking, waterproofing, roof decks, freezer floors, etc. Flexible Polyurethane Methyl Methacrylate (PUMMA) Product #6890 can be mixed in various formulations using Epoxy.com Self-Leveling Filler #78, or Mortar Blend Aggregate #82, depending on the applied thickness and intended use. Refer to Formulas 6890/1-4. Consult with Epoxy.com Resin Technical Service for recommendations on the best formula, thickness and system design to use for any particular project.

#### FORMULATION GUIDE – MEMBRANE SLURRY

Typical Slurry Formula for 40 mil – 125 mil Basecoat Membrane (Formula 6890/1)

Material Weight Volume
Polyurethane MMA #6890 8.4 lbs. 1.0 gallon
Self Leveling Filler #78 4-5 lbs. 0.25-0.33 gallons

Pigment Pack (optional)

N/A

6.4 vol. oz.

MMA Hardener #695 Follow chart Follow Chart

Add hardener to the clear resin and blend; add dry filler powder and mix thoroughly with jiffy mixer. Blend pigment and mix for 1-2 minutes until no lumps are present. Apply mix to the primed surface using a gauge rake or notched trowel. The above mixture will yield approximately 1.15 gallons of slurry. Coverage per batch is:

Yield\* 1.15 gallons slurry

Coverage: 1/16" 28-30 ft2 1/8" 13-15 ft2

Polyurethane MMA #6890; Typical Slurry Formula for 125-195 mil Basecoat Membrane (Formula 9800/2)

Material Weight Volume 8.4 lbs. Polyurethane MMA #6890 1.0 gallon Self Leveling Filler Product #78 7-8 lbs. 0.5 gallons Silica Sand 30-50 mesh 6-7 lbs. 0.5 gallons Pigment Pack N/A 6.4 vol. oz. MMA Hardener #695 Follow chart Follow Chart

Add hardener to the clear resin and blend; add dry filler powder and filler sand and mix thoroughly with jiffy mixer. Blend pigment and mix for 1-2 minutes until no lumps are present. Apply mix to the primed surface using a gauge rake or notched trowel. The above mixture will yield approximately 1.5 gallons of slurry. Coverage per batch is:

Yield 1.5 Gallon Slurry Coverage: 1/16" 36-38 ft2

1/8" 17-18 ft2 3/16" 13-14 ft2

<sup>\*</sup>Note: Yield of mixed slurry will vary depending on mix design used.

\*Note: Yield of mixed slurry will vary depending on mix design used.

## **Formulation Guide - Joint Filler**

Typical Formula for Use as Joint Filler (Formula 9800/3)

Material Weight Volume
Polyurethane MMA #6890 8.4 lbs. 1.0 gallon

Self Leveling Filler #78 4-5 lbs. 0.25-0.33 gallons

Pigment Pack N/A 6.4 vol. oz.

MMA Hardener #695 Follow chart Follow Chart

Yield = 1.15 gallons of mixed slurry

Add hardener to the clear resin and blend; add pigment pack and filler powder and mix thoroughly with jiffy mixer. Blend for 1-2 minutes until pigment is thoroughly mixed and no lumps from filler are present. For joint filling, transfer mixed resin to a pourable container or caulk gun. One gallon of Polyurethane MMA #6890 slurry will yield 231 cubic inches, or fill an expansion/isolation joint with dimensions of ½ inch x ½ inch x 77 lineal feet. Closed cell backer rod should be used to support bottom of Polyurethane MMA #6890 joint filler.

#### APPLICATION – MEMBRANE SYSTEMS

The fresh slurry coat or joint filler must be applied over substrate primed with Epoxy.com 9112 MMA. Formulas 9800/1, 9800/2, and 9800/4 are applied with a gauge rake or notched trowel/squeegee. When using formula 9800/1, apply in two layers, the first layer "neat" and the second layer broadcast to excess with a wearing course of 20 mesh silica or colored quartz aggregate. Formula 9800/2 may be installed in a single layer and must be broadcast to excess with a wearing course of 20 mesh silica or colored quartz aggregate.

Formula 9800/4 is applied in two layers, with polyester fleece reinforcement imbedded into the first layer. Aggregate broadcast rates will vary from 0.25-1.25 lbs/ft2 depending on type and size of aggregate, mix design, and thickness of slurry. It is recommended to broadcast 20 mesh aggregate or larger. Do not use broadcast aggregate smaller than 20 mesh or the risk of random cure problems increases. Aggregate may be natural or colored quartz, sand, aluminum oxide, emery, etc. Polyurethane MMA #6890 must be top coated or sealed with Epoxy.com 9528 MMA.

#### TROWELED MORTAR SYSTEM

Polyurethane MMA #6890 MORTAR SYSTEM is used for patching damaged concrete or asphalt in highways, bridge decks, pedestrian decks/walkways, roof decks, freezer floors, etc. Polyurethane MMA #6890 can be mixed in various formulations using blended mortar silica aggregate and pea gravel or other large aggregate for thicker applications. Polyurethane MMA #6890 MORTAR SYSTEM may require a sealer such as Epoxy.com 9528 or Epoxy.com 9526, depending on expected service conditions. Consult with Epoxy.com Resin Technical Service for recommendations on the best formula, thickness and system design to use for any particular project.

#### FORMULATION GUIDE – TROWELED MORTAR

#### Typical Batch Formula with Epoxy.com Blended Mortar Aggregate

Material % Parts by Wt. Typical Batch Wt. Volume 14.0 8.4 lbs. Polyurethane MMA #6890 1 gallon Blended Mortar Aggregate #82 85.0 50 lbs. 3.25 gallons Pigment Pack N/A N/A 6.4 vol. oz.

Hardener Varies with temp. Varies with temp. Varies with temp.

Yield\*: ±3.0 gallons Mortar (0.4 cu. ft.)

Yield\* ± 3.0 gallons Mortar (0.4 cu. ft.)

Coverage 1/8"	35 ft2
3/16"	25 ft2
1/4"	18 ft2
1/2"	9 ft2

<sup>\*</sup>Note: Yield of mixed mortar will vary depending on mix design used.

IMPORTANT: Mortar mix design MUST yield a resin-rich mortar with pourable consistency, which has a resin-rich surface after troweling. A mortar with a resin-lean, dry consistency may have cure problems.

The above mix design formulation permits installation up to 2.5 inches in one placement. For thicknesses greater than ½ inch, additional aggregate may be added to reduce the resin content and lower the shrinkage. The addition of up to 75% additional aggregate allows for installation of up to 5 inches in one placement.

#### Addition of Aggregate for Greater than $\frac{1}{2}$ inch thickness. Additional Aggregate per Gallon of Resin

Thickness of Placement <1/2 inch	Aggregate Size	Added Weight %	Weight	Volume	Yield 0.4 cu. ft.
½ - 1 inch	1/8" x 1/16"	25%	12.0 lb.	0.9 gal.	0.49 cu. ft.
1-2 inch	1/16" x 3/8"	50%	24.0 lb.	1.8 gal.	0.57 cu. ft.
>2 inches	3/8" x 5/8"	75%	36.0 lb.	2.7 gal.	0.63 cu. ft.

#### APPLICATION – TROWELED MORTAR

Polyurethane MMA #6890 and hardener powder are mixed and blended with the blended mortar aggregate for 3 minutes until no lumps are present. Add the additional aggregates to extend the mortar if needed. IMPORTANT: Mortar mix design MUST yield a resin-rich mortar, pourable consistency, which has a resin-rich Polyurethane MMA #6890; surface after troweling. Apply mortar to the primed surface using a trowel. If excessive resin forms on the surface of the mortar while troweling, it is optional to lightly broadcast 20 mesh silica sand into the resin. A mortar with a resin-lean, dry consistency may have cure problems, resulting in isolated sticky areas that do not cure completely. Any areas that do not cure hard must be removed, spot primed, and replaced with resin-rich mortar before application of sealer (if used). Polyurethane MMA #6890 mortar may require a sealer suitable for the intended application. Consult with Epoxy.com Resin for recommendations.

## PHYSICAL PROPERTIES - RESIN/SYSTEM

Percent Reactive 100%, zero VOC

Working Life, 50°F-70°F 15-25 minutes, will vary w/temp. & amount of Hardener

Recoat Time 55-75 minutes
Viscosity, cps 600-800 cps
Weight per Gallon 8.4 lbs.
Tensile Strength 250 psi

Elongation at Break 300%-resin, 100%-filled mortar

# **CLEAN-UP**

Clean tools and equipment with lacquer thinner or MEK. Consult Material Safety Data Sheet for safety and health precautions.

# **MAINTENANCE**

Polyurethane MMA #6890 is a basecoat resin or binder resin used with various Epoxy.com MMA Systems, refer to specific system data sheet or sealer data sheet for recommended maintenance.

# **STORAGE**

Store in a cool and dry place, below 80°F, out of direct sunlight. Do not store near open flame or food. Shelf life is 6 months in the original unopened containers. After extended storage: Additives and fillers can separate with storage, materials should be inspected for any visible signs of settlement, polymerization, or paraffin coagulation (clumps, strands). Thoroughly mix pails or drums (use a drum mixer, do not rely on rolling drum on floor) and pour into new containers to inspect resin before use.

### **HELPFUL HINTS**

Adequate cross ventilation should be provided. Good ventilation during the processing ensures a good cross linking and hardening. Read, understand and follow Material Safety Data Sheets and Application Instructions prior to use. Use only as directed. If substrate and/or material temperature is above 90F, DO NOT apply material.

#### TECHNICAL SERVICE

Epoxy.com Technical Support Department provide services and consultations on material selection, specification, troubleshooting, and other information on the proper repair and protection of concrete surfaces. Epoxy.com Resin Sales/Technical Representatives are available to assist you. Telephone (352) 533-2167 or visit <a href="https://www.Epoxy.com">www.Epoxy.com</a>.

#### WARRANTY

Information regarding Epoxy.com Resin brand MMA resins and systems is based upon extensive research and experience in the field of applied engineering by the manufacturer. By making such information available, Epoxy.com does not thereby assume any liability beyond express terms of our standard limited material warranty. Epoxy.com does not warrant the accuracy or completeness of any such information, whether conveyed orally or in writing, but to the best of our knowledge believe it to be accurate. We reserve the right at any time and without notice to update or improve our products and process and our information concerning the same. By Epoxy.com Resin making this information available does not relieve the purchaser or user from his obligation to verify the suitability of our products and processes for the intended use or application. The purchaser and user likewise have the responsibility to ensure that the purchase, use or application does not infringe upon patent rights or other rights of third parties. "Epoxy.com warrants for a period of one (1) year that its products will be free of manufacturing defects and will be in conformity with published specifications when handled, stored, mixed, and applied in accordance with recommendations of Epoxy.com. If any product fails to meet this warranty, the liability of Epoxy.com will be limited to replacement of any non-conforming material if notice of such non-conformity is given to Epoxy.com within one (1) year of delivery of materials. Epoxy.com may in its discretion refund the price received by Epoxy.com in lieu of replacing the material. No customer, distributor, or representative of Epoxy.com is authorized to change or modify the published specifications of this warranty in any way. No one is authorized to make oral warranties on behalf of Epoxy.com. In order to obtain replacement or refund the customer must provide written notice containing full details of the non-conformity. Epoxy.com reserves the right to inspect the non-conforming material prior to replacemen

Proper mixing and installation is critical to the optimal success of all product. See <u>Installation Tips</u>, <u>Techdata</u>, & <u>MSDS</u> for more details on our products. Be sure to contact us with any questions and/or concerns that you have.

For more information please contact:

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