POLY-TUFF SYSTEMS INTERNATIONAL
HIGHWAY DIVISION

TuffMend™ VOH

Fast Setting, Non-Sag, Vertical & Overhead Repair Mortar

1.01 DESCRIPTION

TuffMend™ VOH is a single component, fiber reinforced, Portland-Cement based, polymer-modified material designed to repair and rehabilitate vertical and overhead concrete and masonry surfaces without the need for costly form work. The fast setting, low shrinkage, non-sag, and high strength of TuffMend™ VOH allow it to be placed and sculpted to final shape in a single application up to 3" (7.62 cm) in thickness. Please use the correct product grade that complies with VOC regulations as per federal, state, county and city regulations/codes at the place of installation of product.

1.02 USES

- Fast Repair of Bridges, Pilings And Buildings
- Rebuild Cornices and Ornate Precast Without Forming
- Repair Piers, Tunnels, Precast Concrete Panels and Concrete Pipes
- Structural Repairs in Vertical And Overhead Surfaces

1.03 FEATURES

- Apply from Featheredge up to 3" in a Single Application
- Freeze-Thaw Resistant
- High Polymer Modification Provides A Tenacious Bond
- No Bonding Agent or Additives Required
- Non-Shrink, Free of Chloride, Gypsum
- Rapid Hardening, 30-35 Minute Initial Set
- Self-Curing

1.04 TECHNICAL DATA

Meets ASTM C-928 for dry packaged rapid hardening cementitious materials for concrete repairs.

1.05 COLOR

Light Gray

1.06 PACKAGING

Available in 50 lbs (22.68 kgs) multi-walled paper bags.

1.07 COVERAGE

Approx: 20 sqft @ 1/4" (1.858 sqm @ 0.65 cm)
Yield: 0.42 cf/50 lbs (0.11 cum/22.68 kgs)
Yield Extended: 0.6 cuft with 25 lbs 3/8" gravel (11.34 kgs 0.96 cm)

1.08 PREPARATION

The concrete must be sound and free of all foreign material, including oil, grease, dust, laitance or other surface contaminants. Square edges by saw cutting the perimeter of the repair 1/8" (0.3175 cm) deeper than the depth of the repair, creating a notched, reinforced edge for maximum durability. Mechanically abrade the surface by grinding, abrasive blasting, or water blasting. All concrete of poor quality that is in contact with reinforcing steel should be removed. Remove rust from exposed reinforcing steel by brushing or sandblasting. Apply PSI's **RustCheck**™ permanent rust converter to the exposed steel, prior to repairing with **TuffMend**™ **VOH**. Have all necessary tools and materials as near work areas as possible to permit rapid and continuous placement of **TuffMend**™ **VOH**. All surfaces to be repaired should be in a saturated surface-dry (SSD) condition with no standing water on the surface.

1.09 MIXING

Mix 6.25-6.75 pints (5.92-6.15 liters) of clean potable water per 50 pounds (22.68 kg) of **TuffMend**™ **VOH** using either the PSI's **Rapid Pail Mixer** "or" a 1/2+ hp heavy-duty drill with the PSI's **Mortar Paddle** utilizing the PSI's **1 Man Stand**. Mix until completely blended and free of lumps. Do Not Over Mix. When using a power mixer to blend material use a slow speed high torque drill at no more than 500-650 rpm. ALWAYS add material to water when using a bucket or mortar mixer, but add water to material if hand mixing smaller batches.

1.10 APPLICATION

Trowel on immediately. Vertical or overhead patches greater than 3" (7.62 cm) in depth may need to be built up in successive layers. If layering deep patches, scratch surface of each layer. Allow previous layer to tighten (5–10 minutes) before building another layer. Mist first layer before applying second. Overfill patch and shave to shape. **TuffMend**™ **VOH** can be shaved with a trowel for up to 1 hour after initial set. Try to avoid overworking a patch. Finish with a damp sponge, brush or steel trowel.

Deep Applications: For repair applications over 3" (7.62 cm) , **TuffMend**™ **VOH** can be extended with clean, 3/8" (0.96 cm) aggregate up to 50% by weight (25 lbs or 11.34 kgs) and mixed an additional 2 minutes. Choose a clean (free of organic material) well-graded 3/8" (0.96 cm) aggregate. Aggregate should be pre-dampened prior to mixing with **TuffMend**™ **VOH**. The total mixing water for the batch shall be reduced by the amount of free water found in the aggregate. This extension will add approx 0.18 cuft (0.0051 cum) to the unit yield and should be placed within 15-20 min.

1.11 DRY TO USE

Finish the repair material to the desired texture to best match the surrounding concrete. Do not add additional water to the surface during finishing. Lightly spray **TuffAid**™ as a finishing aid on this and any other polymer modified mortars to assist in finishing. **TuffMend**™ **VOH** is self-curing under most conditions. In severe drying conditions, use PSI's **ClearCure**™ **WB** curing compound.

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1.12 CLEAN UP
Tools and equipment can be cleaned with water before **TuffMend™ VOH** hardens.

1.13 STORAGE AND SHELF LIFE
The material should be stored between 40-95°F (4-35°C) in a cool, dry area away from direct sunlight. The shelf life of properly stored, unopened containers is 12 months from the date of manufacture. Excessive temperature differential and/or high humidity can shorten the shelf life expectancy.

1.14 LIMITATIONS
Product is temperature sensitive regarding set time; below 50°F (10°C) set is slower, above 80°F (26.67°C) set is faster. In hot weather, cool surface to be patched with cold water and use cold water for mixing. Do not apply **TuffMend™ VOH** when dry product or surface temperature is below 40°F (4.44°C). Do not use "antifreeze" or set accelerator solutions. Do not add any concrete additives, primers, or bonders. Protect from precipitation and freezing for at least 4 hours.

1.15 CAUTION
Contains Portland cement CAS# 65997-15-1. Freshly mixed cement products may cause skin injury. Avoid contact with skin where possible and wash exposed areas promptly with water. If any product gets into the eye, rinse immediately and repeatedly with water. If ingested, do not induce vomiting and get prompt medical attention. Also contains Sand CAS# 14808-60-7. Avoid breathing dust. Prolonged exposure to dust may cause delayed and lung injury (silicosis) or cancer IARC Class 2A. Wear NIOSH approved mask for silica dust.

READ SDS PRIOR TO USING PRODUCT. KEEP OUT OF THE REACH OF CHILDREN.

1.16 PHYSICALS	
Compressive Strength (ASTM C-109)	
3 Hours	3000 psi (20.68 MPa)
1 day	4850 psi (33.44 MPa)
7 days	7250 psi (49.97 MPa)
28 days	9025 psi (62.24 MPa)
Flexural Strength (ASTM C-348)	
1 day	650 psi (4.48 MPa)
7 days	1025 psi (7.07 MPa)
28 days	1180 psi (8.14 MPa)
Shear Bond Strength (ASTM C-882)	
7 days	1040 psi (7.17 MPa)
14 days	1545 psi (10.65 MPa)
Shrinkage (ASTM C-157) 28 days	-0.045%
Freeze Thaw (ASTM C-666) 50 cycles	Excellent
Initial Set	35 min
Final Set	45 min

Please read all information in the General & Safety Guidelines, Technical Data Sheets, Guide Specifications and Safety Data Sheets (SDS) before applying material. PSI Products are for "Professional Use Only" and preferably applied by professionals who have prior experience with PSI Products or have undergone training in application of PSI Products. Published technical data and instructions are subject to change without notice. Contact your local PSI representative or visit our website for current technical data, instructions, and project specific recommendations.