

# PUMP-X53, 53i, 53iE, 53iL

## PUMPABLE INJECTION GROUTS & FILLERS

**DESCRIPTION:**

*PUMP-X53-Series* products are prepackaged specialty grouts used for a wide variety of construction, restoration, and masonry stabilization applications.

*PUMP-X53* is a multi-purpose, low modulus, moderate strength filler used for filling cavities, voids, and cracks from a minimum width of ¼” up to approximately 18”. It is a two-component, latex-modified, super-plasticized lime-cement mortar designed for broad compatibility with masonry structures.

*PUMP-X53i* is an ultra-fine, non-shrinking, moderate strength micro-injection grout that achieves high flow for efficient filling of small cracks and voids, from a minimum width of approximately 1 mm to as much as several inches thick. It is a single component, polymer-modified mortar which is mixed with water to achieve fluid working consistencies without separation or bleeding.

*PUMP-X53iE* is an ultra-fine, expanding, non-polymer cementitious injection grout designed for filling small cracks and voids in sound concrete and masonry construction. Slight expansion after placement and before final set enables the material to force itself into close, positive contact with internal crack surfaces where desired.

*PUMP-X53iL* is a softer, non-polymer, pozzolan-lime grout, for use in Historic masonry restorations requiring repairs to lower strength brick and softer stone elements.

**CUSTOMIZATION:**

*PUMP-X53-Series* products can be customized for specific project requirements. Typical customizations may include color-match, strength adjustment, addition/deletion or change in concentration of polymers, acceleration or slowing of set time, increase or reduction in expansion properties or alteration of other performance properties.



*Photo: Pumping PUMP-X53iL with a low pressure grout pump (<30 psi)*

A rubber seal, set 2-3 inches from the tip prevents grout from running back out of the injection point.

| PERFORMANCE                             |                                      |  |                |           |
|---|--------------------------------------|--|----------------|-----------|
| Property                                | 53                                   | 53i                                      | 53iE           | 53iL      |
| Compressive Strength (psi), ASTM C109   | 1300-1800                            | 1800-2200                                | 1800-2200      | 650-1300* |
| Tensile Strength (psi)                  | 250-300                              | 300-400                                  | 300-400        | 200-300   |
| Flow, ASTM C230-modified (No Vibration) | 116 mm                               |  |                |           |
| Direct Tensile Bond Strength            | >100 psi                             |  |                |           |
| Drying Shrinkage                        | 0.1%                                 | 0.0%                                     | 2.4% Expansion | 0.3%      |
| Moisture Vapor Permeance                | >30 perms @ ½” thickness             |  |                |           |
| Mix Ratios, Powder:Liquid               | 50 lbs Pt B to 1 gallon Pt. A (RL 2) | 16 lb. powder to ¾- 1 gallon clean water |                |           |

\*Pozzolan Lime properties develop over longer periods of time.

## APPLICATION:

Grouting procedures can vary considerably from one application to another. The following are some general guidelines:

1. Loose materials, such as unbonded masonry mortar, loose bricks, or delaminated concrete must be removed and replaced prior to crack injection.
2. Injection holes should be drilled to enable delivery of grout to the full length and depth of the cavity to be filled. For transverse (perpendicular to surface) crack-filling and for void injection, injection holes are typically drilled into the face of the crack at a downward angle to a depth of ½ the masonry thickness. For filling of lateral cracks (parallel to surface, e.g. delaminating layers of sandstone), holes are generally drilled near the top and bottom of the area to be filled, beginning at the upper and lower corners and then every 3-9 inches along the upper and lower edges of the cavity. The lower row may be drilled square with the surface (at 90° to the wall surface).

For filling of voids with *PUMP-X53*, the diameter of the holes drilled may vary with the intended method of grout delivery. For typical delivery by grout pump through ½” pressure hose, a ¾” hole is required.

For crack injection with any of the *PUMP-X53i* series products, smaller holes may be drilled. ¼” diameter holes are sufficient for grout delivery through 1/8” diameter tubing.

3. Seal the face of the crack with temporary non-staining clay, sealant, or mortar.
4. All crack and void cavities must be thoroughly flushed with clean water to remove as much dirt, debris, and contaminants as possible and to pre-saturate the areas to be grouted. Continue flushing until clean water runs from the lowest port. A minimum of 20 minutes of pre-wetting should be performed prior to grouting. Repeat pre-wetting if either drying occurs prior to injection or if more than two hours elapse from the time of pre-wetting.

5. Some methods of grouting involve injecting from the lowest port, followed by plugging of the injection port once grout flows from the port above. Other methods involve injection from the upper port, plugging the lower port once grout begins to flow from the port. *PUMP-X53-Series* products are compatible with a variety of good grouting practices and equipment.

Thoroughly mix the *PUMP-X53-Series* product selected using a mortar mixer or slow speed drill. (250-450 rpm, “Jiffy” type mixing tool)

Grouting for structural repair should always be performed under the supervision of a licensed structural engineer and an experienced grouting engineer.

6. For aesthetic repair after grouting, refer to product data for *Custom SYSTEM 45*, *SPEC-JOINT 46*, and/or *FLEXI-FILL 530*.

## LIMITATIONS:

Expanding grouts require sound substrates to restrain the grout as it expands. They should not be used on low strength materials, such as exfoliating sandstone. Thorough testing under the supervision of an experienced grouting engineer should be performed on a small scale in an insensitive area, prior to large-scale application.

## SAFETY:

Products contain Portland cement and/or lime. Avoid skin and eye contact. Avoid breathing of dust. When handling dry powders, use NIOSH-approved respirator. Read and observe the safety and handling guidelines as detailed in the Safety Data Sheets supplied with these products. **KEEP LIQUID COMPONENTS FROM FREEZING.**

**FOR COMMERCIAL AND INDUSTRIAL USE ONLY**



Revised: 03/2019

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