KEMKO® 051 LoMod IR

Low Modulus Epoxy Adhesive for Pressure Injection Grouting

Type:	Two-component, solvent-free, epoxy resin / hardener.
Primary Use:	Non-structural, pressure injection grouting of cracks, delaminations and voids in rigid construction materials where a low modulus adhesive is specified. Waterstop filling of cracks, construction and control joints in concrete. Bonding rigid to flexible substrates.
Substrates:	Concrete, masonry, stone (dry, damp), steel and sealed wood.
Minimum Temp:	Installation: 40° F (substrate temperature).
Applications:	Cracks and gaps up to 1/4" width; greater than 1/4" with pre-placed aggregate.
Shelf Life:	Three years minimum in sealed containers (see below for conditions).
ASTM:	Meets ASTM C881, Type III, Group 1

The properties listed in this bulletin are typical and descriptive of the product and should not be used for specification purposes. For specification preparation, reference the specification of this product available from ChemCo Systems, Inc. This product is available only through KIP System (KEMKO Injection Process) licensee/applicators.

***Description*:** KEMKO® 051, LoMod IR is a two-component, low viscosity, non-structural, epoxy adhesive designed for pressure injection grouting. The adhesive is suitable for installation with KIP System application equipment. Primary uses include non-structural, pressure injection grouting of cracks, delaminations and voids in rigid construction materials (e.g., concrete, masonry, stone, steel, wood and FRP) where repair with a low modulus epoxy resin adhesive is specified and waterstop filling of cracks, construction and control joints. Bonds rigid substrates to flexible elastomers. Applications requiring material thickness in excess of 1/4 inch may be facilitated by pre-placing aggregate in the void. KEMKO 051 bonds to dry, damp and wet substrates. The components do not contain volatile organic compounds (VOC's).

***Features*:** Unlike many other low modulus (flexible) epoxy adhesives, KEMKO 051 bonds to dry, damp and wet surfaces, does not embrittle over long periods of time or when exposed to large amounts of direct sunlight and does not contain volatile solvents (VOC's). Its short cure cycle, tolerance of surface dampness and resistance to most automotive and aircraft fluids and pavement deicing chemicals make it ideally suited for a variety of exterior and interior repairs. Low viscosity and exceptional substrate wetting ensures penetration and filling of fine fissures and tributary cracks. It has a convenient 2:1 (by vol.) mixing ratio.

***Limitations*:** The recommended minimum substrate temperature during installation is 40 °F. KEMKO 051 is a low modulus adhesive and, therefore, is not recommended for use as a rigid materials bonding agent in applications subjected to substantial and sustained shear stresses that may cause creep. Installed thickness in excess of 1/4 inch may require the use of pre-placed aggregate to dissipate heat generated during the cure process. Do not add solvents or otherwise thin this material.

***Packaging*:** Standard package sizes of Part A + Part B are 3, 15 and 150 gallon units.

***Shelf-Life*:** Three years minimum in unopened, original containers when stored between 60 and 90 °F in a dry place away from sunlight. Remixing of components may be required upon prolonged storage.

***Color Selection*:** The standard color of the mixed components is dark purple. A clear amber color is available and may require minimum quantities and/or slightly higher cost.

***Chemical Resistance*:** KEMKO 051 has excellent resistance to a wide range of commonly encountered chemicals including acids and bases, aircraft and automotive fluids, petroleum fuels, cutting oils, etc. It has limited resistance to hydrocarbon solvents. Performance is a function of the specific chemical and concentration, ambient and solution temperatures, exposure times and housekeeping procedures. For information on specific chemicals and exposure conditions, contact a ChemCo Systems, Inc., technical representative.

***Surface Preparation*:** Concrete surfaces may be dry or damp but must be sound and free of all bond-inhibiting substances. Prepare cracks by blowing clean with oil-free compressed air or by flushing clean with an appropriate cleansing solution as required to remove foreign substances and contaminants. Prepare exposed surfaces for bonding in accordance with *ASTM D 4259*, "Standard Practice for Abrading Concrete," or *ACI 503R, Chapter 5*, "Preparing Surfaces for Epoxy Compound Application," and ChemCo Systems, Inc.'s specific recommendations. Properly prepared concrete surfaces should have a minimum strength of 250 psi in direct tension. Steel surfaces should be cleaned to "white metal" according to SSPC SP 5.

***Mixing*:** KEMKO 051 is a two-component adhesive designed for pressure injection grouting. It may be installed with KIP System automatic meter, mix and dispense application equipment. The resin to hardener (Part A:Part B) mix ratio is 2:1, by volume. The KIP System Guideline Specification includes provisions for routine periodic testing of the KIP System grouting equipment to determine that it is metering the components accurately and delivering thoroughly mixed material.

***Installing*:** The KIP System, its products and equipment are only available from KEMKO licensee/applicators. KEMKO 051 is installed in accordance with KIP System Guideline Specification procedures and ChemCo Systems, Inc.'s specific recommendations. For additional information on repair by pressure injection grouting, see *ACI 503R, Chapter 7*, "Applying Epoxy Compounds."

***Clean up*:** All tools and equipment must be cleaned before the mixed material cures. Cleaning can be facilitated with a solvent such as acetone or heavy-duty detergents. Cured material may be removed from equipment and tools by soaking in an epoxy stripper.

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Typical Properties (1)

Property		Test Method	Value
Mix Ratio, A:B,	by vol		2:1
	by wt		100:43
Color:	Part A	VISUAL	Clear amber
	Part B		Clear amber
	Mixed		Clear amber
Weight per Gallon, lb:	Part A	ASTM D 1475	9.2
	Part B		7.8
	Mixed		8.7
Viscosity, cp:	Part A	ASTM D 2393	300
	Part B		250
	Mixed		275
Gel Time, 100 g, minutes		ASTM D 2471	30
Tensile Strength, psi		ASTM D 638	2200
Tensile Modulus, psi		ASTM D 638	16,000
Elongation at Break, %		ASTM D 638	70
Bond Strength to ASTM		ASTM D 4541	
C 109 Cement Mortar, psi:	dry		500 (2)
	damp		430 (2)

(1) Cure schedule, 7 days at 73° ± 4° F and test temperature, 73° ± 4° F.

(2) Compressive strength of cement mortar, 4500 psi.

Handling and Toxicity*:** This bulletin does not accompany the product when sold. For hazard warnings, safe handling and first aid instructions. ***CAREFULLY READ THE MATERIAL SAFETY DATA SHEETS AND CONTAINER WARNING LABELS.

Part A: Liquid epoxy resin, HMIS Health Hazard Rating- 2 (Moderate Hazard). Warning! Causes eye and skin irritation. May cause allergic skin reaction, Harmful if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling, Avoid prolonged or repeated contact with skin.

Part B: Liquid epoxy hardener, HMIS Health Hazard Rating- 3 (Serious Hazard). Contains alkaline amines. Danger! Causes severe eye and skin burns, May cause allergic skin and respiratory reaction, Combustible, corrosive. Do not get in eyes or skin or on clothing, Avoid breathing vapor, keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep away from heat and open flame.

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