

KEMKO® 038 Regular IR

Epoxy Adhesive for
Pressure Injection
Grouting

Type:	Two-component, solvent-free, epoxy resin / hardener.
Primary Use:	Structural repair of cracks and delaminations in concrete, masonry and wood. Filling of porous and honeycombed concrete and grout. Adhesive bonding of steel (external reinforcement). Anchoring bolts, dowels and rebar into concrete, masonry and stone.
Substrates:	Concrete, masonry, stone (dry, damp and wet), steel and sealed wood.
Minimum Temp:	Installation: 50° F, Cure: 40° F (substrate temperature).
Applications:	Cracks, voids, delaminations and annular spaces greater than 1/4" is improved with pre-placed aggregate.
ASTM C 881:	Meets the requirements Type IV load bearing applications.
Shelf Life:	Three years minimum in sealed containers (see below for conditions).

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® 038, Regular IR is a two-component, low viscosity, structural, epoxy adhesive specifically designed for pressure injection grouting using KIP System automatic meter, mix and dispense application equipment. Primary uses include the structural repair of cracks and delaminations in concrete, masonry, stone and sealed wood; filling of voids in porous and honeycombed concrete and grout; adhesive bonding of steel plates (external reinforcement); and, anchoring bolts, dowels and rebar into concrete, masonry or stone. Applications requiring material thickness in excess of 1/4 inch may be facilitated by pre-placing aggregate in the void. KEMKO 038 bonds to dry and damp substrates; wet substrates must be free of standing water. The components do not contain volatile organic compounds (VOC's).

Features: The physical properties of the product allow its use in applications requiring resistance to creep and stress relaxation, maintenance of mechanical properties at high ambient temperatures, high load bearing strength and excellent adhesion under adverse application conditions, e.g., cold, wet concrete. Unlike many other high modulus epoxy adhesives, KEMKO 038 cures to a tough, resilient polymer and has excellent load transfer capability. Exceptional substrate wetting ensures penetration and filling of fine fissures and tributary cracks. It has a convenient 2:1 (by vol.) mixing ratio and employs special colorants for contrasting component color.

Limitations: The recommended minimum substrate temperature during installation is approximately 50 deg F. (For installation temperatures down to 40 deg F or when very narrow cracks are encountered, consider use of KEMKO 068, LoVis IR. For Installation temperatures above approximately 90 deg F, consider use of KEMKO 030, HiAmb IR.) The minimum substrate temperature for cure is 40 deg F. The maximum in-service temperature should not exceed 20 deg F below the HDT in bonding 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 deg F in a dry place away from sunlight. Remixing of components may be required upon long-term storage.

Chemical Resistance: KEMKO 038 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.

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.

Surface Preparation: Concrete surfaces may be dry, damp or wet (no freestanding water) 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 038 is a two-component adhesive specifically designed for use 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 038 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'.*



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Typical Properties (1)

Property	Test Method	Value
Mix Ratio, A:B,	by vol by wt	2: 1 100:43
Color:	Part A Part B Mixed	VISUAL Clear amber Dark purple Dark purple
Weight per Gallon, lb:	Part A Part B Mixed	ASTM D 1475 9.4 8.1 9.0
Viscosity, cp:	Part A Part B Mixed	ASTM D 2393 400 150 350
Mixed Viscosity	@ 50° F, cp	ASTM D 2393 1400
Gel Time, 100 g, minutes:	@ 50° F @ 73° F	ASTM D 2471 35 14
Tensile Strength, psi	ASTM D 638	9000
Elongation at Break, %	ASTM D 638	2
Compressive Yield Strength, psi	ASTM D 695	16,000
Compressive Modulus, psi	ASTM D 695	400,000
Flexural Strength, psi	ASTM D 790	12,000
Flexural Modulus, psi	ASTM D 790	550,000
Heat Deflection Temp, deg F	ASTM D 648	140
Bond Strength, psi:	ASTM C 882	2000
2 days (moist cure)		2800
14 days (moist cure)		

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

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.

Handling and Toxicity: This bulletin does not accompany the product when sold. For hazard warnings, safe handling and first aid instructions, READ **CAREFULLY 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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KEMKO® and KIP System are trade names of ChemCo Systems, Inc.

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