

KEMKO® 077 Large Void IR

Low Exotherm Epoxy
Adhesive for Pressure
Injection Grouting

TYPE:	Two-component, solvent-free, epoxy resin / hardener.
PRIMARY USE:	Filling of wide cracks, gaps, voids and inadequate consolidations in concrete. Filling of cracks and delaminations in wood structures. Grouting of tanks and piles.
SUBSTRATES:	Concrete, masonry, stone, steel, wood and FRP in dry, damp and underwater applications.
MINIMUM TEMP:	Installation: 45° F (substrate temperature).
APPLICATIONS:	Cracks, voids, delaminations and annular spaces greater than 1/4" width; used in conjunction with pre-placed aggregate. Complies with ASTM C881, Grade 1. Very long useful mixed life even at high ambient temperatures. Extraordinary chemical and radiation resistance due to its aromatic amine cure.
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® 077, Large Void IR is a two-component, low viscosity, low exotherm, epoxy adhesive designed for pressure injection grouting using KIP System automatic meter, mix and dispense application equipment. Primary uses include filling wide cracks, gaps and delaminations in concrete, masonry, stone and steel; filling voids in porous and inadequately consolidated (honeycombed) concrete and grout; and, filling wide cracks and delaminations in wood structures. The product is designed for applications requiring material thickness in excess of 1/4 inch. When possible, use dry, pre-placed aggregate in conjunction with the adhesive. KEMKO 077 bonds to dry, damp and wet substrates. The components do not contain volatile organic compounds (VOC's).

FEATURES: KEMKO 077 has a long working life and a low exothermic reaction (minimal heat generation during cure) that make it suitable for applications where a relatively large mass of adhesive is employed. The low exotherm cure characteristics, particularly when used in conjunction with pre-placed aggregate, minimizes heat build-up and the attendant material shrinkage upon cooling. The low viscosity, long working life and exceptional substrate wetting allows deep penetration into structures where voids and honeycombs may be located and ensures the filling of fine tributary cracks. KEMKO 077 has a convenient 2:1 (by vol.) mixing ratio.

LIMITATIONS: The recommended minimum substrate temperature during installation is 45°F. The maximum in-service temperature should not exceed 20°F below the HDT in bonding applications subjected to substantial and sustained shear stresses that may cause creep. 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.

CHEMICAL AND RADIATION RESISTANCE: KEMKO 077 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 good resistance to some hydrocarbon solvents. Performance is a function of the specific chemical and concentration, ambient and solution temperatures, exposure times and housekeeping procedures. The radiation resistance of Kemko 077 is approximately an order of magnitude greater than a standard epoxy system. 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 amber.

SURFACE PREPARATION: Concrete surfaces may be dry, damp or wet 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 077 is a two-component adhesive designed specifically 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.

If mixed in bulk, make certain to properly proportion components and blend thoroughly using a Jiffy mixer blade attached to a low speed (350 - 750 rpm) electric or pneumatic drill. Proper mixing will take 2 - 3 minutes. For fluid, epoxy-rich mixtures continue mixing and slowly add aggregate to the mixing vessel. For less fluid, epoxy-lean mixtures, transfer the mixed binder into a mortar or plaster mixer, add aggregate (coarse first, fine last) and mix an additional 1-2 minutes.

INSTALLING: KEMKO 077 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."*

SELF-LEVELING AND PUMPABLE REPAIR MORTARS: The preferred aggregate for most applications is high silica sand (>85% SiO₂), washed, kiln-dried, graded and bagged. The sand particles should be round to sub-angular in shape. A good gradation for low void content is a 2:1 or 3:1 blend of #12 or 15 mesh and #70 or 90 mesh. If using a single sand fraction, a #20 or 30 mesh is recommended. Consult ChemCo Systems for recommendations on specialized mortar applications.



ChemCo Systems, Inc.
2800 Bay Road
Redwood City, CA 94063
Ph 650-261-3790 Fax 650-261-3799
www.chemcosystems.com

TYPICAL PROPERTIES (1)

PROPERTY		TEST METHOD	VALUE
MIX RATIO, A:B,	BY VOL		2 : 1
	BY WT		100 : 46
COLOR:	PART A	VISUAL	LIGHT AMBER
	PART B		AMBER
	MIXED		AMBER
WEIGHT PER GALLON, LB:	PART A	ASTM D 1475	9.5
	PART B		8.7
	MIXED		9.0
VISCOSITY, CP:	PART A	ASTM D 2393	550
	PART B		70
	MIXED		250
GEL TIME, 1 QUART, HOURS		ASTM D 2471	2.25
TENSILE STRENGTH, PSI		ASTM D 638	6300
ELONGATION AT BREAK, %		ASTM D 638	2.5
COMPRESSIVE YIELD STRENGTH, PSI		ASTM D 695	10,200
COMPRESSIVE MODULUS, PSI		ASTM D 695	275,000
FLEXURAL STRENGTH, PSI		ASTM D 790	8500
HARDNESS, SHORE D		ASTM D 2240	80
HEAT DEFLECTION TEMP, DEG F		ASTM D 648	108
SLANT SHEAR STRENGTH, PSI		AASHTO T-237	CEMENT MORTAR FAILURE (2)

(1) CURE SCHEDULE, 14 DAYS AT 73° ± 4° F AND TEST TEMPERATURE, 73° ± 4° F UNLESS OTHERWISE INDICATED.

(2) COMPRESSIVE STRENGTH OF CEMENT MORTAR, 4500 PSI.

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. **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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