Chemical/Radiation Resistant Epoxy Paste Adhesive for Bonding

KEMKO® 513 Chem/Rad Paste

Type:	Two-component, solvent-free, epoxy resin / hardener.
Primary Use:	Applications requiring resistance to chemicals and/or radiation, including: Bonding precast concrete segments to concrete or steel. Bonding rigid construction materials to themselves or each other. Filling spalls, gaps and cracks in concrete and masonry.
Substrates:	Concrete, masonry, stone (dry, damp and wet), steel and sealed wood. Suitable for horizontal surfaces and vertical, (downward); oriented holes
Minimum Temp:	Installation: 60° F, Cure: 50° F (substrate temperature).
Special Feature:	Adjustable working life and viscosity by blending with compatible products**.**
Color:	Opaque amber (un-pigmented).
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® 513, Chem/Rad Paste is a two-component, long working life, structural epoxy paste adhesive designed for applications requiring resistance to corrosive chemicals and/or radiation. It is suitable for use on horizontal, vertical and overhead surfaces. Primary uses include bonding pre-cast concrete segments to concrete or steel, bonding rigid construction materials to themselves or each other and filling spalls, gaps and cracks in concrete, masonry or stone. KEMKO 513 bonds to dry and damp substrates and can be applied up to 1/4 inch thick without sag or flow. The components do not contain volatile organic compounds (VOC's).

***Features*:** KEMKO 513 is formulated with chemical constituents that (unlike many other civil engineering epoxy resin products) have excellent chemical and radiation resistance. The product is unique in the degree of chemical and radiation resistance attained by an ambient temperature curing epoxy adhesive. KEMKO 513 may be extended with up to one volume of dried silica sand without loss of non-sag properties. Sand extension reduces the heat generated by the curing reaction and allows for the placement of thicker cross-sections of material when resistance to sag or flow is not an application requirement. The product has a convenient 2:1 (by vol.) mix ratio and similar component viscosities for ease of proportioning and mixing. Due to its long working life, the product is ideally suited for applications requiring significant installation time.

***Limitations*:** The recommended minimum substrate temperature during installation is 60 deg F. The minimum substrate temperature for cure is 50 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. Do not add solvents or otherwise thin this material.

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

***Shelf Life*:** One-year minimum in unopened, original containers when stored between 50 and 90 deg F in a dry place away from sunlight. Remixing of components may be required upon prolonged storage.

***Chemical Resistance*:** KEMKO 513 provides excellent resistance to water, detergent and salt solutions, alcoholic and carbonated beverages, gasoline, kerosene, crude, fuel and mineral oil, strong alkali and inorganic acids in concentrations up to 25% and to most organic acids. Exposure to organic acids, strong acids and alkali in higher concentrations, hot water (above 140° F), bleaches and other highly corrosive chemicals should be occasional and time limited. Resistance under these conditions should be determined by actual test before the product is applied. The product has limited resistance to hydrocarbon solvents. KEMKO 513 also Is resistant to radiation. For specific information on chemical resistance/exposure conditions and radiation resistance, contact a ChemCo Systems, Inc., technical representative.

***Color Selection*:** The standard color of the mixed components is dark amber (un-pigmented). Custom colors are available and may require minimum quantities and/or slightly higher cost.

***Surface Preparation*:** Concrete surfaces may be dry or damp but must be sound and free of all bond-inhibiting substances. Prepare 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 513 is a two-component adhesive. The resin to hardener (Part A:Part B) mix ratio is 2:1, by volume. Premix the individual components before drawing from bulk packaging. Wear safety glasses and clean neoprene rubber gloves when handling the material. Transfer the appropriate quantities of Part A and Part B into a mixing container. Use quantities that can be applied before the potlife of the material expires. 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. The preferred aggregate for extending the material is high silica content sand (>85% SiO2), washed, kiln-dried, graded and bagged. The sand particles should be round to sub angular in shape. Depending on the application, #16, 20 or 30 mesh size is recommended. Add aggregate to the combined Parts A and B and mix an additional 2 - 3 minutes

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Typical Properties (1)

Property		Test Method	Value
Mix Ratio, A:B,	by vol		2:1
	by wt		100:49
Color:	Part A	VISUAL	Amber
	Part B		Dark amber
	Mixed		Dark amber
Weight per Gallon, lb: (approx.)	Part A	ASTM D 1475	9.5
	Part B		9.2
	Mixed		9.4
Non-Sag Thickness, inches		ASTM D 2730	1/4
Gel Time, 225 g, minutes		ASTM D 2471	50
Open Time, 1/2" bead, hours		CHEMCO	4
Compressive Yield Strength, psi		ASTM D 695	8000
Compressive Modulus, psi		ASTM D 695	200,000
Flexural Strength, psi		ASTM D 790	6000
Flexural Modulus, psi		ASTM D 790	200,000
Heat Deflection Temp., deg F		ASTM D 648	115
Slant Shear Strength, dry, psi		AASHTO T-237	Cement mortar failure (2)
Compressive Yield Strength Development, psi:	@ 25 hours	ASTM D 695	1500
	40 hours		6400
	48 hours		7500
	14 days		8000

(1) Cure schedule, 14 days at 73° ± 4° F and test temperature, 73° ± 4° F.

(2) Cure schedule, 7 days at 73° ± 4° F and test temperature, 73° ± 4° F. Compressive strength of cement mortar, 4500 psi.

***Installing*:** For fairing, leveling and gap filling applications, apply mixed material on the prepared substrate using a margin or finishing trowel. When bonding two solid surfaces, apply mixed material to both surfaces to be mated. Establish contact between the surfaces using positive contact pressure. Maintain contact pressure until the adhesive has set. Remove excess material (squeeze-out) before the material sets. Pumping or caulking the material into place may fill wide cracks and voids.

***Clean up*:** Excess mixed product is best removed from the work area and tools before it hardens. Use of rags and solvents such as acetone or heavy-duty detergents facilitate cleaning. Cured material may be removed from equipment 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.

Publication Number: 6 EP KEM-142L, Chem/Rad Paste Publication Date: Nov. 1995