Epoxy Paste Adhesive For Dowel, Rebar and Bolt Grouting

KEMKO® 040 Dowel RegSET Grout

Type:	Two-component, solvent-free, epoxy resin / hardener.
Primary Use:	Anchoring bolts, dowels and rebar into concrete, masonry or stone. Bonding rigid construction materials to themselves or each other. Adhesive bonding of steel plates to concrete (external reinforcement).
Substrates:	Concrete, masonry, stone (dry, damp and wet), steel and sealed wood. Suitable for horizontal and Vertical (downward) oriented holes and surfaces.
Minimum Temp:	Installation: 60° F, Cure: 60° F (substrate temperature).
Special Feature:	Non-sag consistency with a convenient 1: 1, by volume mixing ratio.
ASTM C 881:	Meets the requirements for bonding agents in 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® 040, Dowel RegSET Grout is a two-component, structural, epoxy paste adhesive designed specifically for grouting bolts, dowels and rebar in concrete, masonry or stone at high ambient temperatures or at moderate temperatures when a long working life/cure cycle is desired (approx. 75 - 105 deg F). Its non-sag consistency allows for application in horizontal and overhead oriented holes and on vertical and overhead surfaces. Additional uses include general bonding of rigid construction materials, e.g., hardened concrete, masonry, steel and stone to themselves or each other and steel plate bonding (external reinforcement). KEMKO 040 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 high heat deflection temperature (145° F) of KEMKO 040 allows its use in applications requiring resistance to creep and stress relaxation, maintenance of mechanical properties at high ambient temperatures and high load bearing strength. Exceptional substrate wetting and water displacement properties ensure excellent adhesion under adverse application conditions, e.g., cold, wet concrete. KEMKO 040 employs a convenient 1: 1 (by vol.) mix ratio and contrasting component colors that provide a visual check of component proportioning and mixing efficiency. The product is non-sag in applied thickness up to 1/4 inch.

***Limitations*:** The recommended minimum substrate temperature during installation and cure is 60 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 2, 10 and 100 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 prolonged storage.

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

***Chemical Resistance*:** KEMKO 040 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, damp or wet (no free standing water) 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 040 is a two-component adhesive. The resin to hardener (Part A: Part B) mix ratio is 1:1, 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.

***Installing*:** To grout bolts, dowels and rebar, place the required amount of material' in the hole (approx. 40% of hole volume) using a caulking gun with a nozzle of appropriate length. Retract the nozzle tip as the hole fills. Insert the bar slowly while rotating to expel air. Secure the bar in the center of the hole. For general and steel plate bonding, apply mixed material with a trowel and spread to the specified bond line thickness on 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. Allow for adequate cure of the adhesive before the bonded section is returned to service. For additional information on adhesive bonding, see *ACI 503R, Chapter 7*, "Applying Epoxy Compounds."

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		1 : 1
	by wt		100 · 140
Color:	Part A	VISUAL	White
	Part B		Black
	Mixed		Concrete blue-gray
Weight per Gallon, lb:	Part A	ASTM D 1475	10.2
	Part B		14.1
	Mixed		12.5
Viscosity, poise:	Part A	ASTM D 2393	6500
	Part B		750
	Mixed		950
Non-Sag Thickness, inches		ASTM D 2730	1/4
Gel Time, 200 g, minutes:	@ 73° F	ASTM D 2471	120
	@ 105° F		30
Compressive Yield Strength, psi		ASTM D 695	10,400
Compressive Modulus, psi		ASTM D 695	490,000
Heat Deflection Temp, deg F		ASTM D 648	145
Slant Shear Strength, psi:		AASHTO T-237	
	dry substrate		Cement mortar failure (2)
	wet substrate		Cement mortar failure (2)

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

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

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 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- 2 (Moderate Hazard), Contains alkaline amines. Warning! Causes eye and skin irritation. 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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