

# KEMKO® 170 LP PASTE BONDER

BONDER - LONG POT LIFE, STRUCTURAL EPOXY ADHESIVE

NON-SAG PASTE

## TECHNICAL DATA SHEET

PRODUCT IS ONLY AVAILABLE TO KEMKO® APPLICATORS IN U.S., CANADA, AND INTERNATIONAL CUSTOMERS

KEMKO® 170 LP Paste is a 1:1 ratio, two-component, long pot life, low exotherm, structural epoxy adhesive paste designed for structural and non-structural application on horizontal, vertical, and overhead concrete surfaces and for pressure injection grouting using KIP™ (KEMKO® Injection Process) System automatic meter, mix, and dispensing application equipment. Primary uses include the structural repair of cracks, external steel plate reinforcement bonding, seismic upgrade K-Bracing historical brick buildings, filling rubble zone in brick buildings, filling of voids and gaps in pre-cast concrete elements, and anchoring bolts, dowels, and rebar into concrete, masonry, or stone. Its excellent physical properties allow its use in applications requiring resistance to creep and stress relaxation, maintenance of mechanical properties at high ambient temperatures and high load bearing strength. It bonds dissimilar materials to hardened concrete, masonry, and stone. It is designed for bonding and grouting applications requiring long set times at elevated temperatures. It also may be used as a surface seal in a pressure injection crack repair process. It bonds to dry and damp substrates; wet substrates must be free of standing water. No SiO<sub>2</sub> (silica sand fillers are used as a low-cost filler or to control viscosity) is used in the manufacturing of KEMKO® 170 LP. It contains no VOC's (volatile organic compounds).

- Meets - ASTM C881, Type I, II, IV and V, Grade 3, Class C and AASTHO M235, Type I, II, IV and V, Grade 3, Class C.
- Meets - ACI 548.15-20 Specification for Crack Repair by Epoxy Injection
- Meets - ACI 548.12-12 Specification for Bonding Hardened Concrete and Steel to Hardened Concrete

### FEATURES

KEMKO® 170 LP is convenient 1:1 ratio, long working time structural epoxy adhesive, 1/4 inch plus non-sag paste. 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, and high-load bearing strength. Exceptional substrate wetting and water displacement properties ensure excellent adhesion under adverse application conditions, e.g., cold, wet concrete.

- High chemical resistance
- Bonds to dry and damp substrates
- No sag at applied thickness of 1/4 inch, plus
- Environmentally safe- No VOC solvents

### TYPICAL USES

- Injection of wide cracks in hardened concrete
- Bonding hardened concrete to hardened concrete
- Segmental Bonding of Pre-Cast Elements, Bridges, Elevated Highways, Parking Structures, etc.
- Bonding dissimilar materials to hardened concrete.
- Suitable for bonding horizontal, vertical, and overhead bonding of anchor bolts, dowels, and rebar to concrete, masonry, and stone.
- Bonding external steel reinforcement to concrete, including plates and K-Bracing for lateral reinforcement.

### TECHNICAL DATA

7 days 73°F (23°C) unless otherwise indicated. Compressive strength of cement mortar 4,500 psi (13.0 MPa).

PHYSICAL PROPERTIES		TEST METHOD	VALUE
<b>Mix Ratio by Volume</b>			1:1
<b>Mix Ratio by Weight</b>			100:129
<b>Color</b>	<b>Part A Part B Mixed</b>	Visual	White Black Blue Gray
<b>Weight per Gallon</b>	<b>Part A Part B Mixed</b>	ASTM D1475	10.6 lbs. (4.8 kg) 13.5 lbs. (6.1 kg) 12.2 lbs. (5.5 kg)
<b>Viscosity Poise</b>	<b>Part A Part B Mixed</b>	ASTM D2393	7,700 4,800 6,700
<b>Non-Sag Thickness</b>		ASTM C881	1/4 Inch (6.3 mm)
<b>Gel Time</b>	<b>50°F (10°C) 73°F (23°C) 105°F (41°C)</b>	ASTM C881	100 Minutes 70 Minutes 30 Minutes
<b>Open Time</b>	<b>50°F (10°C) 73°F (23°C) 105°F (41°C)</b>	AASHTO T237	5 Hours 4 Hours 0.7 Hours
<b>Cure Time Hard Dry</b>	<b>50°F (10°C) 73°F (23°C) 105°F (41°C)</b>	ASTM C881	14 Hours 7 Hours 3 Hours
<b>Compressive Yield Strength</b>	<b>40°F (4°C) 60°F (15.6°C)</b>	ASTM D695	6,970 psi (48.1 MPa) 10,010 psi (69 MPa)



<b>Compressive Modulus</b>	<b>40°F (4°C)</b>	ASTM D695	371,900 psi (2,564 MPa)
	<b>60°F (15.6°C)</b>		290,000 psi (1,999 MPa)
<b>Flexural Strength</b>		ASTM D790	10,500 psi (72.4 MPa)
<b>Flexural Modulus</b>		ASTM D790	450,000 psi (3,102.6 MPa)
<b>Tensile Strength</b>		ASTM D638	6,900 psi (47.6 MPa)
<b>Tensile Elongation</b>		ASTM D638	2.5%
<b>Heat Deflection Temp</b>		ASTM D648	130°F (54°C)
<b>Bond Strength Diagonal Tension</b>	<b>2 Days, 40°F (4°C)</b>	ASTM C882	1,340 psi (9.2 MPa)
	<b>14 Days, 40°F (4°C)</b>		2,720 psi (18.8 MPa)
<b>Bond Strength Diagonal Tension</b>	<b>2 Days, 60°F (15.6°C)</b>	ASTM C882	1,320 psi (9.1 MPa)
	<b>14 Days, 60°F (15.6°C)</b>		2,650 psi (18.5 MPa)
<b>Bond Strength Diagonal Tension</b>	<b>14 Days, 75°F (25°C)</b>	ASTM C882	2,350 psi (16.2 MPa)
<b>Linear Shrinkage (in./in.) 48 Hours</b>		ASTM D2566	0.0003
<b>Water Absorption</b>		ASTM D570	0.4 %
<b>Bond Pull-Off Strength to Concrete</b>		ASTM C1583	400 psi (2.8 MPa)

## LIMITATIONS

The recommended minimum substrate temperature during installation and for cure is 50°F (10°C).

- For installation and cure temperatures down to 40°F (4°C) or when a faster cure is needed, use KEMKO® 171 SP.
- The maximum in-service temperature should be 20°F (10°C) below the HDT (Heat Deflection Temperature) in bonding applications subjected to substantial and sustained shear stresses that may cause creep.
- When bonding plastic concrete containing resinous admixtures, establish the suitability of the concrete mix
- Do not add solvents or otherwise thin this product.

## PACKAGING

Standard package sizes of Part A + Part B are 2, 10, and 100 gallon (7.6, 37.9 and 378.5 l.) kits. Cartridges available.

## SHELF LIFE AND SHIPPING

Three years minimum in unopened, original containers when stored between 50°F (10°C) and 90°F (32°C) in a dry place away from sunlight. Remixing of each component may be required upon prolonged storage.

## COLOR SELECTION

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

## CHEMICAL RESISTANCE

KEMKO® 170 LP Paste 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 technical representative.

## SURFACE PREPARATION

Substrate surfaces must be dry or damp, sound and free of all bond-inhibiting substances. Prepare surfaces in accordance with International Concrete Repair Institute, ICRI Guideline No. 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair, Concrete Surface Profile, CSP 2 to CSP 4. The concrete surfaces should have a minimum strength of 250 psi (1.72 MPa) in direct tension per ASTM C1583 Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method). Steel surfaces should be cleaned to "white metal" according to SSPC-SP 5/NACE No. 1 White Metal Blast Cleaning is a standard used for white metal blast cleaning put forth by the SSPC (Society for Protective Coatings) and NACE (National Association of Chemical Engineers) international standard.

## MIXING

KEMKO® 170 LP Paste 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 pot life 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

Pour mixed material onto the prepared substrate and spread to the specified coverage with a V-notch trowel, squeegee, or paint roller. For large areas, spray application of the material is recommended. When mating two solid surfaces, apply a bonding agent to both surfaces. Allow all coated substrate surfaces to rest for 5-10 minutes before pouring fresh concrete or mating with another surface. In plastic to hardened concrete bonding applications, the bond line should be at least 15 mils. Lightweight concrete may require a second coat of epoxy adhesive. In other bonding applications, bond line thickness is less critical but should



**BOLT, DOWEL, & REBAR STRUCTURAL EPOXY ADHESIVE EMBEDMENT****Estimate - Exact Number - No Wastage Included****Epoxy Needed per 100 Rebar Anchors in 0.25 Inch Larger Hole  
(DO NOT EXCEED THIS HOLE SIZE)**

Rebar #	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13
Rebar Diameter	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625
Hole Diameter	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750	1.875
Depth of Embedment	<b>Gallons Required per 100 Rebar Anchors</b>										
2 Inches	0.17	0.21	0.25	0.30	0.34	0.38	0.42	0.47	0.51	0.55	0.59
4 Inches	0.34	0.42	0.51	0.59	0.68	0.76	0.85	0.93	1.02	1.10	1.19
6 Inches	0.51	0.64	0.76	0.89	1.02	1.15	1.27	1.40	1.53	1.66	1.78
8 Inches	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04	2.21	2.38
10 Inches	0.85	1.06	1.27	1.49	1.70	1.91	2.12	2.34	2.55	2.76	2.97
12 Inches	1.02	1.27	1.53	1.78	2.04	2.29	2.55	2.80	3.06	3.31	3.57

**BOLT, DOWEL, & REBAR STRUCTURAL EPOXY ADHESIVE EMBEDMENT****Estimate - Exact Number - No Wastage Included****Epoxy Needed per 100 Rebar Anchors in 0.125 Inch Larger Hole  
(DO NOT EXCEED THIS HOLE SIZE)**

Rebar #	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13
Rebar Diameter	0.375	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625
Hole Diameter	0.500	0.625	0.750	0.875	1.000	1.125	1.250	1.375	1.500	1.625	1.750
Depth of Embedment	<b>Gallons Required per 100 Rebar Anchors</b>										
2 Inches	0.17	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.27	0.29
4 Inches	0.15	0.19	0.23	0.28	0.32	0.36	0.40	0.45	0.49	0.53	0.57
6 Inches	0.22	0.29	0.35	0.41	0.48	0.54	0.61	0.67	0.73	0.80	0.86
8 Inches	0.30	0.38	0.47	0.55	0.64	0.72	0.81	0.89	0.98	1.06	1.15
10 Inches	0.37	0.48	0.58	0.69	0.80	0.90	1.01	1.12	1.22	1.33	1.43
12 Inches	0.45	0.57	0.70	0.83	0.96	1.08	1.21	1.34	1.47	1.59	1.72



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be at least 4 mils above the peaks of the surface profile. For additional application information, see ACI 503R, Chapter 7, Applying Epoxy Compounds.

### AGGREGATE EXTENSION

One gallon of neat KEMKO® 170 LP Paste yields 231 cubic inches, which can be extended with uniform size sand that has been washed, kiln dried, and bagged.

- Add up to two gallons of aggregate to one gallon of epoxy for a pourable aggregate extension, which yields approximately 500 cubic inches. Use 20 – 60 US Sieve Mesh, aggregate should be round or tending toward round for best flowability.
- For troweling or patching use a flooring mortar tri-blended, with the larger aggregate being angular in shape.
- Broadcast 100 US Sieve Mesh aggregate that has been washed, dried, and bagged on patches or mortar repairs to minimize tracking of uncured material if accidentally stepped on.
- Note: ChemCo Systems can recommend pre-coated aggregate when it is required for safety reasons.

### SAFETY

This bulletin does not accompany the product when sold. For hazard warnings, safe handling, and first aid instructions, CAREFULLY READ THE 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 an 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. Keep away from heat and open flame.

### BIO-BASED RAW MATERIALS

KEMKO® 170 Part A and Part B contain non-food oleochemicals that are based on eco-friendly sustainable and renewable filler raw materials.

### CLEAN-UP / DISPOSAL

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.

### TECHNICAL SUPPORT

Additional information, technical assistance, and management services are also available from a ChemCo Systems Technical Consultant at [sales@chemcosystems.com](mailto:sales@chemcosystems.com) or 650-261-3790.

*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. This product is available only through KIP™ System (KEMKO® Injection Process) applicators.*



**Limited Warranty:** Please read all information in the General Guidelines, Technical Data Sheets, Guide Specifications and Safety Data Sheets (SDS) before applying material. These products are for professional use only and preferably applied by professionals who have prior experience with ChemCo Systems materials or have undergone training in application of ChemCo Systems materials. Published technical data and instructions are subject to change without notice. Contact your local ChemCo Systems representative or visit our website for current technical data, instructions, and project specific recommendations.

ChemCo Systems warrants its products to be free of manufacturing defects and that they will meet ChemCo Systems' current published physical properties. Seller's and manufacturer's sole responsibility shall be to replace that portion of the product which proves to be defective. There are no other warranties by ChemCo Systems of any nature whatsoever expressed or implied, including any warranty of merchantability or fitness for a particular purpose in connection with this product. ChemCo Systems shall not be liable for damages of any sort, including remote or consequential damages resulting from any claimed breach of any warranty whether expressed or implied. ChemCo Systems shall not be responsible for use of this product in a manner to infringe on any patent held by others. In addition, no warranty or guarantee is being issued with respect to appearance, color, fading, chalking, staining, shrinkage, peeling, normal wear and tear or improper application by the applicator. Damage caused by abuse, neglect and lack of proper maintenance, acts of nature and/or physical movement of the substrate or structural defects are also excluded from the limited warranty. ChemCo Systems reserves the right to conduct performance tests on any material claimed to be defective prior to any repairs by owner, general contractor, or applicator.

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