

# CCS™ LOW EXOTHERM IR

## INJECTION RESIN – LARGE VOID & WIDE CRACK STRUCTURAL EPOXY ADHESIVE PRESSURE INJECTION

### TECHNICAL DATA SHEET FOR PROFESSIONAL CONTRACTOR USE ONLY

#### DESCRIPTION

CCS™ Low Exotherm IR is a two-component, low viscosity, low exotherm (isothermic), structural epoxy adhesive specifically designed for large voids, wide cracks/delaminations, gaps, honeycombs in concrete, and grouting of steel plates for external reinforcement. For filling voids or cracks in excess of several inches to a cubic foot or greater it is recommended when possible, pre-pack the voids or wide cracks with uniformed size aggregate that has been washed, dried, bagged, and then pressure injected. Packing with aggregate will help increase the stiffness (compressive modulus) of CCS™ Low Exotherm IR. It bonds to dry, damp, wet, and underwater substrates. It contains no VOC's (volatile organic compounds).

- Meets - ASTM C881 and AASHTO M235, Type I, II, & IV, Grade 1, Class C (modified cure hours)
- Meets - ACI 548.15-20 Specification for Crack Repair by Epoxy Injection
- Meets - ICRI 210.1R Guide for Field Performance of Epoxy Injection of Concrete Cracks

#### FEATURES

CCS™ Low Exotherm IR has a long working life and a low exothermic (isothermic) reaction (minimal heat generation during cure) that makes 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 associated volumetric shrinkage, and the liquid material shrinkage upon cooling and curing.

#### TYPICAL USES

It has exceptional substrate wetting, allows deep penetration into structures where voids and honeycombs may be located, and ensures the filling of fine tributary cracks.

- It has a convenient 2:1 (by vol.) mixing ratio.
- It is designed for filling large voids associated with external reinforcement of steel plates.
- Grouting of load bearing voids under equipment.
- It contains no VOC's (volatile organic compounds).

#### APPLICATIONS

Cracks, voids, delaminations, and annular spaces greater than 1/4 inch. If desired, the modulus of elasticity can be improved with pre-placed aggregate.

#### LIMITATIONS

- The minimum substrate temperature for cure is 40°F (4.4°C).
- For installation in wider cracks ranging from 6 mils to 1/4 inch (0.15 mm to 6.35 mm) use CCS™ Standard IR.
- For installation in hairline cracks 2 mils (0.05 mm) and larger use CCS™ Low Viscosity IR
- For installation temperatures 35°F - 65°F (1.7°C - 18.3°C) or when very narrow cracks are encountered, consider using CCS™ Low Viscosity IR.
- For cracks that cannot be sealed on the backside consider using CCS™ Slump Pumping IR.

#### 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>			2:1
<b>Mix Ratio by Weight</b>			100:46
<b>Color</b>	<b>Part A</b> <b>Part B</b> <b>Mixed</b>	VISUAL	Light Amber Dark Purple Dark Purple
<b>Weight per Gallon</b>	<b>Part A</b> <b>Part B</b> <b>Mixed</b>	ASTM D1475	9.5 lbs. (4.3 kg) 8.7 lbs. (3.7 kg) 9.0 lbs. (4.1 kg)
<b>Viscosity</b>	<b>Part A</b> <b>Part B</b> <b>Mixed</b>	ASTM D2393	550 cp 70 cp 250 cp
<b>Gel Time, 1 quart</b>		ASTM D2471	2.25 hours
<b>Tensile Strength</b>		ASTM D638	6,300 psi (43.4 MPa)
<b>Elongation at Break</b>		ASTM D638	2.5%
<b>Compressive Yield Strength</b>		ASTM D695	10,200 psi (110.32 MPa)
<b>Compressive Modulus</b>		ASTM D695	275,000 psi (3,702.48 MPa)
<b>Flexural Strength</b>		ASTM D790	8,500 psi (58.6 MPa)
<b>Heat Deflection Temp</b>		ASTM D648	108°F
<b>Bond Strength (moisture)</b>	<b>2 days</b> <b>14 days</b>	ASTM C882	3,600 psi (24.82 MPa) 3,700 psi (25.51 MPa)
<b>Bond Pull-Off Strength to Concrete</b>		ASTM C1583	400 psi (2.8 MPa)

Note: The isothermic chemistry ASTM C881 and ASTM C882 results must be modified because of its extended cure times. Full cure occurs 28 days after placement at 75°F (25°C).



- For Installation temperatures above approximately 90°F (32.2°C), consider using CCS™ HiAmb IR.
- The maximum in-service temperature should be 20°F (10°C) 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 (6.35 mm) pre-pack with uniform size aggregate to dissipate heat generated during the cure process.
- Do not add solvents or otherwise thin this material.

## PACKAGING & COLORS

Standard kit sizes of Part A + Part B are 3, 15, and 150 gallon (11.36, 56.78 and 567.8 l.) kits.

The standard color of the mixed components is dark purple. For decorative application a clear amber color is available and may require minimum quantities and/ or slightly higher cost.

## CHEMICAL RESISTANCE

CCS™ Low Exotherm IR 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 for sealers used as epoxy dams. Prepare surfaces in accordance with ICRI (International Concrete Repair Institute) 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 Corrosion Engineers) international standard.

## MIXING

CCS™ Low Exotherm IR is a two-component adhesive. The resin to hardener (Part A: Part B) mix ratio is 2:1, by volume.

## INSTALLING

CCS™ Low Exotherm IR is installed in accordance with ChemCo Systems specific recommendations. For additional information on repair by pressure injection grouting, see ACI 503.7, Specification for Crack Repair by Epoxy Injection and ICRI 210.1R Guide for Verifying Field Performance of Epoxy Injection of Concrete Cracks. Minimum Temperature: Installation 40°F (4.4°C) Substrate Temperature.

## 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.

## SUBSTRATES

Concrete (dry, damp, wet, and underwater), masonry, stone, steel, wood, and CFRP.

## SHELF LIFE

Three years in unopened, original containers when stored between 60°F and 90°F (15.6°C and 32.2°C) in a dry place away from sunlight. Remixing of components may be required upon long-term storage. Avoid freezing temperatures.

## 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- 3 (Serious Hazard). Contains alkaline amines. Danger! Causes severe eye and skin burns. May cause allergic skin and respiratory reactions. 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.

## TECHNICAL SUPPORT

Additional information, technical assistance, and management services are also available from a ChemCo Systems Technical Representative 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.

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#### PROJECT NOTES



**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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