

CCS™ CONCENTRATED SULFURIC ACID RESISTANCE COATING AND SURFACING(CSA)



TECHNICAL DATA SHEET FOR PROFESSIONAL CONTRACTOR USE ONLY

DESCRIPTION

CCS™ Concentrated Sulfuric Acid Resistance (CSA) is a 2:1 mix ratio, two-component, low viscosity, solvent free, 100% solids, multi-functional phenol novolac epoxy designed for resistance to strong acids, bases, inorganic solvents, and organic solvents. (See Chemical Resistant Chart below). In addition, it provides outstanding elevated operating temperatures, thermal shock, freeze-thaw, impact, and abrasion resistance. It is a “thru system” which mean it can be used as a primer, body coat, binder for trowel down aggregate, receiving coat for broadcast aggregate, grout coat, and top coat. It can be used on properly prepared concrete and steel substrates. It can be used for indoor and outdoor application without embrittlement, prolonged exposure to sunlight will result in non-deleterious surface chalking. It contains no VOC’s (volatile organic compounds).

FEATURES

- CCS™ CSA will bond to properly prepared concrete and steel substrates.
- Concrete substrate can be dry and damp.
- Cures to a tough, blush-free, tile-like surface. In outdoor use, the coating is freeze-thaw resistant and will not embrittle, however it will acquire a chalky surface when exposed to sunlight.
- CCS™ CSA is a 100% solids product. It has a convenient 2:1 mixing ratio volume and can be applied by brush, roller, or with two-component spray equipment.
- CCS™ CSA is resistant to strong mineral acids, bases, as well as organic and inorganic solvents.

TYPICAL USES

- Crude Oil Storage Tanks
- Food and Beverage Processing Facilities (no direct contact)
- Internal Tank and Pipe Lining
- Mining and Milling Industries
- Petrochemical Plants
- Power Generating Plants
- Pulp and Paper Industry
- Steel Structures and Bridges
- Secondary Containment Floors and Walls
- Semi-Conductor Manufacturing and Etching
- Water and Wastewater Treatment Plants

COVERAGE RATE

Coating – Coverage per gallon (3.79 l.). Three coats at 8 to 10 mils (0.2 to 0.25 mm) each.

- Primer: 160 – 200 sq. ft. (14.9 – 18.6 sq.m)
 - Body Coat: 160 – 200 sq. ft. (14.9 – 18.6 sq.m)
 - Top Coat: 160 – 200 sq. ft. (14.9 – 18.6 sq.m)
- Note: For a more durable slip resistance topping add a #60 aluminum oxide as a sprinkle coat.

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 |
|---|--|-------------|--|
| Mix Ratio by Volume | | | 2:1 |
| Mix Ratio by Weight | | | 100:39 |
| Colors Tan-Gray or Tile-Red | Part A Part B Mixed | Visual | Pigmented Amber Pigment |
| Weight per Gallon | Part A Part B Mixed | ASTM D1475 | 10.3 lbs. (4.7 kg) 8.3 lbs. (3.8 kg) 9.7 lbs. (4.4 kg) |
| Viscosity Poise | Part A Part B Mixed | ASTM D2393 | 68 14 55 |
| Gel Time, 200 gr. | | ASTM D2471 | 40 Minutes |
| Thin Film Dry Time | | ASTM D1640 | 6 Hours |
| Thin Film Hard Dry Time | | ASTM D1640 | 16 Hours |
| Recoat Time | 60°F (16°C) 73°F (23°C) 90°F (32°C) | | 10 – 72 Hours 6 – 32 Hours 4 – 16 Hours |
| Tensile Strength | | ASTM D638 | 6,500 psi (44.8 MPa) |
| Tensile Elongation | | ASTM D638 | 2% |
| Bond Pull-Off Strength to Concrete | | ASTM C1583 | 300 psi (2.1 MPa) |
| Hardness, Shore D | | ASTM D2240 | 85 |
| Heat Deflection Temp | | ASTM D648 | 115°F (46°C) |

Broadcast - Total system 86 to 94 mils (2.2 to 2.4 mm)

- Primer: 160 – 200 sq. ft. (14.9 – 18.6 sq. m)
- Receiving Coat: 160 – 200 sq. ft. (14.9 – 18.6 sq. m.) and Broadcast US Sieve size 20 x 40 at 0.75 pounds per sq. ft.
- Grout Coat: 160-200 sq. ft. (14.9 - 18.6 sq. m.)
- Top Coat: 160 - 200 sq. ft. (14.9 - 18.6 sq. m.)

LIMITATIONS

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

- The maximum in-service temperature should not exceed 20°F (-7°C) below the HDT (Heat Deflection Temperature) in bonding applications subjected to substantial and sustained shear stresses that may cause creep.
- Do not add solvents or otherwise thin this product.

PACKAGING & COLORS

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

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

SHELF LIFE

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

CHEMICAL RESISTANCE

Please see on page 4 of this TDS.

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

CCS™ CSA 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 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. For other bonding applications, bond line thickness is less critical but should be at least 4 mils above the peaks of the surface profile. Additional application information, see ACI 503R, Applying Epoxy Compounds.

RECOAT WINDOW

For recoat times based on temperature, refer to chart on page 1.

- Higher temperatures will shorten the recoat window and lower temperatures will lengthen the recoat window.
- During the interim between placement and recoating, job site condition may result in contamination of the original surface, therefore acetone solvent wipes may be required.
- For heavier contamination, light screening or light sanding followed by removal of residue by vacuuming or acetone wipe (or both) may be required to remove the contamination.
- The minimum time to recoat a 100% solid coating is when the product to be recoated is tack free.
- The recoat temperature is between 50°F (10°C) and 100°F (38°C).

Consult a Technical Representative for additional information.

AGGREGATE EXTENSION

One gallon of neat CCS™ CSA 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- 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.

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 Representative at 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.

CHEMICAL RESISTANCE CHART

The chemical resistance of CCS™ CSA is influenced by many factors, including exposure to a mixture of chemicals, service temperature, and housekeeping practices. Successful engineering of the CCS™ CSA must also take into consideration such factors as substrate design, temperature cycling, and anticipated thermal and mechanical shock. Whenever possible, a sample should be tested under actual or simulated field conditions before a decision is made on the suitability of a given system. Users are urged to consult ChemCo Systems' technical service department for recommendations on the specific project. The following chart is a guide to the resistance properties of CCS™ CSA may stain without affecting its chemical resistance.

Key: **E = Excellent**
G = Good, not suitable for long term exposure
OS = Suitable for occasional spills followed by immediate clean up.
NR = Not Recommended

| ACIDS | | | |
|-------------------|----|-----------------|----|
| Acetic-5% | E | Lactic-10 % | E |
| Acetic-10% | E | Lactic-50 % | E |
| Acetic-Glacial | OS | Maleic-30 % | E |
| Benzoic-sat. (3%) | E | Malic-40 % | E |
| Benzoic-sat. (3%) | E | Nitric-10 % | E |
| Chromic-10 % | G | Nitric-25 % | G |
| Chromic-20 % | OS | Oleic | E |
| Citric-50 % | E | Oxalic-sat. | E |
| Cresylic | G | Perchloric-35 % | OS |
| Diglycolic | E | Phosphoric-50 % | G |
| Fatty | E | Phthalic | G |
| Fluoboric | OS | Phenol-5 % | E |
| Formic-10 % | G | Stearic | E |
| Heptanoic | E | Succinic-sat. | E |
| Hydrochloric-15 % | E | Sulfuric-25 % | E |
| Hydrochloric-37 % | G | Sulfuric-98 % | E |
| Hydrofluoric-5 % | G | Tannic-sat. | E |
| Hydrofluoric-10 % | OS | Tartaric-sat. | E |
| Hydrochlorous-5 % | G | | |

| ALKALIS, SALTS, SOLVENTS AND OTHER CHEMICALS | | | |
|---|----|---------------------|----|
| Acetone | OS | Hexane | E |
| Alcohol (methyl) | OS | Hydro Peroxide-10% | E |
| Alcohol (others) | G | JP5 Jet Fuel | E |
| Benzene | G | Juices-Fruit | E |
| Beer | E | Juices-Vegetable | E |
| Bromine | G | Lard | E |
| Brake Fluid-Oil Base | E | Linseed Oil | E |
| Brake Fluid-H. Duty | OS | Methyl Ethyl Ketone | OS |
| Butyl Acetate | OS | Methylene Chloride | NR |
| Carbon Tetrachloride | E | Milk | E |
| Castor Oil | E | Mineral Spirits | E |
| Coke | E | Naptha | E |
| Corn Oil | E | Oils-Cutting | E |
| Cyclohexane | OS | Oils-Mineral | E |
| Diacetone Alcohol | OS | Oils-Vegetable | E |
| Diesel Fuel | E | Perchlor | OS |
| Ethylene Glycol | E | Skydrol | G |
| Ether | G | Sugar | E |
| Formaldehyde | E | Toluene | OS |
| Fuel Oil | E | Trichlor | E |
| Gasoline | E | Turpentine | G |
| Gasohol | OS | Urea | E |
| G. P Floor Cleaners | E | Vinegar-Household | E |
| Germicidal Solutions | E | Water | E |
| Glycerine | E | Xylene | OS |



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.

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