

# CSI Microtopping HD (Heavy Duty)



## Technical Data Sheet

*Helix Color Systems is a premier line of specialty decorative concrete admixtures manufactured by ChemSystems Inc. Helix Color Systems is manufactured for the discriminating installer or designer who values service and quality. Specializing in custom colors, specialty products, and superior service, Helix Color Systems offers an innovative alternative in the decorative concrete industry.*

### Description

CSI Microtopping HD is a polymer-modified, two component, cement-based universal coating that can be applied over a variety of surfaces including concrete, masonry, metal, wood and tile. It consists of a unique vinyl – acrylic polymer liquid that is mixed with a proprietary cement and aggregate blend. CSI Microtopping HD is then applied in two or more coats by trowel, brush, roller, spray or squeegee to a typical thickness of 1/16" (16mm).

Designed for both exterior and interior use, CSI Microtopping HD restores and protects concrete surfaces from the consequences of exposure to water and salt intrusion, freeze thaw damage and carbonation. CSI Microtopping HD is an extremely durable coating that is "breathable" and allows for the transmission of inherent moisture vapor within concrete without blistering or delaminating. CSI Microtopping HD is available in a white base, as well as any color from the CSI Standard Color Selection color chart. CSI Microtopping HD Liquid tint Packs are available to achieve additional custom colors. CSI Microtopping HD is available in sanded and "un-sanded" smooth formulas.

**Recommended Equipment:** Heavy Duty 1/2" Drill and Mixing Blade, Mixing Containers, Muriatic acid (15% solution) Power Washer (2,500 psi) Crack router or Grinder with Masonry Cutting Blade Caulking Guns and Polyurethane sealant (sika flex 1-a or equal) spiked shoes Brooms, air Blowers Duct tape and Masking Paper Depending on desired finish - rectangular steel trowels, Pool Plaster trowel, Walking trowel acoustic texture rig or Hopper Gun; Mortex-type Dash Brush or rice Brush Brushes and rollers (1/2" and 3/16" nap).

### Product Benefits

- Provides a sprayable cementitious coating for exterior and interior concrete surfaces.
- Extraordinary adhesion and its ability to withstand prolonged pedestrian and vehicular traffic.
- Provides a tough water-retardant coating that substantially reduces water penetration, freeze-thaw scaling and concrete carbonation.
- It is a "breathable" coating that releases normal entrapped vapor without loosening or blistering.
- CSI Microtopping HD is available in two base colors – white and natural cement.
- CSI Microtopping HD Liquid Tint Packs are available to achieve additional colors.
- Recommended Thickness: 90 mils (3/32") (2.38 mm) up to 1/4 inch thick. Can be used to fill pop outs, voids, and damaged areas up to 1 inch deep before final application.

### Pre-Application

**1.** CSI utilizes the International Concrete repair Institute's (ICRI) Concrete surface Profile (CSP) standards for specifying finished surface roughness prior to applying CSI Microtopping HD. For proper adhesion, the surface must be a minimum #2 in accordance with ICRI's CSP chart. Contact the International Concrete repair Institute at [www.ICRI.org](http://www.ICRI.org), or CSI for more information on these surface profiles.

**2.** Remove all loose decking material, paint or other coatings. Remove all spalled concrete. In particular, be sure to remove all grease, oil, silicone coatings, or any other material on concrete that would prevent adhesion. Generally, concrete is to be etched with a 1:4 solution of Muriatic acid and water to remove alkali deposits or loose particles on the surface. After any acid etching procedure, always neutralize the surface with an alkaline soap and water rinse. Grinding, shot blasting or power scarifying are also acceptable methods. CAUTION: remove acid residue in accordance with safe-handling practice and in compliance with general regulations. Fill major depressions or cavities in concrete or deck coating with an appropriate repair mortar.

**3.** Concrete decks should have a control joint system worked out to meet all known deck-stress concentration points. CSI Microtopping HD can apply to wood sub floor or decks, as long as the deflection is controlled to inhibit cracking. For application to wood substrates, prepare the floor similar to application of floor tile. Use of cement board or a reinforced mortar bed is recommended. Do not apply CSI Microtopping HD directly to wood surfaces.

**4.** Control joints and moving/working cracks in the existing concrete are expected to transfer through the surface of the topping and create potential cracking problems. To isolate moving cracks, use a semi rigid crack repair system according to the kit instructions. In the case of existing joints or saw cuts, new joints or saw cuts must be placed through full depth through CSI Microtopping HD directly over the existing joints or saw cuts.

### Mixing Applications

**1.** Mix the CSI Microtopping HD Mix Liquid thoroughly with a wooden mixing stick prior to use.

**2.** If coloring CSI Microtopping HD on site – add one CSI Microtopping HD Liquid tint Pack to each 2.5-gallon container of liquid and mix thoroughly prior to adding 1 bag of powder component to the liquid to achieve desired architectural colors.

**3.** To make a full "unit" of CSI Microtopping HD, pour 5-gallons of CSI Microtopping HD liquid into a large mixing container. Start mixing with an electric mixing paddle-type mixing blade, or equal. **Gradually** add 2 bags of CSI Microtopping HD Base Coat into the mixing container. Never reverse the procedure and attempt to pour the liquid into the powder. For half batches, mix 1 bag of CSI Microtopping HD powder into 2.5-gallons of CSI Microtopping HD mix liquid.

**4.** After the material has been mixed free of any obvious lumps, continue to mix for at least **two more minutes** with the "Jiffy" blade submerged in the mix and held at an angle. You will observe that the mix gradually loses its grainy look and develops a creamy appearance. These two minutes of final mixing is essential to eliminate dry pockets of unmixed material that could produce pinholes and white efflorescing in the finished work.

**5.** Apply CSI Microtopping HD **immediately upon completion** of mixing. Working time of material at 70 °F (21 °C - 24 °C) is about 30 minutes. Mix no more material than can be applied in that time. Discard any material that starts to set up in the mixing container. Do not attempt to re-temper material. **Keep material stirred to avoid aggregate settling in container during use.**

**6.** Slightly dampen any concrete and masonry surfaces with water before applying the bond coat. Do not dampen to a point where surfaces are shiny wet—only damp. Non-porous surfaces such as metal, tile, etc. do not require dampening.

**7.** Trowel or squeegee the first coat over the concrete for best results. Be sure to work the material into porous concrete surfaces. To produce a smoother, flatter surface on concrete that has surface irregularities, pits, and voids, troweling is recommended. On large areas, it is recommended to squeegee the first coat of material for fastest production. Use an inexpensive brush to apply bond coat material in corners and cove the material up at walls. Cure time for the first coat is 2-4 hours or until no material comes up when you press your foot down on the deck and swivel it under weight.

**8.** Follow the above steps when applying the second coat. The second coat is designed to provide a uniform, slip-resistant, decorative finish where desired. A variety of functional or decorative texture finishes may be applied, including, but not limited to smooth, knock down, broom, or float finish.

**9.** If a smooth finish is desired, similar to hard trowel concrete, a third coat, utilizing CSI Microtopping HD Smooth, can be applied. The same mixing and application guidelines as noted above for the sanded CSI Microtopping HD should be followed for the "un-sanded" Smooth material.

**10.** After final coat has been applied, allow to cure (24) hours before staining or sealing.

**11.** Always install a minimum 4' by 4' test area or job site mock up for owner approval of acceptable color, texture, finish adhesion and any other critical requirements prior to proceeding with the installation. Verify that the most current versions of product technical data sheets (PTDS), material safety data sheets (MSDS), and installation guidelines (IG) are being utilized for project submittals and application reference. Protect materials at all times from excessive heat and cold. Regularly check wet film thickness with mil gauge and monitor product consumption to ensure correct application thicknesses are obtained. The proper application of this product is the sole responsibility of the installer. Job site visits by CSI representatives are only for the purpose of making recommendations. Measure surface and ambient temperatures to ensure that material is only applied when temperatures are 50 °F (4.5 °C) and rising during placement and cure time.

## Stain and Dye Application

- Once desired finish is achieved, material should be left to cure for 24 hours prior to staining.
- CSI Microtopping HD may not produce colors representative of the stain color charts. The combination of polymers and cement in CSI Microtopping HD may cause stains to react differently.
- Always test or sample stains in an inconspicuous area to assure desired color effects are achieved.
- Sanding the top finish coat with a 100 to 150-grit sanding screen may allow better stain penetration and adhesion, as well as better sealer adhesion.
- For best results, stain CSI Microtopping HD within 72 hours of application. Waiting longer than 72 hours may require additional sanding prior to stain application.

## Surface Protection and Maintenance

- CSI offers a full range of high-end sealer systems to ensure the long lasting protection and enhanced color of the final project. The interior system consists of two coats of a durable base coat sealer, followed by three coats of a special high-solids top coat maintenance sealer. The exterior system consists of two thin coats of a durable base coat sealer.
- Allow CSI Microtopping HD to fully cure before sealing, minimum 24 hours. Sanding the top finish coat with a 100- to 150-grit sanding screen may allow better adhesion of the sealer. After sufficient curing, if water gets on the surface before sealing, a white film can result. While this film won't affect the bond or durability, the film should be cleaned off before sealing with a mild acid or detergent.
- All decorative concrete installations should be maintained on a routine basis with the use of CSI Sealers and maintenance products to ensure the preservation of a high-quality, long-lasting surface. Maintenance schedules will vary depending on a number of factors, including volume and intensity of traffic, UV light exposure, geographical location and weather conditions. Resealing will be required periodically, depending on the amount of foot traffic. As with any surface treatment, the lifetime of this product is dependent on the care it is given. The use of a qualified flooring maintenance contractor is recommended for resealing, especially in commercial applications

## Limitations and Precautions

- CSI Microtopping HD will stick to almost everything and is much easier to clean off when it is still wet. Otherwise, sanding, grinding or chipping may be required to remove unwanted material.
- Never mix water with CSI Microtopping HD when thinning is required – use CSI Microtopping HD Liquid only.
- If CSI Microtopping HD has started to set up, do not attempt to remix.
- When masking off for protection or grout lines, use duct tape or filament tape for best results. Remove while material is still wet for best results.
- When applying CSI Microtopping HD in full sun, on a hot day, or in high winds, expect greatly reduced working time. Set extending admixtures can be used to extend the working life of the material.
- Do not apply CSI Microtopping HD at temperatures below 50 °F or when such temperatures may be expected during its drying and curing time.
- CSI Microtopping HD is never to be applied over joints, moving or working cracks, cracks greater than 1/16", or any untreated or unprepared surfaces.

## Shelf Life and Storage

CSI Microtopping HD products have a shelf life of one year.

**Liquid:** CSI Microtopping HD Liquid should be stored indoors and above freezing temperatures. Do not allow liquid to freeze. If liquid freezes, discard.

**Powder:** CSI Microtopping HD Powders should be stored indoors and away from moisture.

## Coverage Rate and Drying Times

Actual coverage may vary depending on color choice, application method, and other local conditions.

- CSI Microtopping HD Sanded Base- 2.5 gallons of liquid and 1 bag yields approx. 200 – 250 sq/ft
- CSI Microtopping HD Smooth Finish - 2.5 gallons of liquid and 1 bag yields approx. 400- 500 sq/ft

## Package Sizes

CSI Microtopping HD Liquid is available in 1, 5 and 55 gallon units

CSI Microtopping HD Powder is available in 50 lb bags

## Technical Data

Please refer to the corresponding MSDS for hazard-related information.

**Working Life**.....15-60 minutes (temperature dependent)

**Recoat Time**.....1-4 hours or when dry

**Open to Traffic**.....12 – 24 hours

**Adhesion** ASTM C-882, Type 1.....515 psi

**Tensile Strength** ASTM C190.....450 psi

**Compressive Strength** ASTM C109.....2,440 psi

**Water Vapor Permeability** ASTM E96.....1.96 perms/in

**Water Absorption** Weight gain of 4" coated concrete cube after 21 days water immersion (CMCH)..... <2%

**Freeze-Thaw Resistance – 50 Cycles** .....no scaling/peeling/flaking (Concrete cylinders immersed for 8 hrs in coated salt water solution followed by 16 hrs. of freezing).

**Weathering** ASTM G23.....No visible degradation (Method I Procedure, 60 cycles)

**Resistance to Wind Driven Rain**

Fed. Spec. TT-C-558..... (8hrs)

Fed. Spec. TT-C-0035 ..... (24hrs)

At 5" water pressure and 60 gal/hr water flow, no water or dampness noted on back of test panels.

**Resistance to Hydrocarbon Substances** .....ASTM D1308

(Spot Open Test) No softening or attack – after 21 days repeated re-application of gasoline, SAE-10 motor oil and jet fuel.

**Impact Resistance** MIL-PRF-3134, Para.4.7.3

2 lb steel ball dropped from 8' height onto coated

steel plate .....No cracking or detachment

**Flammable Properties** ASTM E84 .....Flame spread – 4

.....Smoke Density – 0

**Fire Resistance** UL790.....Complies as Class A

**Potable Water Compatibility** .....NSF/ANSI Compliant

## Product Handling

For complete instructions on handling and use, consult the corresponding Material Safety Data Sheet before using product.

## Warranty

CSI Microtopping HD, a proprietary product, is warranted to be of uniform quality within manufacturing tolerances. Since control is not exercised over its use, no warranty, expressed or implied, is made as to the effects of such use. Seller's and manufacturer's obligation under this warranty shall be limited to refunding the purchase price of that portion of the material proven to be defective. The user assumes all other risks and liabilities resulting from use of this product. If you have any questions, please contact ChemSystems, Inc.



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\*For complete information on all CSI products—including product information catalogs, product brochures, color charts, technical specifications, sales aids and more—contact ChemSystems, Inc.

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