CSI Heavy-Duty Color Hardener

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 Heavy Duty Color Hardener is a specially formulated metallic floor hardener comprised of 16% silicon carbide metallic aggregate, a specialty blend of Portland Cement, and other performance additives. It is available in concrete gray or any of our standard colors. It is designed for use on gray or colored floors requiring a dense, tough and flat floor with high impact and abrasion conditions.

CSI Heavy-Duty Color Hardener is an excellent hardener for surfaces which require increased impact resistance, such as parking structures, streets, warehouses, loading docks, shipping/receiving areas, distribution centers, shopping centers, amusement parks, convention centers and sports centers. CSI Heavy-Duty Color Hardener is an excellent hardener for concrete that has been properly air-entrained, surfaces in cold, harsh climates exposed to freeze-thaw cycles.

Product Benefits

- CSI Heavy-Duty Color Hardener increases abrasion resistance and surface density and reduces porosity. Proper use of CSI Heavy-Duty Color Hardener can increase surface abrasion by 5 to 8 times that of standard concrete.
- Used in conjunction with CSI Release Powder, CSI Heavy-Duty Color Hardener is the preferred product for creating vibrant colors for imprinted/ textured concrete.
- CSI Heavy-Duty Color Hardener is an excellent choice for the following types of projects:
  - Colored, imprinted concrete flatwork and a variety of architectural concrete treatments that would benefit from improved pattern transfer and increased abrasion resistance.
  - Surfaces which require increased abrasion and impact resistance, such as street paving, warehouses, shipping/receiving areas and distribution centers.
  - Interior and exterior surfaces exposed to heavy daily wear and high-impact use.
  - When concrete has been properly air-entrained, surfaces in cold, harsh climates exposed to freeze-thaw cycles.
- With its blend of select and gradated aggregates, architectural cements, and plasticizers, CSI Heavy-Duty Color Hardener creates surfaces that are substantially harder and more wear-resistant than concrete not treated with heavy-duty color hardener.
- CSI Heavy-Duty Color Hardener is available in many standard colors and is an excellent choice for coloring concrete in order to achieve lighter colors and/or more brilliant colors.
- Light-reflective surfaces can be achieved through the use of a selection of white or light CSI Heavy-Duty Color Hardener.
- To produce enhanced and richer effects, white-based CSI Heavy-Duty Color Hardener can be excellent base choices for the application of CSI stains and dyes.
- Due to extensive quality control measures in product manufacturing, CSI Heavy-Duty Color Hardener is designed to produce uniformity of color without color drifts. In addition, use of heavy-duty color hardener does not risk day-to-day variances experienced in ready mixed integral coloring.

Pre-Application

1. Good subgrade preparation is essential. Subgrade must be well drained. To create uniform load-bearing characteristics and to reduce cracking, subgrade should be graded at a uniform thickness. Subgrade should be moist, completely consolidated, and free of frost. The subgrade should be dampened with water in advance of concreting. Concrete should not be placed over freestanding water or over areas that are muddy, frozen or soft.

2. Good concrete mix design is essential. Concrete should contain a minimum of 5-1/2 sacks of cement per cubic yard of concrete. All aggregate must be nonreactive. Water content should be at minimum, and the slump should not exceed four inches. A normal or retarded-set, water-reducing admixture may be used. An air-entraining admixture complying with ASTM C260 is recommended in all concrete flatwork that will be subject to freeze/thaw cycles. The concrete mix must not contain any admixture or additive that contains calcium chloride. During cold weather, a non-chloride accelerator may be used. No high-range water reducing admixtures (superplasticizers) should be added unless CSI is consulted. Mixes containing fly ash may be more difficult to finish.

3. Good concrete pouring practices are essential. Weather conditions should be considered during application. Follow ACI standards for installation, especially in extremely hot or cold weather conditions. Concrete mix should be controlled to provide good batch-to-batch uniformity. Concrete should be placed and spread so that it completely fills space inside the forms. Concrete should be consolidated by vibrating to create a suitable surface for finishing. If tamping is done, it should be kept to a minimum and concrete closest to the forms should be spaded. Before the appearance of bleed water, screed and wood-float the surface to the finished grade.

4. Before applying CSI Heavy-Duty Color Hardener a job site sample—using the specified mix design, tools and construction techniques—is recommended. If in doubt about application methods, consult ChemSystems, Inc.

5. It is recommended that a pre-site meeting take place to include the proper authorities and to ensure site conditions are met.

Application

1. Once concrete reaches the point when no bleed water remains on the surface, CSI Heavy-Duty Color Hardener should be evenly hand-broadcast or mechanically applied on the surface.

2. CSI Heavy-Duty Color Hardener is usually provided in two shakes, with two-thirds of the product being applied in the first shake and one-third of the product being applied in the second shake (while also holding back a small amount for touch-up work).

3. After the first shake has been uniformly applied and has absorbed water from the slab, the surface is floated. Wood floats are recommended during this first application.

4. Apply the second shake perpendicular to the first application in a uniform manner. Magnesium or fiberglass floats may be used after the second application, providing all bleed water has left the surface.

5. Saw cuts should be made as soon as possible without disturbing the joint edges.

6. Care should be taken to prevent hard-steel trowel burns, especially at tooled joints and edges.

7. In dry, hot or windy conditions, the use of an evaporation retardant/finishing aid may be used.

8. Alternative Application for Large Areas: A mechanical spreader and a powertroweling machine may be used. The mechanical spreader, equipped with an adjustable flow, should spread between one-half pound to one pound of hardener per square foot. The power-troweling machine, equipped with float blades, should work the hardener shakes into the surface of the plastic concrete. Float blades should be removed during final troweling.

Application to Vertical Surfaces

1. CSI Heavy-Duty Color Hardener may be used to finish vertical surfaces such as curbs or the faces of step risers, but the product is not designed for use on large areas of vertical surfaces.

2. A "plaster mix" of CSI Heavy-Duty Color Hardener may be used when doing steps or other vertical surfaces. To create this mix during the final set stage of the concrete, add only enough water , or a 1:1 mix of water and CSI Concrete Bonder, to CSI Heavy-Duty Color Hardener to achieve a workable consistency. Then apply the "plaster mix" to the vertical surface while the concrete is fresh and finish as normal.

Curing Color Hardened Concrete

Choose from a variety of CSI cures appropriate to the project requirements. It is recommended to use a clear or colored curing compound that meets ASTM C309 or ASTM 1315 when curing CSI Heavy-Duty Color Hardener.

Surface Protection and Maintenance

- ChemSystems, Inc. offers a full range of high-end sealer systems for colored and stained surfaces to ensure the long lasting protection and enhanced color of the final project. These systems consist of two coats with a durable base coat sealer, followed by three coats of a special high-solids top coat high performance solvent or water-based maintenance sealer.
- Allow CSI Heavy-Duty Color Hardener to fully cure before sealing, 28 days per ASTM.
- All decorative concrete installations should be maintained on a routine basis with the use of CSI 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

- Inconsistencies in job site conditions, finishing practices and curing methods may produce variations in the color of the finished product.
- All aggregates in the concrete substrate must be non-reactive.
- When using CSI Heavy-Duty Color Hardener on air entrained concrete, air content should not exceed 4%.
- Application of product must follow minimum rates under the coverage guide or else slip and abrasion resistance will be compromised.
- To achieve maximum slip resistance (i.e. ramps, wet areas, etc.), expose aggregates in CSI Heavy-Duty Color Hardener to a light sandblast or acid wash.
- As the color-hardened surface is exposed to normal wear, darker colored aggregates may become more apparent on the surface. In architectural concrete applications, this wear is more common when lighter colors are used and is considered desirable. However, if this kind of wear is not desired, it is recommended that darker colors be used.

Shelf Life and Storage

CSI Heavy-Duty Color Hardener has a 1 year shelf life if stored inside, in a dry and temperature controlled environment, in an unopened original container.

Coverage Rate and Drying Times

Coverage rates may vary depending on color choice, application method, and other local conditions.

- *Dark Colors:* 0.6 pound per sq. ft. minimum
- *Medium Colors:* 0.7-0.8 pound per sq. ft. minimum
- *Light Colors:* 0.9-1.0 pound per sq. ft. minimum

Package Sizes

CSI Heavy-Duty Color Hardener is available in 60-pound plastic-lined bags. Also available in 60-pound pails, at an additional charge.

Applicable Standards

- Contributes toward Leeds Qualification depending on color – SS Credit 7.1: Heat Island Effect: Non-Roof
- The synthetic iron oxide pigments used in CSI Heavy-Duty Color Hardener meet or exceed ATSM C979 and produce brilliant, streak-free, non-fading surfaces.

Technical Data

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

Product Handling

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

Specifications

For specification assistance for CSI Heavy-Duty Color Hardener and other CSI products, please contact ChemSystems, Inc.

Warranty

CSI Heavy-Duty Color Hardener 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.