TECHNICAL DATA SHEET

GREENUMBRELLA®

ICESTART

Start High-Performance Concrete

Green Umbrella® IceStart™ is a unique curing agent used to ensure an adequately cured floor and is the first of a two-part treatment GreenIce Cure™ system. Using a treatment & trowel process to achieve high-performance floors. IceStart reduces subsurface lateral micro-cracks, mud & shrinkage cracks, cat faces and is formulated to ease finishing by reducing drag on concrete. IceStart provides increased finishability in hot weather without extending the set time in cold weather. IceStart minimizes false sets. Used on dry shake, it will finish as if conventional concrete. Control joints will have a sharper cut that will be shallower. From the Start, you will have the treatment for a high-performance architectural concrete floor.

BASIC USE

Green Umbrella IceStart is a *Surface Applied SCM (Supplementary Cementitious Material) Admixture* that is the first treatment of a *Two-part Surface Applied Admixture Cure and Densification System*, called GreenIce Cure System™ with GUnanoInside™ technology— that is designed for Interior or Exterior concrete. Used only *@EarlyAge* concrete staging, it is a chemical and mechanical process applied at time of concrete placement and power troweling. IceStart is a unique, non-film-forming, no VOC cure. Working as a finishing aid that provides initial cure protection that also ensures a final cured floor with many benefits conventionally seen only in polished concrete floors and the highest abrasion-resistant, high-performance concrete floors. It is additionally providing an unconventional advancement in concrete staging.

GREENUMBRELLA®

ICESTOP

Stop the Damage @EarlyAge

Green Umbrella® IceStop™ is applied on the surface as the second part of the GreenIce Cure™ system. Working as a fixative, IceStop is sprayed on concrete once power trowels are finished. It creates a protected slab while curing, extending protection during construction. With specially designed properties, this product will densify and add abrasion resistance while repelling water. IceStop increases the strength and longevity of any concrete surface whether covered or exposed in an Architectural Concrete setting. Gloss readings average in the 40s. Start with a high-performance floor and Stop the damage *@EarlyAge™*.

BASIC USE

Green Umbrella IceStop is a *Hydrophobic Fixative for Surface Applied Admixture Cure* that is the second treatment of a *Two-part Surface Applied Admixture Cure and Densification System*, GreenIce Cure™, with GUnanoInside™ technology— that is designed for Interior, or Exterior concrete—applied after the power trowel concrete finishing is complete. IceStop crosslinks to IceStart cure to form surface and deep subsurface benefits conventionally seen only in polished concrete floors, the highest abrasion-resistant, and high-performance concrete floors. Used *@EarlyAge* staging reduces mobilizations by removing the need for monitoring water cure, chemical cure applications, chemical cure removal, and the need for concrete densifiers and hardeners.

GREENUMBRELLA®

ICESTART

- Concrete Cure
- Advance The Construction Stage
- Finishing Aid
- Eliminate Bond Issues For Flooring
- Minimizes False Set
- Minimizes Crusting
- Closes Capillaries to Water & Vapor Transmission
- No Free Water Creating Denser Concrete
- Surface Applied Admixture
- Neutral pH Calm Surface Reaction
- Increase ACI 302 Window of Finishability
- Mechanical and Chemical Densification
- Compression Dewatering of Slab
- GreenIce Cure™ penetration >25mm (>0.98”).
- Moisture retention evaporation control
- Prevents Rapid Surface Moisture Loss
- Passes ASTM C156 And E96 Parameters For Curing
- Maximum Moisture Retention for Cement Hydration
- Extended Workability Of Slab Surface
- Provides The Ability To Correct Errors In Finishing
- Reduces Drag On Trowel Blades Decreasing Sub-Surface Parallel Micro-Fracturing
- Significantly Reduces Surface Crazing
- Can Be Used In Conjunction With Trap-Rock Or Dry-Shake Hardeners To Ease Their Application
- Densify at placement, no return, no remobilization
- Hard Troweled Surface, Without Over-Troweling
- Ease Of Finishing, Eliminates False Set
- Reduces Drag On The Concrete
- Reduces Subsurface Lateral Micro Cracking
- Removes Cat Faces
- Increases Window of finish-ability In Hot Weather
- Does Not Extend Set Times In Cold Weather
- No More Chasing A Slab That Is Quick Setting
- Collateral Best Practice provides Exceptional Finish And Strength With Superior Fl And Ff Results
- Reduces Plastic Shrinkage Cracks

GREENUMBRELLA®

ICESTOP

- Unlike a Densifier—it Crosslinks to IceStart Cure
- A Hardener Treatment
- Initial Cure protection for Inclimate Weather
- High Water Repellence
- Natural Look
- Eliminates Off-gassing
- Eliminates Concrete Off-Dusting
- Reduces Slab Curl
- Impermeable
- E-96 Perm Test Exceeds Flooring Requirements.
- Retains Water Inside The Slab For Prolonged, Slow Curing Of Concrete
- More effective than 309 cure
- Stripping Not Required Prior To Placement Of Coverings
- Applied @ Time of placement
- Does Not Contribute To ASR
- Almost No Moisture Loss
- Moisture Mitigated Floor
- Concrete densification
- Monogamous Ionic Connection
- Increases Surface Density And Reduces Permeability
- Create Denser Concrete For Enhanced Insulation Qualities And Improves Energy Performance
- Increase In Abrasion Resistance
- Abrasion Resistance To Wear Characteristics Compared To Trap Rock Or Dry-Shake Hardeners
- Reduces Dusting reduces Long-Term Maintenance Costs By Improving The Surface Cap
- Increased Life-Cycle
- Attain A Highly Refined Surface Finish
- Gloss Readings 40-60
- Increased Light Reflectivity (Ave. 45 On 4500 Psi Mix)
- Naturally Darkens Slab

TECHNICAL INFORMATION

GREENUMBRELLA®
ICESTART ▶

Appearance: Purple
Odor: Fragrant smell
pH Level: 6.5-8.5
VOC(grams/Liter): <50
Freezing Point: 32° F
Film Forming: Non
Active Ingredients: 100%
Shelf Life: 18 months
Evaporation Rate: >1.0
Packaging: 5 Gal Pail, 55 Gal Drum, 275 Gal Tote

GREENUMBRELLA®
ICESTOP ■

Appearance: Orange
Odor: Fragrant smell
pH Level: 11.6
Evaporation Rate: 1.0
Freezing Point: 32° F
Foot Traffic: 1 hour
Film Forming: Non
Active Ingredients: 100%
Shelf Life: 18 months
VOC(grams/Liter): <50
Wheeled Traffic: 6 hours
Packaging: 5 Gal Pail, 55 Gal Drum, 275 Gal Tote

Safety Data Sheets available at www.GreenIceCure.com

ARCHITECTURAL APPLICATIONS

Ideal for interior or exterior, horizontal Demanding Applications; warehouse/distribution centers, food service, parking decks, garages, hospitals, or similar & specifically for dye and pigment Decorative Color Applications; retail spaces & showrooms, restaurants, business offices, lobby areas, museums, municipalities, airports, hospitals, schools, fire-stations, or most concrete surfaces

MANUFACTURE & PRODUCT CONSULTING

Green Umbrella
20 Jetview Drive Rochester, NY 14624
(844) 200-7336

Website & Documents Available At:
GreenUmbrellaSystems.com
CutSheet, Application Sheet, Feature Brochure, Technical Data Sheet, Safety Data Sheet

Product Consulting Email:
Info@GreenUmbrellaSystems.com

ESTIMATING

Container Size:
IceStart or IceStop
5 gallon (18.9L) - 43 lbs. (19.5 kgs)
55 gallon (208L) - 469.1 lb (212.8 kg)
275 gallons (1,041 L) - 2,345.6 lb (1,064 kg)

Each Green Umbrella IceStart or IceStop container is properly labeled with information, including the product name, description, batch number, and application instructions.

DILUTION

IceStart & IceStop
None.
R.T.U. (Ready-To-Use)
S.O.L.O. (Spray-on-leave-on)

COVERAGE RATES

IceStart is applied 3x in the finishing process. It has a net application rate of 1200 SF per gallon and should not cover less than or more than this amount.

IceStop has an average coverage rate of 400 SF per gallon and should not cover less than this amount.

SPECIFICATIONS

GreenUmbrella® CUTSPEC™
Simplified Product Spec

EarlyAge Conventional Concrete:

GreenIce Cure: IceStart & IceStop is a concrete cure system designed for Interior or Exterior concrete with a polish concrete sheen—by Green Umbrella® of Rochester, NY (844) 200-7336 R.T.U. (Ready to Use), S.O.L.O. (Spray-On, Leave-On). Green Umbrella IceStart™ is a *Surface Applied Supplementary Cementitious Material Admixture, the first treatment of a two-part Surface Applied Admixture Cure and Densification System*. Used only on *@EarlyAge* concrete, IceStart™ is a chemical and mechanical process applied during concrete placement and power troweling. 1) Apply IceStart™ during screeding or bull-floating, prior to breaking open the substrate using pans, @1200 SF per gallon. 2) Next, spray IceStart™ onto the slab in two equal applications of 1200 SF per gallon, during initial panning and initial troweling for three total applications with a net coverage rate of 400 SF per gallon. Use a low-pressure, high-volume manual or battery-powered commercial sprayer. Alternatively, a screed mounted unit and the retardant tanks of ride-on power trowels may be used. Always apply sufficient material for total net coverage of 400 SF per gallon. 3) Work into the surface following second and third applications during power troweling. 4) After the final application of IceStart™, trowel burn as desired. When the concrete is hard enough for walking, apply Green Umbrella IceStop™, a *Hydrophobic Fixative for Surface Applied Admixture Cure, the second treatment of a two-part Surface Applied Admixture Cure* 5) A single S.O.L.O. application of 400 SF per gallon. Keep wet for a dwell time of 30 minutes. Allow to air dry. No cure & seal, concrete hardener, or wet cure is needed. Apply IceStart™ and IceStop™ only when temperatures are 40°F and rising, not exceeding 90°F.

For certified installers and comprehensive manufacturer instructions, visit www.GreenUmbrellaSystems.com

EarlyAge Concrete To Be Abrasively Trowel Polished:

GreenIce Cure & Profile is a complete *@EarlyAge* concrete cure and polish system designed for Interior concrete—by Green Umbrella® of Rochester, NY (844) 200-7336 R.T.U. (Ready to Use), S.O.L.O. (Spray-On, Leave-On). Green Umbrella IceStart™ is a *Surface Applied Supplementary Cementitious Material Admixture, the first treatment of a two-part Surface Applied Admixture Cure and Densification System*. Used only on *@EarlyAge* concrete, IceStart™ is a chemical and mechanical process applied during concrete placement and power troweling. 1) Apply IceStart™ during screeding or bull-floating, prior to breaking open the substrate using pans, @1200 SF per gallon. 2) Next, spray IceStart™ onto the slab in two equal applications of 1200 SF per gallon, during initial panning and initial troweling for three total applications with a net coverage rate of 400 SF per gallon. Use a low-pressure, high-volume manual or battery-powered commercial sprayer. Alternatively, a screed mounted unit and the retardant tanks of ride-on power trowels may be used. Always apply sufficient material for total net coverage of 400 SF per gallon. 3) Work into the surface following second and third applications during power troweling. 4) After the final application of IceStart™, trowel burn as desired. When the concrete is hard enough for walking, apply Green Umbrella IceStop™, a *Hydrophobic Fixative for Surface Applied Admixture Cure, the second treatment of a two-part Surface Applied Admixture Cure* 5) A single S.O.L.O. application of 400 SF per gallon. Keep wet for a dwell time of 30 minutes. Allow to air dry. No cure & seal, concrete hardener, or wet cure is needed. Apply IceStart™ and IceStop™ only when temperatures are 40°F and rising, not exceeding 90°F. Profile concrete 72 hours after placement and finishing using an RTPMAX or other rider trowel equipped for abrasive polishing or a propane-powered walk-behind grinder. 1) Apply GreenCut™ at 400 SF per gallon and wet profile with and/or BigStock, GC-X, GC-Fusion to the specified profile. 2) **[Optional]** Apply NanoDye™ for colorant. 3) Apply a S.O.L.O application of DryShield™, a sub-surface densifier, at 400-500 SF per gallon. Keep wet for a dwell time of 30 minutes. Allow to dry. 4) Wet hone using GC-Fusion or GC-Eraser. 5) Apply a S.O.L.O. application of Shield & Enhance™, a salt, and colorguard @ 600-800 SF per gallon. Allow 20 minutes of dwell time. Allow to dry. 6) Polish using PolishPlus™ abrasives. 7) Apply 2-3 applications of Interior MicroFilm™, a wearguard, at 1000-1200 SF per gallon. Allow to dry. 8) Burnish using a GreenGloss™ propane-powered UHS burnisher; concrete weighted and equipped with GreenGloss™ pads.

For certified installers and comprehensive manufacturer instructions, visit www.GreenUmbrellaSystems.com

CSI SPECIFICATIONS

DIVISION 03 & 09
Section 03 3536
EarlyAge Concrete
Mature Concrete or Retrofit
Section 03 3543 & 03 3536 Abrasive Polish
Coordinate with section:
Section 032400 - Synthetic Fiber Reinforcement Section 033119 - Shrinkage Compensating Concrete Section 033550 - Integrally Colored Concrete Section 033000 - Cast in place concrete
Section 033500 - Concrete Finishing
Section 033900 - Concrete Curing
Section 079200 - Joint Sealer

For CSI Specifications Contact a Consultant:
info@greenumbrellasystems.com

Note to Specifier
Green Umbrella Architectural Concrete System treatments like Green Umbrella® IceStart™ & Green Umbrella® IceStop™ are just part of a successfully specified concrete floor.
The specifier must keep in mind several construction disciplines: the concrete mix design, concrete placement, concrete finishing, and finally, the "polisher" or the PHP craftsman. We encourage you to carefully specify these elements, even if Green Umbrella products are not used. Each of these disciplines is critical for the overall success of this design element. Ways and means generally need to be specified. Green Umbrella Architectural Concrete System is an approach from design to completion, created to help the specifier succeed, covering stages from the concrete pour through to the floor's maintenance.

There are six major components to the Green Umbrella Architectural Concrete System: knowledgeable CONSULTANTS, the CANVAS, the PROCESS made up of 'ways and means,' high productivity EQUIPMENT, TREATMENTS and finally, qualified flatwork and polishing CRAFTSMEN.
All of its components follow the Nine Fundamentals of Green Polishing (www.theconcrete9.com) that educate a specifier on these principles. Consulting ACI Guide to Decorative Concrete (ACI 310R-19) can be helpful. The GUAC System is not simply opening the concrete substrate and applying a resinous polymer sealer. Specify an environmentally responsible mechanical process that involves processing the floor wet to avoid silicosis issues for the installers and the future occupants and @EarlyAge to improve construction downtime. The process uses a progression of abrasive grits with a wet cut agent Green Umbrella GreenCut™ on a machine built for a wet profile & hone process. The use of water enables a higher-quality cut to the floor. The wet profile system is well supported in the industry for the best clarity, quickest aggregate exposure, and time-savings, among other advantages.

Designing the canvas or concrete slab: Green Umbrella GreenCanvas™ shrinkage compensating concrete can be specified in the mix design (ACI 223R-10) to ensure that the surface is ideal for a jointless, non-curling floor. For conventional concrete, consult American Concrete Institute Guide to Design of Slabs on Ground (ACI 302.1R-15) for joint spacing if shrinkage compensating concrete is not used. The specification should separate concrete slabs into 03 30 00 Cast-In-Place concrete for surfaces not designated for polished concrete and SECTION 033509 – CONCRETE CURE AND PROFILE FINISHING SYSTEMS for surfaces selected for polished concrete
Concrete specification SECTION 03 35 43 - POLISHED CONCRETE FINISHING should be referenced. Mix design should not exceed 20% slag or fly ash content, if at all, for clarity of polishing and color application ease. Due to many factors, pre-qualification of contractors should be in place and required in submittals. Concrete specifications may require ACI flatwork certification. A quality control plan, pre-construction conference, and mock-up are all critical.

For EarlyAge concrete to be Abrasively Polished: Considerations should be given to specifying the following products for an economical & sustainable floor 1) Green Umbrella IceStart™ (cure) & IceStop™ (fixative) during and immediately after concrete placement & finishing. 2) Green Umbrella Fiberlite™ to reduce plastic cracking and for strength. 3) Green Umbrella Hydro-Shield for the hardening of concrete and prevention of concrete off-dusting.

Specify equipment: It is critical to use the appropriate head pressure and rpm for concrete profiling, honing, and polishing. Green Umbrella recommends using equipment with propane and alternative fuels to reduce environmental impact. Cordless PHP equipment may allow for early access to projects with limited 220 volt electricity and eliminates the hazards common to dry grinding or attempting wet cutting using electric equipment. Specify high-productivity machines with sufficient

equipment on large projects to meet production goals and not adversely affect project timeline and/or other trades. Specify equipent that meets LEED Building Operations and Maintenance (LEED O+M) requirements. Green Umbrella grinders (Green Grinder or GreenXtreme) and Green Umbrella Low Profile Edger process the entire floor, with the same abrasive profile within 1⁄4 inch of walls or under shelving. Specify the same matrix of all cutting abrasives, eliminating the inconsistencies found on projects when a mix of manufacturer brands is used.

Hardeners & Densifiers: Research shows that these treatments are effective against concrete dusting and harden- ing of the surface and are accepted as a standard. Green Umbrella concrete treatments are non-sodium and do not generate hazardous waste. The Green Umbrella line of densifiers are not water-soluble and do not contribute to alkali-silica reaction.

Colorants: Green Umbrella treatments that are pH neutral will not resist color introduction or promote "walk-off" common with many color and hardener combinations; this is why it is essential to match the family of treatments to the colorants. Otherwise, the specifier may unknowingly specify treatments that do not work well together. Green Umbrella colorants, dyes, and micro-pigments have superior color fastness compared to traditional stains and dyes. FROM DESIGN TO COMPLETION, YOU EXPERIENCE A COMPLETE SYSTEM.

Environmental Responsibility and LEED Considerations

A Green Umbrella Architectural Concrete Systems specified process is specially designed to require less labor and downtime while lowering environmental impact. Green Umbrella HydroShield is easy and quick to apply, requiring less labor. HydroShield has zero VOC's with no impact on indoor air quality.

Human Health - Indoor Environmental Quality (IEQ)

• Architectural Concrete may be finished so as to dramatically reduce bacterial adhesion and the presence of biofilms, creating a healthier environment free of harmful bacteria and viruses.

Human Health - Indoor Air Quality (IAQ)

• Many studies indicate that indoor air quality is enhanced with properly maintained Architectural Concrete vs. carpet or other floor coverings

• Architectural concrete does not support combustion, nor does it produce smoke or toxic fumes (LEED v4.1 Operations and Maintenance, propane equipment)

• Architectural Concrete can eliminate moisture issues, shrinking possible growth of mold and fungus.

Optimize Energy Performance

• Polished concrete allows the advantage of utilizing the thermal mass of concrete in heating and cooling.

• Polished concrete increases light reflectivity, amplifying the benefit of ambient (natural) lighting, and reducing process loads from light fixtures.

Building Reuse/Construction Waste Management/Recycled Content

• Existing Buildings — Environmental stewardship through the reuse of the existing floor.

• New or Existing Buildings — Not wasting materials or energy required to produce a floor covering or topical coating.

VOC/IAQ/Long-term Maintenance

• Polished concrete has zero VOC content

• Many studies indicate that indoor air quality is enhanced with properly maintained hard surfaces vs. carpet

• Polished concrete does not support combustion, nor does it produce smoke or toxic fumes (LEED v4.1 Operations and Maintenance, propane equipment)

• Polished concrete has a lower maintenance cost and zero replacement cost compared to traditional floor coverings.

Life Cycle Cost

• Sources show polished concrete to be the lowest life-cost flooring option available

TESTING

For all independent lab testing contact us at Info@GreenUmbrellaSystems.com

ASTM C494 / C494M - 19 Standard Specification for Chemical Admixtures for Concrete

Water Loss

ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials

ASTM C156 Water Loss [from a Mortar Specimen] Through Liquid Membrane- Forming Curing Compounds for Concrete

ASTM 309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

Abrasion Resistance, Strength, Hardness

ASTM C779 / C779M 12 " Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces"

ASTM C944: "Abrasion Resistance of Concrete by Rotating-Cutter Method"

BS EN 13892-4: 2002 Standard Methods of test for screed materials. Determination of wear resistance "BCA"
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)

Chemical Resistance Of Finishes

ASTM 1308 Standard Test Method For Effect Of Household Chemicals On Clear And Pigmented Organic Finishes (Aviation Fluid Resistance With Green Umbrella GreenIce Cure & Profile System)

Mohs Scale Of Mineral Hardness

ACI 302 Standard Guide For Concrete Floor And Slab Construction

USDA COMPLIANT

FDA COMPLIANT

Green Umbrella GreenIce Cure & Profile™ System with Shield & Enhance provides a greater Chemical resistance to JP-8+100 fuel - 0.1% weight gain Chemical resistance to 30 wt motor oil — 0.007% weight gain Chemical resistance to Skydrol 500 B-4 - 0.05% weight gain

PROFILE, HONE & POLISHING EQUIPMENT

Green Umbrella propane equipment meets LEED v4.1 Operations and Maintenance Guidelines. Green Umbrella uses propane-fueled equipment to save the owner as much as 50 cents a square foot in electrical cost for three-phase and 220-volt equipment often used by PHP contractors. In itself, propane is not a direct greenhouse gas contributor and is one of the world's most widely used alternative fuels. Electric power adds 80% more CO2 into our atmosphere than does propane. Propane can be a safe, clean, and efficient fuel.

All Green Umbrella propane equipment should have the following:

CARB and EPA certified engines to meet their strict guidelines for low CO2 emissions.
ESDS (emissions shut down system) — machines are manufactured to incorporate a 3-way catalytic muffler to lower CO2 emissions and an ESDS that monitors the engine for irregularities and automatically shuts the machine down if emissions rise.

High Productivity Rider Grinder - processes larger areas in less time
GreenXtreme by Green Umbrella
• Heavy duty commercial floor grinder/polisher or equivalent
• Minimum 933 pounds head pressure
• 77-inch grinding width
• Minimum 8000 square feet per hour production rate.
• Wet abrasive compatible
Variable Abrasive Concrete Grinder — profiles, hones, and mechanically polishes floors

GreenGrinder/Polisher by Green Umbrella
• Propane-powered, heavy-duty commercial floor wet abrasive compatible
• Minimum 785 pounds head pressure
• CARB/EPA approved.
• 30-inch grinding width
• 12 abrasives, counter-clockwise planetary rotation
• Minimum 800 square feet per hour production rate.
• Provide a minimum of two units on site
Variable Abrasive Concrete Edge Grinder — processes floors within a 1⁄4 inch of wall

GreenEdger by Green Umbrella
• Propane-powered, heavy-duty commercial floor edge grinder/polisher
• Wet abrasive compatible
• Minimum 165 pounds head pressure
• CARB/EPA approved
• 1/4 inch cut to the wall
• Four or six abrasive head, 640 RPM abrasive rotation
• Provide a minimum of one unit on site

Weighted Concrete Burnisher — removes unreacted

material, promotes cross-linking and enhances gloss.
GreenGloss by Green Umbrella
• Propane-powered, UHS Burnisher
• CARB/EPA approved.
• 27 or 39-inch burnishing width
• Weighted Head Minimum 2000 RPM
• Provide a min of two on site Walk Behind Slurry Recovery Machine — cleans between abrasive steps to prevent contamination. Important: not all floor scrubbers are effective in slurry recovery.
• Green Umbrella recommended slurry recovery vacuum.
• Auto scrubber similar to Tomcat or Nilfisk-Advance with accessible concrete clean-out
• Minimum 500-pound head pressure
• Water application and minimum 30-gallon recovery tank
Abrasives for PHP Equipment — cut concrete substrate in a sequence of steps.
• Stock removal, profiling, honing and polishing abrasives, hybrid bond abrasives by Green Umbrella
• Match hardness of abrasives to the hardness of concrete

Prep Equipment
• Power Washer on low psi
• Industrial WaterBroom by Water Miser or equivalent, up to 180 PSI of water
Application Equipment
• Hand-Pump Sprayer Applicator — used to apply the product evenly and consistently.
By Green Umbrella, Patriot Sprayers, or equivalent (A Non-Metal Canister)
Maximum tip pressure 40 psi
• T-bar with blended applicator — evenly distributes product sprayed on concrete substrate

All products can be seen at GreenUmbrellaSystems.com

End Note to Specifier

Note to Applicator:

TIME, TEMPERATURE & HUMIDITY

For a chemical reaction to take place successfully, time must be allocated for the full reaction. Likewise, when applying Green Umbrella IceStop to concrete, there must be an adequate amount of dwell time for the reaction to take place. Doing so will help to achieve the best result.

For IceStop to effectively penetrate the substrate, the temperature should not be less than 40°F (4°C) for several hours after application. If temperatures are lower than recommended, the chemistry may take much longer to react and penetrate the concrete substrate. If the temperature exceeds the recommended maximum of 95°F (35°C), or if conditions are windy, the chemistry could react and dry before penetrating the substrate. In such circumstances, keep floors hydrated with water for recommended dwell time.

Humidity also plays a role in the dry time. The product applied to a dry slab of concrete in an arid climate will dry faster than in a humid environment. In dry climates with low humidity, it may be necessary to hydrate the slab to allow for proper dwell time. If several treatments are being applied, product staging should be planned to meet all treatment **dwell times** and **dry times**. It is recommended to use **dew point** data from a mobile hygrometer to determine the best staging of concrete treatments to eliminate needless downtime. Please consult a GreenUmbrella consultant with any questions. The use of on-site hygrometers and thermometers can provide meaningful data to facilitate treatment application success.

IceStop Time to traffic: For best results, light foot traffic when dry or after 1 hour. Wheeled traffic and profiling after 3 hours.

High Temperature or Windy (Consult ACI 305R-20 for Wind Advisory) Application Over (95°F or 35°C) *@EarlyAge* Next-day & *@MatureAge* Concrete Hot Slabs:

(Consult ACI 305R-20 for Wind Advisory)

Reduce slab temperature: Hydrate a hot slab to reduce the surface temperature so flash drying of HydroShield does not occur. Hydrate for an hour in the most arid of conditions, disperse any puddles, then immediately proceed to high temperature and high wind instructions below.

Apply IceStop at 400 SF per gallon, more if needed. If necessary, mist the slab with sufficient water at 20 minutes to achieve the required 30 minutes of wet surface dwell time.

PRODUCT PLACEMENT

EarlyAge Concrete:

IceStart (cure) is placed on new concrete the same day of pour after concrete placement and during the finishing process, once the concrete is hard for walking, after joint cutting IceStop (fixative) is applied. This GreenIce-Cure system removes reason for other products & processes such as cure & seal and wet cure to be placed in construction stages.

MatureAge Concrete:

Not Applicable

APPLICATION

Concrete Placement

After the above placement of the pour it is recommend that within days to a week the Profile Hone and Polish process is done.

1. Proper form setup is essential and must be established from a single benchmark.
2. Ensure sub-grade is properly compacted before placing any concrete. A properly consolidated base will support redi-mix trucks without rutting.
3. Concrete Slump should be maintained +/- 1"
4. Concrete placement should be as uniform as possble in front of the screed to avoid uneven aggregate exposures issues. Placing the concrete too high and striking it off will cause stripes of aggregate when polished, lows will become stripes of cream without visible aggregate.
5. Laser Screed / Truss / Hand-held Vibra Screed acceptable (Vibration is required for proper consolidation) Turn off vibration when stopping screed to avoid creating a cream line with the screed.
6. If above 50 degrees apply the first application of Green Umbrella IceStart @ 400 sqft/gal. Spray system may be mounted to the laser screed for larger pours (If ambient concrete temperature is below 50 degrees, follow ACI Standard 306R-16 for Cold Weather Concreting. Thus waiting for first application until after first pan, applying two other applications during finishing.)
7. Roller Bug (May also be adapted to the Laser Screed) Roller Bug is used to ensure large aggregate is pushed down. Should be run in 1/2 overlapping passes
8. Channel Float/Bull Float "Mop" (8' to 10' preferred) to smooth the surface and locate high and low spots that need to be corrected. Any major re-straightening if required must be done during this phase.
9. Re-straighten edges, columns, wall lines, and around all protrusions w/ 4' Board and smoothed with a magnesium hand float. (These areas shouldn't have a steel trowel used on them until the body of the floor is being closed with steel trowel blades.) Do not premature close the slab

CONCRETE FINISHING

1. If it does exist, wait until bleed water sheen has dissipated, and a footprint leaves 1/4" or less indentation before breaking the surface the first time with pans or float blades. First break w/pans should follow a pattern 90° to screed direction. Back all edges with trowel to avoid stacking the aggregate at the edges.
2. Apply the second application of Green Umbrella IceStart @ 400 SF per gallon. This application may be applied via the sprayers on ride on trowels to avoid walking on the slab, making sure to apply at 400 SF per gallon.
3. If you need to walk on the slab for any reason kneeboards or finishing slicks must be utilized to maximize your floatation and minimize depressing the aggregate. (Failure to do so may result in visible footprints after polishing.)
4. After each pass re-straighten edges, columns, wall lines and around all protrusions w/ 4' board and smoothed with a magnesium float. (These areas shouldn't have a steel trowel used on them until the body of the floor is being closed with steel trowel blades.)
5. Second break w/pans should follow a pattern 90° to initial break direction. Apply the third and final application of Green Umbrella IceStart @ 400 SF per gallon. This application may be applied via the sprayers on the riders to avoid walking on the slab.

** Green Umbrella IceStart may still be utilized as a "Finishing Aid" to correct surface defects and "Cat-Faces" during this phase of floating and even in the early finishing.

6. Third break w/pans if needed however the finisher may use their judgement and experience to begin laying the floor down with combination blades.
7. Combination Blades should be used to close and finish the floor. Blades should be pitched as low as possible 5-8° maximum pitch to minimize edge pressure and ensure the aggregate matrix is consolidated as much as possible and to minimize rolling the aggregate and breaking the cementitious bond.
8. Use a rider trowel or walk behind for final finish. For best results, use a combo machine that has been kept clean for this purpose. At the time of final burnish its very important to make sure any small pieces of concrete that are on the surface are blown off the surface with a leaf blower. Do Not finish over these as

there may be noticeable defects. Use the edge of a finish trowel to cut any of these off the surface and then correct if possible with the trowel.
9. After the finishing has been completed and the trowels have moved off the area ensure you can walk on the surface without marring apply Green Umbrella IceStop @ 300-400 SF per gallon.

HEALTH & SAFETY

Clean Up And Disposal:
Clean sprayers and equipment with warm, soapy water and rinse thoroughly following use. Any product that cannot be saved for recovery or recycling should be disposed of according to local/state laws.

ICESTART

1	HEALTH
0	FIRE
0	REACTIVITY/INSTABILITY
C	PERSONAL PROTECTION
X	IRRITANT

IRRITANT

ICESTOP

1	HEALTH
0	FIRE
0	REACTIVITY/INSTABILITY
C	PERSONAL PROTECTION
X	IRRITANT

IRRITANT

WARNING:
Keep out of reach of children. Read the label before use.
FIRST AID:
Contact a Poison Center or physician if the injured feels unwell. If swallowed: DO NOT induce vomiting. Rinse eyes with water. Remove the injured to fresh air and keep at rest in a position comfortable for breathing. Wash with plenty of soap and water. Remove contaminated clothing and wash before reuse.

For Detailed SDS consult company website www.GreenUmbrellaSystems.com

For Medical Emergency call INFOTRAC (24/7): 1-800-535-5053

Green Umbrella Headquarters (Normal Business Hours): (844) 200-7336

WARRANTY & LIMITATIONS

For a period of ten (10) years beginning the date on which the concrete surface described is treated with Green Umbrella® products, Green Umbrella Companies (GU) warrants to the owner that after the specified completed installation, the treated surface will remain water-resistant, dust-proof, hardened, and abrasion-resistant. In the event the surface fails to perform, GU will, at its own expense and its own discretion, supply either sufficient product(s) to repair any such failure or provide materials cost reimbursement. A GU manufacturer's representative must be on-site to supervise the installation.

It is the contractor's responsibility to follow all directions and requirements, as outlined in the Green Umbrella installation specifications. A completed Project Survey form or equivalent document outlining the steps and products used in the process must accompany this warranty request.

Green Umbrella Companies (GU) solely and expressly warrants that its products shall be free from defects in materials and workmanship for six months from the date of purchase. Unless authorized in writing by an officer of GU, no other representations or statements made by GU or its representatives, in writing or orally, shall alter this warranty. GU MAKES NO WARRANTIES, IMPLIED OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES THE SAME. Green Umbrella PRODUCT APPLIED TO SUB-STANDARD CONCRETE IS EXCLUDED FROM ANY KIND OF WARRANTY. If any Green Umbrella product fails to conform to this warranty, GU will replace Green Umbrella product at no cost to the Buyer. Replacement of any Green Umbrella product shall be the sole and exclusive remedy available, and the Buyer shall have no claim for incidental or consequential damages. Any installation of Green Umbrella products that fail to conform to such installation information and instructions shall void this warranty. If any, product demonstrations are done for illustrative purposes only and do not constitute a

GREENUMBRELLA

GreenUmbrella™ RTU MICROFILM

Product Description

Green Umbrella™ RTU (Ready to Use) Microfilm is an environmentally friendly hybrid surface treatment that creates a durable micro-thin layer to seal already hardened or densified concrete floors. Green Umbrella™ RTU Micro-film forms a breathable, dense protective layer. It is highly resisting to aviation oils, stands up to chemical exposure, and is not prone to whitening, peeling or flaking—with a beautiful high-gloss finish. It enhances and protects colored concrete surfaces.

Basic Use

Green Umbrella™ RTU Microfilm is intended to be the last treatment on a concrete floor. It is an impregnating MICROFILM; not a coating. It offers a sacrificial layer between the surface and the concrete substrate that produces a nice gloss. However, it also penetrates in to the subsurface and forms a hard bond. This allows dwell time for contaminates so they can be cleaned off the surface before reaching the porosities of the the concrete.

It is intended to be the last treatment applied on a polished concrete floor. It is part of the GUEPC System and may be applied to ground, honed or polished concrete floors in manufacturing & light assembly plants, warehouse/distribution centers, food service operations, retail stores & showrooms, garages and any other areas where polished concrete surfaces are maintained. It is designed for indoor use. Green Umbrella™ RTU Microfilm canal so be used to repair damaged floors that were previ-ously treated with Green Umbrella™ products. Also it can maintain resistance against chemical damage. It also enhances dyed or colored concrete. Green Umbrella™ RTU Microfilm is also one part of the Green Umbrella™ BASE DEFENSE and Green Umbrella™ MAX DEFENSE Systems, that consist of: Green Umbrella™ Dry Shield and Green Umbrella™ Shield & Enhance.

Features and Benefits

- Highly resistant to aviation oils for up to 48 hours
- Enhances and protects colored concrete surfaces
- Repairable
- Stands up to heavy abrasion and high foot traffic
- Does not support mildew or fungi growth
- Adds gloss
- Not prone to whitening; will not peel or flake
- USDA/FDA approved for incidental food contact
- Very low maintenance

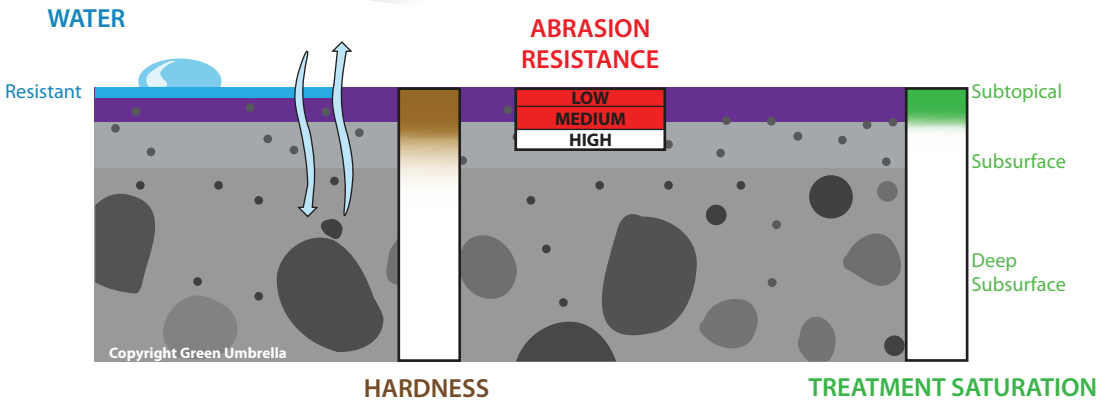
Technical Information:	
Chemical Family	Hybrid Colloidal
Substrate Location	Surface Treatment
Appearance	Milky Liquid
Odor	None
Film Forming	Partial
Active Ingredients	100%
Type	Partially ReactiveContiguous Impregnating Microfilm
pH	11.0
Boiling Point	212 F
Packaging	5-gal bucket, 55-gal barrel, 275-gal tote
Shelf Life	2 years
VOC (grams/liters)	0
Freezing Point	32 F

MSDS sheets for all products are available at www.GreenUmbrellaSystems.com

GREENUMBRELLA™ SUBSTRATE INDEX

Gloss w/Polishing

GREENUMBRELLA™ RTU MICROFILM



Websites & Consulting

Architects & General Contractors:
GreenUmbrellaSystems.com

Product Consulting:
Info@GreenUmbrellaSystems.com

Estimating

Container Sizes: Green Umbrella™ RTU Microfilm is available in containers holding 5, 55 and 275-gallons and only through Green Umbrella™. Each container is properly labeled with information including the product name, description, and condensed application instructions.
Dilution: No dilution.
Coverage Rates: When applied using a Green Umbrella™ sprayer, Green Umbrella™ RTU Microfilm has a coverage rate of up to 700 sq. ft. per gallon, but on average covers 400 sq. ft. per gallon. Only one coat is necessary. Coverage depends on the porosity of concrete substrate, time, temperature and humidity.

Specifcations

For Long Specifications or CSI Specifications, go to www.GreenUmbrellaSystems.com

www.GreenUmbrellaSystems.com
Short Specifcation
DIVISION THREE
SECTION 03 3536

Ground Honed & Polished (GHP)

A Green Umbrella Engineered Polished Concrete (GUEPC) floor requires that surfaces must be processed by means of a planetary grinding machine to mechanically remove existing coatings, surface imperfections and flatten concrete floors. To reach the desired surface cut and clarity of reflection additional abrasive steps may be required to grind, hone or polish floors to the specified sheen.

Green Umbrella™ RTU Microfilm is applied as the final step in the GUEPC system to give added protection from oil, chemical and other fluids for up to 48 hours. The application of this odorless impregnating Green Umbrella™ RTU Microfilm provides a micro-thin layer of protection for ground, honed or polished concrete surfaces usually applied following the use of 800 GUr abrasives. Green Umbrella™ RTU Microfilm is a repairable product and a component of the GUEPC system and should only be installed by Certified Green Umbrella™ Craftsman. To find a certified contractor, call (844) 200-7336. A ten-year limited warranty will be issued to the owner upon receipt of a completed and signed job survey form, detailing the steps, cuts and products used in the processing of the floor.

IMPORTANT: FOR A SUCCESSFULLY POLISHED CONCRETE FLOOR MORE IS NEEDED THAN SPECIFYING CHEMISTRY. WAYS AND MEANS MAY BE NECESSARY, PLEASE CONSIDER THE FOLLOWING: SPECIFYING GREEN UMBRELLA ENGINEERED POLISHED CONCRETE (GUEPC)

(continued from pg 2)

Green chemistry; like Green Umbrella™ RTU Microfilm is just one part of a successful specified concrete floor. GUEPC system is a complete concrete polishing system from design to completion it uses our Green Umbrella™ chemistry in the polished concrete market. The GUEPC can be as extensive as from the concrete pour to the maintenance of the floor. It starts, if possible, by designing the canvas, or the slab. Green Umbrella™ Green Canvas shrink-age compensating concrete can be specified within the mix design (ACI 223R-10) to ensure that the surface is ideal for polishing. Moving beyond the canvas, there are four major components to the **GUEPCS: the Process, the Equipment, the Chemistry and the Craftsmen**. All of its components follow the GP Nine (Fundamentals of Green Polishing) GUEPC is not opening the concrete substrate and applying a polymer sealer. A green mechanical process involves processing the floor wet to avoid silicosis issues affecting either installers themselves or by endangering future inhabitants by contaminating air ducts in the building. The process uses a progression of diamond grits on a machine built for wet concrete processing. The use of water enables a higher quality cut to the floor. The wet grinding system has been well supported in the industry for the best approach to clarity and time savings for exposure of aggregate among other advantages.

GUEPC equipment carries the weight to see the concrete grinding, honing and polishing process through to completion and can even expose aggregate if desired. GUEPC uses alternative fuels to leave a lesser impact on the environment. Meeting GS-24 and other sustainable requirements. Green Umbrella™ grinders (Green Grinder or Stone Extreme) and edger (Green Umbrella™ Low Profile Edger) process the entire floor, with the same profile within ¼ inch of walls or under shelving. Green Umbrella™ controls the diamond matrix of all our cutting abrasives, eliminating the inconsistencies often found in the industry and maintaining a consistent look through-out the entire floor.

Green Umbrella™ concrete treatments are nonsodium and do not generate hazardous waste. The Green Umbrella™ line of densifiers are not water soluble and do not contribute to alkali-silica reaction. Green Umbrella™ treatments that are pH neutral will not resist color introduction or promote "walk off", which is common with many hardeners. Green Umbrella™ dyes are a standard in the industry. Green Umbrella™ colorants are micro-pigments (Color Polish or Color Shield), and have superior color fastness compared to traditional stains and dyes.

GUEPC floors include accountability through onsite management. Green Umbrella™ Craftsmen are experienced and have many certifications through indepth training. From design to completion, the GUEPC system covers all aspects of the GP Nine. We simply offer the greenest options for grey concrete. FROM DESIGN TO COMPLETION, YOU EXPERIENCE A COMPLETE SYSTEM.

Environmental Responsibility and LEED Considerations

GUEPC specified process is specially designed to require less labor and downtime while lowering environmental impact. Green Umbrella™ RTU Microfilm is easy to apply, and because the application is simple fewer laborers are required. Green Umbrella™ RTU Microfilm has zero VOCs and has a minimal impact on indoor air quality.

Optimize Energy Performance

- Polished concrete allows the advantage of utilizing the thermal mass of concrete in heating and cooling.
- Polished concrete provides the ability to increase the benefit of ambient natural lighting and/or reduce the required lampage.

Building Reuse/Construction Waste Management/Recycled Content

- Existing Buildings — Environmental stewardship through the reuse of existing floor.
- New or Existing Buildings — Not wasting materials or energy required to produce a floor covering or topical coating.

VOC/IAQ/Long-term Maintenance

- Polished concrete has zero VOC content.
- Many studies indicate that indoor air quality is enhanced with properly maintained hard surfaces vs. carpet.
- Polished concrete does not support combustion, nor does it produce smoke or toxic fumes.

Life Cycle Cost

- Sources show polished concrete to be the lowest life-cost flooring option available

Potential LEED Credits

Polished Concrete is a sustainable floor. The intent of the following credits is to rate output efficiency. Polished concrete reduces energy and material waste, thus reducing environmental impact.

New Construction, Schools, Core and Shell, Commercial Interior.

Material and Resources - MR Credit 1 & 1.1 Building Reuse

Material and Resources - MR Credit 1.2 Building Reuse

Material and Resources - MR Credit 3 & 3.1 Material Reuse

Material and Resources - MR Credit 4 Recycled Content

Indoor Environmental Quality - IEQ Credit 4.3 Regional Materials

Testing

For all independent lab testing contact us at Info@GreenUmbrellaSystems.com
Green Umbrella™ MAX DEFENSE System with RTU Microfilm
Tested to – ASTM D-1308
Chemical resistance to JP-8+100 fuel - 0.1 % weight gain
Chemical resistance to 30 wt motor oil - 0.007% weight gain
Chemical resistance to Skydrol 500 B-4 - 0.05% weight gain

ACI Standard 302.IR-89 Chemical concrete hardners can be used to increase concrete resistance to chemicals including , but not limited to the following:

Aluminum sulfate
Ammonium chloride
Barium hydroxide
Beef fat
Calcium hydroxide
Calcium nitrate
Carbon dioxide
Carbonic acid
Castor oil
Coal-tar oils
Cottonseed oil
Creosote
Cresol
Distillers slop
Ethylene glycol
Ferric chloride
Ferric sulfate
Ferrous chloride
Ferrous sulfate
Fish oil
Fruit juices
Glucose
Glycerin
Hydrogen sulfide
Iodine
Lactic acid, 25%
Lead refining solutions, 10%
Lignite oils
Machine oils
Magnesium chloride
Magnesium sulfate
Manganese sulfate
Manure
Mash, fermenting
Mercuric chloride
Mercurous chloride
Mine water, waste
Mineral oil Molasses
Mustard oil Nickel sulfate Oleic acid, 100%Olive oil
Paraffin
Phenol, 25%
Phosphoric acid, 85%
Pickling brine, 10%
Poppy seed oil
Potassium aluminum sulfate, 10%
Potassium carbonate
Potassium persulfate
Potassium sulfate
Rapeseed oil
Sea water
Silage
Sodium bromide
Sodium carbonate
Sodium chloride
Sodium dichromate
Sodium nitrite
Sodium sulfate, 10%
Sodium sulfite, 10%
Sodium thiosulfate
Soybean oil
Sugar
Sulfite liquor
Tallow and tallow oil
Tannic acid
Tanning liquor, 10%
Tobacco
Walnut oil
Zinc chloride
Zinc sulfate
Zinc nitrate

Grind Hone & Polishing Equipment

Green Umbrella™ equipment meets GS-24 and LEED Maintenance Guidelines.

Green Umbrella™ Uses Propane fueled equipment which saves the owner as much as 50 cents a square foot in electrical bills due to the three phase and 22O volt equipment that is used by many GHP contractors. Propane in itself is a nondirect greenhouse gas and is one of the world's most widely used alternative fuels. In fact, electric power adds 80% more CO2 into our atmosphere than does propane. Propane fueled equipment can be safe, clean, and fuel efficient. However, all Green Umbrella™ propane equipment should have the following to be used in the concrete polishing industry: CARB and EPA certification - the engines are certified annually and independently by CARB and EPA to meet their strict guidelines for low CO2 emissions.

ESDS (emissions shut down system) – machines are manufactured to incorporate a 3-way catalytic muffler to lower CO2 emissions and an ESDS that monitors the engine for irregularities and automatically shuts the machine down if emissions rise.

GHP Equipment:

- High Productivity Rider Grinder — processes larger areas in less time.
  - o Heavy duty commercial floor grinder/polisher by Green Umbrella™, Stonextreme or equivalent.
  - o Minimum 933 pounds head pressure.
  - o 77 inch grinding width.
  - o Minimum 8000 square feet per hour production rate.
- Grinder/Honer/Polisher — grinds, hones, and mechanically polishes floors.
  - o Propane powered, heavy duty commercial floor Green Grinder/Polisher by Green Umbrella™.
  - o Minimum 785 pounds head pressure.
  - o CARB/EPA approved.
  - o 30 inch grinding width.
  - o 12 diamond, counter clockwise rotation.
  - o Minimum 1200 square feet per hour production rate.
  - o Provide minimum of two units on site.
- Edger — processes floors within a ¼ inch of wall.
  - o Propane powered Green Edger by Green Umbrella™ or Productions Team
  - o Minimum 165 pounds head pressure.
  - o CARB/EPA approved.
  - o 1/4 inch cut to wall.
  - o Four diamond head, 640 RPM diamond rotation.
  - o Provide minimum of two units on site.
- Burnisher — removes un-reacted material and gives high gloss shine.
  - o Propane powered, high productivity Green Polisher by Green Umbrella™, Pioneer Eclipse or Eagle.
  - o CARB/EPA approved.
  - o 27 or 39 inch burnishing width.
  - o Head Pressured
  - o Minimum 2000 RPM.
- Auto Scrubber — cleans between abrasive steps to prevent contamination. *Important: not all foor scrubbers are effective in slurry recovery.*
  - o Auto scrubber by Tomcat, Pioneer Eclipse or Nilfisk-Advance.
  - o Minimum 500 pound head pressure.
  - o Water application and minimum 30 gallon recovery tank.

Abrasives for GHP Equipment

· Abrasives — diamond abrasives cut concrete substrate in a sequence of steps.
  - o Metal bond abrasives (GUm), resin bond abrasives (GUr), and coating removal metal bond abrasives (GUcr) by Green Umbrella™.
  - o Match hardness of abrasives to hardness of concrete.
  - o 10-segment diamond pad except for coating removal with GUm or GUr matrix.

Prep. Equipment

For non-GHP (Grind, Hone and Polish) or vertical concrete:

· Power Washer on low psi

· Industrial Water Broom — cleans and removes dirt buildup before product application.
  - o Heavy duty industrial water broom by WaterMiser Broom or equivalent.
  - o Up to 180 PSI of water.

Application Equipment

· Hand-Pump Sprayer Applicator — used to apply product evenly and consistently.
  - o Industrial CO2 driven hand-pump sprayer applicator by Green Umbrella™, Patriot Sprayers, or equivalent.
  - o Maximum tip pressure 40 psi.
  - o # 8 gray conical tip.

· T-bar with blended applicator — distributes product sprayed on concrete substrate.

All products can be seen at GreenUmbrellaSystems.com

Product Placement/Application

Green Umbrella™ RTU Microfilm does not require any dilution and can be used neat.

(Due to the variety of substrates, environments, and variables in preparation and application methods, the customer should test the product in an inconspicuous area for compatibility prior to full-scale application.)

For deep even coverage, penetration and superior performance, Green Umbrella™ recommends Green Umbrella™ RTU Microfilm be applied to the substrate twice.

Important: For best results, Green Umbrella™ recommends that the substrate be processed through a 800 grit resin bond before application on a GHP floor. 200 grit resin on a Green Cut GHP floor. Green Umbrella™ RTU Microfilm is not recommended for outdoor applications or on very porous, unprocessed concrete. Green Umbrella™ RTU Microfilm is especially formulated for open, broom- finished and ground concrete.

Green Umbrella™ RTU Microfilm is a permanent application; make sure color and cut are to satisfaction before proceeding.

1. Process Ground Honed Polished floor to last resin cut.
2. thoroughly sweep all debris from floor. Then re-sweep with Auto-scrubber any leftover residue with Green Umbrella™ noncorrosive cleaning products. Sweep with a microfiber dust mop.
3. To prevent overspray, protect areas like aluminum surfaces, where product is not desired.
4. Apply first application with Green Umbrella™ sprayer and immediately spread with T-bar and woven Green Umbrella™ applicator. Under average temperature and humidity allow for several hours before the application of the second coat. Apply a second coat of Green Umbrella ™ RTU Microfilm and allow a minimum of four hours dry time between the second and third coats. **Important: Frequently clean T-bar of debris, or periodically change applicators to avoid streaking in Green Umbrella™ RTU Microfilm.**
5. To increase the bond of Green Umbrella™ RTU Microfilm, burnish with a high-speed, head-pressured, propane Green Umbrella™ burnisher. It is important to use black pads with no resin-transfer.
6. No more than three coats are needed. For the best penetration and cure allow at least twelve hours dry time between second and third coats.
7. As a precaution. Do not let water stand in puddle for first 72 hours. This allows the film to bond properly.
8. Under extreme conditions reapplication may be neces sary after 12-24 months. Product will not flake off or show wear patterns, but to maintain peak resistance, we recommend the application of one coat of Green Umbrella™ RTU Microfilm by a certified installer every 18 months.

Note: Time, Temperature & Humidity:
For a chemical reaction to take place successfully, time must be allocated for reactants to fully react.

Likewise, when applying Green Umbrella™ RTU Microfilm to concrete, there must be adequate amount of dwell time for the reaction to take place. Doing so will help to achieve the best result. For Green Umbrella™ RTU Microfilm to effectively penetrate the substrate, the temperature should not be less than 35° F. If temperatures are lower than is recommended, the chemistry may take much longer to react with and penetrate the concrete substrate. If the temperature exceeds 95° F or conditions are windy, the chemistry may react and dry before penetrating the substrate. In such circumstances, keep floors hydrated with water for recommended dwell time. Humidity also plays a role in the dry time. Product applied to a dry slab of concrete in an arid climate will dry faster than to a dry slab of concrete in a humid climate due to the amount of humidity present in the air. In dry climates with low humidity it may be necessary to hydrate the slab in order to allow for proper dwell time. Please consult a Green Umbrella™ representative if you have any questions.

(continued from pg 5)
Please consult a Green Umbrella™ representative if you have any questions.

For Best Results:
Light foot traffic Until dry or 1 hour
Wheeled traffic 3 hours

Clean up: When Green Umbrella™ RTU Microfilm is applied to a polished concrete floor after all polishing steps are complete. For ground or honed concrete floors use a high-speed propane burnisher and a Green Umbrella™ black pad.

Removal of Green Umbrella™ RTU Microfilm off substrate: If Green Umbrella™ RTU Microfilm has dried it is necessary to recut the floor a minimum of one or two resin cuts with a GHP machine, re-polish. Then reapply material.

Maintenance

IMPORTANT: Only use pH neutral cleaner.
Non-GHP Floors (GHP)

- Regularly sweep away debris
- Regularly use a water broom to remove dirt build up from treated concrete surfaces

GHP Floors

- Regularly sweep away debris
- Regularly auto-scrub or mop with water or Green Umbrella™ Green Clean
- Use Green Umbrella™ Degreaser as needed
- For GHP loors periodically burnish with a weighted, high speed propane burnisher using Green Umbrella™ black pad to remove dirt build up and restore gloss

Warranty & Limitations

For a period of ten (10) years beginning the date on which the concrete surface described is treated with Green Umbrella™ products, Green Umbrella™ warrants to the owner that after the specified completed installation, the treated surface will remain water resistant, dust proof, hardened and abrasion resistant. In the event the surface fails to perform, Green Umbrella™ will at its own expense and its own discretion, supply either sufficient product(s) to repair any such failure, or provide materials cost reimbursement. A manufacturer's representative must be on site to supervise installation.

It is the responsibility of the contractor to follow all directions and requirements as outlined in the Green Umbrella ™ installation specifications. A completed Job Survey form must accompany this warranty request.

Green Umbrella™ Companies (GU) expressly warrants that its products shall be free from defects in materials and workmanship for six months from the date of purchase. Unless authorized in writing by an officer of Green Umbrella™, no other representations or statements made by Green Umbrella™ or its representatives, in writing or orally, shall alter this warranty. GREEN UMBRELLA™ MAKES NO WARRANTIES, IMPLIED OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES THE SAME. GREEN UMBRELLA™ APPLIED TO SUBSTANDARD CONCRETE IS EXCLUDED FROM ANY KIND OF WARRANTY. If any Green Umbrella™ product fails to conform to this warranty, Green Umbrella™ will replace Green Umbrella™ product at no cost to the buyer. Replacement of any product shall be the sole and exclusive remedy available and the buyer shall have no claim for incidental or consequential damages. Any installation of Green Umbrella™ products that fails to conform to such installation information and instructions shall void this warranty. Product demonstrations, if any are done for illustrative purposes only and do not constitute a warranty or warranty alteration of any kind. Buyer shall be solely responsible for determining suitability of Green Umbrella ™ products for the Buyers intended purposes.

For Professional Use Only.

TECHNICAL DATA SHEET

SUBSURFACE / WATER & SALT RESISTANT HARDENER / COLOR GUARD

GREENUMBRELLA®

SHIELD&ENHANCE

RESISTING SALT & TRANSFORMING COLOR

PRODUCT DESCRIPTION

Green Umbrella® Shield & Enhance™ is an environmentally formulated premium hardener. Shield & Enhance™ is engineered as a colorguard to enhance colored and profiled architectural concrete floors, providing a darker, clarified-gloss appearance. As a unique oxidation inhibitor, Shield & Enhance™, significantly increases a salt pigmented or nano dye's life-cycle, extending colorfastness. Preventing concrete off-dusting and not contributing to alkali-silica reaction, at the same time providing exceptional resistants to water and salt's damaging effects with over ninety-percent chloride prevention. The addition of a chloride screen significantly protects concrete in applications were salt-water and deicers are present. Shield & Enhance™ takes only one S.O.L.O.™[1] application and is packaged R.T.U.[2], resists and transforms for sustainable concrete.

BASIC USE

For Non GHP (Non Polished Concrete): Green Umbrella™ Shield & Enhance can be used as stand alone concrete hardener and densifier with many added benefits, being used indoors or outdoor. Wherever chloride intrusion or concrete scaling may be an issue. Especially in seawater environments or where concrete deicer is very prevalent. Green Umbrella™ Shield & Enhance darkens the substrate slightly for an enhanced look. Prevents dusting of concrete. Its a superior water proofer.

It can be used on many infrastructure projects: bridges, highways, dams and spillways. It is excellent product in combination with AC1223 Green Umbrella Green Canvas. When used simply as a densifier on floors it can be burnished to semigloss appearance.

For GHP Floors (Ground Honed & Polished):Green Umbrella™ Shield & Enhance is part of the GUEPC System

(described in section below). It is designed to be introduced into the substrate before the last resin cut. Green Umbrella Shield & Enhance has superior water resistance and "sealant" properties. It allows for a darkened appearance to polished concrete.

Green Umbrella™ Shield & Enhance can be use in manufacturing & light assembly plants, warehouse/distribution. centers, food service operations, retail stores & show rooms, parking decks, garages, airports, hospitals and any other areas where concrete surfaces are maintained. It can be used for indoor or outdoor concrete.

ARCHITECTURAL APPLICATIONS

Toppings Slabs

Interior/Exterior

Piers Oil/Gas

Arenas/Artificial Skating Rinks

Watertight Construction Walls/Tilt up

Slab on Grade/Slab on Deck

Concrete Storage Tanks

Shotcrete Bridge Decks

Grout

Parking Structures

Integrally Troweled Placed Concrete

Architectural Concrete Floors

Architectural Abrasive Polished Concrete

FEATURES

- Superior chloride intrusion prevention
- Enhances the appearance of dyed or pigmented floors

• Repels water oil and shop chemicals while it darkens and enhances the natural beauty of concrete, can be polished to semigloss
• Breathable surface
• Will not yellow
• Increases hardness 4 inch deep, while reducing porosity
• Requires no rinsing & disposal and will not gel on surface - can be allowed to air dry
• Decreases black tire marking from lift trucks and equipment- improving appearance
• Stands up to heavy abrasion and foot traffic while providing excellent slip resistance
• Resistant to most deicers
• Prevents scaling of concrete

MANUFACTURE & PRODUCT CONSULTING

Green Umbrella
20 Jetview Drive
Rochester, NY 14624
(844) 200-7336
Website & Documents Available At:
GreenUmbrellaSystems.com
CutSheet, Application Sheet, Feature Brochure,
Technical Data Sheet, Safety Data Sheet
Product Consulting Email:
Info@GreenUmbrellaSystems.com

ESTIMATING

Container Sizes: Green Umbrella™ Shield & Enhance is available in containers holding 5, 55 and 275-gallons and only through Green Umbrella. Each container is properly labeled with information including the product name, description, and condensed application instructions. Dilution: None

Coverage Rates: When applied using a Green Umbrella™ sprayer, Green Umbrella™ Shield & Enhance has a coverage rate of up to 600 sq. ft. per gallon, but on average covers 450 sq. ft. per gallon. Only one coat is necessary. Coverage depends on the porosity of concrete substrate, time, temperature and humidity.

SPECIFICATIONS

A Green Umbrella Engineered Polished Concrete (GUEPC) floor requires that surfaces must be processed by means of a planetary grinding machine to mechanically remove existing coatings, surface imperfections and flatten concrete floors. To reach the desired surface cut and clarity of reflection additional abrasive steps may be required to grind, hone or polish floors to the specified sheen. When a polished surface is desired, Green Umbrella Shield & Enhance is typically applied in one coat after floors have been polished using a 400 grit Green Umbrella resin (GU) diamond abrasive. The application of this, odorless lithium solution that chemically hardens, seals, densifies and povides chloide potection for ground, honed or polished concrete surfaces. Green Umbrella™ Shield & Enhance is a component of the GUEPC system and should only be installed by certified Green Umbrella™ Craftsman. To find a certified contractor, call (844) 200-7336. A ten-year limited warranty will be issued to the owner upon receipt of a completed and signed job survey form, detailing the steps, cuts and products used in the processing of the floor.

IMPORTANT: FOR A SUCCESSFULLY POLISHED CON

TECHNICAL INFORMATION

Chemical Family	Lithium
Substrate Location	Subsurface
Appearance	Clear Liquid
Odor	None
Film Forming	None
Active Ingredients	100%
Type	Densifier/Hardner
pH	Approximately 11
Boiling Point	212 F
Packaging	5-gal bucket, 55-gal barrel, 275-gal tote
Shelf Life	2 years
VOC (grams/liters)	0
Freezing Point	32 F

CRETE FLOOR MORE IS NEEDED THAN SPECIFYING CHEMISTRY. WAYS AND MEANS MAY BE NECESSARY, PLEASE CONSIDER THE FOLLOWING: SPECIFYING GREEN UMBRELLA Engineered Polished Concrete (GUEPC)

Green chemistry; like Green Umbrella™ Shield & Enhance is just one part of a successful specified concrete floor. GUEPC system is a complete concrete polishing system from design to completion it uses our Green Umbrella™ chemistry in the polished concrete market. The GUEPC can be as extensive as from the concrete pour to the mainte nance of the floor. It starts, if possible, by designing the canvas, or the slab. Green Umbrella Green Canvas shrink age compensating concrete can be specified within the mix design (ACI 223R-10) to ensure that the surface is ideal for polishing. Moving beyond the canvas, there are four major components to the GUEPCS: the Process, the Equipment, the Chemistry and the Craftsmen. All of its compo nents follow the GP Nine (Fundamentals of Green Polishing) GUEPC is not opening the concrete substrate and applying a polymer sealer. A green mechani-cal process involves processing the floor wet to avoid silicosis issues affecting either installers themselves or by endangering future inhabitants by contaminating air ducts in the building. The process uses a progression of diamond grits on a machine built for wet concrete processing. The use of water enables a higher quality cut to the floor. The wet grinding system has been well supported in the industry for the best approach to clarity and time savings for exposure of aggregate among other advantages.

GUEPC equipment carries the weight to see the concrete grinding, honing and polishing process through to completion and can even expose aggregate if desired. GUEPC uses alternative fuels to leave a lesser impact on the environment. Meeting GS-24 and other sustainable requirements. Green Umbrella™ grinders (Green Grinder or Stone Extreme) and edger (Green Umbrella™ Low Profile Edger) process the entire floor, with the same profile within 14 inch of walls or under shelving. Green Umbrella™ controls the diamond matrix of all our cutting abrasives, eliminating the inconsistencies often found in the industry and maintaining a consistent look through out the entire floor. Green Umbrella concrete treatments are nonsodium and do not generate hazardous waste. The Green Umbrella ™ line of densifiers are not water soluble and do not contribute to alkali-silica reaction.

Green Umbrella™ treatments that are pH neutral they will not resist color introduction or promote "walk off", which is common with many hardeners. Green Umbrella™ dyes are a standard in the industry. Green Umbrella™ colorants are micro-pigments (Color Polish or Color Shield), and have superior color fastness compared to traditional stains and dyes. GUEPC floors include accountability through onsite management. Green Umbrella™ Craftsmen are experienced and have many certifications through indepth training. From design to completion, the GUEPC system covers all aspects of the GP Nine. We simply offer the greenest options for grey concrete. FROM DESIGN TO COMPLETION, YOU EXPERIENCE A COMPLETE SYSTEM.

ENVIRONMENTAL RESPONSIBILITY AND LEED CONSIDERATIONS

GUEPC specified process is specially designed to require less labor and downtime while lowering environmental impact. Green Umbrella™ Shield & Enhance is easy to apply, and because the application is simple fewer labor ers are required. Green Umbrella™ Shield & Enhance has low VOCs and has a minimal impact on indoor air quality.

Optimize Energy Performance

- Polished concrete allows the advantage of utilizing the . thermal mass of concrete in heating and cooling.
- Polished concrete provides the ability to increase the benefit of ambient natural lighting and/or reduce the required lampage.

Building Reuse/Construction Waste Management/Recycled Content

- Existing Buildings - Environmental stewardship through the reuse of existing floor.
- New or Existing Buildings-Not wasting materials or energy required to produce a floor covering or topical coating.

VOC/IAQ/Long-term Maintenance

- Polished concrete has zero VOC content.
- Many studies indicate that indoor air quality is enhanced with properly maintained hard surfaces vs. carpet.
- Polished concrete does not support combustion, nor does it produce smoke or toxic fumes.

Life Cycle Cost

- Sources show polished concrete to be the lowest life-cost flooring option available.

POTENTIAL LEED CREDITS

Polished Concrete is a sustainable floor. The intent of the following credits is to rate output efficiency. Polished concrete reduces energy and material waste, thus reducing environmental impact.

New Construction, Schools, Core and Shell, Commercial Interior.

Material and Resources - MR Credit 1 & 1.1 Building Reuse
Material and Resources - MR Credit 1.2 Building Reuse
Material and Resources - MR Credit 3 & 3.1 Material Reuse
Material and Resources-MR Credit 4 Recycled Content
Indoor Environmental Quality - IEQ Credit 4.3 Regional Materials

TESTING

For all independent lab testing contact us at

Info@GreenUmbrellaSystems.com
244 NCHRP-Chloride ingress testing ASTM C672-Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals with Green Umbrella™ Max Defense System™ with Shield & Enhance

Tested to ASTM D-1308
Chemical resistance to JP-8+100 fuel - 0.1 % weight gain
Chemical resistance to 30 wt motor oil 0.007% weight gain
Chemical resistance to Skydrol 500 B-4-0.05% weight gain

ACI STANDARD 302.IR-89 CHEMICAL CONCRETE HARDNERS CAN BE USED TO INCREASE CONCRETE RESISTANCE TO CHEMICALS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

ALUMINUM SULFATE
AMMONIUM CHLORIDE
BARIUM HYDROXIDE
BEEF FAT
CALCIUM HYDROXIDE CALCIUM NITRATE
CARBON DIOXIDE
CARBONIC ACID CASTOR OIL
COAL-TAR OILS
COTTONSEED OIL CREOSOTE
CRESOL
DISTILLERS SLOP
ETHYLENE GLYCOL
FERRIC CHLORIDE
FERRIC SULFATE
FERROUS CHLORIDE
FERROUS SULFATE
FISH OIL FRUIT JUICES
GLUCOSE
GLYCERIN
HYDROGEN SULFIDE
LODINE
LACTIC ACID, 25%
LEAD REFINING SOLUTIONS, 10%
LIGNITE OILS
MACHINE OILS
MAGNESIUM CHLORIDE.
MAGNESIUM SULFATE
MANGANESE SULFATE MANURE
MASH, FERMENTING
MERCURIC CHLORIDE
MERCUROUS CHLORIDE
MINE WATER, WASTE
MINERAL OIL MOLASSES
MUSTARD OIL NICKEL
SULFATE OLEIC ACID, 100%OLIVE OIL
PARAFFIN
PHENOL, 25%
PHOSPHORIC ACID, 85%
PICKLING BRINE, 10%
POPPY SEED OIL POTASSIUM
ALUMINUM SULFATE, 10%
POTASSIUM CARBONATE
POTASSIUM PERSULFATE
POTASSIUM SULFATE
RAPESEED OIL SEA WATER
SILAGE
SODIUM BROMIDE
SODIUM CARBONATE
SODIUM CHLORIDE
SODIUM DICHROMATE
SODIUM NITRITE
SODIUM SULFATE, 10%
SODIUM SULFITE, 10%
SODIUM THIOSULFATE
SOYBEAN OIL
SUGAR
SULFITE LIQUOR TALLOW & TALLOW
OIL
TANNIC ACID
TANNING LIQUOR, 10%
TOBACCO
WALNUT OIL
ZINC CHLORIDE ZINC SULFATE
ZINC NITRATE

GRIND HONE & POLISHING EQUIPMENT

Green Umbrella™ equipment meets GS-24 and LEED Main tenance Guidelines. Green Umbrella™ Uses Propane fueled equipment which saves the owner as much as 50 cents a square foot in electrical bills due to three phase and 220 volt equipment that is used by many GHP contractors. Propane in itself is not a direct greenhouse gas and is one of the world's most widely used alternative fuels. In fact, electric power adds 80% more CO2 into our atmosphere than does propane. Propane equipment can be safe, clean, and efficient fuel. However, all Green Umbrella™ propane equipment should have the following to be used in the concrete polishing industry: CARB and EPA certification - the engines are certified annually and independently by CARB and EPA to meet their strict guidelines for low CO2 emissions.

ESDS (emissions shut down system) - machines are manu factured to incorporate a 3-way catalytic muffler to lower CO2 emissions and an ESDS that monitors the engine for irregularities and automatically shuts the machine down if emissions rise.

GHP Equipment:

- High Productivity Rider Grinder-processes larger areas in less time.

o Heavy duty commercial floor grinder/polisher by Green Umbrella, Stonextreme or equivalent. o Minimum 933 pounds head pressure.

o 77 inch grinding width.

o Minimum 8000 square feet per hour production rate.

Grinder/Honer/Polisher-grinds, hones, and mechanically polishes floors.

o Propane powered, heavy duty commercial floor Green Grinder/Polisher by Green Umbrella™.

o Minimum 785 pounds head pressure.

o CARB/EPA approved.

o 30 inch grinding width.

o 12 diamond, counter clockwise rotation.

o Minimum 1200 square feet per hour production rate.

o Provide minimum of two units on site.

Edger-processes floors within a 14 inch of wall.

o Propane powered Green Edge by GreenUmbrella™ or Productions Team

o Minimum 165 pounds head pressure.
o CARB/EPA approved.

o 1/4 inch cut to wall.

o Four diamond head, 640 RPM diamond rotatio

o Provide minimum of two units on site.

· Burnisher- removes un-reacted material and gives high gloss shine.

o Propane powered, high productivity Green Polisher by Green Umbrella, Pioneer Eclipse or Eagle.

o CARB/EPA approved.

o 27 or 39 inch burnishing width.

o Head Pressured

o Minimum 2000 RPM.

- Auto Scrubber cleans between abrasive steps to prevent contamination. Important: not all floor scrubber are effective in slurry recovery.

o Auto scrubber by Tomcat, Pioneer Eclipse or Nilfisk-Advance.

o Minimum 500 pound head pressure. o Water application and minimum 30 gallon recovery tank.

Abrasives-diamond abrasives cut concrete substrate in a sequence of steps.

o Metal bond abrasives (GUm), resin bond abrasives (GUr), and coating removal metal bond abrasives (GUcr) by Green Umbrella.

o Match hardness of abrasives to hardness of concrete.

o 10-segment diamond pad except for coating removal with GUm or Gur matrix.

Prep. Equipment

For non-GHP (Grind, Hone and Polish) or vertical concrete:

• Power Washer on low psi

. Industrial Water Broom cleans and removes buildup before product application.

o Heavy duty industrial water broom by WaterMiser Broom or equivalent.

o Up to 180 PSI of water.

Application Equipment

Hand-Pump Sprayer Applicator - used to apply product evenly and consistently.

o Industrial CO2 driven hand-pump sprayer applicator by Green Umbrella, Patriot Sprayers, or equivalent.

o Maximum tip pressure 40 psi.

o # 8 gray conical tip.

T-bar with blended applicator distributes product sprayed on concrete substrate.

Product Placement/Application

New Concrete: If specifying concrete, preference should be given to ACI 223, concrete using Green Umbrella™ Green Canvas. Before any concrete processing begins, new concrete should be fully cured for seven (7) days and free of all potential contaminants. Green Umbrella™ Shield & Enhance is used neat and does not require any dilution or mixing.

Existing Concrete:

Existing concrete should be thoroughly cleaned and swept of all debris and potential contaminants-including sealers, wax, coatings and oil or food spills-prior to concrete processing. Green Umbrella™ Shield & Enhance is used neat and does not require any dilution or mixing.

GUEPC floors are only available through certified Green

Umbrella™ Craftsmen. Green Umbrella Craftsmen are trained in chemical application, dye application and concrete grinding and carry multiple certifications.

Open Concrete:

1. Apply Green Umbrella™ Shield & Enhance with a Green Umbrella™ solution sprayer or spreader.

2. Distribute product with an exploded tip bristle broom for rough concrete or Green Umbrella™ keeping the surface wet with product for a minimum of 20 minutes.

3. Allow product to air dry. GreenShield & Enhance will not gel on surface and does not require rinsing. Umbrella™

Non-GHP Floor

1. Apply Green Umbrella™ Shield & Enhance with a Green Umbrella solution spreader or sprayer.

2. Distribute product with an exploded-tip bristle broom for rough concrete or Green Umbrella T-bar with blended applicator head for hard-troweled concrete to ensure uniform coverage, keeping the surface wet with product for a minimum of 20 minutes.

3. Allow product to air dry. Green Umbrella™ Shield & Enhance will not gel on surface and does not require rinsing. Do not allow product to puddle.

4. Remove any un-reacted material with a broom after product has dried.

5. If slight gloss is desired burnish floors with a high-speed, head-pressured propane burnisher with non-resin Green Umbrella™ black pads.

GHP Floor

1. Hone floors to 200 grit Green Umbrella resin (GUr) diamond abrasive.

2. Note: If the desired finish includes color, Green Umbrella ™ ColorDeep to harden and color at same time OR Green Umbrella™ Dye should be applied before proceeding to the next step.

3. Apply Green Umbrella™ Shield & Enhance with a Green Umbrella™ recommended solution spreader or sprayer.

4. Distribute product with an exploded-tip bristle broom for rough concrete or Green Umbrella™ T-bar with blended applicator head for hard troweled concrete to ensure uniform coverage, keeping the surface wet for a minimum of 20 minutes. Do not allow product to puddle.

5. Allow product to air dry. Green Umbrella™ Shield & Enhance will not gel on surface and does not require rinsing.

6. Auto-scrub to remove any un-reacted material after product has dried.

7. Either burnish floors with a high-speed, head pressured propane burnisher with non-resin GU black pads or polish floors with previous grit or next GUr diamond abrasives.

8. For superior oil and chemical resistance, apply Green Umbrella Microfilm to treated surface.

Note: Time, Temperature & Humidity: For a chemical reaction to take place successfully, time

must be allocated for reactants to fully react. Likewise, when applying Green Umbrella™ Shield & Enhance to concrete, there must be adequate amount of dwell time for the reaction to take place. Doing so will help to achieve the best result. For Green Umbrella™ Shield & Enhance to effectively penetrate the substrate, the temperature should not be less than 40° F. If temperatures are lower than is recommended, the chemistry may take much longer to react with and penetrate the concrete substrate. If the temperature exceeds 95° F or conditions are windy, the chemistry may react and dry before penetrating the substrate. In such circumstances, keep floors hydrated with water for recommended dwell time. Humidity also plays a role in the dry time. Product applied to a dry slab of concrete in an arid climate will dry faster than to a dry slab of concrete in a humid climate due to the amount of humidity present in the air. In dry climates with low humidity it may be necessary to hydrate the slab in order to allow for proper dwell time. Please consult a Green Umbrella representative if you have any questions. Please consult a Green Umbrella representative if you have any questions.

For Best Results: Light foot traffic Until dry or 1 hour Wheeled traffic 3 hours

MAINTENANCE

IMPORTANT: Only use pH neutral cleaner. Non-GHP Floors (GHP)

• Regularly sweep away debris

• Regularly use a water broom to remove dirt build up from treated concrete surfaces

GHP Floors

• Regularly sweep away debris

• Regularly auto-scrub or mop with water or Green Umbrella Green Clean

• Use Green Umbrella Degreaser as needed

• For GHP floors periodically burnish with a weighted, high speed propane burnisher using Green Umbrella™ black pad to remove dirt build up and restore gloss

WARRANTY & LIMITATIONS

For a period of ten (10) years beginning the date on which the concrete surface described is treated with Green Umbrella products, Green Umbrella warrants to the owner that after the specified completed installation, the treated surface will remain water resistant, dust proof, hardened, and abrasion resistant. In the event the surface fails to perform, Green Umbrella™ will at its own expense and its own discretion, supply either sufficient product(s) to repair any such failure, or provide materials cost reimbursement. A manufacturer's representative must be on site to supervise installation.

It is the responsibility of the contractor to follow all direc tions and requirements as outlined in the Green Umbrella. ™ installation specifications. A completed Job Survey form must accompany this warranty request.

Green Umbrella™ Companies (GU) solely and expressly warrants that its products shall be free from defects in materials and workmanship for six months from the date of purchase. Unless authorized in writing by an officer of Green Umbrella, no other representations or statements made by Green Umbrella™ or its representa-tives, in writing or orally, shall alter this warranty. GREEN UMBRELLA™ MAKES NO WARRANTIES, IMPLIED OR OTHER-WISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES THE SAME. GREEN UMBRELLA™ APPLIED TO SUBSTANDARD CONCRETE IS EXCLUDED FROM ANY KIND OF WARRANTY. If any Green Umbrella product fails to conform to this warranty, Green Umbrella will replace Green Umbrella™ product at no cost to the Buyer. Replace-ment of any product shall be the sole and exclusive remedy available and the buyer shall have no claim for incidental or consequential damages. Any installation of Green Umbrella products that fails to conform to such installation information and instructions shall void this warranty. Product demonstra tions, if any are done for illustrative purposes only and do not constitute a warranty or warranty alteration of any kind. Buyer shall be solely responsible for determining suitability of Green Umbrella ™ products for the Buyers intended purposes.

For Professional Use Only.

SAFETY DATA SHEET

GREENUMBRELLA®
NanoDye

Section 1. Product and Company Identification

PRODUCT NAME:	NanoDye
PRODUCT USE:	Concrete Colorant
EFFECTIVE DATE:	January 2022
MANUFACTURER INFORMATION:	GREENUMBRELLA® Architectural Concrete Systems Green Umbrella 20 Jetview Drive Rochester, NY 14624 (844) 200-7336
EMERGENCY PHONE NUMBER:	For Hazardous Materials [or Dangerous Goods] Incident Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC 24 Hours 1-800-424-9300 / +1 703-527-3887 CCN: 871558

Section 2. Hazard Identification

Sandstone, Cayenne, Fawn, Butternut & Gator Green Colors:

Category 3: Specific Target Organ Acute Toxicity (central nervous system)
Category 3: Flammable Liquid Category
Category 5: Acute Inhalation Toxicity Category
Category 5: Acute Dermal Toxicity Category
Category 2A: Eye Irritation Category
Category 2: Skin Irritation

GHS PICTOGRAMS:

GHS SIGNAL WORD: WARNING

POTENTIAL HEALTH EFFECTS

CODE OF HAZARD STATEMENTS:

Physical Hazards	Health Hazards	Environmental Hazards
None	H226 Flammable liquid and vapor. H313 May be harmful in contact with skin. H319 Causes serious eye irritation. H333 May be harmful if inhaled. H336 May cause drowsiness or dizziness.	None

Section 2. Hazard Identification (Continued)

CODE OF PRECAUTIONARY STATEMENTS:

Prevention Statements

P233 Keep container tightly closed
P261 Avoid breathing mist
P270 Do not eat, drink, or smoke while using this product
P271 Use only outdoors or in a well-ventilated environment
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Upper respiratory protection
P264 Wash skin thoroughly after handling

Response Statements

P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN:	Wash with plenty of water
P301+P310 IF SWALLOWED:	Immediately call a POISON CENTER or doctor/physician
P304+P340 IF INHALED:	Remove person to fresh air and keep comfortable for breathing

Coal & Meidling Blue Colors:

Category 3: Specific Target Organ Acute Toxicity (central nervous system)
Category 3: Flammable Liquid
Category 5: Acute Inhalation Toxicity
Category 2A: Eye Irritation
Category 2B: Skin Irritation

GHS PICTOGRAMS:

GHS SIGNAL WORD: WARNING

POTENTIAL HEALTH EFFECTS

CODE OF HAZARD STATEMENTS:

Physical Hazards	Health Hazards		Environmental Hazards
None	H226	Flammable liquid and vapor.	None
	H319	Causes serious eye irritation.	
	H333	May be harmful if inhaled.	
	H336	May cause drowsiness or dizziness.	

Section 2. Hazard Identification (Continued)

CODE OF PRECAUTIONARY STATEMENTS:

Prevention Statements

P233 Keep container tightly closed
P261 Avoid breathing mist
P270 Do not eat, drink, or smoke while using this product
P271 Use only outdoors or in a well-ventilated environment
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Upper respiratory protection
P264 Wash skin thoroughly after handling

Response Statements

P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN:	Wash with plenty of water
P301+P310 IF SWALLOWED:	Immediately call a POISON CENTER or doctor/physician
P304+P340 IF INHALED:	Remove person to fresh air and keep comfortable for breathing

Otter & Cocoa Bean Colors:

Category 2A: Eye Irritation
Category 3: Specific Target Organ Acute Toxicity (central nervous system)
Category 3: Flammable Liquid
Category 5: Acute Inhalation Toxicity
Category 5: Acute Dermal Toxicity
Category 2: Skin Irritation

GHS PICTOGRAMS:

GHS SIGNAL WORD: WARNING

POTENTIAL HEALTH EFFECTS

CODE OF HAZARD STATEMENTS:

Physical Hazards	Health Hazards	Environmental Hazards
None	H226 Flammable liquid and vapor. H319 Causes serious eye irritation. H313 May be harmful in contact with skin. H333 May be harmful if inhaled. H336 May cause drowsiness or dizziness.	None

Section 2. Hazard Identification (Continued)

CODE OF PRECAUTIONARY STATEMENTS:

Prevention Statements

P233 Keep container tightly closed
P220 Keep/Store away from clothing
P261 Avoid breathing mist
P270 Do not eat, drink, or smoke while using this product
P271 Use only outdoors or in a well-ventilated environment
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Upper respiratory protection
P264 Wash skin thoroughly after handling

Response Statements

P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN:	Wash with plenty of water
P301+P310 IF SWALLOWED:	Immediately call a POISON CENTER or doctor/physician
P304+P340 IF INHALED:	Remove person to fresh air and keep comfortable for breathing

Jenna Blue & Merlot Colors:

Category 2A: Eye Irritation
Category 4: Flammable Liquid
Category 5: Acute Inhalation Toxicity
Category 5: Acute Dermal Toxicity
Category 2: Skin Irritation

GHS PICTOGRAMS:

GHS SIGNAL WORD: WARNING

POTENTIAL HEALTH EFFECTS

CODE OF HAZARD STATEMENTS:

Physical Hazards	Health Hazards	Environmental Hazards
None	H227 Combustible liquid H319 Causes serious eye irritation H313 May be harmful in contact with skin H333 May be harmful if inhaled	None

Section 2. Hazard Identification (Continued)

CODE OF PRECAUTIONARY STATEMENTS:

Prevention Statements

P233 Keep container tightly closed
P220 Keep/Store away from clothing
P261 Avoid breathing mist
P270 Do not eat, drink, or smoke while using this product
P271 Use only outdoors or in a well-ventilated environment
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Upper respiratory protection
P264 Wash skin thoroughly after handling

Response Statements

P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN:	Wash with plenty of water
P301+P310 IF SWALLOWED:	Immediately call a POISON CENTER or doctor/physician
P304+P340 IF INHALED:	Remove person to fresh air and keep comfortable for breathing

New Penny & Terra Bark Colors:

Category 3: Specific Target Organ Acute Toxicity (central nervous system)
Category 4: Flammable Liquid
Category 5: Acute Inhalation Toxicity
Category 5: Acute Dermal Toxicity
Category 2A: Eye Irritation
Category 2: Skin Irritation

GHS PICTOGRAMS:

GHS SIGNAL WORD: WARNING

POTENTIAL HEALTH EFFECTS
CODE OF HAZARD STATEMENTS:

Physical Hazards	Health Hazards	Environmental Hazards
None	H227 Combustible liquid H313 May be harmful in contact with skin. H319 Causes serious eye irritation. H333 May be harmful if inhaled. H336 May cause drowsiness or dizziness.	None

Section 2. Hazard Identification (Continued)

CODE OF PRECAUTIONARY STATEMENTS:

Prevention Statements

P233 Keep container tightly closed
P220 Keep/Store away from clothing
P261 Avoid breathing mist
P270 Do not eat, drink, or smoke while using this product
P271 Use only outdoors or in a well-ventilated environment
P273 Avoid release to the environment
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Upper respiratory protection
P264 Wash skin thoroughly after handling

Response Statements

P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN:	Wash with plenty of water
P301+P310 IF SWALLOWED:	Immediately call a POISON CENTER or doctor/physician
P304+P340 IF INHALED:	Remove person to fresh air and keep comfortable for breathing

Cardinal Color:

Category 1: Eye Damage/Irritation
Category 4: Flammable Liquid
Category 5: Acute Oral Toxicity
Category 5: Acute Dermal Toxicity
Category 2: Skin Irritation

GHS PICTOGRAMS:

GHS SIGNAL WORD: DANGER

POTENTIAL HEALTH EFFECTS
CODE OF HAZARD STATEMENTS:

Physical Hazards

None

Health Hazards

H227 Combustible liquid
H303 May be harmful if swallowed
H313 May be harmful in contact with skin
H318 Causes serious eye damage

Environmental Hazards

None

Section 2. Hazard Identification (Continued)

CODE OF PRECAUTIONARY STATEMENTS:

Prevention Statements

P233 Keep container tightly closed
P220 Keep/Store away from clothing
P261 Avoid breathing mist
P270 Do not eat, drink, or smoke while using this product
P271 Use only outdoors or in a well-ventilated environment
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P280 Wear protective gloves/protective clothing/eye protection/face protection.
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P305+P351+P338 IF IN EYES:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN:	Wash with plenty of water
P301+P310 IF SWALLOWED:	Immediately call a POISON CENTER or doctor/physician
P304+P340 IF INHALED:	Remove person to fresh air and keep comfortable for breathing

Section 3. Composition Information on Ingredients

Color	Component	CAS No.	OSHA PEL(TWA)	ACGIH(TLV-TWA)	Weight %
Coal	Glycol Ether PM	107-98-2	Not Established	100 ppm	34.5 – 41.4
	Alcohol Glycol Ether DPM	34590-94-8	Not Established	100 ppm	13.8 – 20.7
	Dye Molecule	Proprietary	0.5 mg/m3	Not Established	6.9 – 13.8
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Jenna Blue	Glycol Ether DB	112-34-5	50 ppm	20 ppm	34.5 – 41.4
	Propylene Glycol	57-55-6	Not Established	Not Established	13.8 – 20.7
	Dye Molecule	Proprietary	Not Established	Not Established	6.9 – 20.7
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Meidling Blue	Glycol Ether DB	107-98-2	Not Established	100ppm	41.4 – 48.3
	Propylene Glycol	7732-18-5	Not Established	Not Established	0.0 – 7.0
	Dye Molecule	Proprietary	15 mg/m^3	10 mg/m^3	20.7 – 27.6
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Otter	Ethoxy Propanol	1569-02-4	Not Established	Not Established	27.6 – 34.5
	2-Propoxyethanol	2807-30-9	Not Established	Not Established	3.5 – 6.9
	Dihydrogen Oxide	7732-18-5	Not Established	Not Established	0.0 – 23.4
	Glycol Ether DB	112-34-5	50 ppm	20 ppm	3.5 – 6.9
	Glycol Ether DPM	34590-94-8	Not Established	100 ppm	0.7 – 3.5
	Dye Molecule	Proprietary	Not Established	Not Established	10.4 – 26.9
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Butternut	Ethoxy Propanol	1569-02-4	Not Established	Not Established	
	Dye Molecule	Proprietary	15mg/m3	10mg/m3	
	Glycol Ether	Proprietary	50 ppm	20 ppm	

Section 3. Composition Information on Ingredients

Color	Component	CAS No.	OSHA PEL(TWA)	ACGIH(TLV-TWA)	Weight %
Cocoa Bean	Ethoxy Propanol	1569-02-4	Not Established	Not Established	34.5 – 41.4
	Glycol Ether DB	112-34-5	50 ppm	20 ppm	0.7 – 3.5
	Glycol Ether DPM	34590-94-8	Not Established	100 ppm	0.7 – 3.5
	Ethyl Lactate	97-64-3	Not Established	Not Established	0.7 – 3.5
	Dye Molecule	Proprietary	15 mg/m3	10 mg/m3	25.0 – 30.0
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Sandstone	Ethoxy Propanol	1569-02-4	Not Established	Not Established	41.4 – 48.3
	Dye Molecule	Proprietary	15 mg/m^3	10 mg/m^3	20.7 – 27.6
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Merlot	Glycol Ether DB	112-34-5	50ppm	20ppm	13.8 - 20.7
	Ethoxy Propanol	1569-02-4	Not Established	Not Established	0.7 - 3.5
	Glycol Ether PM	107-98-2	Not Established	100ppm	0.7 - 3.5
	Alcohol	7732-18-5	Not Established	Not Established	0.0 - 10.0
	Dihydrogen Oxide	Proprietary	0.5mg/m^3	Not Established	30.0 - 44.0
	Dye Molecule	Proprietary	50ppm	20ppm	25.0 - 31.0
	Glycol Ether				
Obsolete	Ethoxy Propanol	1569-02-4	Not Established	Not Established	20.7 – 27.6
	Dihydrogen Oxide	7732-18-5	Not Established	Not Established	13.9 – 30.0
	Dye Molecule	Proprietary	15 mg/m^3	10 mg/m^3	20.7 – 27.6
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Cardinal	Glycol Ether DB	111-34-5	50 ppm	20 ppm	34.5 – 41.4
	Ethyl Lactate	97-64-3	Not Established	Not Established	6.9 – 13.8
	Dye Molecule	Proprietary	15 mg/m^3	10 mg/m^3	13.8 – 20.0
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Cayenne	Ethoxy Propanol	1569-02-4	Not Established	Not Established	27.6 – 34.5
	Dihydrogen Oxide	7732-18-5	Not Established	Not Established	13.8 – 31.1
	Dye Molecule	Proprietary	15 mg/m^3	10 mg/m^3	10.4 – 20.7
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Fawn	Ethoxy Propanol	1569-02-4	Not Established	Not Established	27.6 – 34.5
	Dihydrogen Oxide	7732-18-5	Not Established	Not Established	13.8 – 31.1
	Dye Molecule	Proprietary	15 mg/m^3	10 mg/m^3	10.4 – 20.7
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
New Penny	Ethoxy Propanol	1569-02-4	Not Established	Not Established	20.7 – 27.6
	Dihydrogen Oxide	7732-18-5	Not Established	Not Established	13.8 – 20.7
	Dye Molecule	Proprietary	Not Established	Not Established	20.7 – 34.5
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Gator Green	Ethoxy Propanol	1569-02-4	Not Established	Not Established	34.5 – 41.4
	Glycol Ether PM	107-98-2	Not Established	100 ppm	3.5 – 6.9
	Alcohol	112-34-5	50 ppm	20 ppm	0.7 – 3.5
	Glycol Ether DB	Proprietary	15 mg/m^3	10 mg/m^3	17.3 – 30.4
	Dye Molecule	Proprietary	50 ppm	20 ppm	25.0 – 31.0
	Glycol Ether				
Obsolete	Ethoxy Propanol	1569-02-4	Not Established	Not Established	27.6 – 34.5
	Dihydrogen Oxide	7732-18-5	Not Established	Not Established	13.8 – 27.6
	Dye Molecule	Proprietary	0.5 mg/m^3	Not Established	13.8 – 20.7
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0
Terra Bark	Ethoxy Propanol	1569-02-4	Not Established	Not Established	41.4 – 48.3
	Glycol Ether DPM	34590-94-8	Not Established	Not Established	0.7 – 3.5
	Dye Molecule	Proprietary	Not Established	Not Established	17.3 – 26.9
	Glycol Ether	Proprietary	50 ppm	20 ppm	25.0 – 31.0

Section 4. First Aid Measures

SKIN:	Remove contaminated clothing and wash the affected area with soap and water. Call a physician if skin irritation persists.
EYES:	Immediately flush with plenty of water. After initial rinsing, remove contacts (if present) and continue rinsing for 15 more minutes. If symptoms persist, call a physician.
INHALATION:	Remove to fresh air. Administer artificial respiration if necessary. Call a physician if symptoms persist.
INGESTION:	DO NOT induce vomiting. Rinse mouth thoroughly with water. Drink plenty of water dilute the material. Never give anything by mouth to an unconscious person. Consult a physician.

Section 5. Fire Fighting Measures

EXTINGUISHING MEDIA:	Dry chemical, alcohol-resistant foam, water spray, or CO2
FLAMMABILITY LIMITS (% VOLUME IN AIR FOR SOLVENTS):	LEL: Not Determined UEL: Not Determined Special
SPECIAL FIRE FIGHTING PROCEDURES:	Keep material and container away from sources of ignition. Use SCBA when fighting fire.

Section 6. Accidental Release Measures

SMALL SPILLS:	Spills may be absorbed using inert materials and shoveled into properly labeled containers. Take precautionary measures against static discharge. Prevent runoff from entering surface waters. Notify proper authorities if runoff should occur.
LARGE SPILL CONTAINMENT:	For large spills, dike far ahead of l iquid spill for later disposal. Do not release into sewers or waterways.
CLEANUP:	Spills may be absorbed using inert materials and shoveled into properly-labeled containers. Take precautionary measures against static discharge. Prevent runoff from entering surface waters. Notify proper authorities if runoff should occur.
DISPOSAL REGULATOR REQUIREMENTS:	Follow applicable Federal, state, and local regulations.
CONTAINER CLEANING & DISPOSAL:	Containers must not be washed out or used for other purposes. Do not weld or flame cut empty containers.
WASTE CODES:	Coal, Butternut, Cayenne & Fawn colors carry D001 & D007 codes. Meidling Blue, Otter, Cocoa Bean, Sandstone, Gator Green, Jenna Blue, & Terra Bark colors carry D001 code. Merlot, Cardinal, & New Penny colors carry D007 code.

Section 7. Handling and Storage

NORMAL HANDLING:	Keep away from heat or ignition sources. Use only in well ventilated areas. Never pierce, saw, cut, grind, or weld empty containers.
STORAGE:	Store material in its original container. Keep containers tightly closed when not in use.
WASTE DISPOSAL METHOD:	Dispose of material in accordance with federal, state, and local guidelines.
SPECIAL PRECAUTIONS:	Avoid breathing mist. Avoid freezing.

Section 8. Exposure Control/Personal Protection

RESPIRATORY PROTECTION:	Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear an OSHA/NIOSH approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contaminations, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.
VENTILATION:	Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.
PROTECTIVE CLOTHING/ EQUIPMENT:	Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact
EYE PROTECTION:	Wear protective eyeglasses or chemical safety goggles, per OSHA eye and face protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
SAFETY STATIONS:	Make emergency eyewash stations, safety/quick drench showers, and washing facilities available in work area.
CONTAMINATED EQUIPMENT:	Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment. Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Physical and Chemical Properties

Appearance:	Colored liquid	**Melting Point:**	Not determined
Odor:	Glycol Ether	**Freezing Point:**	<32° F
Threshold:	No data available	**Boiling Point:**	215° F (102 °C)
pH:	6 - 10		

Flash Point:				
	Coal	110° F	Meidling Blue	120° F
	Merlot	150° F	Sandstone	126° F
	Fawn	135° F	Cardinal	150° F
	Terra Bark	150° F	Gator Green	129° F
	Jenna Blue	150° F	Otter	126° F
	Cocoa Bean	126° F	Butternut	116° F
	New Penny	150° F	Cayenne	135° F

Evaporation Rate:	Not determined	**Water Solubility:**	100%
Flammability (solid, gas):	Combustible liquid	**Partition Coefficient:**	No data available
Upper/lower Flammability:	N/A	**Auto-Ignition Temperature:**	N/A
Vapor Pressure:	Not determined	**Decomposition Temperature:**	Not determined
Vapor Density:	Not determined	**Viscosity:**	Not determined
Relative Density:	1.01-1.11	**Specific Gravity (H20=1, at 4 °C):**	1.01-1.11

Section 10. Stability and Reactivity

REACTIVITY:	Stable under normal conditions.
CONDITIONS TO AVOID:	Heat, open flame, reactive metals, and strong oxidizers.
INCOMPATIBILITY (MATERIALS TO AVOID):	None known.
HAZARDOUS DECOMPOSITION (BYPRODUCTS):	May emit toxic fumes under fire conditions.
HAZARDOUS POLYMERIZATION:	Will not occur

Section 11. Toxicological Information

ROUTES OF EXPOSURE: Inhalation, ingestion, eyes, and skin.

ACUTE TOXICITY ESTIMATES (ATE):

Coal:
LC50 (inhl) 25.3 mg/m3
LD50 (oral) 6250 mg/kg
LD50 (skin) 5128 mg/kg

Cardinal:
LC50 (inhl) No Data Avail
LD50 (oral) 8197 mg/kg
LD50 (skin) 2994 mg/kg

Otter:
LC50 (inhl) 29.7 mg/m3
LD50 (oral) 5102 mg/kg
LD50 (skin) 3509 mg/kg

Cocoa Bean:
LC50 (inhl) 28.5 mg/m3
LD50 (oral) 5376 mg/kg
LD50 (skin) 4464 mg/kg

Butternut:
LC50 (inhl) 27.7 mg/m3
LD50 (oral) 5587 mg/kg
LD50 (skin) 4651 mg/kg

New Penny:
LC50 (inhl) 28.0 mg/m3
LD50 (oral) 5780 mg/kg
LD50 (skin) 4717 mg/kg

Meidling Blue:
LC50 (inhl) 26.8 mg/m3
LD50 (oral) 6289 mg/kg
LD50 (skin) 5236 mg/kg

Gator Green:
LC50 (inhl) 30.2 mg/m3
LD50 (oral) 5882 mg/kg
LD50 (skin) 4717 mg/kg

Cayenne:
LC50 (inhl) 28.8 mg/m3
LD50 (oral) 6024 mg/kg
LD50 (skin) 4808 mg/kg

Warm Honey:
LC50 (inhl) 28.0 mg/m3
LD50 (oral) 5650 mg/kg
LD50 (skin) 4673 mg/kg

Jenna Blue:
LC50 (inhl) 26.8 mg/m3
LD50 (oral) 5181 mg/kg
LD50 (skin) 3247 mg/kg

Fawn:
LC50 (inhl) 28.0 mg/m3
LD50 (oral) 5714 mg/kg
LD50 (skin) 4695 mg/kg

Merlot:
LC50 (inhl) 39.4 mg/m3
LD50 (oral) 4950 mg/kg
LD50 (skin) 3289 mg/kg

Sandstone:
LC50 (inhl) 28.1 mg/m3
LD50 (oral) 5747 mg/kg
LD50 (skin) 4717 mg/kg

SKIN CONTACT: May cause skin irritation. Prolonged or repeated exposure can defeat the skin.

EYE CONTACT: Category 2 Eye Irritants will cause serious eye irritation. Category 1 Eye Irritants will cause serious eye damage.

INHALATION: May depress the central nervous system, causing dizziness and/or drowsiness.

INGESTION: May cause irritation of the skin inside the mouth, nausea, or stomach cramps/-discomfort.

CARCINOGEN: Coal, Butternut, Cayenne, Fawn and New Penny colors contain trivalent chromium compounds in solution. Trivalent chromium is IARC Group 3 – which is not classifiable as to its carcinogenicity to humans.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Inhalation of fumes may aggravate existing lung problems.

Section 12. Ecological Information

AQUATIC TOXICITY (CALCULATED):

Coal:
LC50 (fish) 44.8 mg/L
LC50 (inv.) 2941 mg/L
EC50 (plants) No Data Available

Obsolete:
LC50 (fish) 3584 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

Jenna Blue
LC50 (fish) 1923 mg/L
LC50 (inv.) 3734 mg/L
EC50 (plants) 149.6 mg/L

Cardinal:
LC50 (fish) 1350 mg/L
LC50 (inv.) 2262 mg/L
EC50 (plants) No Data Available

Meidling Blue:
LC50 (fish) 29.9 mg/L
LC50 (inv.) 4348 mg/L
EC50 (plants) No Data Available

Cayenne:
LC50 (fish) 3584 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

Otter:
LC50 (fish) 2857 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

Fawn:
LC50 (fish) 3584 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

Cocoa Bean:
LC50 (fish) 3205 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

New Penny:
LC50 (fish) 3584 mg/L
LC50 (inv.) 1786 mg/L
EC50 (plants) No Data Available

Maple Syrup:
LC50 (fish) 3584 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

Gator Green:
LC50 (fish) 211.4 mg/L
LC50 (inv.) 3322 mg/L
EC50 (plants) No Data Available

Butternut:
LC50 (fish) 3584 mg/L
LC50 (inv.) 1786 mg/L
EC50 (plants) No Data Available

Terra Bark:
LC50 (fish) 3584 mg/L
LC50 (inv.) No Data Available
EC50 (plants) No Data Available

Merlot:
LC50 (fish) 211.4 mg/L
LC50 (inv.) 3322 mg/L
EC50 (plants) No Data Available

PERSISTENCE & DEGRADABILITY:	No data available
BIOACCUMULATION POTENTIAL:	Potential for bioaccumulation of metals
MOBILITY IN THE SOIL:	Highly mobile in wet soil
OTHER ADVERSE EFFECTS:	None

Section 15. Regulatory Information

RCRA HAZARDOU WASTE NUMBER (40 CFR 261.33):	Possibly D002 or D007

Color	SARA 313	SARA311/312
Coal:	Yes (CAS 34590-94-8, Proprietary Glycol Ether)	Yes (Acute, Fire)
Jenna Blue	Yes (CAS 112-34-5, Proprietary Glycol Ether)	Yes (Acute, Fire)
Meidling Blue:	Yes (Proprietary Glycol Ether)	Yes (Acute, Fire)
Otter:	Yes (CAS 1569-02-4, 2807-30-9,112-34-5, 34590-94-8, Proprietary Glycol Ether)	Yes (Acute, Fire)
Obsolete:	Obsolete:	Obsolete:
Cocoa Bean:	Yes (CAS 1569-02-4, 112-34-5, 34590-94-8, Proprietary Glycol Ether)	Yes (Acute, Fire)
Sandstone:	Yes (CAS 1569-02-4, Proprietary Glycol Ether)	Yes (Acute, Fire)
Butternut:	Yes (CAS 1569-02-4, Proprietary Glycol Ether)	Yes (Acute, Fire)
Merlot:	Yes (CAS 112-34-5, 1569-02-4, Proprietary Glycol Ether)	Yes (Acute, Fire)
Cardinal:	Yes (CAS 111-34-5, Proprietary Glycol Ether)	Yes (Acute, Fire)
Cayenne:	Yes (CAS 1569-02-4, Proprietary Glycol Ether)	Yes (Acute, Fire)
Fawn:	Yes (CAS 1569-02-4, Proprietary Glycol Ether)	Yes (Acute, Fire)
New Penny:	Yes (CAS 34590-94-8, 1569-02-4, Proprietary Glycol Ether)	Yes (Acute, Fire)
Gator Green:	Yes (CAS 1569-02-4, 112-34-5, Proprietary Glycol Ether)	Yes (Acute, Fire)
Terra Bark:	Yes (CAS 1569-02-4, 34590-94-8, Proprietary Glycol Ether)	Yes (Acute, Fire)

STATE REGULATIONS:

COMPONENT	CAS	MASSACHUSETTS	NEW JERSEY	PENNSYLVANIA	ILLINOIS
Glycol Ether PM Alcohol	107-98-2	YES	YES	YES	NO
Glycol Ether DPM	34590-94-8	YES	YES	YES	YES
Dye Molecule	Proprietary	NO	YES	YES	YES
Glycol Ether	Proprietary	YES	YES	YES	YES
Glycol Ether DB	112-34-5	NO	YES	YES	YES
Propylene Glycol	57-55-6	NO	YES	YES	NO
2-Propoxyethanol	2807-30-9	NO	YES	YES	YES
Ethyl Lactate	97-64-3	YES	YES	YES	NO

CALIFORNIA PROP. 65:	None of these products contain chemical(s) known to the state of California to cause cancer and/or birth defects.

Section 16. Other Information

The regulatory information provided is not intended to be comprehensive. Other Federal, State and Local regulations may apply to this material.

DISCLAIMER:

The information is furnished without warranty, representation, inducement, or license of any kind, except that it is accurate to the best of Green Umbrellas' knowledge. Because use conditions and applicable laws may differ from one location to another and may change with time, recipient is responsible for determining whether the information is appropriate for recipient's use. Since company has no control over how this information may be ultimately used, all liability is expressly disclaimed and company assumes no liability.

GREEN UMBRELLA™

COLORPAC

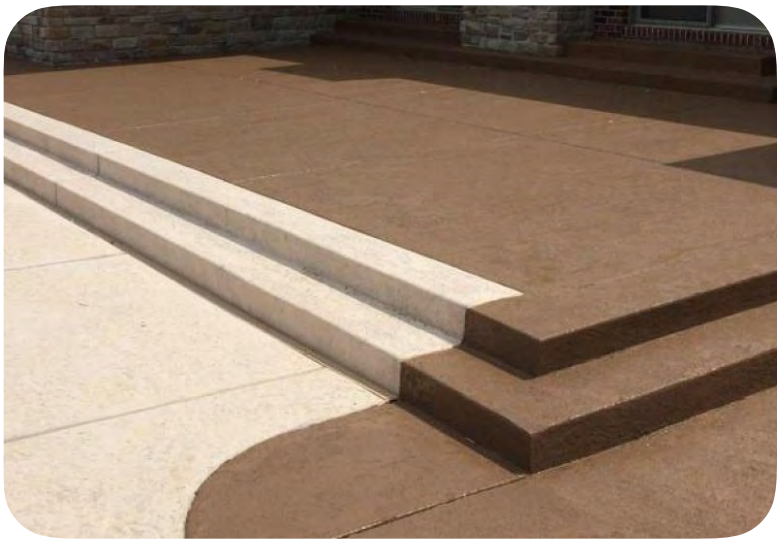
INTEGRAL COLOR FOR CONCRETE

GU Integral ColorPac Colorants are iron oxide pigments that can be used for concrete that is consistent in color from top to bottom. ColorPac Integral Colorants are **Versatile** and may be used in ready mix, pre-cast, tilt-up, ornamental concrete, shot-crete, mortar, concrete masonry units, pavers, roof tiles, and retaining wall units. ColorPac may also be used to color stucco, plaster, cast stone, and many other cement-based construction materials. When coupled with GreenIce Cure they present an **Economical** concrete surface that as the finished floor creates a **Sustainable** project.

Materials: Green Umbrella Integral ColorPac colors do not contain fillers or extenders. All pigments are permanent, light-fast, inert and stable to atmospheric conditions. GU Integral ColorPac colors comply with ASTM C979, Pigments for Integrally Colored Concrete. Integral colors are *not* designed for dust-on application.
Packaging: GU Integral Color ColorPac are packaged in pre-measured per cubic yard disintegrating bags. ColorPac™ may be tossed into mixer without opening or pouring. The mixing action disintegrates the bag allowing the pigment to disperse throughout the mix. Select colors are available in standard 50 lb. paper bags 2000 lb. super sacs, and bulk tanker loads. Quality is assured by a batch label system that tracks the product through production to the warehouse and to your job site. Standard packaging is based on a 5 sack mix (3000psi) per cubic yard.

Mix Design: Make sure to use the same mix design and a consistent water to cement ratio throughout the job with a consistent slump between 3" to 5". Color variation may occur if batch proportion and slump are not maintained from load to load. Keep all raw materials (sand, cement, and aggregates especially) as consistent as possible throughout the entire project. Changes in raw materials (size, color, moisture content) affect the final color. Remember water has a vast effect on final color. Adding too much water will lighten the color of the project giving it a pale or washed out look. When better flowability is required, use a plasticizer or water reducing admixture. Calcium chloride or any chloride based accelerator should not be used. Chloride based additives will cause discoloration in the finished project.

Batch Plant - When mixing at batch plant, truck mixers should be thoroughly cleaned prior to use. For best results add two-thirds of the water and one-half of the aggregates to the drum. Add ColorPac to the drum.
Mix at full charging speed for three minutes or until bags break apart and pigment is dispersed evenly. Add balance of ingredients and mix at full charging speed for 10- 12 minutes (100-120 revolutions).



Job Site - GU Integral ColorPac Integral Color can also be added at the job site. Add bags to drum and mix for 12-15 minutes (120-150 revolutions). Order concrete at a workable slump (3-5") and always keep water addition to a minimum. Make every effort to maintain consistency with multiple loads. Water addition can lead to inconsistent color.

GreenUmbrella™ ColorPac

Integral Color for Concrete

Green Umbrella ColorPac Integral Color for concrete recommends following similar procedures for colored and uncolored concrete regarding base preparation, use of vapor barriers, form placement, reinforcement and joints. Integrally colored concrete should be installed the same way as high quality uncolored concrete. Listed are additional guidelines that should be observed for colored concrete. For more detailed information, please review our color guide.

- GU recommends GreenIce Cure integral curing product to control the moisture in the concrete. Since irregular moisture content and curing are the most serious issue regarding consistent color, this product controls the moisture and will provide consistent color.
- Avoid adding extra water at the job site. Do not wet finishing tools or add water to the surface of the colored concrete.
- The surface should not become wet as the moisture is controlled by the admix. Start finishing the concrete when hard enough to walk on without sinking in more than .". If power troweling you should use Green Ice Curing system with power trowels.
- Do not use wet coverings, plastic sheeting, water proof paper, or liquid membrane curing compounds.
- Even curing + even drying = even color.
- Pigment loading should never exceed 10% of the weight of the cement content.
- Consistency = Reliability.
- Do not sprinkle pigment onto the surface of the concrete.
- Complete the job by sealing your project with Green Umbrella Ice Cap or RTU Microfilm.

Efflorescence is a naturally occurring process. It is a white powdery substance that may occur on the surface of the concrete. This is a result of water evaporation and is more noticeable on colored concrete. Proper curing and protection from water penetration will help reduce the effects of efflorescence. If efflorescence occurs, care should be taken to clean the surface. Use approved products for cleaning colored concrete and be sure to seal with a GU recommended sealer. GU Green Ice System is designed to be applied to freshly placed concrete during the finishing process. This product seals and protects, assures proper curing and will help to prevent efflorescence. Please refer to GU Green Ice System tech data pages for proper application. Always follow manufacturer's recommendations carefully.

GreenUmbrella

ColorPac

				
Fire 5# cubic yard	**Straw** 5# cubic yard	**Light Goldenrod** 5# cubic yard	**Prune** 10# cubic yard	**Tea Green** 5# cubic yard
				
Nutcracker 10# cubic yard	**Chino** 5# cubic yard	**SandShark** 10# cubic yard	**Warm Spice** 10# cubic yard	**Medium Goldenrod** 7.5# cubic yard
				
Vintage Green 10# cubic yard	**Flagstaff** 5# cubic yard	**Red Rocks** 10# cubic yard	**September Morn** 10# cubic yard	**Gray Mist** 10# cubic yard
				
Dark Goldenrod 15# cubic yard	**Salmon** 10# cubic yard	**Vintage Gold** 15# cubic yard	**Red Clay** 20# cubic yard	**Bordeaux** 20# cubic yard
				
Cabernet 25# cubic yard	**River Stone** 25# cubic yard	**Redwood** 25# cubic yard	**Sea Kelp** 20# cubic yard	**Slate Gray** 20# cubic yard
				
Terra Cotta 20# cubic yard	**Black Diamond** 30# cubic yard	**Muscade** 20# cubic yard	**Syrah** 20# cubic yard	**Cumin** 20# cubic yard
				
Warm Honey 25# cubic yard	**Chestnut Brown** 25# cubic yard	**Buckskin** 15# cubic yard	**Onyx** 35# cubic yard	**Hot Chocolate** 20# cubic yard

TECHNICAL DATA SHEET

INTEGRAL / ACRYLIC / DESIGNED FOR POLISHED CONCRETE

GREENUMBRELLA®

FiberLite Concrete Fiber STAGE II

TRANSPARENT & STRONGER FROM TOP TO BOTTOM

FEATURES & BENEFITS

ENHANCES PERFORMANCE & DURABILITY

PROVIDES SECONDARY REINFORCEMENT

ELIMINATES PLASTIC SHRINKAGE CRACKING UP TO 100%

ALKALI RESISTANT & NON CORROSIVE

INSOLUBLE IN WATER

NO FIBER PROTRUSION FOR EASY FINISHING

HIGH IMPACT RESISTANCE

EXCELLENT BOND WITH CONCRETE PASTE

Green Umbrella® FiberLite™ is a low dose, insoluble, transparent in the mix, uniquely designed, secondary reinforcement concrete fiber. Providing isotropic, fiber reinforcement that displaces evenly without clumping or unsightly protrusion from concrete commonly seen in other fibers. The even dispersion and transparency in the mix make it the best choice for exposed architectural concrete with integral or dyed floors and all exposed concrete finishes, vertical or horizontal. FiberLite™ provides the added protection from sudden temperature fluctuation and wind changes that cause unsightly plastic cracking providing an engineered dose that outworks conventional dosing with the lowest .66 pound dosage per c/y and the highest 600,000,000+ fibers per pound count - verses standard market fibers. Transparent in placement and finishing providing no burden to the pumping or finishing crews. Secondary reinforcement with equal strength to Welded Wire Fabric. FiberLite™ reinforces without the need for WWF mats, layout, installation, overlapping, tying/placing and potential vapor barrier damage due to puncture. Fiberlite's unique formulation forms an ionic bond within the fresh matrix attacking plastic shrinkage cracking and reducing it over 94%! Three-dimensional, next generation reinforcement from top to bottom.

BASIC USE

Green Umbrella Fiberlite is a uniquely designed concrete fiber that can be used as a powerful reinforcement. Fiberlite can be used as an alternative or combined with wire mesh to reduce cracking due to stress on the slab. When used in a polished concrete application, the fibers are transparent in the mix and can be dyed and polished.

VERSATILE ARCHITECTURAL APPLICATIONS

Green Umbrella FiberLite's characteristics lend itself to a variety of concrete applications including slab-on-grade, precast concrete, shot-crete, stucco, decorative and other specialty concrete applications.

MANUFACTURER

GREEN UMBRELLA

20 JETVIEW DRIVE

ROCHESTER, NY 14624

844.200.7336

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DIVISION/SECTION

SECTION 0324
FIBROUS REINFORCING

RELATED SECTIONS

SECTION0321
REINFORCING STEEL

SECTION03300
CAST-IN-PLACE CONCRETE

SECTION03370
SHOTCRETE

SECTION03500
CEMENTITIOUS DECKS
AND UNDERLAYMENT

GREENUMBRELLA®

ARCHITECTURAL APPLICATIONS FAQ

What other applications besides typical slabs on ground and precast can FiberLite be specified?

FiberLite can been utilized in a multitude of high performance applications such as: tunnels, saline environments, swamp areas, hurricane or seismic regions as well as less demanding applications: precast, shotcrete, thin-overlays (concrete less than 4 in. (100 mm) thick), whitetoppings, concrete curbs. For more details on each of these applications and more please contact your Green Umbrella Concrete Additives.

Can Green Umbrella fibers be used in precast products?

Yes. The definition of a precast concrete member is simply an item that is "cast before" — one that is cast and cured in a form other than its final position. This concrete product application might include a wide variety of items: patio stones, splash blocks, step units, septic tanks, architectural facade panels, median barriers, railroad ties, burial vaults, utility boxes, bridge beams, grade rings, pipes, hollow-core slabs, manholes, and fence posts, as well as hundreds of different decorative ornamental items. It is very important for the precast producer to find methods to increase the toughness and early strength of his concrete products to reduce waste, minimize callbacks and returns, and aid in the item's long-term durability. If precasters are able to strip the forms and move "green" products to a curing area without breakage, the fiber reinforcement is obviously fulfilling its initial performance obligation. In addition, precasters notice less breakage, chipping, and spalling during handling, delivery, and placement of their products due to the unique three-dimensional Green Umbrella fiber coverage. The use of higher dosages of macro fibers allows the precaster to replace a higher level of conventional steel — contact Green Umbrella for engineering assistance.

Can FiberLite be used in shotcrete applications?

Yes. The term 'shotcrete' is generally used to describe concrete or mortar that is placed or shot at a high velocity onto a given surface by means of compressed air. The reinforcement used in typical shotcrete applications is expected to provide resistance to shear, flexure, and bending loading that may result from soil or rock movement, or from local hydrostatic pressures. The placement of wire mesh on typical irregular shotcrete surfaces is both cumbersome and costly with regards to labor. Synthetic fibers may be used as alternate materials that offer the necessary toughness-index and residual strength levels required, without the hassle and labor costs associated with mesh.

Can Green Umbrella fibers be used in toppings or overlays?

Yes. An overlay is defined as a layer of concrete or mortar, seldom thinner than 1 inch (25 mm.), placed on, and usually bonded onto, the worn or cracked surface of a concrete slab. The overlay is usually designed to either restore or improve the function of the previous surface. Similarly, a topping is also defined as a layer of concrete or mortar placed to form a floor surface on a concrete base, yet is not necessarily bonded to the existing slab. Although deterioration of the old surface or severe cracking of the old slab is most often the reason for a topping course, other reasons might include a lack of floor levelness, improper elevation or plane, inadequate skid or slip resistance, or a lack of wear resistance. Regardless of the

WEBSITE & DOCUMENTS AVAILABLE AT:

GREENUMBRELLASYSTEMS.COM

CUTSHEET, APPLICATION SHEET, FEATURE BROCHURE, TECHNICAL DATA SHEET, SAFETY DATA SHEET

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reasons, slab toppings and overlays can provide a cost-effective method of restoring an existing slab into serviceable condition, without the expense of removal and replacement. In addition to the normal difficulties of placing mesh in flatwork applications, there are additional related complications when toppings and overlays are placed. Naturally, the steel wire mesh requires sufficient cover within the concrete (usually a minimum of 2" or 5 cm.) to prevent corrosion-related spalling and unsightly mesh lines. Obviously, this cover becomes impossible in thin concrete toppings. In unbonded overlay applications, the placement of wire mesh becomes equally difficult without disrupting or damaging the bond-breaking layer or sheeting. One of the most important negatives with regards to mesh is the lack of uniform reinforcement coverage. The mesh is obviously located in one plane only in these thin applications that demand reinforcement to counter problems caused by one-directional bleeding, differential shrinkage, and curling. The use of fiber alleviates these concerns.

ADDITIONAL BENEFITS

In addition to the post-first crack benefits, additional benefits in this application will include the plastic shrinkage cracking mechanism and the reduced volume change due to thermal and moisture variables. There are further quantifiable benefits that would be gained by using this 3-dimensional reinforcement system provided by the FiberLite micro fiber including enhanced surface abrasion resistance and impact resistance.

PHYSICAL PROPERTIES

Material	Modified Acrylic
Specific Gravity (g/m3)	117
Elastic Modulus (GPa)	>10.5
Tenacity (MPa)	>650
Decomposition Temperature	330˚C / 626˚F (Green Umbrella Fiberlite does not melt)
Acid & Alkali Resistance	Excellent
Color	White
Dispersity Rate	Excellent
Filament Diameter (μ)	1015
Fiber Count (fiber/kg) approx	794,000,000
Fiber Length (mm) (other lengths available)	6

PACKAGING

1 bag (.66lb)
1 Carton/32 Bags; 36 Cartons/Pallet
Truckloads are available. Bales are available upon request.

For general applications such as slab-on grade, a standard dosage of (1) bag/yd is recommended. Other fibers require higher dosage rates to achieve similar performance. For other applications, consult with your Green Umbrella™ representative for recommended dosages.

WHY DO FIBERS "BALL UP" IN CONCRETE MIXES?

ALL FIBER TYPES (STEEL, MICRO AND MACRO SYNTHETIC) HAVE THE POTENTIAL TO "BALL UP" IN CONCRETE. THIS PHENOMENON IS USUALLY CAUSED BY ADDITION OF FIBERS INTO CONCRETE MIXES THAT ARE TOO DRY (SLUMP DECREASES TO ZERO) OR INTO MIXTURES THAT DO NOT HAVE ENOUGH FINE PARTICLES (CEMENT, SAND, SUPPLEMENTAL MATERIALS, ETC.) TO COAT THE FIBER PARTICLES, WHICH IN TURN "PASTE STARVES" THE SYSTEM AND AGAIN CAUSES THE SLUMP TO DECREASE TO ZERO. LOOSE FIBERS IN AN EMPTY DRUM MAY CLUMP TOGETHER AND FIBER TYPES THAT ARE TOO LONG OR HAVE VARYING GEOMETRIES MAY ALSO CAUSE PROBLEMS. AS ALWAYS, A TEST TRIAL SHOULD BE PERFORMED TO ENSURE THAT THE MIXTURE WILL SUPPORT THE FIBER TYPE AND DOSAGE AND THAT THE BATCHING SEQUENCE WILL NOT CAUSE ANY PROBLEMS. IF NECESSARY, THE USE OF A WATER REDUCING ADMIXTURE MAY BE WARRANTED TO MAINTAIN THE DESIRED SLUMP FOR PLACEMENT.

SPECIFICATIONS

CUTSPEC

FiberLite™ by Green Umbrella® of Rochester, NY (844) 200-7336 is a low dose, insoluble, transparent in the mix, uniquely designed, secondary reinforcement concrete fiber. Providing isotropic fiber reinforcement that displaces evenly without clumping or unsightly protrusion from concrete commonly seen in other fibers. Place at mixing of *@EarlyAge* concrete at a DOSAGE RATE of .66 lb/cyd for general applications such as slab-on grade, a standard dosage of (1) bag/yd3 is recommended. Other fibers require higher dosage rates to achieve similar performance. For other applications, consult with your Green Umbrella® representative for recommended dosages.

TEST STANDARDS

ASTM C39	Concrete Cylinder Compression
ASTM C78-1	Standard Test Method for Flexural Strength of Concrete
ASTM C1018	Standard Test Method for Flexural Toughness and First-Crack Strength of Fiber-Reinforced Concrete
ASTM C666	Freeze Thaw Durability
ASTM C234	Bond Strength
ASTM C1116/ C1116 M-08a	Standard Specification for Fiber-reinforced Concrete
ICS ES AC 32	Section 3.1.1 3.1.2

SUMMARY

Flexural	4.38 MPa (635 psi) 110% of Control
Bond Strength	89.02 kN (20,012 psi) 111% of Control
Impact Resistance	7 Days 225% of Control
Impact Resistance	28 Days 193% of Control
Plastic Shrinkage Cracking Average Reduction	90.4%

CONCLUSION

Based on the test results, Green Umbrella® FiberLite™ used at a dosage rate of 0.66 lb/yd (0.39 kg/m) exceeded the test parameters required by ICCES AC32.

FIBERLITE FOR WWF REPLACEMENT

FiberLite meets the definition of a micro synthetic fiber. FiberLite at .66 lb/cyd. will meet the same engineering property requirements for the slab-on-ground on projects as 6x6-W1.4xW1.4 WWF.

PRODUCT MIXING AND PUMPING

No Mix Design Change Needed

When fibers are used at recommended dosage and application rates, no mix design changes are necessary. However, if fiber volume rates are dramatically increased, some alterations in the mix design may be required. Please contact us for assistance regarding mix design and fiber dosage rates.

Dosage Rate
Green Umbrella produces a range of synthetic fibers used at various dosages to meet the performance requirements of a project or owner. Green Umbrella recommends the following performance-based characteristics:

1. For plastic shrinkage crack-control during the early life of the concrete: 1 bag per yard of FiberLite;
2. For shrinkage and temperature-related crack-control as an alternate to light non-structural wire mesh in most applications: 1 bag per yard of FiberLite;

See your Green Umbrella representative for engineered dose per application.

Timing of Fiber Addition
Green Umbrella products should be added to the concrete mixing system at the batch plant for best distribution. Follow the normal mixer manufacturers' standard recommendations and ASTM C-94. Mixing time should be a minimum of four to five minutes per load at a normal mixing speed. The batch plant will be the most economical and safest place for addition of the fibers. Typically it is not recommended that fibers be introduced to the mixer as a first ingredient, but added with other ingredients or at the end of the addition sequence.

Job Site Addition
Fibers can be added to ready-mix trucks at the job site, though it is recommended they be added at the batch plant for optimum mixing and distribution. If fibers are added at the site, extra caution should be exercised to ensure sufficient mixing time. Allow at least 4 to 5 minutes of mixing time at drum mixing speed after the last product bag has been added. Fiberlite can be stored at the job site as long as it is properly covered to keep the packaging materials intact and dry.

Concrete Slump
Because of its isotropic three-dimensional cohesive nature, fiber-reinforced concrete has the appearance of being less workable than plain concrete. In actuality, the visual slump may be reduced slightly but the flowability remains nearly same. Caution; never allow water to be added at the job site to bring back slump loss. The use of a super plasticizer is recommended to increase slump if needed.

Compatibility with Liquid Admixtures
Synthetic fibers have no effect on air entrainment, super plasticizers, or water reducers. If possible, synthetic fibers should be added prior to any liquid admixtures to take full advantage of the mixing shear and friction of the mix to optimize the distribution.

Concrete Pumping
For normal weight concrete FiberLite does not increase the pressure needed to pump the concrete mix or cause any other issues. Fiber reinforcement has become a desirable construction practice for a wide range of concrete applications. The ease of addition and the uniform distribution have given fibers distinct job site advantages over non-structural wire mesh. These advantages are even more valuable on projects where the concrete is delivered by a pumping process. The use of integral fiber reinforcement eliminates the wire mesh hassle encountered by the pump-line labor force, and allows the nozzle-man an unencumbered field in which to operate. In lieu of hoisting rolls of mesh onto upper-level deck projects, Green Umbrella-reinforced concrete can simply be pumped into place, offering significant time and labor savings to the project. Though fibers tend to change the "visual appearance" of the concrete, the pump operators typically

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MADE IN THE U.S.A.

notice more consistent and slightly lower pump pressures are required for fiber concrete.

Concrete Finishing
Fiberlite will not interfere with a laser screed or power trowel finish. The vibration of the laser guided screed brings cement to the surface and covers almost all exposed fibers. Those not covered will be burned off with any power trowel finish. The possibility of replacing conventional steel mats with High Volume Synthetic Fibers allows for a much easier laser screed placement and finishing process.

Broom Finish
The use of a stiff bristled broom used in only one direction will help align surface fibers with the texture ridges, making them considerably less noticeable.
There is no surface protrusion when using FiberLite. FiberLite can be pumped or placed using conventional equipment and can be used with all finishing techniques including power and hand troweling, broom finished and colored concrete.

SURFACE APPEARANCE

There is no surface protrusion when using FiberLite. FiberLite can be pumped or placed using conventional equipment and can be used with all finishing techniques including power and hand troweling, broom finished and colored concrete.

NOTE: TIME, TEMP, AND HUMIDITY

Best Practice according to ACI Standards.

WARRANTY AND LIMITATIONS

It is the responsibility of the contractor to follow all directions and requirements as outlined in the Green Umbrella installation specifications. A completed Job Survey form must accompany this warranty request. Green Umbrella™ Companies (GU) solely and expressly warrants that its products shall be free from defects in materials. and workmanship for six months from the date of purchase. Unless authorized in writing by an officer of Green Umbrella, no other representations or statements made by Green Umbrella™ or its representatives, in writing or orally shall alter this warranty, GREEN UMBRELLA MAKES NO WARRANTIES, IMPLIED OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES THE SAME. GREEN UMBRELLA APPLIED TO SUBSTANDARD CONCRETE IS EXCLUDED FROM ANY KIND OF WARRANTY. If any Green Umbrella™ product fails to conform to this warranty Green Umbrella™ will replace Green UmbrellaTM product at no cost to the Buyer. Replacement of any product shall be the sole and exclusive remedy available and the buyer shall have no claim for incidental or consequential damages. Any installation of Green Umbrella products that fails to conform to such installation information and instructions shall void this warranty. Product demonstrations, if any are done for illustrative purposes only and do not constitute a warranty or warranty alteration of any kind. Buyer shall be solely responsible for determining suitability of Green Umbrella products for the Buyers intended purposes.