PART I – GENERAL

1.1 SUMMARY

1. NEW CONSTRUCTION COMMERCIAL / RETAIL (DFS™) SPECIFICATION USING LITHIUM SURFACE DENSIFIER PENTRA-HARD™ DENSIFIER “AT-TIME-OF-PLACEMENT” OF CONCRETE FOLLOWED BY A CURING COMPOUND AND PENTRA-HARD™ FINISH TREATMENT FOR ENHANCED GLOSS, STAIN AND WEAR PROTECTION.

2. All equipment, products, and procedures are specified herein for the installation of the PENTRA-HARD DFS System for new construction applications.

1.2 SUBMITTALS

1. CHEMICAL APPLICATION

   1. Product Data: Submit Manufacturer’s technical literature to include surface preparation, application instructions, recommendations and storage and handling requirements for product indicated, specified or required. Include manufacturer’s technical data, application instructions, recommendations and MSDS.

   2. Installer Qualifications: Data for company, principal personnel, experience, and training. Provide a letter documenting installer’s accreditation and certification compliance, as specified under quality assurance.

   3. Maintenance Data: Provide manufacturer’s instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum conditions.
2. SURFACE PREPARATION (Cleaning)

If concrete contractor and general contractor determine that the saw cuts must be made prior to the application of the PENTRA-HARD™ DENSIFIER, then the residue left behind by the saw cutting process must be cleaned. Residue can be cleaned by using mops, blowers, brooms, or auto-scrubbers if concrete contractor and general contractor determine that it will not damage the concrete surface. The concrete contractor and general contractor (under the engineer’s direction) can determine that the saw cuts can be made after the PENTRA-HARD DENSIFIER application.

1.3 QUALITY ASSURANCE

1. APPLICATOR QUALIFICATIONS: Applicator must have prior experience applying specified product, or similar products or have manufacturer’s representative on site ensuring that preparation and application are done correctly.

1.04 DELIVERY, STORAGE, AND HANDLING

1. Materials must be delivered in original, factory sealed containers with the manufacturer’s labels including product name and batch numbers.

2. Store in cool dry area. Protect from freezing.

1.5 ENVIRONMENTAL REQUIREMENTS

1. ENVIRONMENTAL CONDITIONS: Do not apply material when temperature is below 35F (2C).

2. PROTECTION: Precautions should be taken to avoid damage to any surface near the work zone.

PART 2. PRODUCTS AND EQUIPMENT

2.01 MANUFACTURERS

1. PRODUCTS (CHEMICAL TREATMENTS): DAYTON SUPERIOR CORPORATION

For technical assistance, contact our Technical Service Department:

Dayton Superior Corporation
1125 Byers Road
Miamisburg, OH 45342
800-745-3700
www.daytonsuperior.com

2.2.1 MATERIAL DESCRIPTION
1. **PRODUCT: PENTRA-HARD™ DENSIFIER (Lithium Concrete Hardener, DENSIFIER, Dust-Proofener, And Sealer):** A clear, penetrating, breathable, surface-applied liquid that strengthens protects and hardens concrete surfaces. This environmentally friendly treatment reduces alkalinity (efflorescence), improves overall abrasion resistance and reduces dusting.

2. **PRODUCT: Clear Resin Cure J11W:** A ready-to-use resin based dissipating curing compound for use on freshly finished horizontal and vertical concrete surfaces. Clear Resin Cure J11W is formulated to provide an effective curing membrane that will begin to dissipate after exposure to sunlight, weathering and/or traffic.

3. **PRODUCT: PENTRA-HARD™ FINISH (High-gloss, Stain and Wear Protector):** A patented lithium-fortified FINISH that offers increased surface hardness, superior reflectivity, stain and wear protection.

4. **PACKAGING:**
   - 275 Gal Tote
   - 55 Gal Drum
   - 5 Gal Pail
   - 1 Gal Jug

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**PART 3. EXECUTION**

1.01 **EXAMINATION**

1. Examine surfaces to receive penetrating hardener, sealer, and DENSIFIER. Notify Engineer if surfaces are unacceptable. Do not begin surface preparation or placement until acceptable conditions exist.

3.2 **APPLICATION PROCEDURES & INSTRUCTIONS**

1. **GUIDELINES**

   **TIMING:** Joint cutting is more important for the performance of the slab than treating the slab immediately with PENTRA-HARD™ DENSIFIER (Time-of-Placement). PENTRA-HARD™ DENSIFIER may be applied before or after the joints are cut.

   1. Consult with concrete placement Superintendent and Saw Cutting crew about the timing of the PENTRA-HARD™ DENSIFIER application.

   2. Determination: If applying PENTRA-HARD™ DENSIFIER (prior to joint cutting proceed to Application Instructions below. If applying PENTRA-HARD™ DENSIFIER after cutting joints, begin with Application Instruction (2.) below.

2. **APPLICATION INSTRUCTION STEPS PENTRA-HARD™ - DENSIFIER**

   1. **Application Instructions Before Joints are cut:** Using a high volume, low pressure sprayer (HVLP type with a 3 to 5 gallon per minute capacity is recommended); apply
PENTRA-HARD™ DENSIFIER to the surface evenly at the rate of approximately 400-600 square ft. per gallon. (DO NOT OVER APPLY) Keep the surface wet with PENTRA-HARD™ DENSIFIER for at least 20 minutes. DO NOT LET ANY AREA DRY OUT—spray more PENTRA-HARD™ DENSIFIER if required. A microfiber applicator or broom can be used to spread material evenly across the slab immediately after spraying. Lightly broom or squeegee out any puddles after the material has begun to dry. After a 20-minute dwell time, let it dry or squeegee the excess material off the slab. If the material has not begun to dry after 2 hours, remove with either an auto-scrubber or squeegee.

2. Application Instructions After Joints are cut: Clean up saw cut residue from the surface using vacuums, sweepers, blowers, or brooms. Use appropriate scrubber equipment with Red or Blue pad, (Blue pads are more aggressive and should only be used if you have determined they will not damage the surface) clean the joints to remove any residue that sweeping or blowing did not remove. Damp mop the joints and around columns to get the surface thoroughly clean. Then using a high volume, low pressure sprayer (HVLP) with a capacity of 3-5 gallons per minute, apply PENTRA-HARD™ DENSIFIER to the surface evenly at the rate of approximately 400-650 square ft. per gallon. (DO NOT OVER APPLY) Keep the surface wet with PENTRA-HARD™ DENSIFIER for at least 20 minutes. DO NOT LET ANY AREA DRY OUT—spray more PENTRA-HARD™ DENSIFIER if required. You can use a microfiber applicator or broom to spread material evenly across the slab. Lightly broom or squeegee out any puddles after the material has begun to dry. After a 20-minute dwell time you can let it dry or squeegee the excess material off the slab. An auto-scrubber can be used to vacuum up excess material provided that the applicator, concrete contractor, and general contractor deem the concrete surface is of sufficient strength. If the material has not begun to dry after 2 hours remove with either an auto-scrubber or squeegee.

Cold Weather Applications: Do not apply unless temperature will be above 3°F (−18°C) for at least 4 hours following application. Using a high volume, low pressure sprayer, apply PENTRA-HARD™ DENSIFIER to the surface evenly at the rate of approximately 400-650 square ft. per gallon. (DO NOT OVER APPLY) Keep the surface wet with PENTRA-HARD™ DENSIFIER for at least 20 minutes. Use a micro-fiber applicator or broom to spread material evenly across the slab. Lightly broom or squeegee out any puddles after the material has begun to dry. After a 20-minute dwell time, let it dry or squeegee the excess material off the slab. If it is determined that the concrete is hard enough for an auto-scrubber, use that with the vacuum on to clean off the excess. If the material has not begun to dry after 2 hours remove with either an auto-scrubber or squeegee.

Hot Weather Applications: In hot or dry, windy conditions, it may be necessary to apply material in the evening or early morning hours to prevent material from flash-drying on the surface. The surface may also be cooled by spraying water on it prior to application.

3. Integrally Colored Concrete: It is important to get consistent drying on integrally colored concrete. Use a microfiber applicator to spread material evenly immediately after spraying-OR- use an auto-scrubber to remove the material after a 20 minute dwell time on the surface, not allowing any areas to dry out.

4. Shake on Color Hardeners: Use a microfiber applicator to spread material evenly immediately after spraying-OR- use an auto-scrubber to remove the material after a 20 minute dwell time on the surface, not allowing any areas to dry out.

5. Curing Compound: Clear Resin Cure J11W Mixing: The Clear Resin Cure J11W should be thoroughly stirred prior to each days use. Do not thin. Do not use high speed mixing equipment.
Placement: Apply uniformly at 400 ft²/gal. (9.8 m²/L) on interior steel troweled, tightly finished concrete (consult Dayton Superior for any other application conditions) immediately after PENTRA-HARD™ DENSIIFIER has dried. Use low pressure spray. Spray equipment must be able to atomize the material without tailing, splitting or sputtering to create a uniform thin film on the surface. All application equipment and tools should be thoroughly cleaned prior to use to avoid contamination. Apply uniformly without puddling. DO NOT delay in applying the curing compound!

Clear Resin Cure J11W will normally oxidize and begin to wear off within 30-60 days after application when exposed to traffic, sunlight and weathering; additional cleaning may be necessary to completely remove the film, particularly in areas of heavy application, those areas not exposed to sunlight or in vertical applications. The use of auto floor scrubbers and/or chemical cleaners such as Dayton Superior Citrus Cleaner J48 may be required. Scrub surface well and allow cleaner to have sufficient dwell time to soften cure residue, followed by thorough and multiple flushing with clean water. Do not allow cleaner to dry on the surface.

3. APPLICATION INSTRUCTIONS PENTRA-HARD™ FINISH (High-gloss, Stain and Wear Protector):

1. Ensure all Curing Compound residue is removed from concrete surface. If a citrus or other acidic cleaning material has been used, neutralize the surface with TSP, Tide laundry detergent, or other high pH cleaner before proceeding with the application.

2. Mix, shake or stir thoroughly before applying

3. Choose from 12 - 24” microfiber pads. Pad selection based on size of application area and applicator’s relative comfort level with application system.

4. Apply PENTRA-HARD™ FINISH using a clean, water-dampened microfiber pad. Spray PENTRA-HARD™ FINISH across the top of the area to be treated with a pump-up sprayer or HVLP sprayer. Spread PENTRA-HARD™ FINISH from this sprayed area until the pad begins to drag, then spray more material. Don’t scrub or work-in PENTRA-HARD™ FINISH as that may cause unevenness or streaking. Apply at a rate of 1500 - 3,000 sq. ft. per gallon depending on the surface profile spreading material thinly and evenly so as to completely cover the substrate. Spray and treat no larger than 20 x 20’ sections at a time.

5. Allow to dry for 10 - 15 minutes. (burnish / buff coating within 10 - 15 minutes of when it’s dry.)

6. Burnish / buff with high-speed machine (1500-2500 rpms) using hogs hair or a fine / ultrafine diamond impregnated pad. Burnishing between PENTRA-HARD™ FINISH coats is highly recommended to improve curing process and shine.

IMPORTANT: If floor is not burnished, allow each application to dry at least 30-60 minutes before reapplying next coat. Buffing between Applications with a high speed-burnisher equipped with a hogs hair or diamond impregnated pad system is recommended.

7. Repeat steps 4 - 5 depending on the surface profile and desired gloss levels. Repeated applications build a stain resistant microfilm over the substrate. Do not over apply. It is critical to apply very thin multiple coats. If applied too thickly it will dry improperly and discolor, whiten or leave streaks and/or applicator marks.

8. Do not to clean or scrub the surface for at least 72 hours. Clean up any accidental spills immediately.

9. IMPORTANT: Avoid moisture for 72 Hours. Do not allow standing water for 14 days. Do not place protective plastic sheeting, rubber matting, rugs or furniture that can prevent proper drying. Covering the surface can retard curing and result in a cloudy or whitening effect.
a. Light pedestrian use within 30 - 60 minutes, vehicle traffic in 2 hours.

b. Maximum performance may take up to 14 days to develop, depending on temperature and humidity.

3.03 MAINTENANCE

1. Routine sweeping, mopping, washing and mechanical scrubbing of floors with neutral pH cleaners/water is recommended. DO NOT USE acidic, citrus or butoxy-ethanol-containing cleaners to maintain the floor. It is recommended to reapply the PENTRA-HARD FINISH once every six months as needed. No stripping of material is required.

3.04 CLEAN UP

1. Use soap and water to clean tools and equipment. Although Lithium treatments are non-toxic and environmentally safe, they are alkali. Do not dispose of unused material in storm drains or sanitary sewer systems—use it up or dry it out and dispose of properly per local regulations.

3.05 AVAILABILITY

1. PENTRA-HARD™ concrete treatments are sold through DAYTON SUPERIOR CORPORATION’s distribution network. See www.daytonsuperior.com

3.06 TECHNICAL SERVICES

1. A staff of trained service personnel offers design assistance and technical support. For technical assistance, contact our Technical Service Department: Technical Service Customer Care Toll-Free (877) 416-3439

3.07 NATIONWIDE APPLICATOR NETWORK

1 PENTRA-HARD DFS concrete treatments may be installed by trained and experienced “authorized applicators”. Located in major markets across the United States and Canada, these specialty contractors are well versed in our product capabilities and application procedures.

END OF SECTION