

Section 03 35 43 – Special Concrete Floor Finishes

This specification is provided by Curecrete Distribution, Inc. as a service and is intended to be used as a guideline for preparing the appropriate project specification section. Every heading may not be needed. Delete headings not used and renumber remaining used headings to be numerically correct.

Specifier's Note: This section is written to allow polished concrete flooring to be installed using either wet or dry mechanical polishing methods, at the contractor's option. Selection of polishing method shall not alter required performance, appearance, durability or environmental compliance.

Concrete composition, placement, curing and finishing practices directly affect the final polished appearance. Coordinate this section with Section 03 30 00 and require a pre-installation conference and on-site mock-up to establish acceptable results.

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes mechanically polished concrete flooring, including surface preparation, joint filling, crack and spall repair, densification, optional coloring, final polishing, topical protection, cleaning, and maintenance
- B. Polishing may be performed using wet or dry methods, provided specified performance, appearance, environmental, and safety requirements are achieved

1.2 REFERENCES

- A. ACI 302.1R – Guide for Concrete Floor and Slab Construction
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- B. ASTM International
 - 1. ASTM C309 – Standard Specification for Liquid Membrane Forming Compounds
 - 2. ASTM C171 – Standard Specification for Sheet Materials for Curing Concrete
 - 3. ASTM C779 – Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces
 - 4. ASTM C805 – Standard Test Method for Rebound Number of Hardened Concrete
 - 5. ASTM D4039 - Standard Test Method for Reflection Haze of High-Gloss Surfaces
 - 6. ASTM D523 – Specular Gloss
 - 7. ASTM D5767 - Standard Test Method for Determining the Distinction of Image of Hardened Concrete (Gloss)
 - 8. ASTM E1155 – Standard Test Method for Determining Floor Flatness and Levelness Using the F Number System
 - 9. ASTM E84 – Surface Burning Characteristics
- C. Additional Testing Methods
 - 1. Mohs Pencil Hardness Test
 - 2. Modified Phenolphthalein Test

- D. American Society of Concrete Contractors (ASCC) – Concrete Polishing Council:
Exposed Polished Concrete Exposure Chart

1.3 PERFORMANCE REQUIREMENTS

- A. Performance Requirements: Provide polished flooring that has been selected, manufactured and installed to achieve the following:
1. Manufacturer shall provide a current Environmental Product Declaration, issued by an accredited Program Operator
 2. Abrasion Resistance: ASTM C779, up to 400% increase in abrasion resistance
 3. Reflectivity: Increase of 35% as determined by gloss meter
 4. Impact Strength: ASTM C805, up to 21% increased impact strength
 5. Must meet or exceed ANSI A326.3, NFSI B101.1 and B101.3 suggested values for Static and Dynamic Co-Efficient of Friction

1.4 PRE-INSTALLATION MEETINGS

- A. Pre-Installation of Concrete Conference: Prior to placing concrete for areas scheduled for polishing, conduct conference at project to comply with requirements of applicable Division 01 sections
- B. Required Attendees
1. Owner's Representative
 2. Architect
 3. General Contractor, including supervisor
 4. Concrete Producer
 5. Concrete Finisher, including supervisor
 6. Concrete Polisher, including supervisor
 7. Technical Representative of liquid applied densifier manufacturer

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated
- B. LEED Submittals
1. Product data for credit IEQ 4.2; for liquid applied flooring components, documentation including printed statement of VOC content
 2. Health Product Declaration (HPD)
 3. CDPH-1.2-2017: Indoor Emissions Testing Certificate
- C. For Dry Grinding Method
1. Equipment data for grinders and HEPA dust-collection systems.
 2. Dust collection method must meet or exceed the requirements in OSHA table 1 for silica dust exposure.
 3. Sample area (minimum of 100 sq. ft.) demonstrating:
 - a. Aggregate exposure level
 - b. Final gloss level
 - c. Surface clarity
 - d. Concrete for mockup should include the same design and finish techniques as the areas to be polished

1.6 INFORMATIONAL SUBMITTALS

- A. Test Reports: Certified test reports, from an independent testing laboratory, showing compliance with specified performance criteria and physical properties as cited in “Performance Requirements”
 - 1. Provide concrete mix design and cement mill certificate(s)
- B. Certificates:
 - 1. Product and installer certificates signed by the manufacturer certifying materials meet specified performance characteristics and criteria and physical requirements
 - 2. Current installation contractor’s certificate signed by manufacturer declaring contractor as a certified installer of polishing system, prior to bidding of project

1.7 CLOSEOUT SUBMITTALS

- A. Warranty: Submit warranty documents specified
- B. Maintenance Data: Include maintenance manuals for polished concrete
- C. Also including the following:
 - 1. Manufacturer’s instructions on maintenance renewal of applied treatments
 - 2. Protocols and product specifications for joint filling, crack repair and/or surface repair

1.8 QUALITY ASSURANCE

- A. Manufacturers Qualifications
 - 1. Manufacturers have a minimum of 10 years of experience in manufacturing components similar to or exceeding requirements of project
 - 2. Manufacturer must be able to provide technically trained field representative during construction and approve the application method
- B. Installer Qualifications
 - 1. Installer experienced in performing work of this section and who has specialized in installation work similar to that required for this project
 - 2. Installer trained and with current certification for the RetroPlate Concrete Polishing System
 - 3. For Dry Grinding Method: installer shall have a minimum of 3 years experience in dry polished concrete installations
- C. Mock-Ups
 - 1. Mock-up size 10x10’ floor area at job site, at location as directed under conditions similar to those which will exist during actual placement; divide mock-up area into 4 equal zones, allowing for sequential attempts to determine amount of aggregate exposure and color (if required) and shine selection
 - 2. Mock-up will be used to judge workmanship, concrete substrate preparation, operation of equipment, material application, color selection and shine level
 - 3. Allow 24 hours for inspection of mock-up before proceeding with work
 - 4. When accepted, mock-up will demonstrate the minimum standard of quality required for this project; once mock-up is approved by the authorized individual(s), the General Contractor is responsible for protecting the approved mock-up for the duration of the project
 - 5. Aggregate exposure, DOI gloss and haze index shall be:

Specifier’s Note: Edit Level of cut and polish from the following list as per needs of project, delete unused items

Aggregate Appearance Classes Per ASCC Concrete Polishing Council:

Class A – Cement Fines (commonly called cream finish) 85-95% fines; 5-15% fine aggregate

Class B – Fine Aggregate (commonly called salt/pepper finish) 85-95% fine aggregate; 5-15 % blend of fines and coarse aggregate

Class C– Coarse Aggregate; 80-90% coarse aggregate; 10-20% cement fines and fine aggregates

Polished Concrete Appearance Levels Per ASCC Concrete Polishing Council:

Level 1 – Flat [Ground]: Flat Appearance; a DOI reading of 0-9; Haze Reading <12; Reflective Sheen: None to very low

Level 2 – Satin [Honed]: Matte Appearance; a DOI reading of 10-39; Haze Reading <12; Reflective Sheen: Low to medium

Level 3 – Polished: [Polished Gloss]: Images reflected and easily identified as a sharp image; a DOI reading of 40-69; Haze Reading <12; Reflective Sheen: Medium to high

Level 4 – Highly Polished: [Very High Gloss]: Sharp and crisp reflections; a DOI reading >70; Haze Reading <12; Reflective Sheen: High to highest

1.9 DELIVERY, STORAGE & HANDLING

A. Ordering

1. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays

B. Delivery

1. Deliver materials in manufacturer's original packing with identification labels and seals intact

C. Storage and Protection

1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer
2. Protect Concrete Slab
 - a. Protect from petroleum stains during construction
 - b. Diaper all hydraulic lifts and power equipment
 - c. Restrict vehicular parking, drop cloths will be placed under vehicles parked on slab
 - d. No pipe cutting machinery will be used on interior floor slab
 - e. Steel will not be placed on interior floor slab to avoid rust staining
 - f. No acids or acidic detergents will come into contact with slab

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install work until ambient temperature and humidity conditions are maintained at levels indicated in reference standards

- B. Substrate must scratch above a 4 on the Mohs Pencil Hardness Test
- C. Maintain floor temperature between 40° and 95° during polishing
- D. Ensure adequate ventilation during dry grinding operations
- E. Prevent moisture intrusion prior to completion

1.11 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for project warranty provisions
- B. Manufacturer's Warranty: Submit for owner's acceptance, manufacturer's standard 20 year, labor and material warranty document executed by authorized Certified Applicator company official; manufacturer's warranty is in addition to and does not limit other rights Owner may have under contract documents

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Ensure concrete finishing components and materials are from a single source, from single manufacturer

2.2 POLISHED CONCRETE FINISHING PRODUCTS

- A. Basis of Design Product: Curecrete Distribution, Inc., RetroPlate System
 - 1. Contact: 1203 Spring Creem Place, Springville, UT 84663; Telephone: (801) 489-5663
 - 2. Manufacturer's Representative:
- B. Products/Systems (*Specifier's Note – Edit to Project Requirements*):
 - 1. Hardener, Sealer, Densifier: RetroPlate 99 – penetrating, water-based, odorless liquid, VOC compliant, environmentally safe chemical, will leave no film on surface
 - 2. Joint Filler: CreteFill Pro 85MI, semi-rigid, 2 component, self-leveling, 100% solids, rapid curing, polyurea control joint and crack filler with an 85 Shore-A hardness
 - 3. Cleaning Solution: CreteClean Plus with ScarGuard
 - 4. Grinding Accelerant: KickStart
 - 5. Oil Repellent Sealer: RetroPel
 - 6. Stain Protector: RetroGuard
 - 7. Spall Repair: CreteFill Pro Spall Repair
 - 8. Crack Repair: CreteFill Pro Crack Repair EZ Shave
 - 9. Densification Enhancer: PowerPrep LC (low-carbon type concrete)
 - 10. Carbonation Rescue: SnapBack
 - 11. RetroPlate [] AmeriPolish [] Dye color: _____ (final dye color will be determined during mock-up review)
- C. No Substitutions Allowed

PART 3 – EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, and Curecrete's Technical Data Sheets

3.2 EXAMINATION

- A. Site Verification Conditions
 - 1. Verify that concrete substrate conditions, which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of finishing materials
 - 2. Verify concrete is cured to 28 days or 3500 psi strength
 - 3. Verify concrete scratches above a #4 on the Moh's hardness scale
 - 4. Verify concrete meets or exceeds the FF and FL requirements in related sections

3.3 PREPARE

- A. Ensure surfaces are clean and free of dirt and other foreign matter harmful to performance of concrete finishing materials
- B. Examine surface to determine soundness of concrete for polishing
 - 1. Conduct Mohs Pencil Hardness Test; if reading is above 4, continue system installation; if 4 or less, process in 1 of 2 ways:
 - a. Apply PowerPrep LC, then pre-densify with the Ashford Formula or RetroPlate two hours later; re-test after five days or sooner to confirm above a 4 hardness before system installation
 - b. If carbonation is suspected, conduct a modified Phenolphthalein test to determine if the concrete is carbonated; if positive, apply the SnapBack system and retest to above a 4 hardness before system installation.
NOTE: If positive for carbonation, it may be necessary to have a core and petrographic analysis to determine depth of carbonation

3.4 INSTALLATION

- A. **Floor Surface Polishing and Treatment (Wet Grinding)**
 - 1. Provide densified and polished concrete floor treatment in entirety of slab as indicated by approved drawings
 - 2. Provide consistent finish in all contiguous areas
 - 3. Apply floor finish prior to installation of fixtures and accessories
 - 4. Deliver a consistent finish in all contiguous areas utilizing **KickStart** to achieve the approved and designated Concrete Polishing Council's Aggregate Exposure and Polished Concrete Appearance designations as specified (effective 12/2017)
 - 5. Diamond polish concrete floor surfaces utilizing KickStart in conjunction with proper grinding equipment as recommended by polishing system manufacturer
 - a. Comply with manufacturer's recommended polishing grits for each sequence using KickStart to achieve the desired finish level; the level of gloss shall match that of approved mock-up
 - b. Expose aggregate in concrete surface only as determined by approved mock-up
 - c. All concrete surfaces shall be as uniform in appearance as possible

6. Apply dye per manufacturer's directions if required
Note: Dye appearance is affected by the color of the concrete mix, along with the light source under which it will be viewed, and the density of the concrete
7. Apply RetroPlate 99, Hardener, Densifier as follows:
 - a. Apply RetroPlate 99 at 200 ft²/gal OR TO REFUSAL, according to manufacturer's directions
 - b. For low-carbon or Type 1L concrete, apply a densification enhancer such as PowerPrep LC approximately 2 hours prior to RetroPlate 99 application to achieve maximum densification; if PowerPrep LC was already applied during Section 3.3 Preparation, only RetroPlate 99 application is required during the densification phase
 - c. Apply RetroGuard, RetroPel or a combination of both products according to manufacturer's directions
8. Remove defects and re-polish defective areas
9. Finish edges of floor finish adjoining other materials in a clean and sharp manner
10. Protect all adjacent surfaces

B. Floor Surface Polishing and Treatment (Dry Grinding)

1. Equipment Required for Dry Grinding Method
 - a. Planetary or counter rotating grinders suitable for dry operation with diamond tooling
 - b. Integrated shrouds connected to HEPA-filtered dust extractors
 - c. Dust collection shall meet or exceed the OSHA table 1 requirements
2. Densifier Application
 - a. Apply chemical hardener/densifier after completion of metal grinding (100-200 grit) and prior to resin polishing, in accordance with manufacturer recommendations.
 - b. Allow densifier to fully react and dry before continuing polishing operations.
3. Surface shall exhibit:
 - a. Uniform scratch pattern
 - b. Consistent aggregate exposure
 - c. No visible swirl marks or shadowing
 - d. Achieve specified gloss level when measured at 60° in accordance with ASTM D523

3.5 CLEANING

- A. The work area shall be kept clean and free of debris at all times
- B. Dispose of material containers in accordance with local regulations
- C. Mechanically scrub treated floors with soft to medium pads using approved cleaning solution (CreteClean Plus with Scar Guard). Leave one master case of CreteClean 12 oz Single Dose and instructions for initial cleanings, along with contact information for end-users to request a custom Standard Operating Procedure (SOP) for their facility
- D. Upon completion, the general contractor must remove surplus and excess materials, rubbish, tools and equipment

3.6 PROTECTION

- A. Protect installed product(s) (polished floors) from damage during construction; following completion of the final polishing, the surface shall be covered to protect from

other trades; cover with durable completely breathable product, or completely impervious system; do not cover with Masonite, plywood or Visqueen; floor must be allowed to breathe during final curing

B. Suggested Protection Products

1. GoldiLox
2. Skudo
3. Ram Board

Note 1: Whichever system is chosen, it must be either all breathable or all non-breathable materials

Note 2: Floor protection must be maintained during construction, therefore, it is typically the responsibility of the General Contractor

End of Section 03 35 43