



A product brand of LATICRETE International, Inc.



fgsPermaShine[®] 
polished concrete

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This Guide Specification utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*[™], *SectionFormat*[™] and *PageFormat*[™]. This Guide Specification is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This Guide Specification specifies a dry process of finishing and polishing concrete floors, including products as manufactured by LATICRETE International, Inc. Revise the section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 03 3543 POLISHED CONCRETE FINISHING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: This Section specifies [Dyed and] polished concrete.
- B. Related Sections:

Specifier Note: Include in this Article only those sections that directly affect the work of this section. Do not include Division 00 or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 and Division 01 sections to some degree.

1. Section [03 01 30 Maintenance of Cast-in-Place Concrete].
2. Section [03 30 00 Cast-in-Place Concrete].
3. Section [07 91 16 Joint Fillers].

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Section 01 42 19 - Reference Standards may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section. Retain only those reference standards to be used within the text of this Section. Add and delete as required for specific project.

1.02 REFERENCES

- A. American Concrete Institute (ACI):
 1. ACI 302.1R Guide for Concrete Floor and Slab Construction.
- B. ASTM International:

1. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 2. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete.
 3. ASTM C779 Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
- C. Reunion Internationale des Laboratoires D'Essais et de Recherches sur les Materiaux et les Constructions (RILEM):
1. Rilem Test Method 11.4 Standard Measurement of Reduction of Moisture Penetration Through Horizontal Concrete Surfaces.
- D. American National Standards Institute (ANSI):
1. ANSI/NFSI B101.3 Standard Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials
 2. Manufacturer's products/application system required to be Certified by the National Floor Safety Institute (NFSI) as High-Traction

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide polished flooring that has been selected, manufactured and installed to achieve the following:
1. Abrasion Resistance: ASTM C779, Method A, high resistance, no more than 0.008 inch (0.20 mm) wear in 30 minutes.
 2. Reflectivity: Increase of 35% as determined by standard gloss meter.
 3. Waterproof Properties: Rilem Test Method 11.4, 70% or greater reduction in absorption.
 4. High Traction Rating: ANSI/NFSI B101.3, ANSI/NFSI B-101.1
- B. Design Requirements:

Specifier Note: Article below summarizes minimum performance requirements of existing concrete floor prior to receiving floor finishing and polishing process. Retain or delete article below to suit project requirements and specifier's practice (integrated with 03 30 00 Cast-in-Place Concrete section).

1. Hardened Concrete Properties:
 - a. Minimum Concrete Compressive Strength: 3500 psi (24 MPa).
 - b. Normal Weight Concrete: No lightweight aggregate.[Lightweight concrete requires special installation techniques.]
 - c. Non-air entrained.
 - d. Maximum W/Cm ratio of .50.
2. Placement Properties:
 - a. Natural concrete slump of 4 inches - 5 inches (100 - 127 mm). Admixtures may be used.
 - b. Flatness Requirements:
 - 1) Overall FF 50.
 - 2) Local FF 40.
3. Hard-Steel Troweled (3 passes) Concrete: No burnishing marks. Finish to ACI 302.1R, Class 5 floor.

Specifier Note: Retain or delete article below to suit project requirements.

- a. Class 6 floors, special colored mineral aggregate hardener with repeated hard steel trowel finish.
4. Curing Options:
 - a. Membrane forming curing compounds (ASTM C309, Type 1, Class B, all resin, dissipating cure).
 - 1) Acrylic curing and sealing compounds NOT recommended.
 - b. Sheet membrane (ASTM C171); polyethylene film not recommended.
 - c. Damp Curing: Seven day cure.
 - d. Non-membrane curing compound.

Specifier Note: Article below includes the submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.04 ACTION SUBMITTALS

- A. General: Submit listed action submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures] [_____].
- B. Shop Drawings: Indicate information on shop drawings as follows:

1. Typical layout including dimensions and floor grinding schedule.
 2. Plan view of floor and joint pattern layout.
 3. Areas to receive colored surface treatment.
 4. Hardener, sealer, densifier in notes.
- C. Product Data: Submit product data, including manufacturer's SPEC-DATA® product sheet, for specified products.
1. Material Safety Data Sheets (MSDS).
 2. Preparation and concrete grinding procedures.
 3. Colored Concrete Surface, Dye Selection Guides.

1.05 INFORMATION SUBMITTALS

- A. Quality Assurance:
1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties as cited in 1.03 Performance Requirements.
 2. Certificates:
 - a. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - b. Letter of certification from the National Floor Safety Institute confirming the system has been tested and passed phase Two Level of certification when tested per ANSI/NFSI B101.3. ANSI B-101.1 High-Traction range.
 - c. Current contractor's certificate signed by manufacturer declaring contractor as an approved installer of polishing system.
 3. Manufacturer's Instructions: Manufacturer's installation instructions.

1.06 CLOSEOUT SUBMITTALS

- A. Warranty: Submit warranty documents specified.
- B. Operation and Maintenance Data: Submit operation and maintenance data for installed products in accordance with Section [01 78 00 - Closeout Submittals] [_____].
1. Include:
 - a. Manufacturer's instructions on maintenance renewal of applied treatments.
 - b. Protocols and product specifications for joint filing, crack repair and/or surface repair.

1.07 QUALITY ASSURANCE

- A. Qualifications:
1. Installer with a minimum of 5 years experience in performing work of this section who has specialized in installation of work similar to that required for this project.
 2. Installer trained and holding a current certificate as a FGS PermaShine installer.
 3. Current Certification from the CPAA stating that the technicians are trained craftsmen.(delete)
 4. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided. Current data on building code requirements and product compliance may be obtained from manufacturer technical support specialists.

- B. Regulatory Requirements.
NFSI Test Method ANSI/NFSI B101.3 NFSI-certified as "High-Traction." In order to maintain the finished product's level of slip resistance, the end-user shall use an NFSI approved tribometer.
1. High-Traction maintenance product or program.
- C. Mock-Ups:
1. Construct field mock-ups in accordance with Section [01 45 00 - Quality Control] [_____].

Specifier Note: Edit paragraph below to specifying mock-up size.

2. Mock-Up Size: [250 ft² (23.2 m²)] [_____] sample panel at jobsite at location as directed under conditions similar to those that will exist during actual placement.
3. Mock-up will be used to judge workmanship, concrete substrate preparation, operation of equipment, material application, color selection and shine.
4. Allow [24] [_____] hours for inspection of mock-up before proceeding with work.

5. When accepted, mock-up will demonstrate minimum standard of quality required for this work. [Approved mock-up may [Not] remain as part of finished work.] [Remove mock-up and dispose of materials when no longer required and when directed by [Consultant] [_____] [_____].
6. Mock-up will show specified level of aggregate exposure as:

Specifier Note: Edit level of aggregate exposure from the following list, delete unused items.

- Class A – Cream finish – polishing only the Portland cement paste at the surface without exposing small, medium or large aggregate. Note: If dye will be used, this is *not* an acceptable level of grinding. Go to Level 2.
- Class B – Fine Aggregate (Salt & Pepper) Finish - Expose the fine aggregate such as sand and small aggregate with the concrete. The depth of grind will depend greatly on the placement and finishing procedures. Generally, this level of cut can be achieved within 1/16" of the surface.
- Class C – Medium Aggregate – exposing more of the overall girth of the coarse aggregate within the concrete. Generally, this level of cut can be achieved within 1/8" of the surface.
- Class D – Large Aggregate – exposing the overall girth of the coarse aggregate within the concrete. This level of cut generally can be achieved within 1/4" of the surface.

Note: It is important that all parties be informed of the potential for random differences in the exposure of aggregates

7. Mock-up to show specified level of gloss level when concrete is mechanically processed as outlined in section 3.03 Installation.
 - Level 1 Sheen – Flat Appearance as determined by a gloss reading of 0 – 10. (100 grit)
 - Level 2 Sheen – Satin (Matte appearance, with or without slight diffused light) as determined by a gloss reading of 10 – 25 (100 – 400 grit)
 - Level 3 Sheen – Semi-Polished (Medium-High Reflective) as determined by a gloss reading of 25 – 70 (400 – 800 grit)
 - Level 4 Sheen – Highly polished (Sharp, crisp reflections, very high gloss) as determined by a gloss reading of 70 or higher (800 or higher grit)

Note: Gloss readings are not to be obtained through the use of any topical protective coating enhancers or the result of resin transfer from resin bond abrasives. Take readings before application of these products.

- D. Preinstallation Meetings: Conduct a preinstallation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with [Section 01 31 19 - Project Meetings] [_____]. Review the following:
 1. Environmental requirements.
 2. Scheduling and phasing of work.
 3. Coordinating with other work and personnel. Remind all trades that they are working on a surface that is to become a finished surface.
 4. Protection of adjacent surfaces.
 5. Surface preparation.
 6. Repair of defects and defective work prior to installation.
 7. Cleaning.
 8. Installation of polished floor finishes.
 9. Application of liquid hardener, densifier.
 10. Protection of finished surfaces after installation.
 11. Do not place any materials on the concrete surface that may cause staining, etching or scratching

1.08 DELIVERY, STORAGE & HANDLING

- A. General: Comply with [01 61 00 - Common Product Requirements] [_____].
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery:
 1. Deliver materials in manufacturer's original packaging with identification labels and seals intact.
- D. 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 hydraulic power equipment.
- c. Restrict vehicular parking.
- d. Restrict use of pipe cutting machinery.
- e. Restrict placement of reinforcing steel and storage of other ferrous metals on concrete surfaces.
- f. Restrict use of acids or acidic detergents on concrete surfaces.
- g. Restrict painting activities over concrete surfaces.

E. Waste Management and Disposal:

- 1. Separate waste materials for [Reuse] [And] [Recycling] [_____] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal] [_____].
- 2. Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.09 PROJECT AMBIENT CONDITIONS

- A. Installation Location: Comply with manufacturer's written recommendations.

1.010 SEQUENCING

- A. Sequence With Other Work: Comply with manufacturer's written recommendations for sequencing construction operations.

Specifier Note: Coordinate article below with Conditions of the Contract and with [01 78 36 - Warranties] [_____].

1.011 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and does not limit, other rights Owner may have under Contract Documents.

Specifier Note: Coordinate article below with manufacturer's warranty requirements.

- C. Warranty: Commencing on date of acceptance by [Owner] [Architect] [Consultant] [_____].

1.012 MAINTENANCE

- A. Comply with manufacturer's written instructions to maintain installed product.

1.013 EXTRA MATERIALS

- A. General Contractor to provide maintenance materials in accordance with Section [01 78 00 - Closeout Submittals] [_____].

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Ensure manufacturer has minimum [5] [_____] years experience in manufacturing components similar to or exceeding requirements of project.

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.02 Polished Concrete Finishing Products

- A. Manufacturer: LATICRETE International, Inc.

- 1. Contact: One LATICRETE Park North Bethany, CT 06524; Telephone: 203-393-0010; Web site: www.LMCC.com, www.fgs-permashine.com; E-mail: technicalservices@laticrete.com

- B. Proprietary Products/Systems:

- 1. Hardener, Sealer, Densifier: Proprietary, water based, odorless liquid, VOC compliant, environmentally safe chemical hardening solution leaving no surface film.
 - a. Acceptable Material: LATICRETE International, Inc., FGS Hardener Plus. Basis of design.
 - b. Acceptable Material: LATICRETE International, Inc. Lion Hard may be substituted when conditions exist where disposing of rinse water is in conflict with local building codes.
- 2. Joint Filler: Semi-rigid, 2-component, self-leveling, 100% solids, rapid curing, polyurea control joint filler with Shore A 80 or higher hardness.
 - a. Acceptable Material: LATICRETE International, Inc., Joint Tite 750.
 - b. Acceptable Material: LATICRETE International, Inc., L&M Restore (for crack repair)

3. Oil Repellent Sealer: Ready to use, silane, siloxane and fluoropolymers blended water based solution sealer, quick drying, low-odor, oil and water repellent, VOC compliant and compatible with chemically hardened floors.
 - a. Acceptable Material: LATICRETE International, Inc., Petrotex.
4. Concrete Dyes: Fast-drying dye, packaged in premeasured units ready for mixing with water or VOC exempt solvent; formulated for application to polished cementitious surfaces.
 - a. Acceptable Material: LATICRETE International, Inc., Vivid Dye or Vivid Dye WB Plus.

Specifier Note: Vivid Dye is currently available in 22 standard colors. L & M Vivid Dye colors can be combined to create an unlimited number of color variations. For color selection, refer to the L & M Chemicals' Vivid Dye color chart that can be found on their website: http://www.lmcc.com/products/docs/LM-14-0090-Vivid_Dye_Chart_2014_04_LR.pdf Color [_____]

5. Cleaning Solution: Proprietary, mild, highly concentrated liquid concrete cleaner and conditioner containing wetting and emulsifying agents; biodegradable, environmentally safe and certified High Traction by National Floor Safety Institute (NFSI).
 - a. Acceptable Material: LATICRETE International, Inc. FGS Concrete Conditioner.
6. Stain Guard Sealer: Ready to use, is a low odor, VOC compliant, topical sealer consisting of low molecular emulsified cross-linking, coupling polymers that effectively protect concrete and other natural stone floor surfaces from the damaging effects of staining, defacing and deterioration due to contaminant penetration.
 - a. Acceptable Material: LATICRETE International, Inc. Permaguard SPS

Specifier Note: If more than one concrete finish or gloss level is required for the project, (See Section 1:07 C.7 for definition of Gloss levels) copy and edit the following articles as required and identify finishes and other variables in a schedule at the end of Part 3 of this section.

Gloss Level: Standard [Highly polished (Level 4), 1500 grit], or optional [[Semi-Polished,(Level 3,) 800 grit], or optional [Satin, Matte Finish,(Level 2,) 400 grit] or optional [Flat finish,(Level 1,) 100 grit].

2.03 SOURCE QUALITY CONTROL

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

Specifier Note: Edit Paragraph below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Section [01 25 13 - Product Substitution Procedures.]

2.04 PRODUCT SUBSTITUTIONS

- A. Substitutions: [In accordance with Section 01 25 13 - Product Substitution Procedures] [_____]] [No substitutions permitted].

PART 3 EXECUTION

3.01 MANUFACTURERS INSTRUCTIONS

Specifier Note: Article below is an addition to the CSI *SectionFormat* and a supplement to MANU-SPEC. Revise article below to suit project requirements and specifier's practice.

- A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product packaging installation instructions and LATICRETE International, Inc., tech data sheets.
- B. Use only L & M approved FGS PermaShine installers. Contact Technical Services to find one near you.

3.02 EXAMINATION

- A. Site Verification of 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 concrete finishing materials.

Specifier Note: Consult floor finishing product manufacturer for additional concrete placement specifications required for application of floor finishing products. Coordinate with Section [03 30 00 Cast-in-Place Concrete] [_____].

- B. Verify Concrete Slab Performance Requirements:
 1. Verify concrete is cured to [28 day] [_____] [3500 psi (24 MPa)] [_____] strength.
 2. Verify concrete surfaces received a hard steel-trowel finish (3 passes) during placement.
 3. Verify overall floor flatness is a minimum FF 40.

3.03 PREPARATION

- 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.

C. General Contractor to remove surface contamination.

3.04 INSTALLATION

Specifier Note: Coordinate installation with the manufacturer's written installation details and instructions.

A. Floor Surface Polishing and Treatment:

1. Provide polished concrete floor treatment in entirety of slab indicated by drawings. Provide consistent finish in all contiguous areas.
2. Apply floor finish prior to installation of fixtures and accessories.
3. Diamond polish concrete floor surfaces with power disc machine recommended by floor finish manufacturer. Sequence with coarse to fine grit. Installer to determine the optimum starting grit in order to achieve the specified aggregate exposure.
 - a. Comply with manufacturer's recommended polishing grits for each sequence to achieve desired finish level. Following the initial passes of metal bond diamonds, the installer shall drop back a minimum of one grit level when transitioning to resin bond diamonds. The separation in grit designation shall be a minimum of 50 for the transitioning step. The installer shall refine each abrasive grit to its fullest potential before moving on to the next level. Floor shall be thoroughly scrubbed between each grit pass to remove all loose material. Level of sheen 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.
4. Dyed and Polished Concrete (option):
 - a. Locate demarcation line between dyed surfaces and other finishes.
 - b. Polish concrete to the 400 grit level, (200 grit for water based dyes).
 - c. Apply pre-mixed dyes to polished concrete surface.
 - d. Allow dye to dry.
 - e. Remove residue with water and buffer pad; reapply as necessary for desired result.
5. Apply FGS Hardener Plus, Hardener, Densifier (or Lion Hard) as follows: **Note: two coat application required.**
 - a. First coat of FGS Hardener Plus at 250 ft²/gal (6.25 m²/L), following the 400 grit level. (Lion Hard @ 400-600 sq ft / gallon)
 - b. Second coat of FGS Hardener Plus at 350 ft²/gal (8.75 m²/L), prior to the final polishing pass (Lion Hard @ 600-800 sq ft / gallon)
 - c. Follow manufacturer's recommendations for drying time between successive coats.
6. Remove defects and re-polish defective areas.
7. Finish edges of floor finish adjoining other materials in a clean and sharp manner.

3.05 ADJUSTMENTS

- A. Re-polish those areas not meeting specified gloss levels per mock-up.
- B. Fill joints flush to surface prior to the start of polishing operations

3.06 FINAL CLEANING

- A. Do cleanup in accordance with Section [01 74 00 - Cleaning and Waste Management] [_____].
- B. Upon completion, General Contractor must remove surplus and excess materials, rubbish, tools and equipment.

3.07 PROTECTION

Specifier Note: Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

- A. Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction] [_____].
- B. Protect with EZ Cover™ by McTech Corp., Ram Board, or comparable product.

3.08 SCHEDULE

Specifier Note: Include a schedule of finish types, colors and locations to suit project requirements.

- A. Standard Finish Highly Polished, Level 4, Color [_____]: [Location].
- B. Optional Finish Semi Polished, Medium Gloss, Level 3, Color [_____]: [Location].
- C. Optional Finish Satin, Level 2, Color [_____]: [Location].
- D. Optional Finish Flat, Level 1, Color [_____]: (Location)

END OF SECTION

(Last updated – December 23, 2015)