

## SECTION 03 35 43

### Formatted Specification for the ULTRAFLOOR® DIAMATIC® Polished Concrete System

#### PART I – GENERAL

##### 1.01 SUMMARY

- A. This is the recommended specification for ULTRAFLOOR® DIAMATIC® Polished Concrete System
- B. Complete installation details are provided in the DIAMATIC® Technical Brochures available at [www.diamaticusa.com](http://www.diamaticusa.com).
- C. ULTRAFLOOR® polished concrete finish is a combination of mechanical grinding, honing and polishing combined with chemical treatments to produce a fully refined surface that's dust proof, durable, stain resistant, light reflective and easy to maintain.

##### 1.02 SECTION INCLUDES

- A. Products and procedures for the installation of the ULTRAFLOOR® DIAMATIC® Polished Concrete System using a multi-step dry mechanical process and accessories indicated, specified or required to complete system and achieve specified finish:
  - a. DIAMATIC® Mechanical Diamond Grinding and Polishing Equipment
  - b. ULTRAFLOOR® DIAMATIC® Concrete Treatment Chemicals
  - c. ULTRAFLOOR® DIAMATIC® Concrete Repair Materials
- B. Products and procedures for the initial and long term maintenance of the ULTRAFLOOR® DIAMATIC® Polished Concrete System.

##### 1.03 SUBMITTALS

- A. Product Data: Submit Manufacturer's technical literature for each product indicated, specified or required. Include manufacturer's technical data, application instructions, recommendations and MSDS.
- B. 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.
- C. Maintenance Data: Provide manufacturer's instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under intended use. These instructions should contain precautions against cleaning products and methods, which may be detrimental to finishes and performance.

#### 1.04 QUALITY ASSURANCE / WARRANTY

- A. Manufacturer Qualifications: The ULTRAFLOOR® DIAMATIC® Polished Concrete System consists of a process and products engineered and manufactured by DIAMATIC. Any substitutions are not permitted and void warranty.
- B. Installer Qualifications:
  - a. Recommended installer is a DIAMATIC® ELITE installer for the ULTRAFLOOR® Polished Concrete System, including the use of DIAMATIC® equipment and diamond abrasives, and DIAMATIC® concrete preparation, and chemical hardening and finishing materials.
  - b. An ULTRAFLOOR® DIAMATIC certified supervisor must be maintained on site during all times during which specified work is performed.
  - c. Installer must provide written documentation from the manufacturer confirming the Installer's current accreditation and training from DIAMATIC on installation of the ULTRAFLOOR® DIAMATIC® Polished Concrete System and related equipment and processes. Failure to provide current accreditation will void any warranty implied or otherwise associated with the ULTRAFLOOR® System.
- C. Mock-Up: Before performing the work in this section, an adequate on-site mock-up of the ULTRAFLOOR® DIAMATIC® Polished Concrete System representative of specified process, surface, finish, color and joint design/treatments must be installed for review and approval. These mock-ups should be installed using the same Installer personnel who will perform work. Approved mock-ups may become part of completed work, if undisturbed at time of substantial completion.
- D. Static Coefficient of Friction: A reading of not less than 0.6 for level floor surfaces shall be achieved and documented, as determined by certified an NFSI walkway auditor using the ANSI B-101.3 SCOF test.
- E. Dynamic Coefficient of Friction: A reading of not less than 0.5 for level floor surfaces shall be achieved and documented, as determined by certified an NFSI walkway auditor using the ASTM D-2047 DCOF test.
- F. Test Reports: Comply with the provisions of the following specifications and standards, except as otherwise noted or specified, or as accepted or directed by the Owner and/or Architect. All test data shall be recorded and submitted upon completion of job.
  - a. Section 03 30 00, Cast-In-Place Concrete
  - b. ASTM E1155, Standard Test Method for Determining Floor Flatness and Levelness using the F number system
  - c. ASTM D-523, Standard Test Method for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry
  - d. ACI 302 1 R-04 Guide for Concrete Floor and Slab Construction
  - e. ACI 310 R-13 Guide to Decorative Concrete
- G. Pre-Installation Conference: Prior to the installation of the ULTRAFLOOR® DIAMATIC® Polished Concrete System, an on-site conference shall be conducted to review specification requirements.

- a. Required attendees include the Owner, Architect, General Contractor, ULTRAFLOOR® DIAMATIC Polished Concrete System Subcontractor, and DMS representative as required in 1.04-B section d, Quality Assurance.
- b. The recommended agenda shall include:
  - a. Tour of work area, inspection and discussion of preparation of substrate and other pre-Installation conditions and issues.
  - b. Review of System requirements, including drawings, specifications and other contract documents.
  - c. Review of required submittals and completion status.
  - d. Review and finalization of installation schedule, and verification of availability of required materials, trained Installer personnel, equipment and facilities to execute specification and avoid delays.
  - e. Limit access to work area by other trades to reduce possible damage to the floor before, during and after completion.
  - f. Review of required inspection, testing, certification and material usage accounting procedures.
  - g. Review of power requirements and responsibility
  - h. Review of governing regulations and requirements for insurance, certifications, inspection and testing, if applicable.
  - i. Review of temporary protection requirements during and after installation.
  - j. Review of cleaning procedures during and after installation.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver all materials in original containers, bearing manufacturer's labels indicating brand name and directions for storage, factory numbered and sealed until ready for installation.
- B. Maintain copies of all chemical MSDS, and Technical data sheets for all products.
- C. Store all materials in a dry, climate-controlled environment at a minimum of 55°F (13°C) and maximum of 85°F (29°C).

#### **1.06 SITE CONDITIONS**

- A. Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting the floor finish.
- B. Close areas to traffic during and after ULTRAFLOOR® DIAMATIC® Polished Concrete System application for a time period recommended by DIAMATIC®
- C. Inspect the existing substrate and document unsatisfactory conditions in writing. Verify that surfaces and site conditions are ready to receive work. See protocol for ghosting if this condition exists. Correct unacceptable conditions prior to installation of system or get

written approvals for any variance before any work begins. Commencement of work constitutes acceptance of substrate conditions.

- D. Existing concrete must be cured for a sufficient time period as recommended by DIAMATIC® before the application can begin, typical 28 days.
- E. Protect existing concrete and the new ULTRAFLOOR® DIAMATIC® Polished Concrete System from contamination by petroleum, oil, hydraulic fluid, acid and acidic detergents, paint and other liquid dripping from trades and equipment working over these substrates. If construction equipment must be used on these substrates, diaper all components that may drip fluids.
- F. Prohibit the placement and storage of construction materials over new ULTRAFLOOR® DIAMATIC® Polished Concrete System, to include ferrous metals and steel members.
- G. Prohibit vehicle parking and pipe cutting operations over concrete before and after the ULTRAFLOOR® DIAMATIC® Polished Concrete System.
- H. Moisture Vapor Testing
  - 1. Test existing concrete for moisture vapor transmission according to methods indicated in ASTM F1869. Acceptable results: not more than 5 pounds per 1,000 square feet in 24 hours.
  - 2. Test existing concrete for relative humidity using in situ probes according to ASTM F2170. Acceptable results: not more than 80%.

## **PART 2 – PRODUCTS**

### **2.01 SYSTEM INTEGRITY**

- A. The ULTRAFLOOR® DIAMATIC® Polished Concrete System is an engineered and integrated complete installation system requiring strict adherence to all specified installation processes, equipment, diamond abrasives, concrete preparation, joint treatment and chemicals to achieve the intended result. Any substitutions from the specified products and/or processes will void the system warranty.

### **2.02 MATERIALS**

#### **A. DIAMATIC® EQUIPMENT**

- 1. DIAMATIC® BMG-780 or BMG-735: Planetary Grinder and Polisher, Large Platform: 32" planetary floor polisher. Head pressure of 600 lbs, or approved equal.
- 2. DIAMATIC® Micro Polisher MPS-1721-1727 - Burnisher: Specific weight and RPM are required to reach temperature of 100°F for application of FLOR-FINISH™ application.
- 3. Vacuums: Dust Collection must be designed for filtering of concrete dust. Minimum air speed of 300 CFM for Large and Medium Platform equipment.
- 4. DIAMATIC® BDC-3140P, BDC 44, BDC 66.

5. DIAMATIC® Shaver for demolition and removal of existing flooring, adhesives or other coatings. Including the BS-110 walk behind, BMS-220 ABD Ride on unit.
6. Power generator capable of supplying a minimum output of 45kw and above and capable of generating 480/240 Volt three phase power.
7. DIAMATIC® Diamond Abrasives and Blades
  - a. Metal Bonded Diamonds – 30/40, 60/80, Grit of soft, medium and hard bonded metal.
    - a. **Note:** Concrete has hardness levels of soft, medium and hard. The hardness of the concrete will determine the required hardness of the metal bonded diamonds:
      1. Hard Concrete: Soft metal bonded diamonds
      2. Medium Concrete: Medium metal bonded diamonds
      3. Soft Concrete: Hard metal bonded diamonds
  - b. Transitional Diamonds, - #0, #1, #2 grit.
  - c. Hybrid Flex-res Resin Bonded Diamonds -50, 100, 200, 400, 800, 1500, 3000 Grit.
  - d. FLOR-GRIT Diamond Impregnated Pads – 200, 400, 800, 1500, 3000 Grit.

**B. ULTRAFLOOR® DIAMATIC® CONCRETE TREATMENT CHEMICALS**

1. DIAMATIC® FLOR-SIL™ Lithium Densifier for standard concrete and terrazzo
2. DIAMATIC RSG Reactive Surface Grout and Pin Hole Filler
3. DIAMATIC FLOR-SHIED™ Surface Densifying and Surface Protective Treatment
4. DIAMATIC® FLOR-COLOR™ Micronized Water Borne High Performance Dye
5. DIAMATIC® FLOR-FINISH Stain and Wear Protection Treatment (high-gloss)

**C. DIAMATIC® REPAIR MATERIALS**

1. DIAMATIC PRM-16 POLISHABLE REPAIR MORTAR
2. DIAMATIC PC-5614 POLISHABLE CONCRETE TOPPING

**D. DIAMATIC® PROTECTION MATERIALS**

1. To prevent minor damage from light trade traffic during build out of site, an approved Construction grade flooring protection material for the ULTRAFLOOR® DIAMATIC Polished Concrete System shall be installed. At no time will any tape be used or applied to a finished ULTRAFLOOR® surface as the adhesive may leave a permanent residue or remove the surface finish.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Inspect all concrete substrates and conditions under which the ULTRAFLOOR® DIAMATIC® Polished Concrete System to be installed.
- B. Verify that all surfaces and site conditions are ready to receive work; document and correct conditions detrimental to timely and proper installation of work. Beginning work constitutes acceptance of substrate condition.
- C. If there is the potential for ghosting recognized at the time of slab inspection, which is required before the contract is administered, the installer must take the required action stated in the ghosting protocol document, including;
  1. Alert DMS of the condition immediately.
  2. Provide digital images or photos showing the affected areas with the slab inspection report.
  3. A mock up of at least 10x10 will be processed in the areas of concern, ESPECIALLY the front entry area of the store.
- D. Verify that existing concrete has cured a minimum of 28 days and meets finish and surface profile requirements in Division 03 Section "Cast-In-Place Concrete," before installing the ULTRAFLOOR® DIAMATIC Polished Concrete System.
- E. Inspect to mock-up panel to insure it is satisfactory and meets all of the owner's requirements.
- F. Conduct pre-installation conference, per Section 1.3 F.

### 3.02 PREPARATION

#### A. DEMOLITION

1. Clear surfaces of any debris and construction materials.
2. If a generator is not provided by the Installer, power connections for the equipment of the ULTRAFLOOR® DIAMATIC® Polished Concrete System shall be located and prepared by general contractor.
3. Using the appropriate mechanical means and methods, remove existing floor coverings and coatings, including but not limited to carpet VCT, ceramic tile and grout, wood, epoxy/ urethane, quartz, mastic, adhesives, paint or other non-concrete floor materials. Adhesives must be removed to their penetrated depth.

a.**Note:** The mechanical removal of resilient flooring, backing, lining felt, cutback and other adhesives can be hazardous, as certain materials may contain asbestos or crystalline silica. Do not sand, dry sweep, dry scrape, drill, saw, bead blast, grind, mechanically chip or pulverize these materials, as harmful dust may result. Inhalation of this dust may cause asbestosis or other bodily harm. Please consult the adhesive manufacturer, the Resilient Floor Covering Institute ([www.rfci.com](http://www.rfci.com)) and all applicable government

agencies for rules and regulations concerning the handling and removal asbestos-containing materials.

- b. To prevent any damage to concrete slab surface during demolition from chipping hammers. Existing flooring should be removed mechanically with DIAMATIC walk-behind or ride-on scraping equipment or approved equal.
4. Prepare the existing concrete mechanically via scarification, shot blasting or other means, including diamond grinding by using aggressive, metal bonded DIAMATIC® Polycrystalline diamonds (18/20 Grit or 30/40 Grit), to remove all contaminants and provide a sound concrete surface free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil and other contaminants.
  5. Chemical preparation of the substrate is NOT acceptable, including but not limited to acid etching, sweeping compounds, solvents and adhesive removers.
  6. Suppress dust during demolition with the use of dust collection equipment to reduce or eliminate airborne concrete and substrate dust.
  7. Where existing concrete is cracked, damaged, spalled, not within specified tolerance, or contains unacceptable levels of contaminants or moisture vapor, the Installer of the ULTRAFLOOR® DIAMATIC® Polished Concrete System will evaluate conditions and proceed with appropriate ULTRAFLOOR® System components.
  8. For specific repairs apply the PRM-16 Polishable Repair Mortar in accordance with the Technical Data Sheet.
- B. Joint Fill (Indoor)
1. All joint fill materials shall be installed in accordance with the written recommendations provided in the approved manufacturer's technical data.
  2. For the best results all joints should be filled after the first pass of metal bonded diamonds, but before any further grinding continues.
  3. If the joint filling will occur after the polishing process, apply DIAMATIC® FLOR- SIL or, tape, or soap to the edge of the concrete to keep the joint filler from staining the concrete.

### 3.03 GLOSS ATTAINMENT (ASTM E430)

- A. Gloss readings are not to be obtained through the use of any microfilming products, sealers, coatings, enhancers or as the result of resin transfer from resin bond abrasives.
- B. Readings shall be taken not less than 10' (3 m) on center in field areas and within 1' (0.3 m) of floor area perimeters. In no case shall a reading be below 2% of specified minimum sheen:
  1. Level A Sheen – Low Gloss reading of 30 to 40. 400 grit diamond finish.
  2. Level B Sheen – Medium Gloss reading of 41 to 55. 800 grit diamond finish.
  3. Level C Sheen – High Gloss reading of 56 or higher. 1500 grit or higher.
- C. For instructions on achieving gloss levels, refer to the appropriate sub-section of section 3.04 below.

### 3.04 POLISHING

Use the section below to determine specific finish details for the project. See the attached addendums for specific tooling and process requirements.

#### A. CUT LEVELS

- a. LEVEL 1 CUT / A light cut that removes the surface paste exposing the fine aggregates near the surface. Also referred to as a cream finish. Note that a Level 1 cut will require high F-numbers to achieve, Min FF 50.
- b. LEVEL 2 CUT / A slightly deeper cut the exposes the fine aggregates and begins to expose the coarse aggregates. Also referred to as a salt and pepper finish.
- c. LEVEL 3 CUT / A deep cut that exposes the coarse aggregates in the surface.

#### B. SPECIFIED POLISHED FLOOR DETAILS

- a. Specified Floor Finish shall have a Cut Level of "insert cut level here"
- b. Specified Floor Finish shall have a Gloss Level of "insert gloss level here"
- c. Specified FLOR-COLOR shall be "insert specified color here"
- c. See addendum for specific steps.

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## C. POLISHING STEPS

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### **3.05 EDGES**

- A. Where desired, polished edge work of all areas shall be done with a 5" or 7" DIAMATIC Hand Held or Walk Behind polishing tool. The edge polishing process may be done utilizing the DIAMATIC EASY EDGE™ ceramic grinding wheels in a 50,100,270, 400 grit as required. Additional steps should be done with the corresponding DIAMATIC resin bonded pads to match the finish of the floor.
- B. NOTE: All grinding and polishing completed with grinder/polisher equipment connected to a dust collector.

### **3.06 ACCEPTANCE**

- A. Remove all installation materials and any foreign materials resulting from the installation, from the site.
- B. Clean adjacent surfaces and materials.
- C. Perform post job walk to ensure that the ULTRAFLOOR® DIAMATIC Concrete System has been completed per the process spec.
- D. Take pictures of final product for documentation and submittal, if requested or required.

### **3.07 PROTECTION**

- A. Prevent any spills or stains from coming into contact with the floor. Clean any spills that may occur as quickly as possible.
- B. Protect the finished ULTRAFLOOR® DIAMATIC® Polished Concrete System from continuing construction and build out as needed by installing the DIAMATIC ECONO-COVER Protective Floor Covering or APPROVED equal.
  - 1. The installation of the DIAMATIC® Protective Covering must be approved by the Installer and General Contractor of the ULTRAFLOOR® installation.
  - 2. Do not tape the protection material directly to the floor. It must only be taped to itself as required.
  - 3. If the DIAMATIC® Protective Cover is damaged during use, then that section must be cut out and replaced to maintain the integrity of the protective covering.
  - 4. The DIAMATIC® Protective Cover can be removed after build out is complete.

### **4.01 ONGOING MAINTENANCE**

- A. Restrict using water on the surface for 72 hours after initial installation. The surface should not be cleaned using a string mop for 60 days to avoid streaking of the FLOR-FINISH. Avoid using mats or treated coverings for a minimum of 14 days to allow the finish to fully cure.
- B. DO NOT USE cleaners that are acidic or have citrus (de-limonene) or butyl compounds. Although the ULTRAFLOOR® DIAMATIC® Polished Concrete System is chemical and stain resistant, the application of these high acid cleaners may etch the surface and cause a residual stain. Regular maintenance and cleaning will help prolong surface shine.

## Daily Maintenance

- A. Once the system is fully cured out (min. 72 hours), routinely sweep, dry mop, use of a high quality micro-fiber dust mop is the best method. A neutral pH cleaner only may be used when soils or stains must be removed. Any standing water should be removed immediately after cleaning. The recommended cleaner shall be DIAMATIC FLOR-CLEAN™.
- B. An auto-scrubber may be used if equipped with a vacuum system to remove any standing water. The equipment tank should be filled with clean water only, NO CHEMICALS. The scrubber should be equipped with a soft pad only, DO NOT USE A BRUSH attachment.

## Weekly Maintenance

- A. An auto-scrubber may be used if equipped with a vacuum system to remove any standing water. The equipment tank should be filled with clean water only, or DIAMATIC FLOR-CLEAN™. The scrubber should be equipped with a soft pad only, DO NOT USE A BRUSH attachment.
- B. Use of a BURNISHER equipped with a FLOR-GRIT pad may be used as needed to restore gloss to specified levels. A 1500 or 3000 grit pad is recommended.

## Extended Maintenance

- A. After thorough cleaning a coat of the DIAMATIC® FLOR-FINISH may be applied to restore original gloss and increase the stain resistance on the surface. Follow all technical data instructions for proper application or consult the original floor installer for assistance.
- B. Use of a BURNISHER equipped with a FLOR-GRIT pad may be used after the application of the FLOR-FINISH to restore gloss to specified levels. An 800 or 1500 grit pad is recommended.

END OF SECTION

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