

ARDEX GUIDE SPECIFICATION

ARDEX PC-TTM POLISHED CONCRETE TOPPING

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Part of the ULTRAFLOOR ARDEX DIAMATIC Polished Concrete System

SECTION 03 35 53 POLISHED CONCRETE TOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, general provisions of the Contract, and other related construction documents such as Division 01 specifications apply to this Section

1.2 SUMMARY

A. This section includes products and procedures for the installation of the ARDEX PC-TTM

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Polished Concrete System using a multi-step dry mechanical process and accessories specified to achieve specified Level (A, B

Polished Concrete Topping component of the ULTRAFLOOR or C) gloss finish:

1. ARDEX PC-TTM Polished Concrete Topping (Gray, White or Light Gray)
2. ARDEX EP 2000™ Substrate Preparation Epoxy
3. DIAMATIC Mechanical Diamond Grinding and Polishing Equipment
4. ARDEX Concrete Topping Treatment Chemicals

B. Related Sections include the following:

1. Section 03 30 00, Cast-In-Place Concrete
2. Section 07 26 19, Topical Moisture Vapor Mitigation

1.3 REFERENCES

- A. ASTM C 109M, Compressive Strength Air-Cure Only
- B. ASTM C348, Flexural Strength of Hydraulic-Cement Mortar
- C. ASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes
- D. ASTM F1869, Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- E. ASTM 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

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F. ASTM E430, Standard Test Method for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Material Safety Data Sheets.
- B. Qualification Data: Provide written documentation from the manufacturer confirming that installer meets the qualifications as specified and is eligible for manufacturer's warranty.
- 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 that may be detrimental to finishes and performance.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

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1. The ULTRAFLOOR ARDEX DIAMATIC Polished Concrete System consists of a

process and products engineered and manufactured by ARDEX and DIAMATIC. Any substitutions are not permitted and void warranty.

B. Installer Qualifications:

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1. Product(s) for the ULTRAFLOOR ARDEX DIAMATIC Polished Concrete System
2. must be installed by an ARDEX DIAMATIC factory trained or approved installer either as a single source or through a joint venture, including the use of DIAMATIC equipment and diamond abrasives, and ARDEX DIAMATIC concrete preparation, toppings, joint treatment and chemical hardening and finishing materials
3. *TM*
4. Qualified installers may include an *ARDEX LevelMaster Elite* who specializes in the
5. *TM*
6. DIAMATIC polishing equipment or an *ULTRAFLOOR ELITE* who has specific
7. experience with the installation of ARDEX DIAMATIC products and systems.

8. Installer must be approved in writing by ARDEX or DIAMATIC and experienced in performing specified work similar in design, products and scope of this project, with a documented track record of successful, in-service performance and with sufficient production capabilities, facilities and personnel to produce specified work.
9. A factory-trained, competent supervisor must be maintained on site during all times during which specified work is performed.
10. For national brand specific projects, Diamatic Management Services (DMS) may be considered for installation management, contractor assistance and advanced project

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installation of ARDEX products, a *DIAMATIC Elite*

who specializes in the use of

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support. DMS: 5220 Gaines Street, San Diego, CA 92110, 866-295-5512,
www.diamaticmanagementservices.com.

C. Mock-Up: Before performing the work in this section, an on-site mock-up of the ARDEX PC-TTM 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.

1. Required attendees include the Owner, Architect, General Contractor, Subcontractor, ARDEX Representative and/or DIAMATIC Representative.
2. The minimum agenda shall include a review of the site conditions, construction documents, schedule, installation procedures, protection procedures and submittals.

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System, an on-site conference shall be conducted to review specification requirements.

D. Pre-Installation Conference: Prior to the installation of the ULTRAFLOOR Polished Concrete

E. Warranty: Provide manufacturer's 10-year ULTRAFLOOR

1.6 DELIVERY, STORAGE AND HANDLING

System Warranty.

- 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. Store all materials in a dry, climate-controlled environment at a minimum of 50°F (10°C) and maximum of 85°F (29°C).
- C. Handle products in accordance with manufacturer's printed recommendations.

1.7 SITE CONDITIONS

- A. ARDEX PC-T is a cementitious material. Observe the basic rules of concrete work. Do not install below 50°F (10°C) or above 85°F (29°C) surface temperature. Install quickly if floor is warm (above 70°F/21°C and up to 85°F/29°C) and follow warm weather precautions available from the ARDEX Technical Service Department (888) 512-7339. Never mix with cement or additives other than ARDEX approved products.
- B. Inspect the existing substrate and document unsatisfactory conditions in writing. Verify that surfaces and site conditions are ready to receive work. Correct unacceptable conditions prior to installation of System. Commencement of work constitutes acceptance of substrate conditions.

- c. Close areas to traffic during and after the ARDEX PC-T application for a time period recommended by the manufacturer.

PART 2 – PRODUCTS

2.1 POLISHED CONCRETE TOPPING

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A. Portland Cement-based Self-Leveling Topping to Suitable to Receive a Mechanical Polish Concrete Process. Acceptable products include:

- 1.
- 2.

ARDEX PC-TTM Polished Concrete Topping; ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, PA 15001, 1-888-512-7339, www.ardexamericas.com

- a. Primer: ARDEX EP 2000TM Substrate Preparation Epoxy.
- b. Water: shall be clean, potable and sufficiently cool (not warmer than 70°F/21°C).

Performance and Physical Properties: Performance and Physical Properties: Meet or exceed the following values for material cured at 70°F (20°C) and 50% relative humidity:

- a. Flow Time: 10 minutes
- b. Initial Set: Approx. 30 minutes
- c. Final Set: Approx. 90 minutes
- d. Compressive Strength: 6200 psi at 28 days, ASTM C109M.
- e. Flexural Strength: 1000 psi at 28 days, ASTM C78.
- f. VOC: 0 g/l, calculated SCAQMD Rule 1168

Repair materials:

- a. Where spalls, repair or minor patchwork is necessary apply ARDEX PC-RTM as necessary and in accordance with recommendations, applied at the appropriate time during the polishing process.
- b. If necessary, correct excessive pinholes with ARDEX PC-MTM. Contact the ARDEX Technical Services department for recommendations.

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2.2 CONCRETE POLISH EQUIPMENT & TOOLING

A. Equipment and Tooling for use as part of the multi-step dry mechanical process and accessories. Acceptable products include:

1. DIAMA TIC BMG-780 or BMG-735 Planetary Grinder and Polisher; DIAMA TIC USA: 5220 Gaines Street, San Diego, CA 92110, 1-866-295-5512, www.diamaticusa.com
 - a. Features: Large Platform: 32” planetary floor polisher. Head pressure of 600 lbs. Or equal as recommended by DIAMATIC USA.
 - b. Required Tooling: DIAMATIC Diamond Abrasives
 - i. Metal Bonded Diamonds - 60/80 Grit of medium and hard bonded metal.
 - ii. Transitional Diamonds Ceramic Bonded - #1 Grit.
 - iii. Resin Bonded Diamonds - 200, 400, 800, 1500 Grit.
2. DIAMA TIC Micro Polisher – Burnishers; DIAMA TIC USA: 5220 Gaines Street, San Diego, CA 92110, 1-866-295-5512, www.diamaticusa.com

- a. Specific weight and RPM are required to reach temperature of 100 °F for application of ARDEX PC FINISHTM.
- b. ®
- c. Required Tooling: DIAMATIC FLOR-GRIT Diamond Impregnated Pads - 800,
- d. 1500, 3000 Grit.

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1. Other equipment as necessary for small areas and edge work as recommended by DIAMATIC USA.
2. Power generator capable of supplying a minimum output of 30kw and up, and 480 Volt three phase power.
3. All grinding and polishing completed with grinder/polisher equipment should be connected to a dust collector.

Note: In some cases, and only with DIAMATIC's approval, burnishing, grinding and polishing machines may be substituted, provided that the specified DIAMATIC abrasives and blades can still be used.

2.3 CONCRETE TREATMENT CHEMICALS

A. Concrete treatments designed for use in conjunction with the installation of the ARDEX PC-T

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and the ULTRAFLOR Polish Concrete System. Acceptable products include:

1. Treatment Chemicals; ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, P A 15001, 1-888-512-7339, www.ardexamericas.com; DIAMATIC USA: 5220 Gaines Street, San Diego, CA 92110, 1-866-295-5512, www.diamaticusa.com.

- a. Densifier: ARDEX PC 10TM Lithium Hardener for ARDEX PC-T.
- b. Finish Treatment: ARDEX PC FINISHTM Stain and Wear Protection Treatment.
- c. Maintenance Treatment: DIAMATIC FLOR MaintainerTM Gloss, Stain and Wear
- d. Protectant.

PART 3 - EXECUTION

3.1 EXAMINATION

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- A. Inspect all concrete substrates and conditions under which the ULTRAFLOOR Polished
- B. Concrete System is to be installed.
- C. Verify that existing concrete has cured a minimum of 28 days before installing ARDEX PC-T and meets the requirement of 3000 psi and 100 pcf.
- D. Conduct pre-installation conference, per Section 1.05 C.

3.2 PREPARATION

- A. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before priming. Mechanically clean if necessary. Acid etching and the use of sweeping compounds and solvents are not acceptable.
- B. Substrates shall be inspected for moisture or any other conditions that could affect the

performance of the ULTRAFLOOR

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system.

Moisture vapor emissions shall not exceed

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5 lbs/1000 sf/24 hrs, ASTM F1869 or 85% RH, ASTM F 2170. For areas where moisture vapor emissions exceed the specified limits refer to Section 07 26 19, Topical Moisture Vapor Mitigation Systems and install the appropriate ARDEX Moisture Control System.

C. Joint Preparation: Honor all joints up through the ARDEX PC-T, including expansion joints, isolation joints and control joints (saw cuts).

1. All moving joints shall be filled with ARDEX ARDISEAL™ RAPID PLUS.
2. All non-moving joints shall be filled with ARDEX ARDIBOND APTM, ARDEX ARDIFIX™ or ARDEX ARDISEAL™ RAPID PLUS.
3. For joints to be filled after the polish process, contact manufacturer for specific recommendations.

3.3 APPLICATION OF ARDEX PC-TTM

A. PRIMING

1. Concrete shall be mechanically prepared to achieve a concrete surface profile (CSP) 3 in accordance with ICRI standards and primed with ARDEX EP 2000™. Follow manufacturers installation instructions, for complete instructions please refer to the Ardex EP 2000 Technical Brochure.

2. If the ARDEX MCTM ULTRA Moisture Control System is used, no additional priming is needed. The sand-broadcast surface of the ARDEX MC ULTRA is the primer.

B. MIX DESIGNS

1. **Mixing Ratio:** The ARDEX PC-T shall be mixed in 2-bag batches. Mix each bag of the powder with the specified amount of water in an ARDEX T-10 Mixing Drum using an ARDEX T-1 Mixing Paddle and a 1/2" heavy-duty drill (12 mm, min. 650 rpm). Mix thoroughly for 2-3 minutes to obtain a lump-free mixture. Follow written instructions on the ARDEX product bag label.
2. **Aggregate mix:** For pre-leveling and areas to be installed over 2" (5 cm) thick, well graded, washed pea gravel may be added to reduce material costs. Mix the powder with water first, and then add from 1 part by volume of aggregate (1/8" to 1/4" [3 to 6 mm] or larger). Do not use sand. The addition of aggregate will diminish the workability of the product and may make it necessary to install a finish layer. Allow the first layer to dry for 12 to 16 hours. Complete aggregate installation instructions are available in the ARDEX PC-T Technical Brochure.
3. TM
4. For pump installations, the topping shall be mixed using the ARDEX Levelcraft Automatic Mixing Pump. Start the pump at 150 gallons of water per hour, and then adjust to the minimum water reading that still allows self-leveling properties. **DO NOT OVERWATER!** Check the consistency of the product on the floor to ensure a uniform distribution of the sand aggregate at both the top surface and bottom of the pour. If settling occurs, reduce the water amount and recheck conditions during installation, such

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as variations in water, powder, substrate, and ambient temperature, require that the water setting be monitored and adjusted carefully to avoid over watering.

C. ARDEX PC-TTM INSTALLATION

1. The minimum installation thickness for ARDEX PC-T shall be 3/8" or 1/4" over the high point in the floor. The necessary thickness will vary with jobsite conditions, and must be adequate to achieve the desired finish.
2. Pour or pump the liquid topping and spread in place with the ARDEX T-4 Spreader. Use the ARDEX T-5 Smoother for feathered edge and touch-up. Wear baseball shoes with non-metallic cleats to avoid leaving marks in the liquid topping. The topping can be walked on in 2-3 hours at 70°F (21°C).
3. Allow the ARDEX PC-T to cure a minimum of 24 to 72 hours before proceeding with the polishing process.
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3.4 ULTRAFLOOR

POLISHING PROCESS FOR ARDEX PC-TTM

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A. PROCESS: The ULTRAFLOOR Polished Concrete System is an engineered and integrated

complete installation system requiring strict adherence to all specified installation processes, equipment, tooling, 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.

1. LEVEL B - Medium Gloss Finish (Gloss Reading, 41-55, ASTM E 430)
 - a. GRIND/POLISH #1: 60/80 Grit Metal Bonded Diamonds.
 - i. Broom and vacuum the floor to remove all residual dust.

- a. If required, apply ARDEX PC-R to fill areas in need of minor repair.
 - i. Locate areas and remove any loose debris from inside
 - ii. Prepare all spall areas by cutting the edges of the spall to have a 90° edge
 - iii. Chip, cut, or grind interior walls of spall to provide a clean surface free of
 - iv. contaminants that could act as a bond breaker.
 - v. Mix and apply PC-R per manufacturer recommendations and overfill spalls
 - vi. slightly higher than surrounding surface.
 - vii. Allow to dry 2-3 hours prior to proceeding with the next step.
- b. GRIND/POLISH #2: #1 Grit Transitional, Ceramic Bonded Diamonds.
 - i. Broom and vacuum floor to remove dust.
- d. Apply ARDEX PC 10, per application instructions at a rate of 400 sq. ft./gal. i. Allow ARDEX PC 10 to dry for 1 hour before beginning the next step.
 - a. GRIND/HONING #3: 200 grit Resin Bonded Diamond.
 - b. GRIND/POLISHING #4: 400 grit Resin Bonded Diamond.
- i. Broom and vacuum to remove dust.
- g. GRIND/POLISH #5: 800 Resin Bonded Diamonds.

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- i. Broom and vacuum to remove dust.

- a. MICROPOLISH/BURNISH #1: FLOR-GRIT
- b. Apply ARDEX PC FINISH per application instructions at a rate of 2,500 sf/gal.
- i. Allow to dry a minimum of 15-30 minutes.
- k. Apply ARDEX PC FINISH per application instructions at a rate of 3,000 sf/gal. i. Allow to dry a minimum of 15-30 minutes.

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1. MICROPOLISH/BURNISH #3: FLOR-GRIT

2. LEVEL C - High Gloss Finish (Gloss Reading 56 or Higher, ASTM E 430)

- a. GRIND/POLISH #1: 60/80 Grit Metal Bonded Diamonds.
- i. Broom and vacuum the floor to remove all residual dust.
 - a. If required, apply ARDEX PC-R to fill areas in need of minor repair.
 - i. Locate areas and remove any loose debris from inside
 - ii. Prepare all spall areas by cutting the edges of the spall to have a 90° edge
 - iii. Chip, cut, or grind interior walls of spall to provide a clean surface free of
 - iv. contaminants that could act as a bond breaker.
 - v. Mix and apply PC-R per manufacturer recommendations and overfill spalls
 - vi. slightly higher than surrounding surface.
 - vii. Allow to dry 2-3 hours prior to proceeding with the next step.

- b. GRIND/POLISH #2: #1 Grit High Performance Transitional Diamonds, Ceramic Bonded.
- i. Broom and vacuum floor to remove dust.
- d. Apply ARDEX PC 10, per application instructions at a rate of 400 sq. ft./gal. i. Allow ARDEX PC 10 to dry for 1 hour before beginning the next step.
 - a. GRIND/HONING #3: 200 grit Resin Bonded Diamond.
 - b. GRIND/POLISHING #4: 400 grit Resin Bonded Diamond.
 - i. Broom and vacuum to remove dust.
 - g. GRIND/POLISH #5: 800 Resin Bonded Diamonds. i. Broom and vacuum to remove dust.
 - h. GRIND/POLISH #6: 1500 grit Resin Bonded Diamonds.
 - i. Broom and vacuum the floor to remove all residual dust.
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 - i. Dry mop the floor clean to remove all debris.
 - j. MICROPOLISH/BURNISH #2: FLOR-GRIT 400 Grit Diamond Pad.
 - i. MICROPOLISH/BURNISH #1: FLOR-GRIT 800 Grit Diamond Pad.
 - j. Apply ARDEX PC FINISH per application instructions at a rate of 2,500 sf/gal. i. Allow to dry a minimum of 15-30 minutes.
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 - k. MICROPOLISH/BURNISH #2: FLOR-GRIT 1500 Grit Diamond Pad.

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400 Grit Diamond Pad.

800 Grit Diamond Pad

i. Dry mop the floor clean to remove all debris.

1. Apply ARDEX PC FINISH per application instructions at a rate of 3,000 sf/gal. i. Allow to dry a minimum of 15-30 minutes.

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m. MICROPOLISH/BURNISH #3: FLOR-GRIT B. EDGEWORK

3000 Grit Diamond Pad

1. Where desired, polished edge work of ARDEX PC-T shall be done with a 5" DIAMATIC Hand Held or Walk Behind polishing tool. The edge polishing process will match the corresponding steps outlined above for the desired gloss level, and each edge polishing step shall be done immediately after the matching main polishing step.

3.5 PROTECTION

- A. Protect the new ARDEX PC-T from spills and 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. Protect surface by installing the DIAMATIC PRIMO- COVER Protective Floor Covering, DIAMATIC ECONO-COVER Protective Floor Covering, or similar.
- B. Avoid moisture for 72 hours after installation.** Don't permit standing water for this period or place any protective plastic sheeting, rubber matting, rugs or furniture that can prevent proper drying, thereby trapping moisture, which can result in a cloudy effect on the floor.
- C. Light pedestrian use only in the 24 hours after installation. Normal traffic recommended 7 days

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after completion of the ULTRAFLOOR

3.6 MAINTENANCE

Concrete Topping System.

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A. IMPORTANT NOTICE: Maintaining the ULTRAFLOOR Polished Concrete System and

adherence to a recommended cleaning schedule will help the floor hold its mechanically polished gloss longer and greatly reduce the absorption of spilled liquids. The treated concrete floor is easily maintained by regular cleaning with the Maintenance/Post Cleaning procedure, accompanied by Micro Polishing. Specific maintenance recommendations shall be provided by

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the certified ULTRAFLOOR installer.

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B. Newly Installed ULTRAFLOOR

Polished Concrete System

1. **Restrict water cleaning for 72 hours after installation of ULTRAFLOOR.** Use only a dry mop to clean. Avoid putting mats or covering treated surface to allow coating to fully cure out.
2. DO NOT USE cleaners that are acidic or that have citrus (de-limonene) or Butyl compounds.

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3.7 FIELD QUALITY CONTROL

A. Test Reports: Provide field quality control sheen gloss reading and static coefficient of friction test results conducted as specified and recorded on floor plan diagram confirming compliance with specified performance criteria.

1. Static Coefficient of Friction: A reading of not less than 0.5 for level floor surfaces shall be achieved and documented, as determined by a certified NFSI walkway auditor using the NFSI 101-A quality control test.
2. Gloss readings should be obtained in accordance with ASTM E430, Standard Test Method for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry.
 - a. 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 the specified minimum sheen.

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