

ARDEX GUIDE SPECIFICATION
ARDEX PC-T™ POLISHED CONCRETE TOPPING
Part of the ARDEX Polished Concrete System (APCS)

SECTION 03 54 16
HYDRAULIC CEMENT UNDERLAYMENT

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-T™ Polished Concrete Topping component of the ARDEX Polished Concrete System (APCS) using a multi-step dry mechanical process and accessories specified to achieve desired gloss level:
 - 1. ARDEX PC-T™ Polished Concrete Topping (Gray, White or Light Gray)
 - 2. ARDEX EP 2000™ Substrate Preparation Epoxy Primer
 - 3. Mechanical Diamond Grinding and Polishing Equipment
 - 4. ARDEX Concrete Topping Treatment Chemicals
 - 5. Integral and Topical color
- B. Related Sections include the following:
 - 1. Section 03 30 00, Cast-In-Place Concrete
 - 2. Section 090561.13, Moisture Vapor Emission Control

1.3 REFERENCES

- A. ASTM C109M, 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 F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

- E. 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 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 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:
 - 1. The ARDEX Polished Concrete System (APCS) consists of a process and products engineered and manufactured by ARDEX Engineered Cements. Any substitutions are not permitted and void warranty.
- B. Installer Qualifications:
 - 1. Product(s) for the ARDEX Polished Concrete System must be installed by an approved installer such as an ARDEX Choice Contractor or ARDEX LevelMaster Elite Installer™, qualified to provide the warranty as specified.
 - 2. Installer must be approved in writing by ARDEX 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.
 - 3. A factory-trained, competent supervisor must be maintained on site during all times during which specified work is performed.
- C. Mock-Up: Before performing the work in this section, an on-site mock-up of the ARDEX PC-T™ 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. Pre-Installation Conference: Prior to the installation of the ARDEX Polished Concrete System, an on-site conference shall be conducted to review specification requirements.
 - 1. Required attendees include the Owner, Architect, General Contractor, Subcontractor and ARDEX Representative.

2. The minimum agenda shall include a review of the site conditions, construction documents, schedule, installation procedures, protection procedures and submittals.
- E. Warranty: Provide manufacturer's 10-year ARDEX Polished Concrete System Warranty or 10-year ARDEX LevelMaster Elite® Warranty.

1.6 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. Store all materials in a dry, climate-controlled environment at a minimum of 50°F (10°C) and maximum of 85°F (29°C). Protect from direct sunlight.
- 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 HYDRAULIC CEMENT UNDERLAYMENT

- A. Portland Cement-based Self-Leveling Topping to Suitable to Receive a Mechanical Polish Concrete Process. Acceptable products include:
 1. ARDEX PC-T™ Polished Concrete Topping; ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, PA 15001, 1-888-512-7339, www.ardexamericas.com
 - a. Primer: ARDEX EP 2000™ Substrate Preparation Epoxy Primer.
 - b. Water: shall be clean, potable and sufficiently cool (not warmer than 70°F/21°C).
 2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70°F (21°C) and 50% +/- 5% relative humidity:

- a. Flow Time: 10 minutes
 - b. Initial Set: Approx. 10 minutes
 - c. Final Set: Approx. 45 minutes
 - d. Compressive Strength: 6100 psi (42.06 N/mm²) at 28 days, ASTM C109M
 - e. Flexural Strength: 1200 (8.27 N/mm²) psi at 28 days, ASTM C78
 - f. VOC: 0
3. Repair materials:
- a. If necessary, correct excessive pinholes with ARDEX SD-M™ Designer Floor Finish™. Contact the ARDEX Technical Services department for recommendations.
4. Topical Color
- a. Dyes and stains designed for use on cementitious toppings.
5. Integral color
- a. Powder or liquid pigments can be utilized for integral pigmentation of ARDEX PC-T. The pigments must be suitable for use with a cementitious product.

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. Planetary Grinder and Polisher
 - a. Large Platform, typically, 32" planetary floor polisher with head pressure of 600 lbs.
 - b. Tooling
 - i. Metal Bonded Diamonds - 60-80 Grit of medium bonded metal
 - ii. Transitional Diamonds Ceramic / Flat block resin Bonded - #100 Grit
 - iii. Resin Bonded Diamonds - 200, 400 and higher Grit, as needed
 - 2. Micro Polisher – Burnishers
 - a. Specific weight and RPM are required to reach temperature of 100°F for application of ARDEX PC FINISH™.
 - b. Required Tooling: Diamond Impregnated – 400, 800, 1500, 3000 Grit, as needed
 - 3. Other equipment and tooling as necessary for small areas and edge work.
 - 4. Power generator – as needed
 - 5. All grinding and polishing completed with grinder/polisher equipment must be connected to a dust collector.

2.3 CONCRETE TREATMENT CHEMICALS

- A. Concrete treatments designed for use in conjunction with the installation of the ARDEX PC-T and the ARDEX Polished Concrete System. Acceptable products include:
 - 1. Treatment Chemicals; ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, PA 15001, 1-888-512-7339, www.ardexamericas.com;
 - a. Densifier: ARDEX PC 10™ Lithium Hardener for ARDEX PC-T™ Polished Concrete Topping
 - b. Finish Treatment: ARDEX PC FINISH™ Stain and Wear Protection
 - c. Maintenance recommendations: Contact the ARDEX Technical Services Department for recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect all concrete substrates and conditions under which the ARDEX Polished Concrete System is to be installed.
- B. Verify that existing concrete has cured a minimum of 28 days before installing ARDEX PC-T and meets the requirement of a minimum 3000 psi compressive strength, a minimum 100 pcf density and a minimum 200 psi tensile strength.
- C. 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. Mechanical preparation of the surface is required to obtain a minimum ICRI Concrete Surface Profile of 3 (CSP 3).
- C. Substrates shall be inspected for moisture or any other conditions that could affect the performance of the ARDEX system. Moisture vapor emissions shall not exceed 85% RH, ASTM F 2170. For areas where moisture vapor emissions exceed the specified limits refer to 09 05 61.13, Moisture Vapor Emission Control and install the appropriate ARDEX Moisture Control System.
- C. Joint and Crack Preparation: Honor all joints and moving cracks up through the ARDEX PC-T, including expansion joints, isolation joints and control joints (saw cuts).
 - 1. All non-moving cracks shall be filled with ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair.

3.3 APPLICATION OF ARDEX PC-T™

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 manufacturer's installation instructions. For complete instructions please refer to the ARDEX EP 2000 Technical Data Sheet.
2. If the ARDEX MC™ RAPID Moisture Control System is used, no additional priming is needed. The sand-broadcast surface of the ARDEX MC RAPID serves as the primer prior to the ARDEX PC-T application.

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 technical data sheet.
2. When mixing sanded materials, ARDEX recommends using the ARDEX DUSTFREE™ or a standard "gutter hook" vacuum attachment in combination with a wet/dry (Shop-Vac® style) vacuum and HEPA dust extraction vacuum system. Additionally, each bag should be handled with care and emptied slowly to avoid creating a plume of dust. Contact the ARDEX Technical Service Department for more details on ARDEX products and air quality management.
3. As this product uses several naturally occurring and mined raw materials, shade and/or color variations are to be expected. For this reason, it is strongly recommended to use product from the same batch or, when this is not possible, mix bags from different batches in a ratio determined by the amounts of each batch available
4. 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 3/8" [3 to 9.5 mm]). Do not use sand. The addition of aggregate will diminish the workability of the product and a finish layer is required. Allow the first layer to dry for 12 to 16 hours. Complete aggregate installation instructions are available in the ARDEX PC-T Technical Data Sheet.
5. For pump installations contact ARDEX technical department ARDEX Engineered Cements: 400 ARDEX Park Drive Aliquippa, PA 15001, 1-888-512-7339, www.ardexamericas.com

C. COLOR MIX

1. Integral Color: The maximum amount of pigment for powdered pigments is 2% of the total weight of the ARDEX which means 100 lbs. of ARDEX PC-T being mixed can have up to 2 lbs. of powdered pigments. Liquid pigments use can have a maximum of 6 oz. per 50 lb.-bag of ARDEX PC-T. Integral pigment loading is done at the sole discretion of the specifier and installer. Note: Adding integral pigment may reduce or enhance installation characteristics of the ARDEX PC-T. Gloss and clarity levels may be affected.

D. ARDEX PC-T™ INSTALLATION

1. The minimum installation thickness for ARDEX PC-T shall be 3/8" (9 mm). The necessary thickness will vary with jobsite conditions, and must be adequate to achieve the desired finish.
2. Pour and spread in place with the ARDEX T-4 Spreader, and then smooth with the ARDEX T-5 Smoother. Contact ARDEX Technical Services if a spike roller is to be used. Wear baseball shoes with non-metallic cleats to avoid leaving marks in the liquid topping.
3. Allow the ARDEX PC-T to cure a minimum of 24 to 72 hours before proceeding with the polishing process. Drying time is a function of jobsite temperature and humidity conditions, as well as the installation thickness.

3.4 POLISHING PROCESS FOR ARDEX PC-T™

- A. The ARDEX Polished Concrete System is an engineered and integrated complete installation system requiring adherence to all written recommendations. Dry processing is required, no wet grinding is permitted. Any substitutions from the specified products without manufacturer approval will void the system warranty. Please note the following:

1. Use a dust separator and collection system with HEPA filters connected to the planetary grinder, following the recommendations of the planetary grinder manufacturer.
2. Remove concrete dust using a portable vacuum with HEPA filters 1) between passes with the floor polisher and 2) when polishing disks are changed.
3. PROCESSING (Typical Gloss Reading: 40-65, ASTM E 430).
 - a. GRIND/POLISH Step #1: 60-80 Grit Metal Bonded Diamonds. Vacuum floor after each grinding/polishing step to remove dust.
 - b. GRIND/POLISH Step #2: #100 Grit Transitional, Ceramic / Flat block resin bonded diamonds. Vacuum floor after each grinding/polishing step to remove dust.
 - c. GRIND/HONING Step #3: 200 grit Resin Bonded Diamond. Vacuum floor after each grinding/polishing step to remove dust.
 - d. Apply ARDEX PC 10, per application instructions at a rate of 400 sq. ft./gal. Allow to dry for 1 hour before beginning the next step.
 - e. GRIND/POLISHING Step #4: 400 grit Resin Bonded Diamond. Vacuum floor after each grinding/polishing step to remove dust. Proceed with successively higher grits until gloss level desired.
 - f. Apply ARDEX PC FINISH Step #5: Per application instructions at a rate of 2,500 sq. ft./gal. Allow to dry a minimum of 30-60 minutes.
 - g. MICROPOLISH/BURNISH Step #6: Use 400 – 1500 grit pad. Dry, micro fiber mop the floor remove all debris. Floor should be allowed to cool to room temperature prior to second application.
 - h. Apply ARDEX PC FINISH Step # 7: Per application instructions at a rate of 2,500 sf/gal. Allow to dry a minimum of 1 hour.

- i. MICROPOLISH/BURNISH Step #8: Use 1500-3000 grit pad. Dry mop the floor clean to remove all debris.
 4. The above steps are typical for the processing and installation of ARDEX PC-T. However, additional steps may be required based on site conditions, age of installation and desired finish.
- B. EDGEWORK
1. Where needed, polished edge work of ARDEX PC-T shall be done with a hand held or walk behind polishing tool. The edge polishing process will match the corresponding steps outlined above for the desired gloss level. Edge work steps should always precede the corresponding polisher steps.
- C. POST INSTALLATION
1. All moving joints and saw cuts shall be filled with ARDEX ARDISEAL™ RAPID PLUS Semi-Rigid Joint Sealant.

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 a temporary, breathable protective floor covering.
- 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 after completion of the ARDEX Polished Concrete System.

3.6 MAINTENANCE

- A. **IMPORTANT NOTICE:** Maintaining the ARDEX 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 the certified installer performing the work of this section. Contact the ARDEX Technical Services Department for recommendations.
- B. Newly Installed ARDEX Polished Concrete System
1. **Restrict water cleaning for 72 hours after installation of ARDEX PC-T.** 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. Do not permit standing liquids at any time.

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.

END OF SECTION