



# HTC SUPERFLOOR - POLISHED CONCRETE FLOORS

## 1. GENERAL

### 1.1 SUMMARY

- A. Section Includes: Products and procedures for processing bonded abrasive polished concrete floors using multi-step wet/dry mechanical process, and accessories indicated, specified, or required to complete polishing.

### 1.2 REFERENCE STANDARDS

#### A. Terminology:

1. To be called a truly HTC Superfloor™, the surface needs to have been refined using solely HTC equipment and tooling following the specified well-defined process for achieving the desired characteristics. Also, the operator must be a certified or approved HTC Superfloor™ contractor and the final result should be registered and approved by HTC.
2. HTC Superfloor™ is mechanically refined, polished and diffusion open concrete surface that meets the daily demands on a professional floor surface for the industry, retail as well as public sector.
3. Polished Concrete: The act of changing a concrete floor surface, with or without aggregate exposure, to achieve a specified “finished gloss” level.
4. Bonded abrasive polished concrete: The multi-step operation of mechanically grinding, honing, and polishing a concrete floor surface with bonded abrasives to cut a concrete floor surface and to refine each cut to the maximum potential to achieve a specified level of finished gloss.
5. This specification does not cover other polished surfaces as toppings, terrazzo floors or resin surfaces.

#### B. Standards:

1. ASTM 5767 - Standard Test Method for Instrumental Measurement of Distinctness-of-Image Gloss of Coating Surfaces
2. ASTM D523 – Standard Test Method for Specular Gloss
3. ANSI A137 for dynamic coefficient of friction

NOTE TO SPECIFIER: FINAL RESULTS OF THE POLISHING PROCESS ARE HIGHLY DEPENDENT UPON THE QUALITY OF THE CONCRETE, MIX DESIGN, FINISHING TECHNIQUES, AND CURING METHODS. IT IS HIGHLY RECOMMENDED THAT BOTH NEW CONSTRUCTION AND RENOVATION PROJECTS ADHERE TO THE SUBPARAGRAPHS BELOW TO ENSURE DESIRED EXPECTATIONS.

## 2. FIELD CONDITIONS

#### A. Recommended concrete quality:

Always according to local standards when applicable.



## HTC SUPERFLOOR - POLISHED CONCRETE FLOORS

1. Apply curing methods / procedures to minimize shrinkage, cracks and pores.
  2. Minimum strength 3500 psi. (C 25/30)
  3. Specified Floor Flatness. Minimum  $F_F$  50 overall or similar local standard.
- B. Field Mock-up:  
Before starting an HTC Superfloor™ project, always provide a field mock-up to verify selections made under submittals and to demonstrate aesthetic effects of polishing. See recommended surface specifications under section H. Note: The recommended specifications are general recommendations/objectives but might vary some depending on specific floor characteristics. It is important that contractor and customer agree upon specifications prior to work.
1. Mock-up shall be representative of work to be expected.
- C. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.

### 2.1 POLISHING EQUIPMENT

- A. Field Grinding and Polishing Equipment:
1. HTC professional floor grinder, such as DURATIQ series or HTC series 500 and above.
  2. HTC professional dust extractor such as the 80iD, D60 or Greyline series.
  3. If wet grinding, honing, or polishing, use slurry extraction equipment suitable for slurry removal and containment prior to proper disposal.
- B. Edge Grinding and Polishing Equipment:
1. HTC 270EG professional floor edge grinder and polisher, and/or handheld grinder.
- C. Diamond Tooling: Abrasive tools that contain industrial grade diamonds within a bonded matrix (such as metallic, resin, ceramic, etc.) that are attached to rotating heads to refine the concrete substrate.
1. HTC Metal Bond Tooling, such as SMHX series diamond tooling.
  2. HTC Transition Tooling, such as FL, DT, Big Block or RP series diamond tooling.
  3. HTC Resin Bond Tooling, such as FL, SR, FP, DX, REP or Fenix series diamond tooling.
  4. Abrasive Pads: Diamond impregnated cleaning pads such as Twister, or alike

### 3. EXECUTION

#### 3.1 PREPARATION

- A. Cleaning New Concrete Surfaces:



1. Prepare and clean concrete surfaces.
2. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

### 3.2 POLISHING CONCRETE FLOORS

- A. Perform all polishing procedures to ensure consistent characteristics from wall to wall.
- B. Initial Grinding: to **Step 4 Brown Metal** (Ra readings down to <math><6 \mu\text{m}</math> / <math><235 \mu</math> inch)
  1. Select appropriate SMHX series diamond tooling by testing, for example by using Moh's hardness test to gauge abrasion resistance of concrete.
  2. Use approved HTC Grinder with selected diamond tooling.
  3. Begin grinding in one direction using sufficient equipment and diamond tooling to meet specified aggregate exposure class.
  4. Make sequential passes with each pass perpendicular to previous pass using finer grit tool with each pass, up to **Step 4 Brown** metal bonded tooling.
  5. Achieve maximum refinement with each pass before proceeding to finer grit tools.
  6. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
  7. Continue grinding until achieving specified Aggregate Exposure. (See section H – Aggregate exposure)
- C. Grouting: Treat Surface Imperfections according to project agreement

If necessary, fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids with grout to eliminate micro pitting in finished work.

To grout, follow the instructions for the actual product.

HTC grouting is usually engaged after **Step 4 Brown** by pouring out HTC Grouting, then directly grinding “down” the grouting into the floor until dry, using **Step 5 Black Metal**.

## HTC SUPERFLOOR - POLISHED CONCRETE FLOORS

### D. Densification: (Usually applied after **Step 5 Back Metal**.)

1. Remove all dust and debris from concrete surface.
2. Use HTC approved densifier such as the HTC Cure+ or Superfloor Densifier -P or HTC Densifier -L. Spray it onto the floor. Use pad applicator fitted with microfiber pad to spread evenly on surface. Product does not need vigorous scrubbing-in and will not form a gel. As product is absorbed into surface, apply additional product as needed until floor starts to reject the product. Keep floor wet for 15-20 minutes, spreading with mop to avoid puddles.  
Allow to dry (usually takes approx. 8-12hrs). Then continue with the next honing step.

When properly applied, the densification process will create a floor with higher density and lower porosity and improved wear resistance which is key to producing a high quality HTC Superfloor.

\* **Note.** Timing for application and choice of densification and grouting is greatly determined by the surface profile and how well the tools are responding. A too soft concrete substrate would hinder the tool from achieving the wanted surface refinement – applying grouting and/or densifying would then assist the tooling to achieve the required surface refinement before continuing the process.

### E. Honing: **Step 5 Black Resin to Step 7 Red Resin** (Ra readings down to <2,5 µm / <100 µ inch)

1. Use approved HTC Grinder with HTC Resin tooling such as: FL, BB, DT, SR, FP, DX, REP or Fenix series diamond tooling.
2. Hone concrete in one direction beginning with a tool sufficient to remove all scratches from previous step and make as many sequential passes required to refine surface, each pass perpendicular to previous pass, up to **Step 7 Red** tooling, reaching maximum refinement with each pass before proceeding to finer grit tooling.
3. Apply additional densification when necessary. We recommend additional application on the first two Honing steps to optimize surface texture and final appearance. Only light sprayed in front of the machine and grinded down when wet. No sequential curing or hardening time necessary.
4. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.



## HTC SUPERFLOOR - POLISHED CONCRETE FLOORS

RETAIN THE FOLLOWING ARTICLE, PARAGRAPH AND SUB-SUBPARAGRAPHS WHEN SPECIFYING HTC SUPERFLOOR PLATINUM AND HTC SUPERFLOOR GOLD

- F. Polishing: **Step 8 White Resin to Step 9 Green Resin** (Until Ra readings, Gloss and DOI is according to project agreement)
1. Use approved HTC Grinder with HTC Resin tooling such as: FL, BB, DT, SR, FP, DX, REP or Fenix series diamond tooling.
  2. Begin polishing in one direction starting with **Step 8 White Resin** tooling.
  3. Make sequential passes with each pass perpendicular to previous pass using finer grit tooling with each pass.
  4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
  5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.

RETAIN THE FOLLOWING SUBPARAGRAPH WHEN SPECIFYING STAIN PROTECTED SURFACES

- G. HTC Stain Protection:
1. Use HTC Stain Protection to improve stain resistance: Apply according to "Users instruction". Uniformly apply and remove excessive liquid according to manufacturer's instructions.

RETAIN THE FOLLOWING THREE SUBPARAGRAPHS FOR CLASS OF AGGREGATE EXPOSURE.

NOTE TO SPECIFIER: AGGREGATE EXPOSURE LEVELS ARE DEPENDANT UPON CONCRETE MIX DESIGN AND FLOOR FLATNESS (F<sub>F</sub>). REVIEW SPECIFIED AGGREGATE EXPOSURE DURING PRE INSTALLATION CONCRETE CONFERENCE.

- H. Final Polished Concrete Floor Aggregate Exposure:
1. Aggregate Exposure: Fine / Sand Aggregate Finish  
Remove not more than 1/16 inch (1.5 mm) of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with no, or small amount of, medium aggregate at random locations.
  2. Aggregate Exposure: Medium Aggregate Finish  
Remove not more than 1/8 inch (3 mm) of concrete surface by grinding and polishing resulting in majority of exposure displaying medium aggregate with no, or small amount of, large aggregate at random locations.
  3. Aggregate Exposure: Large Aggregate Finish  
Remove not more than 1/4 inch (6 mm) of concrete surface by grinding and polishing resulting in majority of exposure displaying large aggregate with no, or small amount of, fine aggregate at random locations. Please note that there can be no guarantees for aggregate exposure as this is dependent upon the composition of the concrete slab, regardless of new installation or renovation project.

## HTC SUPERFLOOR - POLISHED CONCRETE FLOORS

RETAIN THE APPLICABLE SUBPARAGRAPHS FOR LEVELS OF FINISHED SURFACE SPECS (GLOSS, DOI, Ra) AND AGGREGATE EXPOSURE WHEN SPECIFYING THE DESIRED HTC SUPERFLOOR CONCEPT

### I. Final Polished Concrete Floor Appearance:

#### 1. HTC Superfloor™ **Platinum** – Large Aggregate / High Gloss Appearance:

- a. Procedure: Recommended not less than 7 steps with full refinement of each diamond tool with minimum one application of densifier.
- b. Gloss Measurement: Determine the specular gloss by incorporating the following recommendations/objectives:
  - 1) Reflective Clarity Reading (DOI): Not less than 50 according to ASTM D5767 prior to the application of sealers.
  - 2) Reflective Sheen Reading (Specular Gloss): Not less than 50 GU according to ASTM D523 prior to the application of sealers.
  - 3) Surface Profile Reading: Maximum Ra measurement 0.4 µm /16 µ inches

#### 2. HTC Superfloor™ **Gold** Fine to medium Aggregate/ High Gloss Appearance:

- a. Procedure: Recommended not less than 6 steps with full refinement of each diamond tool with minimum one application of densifier. Starting tool not coarser than Step 4 Brown Metal.
- a. Gloss Measurement: Determine the specular gloss by incorporating the following recommendations/objectives:
  - 1) Reflective Clarity Reading (DOI): Not less than 50 according to ASTM D5767 prior to the application of sealers.
  - 2) Reflective Sheen Reading (Specular Gloss): Not less than 50 GU according to ASTM D523 prior to the application of sealers.
  - 3) Surface Profile Reading: Maximum Ra measurement 0.4 µm /16 µ inches

#### 3. HTC Superfloor™ **Silver** – Large Aggregate/ Low Gloss Appearance:

- a. Procedure: Recommended not less than 4 steps with full refinement of each diamond tool with minimum one application of densifier.
- b. Gloss Measurement: Determine the specular gloss by incorporating the following recommendations/objectives:
  - 1) Reflective Clarity Reading (DOI): Not applicable
  - 2) Reflective Sheen Reading (Specular Gloss): Not applicable
  - 3) Surface Profile Reading: Maximum Ra measurement 4µm /150 µ inches

4. HTC Superfloor™ **Bronze**: Fine/Sand aggregate finish / Low Gloss
  - b. Procedure: Recommended not less than 3 steps with full refinement of each diamond tool with minimum one application of densifier. Starting tool not coarser than Step 4 Brown Resin.
  - c. Gloss Measurement: Determine the gloss by incorporating the following recommendations/guidelines:
    - 1) Reflective Clarity Reading (DOI): Not applicable
    - 2) Reflective Sheen Reading (Specular Gloss): Not applicable
    - 3) Surface Profile Reading: Maximum Ra measurement 2,5 µm /100 µ inches

5. SUMMARY of the recommended surface specifications for HTC Superfloor™ processes\*.

The recommended specifications below are general recommendations/objectives but might vary some depending on specific floor characteristics. It is important that contractor and customer always agree upon specifications prior to work, see section 2B for more guidance.

Recommended HTC Superfloor surface specs

<b>Gold</b> Ra: <0,4µm (16µin) GU: >50 DOI: >50	<b>Platinum</b> Ra: <0,4µm (16µin) GU: >50 DOI: >50
<b>Bronze</b> Ra: <2,5µm (100µin) GU: n/a DOI: n/a	<b>Silver</b> Ra: <4,0µm (150µin) GU: n/a DOI: n/a

\* For a complete process overview, see the *HTC Grinding Guide* at [www.htc-floorsystems.com](http://www.htc-floorsystems.com)

### 3.3 FIELD QUALITY CONTROL

- A. Coefficient of friction
  1. ANSI A137 for dynamic coefficient of friction. Field Testing: Engage a qualified walkway auditor to perform field testing to determine if polished concrete floor finish complies with specified coefficient of friction;
- B. Distinction of Image (DOI):
  1. ASTM 5767 - Standard Test Method for Instrumental Measurement of Distinctness-of-Image Gloss of Coating Surfaces
- C. Specular Gloss (GU)
  1. ASTM D523 – Standard Test Method for Specular Gloss

## HTC SUPERFLOOR - POLISHED CONCRETE FLOORS

### D. Surface Profile Reading (Ra)

1. CSDA ST 115 - ST115 is a new standard for the concrete polishing industry that was adopted in fall 2013 by the Concrete Sawing and Drilling Association (CSDA). The standard explains in detail how to measure the texture of a concrete surface by using a texture meter.

### 3.4 CLOSEOUT ACTIVITIES

#### A. Maintenance

1. HTC Superfloor Contractor shall provide Owner's designated personnel with proper HTC Superfloor polished concrete maintenance guideline.

RETAIN ONE OF THE FOLLOWING TWO SUBPARAGRAPHS FOR PROPER MAINTENANCE PROCEDURES.

#### B. Maintenance Procedures

1. Daily cleaning with machine cleaning.
  - a. Dry mop the floor.
  - b. Fill the tank of the auto scrubber (scrubber dryer) with clean water and mount a diamond impregnated cleaning pad, Twister Blue pad, or alike, on the pad holder. (Ensure proper function of the machine prior to scrubbing).
  - c. Machine clean the floor at a speed of 3-5 km/h (2-3,5 mph)
  - d. After cleaning – Rinse the pad thoroughly and check if the color is gone. Color gone – Replace with new Diamond impregnated cleaning pad, like Twister Blue or alike.
  - e. For extra high gloss, use a high speed burnisher (<3500 RPM) with a dry Diamond impregnated cleaning pad, like Twister Green or alike.
2. Daily cleaning without machine cleaning
  - a. Dry mop the floor.
  - b. Mop with hot water and HTC Cleaner using a cotton mop.
  - c. Rinse and repeat as needed until water removed from floor appears clean.
  - d. Use a ultra-high speed burnisher (>3500 rpm) with clean and dry Diamond impregnated cleaning pad, like Twister Green or alike.

### 3.5 PROTECTION

- A. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.

END OF SECTION