

Concrete Surface Preparation Profiles for Overlay or Restoring Existing Concrete

Proper surface preparation of existing concrete is essential for achieving a successful project including resurfacers, polymer-modified or self-leveling overlays, sealers, coatings, or stains. Since there are many products available for overlays and restoration, it is important you know the surface condition requirements for the specific product you plan to use. Taking steps to correctly prepare the existing concrete surface will save you time and money, and can substantially reduce the possibility of coating failure.

These Concrete Surface Profiles were developed by the International Concrete Repair Institute (ICRI), are divided into ten classifications (CSP 1-10) of surface textures based on the average distance from the peaks of the surface to the valleys. They are accepted industry standards to help guide the installer achieve the proper texture for successful bonding of the overlay or coating. The lower number profiles are smoother (CSP 1 is nearly flat), and the higher numbers have more “tooth” and get progressively rougher.

- **These surface profile pictures provide guidelines based on the requirements of the system or products being used.**
- **Use the chart on the next page to validate the method for surface preparation.**



CSP 1 (acid etched)



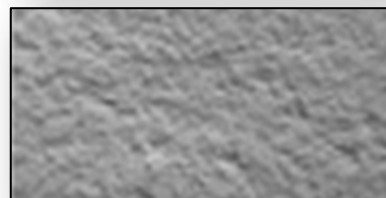
CSP 2 (grinding)



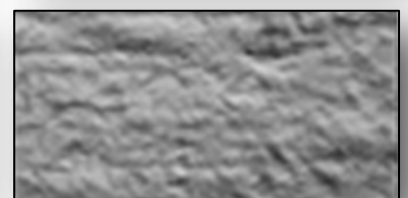
CSP 3 (light shotblast)



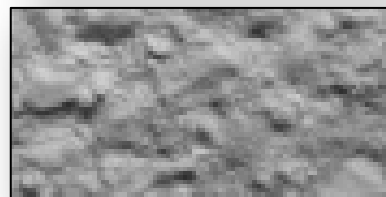
CSP 4 (light scarification)



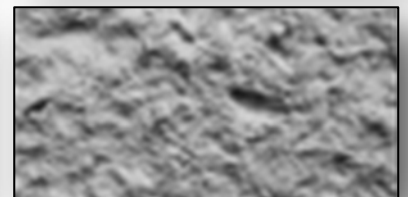
CSP 5 (medium shotblast)



CSP 6 (medium scarification)



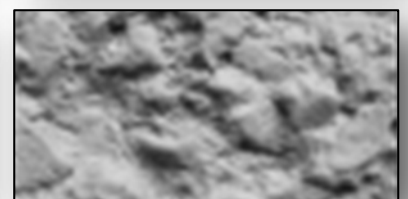
CSP 7 (heavy abrasive blast)



CSP 8 (scabbed)



CSP 9 (heavy scarification)



CSP 10 (course planing)

NOTE: ICRI CSP profiles should reference ICRI Technical Guideline No 310-2



Concrete Surface Preparation & Profiles

Concrete surface preparation for resurfacers, overlays, sealers, stains, or coatings on existing concrete

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Validating the Surface Preparation

Concrete Surface Profile (ICRI Method Selector)

	CSP 1	CSP 2	CSP 3	CSP 4	CSP 5	CSP 6	CSP 7	CSP 8	CSP 9	CSP 10
Coating to be applied:										
• Sealers (0-3 mils)	████████████████████									
• Thin-film (4-10 mils)	████████████████████									
• High build (10-40 mils)			████████████████████	████████████████████	████████████████████					
• Self-Leveling (50 mils-1/8 inch)				████████████████████	████████████████████	████████████████████				
• Polymer overlay (1/8-1/4 inch)					████████████████████	████████████████████	████████████████████	████████████████████	████████████████████	████████████████████
Preparation methods:										
• Detergent scrubbing	████████████████████									
• Low-pressure water	████████████████████									
• Acid etching	████████████████████	████████████████████								
• Grinding	████████████████████	████████████████████	████████████████████							
• Abrasive (sand) blasting		████████████████████	████████████████████	████████████████████	████████████████████					
• Steel shotblasting*			████████████████████	████████████████████	████████████████████	████████████████████	████████████████████	████████████████████		
• Scarifying				████████████████████	████████████████████	████████████████████	████████████████████	████████████████████	████████████████████	
• High/ultra-high pressure water jetting						████████████████████	████████████████████	████████████████████	████████████████████	
• Scabbing							████████████████████	████████████████████	████████████████████	
• Flame blasting								████████████████████	████████████████████	████████████████████
• Milling/rotomilling									████████████████████	████████████████████

* Preferred method

Preparation method
required for resurfacing
materials

NOTE: ICRI CSP profiles should reference ICRI Technical Guideline No 310-2

Notes

- In addition to having the surface clean, with all chemicals, oil, grease, curing compounds, or other contaminants removed, the surface profile of the existing concrete needs to be suitable for the selected overlay. Always consult with the manufacturer for the recommended surface profile.
- Mechanical profiling or acid etching are techniques used to prepare floors for overlays and restorations. Mechanical profiling should always be the first method of choice for roughening the concrete; it is also the safest method. Acid etching can provide adequate surface preparation for some coatings, sealers and toppings, however, acids can be difficult to rinse completely and neutralize, require a well-ventilated area, and they will not remove petroleum-based products or animal vegetable oils from the existing concrete.
- More aggressive surface preparation techniques (flame blasting, scarifying, scabbling and milling/rotomilling) risk the introduction of micro-cracking. Additional surface preparation is required when micro-cracking occurs.
- Repairs for cracking or spalling should be done in the surface preparation process, before the final overlay.
- It is important to always honor control/construction expansion joints.
- Apply the coating to a mock-up or test area under the same conditions of ambient temperature and surface moisture as the installation to verify the surface profile is adequately prepared.

Reference the following industry standards for preparation of concrete from the ASTM International (formerly known as American Society for Testing and Materials-ASTM), NACE International (formerly National Association of Corrosion Engineers), Society for Protective Coatings (SSPC), and the International Concrete Repair Institute (ICRI):

ASTM D4258, Standard Practice for Surface Cleaning Concrete for Coating

ASTM D4259, Standard Practice for Abrading Concrete

ASTM D4260, Standard Practice for Liquid and Gelled Acid Etching of Concrete

ASTM D4261, Standard Practice for Surface Cleaning Concrete Unit Masonry for Coating

ASTM D7682, Standard Test Method for Replication and Measurement of Concrete Surface Profiles Using Replica Putty

SSPC-SP13/NACE 6, Surface Preparation of Concrete

ICRI Standard 310.2 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair with CSP Chips.