

SSPC: The Society for Protective Coatings

Surface Preparation Standard No. 15

Commercial Grade Power-Tool Cleaning

1. Scope

1.1 This standard contains the requirements for power-tool cleaning steel to produce a commercial grade power-tool cleaned steel surface having a minimum 25 micrometer (1.0 mil) surface profile.

1.2 This standard is suitable where a roughened metal surface that is free of all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter except as noted in Section 2.2 is required, but where abrasive blasting is not feasible or permissible (see Notes 8.1 and 8.2).

1.3 This standard differs from SSPC-SP 3, Power-Tool Cleaning, in that SSPC-SP 3 requires only the removal of loosely adherent materials, and contains no requirement to expose bare metal or to achieve a minimum surface profile.

1.4 This standard differs from SSPC-SP 11, Power-Tool Cleaning to Bare Metal, in that SSPC-SP 11 does not allow stains to remain on the surface.

2. Definition

2.1 A commercial grade power-tool cleaned steel surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter, except as noted in Section 2.2 (see Notes 8.1 and 8.3).

2.2 Random staining shall be limited to no more than 33 percent of each unit area of surface as defined in Section 2.3. Staining consists of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating. Slight residues of rust and paint are permitted to remain in the lower portions of pits if the original surface is pitted.

2.3 Unit area for determining staining shall be approximately 5800 mm² (9 in²) (i.e., a square 76 x 76 mm [3 x 3 inches]).

2.4 Acceptable variations in appearance that do not affect surface cleanliness as defined in Section 2.1 and 2.2 include variations caused by type of steel, original surface condition, thickness of the steel, weld metal, mill or fabrication marks, heat treating, heat-affected zones, or the texture/features associated with the use of a particular power tool.

2.5 The surface profile shall be a minimum of 25 micrometers (1.0 mil). The peaks and valleys on the prepared surface shall form a continuous pattern with no smooth, unprofiled areas.

2.6 The profile shall be measured in accordance with ASTM D 4417 Method B unless otherwise specified (see Notes 8.4, 8.5, and 8.6).¹

2.7 Reference photographs of power-tool cleaned surfaces found in SSPC-VIS 3 are often used to supplement the written definition. In any dispute, the written definition set forth in this standard shall take precedence over reference photographs. Additional information on reference photographs is in Note 8.3.

3. Referenced Standards

3.1 The latest issue, revision, or amendment of the referenced standards in effect on the date of invitation to bid shall govern unless otherwise specified. Standards marked with an asterisk (*) are referenced only in the Notes, which are not requirements of this standard.

3.2 If there is a conflict between the requirements of any of the cited reference standards and this standard, the requirements of this standard shall prevail.

3.3 SSPC STANDARDS:

* PA 2	Procedure for Determining Compliance to Dry Coating Thickness Requirements
SP 1	Solvent Cleaning
SP 3	Power-Tool Cleaning
SP 11	Power-Tool Cleaning to Bare Metal
* SP 6	Commercial Blast Cleaning
VIS 3	Guide and Reference Photographs for Steel Surfaces Prepared by Power- and Hand-Tool Cleaning

¹ Although ASTM D 4417 and ASTM D 7127 indicate in their titles that they describe methods intended for use on blast-cleaned steel, there is currently no method specifically designed for measurement of profile on steel surfaces prepared using power tools. Visual comparators used for ASTM D 4417 Method A represent surfaces prepared by abrasive blast cleaning and are inappropriate for comparison with power-tool cleaned surfaces. The replica tape used for ASTM D 4417 Method C cannot accurately measure the profile produced by some types of power-tool cleaning media. A test area prepared at the job site can be used to assess the suitability of media and profile measurement method for a project prior to full-scale production.

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2.7 Reference photographs of power-tool cleaned surfaces found in SSPC-VIS 3 are often used to supplement the written definition. In any dispute, the written definition set forth in this standard shall take precedence over reference photographs. Additional information on reference photographs is in Note 8.3.

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3.4 ASTM INTERNATIONAL STANDARDS:²

D 4285	Standard Test Method for Indicating the Presence of Oil or Water in Compressed Air
D 4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
* D 7127	Standard Test Method for Measurement of Surface Roughness of Abrasive Blast Cleaned Metal Surfaces Using a Portable Stylus Instrument

4. Tools and Methods for Commercial Grade Power-Tool Cleaning

4.1 POWER TOOLS: Any hand-held motorized tool on which the media described in Sections 4.1.1 and 4.1.2 are capable of being mounted in accordance with manufacturer's instructions and that will produce a steel surface meeting the requirements of Sections 2.1, 2.2, and 2.5 is acceptable (see Notes 8.7.1, 8.7.2, 8.8 and 8.9). Sections 4.1.1 and 4.1.2 describe the two main categories of power tools. It is possible for power tools to alter an existing surface profile.

4.1.1 Grinding Tools: Grinding tools use media containing bonded abrasive grains to cut through corroded surfaces and include, but are not limited to, discs or wheels as described in Note 8.6.1.

4.1.2 Impact Tools: Impact tools use media that repeatedly collide with the target surface and include, but are not limited to, various rotary and reciprocating devices as described in Note 8.6.2.

4.2 The use of several different power tools meeting the requirements of Sections 4.1, 4.1.1 and 4.1.2 is sometimes necessary to achieve a commercial grade power-tool cleaned surface meeting the requirements of Sections 2.1 and 2.2 (see Note 8.7 and subsections).

4.3 If the procurement documents require power-tool cleaning to prepare surfaces for subsequent coating, the edges of remaining intact coatings shall, unless otherwise specified, be feathered to improve the appearance of the repaired coating (see Note 8.2).

5. Procedures Prior to Power-Tool Cleaning

5.1 Prior to power-tool cleaning, visible deposits of oil, grease, or other materials that may interfere with coating adhesion shall be removed in accordance with SSPC-SP 1 or other specified methods.

5.2 Surface imperfections such as slivers and laminations, sharp edges, weld spatter, or burning slag shall be removed from the surface to the extent specified by the procurement documents [project specifications] (see Note 8.10).

5.3 When air-driven tools are used, cleanliness of the compressed air shall be verified in accordance with the procedure described in ASTM D 4285.

6. Procedures Following Power-Tool Cleaning and Immediately Prior to Coating

6.1 Visible deposits of oil, grease, or other contaminants shall be removed in accordance with SSPC-SP 1 or as specified.

6.2 Dust and loose residues shall be removed from commercial grade power-tool cleaned (SSPC-SP 15) surfaces by brushing; blowing off with clean, dry air per Section 5.3; vacuum cleaning; or other methods established in the procurement documents (project specification).

6.3 After power-tool cleaning, any remaining surface imperfections revealed by the processing in Section 5.2 (e.g., laminations, sharp edges, weld spatter, burning slag, scabs, slivers) shall be removed to the extent required by the procurement documents (project specification). Any damage to the surface profile resulting from the removal of surface imperfections shall be corrected to meet the requirements of Section 2.5 (see Note 8.10).

6.4 Immediately prior to coating application, the entire surface to be coated shall comply with the requirements of Sections 2.1, 2.2, and 2.3 (see Notes 8.11 and 8.12).

7. Disclaimer

7.1 While every precaution is taken to ensure that all information furnished in SSPC standards and specifications is as accurate, complete, and useful as possible, SSPC cannot assume responsibility nor incur any obligation resulting from the use of any materials, coatings, or methods specified herein, or of the specification or standard itself.

7.2 This standard does not attempt to address problems concerning safety associated with its use. The user of this standard, as well as the user of all products or practices described herein, is responsible for instituting appropriate health and safety practices and for ensuring compliance with all appropriate governmental regulations.

8. Notes

Notes are not requirements of this standard.

8.1 FUNCTION: The type of power-tool surface preparation described in this standard removes tightly adherent material, producing a surface that is free from rust, mill scale,

² ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.