

SSPC: The Society for Protective Coatings

Surface Preparation Standard No. 18

Thorough Spot and Sweep Blast Cleaning for Industrial Coating Maintenance

Foreword

This SSPC standard contains requirements for dry abrasive blast cleaning a previously coated carbon steel surface to prepare retained coating for maintenance; and to clean areas of bare steel to near-white metal as defined in SSPC-SP 10/NACE No. 2. Thorough spot and sweep blast cleaning is used when the objective is to remove all unserviceable coating, clean any exposed steel to a near-white metal cleanliness, and uniformly roughen the remaining serviceable coating. Thorough spot and sweep blast cleaning is designed to subject the entire surface being prepared to significant abrasive impact. Coating that cannot withstand the abrasive blasting process is removed, while the remaining existing coating is suitably prepared for an additional layer of coating. Areas of exposed steel are prepared to the level of near-white metal blast cleaning. This standard is intended for use by coating or lining specifiers, applicators, inspectors, or others whose responsibility is to define a standard degree of surface cleanliness for previously coated carbon steel surfaces.

In this standard, the terms *shall* and *must* are used to state mandatory requirements. The term *should* is used to state something considered good and recommended but not mandatory. The term *may* is used to state something that is considered optional.

Scope

1.1 This standard contains the requirements for the Thorough Spot and Sweep Blast Cleaning degree of visible surface cleanliness of previously coated steel surfaces by the use of dry abrasive blast cleaning. These requirements include the end condition of the surface as determined by visual inspection, and materials and procedures used to achieve and verify the end condition. Thorough spot and sweep blast cleaning is designed to subject the entire surface being prepared to abrasive impact. Coating that cannot withstand the abrasive blasting process is removed, while the remaining existing coating is suitably prepared for application of an additional layer of coating. Areas of exposed steel are prepared to the level of SSPC-SP 10/NACE No. 2.

1.2 This standard is limited to requirements for visible surface contaminants. Information on nonvisible contamination is in nonmandatory Appendix A1. Information on soluble salt testing is in SSPC-Guide 15.

1.3 Information about the function of Thorough Spot and Sweep Blast Cleaning is in Appendix A2. Appendix A3 contains existing coating considerations for project planners and managers.

1.4 Units of Measure: This standard provides both IEEE/ASTM⁽¹⁾ SI 10 International System Units (SI) units and U.S. Customary units. SI Units are presented first, with a conversion into approximate U.S. custom units shown in parentheses. The conversions are not exact; therefore, each system must be used independently of the other.

2: Definitions

2.1 Thorough Spot and Sweep Blast Cleaned Surface: A thorough spot and sweep blast cleaned surface, when viewed without magnification, shall consist of areas of exposed steel cleaned to near-white metal level as defined in Section 2.1.1, as well as areas of retained existing coating as described in Sections 2.1.2 and 2.1.3.

2.1.1 As defined in SSPC-SP 10/NACE No. 2, near-white blast cleaned steel surfaces shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, and other foreign matter. Random staining shall be limited to no more than 5 percent of each unit area of surface (approximately 5,800 mm² [9.0 in²] (i.e., a square 76 mm x 76 mm [3.0 in x 3.0 in]), and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating.

2.1.2 Retained existing coating shall have sufficient adhesion that it cannot be removed from the substrate by lifting with a dull putty knife. The borders of the retained coating shall have no clear shoulder or edge at the coating/substrate interface. If the coating can be dislodged, the area shall be rejected and cleaned again until the requirements of this standard are met. Coating that has been tapered by

This standard was developed by the SSPC C.2.21 Partial Blast Cleaning Committee and first issued in 2020.

⁽¹⁾ IEEE/ASTM SI 10, American National Standard for Metric Practice, ASTM International, West Conshohocken, PA, 2017, <<https://www.astm.org>>

the blasting process in a manner that challenges adhesion and removes all sharp edges is well adhered. Additional information about evaluating the edges of retained coating is contained in Appendix A4.

2.1.3 Retained coating shall have no visible cracks, blisters, delamination, or other defects after the blasting. The retained coating shall not have chalking or residual corrosion staining. The retained coating shall be uniformly roughened and shall not have any area larger than 40 mm² (~1/16 in)² that exhibits the appearance of undisturbed coatings. Additional information about evaluating retained coating is contained in Appendix A4.

2.2 Spot Blasting: Localized abrasive blast cleaning as used in surface preparation for maintenance painting. Often applied to specific areas where corrosion or coating weaknesses are evident (e.g., blistering, delamination, cracking).

2.3 Sweep Blasting: A fast pass of the abrasive blasting pattern over a surface to remove loose material and to roughen the surface sufficiently to successfully accept a coat of paint.

Commentary: *The techniques referred to as “sweep blasting” and “brush blasting” should not be confused with the surface cleanliness level “brush-off blast cleaning” as defined in SSPC-SP 7/NACE No. 4.*

3. Additional Technical Considerations

3.1 Acceptable variations in appearance that do not affect surface cleanliness as defined in Section 2.1.1 include variations caused by the type of steel, original surface condition, thickness of the steel, weld metal, mill or fabrication marks, heat treating, heat-affected zones, blasting abrasives, and differences resulting from the abrasive blast pattern.

3.2 Appendices A4 and A5 provide additional information on coating appearance.

3.3 The contractor shall prepare a sample area to serve as a Job Reference Standard (JRS) for the degree of surface preparation specified. The JRS shall be representative of the surface to be prepared. Following acceptance by the contracting parties, the JRS shall be documented, preserved, or both, to serve as a reference for the duration of the project, and all documentation shall be retained as part of the project records. In any dispute, the written definition set forth in this standard shall take precedence over the JRS or other visual comparators.

3.4 This standard shall be used only when the coating to be applied on the prepared surface is determined to be compatible with the existing coating.

3.5 Appendix A6 provides guidance on the removal of pack rust and rust scale prior to blast cleaning. Appendix A7 provides examples of specification statements.

3.6 Coating thickness will vary among surfaces with retained coating and, by definition, there will be no coating at all on surfaces blasted to near-white metal cleanliness (SSPC-SP 10/NACE No. 2). Appendix A8 provides additional information on final applied coating thickness.

4. Referenced Documents

4.1 The latest issue, revision, or amendment of the standards listed in Sections 4.3 through 4.6 shall govern unless otherwise specified. Standards marked with an asterisk (*) are referenced only in the Appendices, which are not requirements of this standard.

4.2 If there is a conflict between the requirements of any of the documents listed in Sections 4.3 through 4.6 and this standard, the requirements of this standard shall prevail.

4.3 SSPC and Joint Standards

* SSPC Guide 12	Guide for Illumination of Industrial Painting Projects
SSPC Guide 15	Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates
SSPC-SP 1	Solvent Cleaning
SSPC-SP 10/ NACE No. 2	Near-White Metal Blast Cleaning
SSPC-SP 10 (WAB)/NACE WAB-2	Near-White Metal Wet Abrasive Blast Cleaning
SSPC-AB 1	Mineral and Slag Abrasives
SSPC-AB 2	Cleanliness of Recycled Ferrous Metallic Abrasives
SSPC-AB 3	Ferrous Metallic Abrasive
SSPC-AB 4	Recyclable Encapsulated Abrasive Media
* SSPC-PA 17	Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements
* SSPC-PA 2	Determining Conformance to Dry Coating Thickness Requirements
* SSPC-SP COM	Surface Preparation Commentary for Steel Substrates
SSPC-SP WJ-2/ NACE WJ-2	Waterjet Cleaning of Metals – Very Thorough Cleaning

4.4 ASTM International Standards⁽²⁾

* ASTM D3359	Standard Test Methods for Rating Adhesion by Tape Test
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⁽²⁾ ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, phone int+1-610-832-9500. For referenced ASTM standards, visit the ASTM website <<http://www.astm.org>>

	ASTM D4285	Standard Test Method for Indicating Oil or Water in Compressed Air
*	ASTM D4414	Standard Practice for Measurement of Wet Film Thickness by Notch Gages
*	ASTM D4417	Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
*	ASTM D6677	Standard Test Method for Evaluating Adhesion by Knife
*	ASTM F21	Standard Test Method for Hydrophobic Surface Films by the Atomizer Test
*	ASTM F22	Standard Test Method for Hydrophobic Surface Films by the Water-Break Test

4.5 International Organization for Standardization (ISO)⁽³⁾ Standard:

- * ISO 8502-3 "Preparation of steel substrates before application of paints and related products— Tests for the assessment of surface cleanliness— Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)"

4.6 NACE International⁽⁴⁾ Standards:

- * NACE 6G186 Surface Preparation of Soluble Salt Contaminated Steel Substrates Prior to Coating
- * NACE SP0178 Design, Fabrication and Surface Finish Practices for Tanks and Vessels to be Lined for Immersion Service

5. Procedures Before Thorough Spot and Sweep Blast Cleaning

5.1 Precleaning: Visible deposits of oil and grease, and heavy deposits of foreign matter such as mud, bird droppings, and caked salts shall be removed by methods in accordance with SSPC-SP 1, or as specified. Appendix A1 provides information about nonvisible contaminants.

5.2 Before beginning cleaning, surface imperfections such as sharp edges, weld spatter, or burning slag shall be removed from the surface to the extent required by the

procurement documents (project specification). Appendix A9 provides additional information.

5.3 The condition of the coated steel prior to blast cleaning should be documented before the blast cleaning commences.

6. Thorough Spot and Sweep Blast Cleaning Methods and Operation

6.1 Any of the following methods of surface preparation can be used to achieve a Thorough Spot and Sweep Blast Cleaned surface.

- (1) Dry abrasive blasting using compressed air, blast nozzles, and abrasive.
- (2) Dry abrasive blasting using a closed-cycle, recirculating abrasive system with compressed air, blast nozzle, and abrasive, with or without vacuum for dust and abrasive recovery.
- (3) Dry abrasive blasting using mobile, closed-cycle, recirculating abrasive systems with centrifugal wheels and abrasive.

Hazardous materials may be present. Appendix A10 provides additional information.

6.2 Clean, dry compressed air shall be used for nozzle blasting. Cleanliness of the compressed air shall be verified in accordance with the procedure described in ASTM D4285. Moisture separators, oil separators, traps, or other equipment may be necessary to achieve this requirement.

6.3 Wet abrasive blast cleaning (WAB) or pressurized water cleaning methods may be substituted for dry abrasive blast cleaning if specified in the contract documents. If WAB cleaning is used, the bare steel shall meet requirements of SSPC-SP 10 (WAB)/ NACE WAB-2. If pressurized water cleaning is used, the bare steel shall meet requirements of SSPC-SP WJ-2/NACE WJ-2.

6.3.1 Information on the use of inhibitors to prevent the formation of rust immediately after cleaning with water methods is contained in Appendix A11.

6.3.2 Surfaces prepared using wet methods should be completely dry prior to coating application.

7. Requirements for Blast Cleaning Abrasive Media

7.1 Selection of abrasive size and type shall be based on the type, grade, and surface condition of the steel to be cleaned, the type of blast cleaning system used, the finished surface to be produced (cleanliness and surface profile [roughness]), and whether the abrasive will be recycled.

7.2 The cleanliness and size of recycled abrasives shall be maintained to ensure compliance with this standard.

⁽³⁾ International Organization for Standardization (ISO), Case Postale 56, Geneva CH-1211, Switzerland. In the United States, ISO standards may be obtained from the American National Standards Institute (ANSI) at <<http://www.ansi.org>>

⁽⁴⁾ NACE International, 15835 Park Ten Place, Houston, Texas 77084, USA, Phone: +1-281-228-6200