

Near-White Metal Blast Cleaning

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Foreword

This standard defines the process for preparing a carbon steel surface to the near-white metal degree of surface cleanliness using a dry abrasive blast method of cleaning. It is intended for use by coating or lining specifiers, applicators, inspectors, or others whose responsibility is to specify a standard degree of surface cleanliness for carbon steel surfaces to be achieved by dry abrasive blast cleaning, or to prepare or inspect carbon steel to conform to defined requirements. The primary functions of blast cleaning before coating are

- a) to remove material from the surface that can cause early failure of the coating, and
- b) to obtain a suitable surface profile (roughness) to enhance the adhesion of the new coating system.

The six degrees of dry abrasive blast cleaning of carbon steel surfaces are:

Degree of Surface Cleanliness	Designation
White Metal Blast Cleaning	SSPC-SP 5/NACE No. 1
Near-White Metal Blast Cleaning	SSPC-SP 10/NACE No. 2
Commercial Blast Cleaning	SSPC-SP 6/NACE No. 3
Industrial Blast Cleaning	SSPC-SP 14/NACE No. 8
Brush-Off Blast Cleaning	SSPC-SP 7/NACE No. 4
Thorough Spot and Sweep Blast Cleaning for Industrial Coating Maintenance	SSPC-SP 18

This standard focuses on near-white metal blast cleaning. Near-white metal blast cleaning provides a greater degree of cleaning than commercial blast cleaning (SSPC-SP 6/NACE No. 3) but less than white metal blast cleaning (SSPC-SP 5/NACE No. 1).

Near-White Metal Blast Cleaning is used when the objective is to remove all rust, coating, and mill scale, but when the extra effort required to remove all stains of these materials is determined to be unwarranted. Near-white metal blast cleaning allows staining on no more than 5% of each unit area of surface.

White Metal Blast Cleaning (SSPC-SP 5/NACE No. 1) does not permit any staining to remain on the surface.

Commercial Blast Cleaning (SSPC-SP 6/NACE No. 3) allows staining on no more than 33% of each unit area of surface.

Industrial Blast Cleaning (SSPC-SP 14/NACE No. 8) allows traces of tightly adherent materials that cannot be lifted with a dull putty knife to remain on up to 10% of each unit area of surface and staining to be present on the remainder of the surface.

Brush-Off Blast Cleaning (SSPC-SP 7/NACE No. 4) allows any tightly adherent materials that cannot be lifted with a dull putty knife to remain on the surface.

Thorough Spot and Sweep Blast Cleaning (SSPC-SP 18) requires areas of exposed steel to be cleaned to a near-white metal level as defined in SSPC-SP 10/NACE No. 2, as well as areas of retained existing coating to be brush-off blasted so that no loose material remains as outlined in Brush-Off Blast Cleaning (SSPC-SP 7/NACE No. 4).

Rationale

This standard was last revised in 2007. Although the technical requirements for near-white metal surface cleanliness have not changed since the 2007 revision, the organization of the standard has been revised to reflect requirements of the *AMPP Publications Style Manual: Standards*. Nonmandatory appendix paragraphs have been added to address removal of pack rust, rust scale, and staining. Editorial revisions to streamline and clarify language have also been made.

Referenced Standards and Other Consensus Documents

Unless specifically dated, the latest edition, revision, or amendment of the documents listed in the table below shall apply.

AMPP/NACE/SSPC, www.ampp.org:

NACE Publication 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
SSPC-AB 1	Mineral and Slag Abrasives
SSPC-AB 2	Cleanliness of Recycled Ferrous Metallic Abrasives
SSPC-AB 3	Ferrous Metallic Abrasives
SSPC-AB 4	Recyclable Encapsulated Abrasive Media
SSPC-Guide 15	Field Methods for Retrieval and Analysis of Soluble Salts on Steel and Other Nonporous Substrates
SSPC-PA 2	Procedure for Determining Conformance to Dry Coating Thickness Requirements
SSPC-PA 17	Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements
SSPC-PA Guide 4	Guide to Maintenance Remaining with Oil Base or Alkyd Painting Systems
SSPC-SP 1	Solvent Cleaning
SSPC-SP 5/NACE No. 1	White Metal Blast Cleaning
SSPC-SP 6/NACE No. 3	Commercial Blast Cleaning
SSPC-SP 7/NACE No. 4	Brush-Off Blast Cleaning
SSPC-SP 8	Pickling
SSPC-SP 10 (WAB)/NACE WAB-2	Near White Metal Wet Abrasive Blast Cleaning
SSPC-SP 14/NACE No. 8	Industrial Blast Cleaning
SSPC-SP 18	Thorough Spot and Sweep Blast Cleaning for Industrial Coating Maintenance
SSPC-VIS 1	Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning

ASTM International, www.astm.org:

ASTM D4417	Standard Test Methods for Field Measurement of Surface Profile of Blast-Cleaned Steel
ASTM D4085	Method for Determining Presence of Oil or Water in Compressed Air

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

Section 1: Scope

- 1.1 This standard defines the process for preparing a carbon steel surface to the Near-White Metal degree of surface cleanliness using a dry abrasive blast method of cleaning. This standard is intended for use by coating or lining specifiers, applicators, inspectors, or others whose responsibility is to specify, prepare, or inspect carbon steel surfaces to the degree of surface cleanliness required by this standard. The requirements include the end condition of the surface as determined by visual inspection and the materials and procedures used to achieve and verify the end condition. Appendix A (nonmandatory) provides additional supplementary information. Paragraph A1 provides an example of language that may be used in a project specification where SSPC-SP 10/NACE No. 2 is specified.
- 1.2 This standard is limited to requirements for visible surface contaminants. Information on nonvisible surface contaminants (NVSC) and an example specification statement are in Paragraph A2. Information on chloride salt testing is in SSPC-Guide 15.
- 1.3 SSPC-SP 10 (WAB)/NACE WAB-2 should be specified if wet abrasive blast cleaning (WAB) technology is required.

Section 2: Requirements for Prepared Surface

- 2.1 A near-white metal blast-cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter. Random staining, consisting of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coating, shall be limited to no more than 5% of each unit area of the surface (~5,800 mm² [9.0 in²] (i.e., a square 76 mm x 76 mm [3.0 in x 3.0 in])). Paragraph A3 provides additional information about stains.
- 2.2 The surface shall meet the requirements above immediately prior to coating application. If any processes have been used to remove flash rusting such as "touch-up" blasting or pickling in accordance with SSPC-SP 8, the surface shall be inspected once again and shall meet the above requirements immediately prior to coating application.

Section 3: Additional Technical Considerations

- 3.1 This standard requires the creation of a surface profile that is compatible with the paint system being applied but does not establish specific profile values. Paragraph A4 provides information on surface profile.
- 3.2 This standard identifies surface imperfections such as sharp edges and weld spatter that may impact coating performance but does not mandate removal unless required by the contract documents (project specification). Information on surface imperfections is in Paragraph A5.
- 3.3 Information about the use of this standard in maintenance coating work is in Paragraph A6.
- 3.4 SSPC-VIS 1 or other visual reference photographs may be specified 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 Paragraph A7.
- 3.5 Acceptable variations in appearance that do not affect surface cleanliness as defined in Paragraph 2.1 include variations caused by the original surface condition, type or thickness of the steel, type of weld metal, mill or fabrication marks, heat treating, heat-affected zones, blasting abrasives, and differences resulting from the abrasive blast pattern.
- 3.6 Paragraph A8 provides guidance on the removal of pack rust and rust scale prior to blast cleaning.