



Standard Practice for Use of Pictorial Surface Preparation Standards and Guides for Painting Steel Surfaces¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 The visual surface preparation guides and standards consist of a series of color prints available as separate publications. Five different sets of photographs are described in this standard, designated as Method A (ISO/Swedish Standard²) and Methods B through E (SSPC Guides and Reference Photographs³). The methods differ in the depiction of the initial surface, in the definition and depiction of the cleaning conditions, and in the number of cleaning methods included. Because of these differences, the specifier should state which method to use.

1.2 The colored visual surface preparation guides represent different conditions of hot rolled carbon steel before and after surface preparation. Prior to cleaning, there are four rust grades, A to D, that cover the range from intact mill scale to 100 % rusted and pitted steel. The standards then depict the appearance of the initial conditions after cleaning by one or more methods (for example, dry abrasive blast cleaning) to various degrees of thoroughness. In addition, Method B includes three painted conditions that contain various degrees of deterioration. The Guide³ depicts these conditions after

various degrees of dry abrasive blast cleaning. Method C includes four rust grades and three painted conditions that contain various degrees of deterioration. The Guide⁴ depicts these conditions after various degrees of hand and power tool cleaning. Method D includes two rust grades and four painted conditions that contain various degrees of deterioration. The Guide⁵ depicts these conditions after various degrees of water jetting, with three levels of flash rusting. Method E includes two rust grades. The Guide⁶ depicts these conditions after various degrees of wet abrasive blast cleaning, with three levels of flash rusting.

2. Referenced Documents

2.1 Other Documents:

Pictorial Surface Preparation Standards and Guides^{2,3,4,5,6}
Surface Cleanliness Definitions^{3,4}

3. Terminology

3.1 Definitions:

3.1.1 The cleanliness definitions for the Method A visual surface preparation standard appear in the text of the pictorial surface preparation standards publication.² The definitions for Methods B, C, D, and E are found in a separate publication.^{3,4,5,6}

4. Significance and Use

4.1 The appearance of the various degrees of dry and wet abrasive blast cleaning, hand and power tool cleaning and

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The pictorial standards described were prepared by the Swedish Corrosion Institute and have been jointly approved by ASTM, The Society For Protective Coatings (SSPC) (VIS 1), and the Swedish Standardizing Commission.

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² The pictorial surface preparation standard Method A is available from The Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org> and Sveriges Standardiseringskommission, Box 3295, Stockholm 3, Sweden.

³ The Visual Guide for Method B and surface cleanliness definitions are available from The Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org>.

⁴ The Visual Guide for Method C and the surface cleanliness definitions are available from The Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org>.

⁵ The Visual Guide for Method D and the surface cleanliness definitions are available from The Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org>.

⁶ The Visual Guide for Method E and the surface cleanliness definitions are available from The Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, <http://www.sspc.org>.

water jetting are influenced by the initial rust grades of the steel being cleaned and/or the type and condition of the coating on the existing steel. The standards and guides aid visually in judging and evaluating the degree of rusting and/or paint deterioration before cleaning and the degree of cleaning of steel surfaces prior to painting.

4.2 Five methods have evolved because of differences in the practice of using visual standards and guides throughout the world, and the method of surface preparation employed. In Europe, the visual standards (Method A) are used as the primary means of assessing the degree of cleaning. In the US, the SSPC written definitions take precedence with the visual guides and reference photographs used as a supplement. The visual guides and reference photographs of Methods B, C, and D conform to the SSPC written definitions. There are no written definitions for Method E.

5. Procedure and Interpretation

Method A — ISO/Swedish Standard (Hand Tool Cleaning, Power Tool Cleaning, Abrasive Blast Cleaning, Flame Cleaning)

5.1 Determine the method of cleaning to be used (for example, hand or power tool cleaning, abrasive blast cleaning, or flame cleaning).

5.2 Determine the initial condition of the steel according to four initial grades (conditions).

- 5.2.1 Condition A: Tightly adhering mill scale.
- 5.2.2 Condition B: Mill scale and rust.
- 5.2.3 Condition C: Rusted.
- 5.2.4 Condition D: Rusted and pitted.

5.3 Following the cleaning operation, compare the prepared surface to the photograph corresponding to the specified degree of thoroughness (St2, St3, F1, Sa1, Sa2, Sa2½, Sa3) for the particular initial condition. Determine whether the prepared surface meets the cleanliness requirements of the contract documents (specification).

5.4 Repeat the procedure for representative areas of structure and record the initial condition, method of cleaning, and degree of thoroughness achieved.

Method B, SSPC VIS 1 — Guide and Reference Photographs for Steel Surfaces Prepared by Abrasive Blast Cleaning (Dry)

5.5 Determine the degree of blast cleaning specified by the contract documents.

5.6 Determine the initial condition of steel according to the seven initial condition photographs A-D: G₁, G₂, G₃.

- 5.6.1 Condition A: Tightly adhering mill scale.
- 5.6.2 Condition B: Mill scale and rust.
- 5.6.3 Condition C: Rusted with little or no pitting.
- 5.6.4 Condition D: Rusted and pitted.
- 5.6.5 Condition G₁: Deteriorated coating with extensive pinpoint rusting.
- 5.6.6 Condition G₂: Deteriorated coating with moderate pitting.

5.6.7 Condition G₃: Deteriorated coating with severe pitting.

5.7 Following the abrasive blast cleaning operation, compare the prepared surface to the photograph corresponding to the degree of surface cleanliness required by the contract documents (SSPC-SP7, SP14, SP6, SP10, SP5) for the particular initial condition. Determine whether the prepared surface meets the cleanliness requirements.

5.8 Repeat the procedure for all representative areas of structure and record for each area the initial condition and degree of cleanliness achieved.

5.9 When abrasives other than silica sand are used for blast cleaning, consult the photographs in the Appendix A of the SSPC VIS 1 Guide for variations in appearance created by the abrasive type.

5.10 Consult Appendix B of the SSPC VIS 1 Guide for photographs illustrating the effect of variations in surface profile depth, observation angle and lighting on the appearance of prepared surfaces.

NOTE 1—Different steel surfaces show differences in shade, color, tone, pitting, flaking, mill scale, etc. To some extent, these differences between the actual steel surface and the visual guide can be reconciled by preparing a project-specific cleanliness standard.

Method C, SSPC VIS 3 — Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaning

5.11 Determine the degree of hand or power tool cleaning specified by the contract documents.

5.12 Determine the initial condition of previously uncoated or coated steel with photographs A-D or E-G, respectively.

- 5.12.1 Condition A: Tightly adhering mill scale.
- 5.12.2 Condition B: Mill scale and rust.
- 5.12.3 Condition C: Rusted with little or no pitting.
- 5.12.4 Condition D: Rusted and pitted.
- 5.12.5 Condition E: Light colored paint applied to abrasive blast cleaned steel, mostly intact.
- 5.12.6 Condition F: Zinc-rich paint applied to abrasive blast cleaned steel.
- 5.12.7 Condition G: Paint system applied to mill scale, thoroughly weathered, blistered or stained.

5.13 Following the hand or power tool cleaning operation, compare the prepared surface to the photograph corresponding to the degree of cleanliness required by the contract documents (SSPC-SP2, SP3, SP11, SP15) for the particular initial condition. Determine whether the prepared surface meets the cleanliness requirements.

5.14 Repeat the procedure for all representative areas of the structure and record for each area the initial condition, the method of cleaning and the degree of cleanliness achieved.

NOTE 2—Different steel surfaces show differences in shade, color, tone, pitting, flaking, mill scale, etc. To some extent, these differences between the actual steel surface and the visual guide can be reconciled by preparing a project-specific cleanliness standard.

NOTE 3—The type of power tool employed to perform the cleaning can create varying appearances of the prepared surfaces. Visual representations of surfaces prepared using power wire brushes (PWB) and sanding

discs (SD) are depicted in Method C.

NOTE 4—Visual representations of surface profile that has been restored or re-exposed after power tool cleaning to expose bare metal (SP11/R) are depicted for two initial conditions (E and F) in Method C.

Method D, SSPC VIS 4/NACE VIS 7 — Guide and Reference Photographs for Steel Surfaces Prepared by Waterjetting

5.15 Determine the degree of water jetting specified by the contract documents.

5.16 Determine the initial condition of previously uncoated or coated steel with photographs C-D or E-H, respectively.

5.16.1 Condition C: Rusty with little or no pitting.

5.16.2 Condition D: Rusty and pitted.

5.16.3 Condition E: Light colored paint applied to abrasive blast cleaned steel, mostly intact.

5.16.4 Condition F: Zinc-rich paint applied to abrasive blast cleaned steel.

5.16.5 Condition G: Paint system applied to mill scale, thoroughly weathered, blistered or stained.

5.16.6 Condition H: Degraded paint system applied to steel thoroughly weathered, blistered, or stained.

5.17 Following the water jetting operation, compare the prepared surface to the photograph corresponding to the degree of cleanliness required by the contract documents (SP-WJ-1, SP-WJ-2, SP-WJ-3, SP-WJ-4) for the particular initial condition. Determine whether the prepared surface meets the cleanliness requirements immediately after cleaning.

5.18 If flash rusting (rust back) is permitted by the contract documents, assess the level of flash rusting (light, medium, heavy) and determine whether the surface meets the requirements of the contract documents immediately prior to coating.

5.19 Repeat the procedure for all representative areas of the structure and record for each area the initial condition, the method of cleaning, the degree of cleanliness achieved and the level of flash rusting (if permitted).

NOTE 5—Different steel surfaces show differences in shade, color, tone,

pitting, flaking, mill scale, etc. To some extent, these differences between the actual steel surface and the visual guide can be reconciled by preparing a project-specific cleanliness standard.

Method E, SSPC VIS 5/NACE VIS 9 — Guide and Reference Photographs for Steel Surfaces Prepared by Wet Abrasive Blast Cleaning

5.20 Determine the degree of wet abrasive blast cleaning specified by the contract documents.

5.21 Determine the initial condition of previously uncoated steel with photographs C or D.

5.21.1 Condition C: Rusty with little or no pitting.

5.21.2 Condition D: Rusty and pitted.

5.22 Following the wet abrasive blast cleaning operation, compare the prepared surface to the photograph corresponding to the degree of cleanliness required by the contract documents (WAB-6, WAB-10) for the particular initial condition. Determine whether the prepared surface meets the cleanliness requirements immediately after cleaning.

5.23 If flash rusting (rust back) is permitted by the contract documents, assess the level of flash rusting (light, medium, heavy) and determine whether the surface meets the requirements of the contract documents immediately prior to coating.

5.24 Repeat the procedure for all representative areas of the structure and record for each area the initial condition, the method of cleaning, the degree of cleanliness achieved and the level of flash rusting (if permitted).

NOTE 6—Different steel surfaces show differences in shade, color, tone, pitting, flaking, mill scale, etc. To some extent, these differences between the actual steel surface and the visual guide can be reconciled by preparing a project-specific cleanliness standard.

6. Keywords

6.1 abrasive blast cleaning; blast cleaning; flame cleaning; flash rusting; hand tool cleaning; photographic standards for surface preparation; power tool cleaning; surface preparation; surface preparation standards; visual guides; visual standards; water jetting; wet abrasive blast cleaning

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