

SSPC: The Society for Protective Coatings

GUIDE TO SSPC-VIS 3

Visual Standard for Power- and Hand-Tool Cleaned Steel (Standard Reference Photographs)

1. Scope

This guide describes the use of standard reference photographs depicting the appearance of unpainted, painted, and welded hot-rolled carbon steel prior to and after power and hand tool cleaning. These photographs are intended to be used to supplement the written SSPC power and hand tool surface preparation specifications. As the written specifications are the primary means to determine conformance with cleaning requirements, the photographs shall not be used as a substitute for the written specifications.

2. Description

This standard consists of color photographs which represent various conditions of unpainted, painted, and welded steel surfaces prior to and after power- and hand-tool cleaning.

3. Reference Standards

3.1 The standards referenced in this guide are listed in Section 3.3 and form a part of this guide.

3.2 The latest issue, revision or amendment of the reference standards in effect on the date of invitation to bid shall govern unless otherwise specified.

3.3 SSPC STANDARDS:

SP 2	Hand Tool Cleaning
SP 3	Power Tool Cleaning
SP 11	Power Tool Cleaning to Bare Metal

4. Conditions Depicted

4.1 INITIAL CONDITIONS: The standard (SSPC-VIS 3) illustrates seven initial conditions before surface preparation. (See Notes 7.1, 7.2 and 7.3.)

Condition A	Steel surface completely covered with adherent mill scale; little or no rust visible (Rust Grade A).
Condition B	Steel surface covered with both mill scale and rust (Rust Grade B).

Condition C	Steel surface completely covered with rust; little or no pitting visible (Rust Grade C).
Condition D	Steel surface completely covered with rust; pitting visible (Rust Grade D).
Condition E	Previously painted steel surface; light-colored paint applied over blast-cleaned surface, paint mostly intact.
Condition F	Previously painted steel surface; zinc-rich paint applied over blast-cleaned steel, paint mostly intact.
Condition G	Painting system applied over mill scale bearing steel; system thoroughly weathered, thoroughly blistered, or thoroughly stained.

4.2 END CONDITION: The standard illustrates surfaces prepared by several hand and power tools. The various degrees of cleaning and tools represented are:

SSPC-SP 2	Hand Tool Cleaning by hand wire brush (SP 2).
SSPC-SP 3	Power Tool Cleaning by power wire brush (SP 3/PWB).
SSPC-SP 3	Power Tool Cleaning by sanding disc (SP 3/SD).
SSPC-SP 3	Power Tool Cleaning by needle guns (SP 3/NG).
SSPC-SP 11	Power Tool Cleaning to Bare Metal by rotary flaps or needle guns (See Note 7.4).
SSPC-SP 11	Power Tool Cleaning to Bare Metal by restoration (re-exposure) of previously existing profile by non-woven disks (See Note 7.5).

5. Procedures

5.1 Determine initial condition of steel as follows:

5.1.1 If the steel has not been previously painted, proceed to 5.1.2 If it has been painted, proceed to 5.1.3.

5.1.2 Select the photograph of the condition grade (A, B, C or D) that most closely represents the appearance of the unpainted steel to be cleaned. Steel to be cleaned may contain more than one of the initial conditions (rust grades).

5.1.3 Select the photograph of the condition grade (E, F or G) that most closely represents the appearance of the previously painted steel to be cleaned. Steel to be cleaned may contain more than one of the initial conditions.

5.2 Determine the condition and tools to be evaluated as follows:

5.2.1 If hand tool cleaning (SSPC-SP 2) has been specified, use the designation SSPC-SP 2 (SP 2).

5.2.2 If power tool cleaning (SSPC-SP 3) has been specified, determine which of the following tools were used: power wire brush (designated SP 3/PWB), sanding disk (designated SP 3/SD), or needle guns (designated SP 3/NG).

5.2.3 If power tool cleaning to bare metal (SSPC-SP 11) has been specified, determine if the intent was to produce a profile (5.2.3.1) or to restore (re-expose) an existing profile (5.2.3.2). If this cannot be determined, go to 5.2.3.1.

5.2.3.1 If no profile exists or the profile condition is unknown, use the designation SP 11. This condition can be

produced by using either rotary flap peening assembly or 2 mm needle guns. (See Note 7.4.)

5.2.3.2 If there is an existing profile to be restored (reexposed), use the designation SSPC-SP 11 (Non-Woven Disk to Restore [Re-Expose] Profile) or SSPC-SP 11/R. In this case SSPC-SP 11 will be achieved using non-woven disks. (See Note 7.5.)

5.3 Select reference photographs as follows:

5.3.1 Refer to Table 1 to determine which photograph depicts the finished surface.

5.3.2 If SSPC-SP 3 has been specified, use the photograph which corresponds to the type of power tool used (e.g., for power wire brush use SP 3/PWB). If it cannot be determined which power tool was used, any of the three end conditions (i.e., SP 3/PWB, SP 3/SD, or SP 3/NG) is acceptable.

5.4 Determine conformance with photographs as follows:

5.4.1 Compare the prepared surface with the photographs selected in Section 5.3 to evaluate the degree of cleaning and its conformance with the standard (SSPC-VIS 3).

5.4.2 The visual standard shall be used only in conjunc-

TABLE 1

Initial Surface Condition Initial Condition Description	A 100% Adherent Mill Scale	B Mill Scale & Rust	C 100% Rust	D 100% Rust With Pits	E Light-Colored Paint Applied Over Blast Cleaned Steel	F Zinc-Rich Paint Applied Over Blast Cleaned Steel	G Painting System Applied Over Mill Scale (Note 3)
Weld Seam Present (Note 1)	Yes	Yes	Yes	Yes	No	Yes	No
Degree of Cleaning & Tool							
Hand Tool Cleaning (SSPC-SP 2/Wire Brush)	A SP2	B SP2	C SP2	D SP2	E SP2	F SP2	G SP2
Power Tool Cleaning (SSPC-SP 3/Power Wire Brush)	A SP3/PWB	B SP3/PWB	C SP3/PWB	D SP3/PWB	E SP3/PWB	F SP3/PWB	G SP3/PWB
Power Tool Cleaning (SSPC-SP 3/Sanding Disc)	A SP3/SD	B SP3/SD	C SP3/SD	D SP3/SD	E SP3/SD	F SP3/SD	G SP3/SD
Power Tool Cleaning (SSPC-SP 3/Needle Gun)	A SP3/NG	B SP3/NG	C SP3/NG	D SP3/NG	E SP3/NG	F SP3/NG	G SP3/NG
Power Tool Cleaning to Bare Metal (SSPC-SP 11/Needle Gun or Rotary Flap Peen - Produce Profile)	A SP11	B SP11	C SP11	D SP11	E SP11	F SP11	G SP11
Power Tool Cleaning to Bare Metal (SSPC-SP 11/Non-Woven Disk Restore [Re-Expose] Profile)	(Note 2)	(Note 2)	(Note 2)	(Note 2)	E SP11/R	F SP11/R	(Note 2)

Note 1: No special treatment was performed on the welds prior to surface preparation.

Note 2: No photo provided - initial condition did not have original profile to be restored (re-exposed).

Note 3: Substrate consisted of 2-1/4 inch (57 mm) wide lacing bars.

tion with the written SSPC surface preparation specifications, as it is based upon appearance only and does not address other factors necessary for compliance with the written specification.

5.4.3 Steel surfaces show variations in texture, shade, color, tone, pitting, flaking, mill scale, etc., which should be considered when making comparisons with the reference photographs.

6. Disclaimer

Every precaution is taken to ensure that all information furnished in SSPC guides and standards is as accurate, complete, and useful as possible. SSPC cannot assume any responsibility nor incur any obligation resulting from the use of any materials or methods specified therein, including guides and standards.

7. Notes*

7.1 Conditions A, B, C, and D are "new construction" surface conditions, and are defined in Section 3.1 of the SSPC Surface Preparation Commentary.

7.2 Conditions E, F, and G are "maintenance" surface conditions. Condition E and F represent surfaces having aged coatings originally applied over blast cleaned steel. Condition G represents surfaces having aged coatings originally applied over mill scale bearing steel. Although many surfaces encountered in practice may not closely correspond to conditions E, F, or G, careful extrapolation of the photographs can still aid in determining conformance with the cleaning requirements.

7.3 Weld seams have been included with Conditions A, B, C, D, and F to depict the appearance of welds cleaned by power and hand tools prior to painting.

7.4 In some instances it may be necessary to reduce the roughness and depth of profile using non-woven disks or other tools.

7.5 In using this approach, one should make sure that the surface meets the SSPC-SP 11 requirement for a 1 mil (25 micrometer) minimum profile.

* Notes are not requirements of this specification.