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Mazdoor Kisan Shakti Sangathan

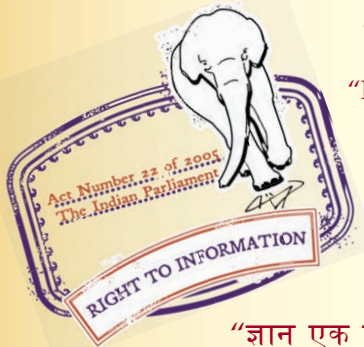
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“Step Out From the Old to the New”

IS 9954 (1981): Pictorial Surface Preparation Standards for Painting of Steel Surfaces [CED 13: Building Construction Practices including Painting, Varnishing and Allied Finishing]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



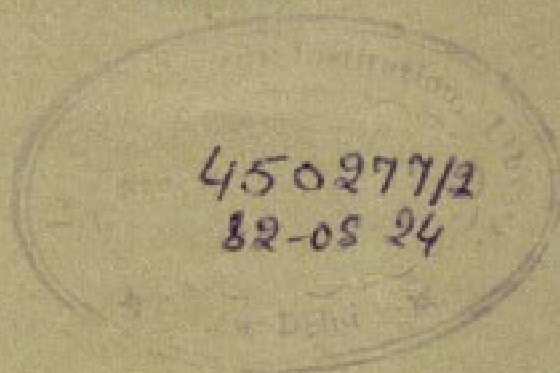
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*Indian Standard*

PICTORIAL SURFACE  
PREPARATION STANDARDS FOR  
PAINTING OF STEEL SURFACES

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

# *Indian Standard*

## PICTORIAL SURFACE PREPARATION STANDARDS FOR PAINTING OF STEEL SURFACES

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**AMENDMENT NO. 1 AUGUST 2010**  
**TO**  
**IS 9954 : 1981 PICTORIAL SURFACE**  
**PREPARATION STANDARDS FOR PAINTING OF**  
**STEEL SURFACES**

(Page 3, Foreword, clause 0.3) — Substitute the following for the existing:

‘The grade of preparation of a steel surface is dependent on the informations like initial condition (termed as rust grade), type of cleaning procedure and the degree of cleaning (termed as preparation grades). This standard specifies four initial conditions of steel surface prior to painting and six degrees of cleaning applicable for the four initial conditions depending on the type of cleaning procedures employed.’

(Page 3, footnote marked \*) — Delete.

(Page 4, clause 1.1.1) — Substitute the following for the existing:

‘1.1.1 The initial conditions and the degree of cleanliness that is required to be achieved prior to painting have been covered in this standard through reference to the following International Standard:

ISO 8501 - 1 : 2007 Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness - Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings

NOTE — The above ISO Standard contains a series of prints each establishing a grade, with coating and various degrees of thoroughness of surface preparation. This standard however recommends the procedure to be adopted for making use of the prints in practice. The type of cleaning procedure to be adopted for achieving the different degrees of cleaning before painting shall be as recommended in IS 1477 (Part 1) : 2000†.’

(Page 4, footnote marked †) — Substitute ‘second revision’ for ‘first revision’.

(CED 13)

# *Indian Standard*

## PICTORIAL SURFACE PREPARATION STANDARDS FOR PAINTING OF STEEL SURFACES

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 30 October 1981, after the draft finalized by the Painting Varnishing and Allied Finishes Sectional Committee had been approved by the Civil Engineering Division Council.

**0.2** The effective life of a coating of anticorrosive paint applied to a steel surface is to a very large extent dependent on how thoroughly the surface has been prepared prior to painting. It is also important to be able to specify clearly the quality of preparation required in each particular case.

**0.3** The grade of preparation of a steel surface is dependent on the informations like initial condition (termed as rust grade), type of cleaning procedure and the degree of cleaning (termed as preparation grades). This standard specifies four initial conditions of steel surface prior to painting and six degrees of cleaning applicable for the four initial conditions depending on the type of cleaning procedures employed. The initial conditions and the degree of cleanliness that is required to be achieved prior to painting has been presented in this standard as a series of prints each establishing a grade. The prints presents various initial conditions of steel surface before preparation for protective coating and various degrees of thoroughness of surface preparation. Attempts are being made by the relevant technical committee to develop and include these prints in this standard, but in the meantime the prints appearing in the Swedish Standard SIS 05 5900-1967 'Pictorial surface preparation standards for painting steel surfaces' may be referred to. The type of cleaning procedure to be adopted for achieving the different degrees of cleaning before painting shall be as recommended in IS: 1477 (Part I)-1971\*, which has been taken up for revision with a view to including the modern cleaning procedures that are being used in practice. This standard, however, recommends the procedure to be adopted for making use of the prints in practice.

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\*Code of practice for painting of ferrous metals in buildings : Part I Pretreatment ( *first revision* ).



**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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## 1. SCOPE

**1.1** This standard specifies four different grades of rust ( *A*, *B*, *C* and *D* ) developed on the surface of steel, and recommends preparation of these rust grades to either two grades of surface preparation ( *St 2* and *St 3* ) when scraping and wire brushing is employed or four grades of surface preparation ( *Sa 1*, *Sa 2*, *Sa 2½* and *Sa 3* ) when blast cleaning is employed.

**1.1.1** The recommended rust and preparation grades are defined by colour prints representing a full scale view of part of the surface.

NOTE — The cleaning techniques to be adopted for achieving the different grades of surface preparation has been covered in IS:1477 (Part I)-1971†.

## 2. TERMINOLOGY

**2.0** For the purpose of this standard the following definitions shall apply.

**2.1 Grit** — This includes all blast abrasives, which have sharp irregular shapes, thus prompting high effectiveness in cutting away surface deposits or imperfections. In this category, the cut wire abrasives are also included.

**2.2 Shot** — These are spherical or near spherical particles and are either produced accidentally as a by-product in some of industrial operations; or intentionally produced for blast-cleaning.

**2.3 Blast Cleaning** — The cleaning or roughening of a surface by the use of natural grit or artificial grit a fine metal shot which is projected on to a surface by compressed air or mechanical means.

**2.4 Mill Scale** — The layer of black oxide of iron produced during the hot rolling of steel.

**2.5 Pitting** — The formation of holes or pits in a metal surfaces, by localized corrosion.

**2.6 Metallic Shean** — The metallic gloss seen at glancing angles on a surface which when viewed normally appears mett.

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\*Rules for rounding off numerical values ( *revised* ).

†Code of practice for painting of ferrous metals in buildings : Part I Pretreatment ( *first revision* ).

**2.7 Flaking** — Lifting of the paint from the underlying surfaces in the form of flakes or scales.

### 3. RUST GRADES

**3.1** For the purpose of this standard the steel surfaces have been grouped into the following rust grades:

Grade *A* — Steel surface covered completely with adherent millscale and on which little rust is visible to the naked eye.

Grade *B* — Steel surface which has begun to rust and from which the millscale has begun to flake.

Grade *C* — Steel surface from which the millscale has rusted away or from which it can be easily scraped, but on which little pitting is visible to the naked eye.

Grade *D* — Steel surface from which the millscale has rusted away and on which considerable pitting is visible to the naked eye.

**3.1.1** The appearance of the above rust grades shall correspond to the prints designated as *A*, *B*, *C* and *D*.

### 4. PREPARATION GRADES

**4.0** It is assumed that prior to treatment the steel surface has been cleaned of dirt grease, algae and fungi and that the heavier layers of rust have been removed by chipping.

**4.1** For the purpose of this standard, the preparation grades have been grouped as given in **4.1** and **4.2** depending on the cleaning procedure employed.

#### **4.1.1** *When Scraping and Wire-Brushing is Employed (St)*

**4.1.1.1** *Thorough scraping and wire brushing* — The treatment shall remove loose millscale, rust, and foreign matter. Finally, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush. It should then have a faint metallic sheen. The appearance shall correspond to the prints designated St. 2.

**4.1.1.2** *Very thorough scraping and wire brushing, using power tools* — Surface preparation shall as for St 2, but much more thoroughly. After removal of dust, the surface shall have a pronounced metallic sheen and correspond to the prints designated St. 3.

#### **4.1.2** *When Blast Cleaning is Employed (Sa)*

**4.1.2.1 Light brush off blast cleaning** — Loose millscale, rust and foreign matter shall be removed. The appearance shall correspond to the prints designated Sa 1.

**4.1.2.2 Fairly thorough blast cleaning** — Almost all millscale, rust and foreign matter shall be removed. Finally, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush. It shall then be greyish in colour and correspond in appearance to the prints designated Sa 2.

**4.1.2.3 Thorough blast cleaning nearly to pure metal** — Millscale, rust and foreign matter shall be removed to the extent that the only traces remaining are slight stains in the form of spots or strip. Finally, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush. It shall then correspond in appearance to the prints designated Sa 2½.

**4.1.2.4 Very thorough blast cleaning to pure metal** — Millscale, rust and foreign matter shall be removed completely. Finally, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush. It shall then have a uniform metallic colour and correspond in appearance to the prints designated Sa 3.

**4.2 Designation of Prepared Surfaces** — A steel surface, for example, originally corresponding to rust Grade B, which has been scrapped or brushed to preparation Grade 2, is designated BST 2 and the one which has been prepared by blast cleaning to preparation Grade 2½ is designated as B Sa 2½.

## 5. PROCEDURE

**5.1** To make use of the prints in practice, the procedure given in 5.1.1 to 5.1.3 may be adopted.

**5.1.1** Hold the book right way up with light coming towards the viewer.

**5.1.2** Ascertain the initial condition of the steel by comparing the untreated steel with prints of rust Grades A, B, C or D.

**5.1.3** After cleaning the steel, select those pages that show preparation Grades (St) or (Sa) and compare the condition of the steel with the print equivalent to the preparation grades. If necessary, continue the cleaning procedure until the steel surface matches the print.