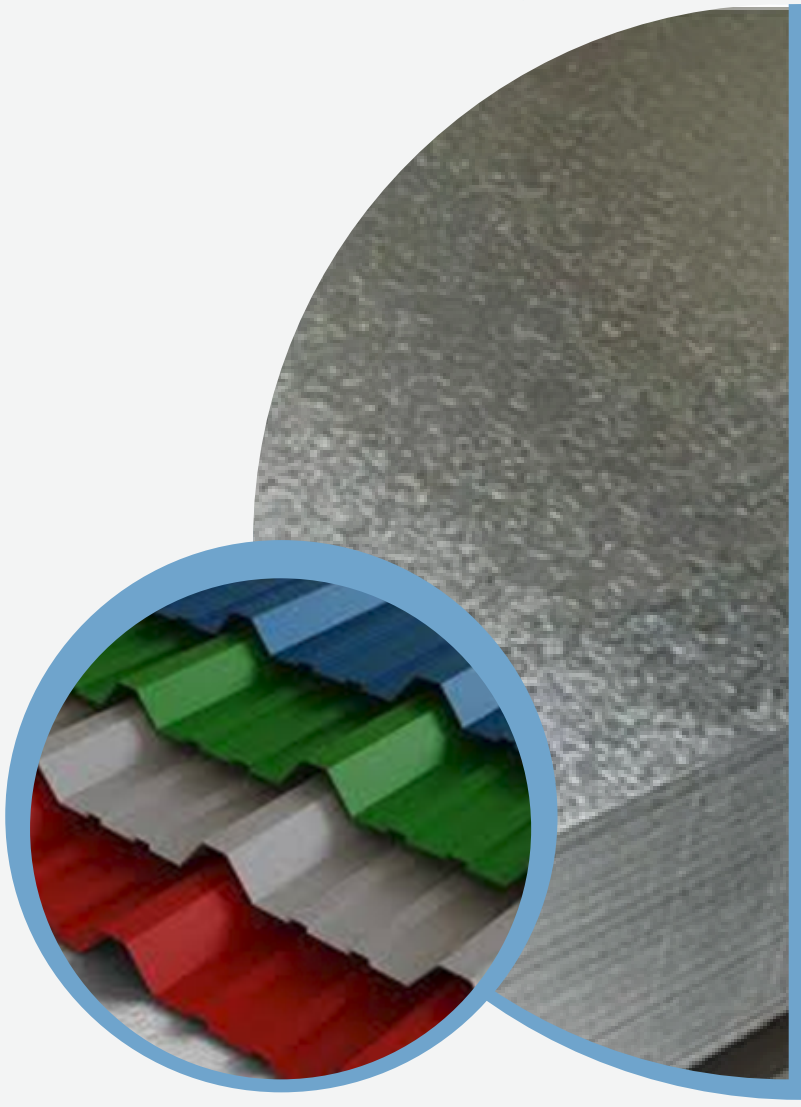
मानकः पथप्रदर्शकः

COMPENDIUM OF INDIAN STANDARDS ON

COATED STEEL SHEETS & STRIPS



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1. Introduction

This compendium consists of all the Indian standards available for coated flat steel standards along with related raw material and test method standards formulated by Wrought Steel Products Sectional Committee MTD 04 of Metallurgical Divisional Council.

Metallic coated such as galvanized, electrogalvanized, galvannealed, ZAM coated, Zn 55% Al coated flat steel product standards cover the requirements of substrate such as chemical composition, surface treatment procedures and coating requirements such as mass of coating, coating adherence, coating finish, tensile properties of coated steel product etc

Pre painted Metallic coated produced by continuously coating and baking durable synthetic resin paint, for example, polyester, epoxy, acrylic, fluorocarbon, etc, over metallic coated flat steel product standards cover the paint requirements such as dry film thickness, coating adhesion test, pencil hardness test, Impact resistance test, cross hatch test, solvent resistance test, salt spray test, gloss and color etc

2. Indian Standards for different types of coatings

2.1 IS 277 : 2018 Galvanized steel strips and sheets (Plain and Corrugated) - Specification

This standard covers the requirements of plain galvanized steel sheets and strips (coils) and corrugated galvanized sheets which are intended to be used for purposes such as panelling, roofing, applications requiring lock forming, etc.

2.2 IS 14246 : 2024 Continuously pre-painted galvanized steel sheets and strips - specification

This standard covers the requirement of continuous pre-painting on hot-dip galvanized steel sheets and strips conforming to IS 277 which are intended to be used for roofing, architectural siding, home appliances and other general article purposes.

2.3 IS 17404 : 2020 Electro galvanized hot rolled and cold reduced carbon steel sheets and strips

This standard covers the requirements of hot rolled and cold reduced carbon steel sheets and strips coated with zinc by electrolytic process. The product can be coated on one or both the surfaces and with equal or differential coating masses on the two surfaces. Electrogalvanized steel is used in applications where aesthetics and precise surface finish are crucial, such as in domestic appliances and automotive parts

2.4 IS 16732 : 2019 Galvanized structural steel - Specification

This standard covers the requirement of steel including micro alloyed steel plates, strips, shapes and sections (angles, tees, beams, channels, etc), flats, bars, etc, for use as hot dip galvanized structural suitable for welded, bolted and riveted structures which is used in a variety of applications including transmission line towers.

2.5 IS 18385 : 2023 Hot- Dip galvanized/galvannealed Steel Sheet and strips for Automotive Applications

This standard covers the requirements for continuous hot-dip zinc coated [Galvanized (G)] and zinc-iron alloy coated [Galvannealed (A)] steel sheets, plates and strips for automotive applications such as components such as body panels, chassis, and structural elements, where corrosion resistance and formability are critical.. It covers sheets, plates and strips up to 6.0 mm thickness.

This standard cover bake hardening steel, interstitial free high strength steel, C-Mn steel, HSLA, Dual Phase, Ferrite bainite steel, TRIP steel, complex phase steel, Martensitic type steel for which requirements such as bake hardening index, Hole expansion ratio, plastic strain ratio, strain hardening index were specified as applicable.

2.6 IS 15961 : 2012 Hot dip aluminium - Zinc alloy metallic coated steel strip and sheet (Plain)

This standard covers the requirement of continuously hot-dip 55% aluminium-zinc alloy metallic coated steel strip and sheet (plain) produced by uniformly coating over both surfaces of cold rolled steel coil as base of 0.25 mm to 1.5 mm thick base steel.

This standard covers requirements for steel grades, coating classes and surface finishes as follows:
a) Normal (N)/Skin-passed (S);
b) Aluminum /Zinc coating classes; and
c) Structural steel grades.

2.7 IS 15965 : 2012 Pre - Painted aluminium zinc alloy metallic coated steel strip and sheet (Plain)

This standard covers the requirement of pre-painting on aluminium-zinc alloy metallic coated steel strip and sheet (plain) conforming to IS 15961 for application as exposed building products.

This standard covers requirements for different classes of durability of paint coatings in accordance with the severity of the application as building products.

2.8 IS 18513 : 2023 Hot-Dip Zinc- Aluminium-Magnesium Alloy Coated Steel Sheets Plates and Strips

This standard covers the requirements for steel sheets, plates and strips, metallic-coated by the continuous hot-dip process, with zinc-aluminium magnesium alloy coating intended for applications requiring high corrosion resistance, formability and paintability.

This standard covers bake hardening steel, interstitial free high strength steel, C-Mn steel, HSLA, Dual Phase, TRIP steel, complex phase steel for which requirements such as bake hardening index, plastic strain ratio, strain hardening index were specified as applicable.

2.9 IS 19210 : 2025 Pre-Painted Zinc-Aluminium-Magnesium Alloy Coated Steel Strip And Sheet

This standard covers the requirement of prepainting on zinc-aluminium-magnesium alloy coated steel strip and sheet conforming to IS 18513.

3. Indian Standards on raw materials used for Coated steel

3.1 Substrate

The following Indian standards specifies the requirements of cold rolled and hot rolled steel sheet, plate and strips which are used as the substrate (base material) on which metallic coating is applied.

IS No.	IS Title
IS 513 (Part 1) : 2016	Cold reduced carbon steel sheet and strip: Part 1 cold forming and drawing purpose (Sixth Revision)

IS 513 (Part 2) : 2016	Cold reduced carbon steel sheet and strip: Part 2 high tensile and multi - Phase steel (Sixth Revision)
IS 1079 : 2017	Hot rolled carbon steel sheet, plate and strip - Specification (Seventh Revision)
IS 5986 : 2017	Hot rolled steel sheet, plate and strip for forming and flanging purposes - Specification

3.2 Ingots

The following Indian standards specifies the requirements of ingots which are used as the coating material which are to be applied on the substrate by hot dipping or electrolysis methods.

IS No.	**IS Title**
IS 209 : 2024	Refined Zinc - Specification (Fifth Revision)
IS 2590 : 1987	Specification for primary aluminium ingots for remelting for general engineering purposes (Second Revision)
IS 617 : 2024	Aluminium and Aluminium Alloys Ingots for Remelting and Castings for General Engineering Purposes â€" Specification (Fourth Revision)
IS 6694 : 1999	Magnesium ingots - Specification (Second Revision)

4. Indian Standards on test methods

4.1 Chemical Analysis

The following Indian standards specifies the test method standards used for chemical analysis of substrate.

TEST	**STANDARDS**
Chemical Composition Test	*i. IS 228 (Part 1) – Determination of carbon (Gravimetric and volumetric methods)* *ii. IS 228 (Part 2) – Determination of sulfur (Evolution method)* *iii. IS 228 (Part 3) – Determination of phosphorus (Volumetric method)* *iv. IS 228 (Part 4) – Determination of manganese (Volumetric method)* *v. IS 228 (Part 5) – Determination of silicon (Gravimetric method)* *vi. IS 228 (Part 8) – Determination of copper (Electrolytic method)* *vii. IS 228 (Part 9) – Determination of aluminum (Gravimetric method)* *viii. IS 228 (Part 11) – Determination of molybdenum (Gravimetric method)* *ix. IS 228 (Part 12) – Determination of vanadium (Colorimetric method)* *x. IS 228 (Part 14) – Determination of nitrogen (Gas-volumetric method)* *xi. IS 228 (Part 15) – Determination of titanium (Colorimetric method)* *xii. IS 228 (Part 16) – Determination of boron (Curcumin method)*

4.2 Mechanical properties

The following Indian standards specifies the test method standards used for testing the mechanical properties.

TEST	STANDARDS
Tensile Test	***IS 1608 (Part 1) : 2022/ISO 6892-1 : 2019*** *Metallic materials - Tensile testing Part 1 Method of test at room temperature*
Bend Test	***IS 1599 : 2023/ ISO 7438 : 2020*** *Metallic materials Bend test*
Plastic strain Ratio	***IS 11999 : 2022/ ISO 10113:2020*** *METALLIC MATERIALS SHEET AND STRIP DETERMINATION OF PLASTIC STRAIN RATIO (Second Revision)*
Hole Expansion	***IS 17414 : 2020/ ISO 16630 : 2017*** *Metallic Materials — Sheet and Strip — Hole Expanding Test*
Strain Hardening Exponent	***IS 15756 : 2022/ ISO 10275:2020*** *Metallic materials - Sheet and strip - Determination of tensile strain hardening exponent*
Impact test	***IS 1757 (Part 1) : 2020/ ISO 148-1 : 2016*** *Metallic Materials — Charpy Pendulum Impact Test Part 1 Test Method (Fourth Revision)*
Dimensions	***IS/ISO 16163 : 2012*** *Continuously hot - Dipped coated steel sheet products - Dimensional and shape tolerances*

4.3 Metallic coating properties

The following Indian standards specifies the test method standards used for determining the metallic coating properties.

TEST	STANDARDS
Mass of coating	***IS 6745 : 1972*** *Methods for determination of mass of zinc coating on zinc coated iron and steel articles*
Coating Thickness	***IS 12860 : 1989*** *Metallic coating thickness by X-ray fluorescence technique method - Determination*
Uniformity of coating	***IS 2633 : 1986*** *Method for testing uniformity of coating on zinc coated articles (Second Revision)*
Corrosion Test	***IS 5528 : 2024 /ISO 9227 : 2022*** *Corrosion Tests in Artificial Atmospheres - Salt Spray Tests (second revision)*
Accelerated Corrosion test	***ISO 14993:2018*** *Corrosion of metals and alloys — Accelerated testing involving cyclic exposure to salt mist, dry and wet conditions*

4.4 Paint properties

The following Indian standards specifies the test method standards used for determining the paint properties.

TEST	STANDARDS
Classification of environment for corrosion protection of paint	***ISO 12944-2 : 2017*** *Paints and varnishes — Corrosion protection of steel structures by protective paint systems* *Part 2: Classification of environments*
Paint Gloss	***IS 101 (Part 4/Sec 4) : 2020 ISO 2813 : 2014*** *Methods of Sampling and Test for Paints, Varnishes and Related Products : Part 4 optical test : Sec 4 gloss - determination of gloss value at 20°, 60° and 85°(Fourth Revision)*
Paint Hardness	***IS 101 (Part 5/Sec 1) : 1988*** *Methods of sampling and test for paints, varnishes and related products: Part 5 mechanical test on paint films: Sec 1 hardness tests*
Paint Flexibility & Adhesion	***IS 101 (Part 5/Sec 2) : 1988*** *Methods of sampling and test for paints, varnishes and related products: Part 5 mechanical tests: Sec 2 flexibility and adhesion (Third Revision)*
Paint Resistance to Humidity	***IS 101 (Part 6/Sec 1) : 1988*** *Methods of sampling and test for paints, varnishes and related products: Part 6 durability tests: Sec 1 resistance to humidity under conditions of condensation (Third Revision)*
Paint Film thickness	***ISO 2808:2019*** *Paints and varnishes — Determination of film thickness*
Defects in painting	***ISO 4628-2:2016*** *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance* *Part 2: Assessment of degree of blistering*