मानकः पथप्रदर्शकः

COMPENDIUM OF INDIAN STANDARDS ON

METALLOGRAPHY

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NEW DELHI

INTRODUCTION

This compendium enlists the standards published by Bureau of Indian Standards on metallography. These standards are used for evaluation of the microstructure of metals and alloys using techniques such as polishing, etching, and microscopic examination. It helps in determining grain size, phase distribution, inclusion content, and other structural features that influence the behaviour of materials during processing and service.

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6.	IS 7739 (Part 6) : 1975	Code of practice for preparation of metallographic specimens: Part 6 lead and its alloys and their examination
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BRIEF ON STANDARDS

1.	**IS 10138 : 2010** Macroscopic methods for determination of non-metallic inclusion content In wrought steels	This standard describes the macroscopic methods used for assessing the content of non-metallic inclusions in wrought steel products.
2.	**IS 11371 : 2022** Method for Macroetch Testing, Inspection and Rating of Wrought Steel Products	This standard covers the method of macroetching, for evaluating wrought steel products, such as bars, billets, blooms, sheets, plates and forgings.
3.	**IS 12037 : 2023/ ISO 4968 : 2022** Steel - Macrographic examination by sulphur print (Baumann method)	This document specifies a method (Baumann) for the macrographic examination of steel by means of contact printing using silver salts and acid.The method is applicable to steels of which the sulphur content is less than 0,40 %.
4.	**IS 12211 : 2024 /ISO 5949 : 1983** Tool Steels and Bearing Steels - Micrographic Method for Assessing the Distribution of Carbides Using Reference Photomicrographs	This Standard specifies the micrographic method for assessing the distribution of carbides in tool and bearing steels, with C levels between 0,l % and 1,5 % and a total content of alloy elements less than or equal to 5 %.
5.	**IS 12378 : 1988** Method for macroetch test for titanium alloys	This standard details the procedure intended for classifying titanium alloys by a graded series showing the characteristic structure and incidence of certain processing defects.
6.	**IS 12573 : 2010** Method for macroetch test for wrought aluminium and aluminium alloy products	This standard describes the method for carrying out macro etch testing of aluminum and aluminium alloys and some of the widely accepted etching solutions currently in use.
7.	**IS 13484 : 2024** Method for Macroetch Test for Copper and Copper Alloys	This standard details the procedure for copper and copper alloys, showing characteristic structure and incidence of certain processing defects and is applicable to wrought and cast products.
8.	**IS 13605 : 2024** Macroetch Test for Zinc and Zinc Alloys — Method of Test	This standard details the procedure for classifying, zinc and zinc alloys, characteristic structure and incidence of certain processing defects and is applicable to zinc and zinc alloy products.
9.	**IS 13691: 1993 /ISO 4970:1979** Steel - Determination of total or	This International Standard specifies a method of measuring the total or effective thickness of thin surface-hardened layers, with thicknesses of less than or equal to 0.3 mm.

	effective thickness of thin surface - Hardened layers	
10.	**IS 15426 : 2004 / ISO 14250:2000** Steel - Metallographic characterization of duplex grain size and distributions	This Standard specifies a micrographic method of determining the duplex grain size of rolled or forged steel products using standard diagrams or by the point count procedure.
11.	**IS 15839 : 2024 / ISO 13520 : 2023** Determination of Ferrite Content in Austenitic Stainless Steel Castings	This standard covers procedures for estimating ferrite content in certain grades of austenitic iron-chromium- nickel alloy castings that have compositions balanced to create the formation of ferrite as a second phase in amounts controlled within specified limits. Methods are described for estimating ferrite content by chemical, magnetic and metallographic means.
12.	**IS 17174 : 2020 / ISO 16574 : 2015** Determination of Percentage of Resolvable Pearlite in High Carbon Steel Wire Rod	This Standard defines resolvable pearlite and specifies two methods of determining the percentage of resolvable pearlite. The methods are applicable for wire rod made from control cooling steel with carbon content greater than 0.65 % C.
13.	**IS 18715 : 2024 / ISO 9042:1988** Steels - Manual Point Counting Method for Statistically Estimating the Volume Fraction of a Constituent with a Point Grid	This Standard specifies a manual point counting method for statistically estimating the volume fraction of a constituent through the microstructure of a steel by means of a point grid.
14.	**IS 18829 : 2024 ISO 2624:1990** Copper and copper alloys - Estimation of average grain size	This Standard specifies three procedures for estimating, and rules for expressing, the average grain size of topper and topper alloys consisting principally of a Single Phase. The respective procedures are termed the comparison procedure, the intercept procedure and the planimetric procedure.
15.	**IS 3848 : 2024 / ISO 642 : 1999** Steel — Hardenability Test by End Quenching (Jominy Test)	This Standard specifies a method for determining the hardenability of steel by end quenching (Jominy test) by using a test piece 25 mm in diameter and 100 mm long.
16.	**IS 4075 : 2024** Macrostreak Flaw Test for Steel — Method of Test	This standard prescribes the method for carrying out the macrostreak flaw test for steel.. This test is essentially used for determination of the presence of inclusions above 0.5 mm.
17.	**IS 4163 : 2021 / ISO 4967 : 2013** Steel - Determination of content of non-metallic inclusions - Micrographic method using standard diagrams	This Standard specifies a micrographic method of determining the non-metallic inclusions in rolled or forged steel products having a reduction ratio of at least 3 using standard diagrams.

18.	**IS 4748 : 2021 / ISO 643 : 2019** Steel - Micrographic determination of the apparent grain size	This standard specifies a micrographic method of determining apparent ferritic or austenitic grain size in steels. It describes the methods of revealing grain boundaries and of estimating the mean grain size of specimens with unimodal size distribution.
19.	**IS 5699 : 1970** Methods for chill testing of cast iron	This standard prescribes the following two methods for chill testing of grey iron: a) Wedge test, and b) Chill test
20.	**IS 6396 : 2023 / ISO 3887 : 2017** Steels - Determination of the depth of decarburization	This document defines the decarburization and specifies three methods of measuring the depth of decarburization of steel products.
21.	**IS 6416 : 2022** Method for measuring case-depth of steel	This standard prescribes the following five methods of measuring case depth (CD) of steel hardened by carburizing, nitriding, carbonitriding, cyaniding or induction and flame hardening: a) Hardness method, b) Chemical method, c) Macrostructure method, d) Microscopic method; and e) Fracture method (for routine process control)
22.	**IS 7739 (Part 1) : 1975** Code of practice for preparation of metallographic specimens: Part 1 general features	This standard (Part I) covers the recommended methods of selection: size, cutting, cleaning and mounting of metallographic specimens for microscopic examination.
23.	**IS 7739 (Part 2) : 1975** Code of practice for preparation of metallographic specimens: Part 2 electrolytic polishing	This standard (Part II) covers electrolytic polishing of metal specimens for metallographic observation.
24.	**IS 7739 (Part 3) : 1975** Code of practice for preparation of metallographic specimens: Part 3 aluminium and its alloys and their examination	This standard (Part III) covers the polishing, etching and examination of aluminium and its alloys.
25.	**IS 7739 (Part 4) : 1975** Code of practice for preparation of metallographic specimens: Part 4 copper and its alloys and their examination	This standard (Part IV) covers the polishing, etching and examination of copper and its alloys.
26.	**IS 7739 (Part 5) : 1976** Code of practice for preparation of metallographic specimens: Part 5	This standard (Part V) covers the polishing, etching and examination of iron and steel.

	iron and steel and their examination	
27.	**IS 7739 (Part 6) : 1975** Code of practice for preparation of metallographic specimens: Part 6 lead and its alloys and their examination	This standard (Part VI) covers polishing, etching and examination of lead and its alloys.
28.	**IS 7739 (Part 7) : 1975** Code of practice for preparation of metallographic specimens: Part 7 magnesium and its alloys and their examination	This standard (Part VII) covers the polishing, etching and examination of magnesium and its alloys.
29.	**IS 7739 (Part 8) : 1975** Code of practice for preparation of metallographic specimens: Part 8 nickel and its alloys and their examination	This standard (Part VIII) covers the polishing, etching and examination of nickel and its alloys.
30.	**IS 7739 (Part 9) : 1975** Code of practice for preparation of metallographic specimens: Part 9 gold, silver, platinum, palladium and their alloys	This standard (Part IX) covers the polishing, etching and examination of gold, silver, platinum, palladium and their alloys.
31.	**IS 7739 (Part 10) : 1975** Code of practice for preparation of metallographic specimens: Part 10 tin and its alloys and their examination	This standard (Part X) covers the polishing, etching and examination of tin and its alloys.
32.	**IS 7739 (Part 11) : 1976** Code of practice for preparation of metallographic specimens: Part 11 zinc and its alloys and their examination	This standard (Part XI) covers the polishing, etching and examination of zinc and its alloys.
33.	**IS 7754 (Part 2) : 2024/ ISO 945-4 : 2019** Microstructure of Cast Irons Part 4 Test Method for Evaluating Nodularity in Spheroidal Graphite Cast Irons	This standard specifies a test method for evaluating nodularity in spheroidal graphite cast irons by comparative visual analysis and image analysis techniques.

34.	**IS 7754 (Part 3) : 2024/ ISO/TR 945-3 : 2016** Microstructure of Cast Iron Part 3 Matrix Structures	This Technical Report gives the designations, descriptions and reference micrographs of the matrix structures of cast irons.
35.	**IS 7754 (Part 2) : 2024 / ISO/TR 945-2 : 2011** Microstructure of cast irons - Part 2 Graphite classification by image analysis	This standard deals with the two-dimensional characterisation of graphite form and size in cast irons.
36.	**IS 7754 (Part 1) : 2022 / ISO 945-1:2019** Microstructure of Cast Irons Part 1 Graphite Classification by Visual Analysis	This standard specifies a method of classifying the microstructure of graphite in cast irons by comparative visual analysis. This standard provides information about the method of graphite classification. It is not intended to give information on the suitability of cast-iron types and grades for any particular application.
37.	**IS 9415 : 2024** Method for Determination of Hardenability and Grain Size of Tool Steels by Penetration Fracture Test	This standard describes the method for determining the hardenability and grain size of tool steels by penetration fracture test for process control purposes.