

ASTM METALLOGRAPHY STANDARDS

A 247: Visual Classification of Graphite in the Microstructure of Cast Iron

A 892: Defining and Rating the Microstructure of High Carbon Bearing Steels

B 390: Evaluating Apparent Grain Size and Distribution of Cemented Tungsten Carbides

B 588: Measurement of the Thickness of Transparent or Opaque Coatings by Double-Beam Interference Microscope Technique

B 657: Metallographic Determination of Microstructure in Cemented Tungsten Carbide

B 681: Measurement of Thickness of Anodic Coatings on Aluminum and of Other Transparent Coatings on Opaque Surfaces Using the Light-Section Microscope

B 748: Measurement of the Thickness of Metallic Coatings by Measurement of Cross Section with a Scanning Electron Microscope

B 795: Determining the Percentage of Alloyed or Unalloyed Iron Contamination Present in Powder Forged Steel Parts

B 796: Nonmetallic Inclusion Level of Powder Forged Steel Parts

B 847: Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of a Cross section

C 664: Thickness of Diffusion Coating

E 3: Preparation of Metallographic Specimens

E 7: Standard Terminology Relating to Metallography

E 45: Determining the Inclusion Content of Steel

E 82: Determining the Orientation of a Metal Crystal

E 112: Determining Average Grain Size

E 340: Macroetching Metals and Alloys

E 381: Macroetch Testing Steel Bars, Billets, Blooms, and Forgings

E 384: Microindentation Hardness of Materials

E 407: Microetching Metals and Alloys

E 562: Determining Volume Fraction by Systematic Manual Point Count

E 766: Calibrating the Magnification of a Scanning Electron Microscope

E 768: Preparing and Evaluating Specimens for Automatic Inclusion Assessment of Steel

E 807: Metallographic Laboratory Evaluation

E 883: Reflected-Light Photomicrography

E 930: Estimating the Largest Grain Observed in a Metallographic Section (ALA Grain Size)

E 975: X-Ray Determination of Retained Austenite in Steel with Near Random Crystallographic Orientation

E 986: Scanning Electron Microscope Beam Size Characterization

E 1077: Estimating the Depth of Decarburization of Steel Specimens

E 1122: Obtaining JK Inclusion Ratings Using Automatic Image Analysis

E 1180: Preparing Sulfur Prints for Macrostructural Examination

E 1181: Characterizing Duplex Grain Sizes

E 1245: Determining the Inclusion or Second-Phase Constituent Content of Metals by Automatic Image Analysis

E 1268: Assessing the Degree of Banding or Orientation of Microstructures

E 1351: Production and Evaluation of Field Metallographic Replicas

E 1382: Determining Average Grain Size Using Semiautomatic and Automatic Image Analysis

E 1508: Quantitative Analysis by Energy-Dispersive Spectroscopy

E 1558: Electrolytic Polishing of Metallographic Specimens

E 1920: Metallographic Preparation of Thermal Spray Coatings

E 1951: Calibrating Reticles and Light Microscope Magnifications

E 2014: Metallographic Laboratory Safety

E 2015: Preparation of Plastics and Polymeric Specimens for Microstructural Examination

F 1854: Stereological Evaluation of Porous Coatings on Medical Implants

ASTM HARDNESS TESTING STANDARDS

- B 578: Microhardness of Electroplated Coatings
- B 721: Microhardness and Case Depth of Powder Metallurgy Parts
- C 730: Knoop Indentation Hardness of Glass
- C 849: Knoop Indentation Hardness of Ceramic Whitewares
- C 1326: Knoop Indentation Hardness of Advanced Ceramics
- C 1327: Vickers Indentation Hardness of Advanced Ceramics
- E 10: Brinell Hardness of Metallic Materials
- E 18: Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
- E 92: Vickers Hardness of Metallic Materials
- E 140: Standard Hardness Conversion Tables for Metals
- E 448: Scleroscope Hardness Testing of Metallic Materials
- E 1842: Macro-Rockwell Hardness Testing of Metallic Materials

ISO METALLOGRAPHY STANDARDS

- ISO 643: Steels – Micrographic Determination of the Ferritic or Austenitic Grain Size
- ISO 945: Cast Iron: Designation of Microstructure of Graphite
- ISO 1083: Spheroidal Graphite Cast Iron – Classification
- ISO 1463: Metallic and Oxide Coatings – Measurement of Coating Thickness – Microscopical Method
- ISO 2624: Copper and Copper Alloys – Estimation of Average Grain Size

- ISO 2639: Steel – Determination and Verification of the Effective Depth of Carburized and Hardened Cases
- ISO 3754: Steel – Determination of Effective Depth of Hardening After Flame or Induction Hardening
- ISO 3763: Wrought Steels – Macroscopic Methods for Assessing the Content of Non-Metallic Inclusions
- ISO 3887: Steel, Non-Alloy and Low Alloy – Determination of Depth of Decarburization
- ISO 4499: Hardmetals: Metallographic Determination of Microstructure
- ISO 4524-1: Metallic Coatings – Test Methods for Electrodeposited Gold and Gold Alloy Coatings – Part 1: Determination of Coating Thickness
- ISO 4964: Steel – Hardness Conversions
- ISO 4967: Steel – Determination of Content of Non-Metallic Inclusions – Micrographic Method Using Standard Diagrams
- ISO 4968: Steel – Macrographic Examination by Sulphur Print (Baumann Method)
- ISO 4970: Steel – Determination of Total or Effective Thickness of Thin Surface-Hardened Layers
- ISO 5949: Tool Steels and Bearing Steels – Micrographic Method for Assessing the Distribution of Carbides Using Reference Photomicrographs
- ISO 9042: Steels – Manual Point Counting Method for Statistically Estimating the Volume Fraction of a Constituent with a Point Grid
- ISO 9220: Metallic Coatings – Measurement of Coating Thickness – Scanning Electron Microscope Method
- ISO 14250: Steel – Metallographic Characterization of Duplex Grain Size and Distribution

ISO HARDNESS STANDARDS

ISO 1355: Metallic Materials – Hardness Test
– Calibration of Standardized Blocks to be Used for Rockwell Superficial Hardness Testing Machines (Scales 15N, 30N, 45N, 15T, 30T and 45T)

ISO 4516: Metallic and Related Coatings – Vickers and Knoop Microhardness Tests

ISO 4545: Metallic Materials – Hardness Test
– Knoop Test

ISO 4546: Metallic Materials – Hardness Test – Verification of Knoop Hardness Testing Machines

ISO 4547: Metallic Materials – Hardness Test
– Calibration of Standardized Blocks to be Used for Knoop Hardness Testing Machines

ISO 6441-1: Paints and Varnishes – Determination of Microindentation Hardness – Part 1: Knoop Hardness by Measurement of Indentation Length

ISO 6441-1: Paints and Varnishes – Determination of Microindentation Hardness – Part 2: Knoop Hardness by Measurement of Indentation Depth Under Load

ISO 6507-1: Metallic Materials – Hardness Test
– Vickers Test – Part I: HV 5 to HV 100

ISO 6507-2: Metallic Materials – Hardness Test – Vickers Test – Part 2: HV 0, 2 to Less Than HV 5

ISO 6508: Metallic Materials – Hardness Test – Rockwell Test (Scales A, B, C, D, E, F, G, H, K)

ISO 9385: Glass and Glass-Ceramics – Knoop Hardness Test

ISO 10250: Metallic Materials – Hardness Testing
– Tables of Knoop Hardness Values for Use in Tests Made on Flat Surfaces

ISO 14271: Vickers Hardness Testing of Resistance Spot, Projection and Seam Welds (low load and microhardness)

OTHER NATIONAL STANDARDS

France

NF A04-10: Determination of the Ferritic and Austenitic Grain Size of Steels

Germany

DIN 50150: Testing of Steel and Cast Steel; Conversion Table for Vickers Hardness, Brinell Hardness, Rockwell Hardness and Tensile Strength

DIN 50192: Determination of the Depth of Decarburization

DIN 50600: Testing of Metallic Materials; Metallographic Micrographs; Picture Scales and Formats

DIN 50601: Metallographic Examination; Determination of the Ferritic or Austenitic Grain Size

DIN 50602: Metallographic Examination; Microscopic Examination of Special Steels Using Standard Diagrams to Assess the Content of Non-Metallic Inclusions

SEP 1510: Microscopic Test of Steels for Grain Size by Comparison with Standard Charts

SEP 1570: Microscopical Examination of Special Steels for Non-Metallic Inclusions Using Standard Micrograph Charts

SEP 1572: Microscopic Testing of Free-Cutting Steels for Non-Metallic Sulphide Inclusions by Means of a Series of Pictures

Italy

UNI 3137: Extraction and Preparation of Samples

UNI 3138: Macrographic Analysis

UNI 3245: Microscopic Examination of Ferrous Materials - Determination of Austenitic or Ferritic Grain Size of Plain Carbon and Low-Alloy Steels

UNI 4227: Determination of Metallographic Structures

UNI 4389: Nonferrous Metals and Their Alloys: Determination of the Dimension of Their Crystal Grains

Japan

JIS B 7724: Brinell Hardness – Verification of Testing Machine

JIS B 7725: Vickers Hardness – Verification of Testing Machines

JIS B 7730: Rockwell Hardness Test – Calibration of Standardized Blocks

JIS B 7734: Knoop Hardness Test – Verification of Testing Machines

JIS B 7735: Vickers Hardness Test – Calibration of the Reference Blocks

JIS B 7736: Brinell Hardness Test – Calibration of Standardized Blocks

JIS G 0551: Methods of Austenite Grain Size Test for Steel

JIS G 0552: Method of Ferrite Grain Size Test for Steel

JIS G 0553: Macrostructure Detecting Method for Steel, Edition 1

JIS H 0501: Methods for Estimating Average Grain Size of Wrought Copper and Copper Alloys

JIS R 1610: Testing Method for Vickers Hardness of High Performance Ceramics

JIS R 1623: Test Method for Vickers Hardness of Fine Ceramics at Elevated Temperatures

JIS Z 2243: Brinell Hardness Test – Test Method

JIS Z 2244: Vickers Hardness Test – Test Method

JIS Z 2245: Rockwell Hardness Test – Test Method

JIS Z 2251: Knoop Hardness Test – Test Method

JIS Z 2252: Test Methods for Vickers Hardness at Elevated Temperatures

Poland

PN-57/H-04501: Macroscopic Examination of Steel. The Deep Etching Test.

PN-61/H-04502: Reagents for Macrostructure Tests of Iron Alloys

PN-61/H-04503: Reagents for Microstructure Tests of Iron Alloys

PN-63/H-04504: Microstructure Testing of Steel Products. Iron Carbide. Ghost Structure. Widmanstätten's Structure.

PN-66/H-04505: Microstructure of Steel Products. Templates and Evaluation.

PN-75/H-04512: Nonferrous Metals. Reagents for Revealing Microstructure.

PN-75/H-04661: Gray, Spheroidal Graphite and Malleable Cast Iron. Metallographic Examination. Evaluation of Microstructure

PN-76/H-04660: Cast Steel and Iron. Microscopic Examination. Sampling and Preparation of Test Pieces.

PN-84/H-04507/01: Metals. Metallographic Testing of Grain Size. Microscopic Methods for Determination of Grain Size.

PN-84/H-04507/02: Metals. Metallographic Testing of Grain Size. Methods of Revealing the Prior-Austenitic Grains in Non-Austenitic Steels.

PN-84/H-04507/03: Metals. Metallographic Testing of Grain Size. Macroscopic Method of Revealing the Prior-Austenitic Grain Size by the Fracture Method.

PN-84/H-04507/04: Metals. Metallographic Testing of Grain Size. A Method of Testing for Overheating of Steel.

PN-87/H-04514: Steel, Cast Steel, Cast Iron. Macrostructure Examination. Baumann's Test.

Russia

GOST 801: Standard for Ball and Roller Bearing Steel

GOST 1778: Metallographic Methods of Determination of Nonmetallic Inclusions

GOST 5639: Grain Size Determination

Sweden

SIS 11 11 01: Estimating the Average Grain Size of Metals

SIS 11 11 02: Estimating the Austenitic Grain Size of Ferritic and Martensitic Steels

SIS 11 11 11: Methods for Assessing the Slag Inclusion Content in Steel: Microscopic Methods

Sweden (continued)

SIS 11 11 14: Determination of Slag Inclusions – Microscopic Methods – Manual Representation

SIS 11 11 16: Steel – Method for Estimation of the Content of Non-Metallic Inclusions – Microscopic Methods – Jernkontoret's Inclusion Chart II for the Assessment of Non-Metallic Inclusions

SIS 11 03 40: Hardness Test – Vickers Test HV 0,2 to HV 100 – Direct Verification of Testing Machines

SIS 11 03 41: Hardness Test – Vickers Test HV 0,2 to HV 100 – Indirect Verification of Testing Machines Using Standardized Blocks

SIS 11 03 42: Hardness Test – Vickers Test HV 0,2 to HV 100 – Direct Verification of Standardizing Machine for Calibration of Standardized Blocks

SIS 11 03 43: Hardness Test – Vickers Test HV 0,2 to HV 100 – Calibration of Standardized Blocks

SIS 11 25 16: Metallic Materials – Hardness Test – Vickers Test HV 5 to HV 100

SIS 11 25 17: Metallic Materials – Hardness Test – Vickers Test HV 0,2 to Less Than HV 5

SIS 11 70 20: Determination of the Depth of Decarburization in Steel

United Kingdom

BS 860: Tables for Comparison of Hardness Scales.

BS 4490: Methods for Micrographic Determination of the Grain Size of Steel

BS 5710: Macroscopic Assessment of the Non-Metallic Inclusion Content of Wrought Steels

BS 6285: Macroscopic Assessment of Steel by Sulphur Print

BS 6286: Measurement of Total or Effective Thickness of Thin Surface-Hardened Layers in Steel

BS 6479: Determination and Verification of Effective Depth of Carburized and Hardened Cases in Steel

BS 6481: Determination of Effective Depth of Hardening of Steel after Flame or Induction Hardening

BS 6533: Macroscopic Examination of Steel by Etching with Strong Mineral Acids

BS 6617: Determination of Decarburisation in Steel