



Designation: A 880 – 95

Standard Practice for Criteria for Use in Evaluation of Testing Laboratories and Organizations for Examination and Inspection of Steel, Stainless Steel, and Related Alloys¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This practice provides a guide for the criteria to be used in the evaluation of testing laboratories and organizations engaged in examination and inspection, or both, for specification-conformance of steel, stainless steel, and related alloys.

1.2 This practice is intended for use by an accrediting authority for qualification and accreditation of laboratories and organizations noted in 1.1.

1.3 These criteria include the general characteristics (generic criteria) or organization, facility, human resources, and the necessary controls, for evaluating the ability of testing laboratories, examination organizations, and inspection organizations, to perform their intended functions.

1.4 These criteria also include specific criteria for equipment and personnel qualification, and for necessary quality control procedures, for evaluating the ability of testing laboratories, examination organizations, and inspection organizations to perform specific tests, examinations, and inspections.

1.4.1 If required, the appropriate ASTM Committee A-1 Subcommittee concerned with a particular test, examination, or inspection discipline may supplement this standard with additional specific criteria. See [Table 1](#).

1.5 This practice may not necessarily provide all the generic criteria for the evaluation of independent testing, examination, and inspection agencies as defined in Practice [E 548](#). However, the generic and specific criteria of this standard, including any supplements, are considered appropriate for the evaluation of any testing laboratory or inspection and examination organizations, or both involve in specification conformance (or verification) testing and inspection of steel, stainless steel and related alloys.

1.6 These generic and specific criteria may, where appropriate, be used by an accrediting authority for evaluating the

capabilities of a laboratory, examination organization, or inspection organization to perform tests, examinations, or inspections of steel products not related to specification conformance.

1.7 This standard practice may also be employed as an evaluation guideline for individual, governmental, or technical society self-certification programs where accreditation may not be required.

2. Referenced Documents

2.1 ASTM Standards:

A 90 Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles²

A 239 Test Method for Locating the Thinnest Spot in a Zinc (Galvanized) Coating on Iron or Steel Articles by the Preece Test (Copper Sulfate Dip)²

A 255 Test Method for End-Quench Test for Hardenability of Steel³

A 262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels⁴

A 275/A275M Test Method for Magnetic Particle Examination of Steel Forgings³

A 309 Test Method for Weight and Composition of Coating on Long Terne Sheet by the Triple-Spot Test²

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products⁴

A 388/A388M Practice for Ultrasonic Examination of Heavy Steel Forgings³

A 428 Test Method for Weight of Coating on Aluminum-Coated Iron or Steel Articles²

A 435/A435M Specification for Straight-Beam Ultrasonic Examination of Steel Plates⁵

A 456 Specification for Magnetic Particle Examination of Large Crankshaft Forgings³

A 503 Specification for Ultrasonic Examination of Large Forged Crankshafts³

¹ This practice is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A1.13 on Methods of Mechanical Testing.

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² *Annual Book of ASTM Standards*, Vol 01.06.

³ *Annual Book of ASTM Standards*, Vol 01.05.

⁴ *Annual Book of ASTM Standards*, Vol 01.03.

⁵ *Annual Book of ASTM Standards*, Vol 01.04.



TABLE 1 Fields of Testing, Examination, and Inspection; and Standards Available

<i>Tension Testing, Room Temperature</i>	<i>Impact Testing Drop Weight</i>
A 370	E 208
A 770	<i>Impact Testing, Swing Weight</i>
E 8	E 436
E 111	E 604
E 132	<i>Miscellaneous Tests</i>
E 143	A 255
E 345	A 610
F 606	A 800
<i>Tension Testing, Elevated Temperature</i>	A 802
E 21	E 228
E 139	E 289
E 192	E 558
<i>Compression Testing, Room Temperature</i>	<i>Calibration Standards</i>
E 9	A 799
<i>Compression Testing, Elevated Temperature</i>	E 4
E 209	E 74
<i>Bend Testing</i>	E 83
A 370	E 1012
E 190	<i>Chemical Analysis</i>
E 290	A 751
<i>Hardness Testing</i>	<i>Formability</i>
A 370	E 517
A 833	E 643
E 10	E 646
E 18	<i>Weight of Coatings</i>
E 92	A 90
E 103	A 239
E 110	A 309
E 384	A 428
E 448	A 630
F 606	A 754
<i>Corrosion Testing</i>	<i>Nondestructive Examination</i>
A 262	A 275
A 763	A 388
<i>Macroetch Testing</i>	A 435
A 604	A 456
E 340	A 503
<i>Metallographic Testing</i>	A 577
E 562	A 578
<i>Impact Testing, Charpy V-Notch</i>	A 745
A 370	E 114
A 673	E 494
E 23	E 709
	E 797

A 577/A577M Specification for Ultrasonic Angle-Beam Examination of Steel Plates⁵
A 578/A578M Specification for Straight-Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications⁵
A 604 Test Method for Macroetch Testing of Consumable Electrode Remelted Steel Bars and Billets³
A 610 Methods of Sampling and Testing Ferroalloys for Determination of Size⁶
A 630 Test Methods for Determination of Tin Coating Weights for Hot-Dip and Electrolytic Tin Plate²
A 673/A673M Specification for Sampling Procedure for Impact Testing of Structural Steel⁵
A 745/A745M Practice for Ultrasonic Examination of Austenitic Steel Forgings³

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products⁴
A 754 Test Method for Coating Thickness by X-Ray Fluorescence²
A 763 Practices for Detecting Susceptibility to Intergranular Attack in Ferritic Stainless Steels⁴
A 770/A770M Specification for Through-Thickness Tension Testing of Steel Plates for Special Applications⁵
A 799/A799M Practice for Steel Castings, Stainless, Instrument Calibration, for Estimating Ferrite Content⁶
A 800/A800M Practice for Steel Casting, Austenitic Alloy, Estimating Ferrite Content Thereof⁶
A 802/A802M Practice for Steel Castings, Textures and Discontinuities, Evaluation and Specifying, by Visual Examination⁶
A 833 Practice for Indentation Hardness of Metallic Materials by Comparison Hardness Testers³
E 4 Practices for Load Verification of Testing Machines⁷
E 8 Test Methods of Tension Testing of Metallic Materials⁷
E 9 Test Methods of Compression Testing of Metallic Materials at Room Temperature⁷
E 10 Test Method for Brinell Hardness of Metallic Materials⁷
E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials⁷
E 21 Practice for Elevated Temperature Tension Tests of Metallic Materials⁷
E 23 Test Methods for Notched Bar Impact Testing of Metallic Materials⁷
E 74 Practice of Calibration of Force-Measuring Instruments for Verifying the Load Indication of Testing Machines⁷
E 83 Practice for Verification and Classification of Extensometers⁷
E 92 Test Method for Vickers Hardness of Metallic Materials⁷
E 103 Test Method for Rapid Indentation Hardness Testing of Metallic Materials⁷
E 110 Test Method for Indentation Hardness of Metallic Materials by Portable Hardness Testers⁷
E 111 Test Method for Young's Modulus, Tangent Modulus, and Chord Modulus⁷
E 112 Test Methods for Determining Average Grain Size⁷
E 114 Practice for Ultrasonic Pulse-Echo Straight-Beam Examination by the Contact Method⁸
E 132 Test Method for Poisson's Ratio at Room Temperature⁷
E 139 Practice for Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials⁷
E 143 Test Method for Shear Modulus at Room Temperature⁷
E 165 Practice for Liquid Penetrant Inspection Method⁸
E 190 Test Method for Guided Bend Test for Ductility of Welds⁷
E 208 Test Method for Conducting Drop-Weight Test to

⁶ Annual Book of ASTM Standards, Vol 01.02.

⁷ Annual Book of ASTM Standards, Vol 03.01.

⁸ Annual Book of ASTM Standards, Vol 03.03.

Determine Nil-Ductility Transition Temperature of Ferritic Steels⁷

E 209 Practice for Compression Tests of Metallic Materials at Elevated Temperatures with Conventional or Rapid Heating Rates and Strain Rates⁷

E 228 Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer⁹

E 289 Test Method for Linear Thermal Expansion of Rigid Solids with Interferometry⁹

E 290 Test Method for Semi-Guided Bend Test for Ductility of Metallic Materials⁷

E 340 Test Method for Macroetching Metals and Alloys⁷

E 345 Test Methods of Tension Testing of Metallic Foil⁷

E 384 Test Method for Microhardness of Materials⁷

E 436 Test Method for Drop-Weight Tear Tests of Ferritic Steels⁷

E 448 Practice for Scleroscope Hardness Testing of Metallic Materials⁷

E 494 Practice for Measuring Ultrasonic Velocity in Materials⁸

E 517 Test Method for Plastic Strain Ratio r for Sheet Metal⁷

E 543 Practice for Determining the Qualification of Nondestructive Testing Agencies⁸

E 548 Practice for Generic Criteria for Evaluating Laboratory Competence⁹

E 558 Test Method for Torsion Testing of Wire⁷

E 562 Practice for Determining Volume Fraction by Systematic Manual Point Count⁷

E 604 Test Method for Dynamic Tear Energy of Metallic Materials⁷

E 643 Test Method for Ball Punch Deformation of Metallic Sheet Material⁷

E 646 Test Method for Tensile Strain-Hardening Exponents (n -Values) of Metallic Sheet Materials⁷

E 709 Practice for Magnetic Particle Examination⁸

E 797 Practice for Measuring Thickness by Manual Ultrasonic Pulse-Echo Contact Method⁸

E 807 Practice for Metallographic Laboratory Evaluation⁷

E 851 Practice for Evaluation of Spectrochemical Laboratories¹⁰

E 882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory¹¹

E 994 Guide for Laboratory Accreditation Systems⁹

E 1012 Practice for Verification of Specimen Alignment Under Tensile Loading⁷

E 1595 Practice for Evaluating the Performance of Mechanical Testing Laboratories⁷

F 606 Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, and Rivets¹²

2.2 ASNT Standard:

RP SNT-TC-1A Personnel Qualification and Certification in

Nondestructive Testing¹³

2.3 ISO Standard:

ISO/IEC Guide 25 General Requirements for the Technical Competence of Testing Laboratories¹⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *accrediting authority*—an organization that evaluates a testing laboratory, examination organization, or inspection organization for conformance to this practice.

3.1.2 *examination*—the process of evaluating materials using nondestructive methods.

3.1.3 *generic criteria*—general characteristics pertaining to organization, equipment, facility, human resources, and quality systems, that provide the basis for evaluation of an organization.

3.1.4 *human resources*—the people involved in the technical operations or an organization being evaluated.

3.1.5 *inspection*—the process of measuring, visually examining, testing, and gaging to determine conformance of materials and products to required standards.

3.1.6 *qualification*—evaluation of an organization that establishes that the organization conforms to established acceptance criteria.

3.1.7 *quality assurance*—the activity of providing, to all concerned, the evidence needed to establish confidence that the quality function is being performed adequately.

3.1.8 *quality control*—the technical process through which actual quality performance is measured, compared with standards, and action taken with regard to differences.

3.1.9 *specific criteria*—those detailed requirements essential to demonstrate an organization's capability to perform specific tests, examinations, or inspections.

3.1.10 *testing*—determination of the chemical, mechanical, and physical characteristics of a material or product using established scientific principles and procedures.

4. Qualification or Accreditation, or Both

4.1 Where qualification or accreditation, or both, of an organization (laboratory, examination organization, or inspection organization) is desired or required, it may be achieved by means of one of the following:

4.1.1 On-site review, by the accrediting authority, of documented quality assurance information (such as a Quality Assurance Manual) which demonstrates that the organization's quality assurance program is in accordance with the referenced criteria of this practice.

4.1.2 On-site review, by the accrediting authority, of the organization's operations and verification that the operations conform to the referenced criteria of this practice.

4.1.3 Off-site review, by the accrediting authority, of documented quality assurance information or objective evidence, or both, that demonstrates that the organization meets the referenced criteria of this practice.

⁹ Annual Book of ASTM Standards, Vol 14.02.

¹⁰ Annual Book of ASTM Standards, Vol 03.06.

¹¹ Annual Book of ASTM Standards, Vol 03.05.

¹² Annual Book of ASTM Standards, Vol 15.08.

¹³ Available from American Society for Nondestructive Testing, 4153 Arlington Plaza, Columbus OH 43228-0518.

¹⁴ Available from International Organization for Standardization, Case Post 56, Geneva 20 1211, Switzerland.



5. Organization, Capabilities, and Responsibilities

5.1 The following information shall be made available to the accrediting authority, for on-site review:

5.1.1 The complete legal name and address of the testing laboratory, examination organization, or inspection organization to be accredited.

5.1.2 A written outline or chart delineating the responsibility and authority of operational personnel positions.

5.1.3 The specific identity, address, and location of the organization to be accredited.

5.1.4 The designated steel, stainless steel, or related alloy products tested, examined, or examined at the location; as well as the specific tests, examinations, and inspections performed.

5.1.5 The capability of the organization to perform specific tests, examinations, and inspections.

5.1.5.1 A detailed listing of fields of testing, examination, or inspection, showing applicable standards and calibration standards shall be available. An example of such a listing is shown in **Table 1**.

5.1.5.2 A summary showing the frequency of testing, examination, or inspection, by type performed, on an annual basis and for the most-recent 12-month period.

5.1.6 Identification of the person accepting technical responsibility for issuance of reports.

NOTE 1—It is not necessary to identify this individual on reports on which the legal name and address of the organization is clearly identified, unless such identification of the individual is required by a jurisdiction.

5.1.7 Existing relevant certification, licensing, and formal qualification granted by technical societies or by jurisdictions, etc.

5.1.8 Evidence of proficiency.

5.1.9 Demonstration of current awareness by such items as participation in specification-writing bodies, participating in round-robin testing programs, written corporate test procedures, and possession of current standards of ASTM and other standards organizations.

5.1.10 Reference samples utilized to verify precision and bias of the particular test method.

NOTE 2—Certain accreditation programs may require that the accrediting authority utilize their own reference samples to verify the accuracy of a particular test method during an on-site review as described in **4.1.2**.

6. Human Resources

6.1 The following information, where applicable, shall be made available for on-site evaluation:

6.1.1 A summary description of each position category, including the requisite education, training or experience, or both, to perform specific tests, examinations, and inspections. Present management and supervisory personnel should be shown, along with their qualifications and experience.

6.1.2 Where personnel qualification or requalification is required, a procedure for such qualification or requalification and necessary documentation.

6.1.3 Training programs for new or untrained staff, and records to document personnel qualifications.

7. Facilities and Laboratory Systems

7.1 The following additional information, as applicable, shall be made available for on-site evaluation.

7.1.1 Systems of metrology employed, such as:

7.1.1.1 Testing, examination, and testing equipment.

7.1.1.2 Calibration programs. Compliance certificates should be either on file traceable to the equipment or displayed by each piece of equipment.

7.1.1.3 Traceability of calibration standards (chemical, physical, mechanical).

7.1.1.4 Objective evidence of accuracy of equipment (small tools, micrometers, dial gages, gage-mark punches, etc.).

7.1.2 Data control systems, including methods of recording, processing, and maintenance, including any computerized systems, software, and data processing equipment.

7.1.3 Documentation of quality system employed, including such elements as:

7.1.3.1 Methods of inspection and measurement,

7.1.3.2 Traceability of samples and data through receiving to final data,

7.1.3.3 Procedure for sample preparation,

7.1.3.4 Internal audits of samples and test data,

7.1.3.5 Corrective action,

7.1.3.6 Quality control program,

7.1.3.7 Quality assurance program,

7.1.3.8 Statistical process control data for personnel and equipment.

7.1.4 Procedures for evaluating services of subcontractors for testing, examination, or calibration.

8. Reports

8.1 Each report supplied to clients (customers) should include the following:

8.1.1 Names and addresses of testing laboratory, examination organization, or inspection organization, or corporate name or logo.

8.1.2 Name and address of client.

8.1.3 Description and identification of the item tested, examined, or inspected.

8.1.4 Identification of material specification, testing specification, examination specification, etc., if applicable.

8.1.5 Description of laboratory sampling procedure, if not included in the documents listed in **8.1.4**, when relevant.

8.1.6 Notation of deviations from standard procedures as defined in **8.1.4**, if any.

8.1.7 Measurements, examination, and derived results, supported where applicable by tables, graphs, sketches, and photographs.

8.1.8 Notation of failures of the item to conform to specification requirements.

9. Record and Sample Retention

9.1 The organization should maintain a record system to suit its particular circumstances and should comply with any existing regulations. The organization should retain on record all original observations, calculations, and derived data, calibration records, and the final test report for an appropriate period. The records for each test, examination, or inspection



should contain sufficient information to permit a review of specification compliance or a satisfactory repetition of the test, etc.

9.2 The organization should maintain a description of its sample retention schedule and traceability.

10. Additional Background Information

10.1 The following list may be useful as background information:

10.1.1 *General*—Practice E 548, Guide E 994, and ISO/IEC Guide 25.

10.1.2 *Nondestructive Examination*—Practice E 543 and Recommended Practice SNT-TC-1A.

10.1.3 *Metallography*—Practice E 807.

10.1.4 *Chemical Analysis*—Practice E 851 and Guide E 882.

10.1.5 *Mechanical Testing*—Practice E 1595.

11. Keywords

11.1 accreditation; accreditation (of test labs); evaluation (of test labs); examination of steels; inspection of steel; laboratory systems; qualification (of test labs)

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