



Standard Guide for Categorizing Fields of Capability for Laboratory Accreditation Purposes¹

This standard is issued under the fixed designation E 1224; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide provides a categorization scheme for uniformly listing the accredited capabilities of a testing laboratory. The categorization scheme consists of three parts. Part One identifies laboratory capability by testing technology or field of testing (chemical testing, mechanical testing, etc.). These are listed numerically in alphabetical order starting with acoustic and vibration. Part Two identifies the laboratory capability in terms of the product or service it normally tests (automotive products, drugs, foods, etc.). Part Three identifies specific test methods performed by the laboratory. Examples are given (for example, Test Method B 117 and Salt Spray, SA J 423 etc.).

1.2 In listing the capability in a directory or advertisement, the descriptors for testing technology (see Part One), product or service (see Part Two) along with an example of test methods (see Part Three) the laboratory is competent to perform are normally used.

1.3 The list of testing technology and product categories are not all-inclusive. Laboratories using this guide and wanting to express their testing technology or product capability not identified in this guide are invited to include these new areas under an appropriate category.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

B 117 Test Method for Salt Spray (Fog) Testing²

E 1187 Terminology Relating to Laboratory Accreditation³

2.2 SAE Standard:

SAE J 423 Measuring Case Depth of Ferrous Materials⁴

¹ This guide is under the jurisdiction of ASTM Committee E-36 on Criteria for the Evaluation of Testing and Inspection Agencies and is the direct responsibility of Subcommittee E36.50 on Guidelines for Defining Fields of Testing.

Current edition approved Jan. 15, 1994. Published April 1994. Originally published as E 1224 – 88. Last previous edition E 1224 – 88.

² Annual Book of ASTM Standards, Vol 06.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

3. Terminology

3.1 Definitions:

3.1.1 Basic definitions are those of Terminology E 1187.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *field of testing*—broad sphere of science, engineering, or technology used to describe a general area of testing for classification purposes.

4. Significance and Use

4.1 This guide categorizes laboratory testing capability for laboratory accreditation purposes. When used in directories, it is intended to assist users of testing services in identifying laboratory testing capability to meet their needs. When used in laboratory accreditation system data bases, it is intended to serve as a cross reference to capability so that laboratories with capability requested by a user can be quickly and accurately identified.

4.2 This guide may prove useful to laboratories for describing their capability in a standard way in their general advertisements or other general directories.

4.3 This guide can be used by technical committees to identify areas for development of specific criteria to be used in determining testing capability under the jurisdiction of the committee.

4.4 A field of testing or product area may include standards and test methods from more than one standards developer. A standard or test method may be included in more than one field of testing or product area.

4.5 Describing a laboratory's capability is difficult because it encompasses three or more dimensions. Fig. 1 attempts to show these dimensions.

4.6 It seems apparent from previous attempts it will not be possible to construct a categorization scheme that will satisfy everyone. Since the scheme described herein is used by some 400 multipurpose laboratories, it is suggested as a point of departure for this guide.

5. Part One—Testing Technology (Fields of Testing)

5.1 Acoustic and Vibration Testing:

5.1.1 Calibration of acoustic measuring and calibrating equipment,

5.1.2 Measurement of sound absorption,

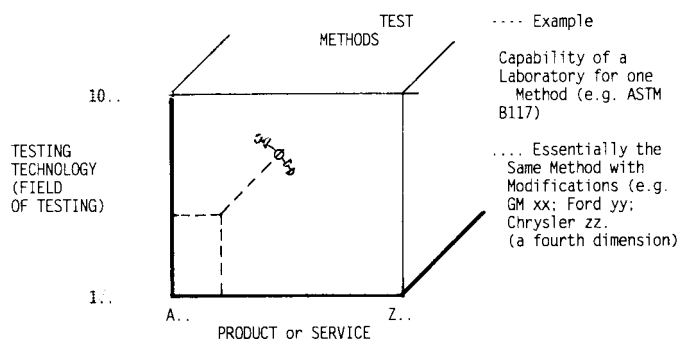


FIG. 1 Laboratory Dimensions

- 5.1.3 Laboratory measurement of sound transmission loss,
- 5.1.4 Laboratory measurement of noise reduction of sound-isolating enclosures,
- 5.1.5 Laboratory measurement of sound power,
- 5.1.6 Measurement of insertion loss ducts and mufflers,
- 5.1.7 Laboratory measurement of impact sound transmission of floor-ceilings,
- 5.1.8 Laboratory measurements on open office furniture,
- 5.1.9 Field measurement of sound levels,
- 5.1.10 Field measurement of sound isolation,
- 5.1.11 Audiometric testing,
- 5.1.12 Calibration of vibration measuring and calibration equipment vibration characteristics of materials, components, assemblies and structures,
- 5.1.13 Measurement of mechanical vibration, and
- 5.1.14 Dynamic balancing.
- 5.2 *Biological Testing:*
- 5.2.1 *Entomology:*
- 5.2.1.1 Insect identification, and
- 5.2.1.2 Extraneous filth.
- 5.2.2 *Environmental Biology:*
- 5.2.2.1 Identification of benthic organisms,
- 5.2.2.2 Identification of macro organisms,
- 5.2.2.3 *Aquatic Toxicity*—Including fish, invertebrate, and microbial.
- 5.2.3 *Microbiology:*
- 5.2.3.1 *Bateriology*—Including identification, enumeration or classification, or both, and bacterial resistance testing.
- 5.2.3.2 *Mycology*—Including identification, enumeration or classification, or both, and fungal resistance testing.
- 5.2.3.3 *Phycology*—Including identification, enumeration or classification, or both, and algicide testing.
- 5.2.3.4 Sterility testing,
- 5.2.3.5 Virology,
- 5.2.3.6 Microbioassays,
- 5.2.3.7 Vitamins,
- 5.2.3.8 Antibiotics/drugs,
- 5.2.3.9 Enzyme,
- 5.2.3.10 Biochemical oxygen demand (BOD), and
- 5.2.3.11 Mutagenicity testing.
- 5.2.4 *Serology*—Mammalian (non-human) studies:
- 5.2.4.1 *Toxicology*—Including acute studies, subchronic/chronic testing, oncogenicity studies, and teratology, fertility, reproductive studies.
- 5.2.4.2 *Pharmacology*—Including screen tests, and efficacy and potency.

- 5.2.4.3 *Nutritional Studies*—Including PER (protein efficiency ratio), and nutrient requirements.
- 5.2.5 *Human Studies*—Toxicology and pharmacology studies:
 - 5.2.5.1 Cutaneous,
 - 5.2.5.2 Clinical pharmacology—Phase I,
 - 5.2.5.3 Industrial hygiene,
 - 5.2.5.4 Efficacy studies, including Drugs—Phase II, III, IV, and non-drugs, and
 - 5.2.5.5 Nutritional studies.
 - 5.2.5.6 *Sensory Evaluations*—Including trained panel, consumer preference.
- 5.2.6 *Non-Human Efficacy Testing:*
- 5.2.6.1 *Plants—Greenhouse Tests*
 - Including growth regulation, herbicide screening, and insecticide screening.
 - 5.2.6.2 *In-Vitro Testing*—Including germicide screening.
 - 5.2.6.3 Pesticide evaluation (non-plant associated),
 - 5.2.6.4 *Seed Evaluation*—Including microscopy (see “Chemical Analysis”).
- 5.3 *Chemical Testing:*
- 5.3.1 *Spectroscopy:*
- 5.3.1.1 Atomic absorption,
- 5.3.1.2 Electron defraction,
- 5.3.1.3 *Emission*—Including plasma (inductively coupled or direct current),
- 5.3.1.4 *X-Ray Spectroscopy*—Including wavelength dispersive, and energy dispersive,
- 5.3.1.5 Fluorescence,
- 5.3.1.6 Infrared,
- 5.3.1.7 FTIR (Fourier transform infrared),
- 5.3.1.8 UV/visible,
- 5.3.1.9 X-ray diffraction,
- 5.3.1.10 X-ray fluorescence,
- 5.3.1.11 NMR (nuclear magnetic resonance),
- 5.3.1.12 ESR (electron spin resonance),
- 5.3.1.13 Mass spectroscopy,
- 5.3.1.14 Neutron activation analysis, and
- 5.3.1.15 Raman.
- 5.3.2 *Surface Analysis Techniques:*
- 5.3.2.1 Auger electron spectroscopy,
- 5.3.2.2 XPS (X-ray photoelectron spectroscopy), and
- 5.3.2.3 SIMS (secondary ion mass spectrometry).
- 5.3.3 *Measurement of Physical Properties:*
- 5.3.3.1 Density,
- 5.3.3.2 Particle size,
- 5.3.3.3 Porosity, and
- 5.3.3.4 Colligative properties.
- 5.3.4 *Microscopy:*
- 5.3.4.1 *Light Microscopy*—Including PC (phase contrast), PLM (polarized light microscopy),
- 5.3.4.2 TEM (transmission electron microscopy),
- 5.3.4.3 SEM (scanning electron microscopy), and
- 5.3.4.4 AEM (analytical electron microscopy).
- 5.3.5 *Chromatography:*
- 5.3.5.1 GC (gas chromatography),
- 5.3.5.2 HPLC (high performance liquid chromatography),
- 5.3.5.3 GPC (gel permeation chromatography),

- 5.3.5.4 Ion chromatography,
- 5.3.5.5 GC/MS (gas chromatography/mass spectrometry),
- 5.3.5.6 LC/MS (liquid chromatography/mass spectrometry),
- 5.3.5.7 Thin layer and paper chromatography, and
- 5.3.5.8 Electrophoresis.
- 5.3.6 *Wet Chemistry Measurements*:
- 5.3.6.1 Gravimetric, and
- 5.3.6.2 Titrimetric (volumetric).
- 5.3.7 *Radioactivity Measurements*:
- 5.3.7.1 Liquid scintillation counting, and
- 5.3.7.2 Gamma counting.
- 5.3.8 *Electrochemical*:
- 5.3.8.1 Polarography,
- 5.3.8.2 Electrochemical deposition, and
- 5.3.8.3 Potentiometric analysis.
- 5.3.9 *Thermal Analysis*:
- 5.3.9.1 DTA (differential thermal analysis),
- 5.3.9.2 DCA (differential calorimetric analysis),
- 5.3.9.3 Calorimetry,
- 5.3.9.4 TGA (thermogravimetric analysis), and
- 5.3.9.5 TMA (thermomechanical analysis).
- 5.3.10 *Microchemical Elemental Analysis*.
- 5.3.11 *Miscellaneous*:
- 5.3.11.1 Specific ion electrode analysis,
- 5.3.11.2 TOC (total organic carbon),
- 5.3.11.3 TOX (total organic halogen),
- 5.3.11.4 Assaying, and
- 5.3.11.5 Fire assaying.
- 5.4 *Electrical Testing*—Admittance (see “Impedance”):
- 5.4.1 Arc resistance.
- 5.4.2 Calibration.
- 5.4.3 *Capacitance*:
- 5.4.3.1 AC capacitance,
- 5.4.3.2 AC loss characteristics, and
- 5.4.3.3 Permittivity (dielectric loss constant), including conductance (see “Impedance”), and conductivity (see “Electrical Conductivity”).
- 5.4.4 Electrical conductivity.
- 5.4.5 *Electrical Current*:
- 5.4.5.1 AC current, and
- 5.4.5.2 DC current.
- 5.4.6 *Electrical Radiation*:
- 5.4.6.1 EMI, and
- 5.4.6.2 RFI, including electrical resistance (see “Electrical Resistivity”).
- 5.4.7 *Electrical Resistivity*:
- 5.4.7.1 AC resistance,
- 5.4.7.2 DC resistance,
- 5.4.7.3 Insulation resistance,
- 5.4.7.4 Surface resistivity, and
- 5.4.7.5 Volume resistivity.
- 5.4.8 Electrical metrology,
- 5.4.9 Electrical power transmission,
- 5.4.10 Electrostatics,
- 5.4.11 Impedance, and
- 5.4.12 Induction.
- 5.4.13 *Magnetism*:
- 5.4.13.1 Permittivity (see “Capacitance”),
- 5.4.13.2 Reactance (see “Impedance”),
- 5.4.13.3 Resistance (see “Electrical Resistivity”),
- 5.4.13.4 Resistivity (see “Electrical Resistivity”), and
- 5.4.13.5 Susceptance (see “Impedance”).
- 5.4.14 *Voltage*:
- 5.4.14.1 AC voltage, and
- 5.4.14.2 DC voltage.
- 5.5 *Ionizing Radiation*:
- 5.6 *Mechanical Testing*:
- 5.6.1 *Tensile*:
- 5.6.1.1 Room temperature,
- 5.6.1.2 High temperature, and
- 5.6.1.3 Low temperature.
- 5.6.2 Compression,
- 5.6.3 Hardness,
- 5.6.4 Shear,
- 5.6.5 Torsion,
- 5.6.6 *Ductility*:
- 5.6.6.1 Bend,
- 5.6.6.2 Formability,
- 5.6.6.3 Drawability,
- 5.6.6.4 Flaring,
- 5.6.7 Stress rupture,
- 5.6.8 Creep/creep rupture,
- 5.6.9 *Fracture*:
- 5.6.9.1 Charpy,
- 5.6.9.2 IZOD,
- 5.6.9.3 Plane stain fracture toughness,
- 5.6.9.4 Crack opening displacement,
- 5.6.9.5 Nil ductility transition, and
- 5.6.9.6 Drop weight tear.
- 5.6.10 *Fatigue*:
- 5.6.10.1 Axial,
- 5.6.10.2 Flexural,
- 5.6.10.3 Rotating beam, and
- 5.6.10.4 Torsional.
- 5.7 *Metrology*:
- 5.7.1 *Assessment of Surface Topography*:
- 5.7.1.1 Calibration (see “Instrument Calibration” in *Product/Services Index—Part 2*)⁵
- 5.7.2 Determination of density,
- 5.7.3 Hygrometry,
- 5.7.4 Masses, and
- 5.7.5 Standards of length and angle.
- 5.8 *Nondestructive Testing*:
- 5.8.1 Acoustic emission,
- 5.8.2 Eddy current,
- 5.8.3 *Leak Testing*:
- 5.8.3.1 Halogen, and
- 5.8.3.2 Helium.
- 5.8.4 Magnetic particle testing,
- 5.8.5 Liquid penetrant,
- 5.8.6 Radiographic testing,
- 5.8.7 Ultrasonic testing, and
- 5.8.8 Visual examination.

⁵ *Detailed Index of Services*, American Council of Independent Laboratories Directory.