



ASTM INTERNATIONAL
Helping our world work better

Testing Programs Improve Quality, Lower Costs, and Provide Confidence

www.astm.org

Programs include:

- Test Method Development
- Proficiency Testing
- Training
- Certification
- Environmental Declarations

Boosting Quality and Consumer Confidence through Testing

ASTM International leads the way in testing solutions worldwide.

In industries around the world, standard test methods and conformance programs play a vital role in developing, manufacturing, and trading products we rely on every day. From the toys our children play with to the gasoline that fuels our cars, testing ensures that countless products, structures, and services are safe and perform as expected.

Standardized test methods, developed in a consensus process by leading technical experts, offer scientifically proven solutions for scrutinizing product characteristics, evaluating materials and systems, and qualifying performance. Used in the laboratory and in the field,

test methods are essential to quality control, helping deliver better goods and services. When testing is conducted as part of an overall conformance program — one that certifies products and personnel to industry-accepted standards — companies can meet regulatory requirements and achieve even higher levels of consumer and supply chain confidence.

ASTM International: Meeting Global Testing Needs

For more than 115 years, ASTM International has been the pre-eminent provider of voluntary consensus standards, including test methods, for many industries. The journey began when engineers created uniform test methods to measure the properties of steel and cement in support of the burgeoning railroad and construction industries. Today, thousands of ASTM test methods support research, manufacturing, quality control, and innovation across sectors such as energy, building construction, consumer products, metals, plastics, and many more.

5,500 Test Methods

ASTM International is the pre-eminent provider of test methods for many diverse industries.

A close-up photograph of a woman with blonde hair, wearing a white lab coat, looking intently through a white and black microscope. The background is softly blurred, showing a laboratory setting with other people in white coats. The overall tone is professional and scientific.

The Benefits of Testing

For Consumers:

- Higher quality products and services
- Higher satisfaction
- Quicker access to new technologies
- Greater selection of goods and services
- Improved product compatibility
- Enhanced health and environmental safety

For Businesses:

- Brand loyalty
- Strong customer confidence
- Lower R&D and manufacturing costs
- Reduced rework and waste
- Shorter time-to-market cycles
- Compliance with government regulations
- Reduced risk of recalls
- Enhanced marketing and branding

ASTM Test Methods: Advancing Precision through Science

ASTM International's portfolio of more than 12,000 voluntary consensus standards includes over 5,500 test methods that support industry worldwide.

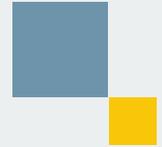
ASTM test methods deliver scientifically proven guidance in determining properties in materials, assemblies, and products. These tests are an integral part of supply chains and trade, helping ensure that materials meet industry specifications. These methods also address the requirements for apparatus, test specimens, calculations, and more needed to achieve

satisfactory precision and bias. The testing process may call for one or more procedures such as chemical and spectrochemical analyses, mechanical and electrical tests, weathering tests, visual examination, fire tests, performance characteristics, sampling, nondestructive tests, radiation exposure tests, and much more.

THE COMPONENTS OF ASTM TEST METHODS:

- 1. Scope** provides information on the purpose of the test, describes if the method is quantitative or qualitative, and identifies any known limitations;
- 2. Apparatus** provides a brief description of the equipment required for the test;
- 3. Reagents and Materials** lists the reagents and materials required for each procedure when more than one procedure is included in the standard;
- 4. Hazards** provides general safety caveats in conducting the test method;
- 5. Sampling, Test Specimens, and Test Units** provides directions for physically obtaining sample test units;
- 6. Procedure** includes the proper sequence and detailed directions for performing the test; and
- 7. Precision and Bias Statements** includes statements required in ASTM methods (see next page).





Precision and Bias

Precision and bias statements are essential to the quality of ASTM test methods, describing how the calculated statistics vary with the measured property level of the characteristic.

- Precision (test repeatability and reproducibility) is the closeness of agreement between test results obtained under prescribed conditions. The precision statement offers guidelines regarding the variability that can be expected among test results when the method is used in one or more laboratories.
- Bias is a systematic error that contributes to the difference between the mean of a large number of test results and an accepted reference value. This statement describes the difference between the expectation of the test results and the reference values.

Precision and bias statements must be included in ASTM test methods. ASTM's Interlaboratory Study Program helps technical committees develop these statements, which enhance the quality of test methods (see page 7 for more on the ILS program).



Testing and ASTM Journals

ASTM International journals (www.astm.org/journals) contain peer-reviewed papers on a wide variety of subjects, from civil engineering to materials performance. The journals include *Advances in Civil Engineering Materials*, *Geotechnical Testing Journal*, *Journal of Testing and Evaluation*, *Materials Performance and Characterization*, and *Smart and Sustainable Manufacturing Systems*.

“One of the things that makes ASTM journals unique and tremendously valuable is the fact that there is a very real synergy between the journals, which define the state-of-the-art, and the ASTM testing standards, which define the state-of-practice.”

William J. Likos, Ph.D.

Professor and chair, geological engineering, University of Wisconsin-Madison, and co-editor of the *Geotechnical Testing Journal*

Quality

ASTM International's Interlaboratory Study Program helps ASTM technical committees develop precision and bias statements, which enhance the usefulness of test methods.

World-Class Testing Solutions

ASTM offers a comprehensive suite of programs and solutions to meet your needs.



Laboratory Programs – Enhancing Testing Quality

Interlaboratory Study Program (ILS)

ASTM's popular Interlaboratory Study Program (ILS) helps technical committees enhance ASTM test methods. The program (www.astm.org/ILS) supports committees in developing precision statements backed by high quality data. ILS staff helps: identify volunteer laboratories and sample vendors; coordinate sample distribution, data collection, and statistical processing; and provide other administrative and financial support. More than 80 ASTM committees have participated in the program, which has registered over 1,000 studies and aided successful balloting of more than 530 precision statements to include in standards.

Proficiency Testing Programs (PTP)

ASTM Proficiency Testing Programs (PTP, www.astm.org/PTP) offer statistical quality assurance that helps laboratories assess their performance in conducting test methods compared with other participating laboratories.

Being part of PTP helps labs satisfy accreditation requirements as well as monitor strengths and weaknesses in doing specific tests. PTP also serves as a tool to demonstrate testing capability to customers.

Some 4,500 labs around the world participate in over 45 programs for petroleum products, metals, plastics, textiles, and more.

Cement and Concrete Reference Lab (CCRL)

Established in 1929, and sponsored by Committees C01 on Cement and C09 on Concrete and Concrete Aggregates, the Cement and Concrete Reference Laboratory (CCRL, www.ccrl.us) provides laboratory inspection and proficiency sampling programs that serve nearly 1,800 laboratories worldwide. The inspection demonstrates a lab's ability to perform ASTM tests, and sampling programs help labs monitor testing quality by comparing their results with those of other labs.

The Safety Equipment Institute — Certifications and Declarations

The Safety Equipment Institute (SEI), an ASTM subsidiary, offers independent third-party product certification, personnel certification, and environmental declarations.

SEI (www.seinet.org), which holds accreditations to ISO 17065 for product certification, provides this service for a wide range of products such as sports and athletic equipment, safety and protective products used by firefighters and emergency responders, eye and face protection for industrial workers, and more. SEI bases its programs on standards from a variety of standards development organizations.

The SEI program:

- Is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) to the International Organization for Standardization's ISO/IEC 17065, Conformity Assessment – Requirements for Bodies Certifying Products, Processes, and Services;
- Works with testing laboratories that are accredited to ISO/IEC 17025; and
- Employs quality assurance auditors with expertise in safety and protective products, specific educational criteria, and complying with ISO quality auditor requirements.



A Subsidiary of
ASTM INTERNATIONAL

Personnel Certification Programs

ASTM sponsors Personnel Certification Programs, including that of its National Center for Aerospace & Transportation Technologies (NCATT). NCATT certifications attest to the knowledge of aerospace industry professionals.

Certified personnel have prerequisite levels of relevant education and experience according to industry standards; have passed an examination that is either written, oral, practical, or observational; and have participated in approved continuing education activities to maintain professional competencies.

Environmental Product Declarations

ASTM International is a program operator for verifying Environmental Product Declarations (EPDs) and more. The program (www.astm.org/EPD) responds to the growing need to understand the real environmental impact of products from raw material extraction to disposal and recycling.

ASTM is part of the first Program Operator Consortium in the industry; the consortium is serving as an expert resource for environmental declarations. Additional partners in the consortium are the International Code Council Evaluation Service, NSF Sustainability, and Sustainable Minds.

Personnel Certificate Programs

ASTM also offers Personnel Certificate Programs for participants who take part in a one-time training program. Certificate programs help employers set competency levels, promote good practices, and maintain trained staff. Certificates are currently available for coal chemistry technicians, light sport aircraft personnel, vapor encroachment condition screening personnel, and test monitoring center rater personnel.

Increasing Sales and Meeting Regulatory Requirements

ASTM test methods are strategic tools for quality, safety, and efficiency relied on by large corporations, small and medium-sized businesses, and government bodies around the world.

Driving Corporate Strategy

Global corporations that invest time and resources in standards and testing can realize a return on investment well beyond the laboratory. By enhancing product value in the marketplace, testing programs help drive revenue growth and foster customer loyalty, which impact bottom line results. Quality processes, built on proven testing methodologies, streamline new product development and manufacturing and lead to lower costs, shorter time-to-market cycles, and easier international market entry. Strict adherence to ASTM test methods during product development can also reduce the potential public harm and liability associated with safety recalls.

Leveling the Playing Field for Small and Medium-Sized Businesses

Test method adherence can help smaller businesses demonstrate that their products meet the same standards as those from larger manufacturers. When small to mid-sized organizations invest in testing to monitor product quality and improve manufacturing processes, they can lower costs, enhance profitability, and make their entire business more agile. Greater customer confidence becomes an asset for marketing and sales strategies while also supporting customer retention and opening doors to new markets.

Improving Government Efficiency, Protecting Consumer Safety

Government agencies rely on test methods and consensus standards developed in the private sector to guide and strengthen laws protecting the public. For example, in the United States, ASTM test methods are cited in regulations from the Consumer Product Safety Commission and Federal Aviation Administration. Support for private sector standards development helps government bodies tap into the technical knowledge offered by diverse industry experts. This approach results in the use of high quality, market-relevant standards that meet consumer needs, advance global trade, and protect public health and safety.

“Standards and manufacturing go hand in hand. Achieving quality control goals requires that key international testing standards are performed accurately and efficiently. Virtually every product we make has one or more ASTM test methods associated with it and is designed to perform these test methods at the highest level of accuracy.”

Earl Ruth

Special projects engineer, Tinius Olsen Testing Machine Company, a leading specialist manufacturer and supplier of static tension and compression materials testing machines.



International Laboratory Directory

ASTM produces the International Laboratory Directory (www.astm.org/LABS), which:

- Lists standards and test methods that each laboratory can perform,
- Provides locations of laboratories in countries throughout the world,
- Allows labs to improve search ranking by purchasing keywords that highlight industry-specific strengths and services,
- Allows manufacturers and other potential partners to compare laboratories, and
- Offers groupings for multiple laboratories that are part of one company.

Professional Development: Become a Test Method Expert

Through ASTM training programs, professionals gain hands-on skills in using and applying standards. From corrosion to concrete, petroleum to textiles, and more, ASTM training provides in-depth education that helps people apply test methods with the highest level of quality and accuracy.

Diverse Training Programs for Global Stakeholders

ASTM — accredited by the International Association for Continuing Education and Training — offers customer-driven training options that are structured to support the needs of professionals around the world (www.astm.org/TPT) both on-site and online:

- In-Person Training – one- to three-day seminars provide practical knowledge of ASTM test methods and other standards in fields such as aviation, construction, metals, plastics, rubber, textiles, and others;
- Online Training – ASTM online training provides self-guided, computer-based learning focused on construction material testing, petroleum lab technician training, and environmental and property professional training, plus recordings of live in-person training;
- On-Site Training – ASTM on-site training courses cover a wide range of technical fields that help larger groups of employees or an entire organization learn together, saving time and travel expenses.

The ASTM Learning Center, a subscription-based learning management system, ties these options together in one system for users to access, track, and report. Learners can access self-paced e-learning modules, instructional videos, and virtual classroom sessions. Managers can track progress and assign courses.

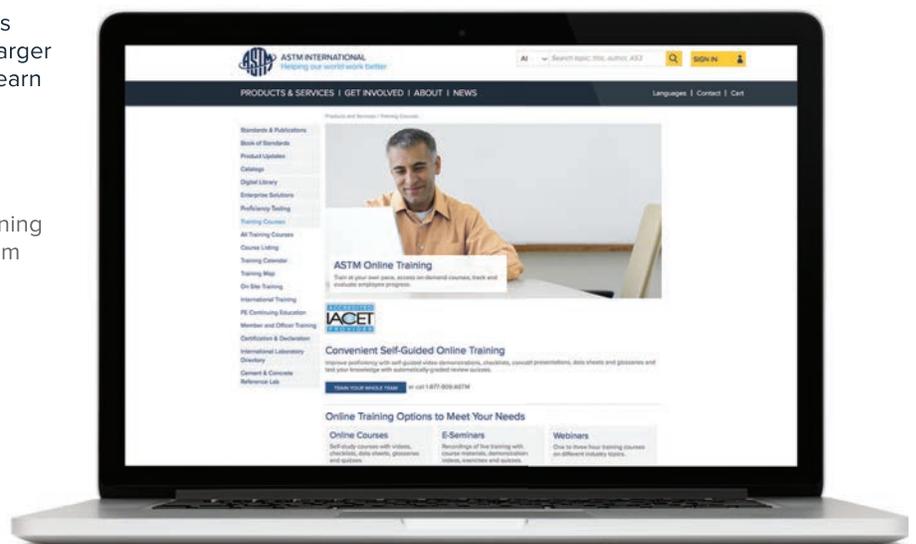
Take a Seat at the Standards Table

Become a member of ASTM and help create the high quality, market-relevant technical standards and test methods that are the foundation of quality, safety, innovation, and trade.

ASTM's membership includes more than 30,000 technical experts from over 140 countries around the world. These technical experts serve on one or more of ASTM's 140+ technical committees, developing standards for metals, paints, plastics, textiles, petroleum, construction, aviation, energy, the environment, consumer products, electronics, medical services and devices, computerized systems, homeland security, and much more.

ASTM membership empowers you to:

- Influence standards that impact your industry,
- Collaborate with technical experts from around the world,
- Learn about the latest technology in your field,
- Gain credibility for business transactions and interactions,
- Connect with customers and clients,
- Increase your company's visibility,
- Network with your peers,
- Advance your career, and
- Access leadership opportunities.



ASTM Members: Creating Test Methods that Help our World Work Better

GREENHOUSE GAS EMISSIONS

ASTM D6348 (determining gaseous compounds) is used to measure gaseous emissions from stationary sources such as toxics and greenhouse gases. These measurements can be used for determining compliance with emissions standards, evaluating the performance of emissions control devices, or evaluating and optimizing process operations.

BUILDING CONSTRUCTION

Insulation product manufacturers benefit from ASTM C1338 (fungi resistance of insulation materials and facings), which helps determine how insulation supports or resists fungal growth under high humidity.

ENERGY EFFICIENCY

Controlling air leakage – the unwanted flow of air through the external fabric of the building envelope – is central to energy efficiency. ASTM test methods E779 (air leakage rate) and E1827 (airtightness of buildings) help green building stakeholders test and quantify the airtightness of a building envelope.

HAZARDOUS SUBSTANCES

Regulations restrict the content of certain hazardous substances in materials used in several global industries. One test method that helps manufacturers and suppliers to meet compliance requirements is F2617 (identification and quantification of chromium, bromine, cadmium, mercury, and lead in polymeric material).

METALS

Corrosion can impact the safety and reliability of industrial equipment and infrastructure such as piping systems and bridges, resulting in potential hazards from structural failures, fluid contamination, and other issues. G28 (detecting susceptibility to intergranular corrosion) has long assisted in conducting critical corrosion testing applications.

MEDICAL PRODUCTS

The “bubble leak” test, F2096, helps users detect gross leaks in packaging. Laboratories use the test to visually inspect medical packaging for bubble streams caused by defects in the packaging/sterile barrier system. F2096 offers a practical way to examine packages for leaks, which may make the product non-sterile.

Join ASTM International

ASTM’s membership includes more than 30,000 technical experts from over 140 countries around the world. These technical experts serve on one or more of ASTM’s more than 140 technical committees, developing standards for metals, paints, plastics, textiles, petroleum, construction, aviation, energy, the environment, consumer products, electronics, medical services and devices, computerized systems, homeland security, and much more.



Robust Standards Products and Services: Reduce Your Time to Knowledge

ASTM International, a world leader in standards development and delivery, offers powerful, easy-to-use solutions for accessing, managing, and sharing technical information throughout an organization.

ASTM Compass and Online Access

All ASTM test methods are readily available for download at www.astm.org or through your subscription to Compass® (www.astm.org/compass).

Other programs featured in this overview include:

- Safety Equipment Institute
- Interlaboratory Study Program
- Proficiency Testing
- International Laboratory Directory
- Environmental Declarations
- Cement and Concrete Reference Laboratory
- Online and In-Person Training

ASTM INTERNATIONAL Helping our world work better

Over 12,000 ASTM standards operate globally. Defined and set by us, they improve the lives of millions every day.

Combined with our innovative business services, they enhance performance and help everyone have confidence in the things they buy and use – from the toy in a child's hand to the aircraft overhead.

Working across borders, disciplines and industries we harness the expertise of over 30,000 members to create consensus and improve performance in manufacturing and materials, products and processes, systems and services.

Understanding commercial needs and consumer priorities, we touch every part of everyday life: helping our world work better.

ASTM International

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