
ASTM INTERNATIONAL
Helping our world work better
INTERCONNECTED
2021 ANNUAL REPORT
www.astm.org

"In 2021, we adapted well to virtual meetings, drove important discussions, and proved that even in challenging times, ASTM standards, programs, and value-added services serve as an interconnection between industries, countries, and many unique ways of life."

– John Logar
2021 Board Chair
Johnson & Johnson

Chair's Letter

Interconnected

The second year of a global pandemic brought a new round of challenges and opportunities that ASTM International met in stride. Our members, staff, and partners consistently displayed their commitment and dedication to ASTM's mission of helping our world work better.

In 2021 we adapted well to virtual meetings, drove important discussions, and proved that even in challenging times, ASTM standards, programs, and value-added services serve as an interconnection between industries, countries, and many unique ways of life.

As you'll soon discover in this year's report, ASTM International championed significant standards development that:

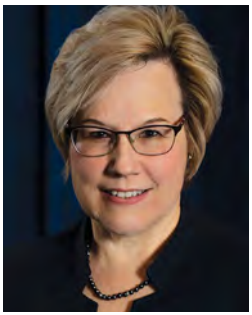
- Responded to critical global health and safety needs,
- Drove impactful environmental practices forward,
- Fostered new developments in cross-cutting innovation sectors, and much more.

At ASTM we recognized that the challenges of a global pandemic connected all of us, and through the work of our members and partners, ASTM led efforts to support significant pandemic response. In early 2021, ASTM published a key standard for barrier face coverings and launched a global collaboration forum for personal protective equipment (PPE) that brought leaders in the industry together to share knowledge and address needs. We also partenered with the International Finance Corporation, a member of the World Bank Group, to empower awareness and capacity building for PPE standardization worldwide.

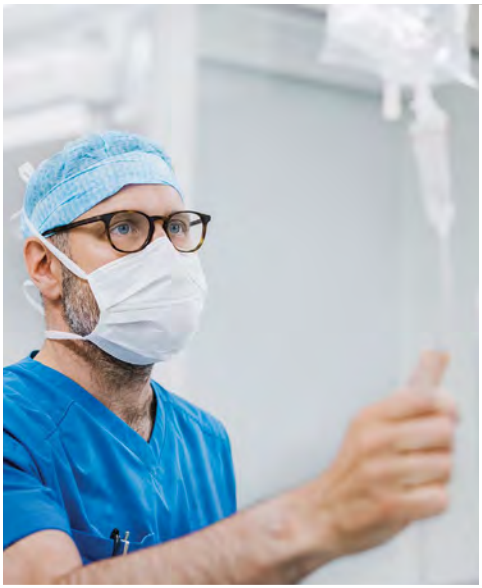
In 2021, we welcomed a report by the Organisation for Economic Co-operation and Development (OECD) that highlighted ASTM's "open participation" and "inclusive and representative decision-making process" as features that allow ASTM to connect people everywhere to engage and develop standards. The OECD report reinforced our belief in the effectiveness of the ASTM process and further demonstrated the significance we bring to key stakeholders. As such, we worked hard to connect our efforts with other important organizations globally. We signed agreements with key partners to support aviation and aerospace, additive manufacturing, exoskeletons, and to advance our petroleum standards and programs in West Africa. We bolstered ASTM's growing Memorandum of Understanding program with the inclusion of Brazil, Burkina Faso, and Mexico. And we launched a new Student Chapter at the Universidad de Ingeniería y Tecnología, in Lima, Peru.

Together we faced another year of unexpected challenges and responded with determination, resolve, and leadership. As we look back at 2021, it is clear ASTM International's expansive efforts emphasized the many ways that our work continuously connects us with those around the world. We encourage you to take a few moments to look through this report and celebrate the many accomplishments of our members, partners, and staff. We look forward to the connections we'll create in the future.

John Logar
2021 Board Chair
Johnson & Johnson



Katharine E. Morgan
President
ASTM International



Health and Safety

Barrier Face Coverings

A new standard from ASTM International's personal protective clothing and equipment committee (F23) will help establish minimum design, performance, labeling, and care requirements for reusable barrier face coverings. The standard (F3502) applies to the general public and workers, and includes specific requirements for barrier face coverings, including design and general construction criteria, particle filtration efficiency levels, sizing and fit testing criteria, labeling instructions, and guidance on cleaning and recommended periods of use. The new standard was recognized internationally by the World Health Organization (WHO).

PPE White Paper

ASTM published a technical white paper titled "Collaboration to Advance Personal Protective Equipment (PPE) Safety, Quality, and Innovation." The paper identifies the current landscape of standards development for PPE, including a summary of a recent workshop on fast-tracking standards development, challenges facing PPE quality and availability, and challenges facing standards development.

Global Collaboration Forum

As part of these efforts, ASTM launched a Global Collaboration Forum for Personal Protective Equipment (PPE) to address challenges facing PPE and accelerating standards development. At its core, the forum is a collaborative effort to identify and fill critical needs.

Best Practices for Pharmaceutical Freeze-Drying

A new standard from ASTM's manufacture of pharmaceutical and biopharmaceutical products committee (E55) will aid the pharmaceutical industry by defining best practices in monitoring process and product condition during freeze-drying. The standard focuses on methods that apply to both laboratory and production environments.

Anesthesia Reservoir Bags

ASTM's rubber and rubber-like materials committee (D11) has approved a new standard for evaluating anesthesia reservoir bags. The new standard will be used primarily by anesthesia equipment manufacturers, as well as original equipment suppliers and regulatory bodies.

Innovation

ASTM Acquires Wohlers Associates

ASTM International announced the acquisition of Wohlers Associates in 2021, a global intelligence leader in the additive manufacturing (AM) and 3D printing industry. As part of the acquisition, ASTM acquired the Wohlers Report, the premier publication for the AM industry, along with intelligence briefs, specialized reports, training in design for AM, and consulting services.

The Fort Collins, Colorado company is now doing business as Wohlers Associates, powered by ASTM International.

Terry Wohlers, the organization's principal consultant and president, now serves as ASTM's head of advisory services and market intelligence.

Noah Mostow of Wohlers Associates is now ASTM's manager of AM market intelligence and analytics. Both serve under ASTM's AM CoE.

AM CoE Adds Experts to Advisory Board

The Additive Manufacturing Center of Excellence (AM CoE) added six new experts to its advisory board in 2021. The new advisors represent key stakeholders from government, industry, research institutes, and non-profit organizations.

Dave Bond, senior vice president, engineering and technology (defense airframes), GKN Aerospace.

Greg Hayes, senior vice president, applied technology, EOS North America.

Lewis Mullen, chief engineer and divisional additive lead in the joint replacement division at Stryker.

Markus Seibold, vice president, additive manufacturing, Siemens Power & Gas.

Venkat Vedula, executive director, additive manufacturing, Raytheon Technologies.

Jennifer Wolk, materials engineer, Office of Naval Research.

Expanded Committee Scope Covers Robotics and Automation

ASTM broadened the scope of its robotics, automation, and autonomous systems committee (F45), which was previously known as the driverless automatic guided industrial vehicles committee. The updated committee scope will now address standards development for automatic, automated, and autonomous vehicles; robotic arms and manipulators; and sensors used in these systems for smart infrastructures, advanced manufacturing, logistics, and other automation.

Maneuverability of Automatic Unmanned Ground Vehicles

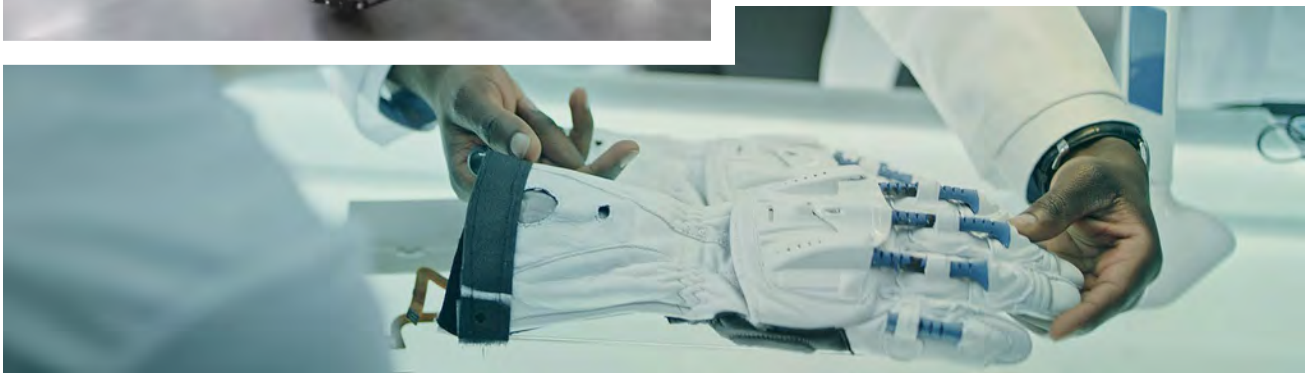
A new standard from the expanded committee will be used to quantitatively evaluate the maneuverability, repeatability, and accuracy of an automatic unmanned ground vehicle (A-UGV) when docking at defined locations in confined areas. The standard will help determine the capability of a mobile robot, an A-UGV, to position itself accurately and repeatably with respect to its environment.

ASTM and HFES Announce Cooperative Agreement for Exoskeletons

In April, representatives of ASTM and The Human Factors and Ergonomics Society (HFES) signed a letter of cooperation supporting exoskeleton standards development. The letter is intended to encourage technical excellence in exoskeletons and their enabling technologies through the application of standards. Additional goals include efforts to enhance technical knowledge and facilitate HFES' input in the development of standards to reflect human-centric solutions.

Ergonomic Parameters for Exoskeletons

A new standard will help establish ergonomic parameters and test metrics for exoskeletons. The standard, from ASTM's exoskeletons and exosuits committee (F48) can be used during the iterative design process of exoskeleton creation as well as for comparisons between commercially off-the-shelf systems.



Laboratory Guide for Identifying Nanomaterials

A new standard guide developed by ASTM International's nanotechnology committee (E56) seeks to familiarize laboratory scientists with the background information and technical content necessary to image and identify engineered nanomaterials in cellular and noncellular samples. The standard is specific to the use of the darkfield microscopy/hyperspectral imaging analysis technique.

Gold Nanoparticle Characterization

The committee developed a new standard that will support the characterization of engineered gold nanoparticles used in advanced technologies, including biomedical applications. The new standard addresses the need for validated methods to characterize the unique properties of nanoscale particles.

Aviation

Airplane Load Data

ASTM's general aviation aircraft committee (F44) approved a new standard that will be helpful in determining load data for small airplanes. The standard will be used by aircraft manufacturers to certify new designs; aircraft repair and modifications organizations to certify changes to aircraft; and regulatory agencies that need to approve changes submitted by applicants.

Material Extrusion Processes in AM

ASTM's additive manufacturing technologies committee (F42) developed a standard guide for the use of layer-based material extrusion (MEX) processes in additive manufacturing. The new standard will help product designers, practitioners, and students to learn about the capabilities, benefits, and limitations of MEX processes as well as process-related limitations when designing parts.

ASTM Signs MoU with NSERC HI-AM Network

ASTM and Canada-based NSERC Network for Holistic Innovation in Additive Manufacturing (HI-AM Network) have signed a Memorandum of Understanding (MoU). The agreement supports closer cooperation between ASTM and the HI-AM Network to support the development of AM standards.

Data Exchange for Commercial Spaceflight

A new standard from ASTM's commercial spaceflight committee (F47) supports the increasing amount of commercial space travel by improving data exchange between space operators and the Federal Aviation Administration. Improved data exchange will help air traffic management (ATM) more efficiently manage the National Airspace System (NAS) during these operations.

ASTM Collaborates with EUROCAE

Representatives from ASTM and the European Organization for Civil Aviation Equipment (EUROCAE) signed a memorandum of understanding (MoU). The agreement will foster information exchange and cooperation in the aviation and aerospace sectors aiming to reduce duplication of efforts and to promote harmonization, interoperability, and compatibility of technical solutions in global aviation.

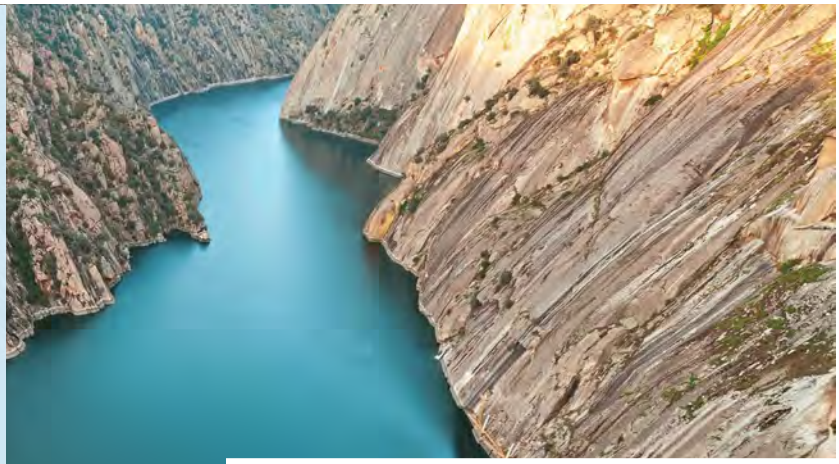
Construction and Infrastructure

Geohazard Netting

ASTM International's soil and rock committee (D18) has approved a new standard that helps design engineers and regulators when using rockfall mitigation nettings on construction projects. Geohazard nettings are often used in mountainous regions along roadways to dampen the energy from rocks falling from mountainsides.

In Situ Rock Deformation

The committee also developed a standard that will aid in the construction of tunnels, concrete dams, and bridges. The standard will support rock testing personnel by providing in situ rock data for firms and contractors responsible for designing and developing specifications for drilled shafts or caissons, tunnel linings, dam foundations, excavations, and more.



Plastic Pipe Fittings

ASTM's plastic piping systems committee (F17) approved a standard that will aid in the design of new fabricated pipe fittings made from crosslinked polyethylene (CX-PE). The standard is intended for manufacturers of fittings used for large-scale utility, commercial, and industrial projects.

Energy Efficient Welded Steel Tubes

A new standard from ASTM's steel, stainless steel, and related alloys committee (A01) covers welded carbon steel tubes that help to enhance the efficiency of heat transfer in industrial plants and heating vacuum and air-conditioning (HVAC) systems.

Vapor Intrusion Monitoring

A new standard developed by ASTM's soil and rock committee (D18) will help those developing long-term monitoring plans for vapor mitigation systems that prevent intrusion of hazardous gases into buildings. This standard provides the framework for the long-term monitoring of vapor intrusion mitigation systems to demonstrate over time that the occupants of the building are protected from hazardous vapors entering the building.

Digital Technology in Pavement Assessment

ASTM's vehicle-pavement systems committee (E17) approved a new standard that aims to promote the use of digital technology as a safe and efficient way to assess pavement infrastructure.

Low-Frequency Impact Noise Rating

ASTM's building and environmental acoustics committee (E33) developed a new standard that establishes an evaluation metric for low-frequency impact noise. The standard provides designers a new evaluation tool for assessing thudding in buildings from heavy footfalls.

Consumer and Public Safety

Child Safety Locks and Latches

A new standard from ASTM International's consumer products committee (F15) covers safety requirements, test methods, and warnings for child safety locks and latches that are intended to be installed by consumers within cabinets or drawers to restrict access by children under the age of 48 months. The standard will help minimize hazards of entrapment and access to hazardous chemicals and other materials.

Playground Equipment Standard Revised

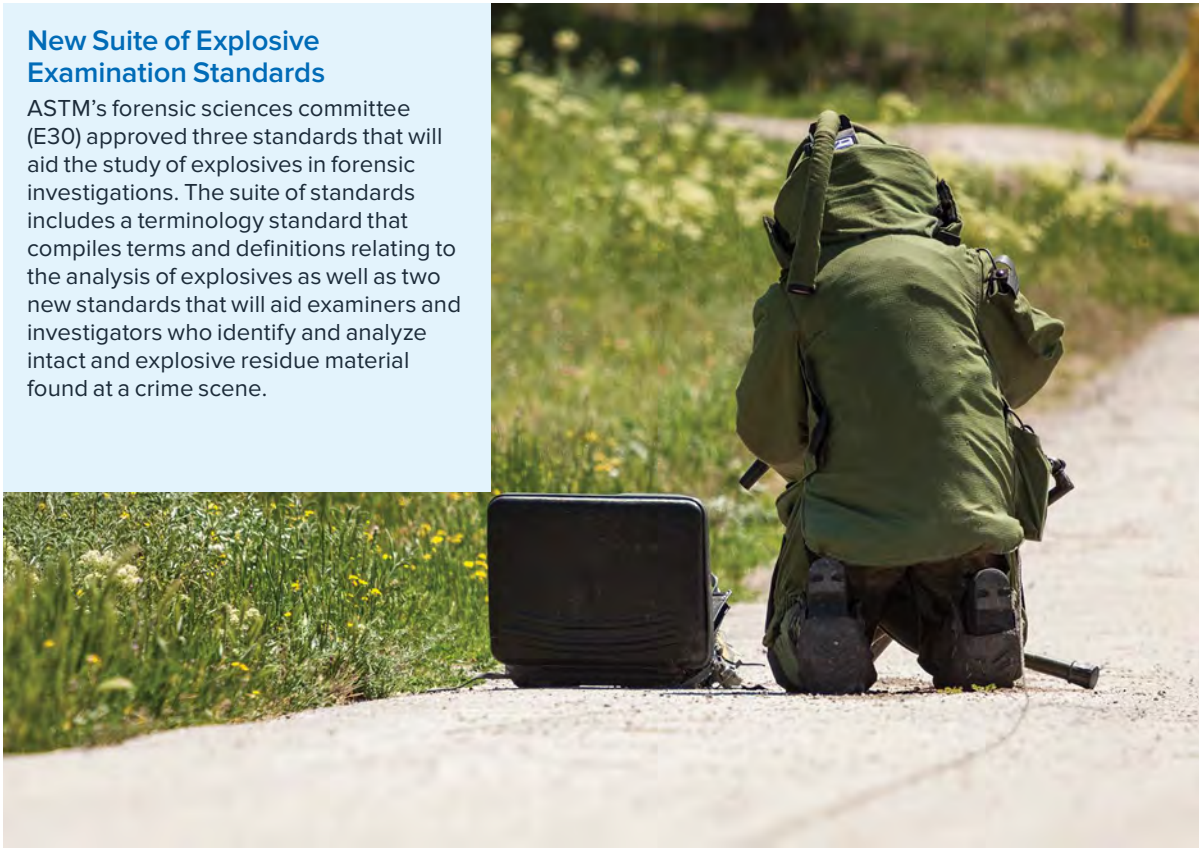
The committee also revised its standard consumer safety performance specification for playground equipment for public use. The revisions address several developments in the playground equipment industry while providing clarification on industry terms and designations.

Amusement Standards to Be Adopted into 2024 International Fire Code

An ASTM International standard practice for inflatable amusement devices, published by the amusement rides and devices committee (F24), will be adopted into the 2024 International Fire Code (IFC) by the International Code Council (ICC). The standard establishes criteria for the design, manufacture, installation, operation, maintenance, and inspection of commercial use inflatable amusement devices.

New Suite of Explosive Examination Standards

ASTM's forensic sciences committee (E30) approved three standards that will aid the study of explosives in forensic investigations. The suite of standards includes a terminology standard that compiles terms and definitions relating to the analysis of explosives as well as two new standards that will aid examiners and investigators who identify and analyze intact and explosive residue material found at a crime scene.



Smart Device Abrasion Coating

A new standard will be used to help determine the abrasion resistance of coatings on the touchscreens of smart devices. ASTM's paint and related coatings, materials, and applications committee (D01) developed the standard, which formalizes a highly effective method for determining the relative durability and effective performance of the coatings.

Flame Retardants in Plastics

A standard developed by ASTM's plastics committee (D20) will help determine whether certain flame retardants, which reduce the flammability of plastics used in consumer products, are retained within the plastic. The new standard will be a fundamental tool for assessing the potential exposure to brominated flame retardants during a product's life cycle.

Safety and Durability of Market Umbrellas

ASTM's consumer products committee (F15) has approved a new standard that will help evaluate the potential safety of market umbrellas, like those found at theme and water parks, hotels, restaurants, bars, and also the backyards of many private homes. The standard establishes procedures designed for testing and rating the wind safety and durability performance characteristics of market umbrellas.

Magnet Labeling

ASTM's consumer products committee (F15) also developed a new standard that aims to improve the labeling, packaging, and marketing of adult magnet sets containing small, powerful magnets to increase child safety. The standard seeks to minimize accidental ingestion of magnets intended for adult use by establishing warning labeling and marketing requirements. It also requires the product be sold with a storage container that young children will have difficulty opening to lessen the risk of exposure.

Environment

Environmental Site Assessments

ASTM International's environmental assessment, risk management and corrective action committee (E50) revised its standard practice for Phase I environmental site assessments. Changes include key terminology revisions, new definitions, a restructured historical records review section, the addition of detailed site reconnaissance requirements, revised report requirements, and updated appendices.

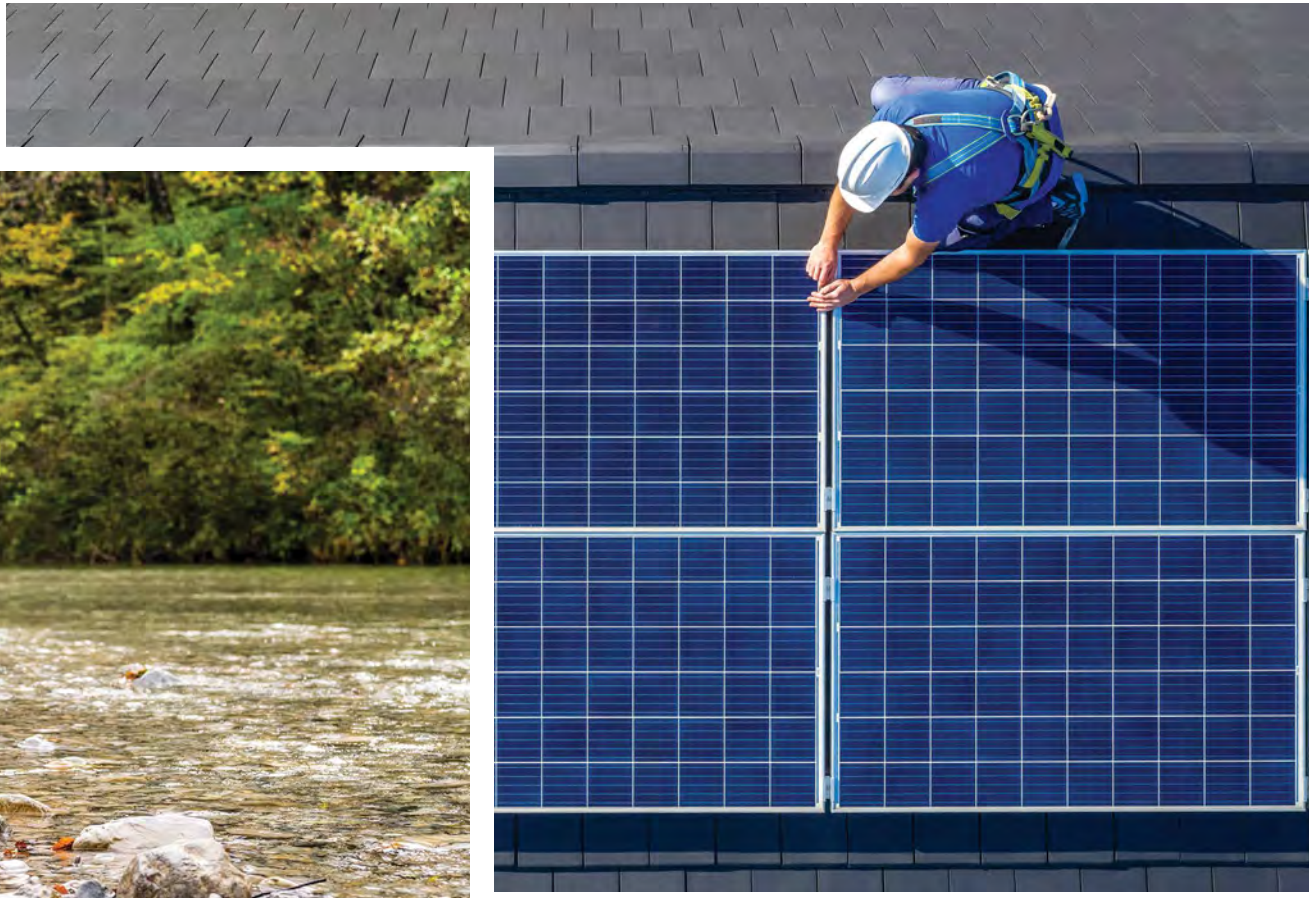
PFAS in Environmental Samples and Water Supplies

The committee also developed a new standard that will help laboratories to better determine the presence of polyfluoroalkyl substances (PFAS) in environmental samples. The new standard will assist users in navigating environmental sample analytical test methods for both targeted and non-targeted analytical approaches, as well as additional protocols applicable to PFAS.

In addition, ASTM's water committee (D19) has approved a new standard that will help address global concerns about the concentration of PFAS in water supplies. The new standard will help minimize water use in laboratories and keep water clean by providing new methods for the analysis of trace contaminants in water.

Analyzing Airborne Formaldehyde

A new ASTM standard describes a range of techniques that can be used to analyze formaldehyde concentrations in indoor air. ASTM's air quality committee (D22) developed the standard, which provides an overview of ten different approaches to quantifying formaldehyde concentrations.

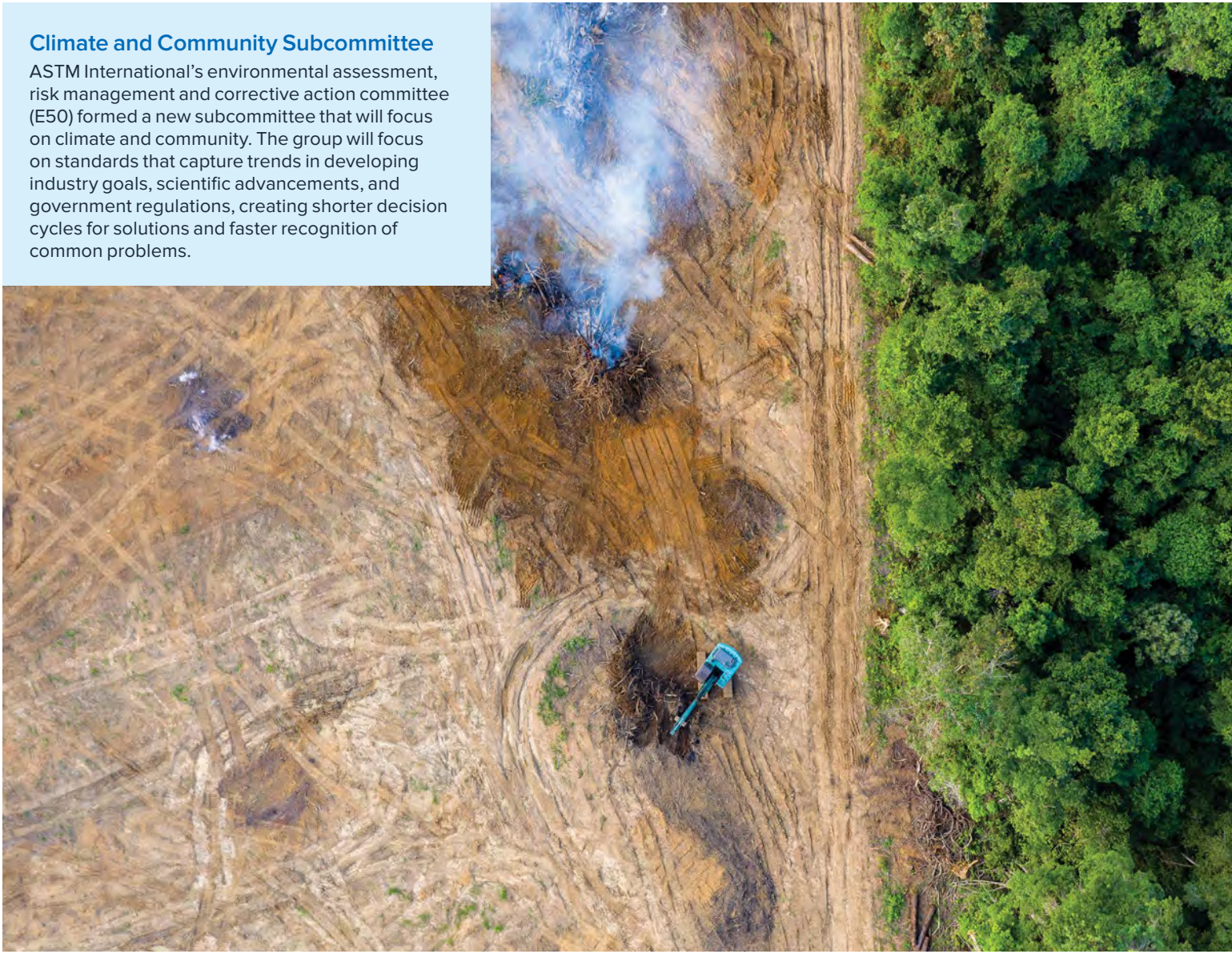


Solar Panel Recycling and Disposal

ASTM's solar, geothermal, and other alternative energy sources committee (E44) developed a standard that will aid in the recycling or safe disposal of solar photovoltaic modules that have reached their end-of-life due to failure, underperformance, or breakage resulting from extreme weather. Photovoltaic modules are found in solar panels and other devices that convert sunlight into electrical energy.

Climate and Community Subcommittee

ASTM International's environmental assessment, risk management and corrective action committee (E50) formed a new subcommittee that will focus on climate and community. The group will focus on standards that capture trends in developing industry goals, scientific advancements, and government regulations, creating shorter decision cycles for solutions and faster recognition of common problems.



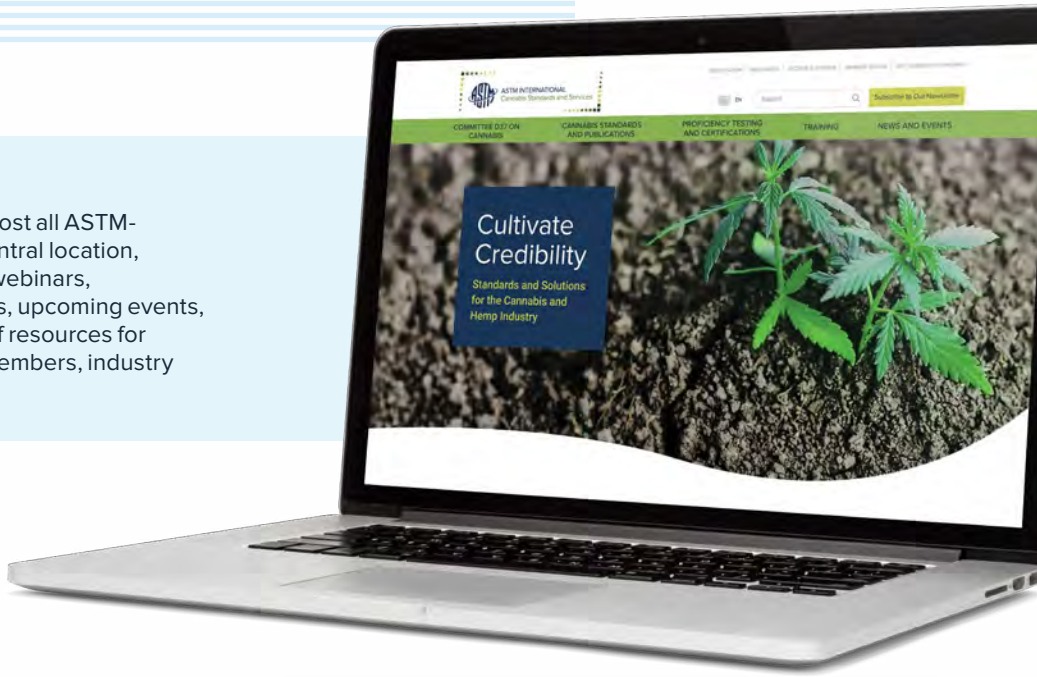
Revised Standard on Climate Change Financial Disclosures

The committee also revised its standard guide for financial disclosures attributed to climate change. The standard guide was revised to provide instructions consistent with good commercial and customary practice for climate change-related disclosures accompanying audited and unaudited financial statements.

Cannabis

Cannabis Microsite Launched

ASTM International launched a microsite to host all ASTM-related cannabis and hemp activity in one central location, including published standards, training and webinars, certification and proficiency testing programs, upcoming events, and more. The microsite will serve as a hub of resources for the cannabis industry, accessible to ASTM members, industry stakeholders, and the public.



Hempseed Assessment and Sampling

ASTM's cannabis committee (D37) approved two new standards related to the assessment and sampling of hempseed.

- One standard will provide a method for rapid, visual, on-site assessment of hempseed spoilage. The new standard will assist in managing food quality and productivity while maintaining consumer safety.
- The second standard will sample hempseed intended for human consumption. This guide aims to help farmers, supply chain partners, labs, and other players in the hemp food supply chain facilitate hempseed samples that are as correct a representation as possible for the hempseed to be assessed.

New Cannabis Subcommittees

ASTM's cannabis committee (D37) formed two new subcommittees. The first, on sustainability, seeks to develop sustainability standards tied to key United Nations Sustainable Development Goals (SDGs) to help the cannabis industry be more efficient, transparent, and well-regulated. The second, government liaison, is aimed at supporting the exchange of cannabis information and knowledge between global policymakers, regulators, scientists, and the general public.

New Cannabis Standards

The committee also developed three new ASTM standards that support cannabis vocations and aim to improve the industry by establishing broadly accepted certification requirements for professional cannabis industry vocations. Vocations include laboratory, transportation, and logistics personnel.

Technical Paper on Delta-8-THC in Cannabis Products

ASTM released a technical white paper on the current landscape of hemp-based products that contain the psychotropic cannabinoid delta-8-THC, which is derived from the non-psychotropic cannabinoid cannabidiol (CBD). The white paper includes detailed technical information on what delta-8-THC is, how it is made, the emergence of delta-8-THC in the hemp-based products marketplace, and the need for safety and performance standards.

ASTM International is a not-for-profit nongovernmental organization that develops voluntary consensus standards and defers to appropriate government authorities to determine the legal and regulatory framework regarding the control and use of cannabis.

Global Connections

List of Virtual Training Sessions

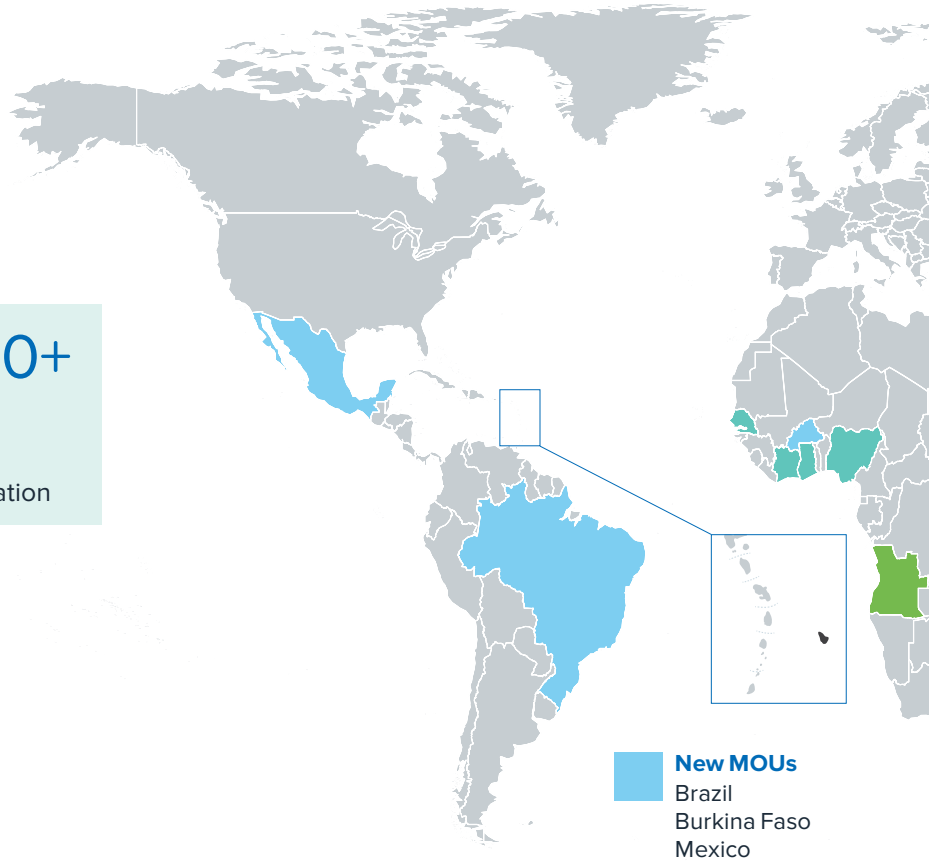
ASTM International provided 72 capacity-building sessions on diverse topics ranging from membership and stakeholder engagement and academic outreach to personal protective equipment and concrete. Over 2100 units of participation from 93 nations watched the no-cost webinars designed to improve international expert engagement and broaden the understanding and application of ASTM standards globally.

72	93	2100+
Sessions	Participating Nations	Units of Participation

MoU Program Grows to 120

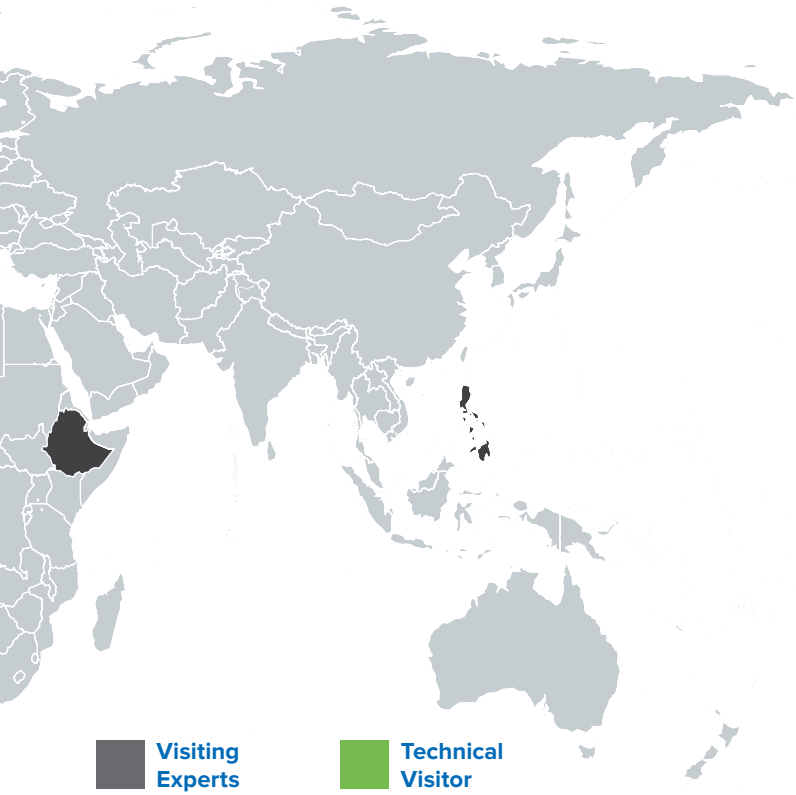
In 2021, ASTM International's Memorandum of Understanding (MoU) program continued to grow as MoUs were signed with national standards bodies in Brazil, Burkina Faso, and Mexico.

As a result of these agreements and global participation across technical committees, ASTM standards have been cited nearly 9,000 times worldwide. The MoU program supports the use of ASTM standards while also encouraging global participation in developing and revising standards.



New MOUs
Brazil
Burkina Faso
Mexico

Petroleum Partnerships
Côte d'Ivoire
Ghana
Nigeria
Senegal



Visiting Experts
Barbados
Ethiopia
Philippines

Technical Visitor
Angola

Capacity Building Unique to MoU Partners

ASTM offers special capacity-building programs for its MoU partners. Two such programs include the Standards Expert Program (SEP) and Technical Visitors Grant Program (TVGP). Standards experts from Barbados, Ethiopia, and the Philippines continued their training in 2021, virtually learning about ASTM processes and resources. Information gained strengthened the partnerships between ASTM and the experts' respective home national standards bodies.

The TVGP supports selected technical experts from MoU partner nation to study ASTM standards in a specific sector. Mauro Cabral, 2021 TVGP participant and expert from the Instituto Regulador de Derivados de Petroleo, Angola's national oil company, studied topics related to petroleum quality at ASTM's petroleum products, liquid fuels, and lubricants committee meeting in Anaheim.

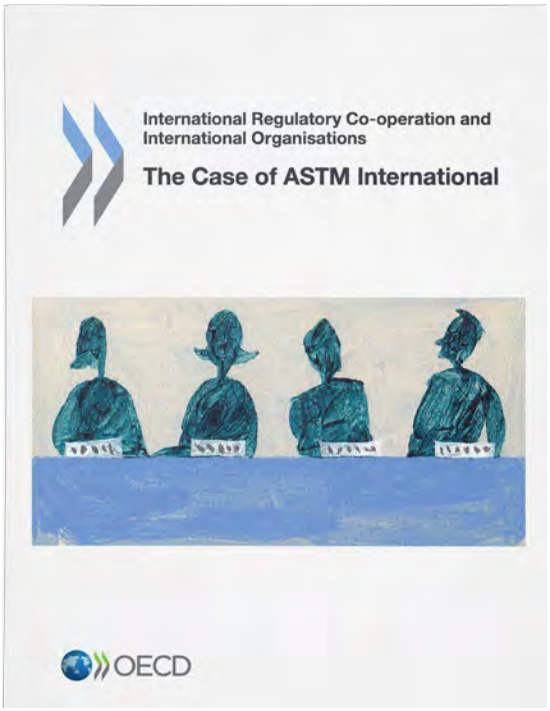
ASTM Partners with the American Petroleum Institute

ASTM International and the American Petroleum Institute (API) announced a partnership on a project aimed at harmonizing petroleum standards in the West African region, with impact in Côte d'Ivoire, Ghana, Nigeria, and Senegal. The three-year project is supported by the USAID Standards Alliance and managed by the American National Standards Institute (ANSI).

ASTM Welcomes OECD Report

ASTM International welcomed the publication of a report by the Organisation for Economic Co-operation and Development (OECD) that highlights unique features and benefits of ASTM's agile, independent process for developing global standards.

The 55-page OECD report cites ASTM's "unique membership structure," "open participation," and "inclusive and representative decision-making process" as features that enable ASTM to quickly develop standards in fast-moving markets such as automation, nanotechnology, 3D printing, and sustainable construction. This in turn facilitates trade as well as environmental and consumer protection.



Virtual Asia Pacific Economic Cooperation Program

ASTM organized and participated in two virtual Asia Pacific Economic Cooperation (APEC) sessions in 2021. The first program gave participants the opportunity to learn about the role standards play in additive manufacturing of personal protective equipment (PPE) and nasopharyngeal (NP) swabs. Over 180 participants from 13 APEC economies joined the conference over two days.

The second program focused on the implementation of unmanned aircraft systems (UAS), or drones, and related standards and policies. More than 160 participants from 15 nations attended the two-day program.

ASTM International and World Bank/IFC

ASTM and the World Bank/International Finance Corporation signed a Memorandum of Understanding (MoU). The MoU encapsulates the two international organizations' mutual commitment to providing awareness, capacity building, standards cooperation, and good international practices related to adopting and disseminating PPE standards. With a focus on Jordan and Vietnam, seven technical sessions addressing masks, face coverings, gloves, and sanitizers were conducted.

Next Generation

Graduate Scholarships

ASTM International boasts more than 5,000 student members and offers several scholarships and grant opportunities each year. In 2021, four $10,000 scholarships were awarded to the following deserving students.

Patricio Carrion is a doctoral candidate at Auburn University studying mechanical engineering. He is an active contributor to the additive manufacturing committee (F42) through the Auburn National Center for Additive Manufacturing Excellence and has been active in conducting research related to committee work items.

Laura Luna is a student member working towards her master's degree in civil and environmental engineering at Dalhousie University. She will begin a doctoral program at the University of California (Davis) this fall. Luna will continue her research using several soil and rock committee (D18) standards as well as teaching more about ASTM standards to fellow graduate and undergraduate students.

Alex Thomas is a student member working towards his master's degree at the University of Wisconsin (Stevens Point). Thomas is a participating member of the committees on steel, stainless steel, and related alloys (A01) and waste management (D34), and is the current sub chair of the D34 subcommittee on treatment, recovery and reuse.

Omid Vakili is a student member of the sports equipment, playing surfaces, and facilities committee (F08) and is experienced with ASTM International standards, particularly helmet safety. He is currently pursuing his master's degree in biomedical physiology and kinesiology at Simon Fraser University.

Emerging Professionals Program

2021 marked the sixth year of ASTM International's Emerging Professionals program. The objective of the program is to create new opportunities with long-term benefits for new members who have demonstrated the potential to be industry and committee leaders. Over the course of the program so far:

- 214 emerging professionals have participated.
- 13 emerging professionals have been from outside the United States.
- 20 past emerging professionals are now committee officers.
- 25 past emerging professionals hold subcommittee positions.

95 Committees Represented

32 Subcommittee Leaders

20 Workshops Conducted

19 ILS Programs Registrered

28
Awards Given

8
Student Members

3 MOU
Partner Members

1 COTCO

ASTM Launches UTEC Student Chapter in Peru

ASTM International launched a new student chapter at UTEC, the Universidad de Ingeniería y Tecnología, in Lima, Peru. The chapter is sponsored by the ASTM precast concrete products committee (C27).

Products and Services

ASTM completed a significant build of a new, extendable, and extensible architecture that will allow us to enhance existing products and add new features. This work frees ASTM to be more responsive to member and customer needs in the future.

Another important component of this 2021 transformation was to complete a journey that escalates the security of every constituent who works with ASTM's different systems, platforms, and portals. This is an initiative that ASTM continues to prioritize so any customer signing into our system is assured we are taking the greatest care with their information.

ASTM Compass®

ASTM recognizes that digital access to standards is increasingly critical as industry manages a virtual workforce in addition to on-site locations. ASTM added more functionality for working with PDFs and increased available standards such as European Norms (ENs) and adopted ISO and IECO content.

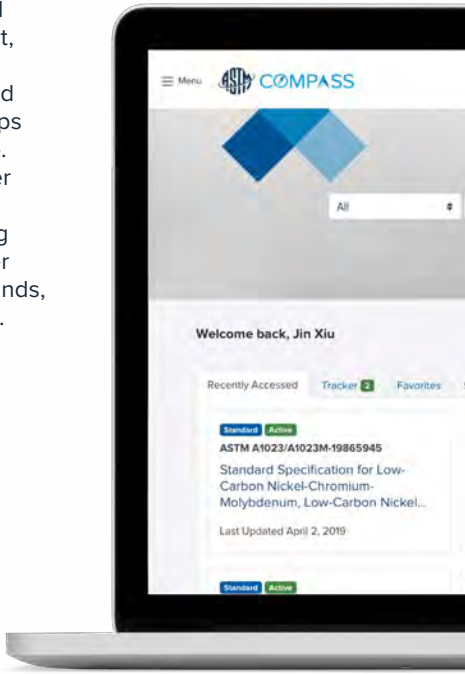
Key features include:

- Notifying users when standards they follow are updated, helping them manage change.
- Dynamic version comparison for PDFs.
- New tabs for page design to quickly see any related video content for the standard, as well as a tab that gives the user the list of linked, referenced standards.

ASTM continued to build a more robust collection of ASTM standards translations to assist adopters in Spanish-speaking Latin America and in Portuguese for Brazil. Already covering industries like energy, new additions support areas in metals, manufacturing, construction, and polymers. These collections are available paired with the normative ASTM standard in English on ASTM Compass.

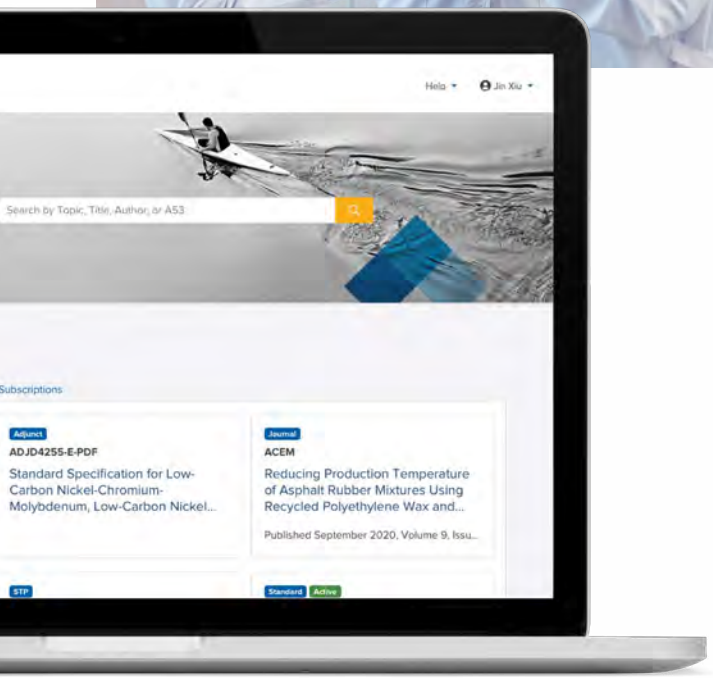
ASTM SpecBuilder and Member Collaboration Tools

ASTM SpecBuilder and the ASTM Member Collaboration area continued to grow as better resources to build consensus standards and specifications. As more committees and customers moved to collaborate with these tools, ASTM continued to aggregate feedback. As a result, several enhancements and upgrades to the platform were released, including customized voter roles, classification labels, parent groups and subgroups, and a detailed support page. SpecBuilder Link was added to make it easier for organizations to efficiently and securely update their volunteers who are participating in collaborative efforts via different Customer Relationship Management (CRM) system brands, supporting our Integrated Services program.



Proficiency Testing Programs

More than 50 Proficiency Testing Programs (PTP) helped labs evaluate, improve, and document their performance in conducting test methods (in areas like petroleum, plastics, metals) when compared with other labs. More than 2,800 laboratories worldwide are involved in these statistical quality assurance programs, which help labs meet quality and accreditation requirements. ASTM International is accredited to ISO 17043 for its PTP and maintained its accreditation during 2021 by passing the renewal audit.



SpecBuilder/Member and Its Collaboration Tools

SpecBuilder and the collaboration tools continued to grow as the hub to build consensus standards and specifications for both customers and members. As more customers and committees moved to collaborate using SpecBuilder and the member collaboration areas, ASTM continued to aggregate feedback. As a result, several enhancements and upgrades to the platform were released, including customized voter roles, classification labels, parent groups and subgroups, and a detailed support page.

Symposia and Workshops

In 2021, eight symposia and 11 workshops took place. All but two of the events were held virtually, and all were well attended. Event topics included cannabis, fatigue and fracture, thermal insulation, pesticides, and fire standards. Four issues of Selected Technical Papers (STP) were published as a result of the symposia.

Two ASTM Journals Receive Increased Impact Factor Rating

ASTM's *Geotechnical Testing* received an increased 2020 impact factor rating of 1.469, up nearly 14% from the previous year. In addition, the *Journal of Testing and Evaluation,* the organization's flagship journal, received an increased 2021 impact factor rating of 1.264, up nearly **45%** from the previous year.

The impact factor is calculated each year by Clarivate Analytics and given to journals that appear in their database, Science Citation Index.

Special Issue on Materials for Extreme Environments

Materials Performance and Characterization (MPC) published a two-part *Special Issue on Materials for Extreme Environments* in the journal. The two-part issue addressed the need to develop materials that can perform well in severe operating environments and covered topics such as advanced materials, fire resistant steels, welding, materials for energy applications, and corrosion/oxidation.

Since launching the new Technical Reports product line in 2018, four TRs have been published, one of which is an ISO/ASTM TR with more in production.

Books and Journals

ASTM International's books and journals program continued to expand with contributions from international authors. Manuals, Standard Technical Papers, and Technical Reports continued to grow and advance science and technology. ASTM's five active journals are published on the ASTM website and in Compass for quick dissemination and are included in prestigious indexes for ease of discovery.

SEI

The Safety Equipment Institute (SEI) operates an independent program for testing and certifying thousands of innovative safety and protective products, from firefighter and baseball helmets to work boots and protective eyewear. SEI works with manufacturers as well as independent laboratories and quality-assurance auditors to certify products to performance standards for products used by consumers, fire and emergency services personnel, general industry workers, and law enforcement officers. In 2021, the list of SEI-certified products continued to grow with the addition of new standards for recreational products and law enforcement.

CCRL

The Cement and Concrete Reference Laboratory (CCRL) program continued to improve construction materials testing through lab assessments, proficiency testing samples, instruction, guidance, and clarification of standards. CCRL's Laboratory Inspection Program provides evidence of a laboratory's ability to perform test methods.
In 2021, the overall program grew to include approximately 1,630 labs in concrete, concrete aggregates, steel-reinforcing bars, cement, pozzolan, slag cement, and masonry products. CCRL's Proficiency Sample Program helped laboratories compare their results with other labs by testing samples of the same material. In 2021, this program shipped approximately 13,000 boxes (255 tons) to more than 1,800 laboratories worldwide.

TMC

The Test Monitoring Center (TMC) became an affiliate of ASTM International in 2021 and moved its operations from Carnegie Mellon University to a newly renovated building in Armstrong, PA. In addition, the TMC staff became staff of ASTM. The center provides worldwide calibration services for more than 45 ASTM test methods used to evaluate automotive lubricants. Reference oil distribution, test-stand calibration, and laboratory visits form the core of the center's mission under the automotive lubricants subcommittee of the petroleum products, liquid fuels, and lubricants committee (D02).

Culture and Community

ASTM Disaster Relief Donations

ASTM International contributed to relief efforts for survivors of the earthquake that struck Haiti in August to assist in emergency response work and rebuilding efforts. A donation of $25,000 was made to a Haiti relief fund in support of the local community in L'Asile, Haiti. The donation will support the community's immediate need for food, water, and safe shelter for those impacted by the earthquake.

Additionally, ASTM donated $25,000 to the Americares U.S. Tornado Relief Fund, which offers relief and assistance to communities devastated by tornadoes.

ASTM International donated $4,500 to World Central Kitchen (WCK), which provides meals to families as they arrive in the United States from Afghanistan, many of whom have gone days without a proper meal.

ASTM also supported the U.S.-based Society for Afghan Engineers, an organization with close industry ties to ASTM and its members. ASTM's donations directly supported emergency-response efforts. The organization seeks to provide connections among Afghan professionals throughout the world and assist as technical consultants to both governmental agencies and private sectors of Afghanistan.

Community Outreach and Staff-Driven Philanthropy

ASTM International's community outreach continued in 2021 with support to a variety of local and regional organizations including the Riverbend Environmental Education Center, For Pete's Sake Cancer Respite, iPraxis, and more.

In 2021, ASTM's staff-driven philanthropy supported a number of charitable organizations including the Special Olympics, Philabundance, American Diabetes Association, and the Salvation Army.

Global Headquarters Renovation Complete

The ASTM International Global Headquarters multi-year revitalization project was completed in 2021 with the successful renovation of the building's second and third floors. Renovations include the creation of additional meeting rooms, new office spaces, and more.

Diversity, Equity, and Inclusion

Every voice is unique, so every voice matters.

ASTM International is committed to diversity, equity, and inclusion efforts within our offices, across our governance structure, and throughout our global communities. We value every voice, bringing together people from various backgrounds, cultures, experiences, and gender identities. This commitment makes our work more impactful and enables us to more effectively fulfill our mission to serve global societal needs and help our world work better. We take seriously the responsibility to develop initiatives that lift all voices. This is a journey, and each day we strive to further our progress and promote a diverse and inclusive environment for our staff, our members, and the world around us.

Our Journey So Far

In 2021, ASTM's Diversity, Equity, and Inclusion Council supported the creation and launch of DE&I Ambassadors. Made up of volunteer staff members from each department, Ambassadors work to open lines of communication related to DE&I across the organization. Together, with the support of the Council, Ambassadors have:

- identified new ways to recognize and honor cultural celebrations and observances of importance;
- launched research into Employee Resource Groups;
- spearheaded unconscious bias training throughout the organization; and
- developed upcoming DE&I training for members.

Awards

2021 Award of Merit Recipients

The prestigious Award of Merit, which includes the accompanying title of fellow, is ASTM's highest recognition for individual contributions to developing standards.

Phillip A. Allen
Fatigue and Fracture (E08)

Graeme Anderson
Nonferrous Metals and Alloys (B02)

Anthony J. Buonicore
Environmental Assessment, Risk Management and Corrective Action (E50)

Dhuanne M. Dodrill
Primary Barrier Packaging (F02)

David R. Forester
Petroleum Products, Liquid Fuels, and Lubricants (D02)

Elliot T. Forsyth
Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres (G04)

Robert A. Hallman
Building and Environmental Acoustics (E33)

Matthew Innocenzi
Gypsum and Related Building Materials and Systems (C11)

Kevin K. Jurrens
Additive Manufacturing Technologies (F42)

Jeffrey A. Knepper
Building Seals and Sealants (C24)

Richard S. Lacey
Geosynthetics (D35)

Nicholas Lang
Manufactured Masonry Units (C15)

Hugh Martin
Concrete Pipe (C13)

Alex Monsour
Steel, Stainless Steel and Related Alloys (A01)

Gregory D. Moody
Concrete and Concrete Aggregates (C09)

Jon P. Moseley
Medical and Surgical Materials and Devices (F04)

Carol Pollack-Nelson
Consumer Products (F15)

George A. Smith
Roofing and Waterproofing (D08)

Larry N. Tucker
Petroleum Products, Liquid Fuels, and Lubricants (D02)

Nazli Yesiller
Soil and Rock (D18)

James A. Thomas President's Leadership Award

This award recognizes individuals early in their ASTM International career who have advanced the organization's mission through extraordinary accomplishment, example, and vision.

Eric Biedermann is is engineering manager at Vibrant Corporation and member of ASTM's nondestructive testing (E07) and additive manufacturing technologies (F42) committees.

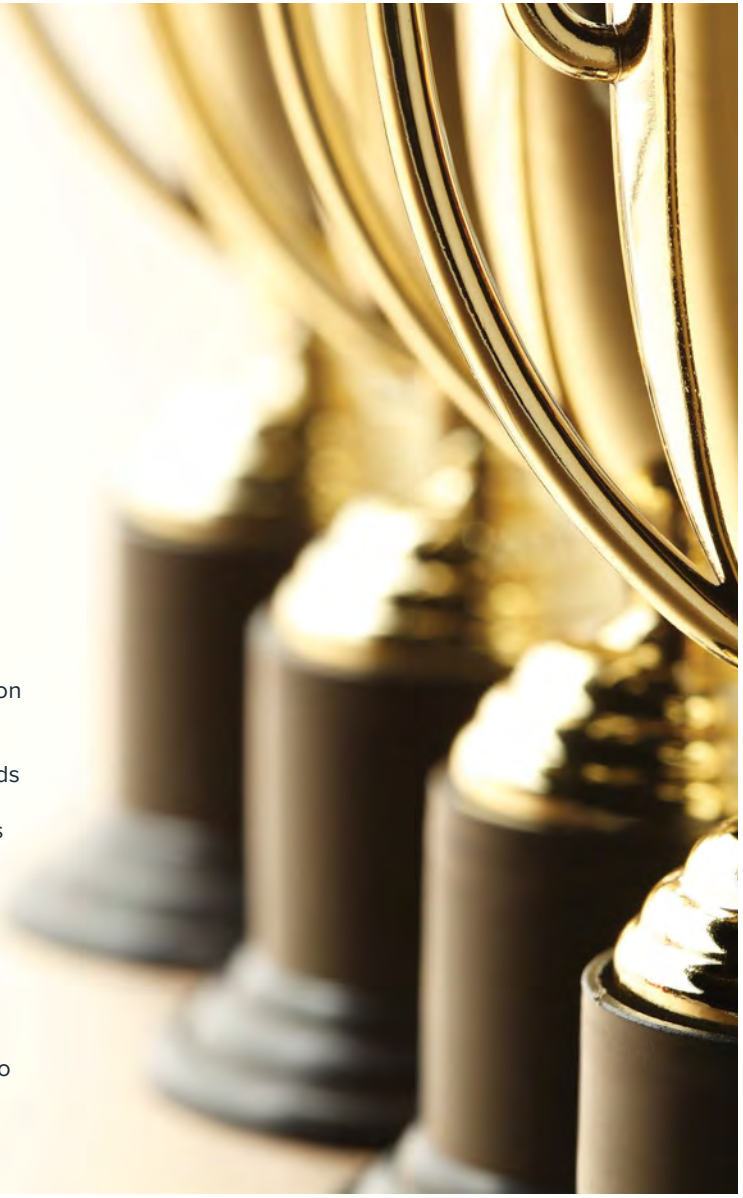
Darwin E. Millard is chief science officer, Canada at the Final Bell Corporation, and member of ASTM International's cannabis committee (D37).

W.T. Cavanaugh Award

The Cavanaugh Memorial Award honors W.T. Cavanaugh, CEO of ASTM International from 1970 to 1985, who established ASTM as the world leader in developing and disseminating voluntary standards.

Anthony W. Thornton is director of technical information and senior technology and applications consultant for Micromeritics Instrument Corporation. He previously served on ASTM International's committee on standards and the board of directors from 2011 to 2013. Thornton is active on many ASTM committees and has served as chair for several.

Ralph M. Paroli is acting director general for the Metrology Research Center, National Research Council of Canada (NRC). He is a former chair of ASTM International's committee on roofing (D08) and current chair of ASTM's cannabis committee (D37). Paroli previously served on ASTM's committee on standards and served on the ASTM board of directors from 2011 to 2018, serving as board chair in 2016.



Financials

Below is a summary of ASTM International's 2021 Financial Results. Please contact the Communications Department if you are interested in the full audited financial statements.

Consolidated Statements of Financial Position (in thousands)

December 31, 2021 and 2020

	2021	2020
ASSETS		
Cash and cash equivalents	$ 17,160	$ 11,321
Short term investments	14,028	3,605
Accounts receivable, less allowance for doubtful accounts of $125 in 2021 and 2020	5,619	8,036
Interest receivable	116	211
Royalties receivable	9,146	8,804
Investments:		
General investment fund	261,060	292,519
Other	9,462	10,799
Cash surrender of life insurance	21,980	-
Inventories	1,267	1,400
Property and equipment, net	94,149	63,937
Prepaid pension asset	70,687	60,849
Other assets	6,552	1,161
	$ 511,226	$ 462,642
LIABILITIES		
Accounts payable and accrued liabilities	$ 12,118	$ 9,179
Deferred income	13,656	13,095
Pension liability	-	3,916
Postretirement benefit liability	4,748	4,903
Other liabilities	665	665
Total liabilities	31,187	31,758
NET ASSETS		
Without donor restriction:		
Undesignated	312,714	266,882
Designated - general	163,399	160,132
	476,113	427,014
With donor restriction	3,926	3,870
Total net assets	480,039	430,884
	$ 511,226	$ 462,642

Consolidated Statements of Activities (in thousands)

Years ended December 31, 2021 and 2020

	2021	2020
Changes in net assets without donor restrictions:		
Operating revenues:		
Publication sales	$ 69,445	$ 65,629
Laboratory services	23,443	18,695
Interest and dividends	3,755	4,167
Members' administrative fees	2,138	2,063
Training, symposium and COE income	3,304	2,185
Contributions	222	89
Other	463	653
	102,770	93,481
Net assets released from restrictions	123	177
Total operating revenues	102,893	93,658
Operating expenses:		
Salaries and benefits	42,206	40,645
Consulting and contract services	14,896	14,480
Other society office expense	6,175	6,243
Depreciation	7,449	6,483
Building occupancy	1,174	1,133
Publications	6,693	6,321
Laboratory services	9,170	6,086
Awards, contracts and other expenses	123	177
Committee expenses	590	598
Training, symposium and COE expense	1,716	989
Total operating expenses	90,192	83,155
Excess of operating revenues over operating expenses	12,701	10,503
Other revenues and (expenses):		
Board meeting - outside headquarters expense	(25)	(3)
Legal, copyright and strategy	(41)	(104)
Asia strategy	(108)	(99)
Advanced manufacturing	(1,714)	(1,167)
ASTM 2.0 Development	(10,391)	-
Other	1,091	4
Investment gain	28,725	23,839
Pension and postretirement benefit changes	18,861	27,446
Total other revenues and expenses	36,398	49,916
increase in net assets without donor restriction	49,099	60,419
Changes in net assets with donor restrictions:		
Interest and dividends	23	24
Research income	-	12
Other	11	-
Contributions	155	214
Investment gain (loss)	(10)	7
	179	257
Net assets released from restrictions	(123)	(177)
Increase in net assets with donor restrictions	56	80
Change in net assets	49,155	60,499
Net assets at beginning of year	430,884	370,385
Net assets at end of year	$ 480,039	$ 430,884

Board of Directors

ASTM International Headquarters
100 Barr Harbor Drive
P.O. Box C700
West Conshohocken, PA
19428-2959 USA
tel +1.610.832.9500

Washington, D.C., USA
Jeffrey Grove
tel +1.202.223.8505
jgrove@astm.org

Beijing, China
Yanan (Nancy) Hu
tel +86.10.5109.6033
nhu@astm.org

Brussels, Belgium
Sara Gobbi
tel +32 (0).28.939.724
sgobbi@astm.org

Lima, Peru
Maria Isabel Barrios
tel +51.1.205.5502
ASTMlatinamerica@astm.org

Ottawa, Canada
Diane C. Thompson
tel +613.751.3409
dthompson@astm.org

Singapore, Singapore
Elvin Chia
tel +65.8778. 4200
echia@astm.org

2021 Snapshot

211
New Standards

1,835
Revised Standards

12,900+
Active Standards

32,000+
Members Worldwide

2,126
Technical Subcommittees

147
Technical Committees

Communications

ASTM International's communication vehicles - *Standardization News* in print and online, press releases, social media, eNews, video, and SmartBrief newsletter, reached thousands of members, customers, and others around the world. In 2021, ASTM's combined impressions across Facebook, Twitter, Instagram, Linkedin, and YouTube, grew to more than 3.8 million.

"A New Way to Build" was the most popular new *Standardization News* article published in 2021. In total, *Standardization News* online saw more than **247,000** page views across multiple languages.

LinkedIn
↑37%
to 37,000 followers

Facebook
↑10%
to 28,902 followers

Twitter
↑2%
to 15,123 followers

Instagram
↑33%
to 3,589 followers

Committed to serving global societal needs, ASTM International positively impacts public health and safety, consumer confidence, and overall quality of life. We integrate consensus standards – developed with our international membership of volunteer technical experts – and innovative services to improve lives... Helping our world work better.

www.astm.org