



A Greener World With the Help of ASTM International Standards

One of the most enduring contributions of ASTM standards is their role as facilitators of a healthy and sustainable environment. Today, the vast body of work by ASTM technical committees includes hundreds of standards that promote environmental safety. The impact of these efforts is felt in cleaner air and water; eco-friendly homes and office buildings; enhanced waste management and recycling programs; new innovations in oil spill response and cleanup; improved environmental assessment processes and many other areas.



BALANCING ENVIRONMENTAL PROTECTION AND ECONOMIC GROWTH

Sustainability — achieving economic prosperity while protecting the natural systems of the planet — has become one of the most important issues for our world. The past several years have brought an increase in consumer, corporate and government interest in sustainability-related programs and initiatives globally.

Supporting the current drive toward sustainable development is also a principal focus of ASTM standards writing-activities.

ASTM's leadership in sustainability standards is evident in industrial sectors like building and construction, where Subcommittee E06.71 on Sustainability has played an important role.

E06.71, previously part of [Committee E06 on Performance of Buildings](#), has contributed standards such as ASTM [E2432, Guide for General Principles of Sustainability Relative to Buildings](#), which identifies methodologies associated with the decision-making process used in pursuing sustainability, and [E2635, Practice for Water Conservation in Buildings Through In-Situ Water Reclamation](#). Water reclamation and reuse offer an effective means of conserving the earth's limited high quality freshwater supplies while helping to meet the ever growing demands for water in residential, commercial and institutional development.

COMMITTEE E60 ON SUSTAINABILITY

E06.71 served as the genesis for a new standards-writing committee that will further extend ASTM's contribution to global sustainability. ASTM [Committee E60 on Sustainability](#), formed in 2008, focuses on the development of consensus standards that will promote and integrate sustainability across multiple industry sectors. For example, in building and construction, Committee E60 will deliver standards that support sustainable development in the built environment, expanding upon the work of E06.71. For the hospitality sector, Committee E60 standards will facilitate the implementation of "green" meetings and events. Standards for other sectors and additional sustainability topics are also planned.

Committee E60 has numerous new standards under way that address such issues as building attributes that promote sustainability; environmentally preferable products and various practices for holding environmentally friendly meetings. The committee has also developed an overview on the topic and a database that identifies standards covering sustainability or aspects related to the subject that have been developed by numerous ASTM International committees (www.astm.org/sustainability).

HEALTHIER WATER, MADE POSSIBLE BY COMMITTEES D19 AND D18

Two longstanding ASTM committees in the environmental arena are [D19 on Water](#) and [D18 on Soil and Rock](#). Through their own portfolio of standards and their cooperative activities, both of these committees continue to make a substantial contribution to issues such as water quality testing and ground water monitoring.

Formed in 1932, D19's membership includes 340 technical experts and professionals who oversee more than 300 standards that cover the sampling and analysis of water, waterborne materials and wastes; measurements of surface and ground water; performance of materials used to modify the characteristics of water; and

measurement of corrosives or deposit-forming properties in water.

A major thrust for Committee D19 is the development of test methods that measure water quality. Whether it's drinking water, surface water used for recreational purposes or wastewater, D19 standards such as [D932, Test Method for Iron Bacteria in Water and Water-Formed Deposits](#), help to identify potentially harmful bacteria and other elements in water. Test and measurement of water purity is also the focus of other notable D19 standards such as [D1193, Specification for Reagent Water](#), which addresses contaminants of microbiological origin.

Cyanide is also routinely analyzed in water samples. Improper sample collection or pretreatment can result in significant positive or negative bias potentially resulting in unnecessary permit violations or undetected cyanide releases into the environment. Here, a new D19 standard — [D7365, Practice for Sampling, Preservation and Mitigating Interferences in Water Samples for Analysis of Cyanide](#) — provides a single, authoritative resource for cyanide sampling and analysis problems.

Like Committee D19, many of the standards from Committee D18 on Soil and Rock serve to protect the health and well-being of people everywhere. D18's 950 members, which includes a broad global representation, are responsible for more than 350 standards, with many related to the environment.

Understanding the behavior of soils adjacent to a landfill is critical to protecting the environment and understanding how the hydrologic properties of the soil assist with determining the contaminant movement through the soil. D18 standards play a key role in testing these parameters in a variety of soil types. Sub-surface analysis of geologic conditions as well as ground-water monitoring and investigation are areas in which Committee D18 has provided standards for the environmental community.

The success of ground-water monitoring programs depends on the quality and reliability of sample collection. To assist these critical efforts in the field, Subcommittee D18.21 on Ground Water and Vadose Zone Investigations has developed a number of key guides and practices to provide technical and procedural guidance to environmental professionals in developing and implementing ground-water monitoring and sampling programs. Notable among these standards is [D5314, Guide for Soil Gas Monitoring in the Vadose Zone](#). D18.21 is also currently working on a new practice covering soil gas sampling from the vadose zone beneath buildings with a specific focus on vapor intrusion evaluations. The new standard will address potential vapor intrusion hazards addressed in the widely used Committee E50 standard, [E2600, Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions](#), discussed in a later section.

Committee D18 is breaking new ground in the environmental area with the formation of a subcommittee focused on the application of sustainability and geotechnical engineering — the science of designing structures in the ground, including the use of soil as a construction material. Geotechnical engineering is an essential element required in the design and construction of foundations for buildings, roads and railways, retaining walls, tunnels and other structures. Newly created Subcommittee D18.14 on Geotechnics of Sustainable Construction will focus on developing

standards related to the use of recycled materials and industrial byproducts together with earth materials for the sustainable construction of infrastructure. D18.14 is currently working on a new standard for the application of recycled asphalt shingles in hot mix asphalt used in road and highway construction.

COMMITTEE D22: HELPING TO ENHANCE AIR QUALITY

Formed nearly 60 years ago by a group of scientists concerned with standards and methodology related to air pollution, [Committee D22 on Air Quality](#) has grown into one of ASTM's pre-eminent environmental standards committees. D22 standards help provide the methodology for sampling and analysis of indoor air quality, source emissions and meteorological conditions.

One important role that Committee D22 serves is to develop standards pertaining to the monitoring of chemical hazards in the workplace. This area is the focus of Subcommittee D22.04 on Workplace Air Quality, which has produced more than 40 standards related to toxic organic and inorganic gases and vapors; acid mists; and metals and metalloids in aerosols and surface dusts. D22 standards such as [E1370, Guide for Air Sampling Strategies for Worker and Workplace Protection](#), are valuable tools used by industrial hygienists, chemists, engineers, health physicists, toxicologists, epidemiologists and other professionals.

Air quality in the residential environment is the focus of the efforts of Subcommittee D22.05 on Indoor Air. Among D22.05's large portfolio of standards is [D7297, Practice for Evaluating Residential Indoor Air Quality Concerns](#). This standard provides a consistent method to address indoor air quality complaints in residential buildings and to guide investigations in an efficient manner. D22.05 also studies air quality concerns in other occupied indoor environments such as aircraft cabins. Standards such as [D7034, Guide for Deriving Acceptable Levels of Airborne Chemical Contaminants in Aircraft Cabins Based on Health and Comfort Considerations](#), ultimately support the health and comfort of passengers and flight crew.

The serious health effects of asbestos have also heightened the importance of the efforts of Subcommittee D22.07 on Sampling and Analysis of Asbestos. D22 members working in this field have been instrumental in developing a series of test methods and practices for monitoring asbestos in bulk materials, settled dust and airborne particles in the indoor environment. Among the notable test methods produced by this group are [D7390, Guide for Evaluating Asbestos in Dust on Surfaces by Comparison Between Two Environments](#). To facilitate information exchange in the area of asbestos monitoring, health effect and laboratory procedures, D22 brings together international experts through ongoing workshops, programs and symposia. D22 conferences have served as benchmarks for developing and refining asbestos monitoring methods and have made major contributions to advancing and understanding asbestos monitoring technology.

ASTM COMMITTEES RESPOND TO ENVIRONMENTAL CONCERNS

With the arrival of the 1970s came a heightened global focus in the area of environmental protection. Driving forces such as

industrial growth and population increases brought issues like pollution control and waste management to the forefront. As these concerns grew stronger during the decade and into the 1980s, ASTM responded to the needs of people everywhere with the formation of several new technical committees.

Concerns over the effect of chemicals on the environment brought the formation of [Committee E47 on Biological Effects and Environmental Fate](#) in 1980. E47's membership of approximately 200 is spread over 10 standards-writing subcommittees that manage more than 80 standards. Activities focus on the effects of physical and chemical stress on aquatic and terrestrial plants and animals, including humans, and the properties of materials that affect and determine their fate, distribution and persistence when introduced into the environment.

Committee E47 standards such as [D3731, Practices for Measurement of Chlorophyll Content of Algae in Surface Waters](#), help measure and assess the level of chemicals and contaminants in aquatic and land environments. Another major focus of the committee is in the area of environmental risk assessment. The efforts of Subcommittee E47.05 on Risk Assessment, Communication and Management have led to the release of important standards like [E2020, Guide for Data and Information Options for Conducting an Ecological Risk Assessment at Contaminated Sites](#). This standard assists remedial project teams, specifically ecological risk assessors, in identifying data and information options to perform a site screening or ecological risk assessment.

Recent activities have also broadened Committee E47's scope into new areas, including the protection of critical water systems in the United States. E47.05 is currently working on its first standard in this area: a guide for applying continuous automated biomonitoring systems to prevent and identify contaminated water supply systems, water treatment systems source and finished water, and waste water effluent systems. E47.05 is also drawing upon the expertise of ASTM Committee E54 on Homeland Security Applications in the development of this new standard.

Another ASTM committee that was born out of the environmental movement of the 1970s was [Committee D34 on Waste Management](#). Standards from D34 address the generation, storage, transportation, treatment, recovery and disposal of wastes generated from industrial, commercial, residential and institutional sources. Overall, Committee D34 has developed more than 120 standards and numerous publications critical to the industry, including [ASTM Standards on Environmental Site Characterization; Manual 42: RCRA Waste Management: Planning, Implementation and Assessment of Sampling Activities](#); and the compilation, [ASTM Standards on Environmental Sampling](#).

Those benefiting from D34 standards include chemical laboratory managers, who can dispose of lab wastes in a safe and environmentally sound manner using the guidelines provided by [D4447, Guide for Disposal of Laboratory Chemicals and Samples](#).

D34 standards also play an important role in remediation activities at sites where waste contamination is present. [D5745, Guide for Developing and Implementing Short-Term Measures or Early Actions for Site Remediation](#), helps reduce the risk posed by waste contamination sites by providing guidance on early action remedies. Several other D34 standards serve to

protect the health of workers involved in waste management occupations. [D4844, Guide for Air Monitoring at Waste Management Facilities for Worker Protection](#), provides an approach for establishing and running an air monitoring program to protect workers at waste management facilities. Similarly, [D6498, Guide for Household Hazardous Waste Training Outline for Household Hazardous Waste Collection Operations](#), covers recommended health and safety training topics for household waste operations workers.

ASTM STANDARDS AND OIL SPILL RESPONSE

During the 1970s, ASTM also assisted industries with environmental protection interests by providing a forum for their standards initiatives. One notable example is [Committee F20 on Hazardous Substances and Oil Spill Response](#). Today, the 100 members of Committee F20 are responsible for standards that address the performance, durability, strength of systems and techniques used for the control of oil and hazardous substances spills.

Standards from Committee F20 cover many topics pertaining to oil and hazardous substance spills, including control, removal, treatment, initial response actions, bioremediation, shoreline countermeasures and more. One example is [F1872, Guide for Use of Chemical Shoreline Cleaning Agents: Environmental and Operational Considerations](#), which provides responders with guidelines for using chemical cleaning agents on oily shorelines. Further, to help facilitate the use of the latest technology in oil spill response situations, F20 offers [F2465, Guide for Oil Spill Dispersant Application Equipment: Single-Point Spray Systems](#).

Another notable focus area for F20 standards development activities is the process of in-situ burning — at the location of the spill — which involves the controlled burning of oil that has spilled from a vessel or a facility. When conducted properly, in-situ burning significantly reduces the amount of oil on the water and minimizes the adverse effect of the oil on the environment. Subcommittee F20.15 on In-Situ Burning has developed several standards for this oil cleanup technology, such as [F2533, Guide for In-Situ Burning of Oil in Ships or Other Vessels](#). This standard helps facilitate the burning of oil on stranded ships, especially those in remote areas, before it can damage the environment. F20.15 is also currently developing a first-of-its-kind guide for in-situ burning of oil spills that occur in marshes.

COMMITTEE E50: SERVING A VALUABLE ROLE IN ENVIRONMENTAL MANAGEMENT

Enhancing the environmental management of buildings, facilities and related development sites is the focus of ASTM [Committee E50 on Environmental Assessment, Risk Management](#)

[and Corrective Action](#). Committee E50's large membership of 1,100 private and public sector stakeholders develops standards that provide tools for environmental site assessment and risk management, corrective action and pollution prevention. Many Committee E50 standards play an important role in protecting the needs of building developers, owners and occupants.

Committee E50 has been instrumental in the development of standards on environmental site assessment for commercial real estate. Two important standards — [E1527, Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process](#), and [E1528, Practice for Limited Environmental Due Diligence: Transaction Screen Process](#) — have provided valuable resources for both purchasers and developers in the area of commercial real estate throughout the U.S. for more than a decade.

Two other notable standards developed by Subcommittee E50.02 on Real Estate Assessment and Management also play a critical role in indoor environmental assessment activities and support a more efficient real estate transaction process. The first is [E2418, Guide for Readily Observable Mold and Conditions Conducive to Mold in Commercial Buildings: Baseline Survey Process](#). E2418 provides common language for all parties involved in mold assessment. A new E50 standard issued in 2008 focuses on vapor intrusion from contaminated soil and groundwater into structures. E2600, Practice for Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transactions, gives guidance for vapor intrusion testing.

In the area of pollution prevention, [E1609, Guide for Development and Implementation of a Pollution Prevention Program](#), provides guidance on the tasks and procedures to be followed in a pollution prevention program to reduce or eliminate the generation of waste and the loss of natural resources.

ASTM COMMITTEE E50 TASK GROUP ON CLIMATE CHANGE

The scope of Committee E50 standards development activities has recently expanded to address the subject of climate change and its impact on businesses. An E50 climate change task group has been formed within Subcommittee E50.05 on Environmental Risk Management. The group currently has a new series of standards under way that focus on topics such as climate change assessment and risk management; the integration of climate change risk management into sustainability and greening programs; and using renewable energy projects in climate risk management strategies.

As new environmental challenges emerge in the years ahead, people everywhere can continue to count on the dedicated efforts of ASTM technical committees in protecting our health and safety.

ASTM INTERNATIONAL TECHNICAL COMMITTEES RELATED TO THE ENVIRONMENT

The ASTM technical committees highlighted in this piece include:

- ▶ [D18 on Soil and Rock](#)
- ▶ [D19 on Water](#)
- ▶ [D22 on Air Quality](#)
- ▶ [D34 on Waste Management](#)
- ▶ [E47 on Biological Effects and Environmental Fate](#)
- ▶ [E50 on Environmental Assessment, Risk Management and Corrective Action](#)
- ▶ [E60 on Sustainability](#)
- ▶ [F20 on Hazardous Substances and Oil Spill Response](#)