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A Greener World through Standards

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One of the most enduring contributions of ASTM standards is their role in supporting a healthy and sustainable environment. ASTM technical committees have hundreds of standards that promote the environment. The results are clear: cleaner air and water; eco-friendly homes and office buildings; enhanced waste management and recycling programs; innovations in oil spill response and cleanup; improved environmental assessments and much more.



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 programs and initiatives globally.

Supporting the current drive toward sustainable development is an important focus of ASTM standards development activities.

Committee E60 on Sustainability, which formed in 2008 and includes more than 700 members, focuses on developing standards to promote and integrate sustainability across multiple industries.

ASTM's leadership in sustainability standards is evident in industrial sectors like building construction, where Subcommittee E60.01 on Buildings and Construction has played an important role. E60.01 has contributed standards such as the guide to building sustainability principles (E2432), which helps industry leaders make decisions to pursue sustainability, and the practice for water conservation in buildings through water reclamation (E2635). 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.

Additional standards are underway to promote sustainability in buildings, the use of green roofs and purchasing products.

In addition, to respond to the need to understand sustainable product claims and to establish credibility in this growing market, manufacturers can assess the true greenness of their products with environmental product declarations. EPDs detail a product's effect on the environment over its lifetime; product category rules (PCRs) are the guidelines for developing environmental declarations for products that can fill equivalent functions. ASTM is a Program Operator for developing PCRs and verifying EPDs (www.astm.org/EPD). EPDs are verified in accordance with an International Organization for Standardization standard (14025) as well to ensure that life cycle assessment data accurately describe the environmental aspects of a product. ASTM helps many construction industries develop PCRs and verify new EPDs.

For the hospitality industry, E60 has completed a suite of standards to help implement "green" meetings and events. The most recently organized E60 subcommittee, E60.13 on Sustainable Manufacturing, has begun work on a group of standards addressing such topics as evaluating and improving the sustainability of manufacturing processes, among others.

The committee has also developed an overview on the topic and compiled sustainability standards that have been developed by numerous ASTM International committees: www.astm.org/sustainability.



E60

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Healthier Water with ASTM Standards

Two longstanding ASTM committees that support the environment are D19 on Water and D18 on Soil and Rock. Both separately and cooperatively, these committees make substantial contributions to issues such as water quality testing and groundwater monitoring. The two committees also have begun work in such areas as hydraulic fracturing: A D19 subcommittee is considering new and revised standards related to assessing related water quality, and a D18 subcommittee is working on standards related to the geologic and geotechnical aspects of hydraulic fracturing.

Committee D19 on Water, formed in 1932, includes more than 325 technical experts and professionals who oversee over 350 standards covering the sampling and analysis of water, waterborne materials and wastes; measurement of surface and groundwater; performance of materials used to modify the characteristics of water and measurement of corrosives or deposit-forming properties in water. (All ASTM standards related to water are compiled online at www.astm.org/waterportals).

A major thrust for Committee D19 is the development of test methods for water quality. Whether it's drinking water, surface water for recreational purposes or wastewater, standards such as D932 help identify potentially harmful bacteria and other elements in water. Test and measurement of water purity is the focus of other notable standards such as D1193, which addresses microbiological contaminants.

Cyanide is routinely analyzed in water samples, and improper sample collection or pretreatment can potentially result in unnecessary permit violations or undetected cyanide releases into the environment. Here, a standard practice (sampling, preservation and mitigating interferences in water samples for analysis of cyanide, D7365) provides a single resource for sampling and analysis problems.

Many D19 sampling and analysis standards have been referenced by the U.S. Environmental Protection Agency to test for pathogens in water. Liaison with the EPA in the committee helps ensure awareness of available ASTM methods as well as needed standards.

Similarly, many of the standards from Committee D18 on Soil and Rock serve to protect the health and well-being of people everywhere. D18, which includes a broad global representation with more than 1,300 members, is responsible for over 370 standards, many of which are related to the environment.

For example, understanding the behavior of soils next to a landfill is critical to protecting the environment and understanding how the properties of the soil help determine contaminant movement through the soil. D18 standards play a key role in testing these parameters in a variety of soil types. D18 has provided standards for the environmental community in subsurface analysis of geologic conditions as well as groundwater monitoring and investigation. A significant standard in these arenas is a guide to choosing passive sampling techniques for groundwater monitoring wells (D7929).

The success of groundwater monitoring programs depends on the quality and reliability of sample collection. To this end, Subcommittee D18.21 on Groundwater and Vadose Zone Investigations has developed standards to guide environmental professionals in developing and implementing groundwater monitoring and sampling programs. Notable among these standards is a practice to evaluate vapor intrusion by sampling soil gas in the vadose zone (D7663).

Committee D18 is also breaking new ground with 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. Recently created Subcommittee D18.14 on Geotechnics of Sustainable Construction is focusing on standards related to the use of recycled materials and industrial byproducts together with

earth materials for the sustainable construction of infrastructure. D18.14 is also working on a new standard that supports recycling asphalt shingles in hot mix asphalt for road and highway construction.



D22

Helps to Enhance Air Quality

Formed decades ago by scientists concerned with air pollution, Committee D22 on Air Quality has grown into one of ASTM's pre-eminent environmental standards committees. D22 standards provide methodology for sampling and analyzing indoor air, source emissions and meteorological conditions. A recent significant addition to standards in this area is a guide for assessing fungal growth in buildings (D7338), which is an important reference for anyone involved in this area.

Subcommittee D22.04 on Workplace Air Quality develops standards pertaining to the monitoring of chemical hazards in the workplace. The group 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. Standards such as the guide for air sampling strategies for worker and workplace protection (E1370) 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 their large portfolio of standards is a practice for evaluating residential indoor air quality (D7297). This standard details a consistent method to address indoor air quality complaints in residential buildings and to guide investigations efficiently. The subcommittee also studies air quality concerns in other environments such as aircraft cabins. Standards such as the guide for deriving acceptable contaminant

levels in aircraft cabins based on health and comfort considerations (D7034) ultimately support the health and comfort of passengers and flight crew.

The serious health effects of asbestos have 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 test methods and practices. Among the group's notable standards are a practice for exposure assessments for those working around asbestos (D7886), a guide for evaluating asbestos in dust on surfaces (D7390) and a test method for determination of asbestos in soil (D7521). D22 brings together international experts through ongoing workshops and programs to support information exchange about asbestos monitoring, health effects and laboratory procedures. D22 conferences serve as benchmarks for developing and refining asbestos monitoring methods and have made major contributions to advancing and understanding asbestos monitoring technology.

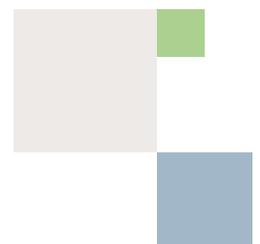
D34

Responds to Environmental Waste Management Concerns

Committee D34 on Waste Management was born from the environmental protection movement. Standards from D34 address the generation, storage, transportation, treatment, recovery and disposal of wastes generated from industrial, commercial, residential and institutional sources. Committee D34 has developed more than 100 standards plus numerous publications critical to the industry.

Those benefiting from D34 standards include chemical laboratory managers, who can dispose of lab wastes in a safe and environmentally sound way using the guidelines provided by a standard for disposing of laboratory chemicals and samples (D4447).

D34 standards also play an important role in waste management. The guide for developing and implementing short-term measures for site remediation (D5745) helps to reduce the risk posed by waste contamination sites by providing guidance on early action remedies. D34 standards such as the method for determining the composition of unprocessed municipal solid waste (D5231) have widespread application. The standards help in planning and designing waste management facilities while also establishing a reference waste composition to use for facility contracts and acceptance test plans. Several other D34 standards help protect the health of workers involved in waste management occupations such as the guide for air monitoring at waste management facilities for worker protection (D4844). Similarly, the training outline for household hazardous waste collection operations (D6498) covers recommended health and safety training topics for workers in this area.

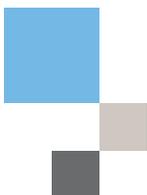


ASTM and Oil Spill Response

ASTM supports 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 95+ members of F20 are responsible for standards that address the performance, durability, strength of systems, and techniques used for controlling oil and hazardous substance spills.

Standards from Committee F20 cover many topics pertaining to spills, including control, removal, treatment, initial response actions, bioremediation, shoreline countermeasures and more. One example is a guide for use of chemical shoreline cleaning agents (F1872), which helps responders who use such chemicals on oily shorelines. Further, to support the use of the latest technology in oil spill responses, F20 offers a guide for oil spill dispersant single-point spray application equipment (F2465) as well as a guide for determining the environmental benefit of dispersant use (F2532).

Another notable focus area for F20 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, this approach 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 technology, such as the guide for in-situ burning of oil in ships or other vessels (F2533). This standard helps guide the burning of oil on stranded ships, especially those in remote areas, before it can damage the environment.



E50 and 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 more than 1,000 private and public sector stakeholders develops standards that provide tools for environmental site assessment, risk management and corrective action. Many E50 standards play an important role in protecting the needs of building developers, owners and occupants.

Committee E50 has been instrumental in developing standards on environmental site assessment for commercial real estate. Two standards — the Phase 1 practices for environmental site assessments (E1527) and the environmental due diligence practice: transaction screen process (E1528) — have provided valuable resources for more than a decade to both purchasers and developers of commercial real estate.

Another notable standard developed by Subcommittee E50.02 on Real Estate Assessment and Management plays a critical role in indoor environmental assessment activities and supports a more efficient real estate transaction process. The guide for vapor encroachment screening on property involved in real estate transactions (E2600) provides practical guidance and a useful process in this area.

And, when a site needs cleanup, E50 guides greener cleanups (E2893). The standard describes a process to reduce the environmental footprint of a cleanup project while working within the existing applicable regulatory framework and satisfying legal requirements.

ASTM Environmental Training

Online programs and on-site courses on environmental topics from ASTM offer practical training for industry and government (www.astm.org/TRAIN).

Self-guided online modules address environmental site assessments for commercial real estate (E1527) and for property vapor encroachment screening (E2600). Designed for environmental professionals, appraisers, property owners, attorneys, bankers and consultants, the courses provide the same content of the in-person courses, with review quizzes.

Intensive, focused and practical environmental education courses that are taught in person also advance the understanding and use of ASTM standards. The courses include open enrollment in cities around the world. And the topics vary from Phase I and Phase II environment site assessment, asbestos control, vapor encroachment, risk-based corrective action and more.





Biological Effects and Environmental Fate

Concerns over the effect of chemicals on the environment brought the formation of a group working on standards in this area. Activities in E50.47 on Biological Effects and Environmental Fate focus on physical and chemical stress on aquatic and terrestrial plants and animals (including humans) and material properties that affect and determine the chemicals' fate, distribution and persistence when introduced into the environment.

Standards such as the practices for measurement of the chlorophyll content of algae in surface waters (D3731) help measure and assess the level of chemicals

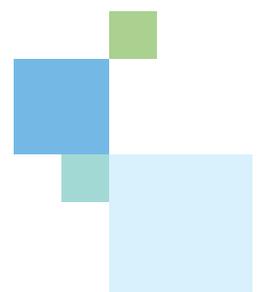
and contaminants in aquatic and land environments. A significant focus for another E50 subcommittee is in the area of environmental risk assessment, which has led to such standards as the guide for a framework for a consensus-based environmental decision-making process (E2348). E2348 is designed to help owners and regulators engage affected stakeholders and establish a process to work through all the key questions and arrive at a mutually acceptable decision for a specific environmental problem.

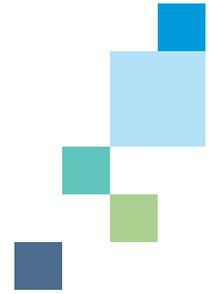
The ASTM Climate Change Task Group

The scope of Committee E50 has expanded to address climate change and its impact on businesses through a new task group in Subcommittee E50.05 on Environmental Risk Management. Committee E50 has approved the guide for financial disclosures attributed to climate change (E2718), which is intended for reporting entities that provide disclosure in financial statements regarding material financial impacts attributed to climate change. E50 has also developed a guide for basic assessment and management of greenhouse gases (E2725). The

task group has other standards underway on such topics as mitigating climate change risk, integrating 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, we can continue to count on the dedicated efforts of ASTM technical committees in protecting our health and safety.





ASTM International technical committees highlighted in this piece include:

- D18 on Soil and Rock
- D19 on Water
- D22 on Air Quality
- D34 on Waste Management
- E50 on Environmental Assessment, Risk Management and Corrective Action
- E60 on Sustainability
- F20 on Hazardous Substances and Oil Spill Response

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.

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