



ASTM International and the Building of Consensus Standards in Support of Environmental Laboratories

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Chair ASTM D22.03, D22.11, D03.12

and D34 Vice Chair

ASTM International Overview



■ Global forum for the development of voluntary consensus standards

- Every member/interest has an equal say in activity
 - Producers
 - Users
 - General Interest
 - Consumer
 - Unclassified

■ Strives for high technical quality and stakeholder relevancy

- Review Every 5 years and approve within 8 years.

Society History



■ Founded in 1898 as the American Section of the International Association for Testing Materials

- Founder: Charles B. Dudley, Ph.D., a chemist with the Pennsylvania Railroad
- First technical committee: **Committee A01** on steel
- C-1 on Cement, Lime and Clay Products 1902
- Renamed as the American Society for Testing Materials in 1902
- Committee D03 on Gaseous Fuels established in 1935
- ASTM D22 on Sampling and Analysis of Atmospheres founded 1951 - Renamed as D22 on Air Quality in 2004
- ASTM D34 on Waste Management established in 1980

https://www.astm.org/ABOUT/history_book.html

ASTM Membership

- Over 30,000 of the world's leading technical experts
- More than 140 countries represented
- More than 140 technical standards writing committees
- More than 12,500 standards
- Dedicated to developing and publishing technically sound and relevant standards
- Open to all interested parties



ASTM Consensus Process



- Facilitates standards without borders
- Process for private and public sector cooperation
- Enables implementation of Public Law 104-113 encouraging governmental usage of consensus standards
- Eliminates duplicative standards development, saving taxpayers and other stakeholders millions of dollars

Standard Uses

- Developed voluntarily and used voluntarily except where required by law
- Government agency reference them in codes, certification, regulations, and laws (US: P.L. 104-115)
- Cited in a contract
- Used by tens of thousands of individuals, companies, and agencies globally
- Over 5,000 ASTM International standards are used as the basis for national standards by reference in regulation in over 50 countries

NTTA and OMB Circular A-119

■ National Technology Transfer and Advancement Act (1995) (Pub. L. 104-115)

- Established policy for US Federal Government to participate in development and adoption of consensus standards
- Government must consider consensus standards in lieu of Government specific requirements

■ Office of Management and Budget's Circular A-119

- Authorized National Institute of Standards Technology (NIST) for conformity assessment
- Federal agencies report to NIST and Congress on consensus standard use

The Consensus Process

- Ensure Due Process
- Everyone has the opportunity and is encouraged to provide input
- All responses must be considered and resolved by technical committee
- Technical and Procedural
- Appeals (Committee on Standards; COS)

The Standard Creation Process

■ Proposal

- Need and scope – presented to subcommittee/committee
- Outline or draft
- Decision to pursue
- Creation of collaboration group (optional)

■ Draft submitted to subcommittee ballot

- Affirmative
- Affirmative with comment – Comments addressed
- Negative – Evaluated as persuasive or non-persuasive
- Abstain – Important since ballot must exceed 60% of the official voting members

The Standard Creation Process

■ Main Ballot (Concurrent ballot)

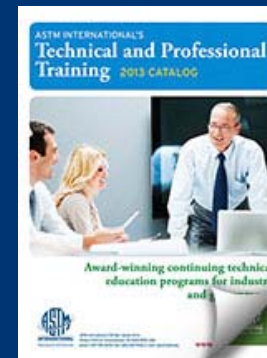
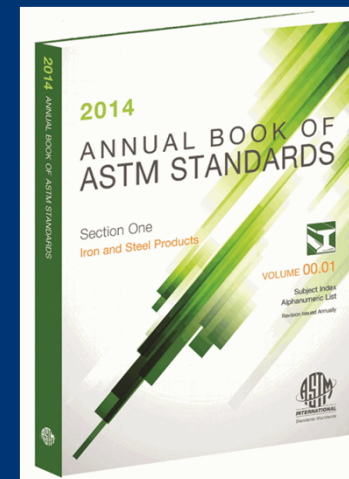
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■ Approval



ASTM Standards and Products

- Standards
 - Test Methods
 - Practices
 - Guidelines
 - Specifications
- Safety Equipment Institute
- Technical training programs
- Proficiency testing.



ASTM Committee D22 – Air Quality

- Established in 1951
- More than 450 Members
- 175 Active Standards
- Meets in March-April and October

■ 9 Technical Subcommittees

- D22.01 Quality Control
- **D22.03 Ambient Atmospheres and Source Emissions**
- **D22.04 Workplace Air Quality**
- **D22.05 Indoor Air**
- **D22.07 Sampling and Analysis of Asbestos**
- **D22.08 Assessment, Sampling, and Analysis of Microorganisms**
- D22.11 Meteorology
- D22.12 Sampling and Analysis of Lead for Exposure and Risk Assessment
- D22.13 Compressed Air Quality

■ Participation in ISO TAG for ISO/TC 146

- **D22.03 Ambient Atmospheres and Source Emissions**

- Develops and maintains standard methods or practices for sampling and analysis of gases or particulates, including radionuclides from source and ambient atmospheres. Fifty three standards are currently under subcommittee jurisdiction.

- Example standards

- D5953M Standard Test Method for Determination of Non-methane Organic Compounds (NMOC) in Ambient Air Using Cryogenic Preconcentration and Direct Flame Ionization Detection
- D7036 Standard Practice for Competence of Air Emission Testing Bodies



D22.03 Ambient Atmospheres and Source Emissions

■ New standards under development

- WK36509 New Test Method for Determination of Sulfur Trioxide and Sulfuric Acid Vapor and Mist, from Stationary Sources Using a Controlled Condensation Sampling System (Technical Contact: Raul Dominguez and Howard Schiff)
- WK54186 Standard Test Method for Determination of Mass Concentration of Particulate Matter from Light Duty Vehicles (Gravimetric Method) (Technical Contact: Coleman Jones)

■ Proposed Standards

- Determination of Ethylene Oxide in Ambient Atmospheres (Technical Contact: Barry Prince)
- Determination of Per- and Polyfluoroalkyl Substances (PFAS) in Ambient Atmospheres (Technical Contact: Seeking)

D22.04 Workplace Air Quality

- Develops and maintains standard methods or practices for sampling and analysis of chemical and biological agents related to occupational exposures.
- Example standards
 - D4856-11(2016) Standard Test Method for Determination of Sulfuric Acid Mist in Workplace Atmospheres Collected on Mixed Cellulose Ester Filters (Ion Chromatographic Analysis)
 - D7035 Standard Test Method for Determination of Metals and Metalloids in Airborne Particulate Matter by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)

Under Development

- WK72704 Ammonium Bifluoride and Nitric Acid Digestion of Airborne Dust and Dust-Wipe Samples for the Determination of Metals (Technical Contact: Kenneth White)

D22.05 Indoor Air

- Promotes knowledge and formulation of standard terminology, test methods, practices, and guides for the sampling and analysis of indoor air.
- Example standards
 - D5197 Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)
 - D5466 Standard Test Method for Determination of Volatile Organic Compounds in Atmospheres (Canister Sampling Methodology)
- Under Development
 - WK40293 * New Test Method for Determining Chemical Emissions from Spray Polyurethane Foam (SPF) Insulation Using Micro-Scale Environmental Test Chambers

ASTM Committee D34 – Waste Management

- Established in 1980
- More than 190 Members
- 104 Active Standards
- Meets in spring (in person) and fall (virtually) every year

2 Technical Subcommittees with 13 Sub-sections

- D34.01 Monitoring and Characterization
 - D34.01.01 Planning for Sampling
 - D34.01.02 Sampling Techniques
 - D34.01.03 Sampling Equipment
 - D34.01.04 Waste Leaching Techniques
 - D34.01.05 Screening Methods
 - **D34.01.06 Analytical Methods**
- D34.03 Treatment, Recovery and Reuse
 - D34.01.01 Solid Waste Collection and Sortation
 - D34.02.02 Thermal and Chemical Treatment
 - D34.03.03 Composting and Aerobic Treatment
 - D-34.03.04 Landfill and Anaerobic Treatment
 - D-34.03.05 Material Recycling and Reuse
 - D-34.03.06 Liquid Waste and Waste Water
 - D-34.03.07 Uncontrolled Waste



D34.01.06 Analytical Methods

■ Example standards

- D5928 Standard Practice for Screening of Waste for Radioactivity
- D5830 Standard Test Method for Solvents Analysis in Hazardous Waste Using Gas Chromatography
- D8064 Standard Test Method for Elemental Analysis of Soil and Solid Waste by Monochromatic Energy Dispersive X-ray Fluorescence Spectrometry Using Multiple Monochromatic Excitation Beams

■ Under Development

- WK66813 Analysis of Target Phenols (TPs) in Soil by Multiple Reaction Monitoring Liquid Chromatography/Mass Spectrometry (LC/MS/MS) (Technical Contact: Lawrence Zintek)

ASTM Committee D03 – Gaseous Fuels

- Established in 1935
- More than 210 Members
- 55 Active Standards
- Meets in June and December

■ 7 Technical Subcommittees

- D03.01 Collection and Measurement of Gaseous Samples
- D03.03 Determination of Heating Value and Relative Density of Gaseous Fuels
- **D03.05 Determination of Special Constituents of Gaseous Fuels**
- **D03.07 Analysis of Chemical Composition of Gaseous Fuels**
- D03.08 Thermophysical Properties
- D03.12 On-Line/At-Line Analysis of Gaseous Fuels
- **D03.14 Hydrogen and Fuel Cells**



D03.05 Determination of Special Constituents of Gaseous Fuels

- Scope: D03.05 is responsible for creating test methods, practices and guides concerning the detection and measurement of special constituents in Gaseous fuels. Special constituents are chemical compounds in gaseous fuels that are not generally considered those which make a major contribution to calorific value....
- Example standards
 - D5504 Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence
 - D8230 Standard Test Method for Measurement of Volatile Silicon-Containing Compounds in a Gaseous Fuel Sample Using Gas Chromatography with Spectroscopic Detection

D03.05 Determination of Special Constituents of Gaseous Fuels

■ New standards under development

- WK49305 Determining Compressor Oil Carryover in Compressed Natural Gas Used as a Natural Gas Motor Vehicle Fuel (Technical Contact: May Lew)
- WK66157 Analysis of Arsine in Gaseous Hydrocarbons by Dry Colorimetry (Technical Contact: Lorena Torres)
- WK52082 Determination of Hydrogen Sulfide (H₂S) in Natural Gas by Tunable Diode Laser Spectroscopy (TDLAS) (Technical Contact: Samuel Miller)

D03.14 Hydrogen and Fuel Cells

- Scope: Hydrogen and Fuel Cells is responsible for developing standards, specifications, practices, and guidelines relating to hydrogen used in energy generation or as feed gas to low, medium and high temperature fuel cells. This subcommittee is also responsible for developing standards, specifications, practices, and guidelines relating to other gaseous fuels used in low, medium and high temperature fuel cells.....

D03.14 Hydrogen and Fuel Cells

■ Example standards

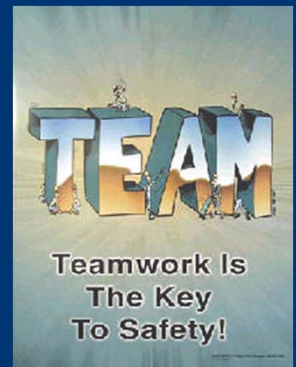
- D7653-18 Standard Test Method for Determination of Trace Gaseous Contaminants in Hydrogen Fuel by Fourier Transform Infrared (FTIR) Spectroscopy
- D7892-15 Standard Test Method for Determination of Total Organic Halides, Total Non-Methane Hydrocarbons, and Formaldehyde in Hydrogen Fuel by Gas Chromatography/Mass Spectrometry
- D7941/D7941M-14 Standard Test Method for Hydrogen Purity Analysis Using a Continuous Wave Cavity Ring-Down Spectroscopy Analyzer

Why Participate in ASTM

- Opportunities for the environmental lab
- Participate in development of standardized laboratory methods
- Learn about analytic alternatives including those on the cutting edge of science
- Contribute to the assessment of method capabilities (P&B and the ILS program)

Get Involved

- Join the with other technical experts
- Impact an entire industry
- Expand your reach; help your organization grow and develop
- Enhance your career; interact with your peers



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