



## Analytical Performance Criteria

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# Analytical Performance Criteria Standards Activities of the ASTM International Committee on Atmospheric Sampling and Analysis

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## INTRODUCTION

Reliable data are required for understanding and controlling the atmospheric environment. The need for sound methodology for sampling and analyzing the atmosphere was recognized over 50 years ago and resulted in the establishment of ASTM Committee D22 to provide standard methods and practices for this purpose. For over 5 decades D22 has provided such methods and has continually monitored them for adequacy and current usefulness. As environmental interests have expanded from ambient air to source analysis, workplace atmospheres, and more recently, to indoor air and atmospheric deposition, so have the areas of activities of D22. Not only have the areas of concern expanded, but the constituents of interest have multiplied.

Progress in the development and maintenance of voluntary consensus standards is expedited, and the quality of each standard is improved, as more persons cooperate in this important activity. ASTM Committee D22 is continually seeking interested and knowledgeable scientists, engineers, and other professionals to pool their efforts to advance standardization processes.

## Voluntary Consensus Standards

ASTM International is a nonprofit organization that provides a global forum for the development and publication of voluntary consensus standards for materials, products, systems, and services. ASTM standards are accepted and used in research and development, product testing, quality systems, and commercial transactions around the world.

Voluntary consensus standards are developed by a cross-section of stakeholders with an interest in their use. When there is a need for a new standard, a request can come from trade associations, government agencies, professional societies, manufacturers, consumer groups, and even individuals. In developing a voluntary consensus standard, consensus is arrived at by representatives of all sectors having an interest in the use of the standard. These sectors include producers, users, and those having a general interest (e.g., representatives of government or academia), as well as ultimate consumers.

Consensus standards, because of their broad input, are considered by many as the most technically sound and most credible documents. They are often used as a basis for commercial and regulatory action. For instance, in the United States, many standards created by ASTM Committee D22 have been cited in regulations promulgated by the Environmental Protection Agency and the Occupational Safety and Health Administration.

## COMMITTEE OVERVIEW

Areas of interest of ASTM Committee D22 on Sampling and Analysis of Atmospheres include ambient air, source emissions, workplace atmospheres, indoor

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Reported on behalf of ASTM  
Committee D22 on Sampling and  
Analysis of Atmospheres

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air, meteorological measurements, sampling strategies, calibration procedures, quality assurance practices, and the development of international standards in these fields. The committee has jurisdiction over about 120 voluntary consensus standards, which are published in Volume 11.03 of the *Annual Book of ASTM Standards*.

Committee D22 was organized in 1951 and currently has over 300 members. The committee meets twice a year, ordinarily in April and October, with members attending various subcommittee meetings over a 3-day period. The work of D22 is coordinated through the ASTM Environmental Coordinating Committee and through individuals who hold memberships in the various committees.

## **ASTM D22 TECHNICAL SUBCOMMITTEES AND THEIR SCOPES**

The technical work in ASTM is carried out almost entirely within the subcommittees. Each subcommittee is responsible for developing standards pertaining to its area(s) of interest. Often subcommittees are comprised of task groups that are created to generate needed standards; this is especially true of large subcommittees. Coordination of effort between subcommittees (and also with other ASTM committees) occurs where subjects of interest overlap. The scopes of the subcommittees within D22 are presented below.

### **Subcommittee D22.01 on Quality Control**

This subcommittee is concerned with monitoring and improving the quality of standards produced by Committee D22. Its activity is concerned with editorial excellence, calibration techniques and methods, and the assurance that every Standard Practice has had proper testing to assure the precision and accuracy required for issuance. It also holds periodic workshops related to the above subjects.

### **Subcommittee D22.03 on Source and Ambient Atmospheres**

This subcommittee is concerned with the formulation of standard methods or practices for the sampling and analysis of source and ambient atmospheres. This includes providing validated manual and instrumental methods for sampling ambient and source atmospheres and for determining concentrations of gases or particulates, including radionuclides, in those atmospheres.

### **Subcommittee D22.04 on Workplace Atmospheres**

This subcommittee is concerned with formulation of methods for sampling and analysis of chemical and biological agents related to occupational exposures.

### **Subcommittee D22.05 on Indoor Air**

This subcommittee is concerned with the promotion of knowledge and the formulation of standard terminology, test methods, practices, and guides for the sampling and analysis

of indoor air and the stimulation of research to accomplish the goals of this subcommittee.

### **Subcommittee D22.06 on Atmospheric Deposition**

This subcommittee is concerned with the development of terminology, practices, guides, and test methods for the measurement of the deposition of atmospheric contaminants to surfaces by wet and dry processes.

### **Subcommittee D22.07 on Asbestos Sampling and Analysis**

This subcommittee is concerned with the development of standard test methods, guides, practices, and terminology for monitoring asbestos in bulk materials, settled dust, and airborne particles. The subcommittee provides a forum for discussing asbestos-monitoring practices, quality assurance procedures, and method research needs. The subcommittee holds periodic conferences, workshops, and symposia to facilitate the exchange of information.

### **Subcommittee D22.09 on International Standards**

This subcommittee is the United States Technical Advisory Group for the International Organization for Standardization (ISO), Technical Committee 146 on Air Quality. It is concerned with international standardization in the field of quality of atmospheres including definitions of terms, sampling of atmospheres, measuring, and reporting the characteristics of atmospheres.

### **Subcommittee D22.11 on Meteorology**

This subcommittee is concerned with the definition of meteorological variables and formulation of standard methods for sampling and analyzing them, and stimulation of research to accomplish this.

## **OUTPUTS**

Currently, committee D22 has jurisdiction over 90 active standards, and more than 60 are in development. Apart from publication of these standards in Volume 11.03 of the *Annual Book of ASTM Standards*, many standards are also published in ASTM compendium documents that cover a particular subject area of interest (e.g., environmental sampling or building air quality). Inputs on where new standards are needed are continually sought, and the contributions of members are especially important in this regard.

D22 holds biennial, summer week-long informal conferences on new developments in its area of interest, and formal conferences are held in alternate years. A number of ASTM Special Technical Publications have been produced as a result of formal conferences sponsored by D22.

## **NEW ACTIVITIES**

### **Symposia**

A D22-sponsored research symposium on silica sampling and analysis will take place at the April 2004 committee

meeting in Salt Lake City, Utah. The symposium will address topics such as differences between monitoring methods (e.g., infrared spectrometry, X-ray diffraction), reference materials, proficiency testing programs, sampling media, respirable sampling, and interferences. Symposia that are planned for the near future will cover mold (summer 2004 in Boulder, Colo.), beryllium (spring 2004 in Reno, Nev.), and asbestos (summer 2005 in Johnson, Vt.). Papers presented at sponsored symposia can be submitted for consideration for publication in the *Journal of ASTM International*; all papers are peer-reviewed.

### New Standards

Many new standards are under consideration and/or development within various D22 subcommittees, and some examples of these are given below.

Within the Quality Control subcommittee, discussions on measurement uncertainty of atmospheric sampling and analysis have ensued, largely because of new international standards governing measurement uncertainty. A possible revision to current standard guidelines regarding precision and bias of atmospheric sampling and analytical methods may be warranted.

The Source and Ambient Atmospheres subcommittee is developing several new draft standards, including a practice for assessing the competence of air emissions testing bodies, and a draft test method for determining gaseous compounds by extractive Fourier transform infrared spectrometry.

The Workplace Atmospheres subcommittee recently approved new standards for sampling and analysis of airborne diesel particles and hexavalent chromium, and the group is balloting a new draft practice on surface wipe sampling for subsequent metals determination. A guide for evaluating the performance of direct-reading instruments is being considered for development.

The Indoor Air subcommittee has begun work on a draft practice for emission testing of indoor sources for volatile organic compounds and is developing a standard to measure the responses and reliability of carbon monoxide detectors. The content of a draft guide for indoor biocontaminant investigations will be discussed at ensuing meetings.

In the subcommittee on Atmospheric Deposition, new work items having to do with the determination of sulfur dioxide or sulfite, total phosphorus, and total nitrogen content in wet deposition have been initiated.

The subcommittee on Asbestos Sampling and Analysis is working on several draft standards for detection of asbestos in bulk materials and air samples. A workshop was held at the most recent meeting (in Tampa, Fla.) to discuss a draft standard guide for asbestos measurement in settled dust samples.

The Meteorology subcommittee is undertaking efforts to publicize the use of ASTM standards in meteorologic observations and instrumentation. The group is presently updating several existing standards.

The ISO Technical Advisory Group continues to provide technical input on ISO standards that are under development. Delegates to several ISO subcommittees have authored or co-authored new or revised international standards on sampling and analysis of airborne isocyanates, lead, atomic spectrometry, and measurement uncertainty, to name a few.

### Upcoming Meetings

Future technical meetings of ASTM Committee D22 during the years 2004–2006 are scheduled as follows:

April 19–21, 2004, in Salt Lake City, Utah

Oct. 4–6, 2004, in Washington, D.C.

April 18–20, 2005, in Reno, Nev.

Oct. 17–19, 2005, in Dallas, Texas

April 24–26, 2006, in Toronto, Ontario

Oct. 23–25, 2006, in Atlanta, Ga.

Meetings are open to ASTM members and nonmembers alike; any and all interested persons are welcome to participate in technical committee discussions. There is no registration fee.

### FURTHER INFORMATION

Additional information on ASTM Committee D22 activities can be obtained from Dr. Richard Danchik, ASTM D22 Chair, tel.: (412) 824-2206, e-mail: [danchik@pittcon.org](mailto:danchik@pittcon.org); and/or Mr. George Luciw, ASTM D22 Staff Manager, tel.: (610) 832-9710, e-mail: [gluciw@astm.org](mailto:gluciw@astm.org). General information on ASTM International including details regarding membership, writing draft standards, the ASTM balloting process, and other subjects not addressed here can be obtained by contacting ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959; tel.: (610) 832-9500; [www.astm.org](http://www.astm.org).