# HOW AN IDEA BECOMES A STANDARD

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According to its bylaws, the purpose of the Acoustical Society of America (ASA) is "to increase and diffuse the knowledge of acoustics and promote its practical application." ASA was founded in 1929, and by 1930, the ASA had already formed the ASA Committee on Standards (ASACOS) that over the years has become its primary vehicle for promoting the practical application of acoustics. Yet at the same time, the ASA Standards Program may be one of the Society's best-kept secrets. In this brief introduction, we hope to shed some light on this outreach arm of ASA and to invite your participation in standards activities that are of interest to you and your company, employer, or sponsor.

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In its scope, the ASA Standards Program spans the disciplines covered by the thirteen ASA Technical Committees. That is not to say that there are currently standards available in every discipline since certainly some subject areas are still at the early research stage and are too new for standardization. As a rule, standards follow research and can only be developed when the science is well-established and mature. As newer scientific areas mature, they often begin to experience the need to standardize some elements of their subject and seek out standards.

The ASA Standards Program includes work on both American National Standards (called "ANSI" standards) and International Standards—either International Organization for Standardization (ISO) or International Electrotechnical Commission (IEC) standards. The Standards Committees are accredited by the American National Standards Institute (ANSI) in the areas of acoustics (S1), mechanical vibration and shock (S2), bioacoustics (S3), and noise (S12).

All the American National and International Standards developed under this program are termed "voluntary consensus standards." They are *voluntary* in that there is no obligation that they be used except to the extent that they may become required by law or contract. The existence of standards does not preclude anyone from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to them. In standards work, the term *consensus* means "substantial agreement has been reached by directly and materially affected interests." This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution.[1] "Standards fulfill many needs such as helping to protect health and safety (ANSI S2.70-2006 dealing with vibration transmitted to the hand, for example), providing a common language to promote and facilitate communication among scientists (ANSI S1.1-1994 Acoustical Terminology, for example), and specifying the performance of an instrument (ANSI S1.4-1983, Sound Level Meters). Regulators rely on some standards such as ANSI S3.22 that specifies the characteristics of hearing aids. Standards are commonly specified in contracts so there is no doubt about the desired outcome. Test and measurement standards promote uniformity where it is desirable. At the same time, well-written standards promote innovation and invention by specifying performance rather than design.

By and large, standards development is a bottom-up process. This summary will focus on the development of an American National Standard in one of the four ASA-managed Committees. The process is different for ISO and IEC standards and differs somewhat among standards developers within the U.S. If you are familiar with the development of ASTM International or IEEE standards, for example, you may note some differences. The key is that each standards developer meets the requirements of the *ANSI Essential Requirements: Due process requirements for American National Standards*, and adheres to operating procedures that meet those requirements and have been accredited by ANSI. Each accredited standards developer is subject to periodic operational audits by ANSI.

The standards development process begins when experts in a given subject area recognize the need for one or more standards in their field and bring the idea forward to the ASA Standards Secretariat. The initial proposal requires a brief overview of the proposed standard, justification of its need, and interest in its development. The standards leadership, including the Chair and Vice Chair(s) of one or more standards committees, Chair of ASACOS, Standards Manager,

and others as needed, conducts an initial review. The scope of the proposed project is then matched to the scope of one of the Standards Committees and the proposal is put out for vote by that Committee. If approved, the project is added to the Committee's work program and a new Working Group is formed. As with most volunteer activities, it is likely that the person who proposes the idea will serve as its project leader. When the scope of the current project has been focused, a project initiation notice is published.[2] These and other standards notices are summarized in *Standards News* in the *Journal of the Acoustical Society of America* every two months. At this early stage outreach is also initiated to attempt to ensure that the Working Group includes a representative group of people with expertise from all interest categories. There is no fee to participate in a Working Group and ASA membership is not required either. In most cases Working Group members are subject-matter experts, but several Working Groups have found it advantageous to include lay people who have experience or first-hand knowledge that is useful to the Working Group.

The task of the Working Group that is limited to drafting the standard for eventual approval by the Standards Committee may take as little as one year or many years. In some cases, Working Groups may work for many years only to determine that it is not possible to reach "consensus." Once the Working Group has completed its draft, the document is returned to the Committee for voting.

The voters on the Committee are appointed by the organizational members of that Committee (i.e., companies, government agencies, professional societies, trade associations, etc.). Each organizational member has one vote and is is asked to select one interest category (user, producer, government, trade association, or general interest). The Committees strive to maintain a balance of interests and to make sure that no one interest or industry dominates the Committee.

The draft standard is made available to the voting members and the Chairs of all the other Working Groups in the voting Committee and to the roster of Individual Experts associated with that Committee. These people may comment on the draft standard but may not vote on its adoption. At the same time, a public comment period is launched through ANSI with notices published in ANSI's publication, *Standards Action*. Public comments are welcomed and treated the same as comments from within the Committee.

Once the ballot is closed, the comments received are compiled and the effort begins to resolve the comments and revise the document by the Committee. Depending upon the number and complexity of the comments and the willingness of the parties to compromise, this may be a lengthy or a short process. When a revised draft is prepared, another public comment period is launched and the document is returned to the Committee for another review. If there are any unresolved objections, the parties are notified that they have the right to appeal the standard. At the end of the process, when the Committee has approved the document and all appeals have been exhausted, the Secretariat will certify to the ANSI Board of Standards Review that consensus has been achieved and that all the requirements of the ANSI-Accredited operating procedures have been followed. Based on this certification and other evidence they may require, ANSI will grant the right to designate this document as an "American National Standard." Note that ANSI's approval is not based on the content of the standard; that is entirely under the jurisdiction of the responsible Committee.

Once the project is completed, the ASA Standards Secretariat will work with the project leaders and Committee leaders to edit and publish the standard and make it available for sale. These standards are copyrighted by ASA and the revenue generated from their sale helps offset the cost of maintaining the program.

Standards may have a long life span or may soon become outdated. To ensure that the standards are still useful and current, each standard is subject to review every five years. At that point, the document must either be reaffirmed without change, revised and a new edition published, or withdrawn. Again, these actions are taken by a vote of the Committee, often with a recommendation from the Working Group or the Committee's Advisory Group, if the Working Group no longer exists. Comments, suggestions for improvement, and notification of errors may be sent to the ASA Standards Secretariat at any time during the life of a standard.

Currently, the ASA Standards Program encompasses more than 75 Working Groups under the four national Committees. Nearly 600 people volunteer their time and talents to work on these Working Groups. About 40% are ASA members and of those 34% are ASA Fellows. We would like to take this opportunity to invite you to join with us to develop the standards that are needed in your subject area. Standards Committee meetings and Working Group meetings are open to all.

## References


1 "ANSI Essential Requirements: Due process requirements for American National Standards," January 2006 edition

2 These notices and other required publications appear in ANSI's *Standards Action,* a weekly online publication that serves as an information source about national and international standards activities.


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*The current members of the Standards Committees and accredited U.S. Technical Advisory Groups to ISO are:*

Acoustical Society of America
AEARO Company
Air-Conditioning & Refrigeration Institute
ALCOA
American Academy of Audiology
American Academy of Otolaryngology, Head & Neck Surgery
American Industrial Hygiene Association
American Society of Heating, Refrigerating and Air-Conditioning Engineers
American Speech-Language-Hearing Association
Association of American Railroads
Beltone/GN Resound
Bruel & Kjaer
Calnetix
Campanella Associates
Caterpillar
Charles M. Salter Associates
Commercial Vehicle Group
Compressed Air & Gas Institute
Council for Accreditation in Occupational Hearing Conservation
Emerson Electric/Copeland
Endevco
Etymotic Research
Food and Drug Administration
Frye Electronics
General Electric
General Motors
Hearing Industries Association
Howard Leight Industries
Information Technology Industry Council
Infrared Training
Institute of Electrical Motor Diagnostics
Institute of Noise Control Engineering
International Association of Geophysical Contractors
International Council for Machinery Lubrication
International Safety Equipment Association
John Deere
Lord Corp
Machinery Information Management Open Systems Alliance
Mechanical Solutions
Modular Building Institute
National Council of Acoustical Consultants
National Hearing Conservation Association
National Institute for Occupational Safety and Health
National Institute of Standards & Technology
Noise Control Engineering
Noise Pollution Clearinghouse
North American Insulation Manufacturers Association
PCB Group
Plantronics
Power Tool Institute
Precision Labs
Quest Technologies
Rubber Manufacturers Association
Sandia National Laboratories
Scantek
Schenck Trebel Corp.
Schomer & Associates
Shock & Vibration Information Analysis Center
Snell Infrared
Society of Automotive Engineers
Society for Machinery Failure Prevention Technology
Starkey Laboratories
Sundyne Corp.
UE Systems
US Air Force
US Army Aeromedical Research Lab
US Army Center for Health Promotion and Preventative Medicine
US Army Construction Engineering Research Lab
US Army Human Research & Engineering Directorate
US Department of Transportation
US Department of Transportation - Volpe Center
US Naval Surface Warfare Center - Carderock
US Navy Sea Systems Command
Vibration Institute
Waukesha Magnetic Bearings
Whirlpool Corp