HEARING PROTECTORS STANDARDS ACTIVITIES

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1. INTRODUCTION

Despite increasing efforts toward hearing conservation, occupational hearing loss is still the most prevalent work-related illnesses in the industrialized world. Because of this fact, every effort should be made to reduce the sound energy entering the ear and damaging the delicate hear cells, damage, that has no cure. Engineering noise controls are accepted to be the best way of reducing the sound levels. However, because of the high cost involved in implementing noise control measures, the use of hearing protectors is still the most popular mean of defence against potentially damaging noise levels. This is why normalization of their testing and applications is such an important activity.

Out of the two main characteristics: sound attenuation and comfort, only the first one has gained wide acceptance up to the point that there is a consistent uniformity among standards produced in different countries. There are, however, some outstanding issues that had to be addressed, and that are, at present, being dealt at national and at the international scene. They are, among others:

- testing method that will produce attenuation figures similar to those observed in the field
- an easy way of using the results from the measurement to assess the noise level of the protected ear.
- methods for measuring the attenuation of nonlinear protectors in continuous and impulsive noise.

In this presentation, we will review the hearing protectors normalization activities performed by the Canadian Standard Association (CSA), the American National Standard Institute (ANSI) and the International Organization for Standardization (ISO). We will describe the writing groups and discuss the standards already produced, those in revision and those that are in the process of writing.

2. CANADA

The Canadian Standard Association (CSA) Technical Committee on Hearing Protection Z94.2, under the jurisdiction of the Standards Steering Committee on Occupational Health and Safety, has the task of preparing and updating the CSA Standard Z94.2 "Hearing Protectors". As with all other standards, the Z94.2 has to be revised/updated every five years. Presently, the Technical Committee is revising the 1994 issue of the Standard. (Originally published in 1974 it was updated in 1979, 1984 and 1994).

For this purpose, the Committee was split into two groups. The first is looking into development of Testing and Classification Criteria, taking into account new developments as well as the experience accrued with the existing standard. The second group will develop a comprehensive Selection, Care and Use Guideline using as a basis the existing Appendix. The result of the work of the second group will also be included in the main body of the Standard. At the present time, both groups are working on their respective texts, aiming at having drafts ready for the general meeting scheduled for October 1999.

3. USA

The American National Standards Institute (ANSI) is the official organization responsible for preparing and issuing standards in the USA. The Acoustical Society of America (ASA) provides the Secretariat for several Accredited Standards Committees. The Accredited Standards Committee S12, Noise, has prepared the latest issue of the American Standard Method for Measuring the Real-Ear Attenuation of Hearing Protectors, ANSI S12.6 -1997, (revision of the ANSI S12.6 -1984).

The Standard contains two testing methods. The first one (Method "A") introduces minor revisions to the 1984 issue of the standard. It is intended to measure the highest attenuation that can be achieved by the protector under test.

The second, Method "B", is the result of a research that lasted for 10 years, thus constituting a unique effort in the field of normalization of hearing protectors testing. Its objective is to obtain attenuations similar to those found in workplaces that have efficient hearing conservation programs in place. The physical environment, test signals and the audiometric procedures are essentially the same for both methods. The main difference between them consists of how the subjects are selected and how the protectors are fitted.

At present, the Standard Committee is working in the forthcoming revision of the Standard, due in the year 2002.

4. ISO

Standard activities at the International Organization for Standardization (ISO), are carried out by Technical Committees (TS), that in turn are divided in Subcommittees (SC). The actual work of writing is done by Working Groups (WG) attached either to a SC or to a TC.

The WG 17 "Methods for the measurement of sound attenuation of hearing protectors" is a part of the TC 43 "Acoustics", SC 1 "Noise". It is responsible for the ISO 4869 Standard "Acoustics-Hearing Protectors". Members of the WG come from Australia, Canada, Czech Republic, Finland, France, Germany, New Zealand, Norway, Sweden, Switzerland, United Kingdom and USA. The Convener is from Denmark.

The Standard has several parts, some of them already finished (and issued), while other are either in revision, in the process or writing, or just intended to be written.

Following is the list of the parts:

Part 1: Subjective method for the measurement of sound attenuation, 1990 (Presently under ordinary revision)

Part 2: Estimation of effective A-weighted sound pressure levels when hearing protectors are worn, 1994

Part 3: Simplified method for the measurement of insertion loss of ear-muff type protectors for quality inspection purposes, 1989. This is a Technical Report and not a full Standard

Part 4: Method for the measurement of effective sound pressure levels for level dependent sound restoration earmuffs, 1998. This is a Technical Report and not a full Standard

Part 5: Measurement of performance characteristics for hearing protectors impulsive noise (under preparation).

Part 6: Active noise reduction of hearing protectors (under consideration)

Part 7: Subjective method for the measurement of sound attenuation.

Right now, the WG is at the task of performing the periodic review of the Part 1. After lengthy discussions, it was decided that there will be also a Part 7 in the Standard, that essentially will be following the Method "B" of the ANSI S12.6-1997.