

CANADIAN STANDARDS ASSOCIATION ACTIVITY IN ACOUSTICS

2002 UPDATE

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ABSTRACT

This article gives an update of Canadian Standards activities in Canada, especially those of the Canadian Standards Association. CSA currently have 11 Acoustics Standards and two more with significant acoustics content. Two committees are responsible for these standards. Z94 is responsible for one standard. Z107, through a variety of subcommittees involving many Canadian acousticians and industry representatives write and review most other standards for the Canadian Acoustics community. An update is given of the main activities and future directions of these groups

SOMMAIRE

Cet article présente une mise à jour des activités de normalisation au Canada pour 2002, tout particulièrement celles de l'Association canadienne de normalisation (ACNOR). L'ACNOR a présentement 11 normes acoustiques et deux autres comportant un contenu acoustique important. Deux comités sont responsables pour ces normes. Z94 est responsable pour une norme. Z107, par divers sous-comités comprenant plusieurs acousticiens canadiens et représentants de l'industrie rédigent et passent en revue la plupart des autres normes pour la communauté acoustique canadienne. Une vue d'ensemble de leurs activités premières ainsi que de l'orientation future de ces groupes y est présentée.

Introduction

The Canadian Standards Association is the largest standards writing body in Canada and one of the largest in the world. There have been CSA standards in Acoustics for over 25 years. The Z94 Protective Devices Committee and the Z107 Committee on Acoustics and Noise Control are active in many areas. Many Canadian acousticians put in a great deal of volunteer effort each year in writing and reviewing acoustics standards. This article is intended to give an update for 2002 of acoustics standards activity in Canada, concentrating on CSA acoustical standards.

Committee Activities

There are two CSA Technical Committees in Acoustics :

Z94 – Hearing Protection

Z94 is responsible for the Hearing Protection Standard Z94.2 which defines Type A, B, and C type hearing protectors and is widely referred to in occupational noise regulations. They have recently approved a major new version of this standard in light of changes to the US hearing protector standards and

procedures. This will mean the introduction of user-fit hearing protector measurements, similar to those used by ANSI and now recognized as being more representative of how hearing protectors are used in practice than the old technician-fitted testing methods.

Z107 Acoustics and Noise Control

Z107, the Acoustics and Noise Control Technical Committee, is responsible for all other CSA Acoustics standards and liaises with Canadian activities on ANSI, ASTM, IEC and ISO standards. Several members belong to these organisations' committees or Z94 and provide liaison to them.

The committee meets twice a year, once during the Canadian Acoustics Week and once in the spring. The latest meeting at the PEI conference was well attended. It reviews progress by each subcommittee and votes on any new work proposals. The main committee is the last technical hurdle for a standard. The CSA will then have their editors put it into final form. The steering committee, to which the main committee reports, approves work and reviews completed standards, however they cannot make technical changes.

New members are encouraged and anyone interested may contact Cameron Sherry, the Chairman, or the author, the vice chair. Those interested in a particular working group should contact the working group chairs listed below.

Table 1 shows all the Canadian Standards currently in force and also lists two standards whose Acoustics sections were written with the assistance of the Z107 committee. This table will also soon be found at the CAA website and will be kept up to date there. Meanwhile the list can be found at

<http://www.csa-intl.org/onlinestore/GetCatalogDrillDown.asp?Parent=430>

Most of the work of the committee is carried out by its sub-committees who are responsible for the following standards:

Hearing Measurement, chaired by Tang Chow, responsible for **CAN3-Z107.4-M86** Pure Tone Air Conduction Audiometers for Hearing Conservation and for Screening and **CAN/CSA-Z107.6-M90** Pure Tone Air Conduction Threshold Audiometry for Hearing Conservation

Vibration, chaired by Tony Brammer, which provides liaison between Z107 and the Technical Advisory Committee of Standards Council on ISO standards on vibration. Tony is active on the ISO group for ISO 2631

Powered Machines, which no longer has standards of its own but recommends adopting or endorsing ANSI, SAE or ISO standards.

Industrial Noise, chaired by Tim Kelsall, responsible for the following standards :

Z107.51-M1980 (R1994) Procedure for In-Situ Measurement of Noise from Industrial Equipment. A group is looking at replacing this standard with a series of ISO standards.

Z107.52-M1983 (R1994) Recommended Practice for the Prediction of Sound Pressure Levels in Large Rooms Containing Sound Sources. This standard is in need of major updating and a chair is being sought to do this work.

Z107.53-M1982 (R1994) Procedure for Performing a Survey of Sound Due to Industrial, Institutional, or Commercial Activities. This standard will be replaced with ISO1996. A working group chaired by Chris Krajewski and including several Ontario consultants is examining using 1996 as a way of updating the way tonal and impulse sounds are handled in community noise¹. They are currently running round robin tests of the procedures with various sample sounds². Stephen Keith of Health Canada is acting as liaison with the ISO committee. The Canadian version will

include an informative annex relating the standard to the Canadian context.

CAN3-Z107.54-M85 (R1993) Procedure for Measurement of Sound and Vibration Due to Blasting Operations. A working group, chaired by Ramani Ramakrishnan, is revising this standard. This activity is just getting started.

CAN/CSA-Z107.55-M86 Recommended Practice for the Prediction of Sound Levels Received at a Distance from an Industrial Plant. A joint CSA/ANSI working group co-chaired by Rich Peppin and Tim Kelsall is looking at ISO9613 for adoption or endorsement. This standard was originally written by an ISO working group chaired by Joe Piercy. It may ultimately replace or become the basis for a revised version of Z107.55.

Z107.56-94 Procedures for the Measurement of Occupational Noise Exposure is referenced in Federal and some provincial regulations and is being updated by a working group chaired by Alberto Behar.

Z107.58-2002 Guidelines For Machinery Noise Emission Declarations Levels was written by a group chaired by Stephen Bly and should be available by the time this article is published³. It is a voluntary guide on noise emission declarations for machinery to be used in Canada and is compatible with European regulations to allow Canadian machinery to be sold into that market.

A Noise Emission Declaration is a statement of sound levels produced by equipment, which would usually be included with the instruction or maintenance manual. Measurements are made according to ISO standards and include estimates of the likely variability of the measurements. Canada recommends use of a declaration stating the level and uncertainty as two numbers, although in some cases they may be added together into a single number.

In addition, the committee undertakes reviews of proposed federal and provincial regulations, often at the request of the regulators, and other activities affecting industrial noise. At the last meeting a review of recent research on the effect of low frequency sounds on worker health by Health Canada was discussed. The subcommittee agreed with the conclusion that there was no evidence at present requiring a change in standards.

Transportation Noise, chaired by Soren Pedersen, responsible for **CAN/CSA-Z107.9-00**: Standard for Certification of Noise Barriers. This standard is an adaptation of the Ontario MTO Highway Noise Barrier specification. It provides municipalities, developers, road and highway departments, railways and industry with a standard specification which

can be used to define the construction of barriers intended for long term use in Canadian conditions.

Specific manufacturers' barrier designs are certified as complying with the standard in such areas as: materials used, weathering and corrosion resistance testing, STC, NRC, etc. Each barrier installation is reviewed and certified for compliance with such items as footings design, material sample testing, welding, caulking, backfilling, etc.

The US Highway Barrier Design Manual is already harmonised with the CSA standard, as is the Ontario Provincial Standard.

Editorial, chaired by Alberto Behar, (which reviews all proposed standards) and is responsible for reviewing and endorsing ANSI S1.1-1994 Acoustical Terminology.

Building Acoustics, chaired by David Quirt, does not have its own standards, but endorses or adopts other standards, mostly from ASTM.

Instrumentation and Calibration, chaired by George Wong, which liaises with Canadian activities on ANSI, IEC and ISO instrumentation standards and endorses or adopts these standards.

Liaison with the Canadian Steering Committee for ISO TC43 and TC43(1), chaired by Krish Krishnappa.

Reviewing other standards

A large part of the committee and subcommittee work is reviewing standards written by other standards writing bodies, such as ANSI or ISO, for adoption or endorsement by Canada. Whenever possible, as global harmonisation becomes more important, CSA adopts or endorses international standards rather than writing their own. In areas where standards apply to goods coming from or going to other countries, use of international standards makes considerable sense.

Adopting a standard, i.e. republishing it, with changes or additions if necessary, costs less than half the cost of writing a new standard. Endorsing, which means that the standard has been reviewed and found suitable for Canadian use is the least expensive option, but less useful because the standard is not so readily available.

Currently there are 24 standards from ANSI, ISO and ASTM endorsed. They are listed in Table 1 following the CSA standards.

Table 1- CSA Acoustics Standards

CAN3-Z107.4-M86 Pure Tone Air Conduction Audiometers for Hearing Conservation and for Screening / Audiomètres tonals à conduction aérienne pour la préservation de l'ouïe et pour le dépistage

CAN/CSA-Z107.6-M90 Pure Tone Air Conduction Threshold Audiometry for Hearing Conservation

CAN/CSA-Z107.9-00: Standard for Certification of Noise Barriers

Z107.51-M1980 (R1994) Procedure for In-Situ Measurement of Noise from Industrial Equipment

Z107.52-M1983 (R1994) Recommended Practice for the Prediction of Sound Pressure Levels in Large Rooms Containing Sound Sources

Z107.53-M1982 (R1994) Procedure for Performing a Survey of Sound Due to Industrial, Institutional, or Commercial Activities

CAN3-Z107.54-M85 (R1993) Procedure for Measurement of Sound and Vibration Due to Blasting Operations / Méthode de mesure du niveau sonore et des vibrations émanant des opérations de dynamitage

CAN/CSA-Z107.55-M86 Recommended Practice for the Prediction of Sound Levels Received at a Distance from an Industrial Plant / Pratique recommandée pour la prévision des niveaux sonores reçus à une distance donnée d'une usine

Z107.56-94 Procedures for the Measurement of Occupational Noise Exposure / Méthode de mesure de l'exposition au bruit en milieux de travail

Z107.58-2002 Guidelines For Machinery Noise Emission Declarations

Z94.2-02 • Hearing Protection Devices - Performance, Selection, Care, and Use / Protecteurs auditifs

Standards with Acoustics Component:

Z62.1-95 Chain Saws

CAN/CSA-Z412-M00 Office Ergonomics / L'ergonomie au bureau

Endorsed Standards

ANSI S1.1-1994 Acoustical Terminology (R1999)

ANSI S1.4-1983 Specification for Sound Level Meters (R2001)

ANSI S1.11-1986 Specifications for Octave-band and Fractional (R1998) Octave-band Analog and Digital Filters

ANSI S1.13-1995 Measurement of Sound Pressure Levels in Air (R1999)

ANSI S12.31-1990 Precision Methods for the Determination of (R1996) Sound Power Levels of Broad-band Noise Sources in Reverberation Rooms

ANSI S12.32-1990 Precision Methods for the Determination of (R1996) Sound Power Levels of Discrete-frequency and Narrow-band Noise Sources in Reverberation Rooms

ANSI/ASTM Standard Test Method for Sound Absorption and C423:00 Sound Absorption Coefficients by the Reverberation Room Method

ANSI/ASTM Standard Test Method for Laboratory E492-90 (1996) E1 Measurement of Impact Sound Transmission Through Floor-ceiling Assemblies Using the Tapping Machine

ASTM C384-98 Standard Test Method for Impedance and Absorption of Acoustical Materials by the Impedance Tube Method

ASTM E90-99 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

ASTM E336-97 Standard Test Method for Measurement of Airborne Sound Insulation in Buildings

ASTM E596-96 Standard Test Method for Laboratory Measurement of the Noise Reduction of Sound-isolating Enclosures

ASTM E795-00 Standard Practices for Mounting Test Specimens During Sound Absorption Tests

ASTM E966-99 Standard Guide for Field Measurement of Airborne Sound Insulation of Building Facades and Facade Elements

ASTM E989-89 Standard Classification for Determination of (1999) Impact Insulation Class (IIC)

ASTM E1007-97 Standard Test Method Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-ceiling Assemblies and Associated Support Structures

IEC 60651-2001 Sound Level Meters

ISO 4872-1978 Acoustics – Measurement of Airborne Noise Emitted by Construction Equipment Intended for Outdoor Use – Method for Determining Compliance with Noise Limits

ISO 6393:1998 Acoustics – Measurement of Exterior Noise Emitted by Earth-moving Machinery – Stationary Test Conditions

ISO 6394:1998 Acoustics – Measurement at the Operator's Position of Noise Emitted by Earth-moving Machinery – Stationary Test Conditions

ISO 6395-1988 Acoustics – Measurement of Exterior Noise Emitted by Earth-moving Machinery – Dynamic Test Conditions

ISO 6395:1998 Acoustics – Measurement of Exterior Noise Emitted by Earth-moving Machinery – Dynamic Test Conditions – Amendment 1

SAE J919-1995 Sound Measurement – Off-road Work Machines – Operator Singular Type

SAE J1096-2000 Measurement of Exterior Sound Levels for Heavy Trucks under Stationary Conditions

References

C. Krajewski, Rating Sound Level- A New Method for Description and Measurement of Environmental Noise- An Overview of Amendment 1 to ISO 1996-2, Canadian Acoustics, Volume 29, No. 3, September, 2001

William J. Gastmeier and James L. Feilders, ISO 1996 Acoustics – Description and Measurement of Environmental Noise Round Robin Testing, Canadian Acoustics, Volume 29, No. 3, September, 2001

Stephen Keith, Stephen Bly, Tim Kelsall, A preview of the Draft CSA Guideline – Noise Emission Declarations for Machinery, Canadian Acoustics, Volume 29, No. 3, September, 2001



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