

# CANADIAN STANDARDS ASSOCIATION ACTIVITY IN ACOUSTICS

## 2001 UPDATE

**Tim Kelsall**

Hatch Associates, 2800 Speakman Drive, Mississauga, Ontario L5K 2R7  
tkelsall@hatch.ca

### ABSTRACT

This article gives an update of Canadian Standards activities in Canada, especially those of the Canadian Standards Association. CSA currently have 10 Acoustics Standards and two more with significant acoustics content. Two committees and a variety of subcommittees involving many Canadian acousticians and industry representatives write and review these standards for the 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, tout particulièrement celles de l'Association canadienne de normalisation. L'association a présentement 10 normes acoustiques et deux autres comportant des normes acoustiques détaillées. Deux comités et divers sous-comités comprenant plusieurs acousticiens canadiens et représentants de l'industrie rédigent et passent en revue ces normes pour la communauté acoustique. Une vue d'ensemble de leurs activités premières ainsi que la direction future de ces groupes y est présenté.

### INTRODUCTION

This article is intended to give an update for 2001 of acoustics standards activity in Canada, concentrating on CSA acoustical standards. 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 and the Z107 Committee on Acoustics and Noise Control is still active in many areas.

### COMMITTEE ACTIVITIES

There are two CSA Technical Committees in Acoustics :

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 the 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 industry than the old technician fitted testing methods.

Z107, the Acoustics and Noise Control Technical Committee, is responsible for all other Acoustics standards. Several members belong to both committees and provide liaison between them.

Z107 is divided into 9 subcommittees. These include:

Hearing Measurement,

Vibration,

Powered Machines

Industrial Noise,

Transportation Noise,

Editorial (which reviews all proposed standards),  
Building Acoustics,

Instrumentation Calibration and

Liaison with the Canadian Steering Committee for ISO  
TC43 and TC43(1). Each subcommittee is responsible for the standard or standards within its area.

As global harmonisation becomes more important, CSA has

started to adopt and endorse international standards where possible 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, which means 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. Given our location, adopting or endorsing international or US acoustical standards has been common practice for years.

Currently there are 22 standards from ANSI, ISO and ASTM out for ballot to be endorsed.

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=6>

## CURRENT ACTIVITIES

Some current highlights include:

### *TRANSPORTATION*

The newest standard to be published is Z107.9, Highway Noise Barriers. It came out in early 2000 and sold out its first printing of 100 within months. This standard is an adaptation of the Ontario MTO Highway Noise Barrier specification. It is intended to provide 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.

This is much more than simply an acoustics standard. It fills an important need in the industry and drafts have been used by several municipalities in recent years. Essentially it allows regulators, consultants or engineers to specify a barrier's construction and durability simply by referring to one standard.

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 OPS.

At present this standard is caught in a chicken and egg scenario. CSA have not committed to certifying barriers until they are sure there is sufficient demand and governments are unable to ask for certified barriers until the certification is in place. Efforts are underway at the technical level to resolve this deadlock.

### *INDUSTRY*

The Industrial Noise Subcommittee is the most varied and active subcommittee.

Ongoing activities include:

A working group looking at adopting the ISO 1996 rating systems for community noise (for tonality and impulse corrections among others)

A writing group preparing Guidelines For The Declaration Of Machinery Noise Emission Levels,

### *Guidelines For The Declaration Of Machinery Noise Emission Levels*

Guidelines For The Declaration Of Machinery Noise Emission Levels will be a voluntary guide for noise labelling of machinery for use in Canada and compatible with the European regulations to allow machinery to be sold into that market.

Labels in this context refer to a statement of sound levels produced by the equipment which would 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.

Currently the standard is about to go out for ballot.

### *Adoption of ISO1996*

A working group chaired by Chris Krajewski and including several Ontario consultants is examining using ISO 1996 as a way of updating the way tonal and impulse sounds are handled in community noise. They are currently running round robin tests of the procedures with various sample sounds. Stephen Keith of Health Canada is acting as liaison with the ISO committee.

The first round of tests was reported at the recent Canadian Acoustics conference and a second round is ongoing. The standard is written to be compatible with a number of different regulations in Europe. A first draft of an informative annex relating the standard to the Canadian context is underway.

## ***BUILDING ACOUSTICS***

The Building Acoustics subcommittee has recommended a large series of ASTM standards for endorsement.

These include ASTM C384, E795, C423 on measuring absorption, ASTM E90, E336, E497, E557 on transmission loss of partitions, E596 on enclosures, E966 on building facades and E989, 492 and 1007 on impact sound transmission through floors.

## ***INSTRUMENTATION AND CALIBRATION***

The Instrumentation and Calibration subcommittee have no standards of their own; instead they have endorsed or adopted IEC instrumentation standards and ANSI standards which can then be referred to in Canadian regulations and other standards. Every five years or more frequently the standards are reviewed automatically to ensure that the latest standards are being endorsed and that they are still suitable for use in Canada. In addition, the chairman, George Wong, is actively involved with the ISO and IEC working groups.

They recently recommended the following standards for endorsement :

ANSI S1.11 on filters, S1.13 on sound measurement and S1.4 and IEC 60651 on sound level meters.

## ***EDITORIAL***

The Editorial subcommittee have endorsed the ANSI Standard for Acoustics Terminology and have had input into it. This standard is updated regularly by ANSI and is reviewed by this subcommittee each time it is revised. The Editorial subcommittee main job is to review every standard written by a Z107. subcommittee, both as a final technical review and to ensure it meets the CSA editorial requirements. They recently finished a major review of the labeling standard.

## ***MAIN Z107.9 COMMITTEE***

The committee meets twice a year, once during the Canadian Acoustics Week and once in the spring. The latest meeting at the Alliston conference was well attended and lively. They review progress by each subcommittee and vote 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.

The main committee also hears reports from members who provide liaison with the ISO, IEC ANSI and ASTM acoustics activities.

One other initiative that the main committee has been trying to propose for some years is a Guideline to provide a standard which summarises the major Canadian and International Standards for Canadian industry users. This is intended to make Acoustical Standard more accessible to Canadian users. Recently they were given authorization to proceed with this project.

New members are encouraged and anyone interested may contact Cameron Sherry, the Chairman, or the author, the vice chair. This article is the third in a series which will provide more information on the activities underway in all areas of Acoustics Standards in Canada.

### **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

**Z94.2-94 • CAN/CSA-Z94.3-92**

Hearing Protectors

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

**ANSI S1.4-1983** Specification for Sound Level Meters

**ANSI S1.11-1966** Octave, Half-octave, and Third Octave Band Filter Sets

**ANSI S1.13-1971** Methods for the Measurement of Sound Pressure Levels

**ANSI S1.31-1980** Precision Methods for the Determination of Sound Power Levels of Broad-band Noise Sources in Reverberation Rooms

**ANSI S1.32-1980** Precision Methods for the Determination of Sound Power Levels of Discrete-frequency and Narrow-band Noise Sources in Reverberation Rooms

**ANSI/ASTM E492-** Laboratory Measurement of Impact Sound 1977 Transmission Through Floor-ceiling Assemblies Using the Tapping Machine

**ASTM C384-85** Impedance and Absorption of Acoustical Materials by the Impedance Tube Method

**ASTM E1007-84** Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-ceiling

**IEC 651 (1979)** 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 6393-1985** Acoustics—Measurement of Airborne Noise Emitted by Earth-Moving Machinery—Method for Determining Compliance with Limits for Exterior Noise—Stationary Test Conditions

**ISO 6394-1985** Acoustics—Measurement of Airborne Noise Emitted by Earth-moving Machinery—Operator's

Position—Stationary Test Conditions

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

**SAE J919-1986** Sound Measurement - Earthmoving Machinery -Operator Singular Type

**SAE J1096-1985** Measurement of Exterior Sound Levels for Heavy Trucks under Stationary Conditions

**ASTM C423-84a** Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

**ASTM E90-1985** Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

**ASTM E336-84** Measurement of Airborne Sound Insulation in Buildings

**ASTM E497-1981** Installation of Fixed Partitions of Light Frame Type for the Purpose of Conserving Their Sound Insulation Efficiency

**ASTM E557-1981** Architectural Application and Installation of Operable Partitions

**ASTM E596-1986** Laboratory Measurement of the Noise Reduction of Sound-Isolating Enclosures

**ASTM E597-1981** Determining a Single-number Rating of Airborne Sound Isolation for Use in Multiunit Building Specifications

**ASTM E795-1983** Mounting Test Specimens During Sound Absorption Tests

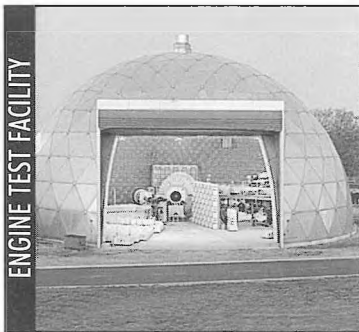
**ASTM E966-1984** Field Measurement of Airborne Sound Insulation of Building Facades and Facade Elements

**ASTM E989-1984** Determination of Impact Insulation Class (11c)

## REFERENCES:

1. 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
2. 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
3. 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

ENGINE TEST FACILITY



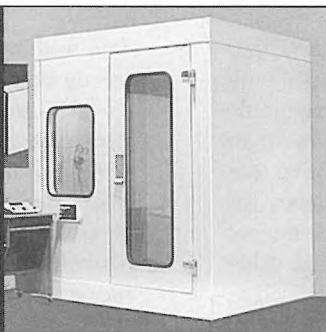
ECKOUSTIC FUNCTIONAL PANELS



O.E.M. ENCLOSURE

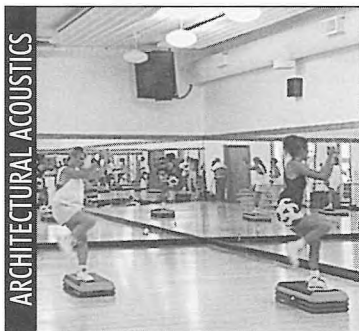


AUDIOMETRIC ROOMS & SUITES

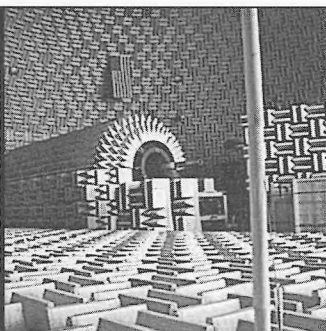


SOUND SOLUTIONS FOR THE FUTURE

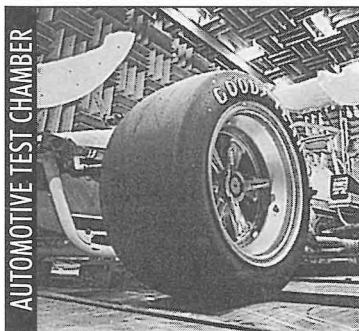
ARCHITECTURAL ACOUSTICS



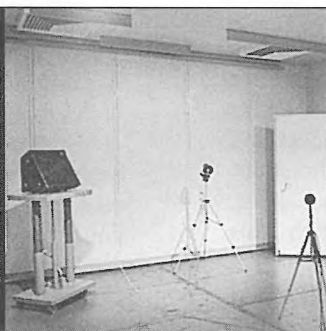
ACOUSTIC RESEARCH



AUTOMOTIVE TEST CHAMBER



REVERBERATION ROOM



# ECKEL

NOISE CONTROL TECHNOLOGIES

CANADIAN OFFICE

Box 776 100 Allison Avenue Morrisburg ON K0C 1X0

Tel: 613-543-2967 800-563-3574 Fax: 613-543-4173

Web site: [www.eckel.ca/eckel](http://www.eckel.ca/eckel) e-mail: [eckel@eckel.ca](mailto:eckel@eckel.ca)

NOISE CONTROL TECHNOLOGIES