

CSA Z107.10 GUIDELINE TO ACOUSTICAL STANDARDS IN CANADA

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1. INTRODUCTION

Why did the CSA Z107 committee decide that there should be a Canadian acoustical standard, Z107.10? There are many acoustical standards available within the world but which ones should be used and which should not? If we use an acoustical standard are there any limitations? What terms should we use when talking or writing about acoustics and how are they defined? The answers to some of these questions should be apparent in this paper.

2. COMMENTARY

The field of acoustics is very broad it includes speech, music, hearing, sound transmission, sound absorption, sound generation, ultra sound, transportation, instruments, etc. the list seems endless. The truth is that it just about all activities we humans participate in involve sound. Either we wish to generate sound or we wish to reduce it. Sometimes we get pleasure from sound sometimes we are in agony or somewhere in between.

If we are to control sound we must be able to measure it. This requires the definition of terms and of course there must be agreement that the terms have been defined appropriately. Canadians have been active on many acoustical committees and thus collectively have a very broad experience. Canadians are members of the following acoustical standards writing committees ANSI, ASTM, ISO, IEC, CSA, SAE and several others I have not listed. Each of these committees then breaks down into subcommittees and then into working groups.

How can acousticians help the public or our fellow acousticians in understanding and choosing acoustical standards that cover all the fields of acoustics? The Z107 committee of CSA had a vision of a Canadian acoustical standard that would provide Canadians with an answer. Canadians do not have enough resources to write the required acoustical standards in all fields and in fact we sometimes are hard pressed to write an acoustical standard in any field. The Z107 committee has for many years been reviewing and endorsing acoustical standards that may be used by the Canadian public. However, the public is at lost sometimes when it realizes there are several standards with somewhat identical objectives. Now what?

The vision of the Z107 committee was the acoustical standard CSA Z107.10. This standard lists by topics the standards endorsed or written by CSA that are recommended for use in Canada. This standard is intended to be a living one, in that each year it is expected that additional material will be added to it. The Z107 committee

would like you to contribute to this standard. It is the standard; we hope you will refer to when you want to choose an appropriate acoustical one. It is available for purchase from CSA.

Following is the present list of headings; hopefully more will be added in the future.

- BUILDING ACOUSTICS
- CALIBRATION OF ACOUSTICAL MEASURING EQUIPMENT
- ENVIRONMENTAL NOISE
- HEARING MEASUREMENT
- HUMAN EXPOSURE TO VIBRATION
- INDUSTRIAL NOISE
- POWERED MACHINES
- TRANSPORTATION NOISE
- TERMINOLOGY

In the field of building acoustics we have an on going discussion about the use of ASTM acoustical standards and ISO acoustical standards. The building practices of Europe and North America are not the same thus the reason why the laboratories have been built to different standards. Canada in its normal position gets stuck in the middle of the sandwich. We have Canadians who head or have headed working groups, subcommittees or main committees in both ASTM and ISO. The standard Z107 provides you with information on fourteen endorsed ASTM building standards and indicates which ones are referenced in the National Building Code of Canada. It is anticipated that some ISO standards will be endorsed in the future. When this is done an explanation will be provided about the advantages or disadvantages of the equivalent ASTM standard.

The calibration of acoustical equipment must be performed on a regular basis otherwise the data obtained may lead us to make some false assumptions. The instruments themselves must be carefully assembled and must meet certain criteria. Some serious problems exist in this area as not everyone agrees on what should be the certain criteria. Just ask Dr. George Wong and he will provide a detailed explanation. It is well known that anyone attempting an acoustic measurement is going to affect the sound field they are measuring to some degree. There are no standards listed in this section. It anticipated that standards will be endorsed by the subcommittee for inclusion in the very near future.

The standards in the Environmental section of the standard are covered in a paper given by Bill Gastmeier. See the Canadian Acoustic Proceedings, September 2006, page 48.

In the section on hearing measurement there are three Canadian standards. One deals with hearing protection, one with audiometers and one with audiometry. These three are rather unique in that are not endorsed standards but ones you can purchase from CSA. The latter two are the responsibility of Z107, the parent of this standard. The other is the responsibility of committee Z94.

In the section on Human Exposure to Vibration there are two endorsed standards. Both standards deal with exposure to hand vibration. They are ISO standards and one of the world's foremost experts is a home grown Canadian, Dr. Tony Brammer, who has made a major contribution to both standards. It is anticipated that more ISO standards in this field will be considered for endorsement.

In the section on Industrial Noise there are 3 CSA standards and 18 endorsed ISO standards. The standards have a wide range of subjects. There is one CSA standard on noise prediction (at a receiver position inside a building), one CSA standard on noise emission declarations and one CSA standard on measuring personal noise exposure using dosimeters or sound level meters. This latter standard was a first in the world and has acted as the base document for several other standard writing bodies. The endorsed ISO standards cover sound power measurements, sound intensity measurements and noise emissions from machinery. It is anticipated that more standards will be added to this section.

In the section on Powered Machines there are 6 endorsed standards of which four are from ISO and two are from SAE. There use to be CSA standards that partially covered the subject areas of these six standards but they since have been withdrawn. The replacements are superior. The machines described in the standards may be used in construction or in agriculture. They cover stationary conditions as well as dynamic ones. One of the standards

indicates how to properly measure sounds at the operator's position.

In the section on Transportation Noise there are 5 measurement standards, one of which is a CSA standard for the Certification of Noise barriers. Originally there were CSA standards for the other subject areas but as there were no Canadians wishing to support them so they were withdrawn. The subject areas are covered by ISO standards for the measurement of noise from vessels in inland waterways, stationary road vehicles, passenger cars in an urban setting and powered recreational craft.

The final section is on Terminology and presently there is only one endorsed ANSI standard. There are other acoustic terminology standards such as one from IEC but it has yet to receive broad recognition by Canadian acousticians. The IEC standard has some definition conflicts with the ANSI document that need to be sorted out.

ACKNOWLEDGEMENTS

The development of this guideline standard is due to the work of the CSA Z107 main committee, subcommittees and working group members.

AUTHOR NOTES

This standard will remain a well referenced document if the Canadian Acoustical Community continues to contribute if information about standards it wishes to be recognized in Canada. You are invited to contact the author or Dave Shanahan of CSA if you have a standard for consideration.

CAA - Web Master

The Canadian Acoustical Association is seeking a volunteer to take on the duties of webmaster for the CAA website at <http://caa-aca.ca/>. The main responsibilities of the webmaster are to keep the site up to date, in response to information provided by the CAA secretary, awards coordinator and other members of the CAA board of directors, and to maintain a "Job Advertisement and Job Wanted" page. Recently a system was created for submission of CAA conference abstracts and papers using an on-line MySQL database and PHP programming. This is an ideal opportunity for someone to improve their knowledge and skills for online database programming and to apply these skills to automation of other aspects of the CAA website. For further information please contact Dave Stredulinsky, email: webmaster@caa-aca.ca. ph. (902) 426-3100 ext 352.