
**Acoustics — Recommended practice for
the design of low-noise workplaces
containing machinery —**

Part 2:
Noise control measures

*Acoustique — Pratique recommandée pour la conception de lieux de travail
à bruit réduit contenant des machines —*

Partie 2: Moyens de réduction du bruit



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11690-2 was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

ISO 11690 consists of the following parts, under the general title *Acoustics — Recommended practice for the design of low-noise workplaces containing machinery*:

- *Part 1: Noise control strategies*
- *Part 2: Noise control measures*
- *Part 3: Sound propagation and noise prediction in workrooms*

Part 1 is the central document in the series. Parts 2 and 3 give additional technical and explanatory information. It is therefore recommended to start with part 1.

Annexes A to K of this part of ISO 11690 are for information only.

Introduction

Most of the existing International Standards prepared in ISO/TC 43/SC 1 specify methods for measurement and/or evaluation of noise. The final objective of ISO 11690, however, is noise reduction.

A number of noise control measures are offered. However, in order to be effective, the most appropriate noise control measure(s) should be chosen for a given situation.

It is important when non-acoustic engineers are involved in noise control practice for these engineers to have a basic knowledge of noise emission and propagation characteristics and to understand the basic principles of noise control.

To assist in the development of noise control in the workplace, it is essential that the information contained in these recommended practices is disseminated through International Standards.

In order to reduce noise as a hazard in the workplace, individual countries have produced national legislation. Generally, such national legislation requires noise control measures to be carried out in order to achieve the lowest reasonable levels of noise emission, noise immission and noise exposure, taking into account:

- known available measures;
- the state of the art regarding technical progress;
- the treatment of noise at source;
- appropriate planning, procurement and installation of machines and equipment.

This part of ISO 11690, together with the two other parts in the series, outlines procedures to be considered when dealing with noise control at workplaces, within workrooms and in the open. These recommended practices give in relatively simple terms the basic information necessary for all parties involved in noise control in workplaces and in the design of low-noise workplaces to promote the understanding of the desired noise control requirements.

The purpose of the ISO 11690 series is to bridge the gap between existing literature on noise control and the practical implementation of noise control measures. In principle, the series applies to all workplaces and its main function is:

- to provide simple, brief information on some aspects of noise control in workplaces;
- to act as a guide to help in the understanding of requirements in standards, directives, text books, manuals, reports and other specialized technical documents;

- to provide assistance in decision making when assessing the various measures available.

The ISO 11690 series should be useful to persons such as plant personnel, health and safety officers, engineers, managers, staff in planning and purchasing departments, architects and suppliers of plants, machines and equipment. However, the above-mentioned parties should keep in mind that adherence to the recommendations of the ISO 11690 series is not all that is necessary to create a safe workplace.

The effects of noise on health, well-being and human activity are many. By giving guidelines for noise control strategies and measures, the ISO 11690 series aims at a reduction of the impact of noise on human beings at workplaces. Assessment of the impact of noise on human beings is dealt with in other documents.

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Acoustics — Recommended practice for the design of low-noise workplaces containing machinery —

Part 2: Noise control measures

1 Scope

This part of ISO 11690 deals with the technical aspects of noise control in workplaces. The various technical measures are stated, the related acoustical quantities described, the magnitude of noise reduction discussed and the verification methods outlined.

This part of ISO 11690 deals only with audible sound.

NOTE 1 Annex K lists relevant International Standards and other literature on noise control measures.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 11690. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 11690 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 11690-1:1996, *Acoustics — Recommended practice for the design of low-noise workplaces containing machinery — Part 1: Noise control strategies*.

3 Definitions

For the purposes of this part of ISO 11690, the definitions given in ISO 11690-1 apply.

4 Technical aspects of noise control

Noise reduction measures can be applied at source (emission), between the source and the receiver (transmission path), and at the work station (receiver). (See figure 1.)

When dealing with the noise emission of a machine, an installation or a production process, etc., all possible noise reduction measures should be considered (see clause 5 and ISO 11690-1). To determine whether noise emission is as low as reasonably practicable, it is necessary to consider noise emission quantities; these are given in the noise emission declaration (see ISO 11690-1:1996, clause 8) or determined by measurements (carried out in compliance with the relevant standard).

An assessment of noise control devices such as enclosures, partial enclosures, barriers and screens, silencers, etc. can be carried out by using, for example, the insertion loss data (see 6.2).

The acoustic quality of workrooms and buildings is assessed with reference to the sound insulation regarding airborne and structure-borne sound (see 6.4), and that of workrooms with reference to sound propagation parameters (see 6.3).