Australian Standard®

Mechanical vibration—Measurement and evaluation of human exposure to hand-transmitted vibration

Part 2: Practical guidance for measurement at the workplace

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- Association of Australian Acoustical Consultants
- Australasian Railway Association
- Australian Acoustical Society
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Institute of Occupational Hygienists
- Department of Defence
- Hire and Rental Industry Association of Australia
- Human Factors and Ergonomics Society of Australia
- NSW Department of Trade and Investment, Regional Infrastructure and Service
- Safe Work Australia
- University of Wollongong

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Part 2: Practical guidance for measurement at the workplace

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PREFACE

This Standard was prepared by the Standards Australia Committee AV-010, Vibration and Shock Human Effects, to supersede (in part) AS 2763—1988, *Vibration and shock—Hand-transmitted vibration—Guidelines for measurement and assessment of human exposure*.

The objective of this Standard is to prescribe procedures for the measurement and assessment of vibration in the workplace that are in keeping with the current best practice.

This Standard is identical with, and has been reproduced from ISO 5349-2:2001, *Mechanical vibration—Measurement and evaluation of human exposure to hand-transmitted vibration*, Part 2: *Practical guidance for measurement at the workplace.*

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this part of ISO 5349' should read 'this Australian Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO		AS ISO	
5349	Mechanical vibration—Measurement and evaluation of human exposure to hand-transmitted vibration	5349	Mechanical vibration—Measurement and evaluation of human exposure to hand-transmitted vibration,
5349-1	Part 1: General requirements	5349.	Part 1: General requirements

The term 'informative' has been used in this Standard to define the application of the annex to which it applies. An 'informative' annex is only for information and guidance.

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INTRODUCTION

Operating machinery may expose workers to hand-transmitted mechanical vibration which can interfere with comfort, working efficiency and, in some circumstances, health and safety. The general requirements for measuring and evaluating hand-transmitted vibration exposure are specified in ISO 5349-1. The aim of the present part of ISO 5349 is to provide practical guidelines in accordance with ISO 5349-1 to perform measurements correctly and to develop an effective strategy for measurement of hand-transmitted vibration at the workplace.

The use of the strategy described in this part of ISO 5349 will lead to a realistic picture of the daily exposure of the operator at the workplace and of the relevant uncertainties.

The evaluation of vibration exposure can be broken up into a number of distinct stages:

– identifying a series of discrete operations which make up the subject's normal working pattern;

– selection of operations to be measured;

– measuring the r.m.s. acceleration value for each selected operation;

– evaluation of the typical daily exposure time for each operation identified;

– calculating the 8-h energy-equivalent vibration total value (daily vibration exposure).

The evaluation of vibration exposure as described in ISO 5349-1 is solely based on the measurement of vibration magnitude at the grip zones or handles and exposure times. Additional factors, such as gripping and feed forces applied by the operator, the posture of the hand and arm, the direction of the vibration and the environmental conditions, etc. are not taken into consideration. This part of ISO 5349, being an application of ISO 5349-1, does not define guidance to evaluate these additional factors. However, it is recognized that reporting of all relevant information is important for the development of improved methods for the assessment of vibration risk.

AUSTRALIAN STANDARD

Mechanical vibration—Measurement and evaluation of human exposure to hand-transmitted vibration

Part 2:
Practical guidance for measurement at the workplace

1 Scope

This part of ISO 5349 provides guidelines for the measurement and evaluation of hand-transmitted vibration at the workplace in accordance with ISO 5349-1.

This part of ISO 5349 describes the precautions to be taken to make representative vibration measurements and to determine the daily exposure time for each operation in order to calculate the 8-h energy-equivalent vibration total value (daily vibration exposure). This part of ISO 5349 provides a means to determine the relevant operations which should be taken into account when determining the vibration exposure.

This part of ISO 5349 applies to all situations where people are exposed to vibration transmitted to the hand-arm system by hand-held or hand-guided machinery, vibrating workpieces, or controls of mobile or fixed machinery.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

ISO 2041, *Vibration and shock – Vocabulary*.

ISO 5349-1:2001, *Mechanical vibration – Measurement and evaluation of human exposure to hand-transmitted vibration – Part 1: General requirements.*

ISO 5805, *Mechanical vibration and shock – Human exposure – Vocabulary*.

ISO 8041, *Human response to vibration – Measuring instrumentation*.

ISO 8662 (all parts), *Hand-held portable power tools – Measurement of vibrations at the handle*.

3 Terms and definitions and symbols

3.1 Terms and definitions

For the purposes of this part of ISO 5349, the terms and definitions given in ISO 2041 and ISO 5805 and the following apply.

3.1.1
hand-fed machine
machine where the operator feeds workpieces to the working part of the machine, such that the vibration exposure is obtained through the hand-held workpiece

EXAMPLE band-saw, pedestal grinder

3.1.2
hand-guided machine
machine which is guided by the operator with his hands, such that the vibration exposure is obtained through the handles, steering wheel or tiller

EXAMPLE ride-on lawn mower, powered pallet truck, swing grinder

3.1.3
hand-held workpiece
workpiece which is held in the hand, such that vibration exposure is obtained through the hand-held workpiece rather than, or as well as, through the power tool handle

EXAMPLE casting held against a pedestal grinder, wood fed into a band-saw