



**SLOVENSKI STANDARD**  
**oSIST prEN ISO 5349-3:2025**  
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**Mehanske vibracije - Merjenje in vrednotenje izpostavljenosti ljudi pri prenosu vibracij na roke - 3. del: Izolirani in ponavljajoči se udarci s frekvenčnim območjem ISO 5349-1 (ISO/DIS 5349-3:2024)**

Mechanical vibration - Measurement and evaluation of human exposure to hand-transmitted vibration - Part 3: Isolated and repeated shocks using the frequency range of ISO 5349-1 (ISO/DIS 5349-3:2024)

Mechanische Schwingungen - Messung und Bewertung der Einwirkung von Schwingungen auf das Hand-Arm-System des Menschen - Teil 3: Isolierte und wiederholte Stöße im Frequenzbereich der ISO 5349-1 (ISO/DIS 5349-3:2024)

Vibrations mécaniques - Mesurage et évaluation de l'exposition des individus aux vibrations transmises à la main - Partie 3: Évaluation de chocs isolés ou répétés en utilisant la gamme de fréquences couverte par l'ISO 5349-1 (ISO/DIS 5349-3:2024)

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**Ta slovenski standard je istoveten z: prEN ISO 5349-3**

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**ICS:**

13.160	Vpliv vibracij in udarcev na ljudi	Vibration and shock with respect to human beings
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**en,fr,de**





# DRAFT International Standard

## ISO/DIS 5349-3

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

#### Part 3: Isolated and repeated shocks using the frequency range of ISO 5349-1

ICS: 13.160

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## ISO/DIS 5349-3:2024(en)

### 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 4, *Human exposure to mechanical vibration and shock*.

A list of all parts in the ISO 5349 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## ISO/DIS 5349-3:2024(en)

### Introduction

The risk estimation for hand-arm vibration injury is based on ISO 5349-1. The scope of the 2001 revision of that ISO Standard notes that “the time dependency for human response to repeated shocks is not fully known” and the application of ISO 5349-1 to such vibration is to be “made with caution”.

Despite the lack of knowledge in this field, it is desirable to standardise methods for evaluating hand-transmitted shock (HTS) vibrations from hand-held and hand-guided machinery, and specifically provide a metric suitable for evaluating the peak amplitude of acceleration signals. This document gives guidance for evaluating HTS in the frequency range covered by ISO 5349-1.

NOTE European Regulations relating to machinery safety require (from 2027) manufacturers or suppliers to provide values for the “mean of the peak amplitude of the acceleration” from repeated HTS.

The objective for this document is to:

- enhance research on health effects from HTS;
- provide machine manufactures and user a method for evaluating hand-transmitted shock;
- encourage and enable:
  - machine producers to reduce hand-transmitted shock;
  - the development of mitigation measures on existing tools;
  - the reduction of hand-transmitted isolated and repeated shock vibration exposures in the workplace.

The use of this document will contribute to the gathering of consistent HTS data to improve occupational safety. There is currently no clear evidence that HTS produces specific health effects beyond those associated with hand-transmitted vibration or presents a risk of developing other musculoskeletal injuries to the hand and arm such as repetitive strain injury and carpal tunnel syndrome. The systematic measurement and reporting of parameters relating to HTS may provide evidence of associations with individual health effects.

This document specifies the general requirements for the measurement and evaluation of human exposure to HTS. It builds on the requirements of ISO 5349-1 and measurement guidance in ISO 5349-2. It uses instrumentation that conforms to the requirements of ISO 8041-1. The current version ISO 8041-1:2017 does not require measurement of the peak value of acceleration for hand-transmitted vibration, however, the instrumentation conforming to ISO 8041-1:2017, should provide some confidence in measurements of the metrics defined here.

This document is based on measurements in the frequency range covered by ISO 5349-1 (nominally 6,3 Hz to 1 250 Hz). An additional Technical Specification is being prepared that enables both hand-transmitted vibration (HTV) and HTS evaluations to include vibration frequencies much higher than the 1 250 Hz limit of ISO 5349-1.





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

## Part 3: Isolated and repeated shocks using the frequency range of ISO 5349-1

### 1 Scope

This document gives information and guidance on the evaluation and assessment of hand-transmitted shock. For the purposes of this document, hand-transmitted shock is any impactive or impulsive vibration that the machine or tool produces as a sequence of single events (isolated shocks) linked by periods of no, or lower vibration.

This document defines parameters for the evaluation of machinery emissions of hand-transmitted shocks in the frequency range covered by ISO 5349-1 (nominally 6,3 Hz to 1 250 Hz).

NOTE It is recognised that shock vibration often includes substantial levels of high-frequency vibration energy. The measured peak values of hand-transmitted shock are likely to be higher if the upper frequency limit is increased. High-frequency shocks, composed of vibrations at frequencies greater than 1 250 Hz, are dealt with in ISO/PWI TS 5349-4.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2041, *Mechanical vibration, shock and condition monitoring — Vocabulary*

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

ISO 5349-2, *Mechanical vibration — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 2: Practical guidance for measurement at the workplace*

ISO 8041-1:2017, *Human response to vibration — Measuring instrumentation — Part 1: General purpose vibration meters*

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5349-1, ISO 5349-2, ISO 8141-1, ISO 2041 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

## ISO/DIS 5349-3:2024(en)

### 3.1

#### **shock**

sudden change of force, position, velocity or acceleration occurring in a time less than, or similar to, that corresponding to the natural frequency of a component of a machine or biological system and excites disturbances in that component

### 3.2

#### **shock vibration**

vibration caused by events that generate shocks

### 3.3

#### **isolated shock**

single shock vibration or isolated shock hand-transmitted vibrations clearly separated in time

### 3.4

#### **repeated shock**

sequences of hand-transmitted shock vibrations linked by periods of no, or low vibration level

Note 1 to entry: The sequences of repeated shock may be at regular or irregular intervals.

### 3.5

#### **continuous shock vibration**

continuous sequences of hand-transmitted shock vibration linked by periods where the vibration level does not decay significantly between individual shocks

### 3.6

#### **$W_h$ frequency weighting**

$W_h$  frequency weighting as specified in ISO 8041-1

### 3.7

#### **flat<sub>h</sub> frequency weighting**

band-limiting component of the  $W_h$  frequency weighting as specified in ISO 8041-1

### 3.8

#### **vibration peak magnitude**

#### **VPM**

a value representing the mean value of the peak amplitude of the acceleration

## 4 Symbols and abbreviated terms

HTS	hand-transmitted shock vibration
$a_F$	flat <sub>h</sub> acceleration Acceleration which is frequency weighted using the flat <sub>h</sub> frequency weighting.
$a_{F, peak}$	peak value or peak amplitude of flat <sub>h</sub> frequency weighted triaxial acceleration For any specified time interval $0 \leq t \leq T_m$ , the peak value of $a_F(t)$ is the maximum absolute instantaneous value, as given by: $a_{F, peak} = \max_{0 \leq t \leq T} ( a_{Fv}(t) )$
NOTE 1	This quantity is used to describe the maximum amplitude of the flat <sub>h</sub> band-limited triaxial acceleration.