



BSI Standards Publication

Mechanical vibration and shock — Hand-arm vibration — Measurement and evaluation of the vibration transmissibility of gloves at the palm of the hand

National foreword

This British Standard is the UK implementation of EN ISO 10819:2013+A2:2022. It is identical to ISO 10819:2013 incorporating amendment 1:2019 and 2:2021. It supersedes BS EN ISO 10819:2013+A1:2019, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee GME/21/6, Human exposure to mechanical vibration and shock.

A list of organizations represented on this committee can be obtained on request to its committee manager.

BSI, as a member of CEN, is obliged to publish EN ISO 10819:2013+A2:2022 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval.

The UK Technical Committee GME/21/6, which includes technical specialists from the Health and Safety Executive, agrees that gloves passing the test defined in this standard do not normally provide any protection from vibration, and can increase the risk from vibration transmitted to the fingers.

In the opinion of the UK committee, the pictogram defined in this standard ([Figure B.1](#)) does not convey appropriate information on the control of vibration risk. It cannot replace a risk assessment by the employer or guarantee conformity with health and safety regulations.

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UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

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Amendments/corrigenda issued since publication

Date	Text affected
31 August 2015	Implementation of CEN Correction Notice 7 August 2013: the European foreword now contains information regarding the background of the project
28 February 2019	Implementation of ISO amendment 1:2019 with CEN endorsement A1:2019
30 November 2022	Implementation of ISO amendment 2:2021 with CEN endorsement A2:2022

English Version

**Mechanical vibration and shock - Hand-arm vibration
- Measurement and evaluation of the vibration
transmissibility of gloves at the palm of the hand
(ISO 10819:2013)**

Vibrations et chocs mécaniques - Vibrations
main-bras - Mesurage et évaluation du facteur
de transmission des vibrations par les gants
à la paume de la main (ISO 10819:2013)

Mechanische Schwingungen und Stöße - Hand-
Arm-Schwingungen - Messung und Bewertung
der Schwingungsübertragung von Handschuhen
in der Handfläche ISO 10819:2013)

This European Standard was approved by CEN on 29 May 2013.

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European foreword

This document (EN ISO 10819:2013) has been prepared by Technical Committee ISO/TC 108 "Mechanical vibration, shock and condition monitoring" in collaboration with Technical Committee CEN/TC 231 "Mechanical vibration and shock" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 10819:1996.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive.

For relationship with EU Directive, see informative [Annex ZA](#), which is an integral part of this document.

The main changes to the first edition EN ISO 10819:1996 are stronger criteria for antivibration gloves and the addition of a method for measuring the material thickness.

To place anti-vibration gloves on the market of the European Union (EU), manufacturers or their authorised representatives established within the EU shall make sure that they cover all Basic Health and Safety Requirements (BHSRs) applicable to their products under the foreseeable conditions of use for which such Personal Protective Equipment (PPE) is intended (EU Directive 89/686/EEC on PPE). If the relevant harmonized European Standards do not cover all applicable BHSRs they have, in addition to the application of these standards, to assess the conformity to those BHSRs not covered by using other relevant technical specifications and test methods.

This European Standard EN ISO 10819 is intended to confirm the vibration reducing properties of gloves placed on the EU market as anti-vibration gloves.

To mark anti-vibration gloves with the CE conformity mark they must also satisfy the BHSRs of the PPE Directive using harmonised European Standards, such as EN 388 and EN 420. As such, manufacturers or their authorised representatives established within the EU shall make an application for type-examination to an approved inspection body (notified body).

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Endorsement notice

The text of ISO 10819:2013 has been approved by CEN as EN ISO 10819:2013 without any modification.

Foreword to amendment A1

This document (EN ISO 10819:2013/A1:2019) has been prepared by Technical Committee ISO/TC 108 "Mechanical vibration, shock and condition monitoring" in collaboration with Technical Committee CEN/TC 231 "Mechanical vibration and shock" the secretariat of which is held by DIN.

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Endorsement notice

The text of ISO 10819:2013/Amd 1:2019 has been approved by CEN as EN ISO 10819:2013/A1:2019 without any modification.

European foreword to amendment 2

This document (EN ISO 10819:2013/A2:2022) has been prepared by Technical Committee ISO/TC 108 "Mechanical vibration, shock and condition monitoring" in collaboration with Technical Committee CEN/TC 231 "Mechanical vibration and shock" the secretariat of which is held by DIN.

This Amendment to the European Standard EN ISO 10819:2013 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2023, and conflicting national standards shall be withdrawn at the latest by April 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request M/571/C(2020) 7924 final given to CEN/CENELEC by the European Commission and the European Free Trade Association, and supports the essential health and safety requirements of Regulation (EU) 2016/425.

For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 10819:2013/Amd 2:2021 has been approved by CEN as EN ISO 10819:2013/A2:2022 without any modification.

Annex ZA
(informative)

Relationship between this European Standard and the essential health and safety requirements of Regulation (EU) 2016/425 aimed to be covered

This document has been prepared under a Commission’s standardization request M/571/C(2020) 7924 final to provide one voluntary means of conforming to essential health and safety requirements of Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment.

Once this standard is cited in the Official Journal of the European Union under that Regulation (EU) 2016/425, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential health and safety requirements of that Regulation (EU) 2016/425 and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Annex II of Regulation (EU) 2016/425

Essential health and safety Requirements of Regulation (EU) 2016/425	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
3.1.3 Mechanical vibration	Clause 9	None

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

Contents

Page

Foreword	vii
Introduction	viii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and abbreviations	2
5 Measuring principle and equipment	3
5.1 General principle and setup	3
5.2 Measuring equipment	4
5.2.1 General requirements	4
5.2.2 Transducer mounting	4
5.2.3 Frequency analyses	5
5.2.4 Grip force measuring system	5
5.2.5 Feed force measuring system	5
5.3 Vibration excitation system	6
5.3.1 Characteristics of the instrumented handle	6
5.3.2 Position of the excitation system	7
5.3.3 Performance	7
6 Measurement conditions and procedure	7
6.1 Measurement conditions	7
6.1.1 Test subjects	7
6.1.2 Test gloves	7
6.1.3 Test conditions	7
6.1.4 Test subject's posture	7
6.1.5 Position of the palm adaptor in glove vibration transmissibility tests	8
6.2 Vibration signal	9
6.3 Test procedure	11
6.3.1 Preparation	11
6.3.2 Measurements with the bare adaptor	11
6.3.3 Measurements with gloved hand	12
6.3.4 Measurements with resilient material	12
6.3.5 Required number of tests	12
7 Evaluation of results	12
7.1 Calculation of transmissibility	12
7.1.1 General	12
7.1.2 One-third-octave frequency ranges	13
7.1.3 Frequency-weighted acceleration values	13
7.2 Bare palm adaptor vibration transmissibility	14
7.2.1 One-third-octave vibration transmissibility	14
7.2.2 Frequency-weighted vibration transmissibility	15
7.3 Uncorrected glove vibration transmissibility	15
7.3.1 One-third-octave vibration transmissibility	15
7.3.2 Frequency-weighted vibration transmissibility	16
7.4 Corrected glove vibration transmissibility	16
7.4.1 One-third-octave vibration transmissibility	16
7.4.2 Frequency-weighted vibration transmissibility	16
8 Calculation of statistical values	16
8.1 General	16
8.2 One-third-octave vibration transmissibility	17
8.3 Frequency-weighted vibration transmissibility	17
9 Criteria for designating gloves as antivibration gloves	17

ISO 10819:2013+A2:2021

9.1	General.....	18
9.2	Vibration transmissibility of the gloves.....	18
9.3	Construction of the gloves.....	18
9.3.1	Glove vibration-reducing material thickness.....	18
9.3.2	Measurement of the thickness of the glove vibration-reducing material.....	19
9.3.3	Lacks (gaps) in the vibration-reducing material.....	21
9.3.4	Requirements within the European Union	21
10	Test report.....	21
Annex A (informative) Examples of handles with force and acceleration measuring systems		23
A1 Annex B (normative) Further requirements for protective gloves against vibration		26
A2 Annex C (normative) Test procedure for verification of the gaps (interspace) between the vibration-reducing material.....		29 A2
Bibliography		33

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, www.iso.org/directives.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received, www.iso.org/patents.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 4, *Human exposure to mechanical vibration and shock*.

This second edition cancels and replaces the first edition (ISO 10819:1996), of which it constitutes a technical revision. The main changes are stronger criteria for antivibration gloves and the addition of a method for measuring the material thickness.

Introduction

Because of the growing demand to reduce health risks associated with exposure to hand-transmitted vibration, gloves with vibration-reducing materials are often used to attenuate vibration transmitted to the hands. These gloves normally provide little reduction in hand-transmitted vibration at frequencies below 150 Hz. Some gloves can increase the vibration transmitted to the hands at these low frequencies. Gloves with vibration-reducing materials that meet the requirements of this International Standard to be classified as an antivibration glove can be expected to reduce hand-transmitted vibration at frequencies above 150 Hz. These gloves can reduce but not eliminate health risks associated with hand-transmitted vibration exposure.

Field observations indicate that gloves with vibration-reducing materials can result in positive and negative health effects. Positive health effects can occur with gloves that reduce finger tingling and numbness and that keep the hands warm and dry. Negative health effects can occur with gloves that increase the vibration transmitted to the hands at low frequencies and that increase hand and arm fatigue because they increase the hand grip effort required to control a vibrating machine.

Gloves tested in accordance with the requirements of this International Standard are evaluated in a controlled laboratory environment. The actual vibration attenuation of a glove in a work environment can differ from that measured in a controlled laboratory environment.

Vibration transmissibility measurements made in accordance with the requirements of this International Standard are performed only at the palm of the hand. The transmission of vibration to the fingers is not measured. When evaluating the effectiveness of a glove with a vibration-reducing material used to reduce vibration transmitted to the hand, vibration transmission to the fingers should also be assessed. However, research subsequent to the publication of this International Standard is needed to develop a measurement procedure that can be used to measure the vibration transmissibility of gloves at the fingers.

The measurement procedure specified in this International Standard only addresses glove properties that can reduce health risks associated with hand-transmitted vibration in work environments. It does not address glove properties necessary to reduce other hand-related health and safety risks in work environments.

The measurement procedure specified in this International Standard can also be used to measure the vibration transmissibility of a material that is being evaluated for use to cover a handle of a machine or for potential use in a glove.

Mechanical vibration and shock - Hand-arm vibration - Measurement and evaluation of the vibration transmissibility of gloves at the palm of the hand

WARNING — This International Standard defines a screening test procedure for measuring the vibration transmission through gloves with an embedded vibration-reducing material. Many factors not addressed in this International Standard can influence the transmission of vibration through these gloves. Therefore, use the vibration transmissibility values obtained in accordance with this International Standard with caution in the assessment of the vibration-reducing effects of gloves.

1 Scope

This International Standard specifies a method for the laboratory measurement, data analysis, and reporting of the vibration transmissibility of a glove with a vibration-reducing material that covers the palm, fingers, and thumb of the hand. This International Standard specifies vibration transmissibility in terms of vibration transmitted from a handle through a glove to the palm of the hand in one-third-octave frequency bands with centre frequencies of 25 Hz to 1 250 Hz.

The measurement procedure specified in this International Standard can also be used to measure the vibration transmissibility of a material that is being evaluated for use to cover a handle of a machine or for potential use in a glove. However, results from this test cannot be used to certify that a material used to cover a handle meets the requirements of this International Standard to be classified as an antivibration covering. A material tested in this manner could later be placed in a glove. When this is the case, the glove needs to be tested in accordance with the measurement procedure of this International Standard and needs to meet the vibration attenuation performance requirements of this International Standard in order to be classified as an antivibration glove.

NOTE ISO 13753^[1] defines a method for screening materials used for vibration attenuation on the handles of machines and for gloves.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *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*

IEC 61260, *Electroacoustics — Octave-band and fractional-octave-band filters*

EN 388:2016, *Protective gloves against mechanical risks*

EN 420+A1:2009, *Protective gloves — General requirements and test methods*

3 Terms and definitions

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

3.1

glove vibration transmissibility

ratio of the acceleration measured on the palm adaptor of the gloved hand to the acceleration measured on the instrumented handle

Note 1 to entry: Glove vibration transmissibility values greater than 1 indicate that the glove amplifies the vibration, and values lower than 1 indicate that the glove attenuates the vibration.

4 Symbols and abbreviations

The following symbols and abbreviations are used.

$a_{h(Pb)}(f_i)$	unweighted r.m.s. acceleration measured on the bare adaptor in the i th one-third-octave band
$a_{h(Pb_{x,y,z})}(f_i)$	value of $a_{h(Pb)}(f_i)$ on three mutually orthogonal axes, respectively
$a_{h(Pg)}(f_i)$	unweighted r.m.s. acceleration measured on the palm adaptor of the gloved hand in the i th one-third-octave band
$a_{h(Pg_{x,y,z})}(f_i)$	value of $a_{h(Pg)}(f_i)$ on three mutually orthogonal axes, respectively
$a_{h(S)}(f_i)$	unweighted r.m.s. acceleration for spectrum S in the i th one-third-octave band
$a_{hw(S)}(f_i)$	frequency-weighted r.m.s. acceleration for spectrum S in the i th one-third-octave band
$a_R(f_i)$	unweighted r.m.s. acceleration measured at the reference position on the handle in the i th one-third-octave band
$C_{V,T}(f_i)$	coefficient of variation for the corrected handle-gloved hand transmissibility in the i th one-third-octave band
$C_{V,T}(S)$	coefficient of variation for the handle-gloved ISO-weighted hand transmissibility for spectrum S
f_i	centre frequency of the i th one-third-octave band
H	subscript representing one-third-octave frequency bands from 200 Hz to 1 250 Hz
i_L	frequency band number of the lowest one-third-octave band associated with each spectrum S according to Table 2
i_U	frequency band number of the uppermost one-third-octave band associated with each spectrum S according to Table 2
M	subscript representing one-third-octave frequency bands from 25 Hz to 200 Hz
S	spectrum, $S = S_M$ or S_H
$s_T(f_i)$	standard deviation for the corrected handle-gloved hand transmissibility in the i th one-third-octave band
$s_T(S)$	standard deviation for the handle-gloved ISO-weighted hand transmissibility for spectrum S
$T_b(f_i)$	handle-adaptor bare adaptor transmissibility in the i th one-third-octave band
$T_g(f_i)$	handle-gloved hand transmissibility in the i th one-third-octave band