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AMENDMENT 1
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Mechanical vibration and shock — Hand-arm vibration — Measurement and evaluation of the vibration transmissibility of gloves at the palm of the hand

AMENDMENT 1

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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

AMENDEMENT 1

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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.*

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

AMENDMENT 1

Clause 2

Replace the last two normative references listed with the following:

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

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

6.1.1

Replace the text with the following:

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Five adults with hand sizes between 7 and 10, as specified by EN 420+A1, shall serve as test subjects. The test subjects shall use their dominant hand for the glove vibration transmissibility tests.

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6.1.3

Replace list item f) with the following:

f) Fitting of gloves — the size of the gloves shall be chosen according to EN 420+A1.

6.3.2

Replace Table 1 with the following table:

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Table 1 — Required handle acceleration values

Frequency f_i Hz	Acceleration PSD value P_{zz} $(m/s^2)^2/Hz$	Acceleration tolerance in the one-third octave band dB	One-third-octave acceleration value m/s^2
25	0,709	±2	2,03
31,5	0,893	±1	2,55
40	1,134	±1	3,23
50	1,417	±1	4,05
63	1,786	±1	5,10
80	2,268	±1	6,45
100	2,835	±1	8,09
125	3,543	±1	10,15
160	4,535	±1	12,88
200	5,669	±1	16,16
250	7,087	±1	20,27
315	8,521	±1	24,94
400	9,179	±1	29,04
500	9,179	±1	32,58
630	8,555	±1	35,29
800	7,069	±1	36,00
1 000	4,994	±1	33,95
1 250	2,905	+2 −∞	29,05
Unweighted acceleration (without 1 250 Hz)			90,42
Frequency-weighted acceleration			4,91
Frequency-weighted acceleration tolerance			±0,50

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9.3.4

Replace the text with the following:

9.3.4 Requirements within the European Union

Gloves that are designated as protective gloves against vibration according to this document that will be used in workplace environments in the European Union shall meet the minimal requirements for mechanical risks specified in EN 388 and the requirements specified in Annex B.

NOTE Further requirements can apply in the European Union.

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Annex A

Add the following annex after Annex A.

Annex B
(normative)
Further requirements for protective gloves against vibration

B.1 General

The application of this annex is optional for gloves that are to be used outside the European Union. The requirements of this annex are compulsory only for protective gloves against vibration designated to be used in workplace environments in the European Union.

NOTE These specific requirements are derived from the general requirements for protective gloves given in EN 420+A1 and from the requirements for protective gloves against mechanical risks given in EN 388.

B.2 Information supplied by the manufacturer

Information supplied by the manufacturer for each type of protective glove against vibration shall be precise, legible and comprehensive, and shall be provided at least in the official language(s) of the country of destination.

Besides the information according to EN 420+A1, the information supplied by the manufacturer shall also include the following:

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a) the corrected arithmetic mean transmissibility combined for five test subjects as reported in Clause 10 i) 1);

b) a warning that the use of a protective glove does not imply a sufficient protection against health risks due to vibration or other factors. In addition, the measured vibration attenuation results cannot be used to calculate daily vibration exposure values within a risk assessment, e.g. according to ISO 5349-1;

c) the useful life in relation to the conditions of use; see B.5;

d) if applicable, the shelf life or date of obsolescence; see B.5;

e) if applicable, conditions under which the glove is able to absorb Chromium VI from the environment; see B.6.

Additionally, the following information should be provided:

f) the limits of use, for example that a reduction in vibration should not be expected during the use with low-frequency tools (i.e. tools with main excitation below 150 Hz);

g) how impairment of the glove's efficacy can be detected, for example when the outer material is damaged.

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B.3 Marking

In addition to the marking according to EN 420+A1 (pictogram according to EN 388 with performance levels), the pictogram shown in Figure B.1 may be used for marking of protective gloves against vibration:

Figure B.1 — ISO 7000-3634

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B.4 Mechanical properties

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The following four mechanical properties shall be tested in accordance with EN 388:

1) abrasion resistance;
2) blade cut resistance (only for the surface material; see below);
3) tear resistance;
4) puncture resistance.

The methods for testing the abrasion resistance and the blade cut resistance specified in EN 388 are unsuitable for the entire protective glove against vibration. These tests shall therefore be performed only on the surface material of the glove. In case the design of the glove does not permit separation of the surface material, the manufacturer shall supply the latter separately.

NOTE 1 Although cut protection is often assured by the damping material, the ingress of moisture and dirt following damage to the surface can modify the material properties, and displacement of the damping material can impair the vibration attenuation properties.

Protective gloves against vibration shall have at least performance level 1 according to EN 388:2016, Table 1, for all four requirements, but performance level 2 is recommended. Protective gloves against vibration having only performance level 1 should be provided with the information that their use would be impaired with regard to their mechanical stability.

NOTE 2 The required performance level 1 is reasonable since the gloves are also exposed to mechanical influences when vibrating equipment is used.

B.5 Useful life and date of obsolescence

NOTE The vibration attenuation properties of protective gloves against vibration can be modified by ageing, absorption of moisture, the effect of temperature and creeping, and high contact pressures.

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The useful life (see EN 420+A1:2009, 7.2.1.2) shall be stated in relation to the conditions of use. The useful life shall end when values have fallen to 20 % below the vibration attenuation results as stated in the test report; see Clause 10 i) and B.2.

If the vibration attenuation properties of the protective glove against vibration can be significantly affected by ageing, i.e. if values decrease within a year after glove production and before use, by more than 20 % of the vibration attenuation results as stated in the test report [see Clause 10 i)], a date of obsolescence (see EN 420+A1:2009, 7.2.3) shall be indicated on gloves and packaging; see B.2.

The limit of useful life is reached, for example, when the outer material of the gloves is damaged.

B.6 Chromium VI content

For protective gloves against vibration containing leather, the conditions under which the gloves are able to absorb Chromium VI from the environment shall be stated in the information supplied by the manufacturer (see B.2). Besides, the Chromium VI content shall be observed in accordance with EN 420+A1:2009, 4.3.3.

Bibliography

Add the following entry to the Bibliography and renumber subsequent entries accordingly:

[1] ISO 7000, *Graphical symbols for use on equipment — Registered symbols*

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