



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18703-2021

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

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 18703-2002 "Measurement and Evaluation of Vibration Transmissibility of Glove Palm", and is consistent with GB/T 18703-2002

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Changed the scope (see Chapter 1, Chapter 1 of the.2002 edition);
- Added the content of symbols and abbreviations (see Chapter 4, 4.1, 4.2 of the.2002 edition);
- Changed the schematic diagram of the vibration transmission rate measurement (see Figure 1, Figure 1 of the.2002 edition);
- Added the technical description of the calibration of the handle system (see 5.2.2.2);
- Changed the range, measurement error and display integration time of the grip force sensor (see 5.2.4, 5.2.4 of the.2002 edition);
- Changed the measurement error and display integration time of the feed force sensor (see 5.2.5, 5.2.5 of the.2002 edition);
- Added "angle and indication mark" in Figure 5 (see Figure 5, Figure 5 of the.2002 edition);
- Deleted the "two vibration signals (M and N) spectrum measured at the handle" (see Figure 6 in the.2002 edition);
- Added "Schematic diagram of palm adapter calibration at the top of the handle" (see Figure 6);
- Added "handle acceleration power spectral density spectrum" and "1/3 octave handle acceleration value graph" (see Figure 8, Figure 9);
- Added the "required handle acceleration value list" (see Table 1);
- Added "Measurement of Elastic Materials" and "Requirements for Measurement Quantity" (see 6.3.4 and 6.3.5);
- Deleted the "principle of determining the average corrected transmission rate" (see Figure 7 in the.2002 edition);
- Added the "flow chart for determining the average corrected transfer rate value, standard deviation, and coefficient of variation" (see Figure 10);
- Added "frequency-weighted acceleration value", "bare adapter vibration transmission rate", "uncorrected glove vibration transmission rate", and "corrected hand Set of vibration transmission rate" "Statistical value calculation" and its calculation method

(see 7.1.3, 7.2, 7.3, 7.4, Chapter 8);

--- Changed the judgment index value of glove vibration transmission rate T(M) (see 9.2, 2002 edition 7.2);

--- Deleted the "transmission rate of narrowband analysis" (see 7.3.3 of the 2002 edition);

--- Added "criteria for determining gloves as anti-vibration gloves" (see Chapter 9);

--- Added the content and requirements of the test report (see Chapter 10, Chapter 8 of the 2002 edition);

--- Deleted Appendix A and Appendix C of the 2002 edition (see Appendix A and Appendix C of the 2002 edition);

--- Changed the content of Appendix B, and adjusted to Appendix A (see Appendix A, Appendix B of the 2002 edition).

This standard uses the redrafting method to amend and adopt ISO 10819:2013 "Mechanical Vibration and Shock Hand-transmitted Vibration Gloves Palm Vibration Transmission"

Measurement and evaluation of transfer rate.

Compared with ISO 10819:2013, there are technical differences between this standard and the corresponding technical differences and their reasons as follows.

--- Regarding normative reference documents, this standard has made adjustments with technical differences to adapt to my country's technical conditions and adjustments.

The situation is collectively reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

* Replace ISO 2041 with GB/T 2298, which is equivalent to the international standard (see Chapter 3);

* Replace ISO 5805 with GB/T 15619, which is equivalent to adopting international standards (see Chapter 3);

* Replace ISO 5349-1 with GB/T 14790.1, which is equivalent to the international standard (see Chapter 4);

* Replace ISO 8041 (see 5.2.1) with GB/T 23716 which is equivalent to adopting international standards;

* Replace IEC 61260 (see 5.2.3) with GB/T 3241 modified to adopt international standards;

* Delete EN388;

* Use GB/T 16252-1996 instead of EN420 (see 6.1).

---Changed the size of the hand size suitable for adults in my country (see 6.1.1, 6.1.3).

--- Delete 9.3.4 in ISO 10819:2013, which is an international

Technical conditions.

Introduction

As people's requirements for reducing the health hazards of exposure to hand-transmitted vibrations are gradually increasing, gloves with vibration damping materials are usually used for

Attenuate the vibration transmitted to the hand. When the vibration frequency is lower than 150Hz, this kind of gloves can usually only weakly reduce the hand-transmitted vibration.

The sleeve may even increase the vibrations transmitted to the hand. According to the classification requirements of this standard, anti-vibration gloves with anti-vibration materials can attenuate the vibration frequency

Vibration transmitted to the hand when the frequency is higher than 150 Hz. Such gloves can reduce but not eliminate the health risks of exposure to hand-borne vibration.

Field observations show that gloves with damping materials can cause both positive and negative health effects. The positive side is that it can reduce fingers

The tingling and numbness keep the hands warm and dry. The negative effect is that it can increase the vibration transmitted to the hand during low-frequency vibration, and

Moreover, since wearing anti-vibration gloves to control the vibration machine needs to increase the grip strength, it also increases the fatigue of the hands and arms.

The evaluation of the anti-vibration performance of gloves according to the requirements of this standard is carried out in a controlled laboratory environment. The actual vibration reduction of gloves in the working environment is

Measurement results in a controlled laboratory environment may vary.

According to the requirements of this standard, the measurement of vibration transmission rate is only for the palm, and the vibration transmission rate of the fingers is not within the measurement range.

When evaluating the damping effect of gloves with damping materials, it is also appropriate to evaluate the vibration transmitted to the fingers. After the publication of this standard, follow-up studies are needed.

This measurement method is used to measure the vibration transmission rate of the finger part of the glove.

The measurement methods specified in this standard only involve the characteristics of