



BSI Standards Publication

Protective gloves against mechanical risks

National foreword

This British Standard is the UK implementation of [ISO 23388:2018](#).

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

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Protective gloves against mechanical risks

Gants de protection contre les risques mécaniques





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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).

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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.

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 13, *Protective clothing*.

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.

Introduction

This first edition of [ISO 23388](#) was developed based on the [EN 388:2016](#) including a proposed amendment to [EN 388](#) regarding the cotton canvas ([6.2.5](#)). This adoption of [EN 388](#) in to ISO was done at the request of many non-EU countries. At the ISO/TC 94/SC 13 plenary, it was agreed to adopt at ISO the [EN 388](#) without changes but to keep any comments until the next revision date as the document has just been revised at EU level.

Protective gloves against mechanical risks

1 Scope

This document specifies requirements, test methods, marking and information to be supplied for protective gloves against the mechanical risks of abrasion, blade cut, tear, puncture and, if applicable, impact.

This document is intended to be used in conjunction with ISO 21420.

The test methods developed in this document can also be applicable to arm protectors.

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

ISO/IEC Guide 98-4, *Uncertainty of measurement — Part 4: Role of measurement uncertainty in conformity assessment*

ISO 1139, *Textiles — Designation of yarns*

[ISO 4649:2010](#), *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

[ISO 5084](#), *Textiles — Determination of thickness of textiles and textile products*

[ISO 5725-2](#), *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

[ISO 7211-1](#), *Textiles — Woven fabrics — Construction — Methods of analysis — Part 1: Methods for the presentation of a weave diagram and plans for drafting, denting and lifting*

[ISO 7211-4](#), *Textiles — Woven fabrics — Construction — Methods of analysis — Part 4: Determination of twist in yarn removed from fabric*

[ISO 7211-5](#), *Textiles — Woven fabrics — Construction — Method of analysis — Part 5: Determination of linear density of yarn removed from fabric*

[ISO 7500-1](#), *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

[ISO/TR 11827](#), *Textiles — Composition testing — Identification of fibres*

[ISO 12947-1](#), *Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1: Martindale abrasion testing apparatus*

[ISO 13934-1](#), *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method*

[ISO 13997:1999](#), *Protective clothing — Mechanical properties — Determination of resistance to cutting by sharp objects*

ISO 21420, *Protective gloves — General requirements and test methods*

[EN 1049-2](#), *Textiles — Woven fabrics — Construction — Method of analysis — Part 2: Determination of number of threads per unit length*

[EN 12127](#), *Textiles — Fabrics — Determination of mass per unit area using small samples*

[EN 13594:2015](#), *Protective gloves for motorcycle riders — Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1 **abrasion cycle**

completion of all the translational abrasion movements tracing a Lissajous figure comprising 16 rubs, i.e. 16 revolutions of the two outer drives and 15 revolutions of the inner drive of the Martindale abrasion tester

Note 1 to entry: An abrasion rub is one revolution of the outer drives of the Martindale abrasion tester (see [ISO 12947-1](#)).

[SOURCE: ISO 12947-1:1998, 3.2]

3.2 **arm**

part of the body between the wrist and the shoulder

3.3 **arm protector**

protective sleeve separate from the glove or the clothing that provides protection against at least one of the following mechanical risks: abrasion, blade cut, tear and puncture

3.4 **glove made from several layers**

glove that is made from two or more layers of materials

3.5 **glove made from several un-bonded layers**

glove that is made from two or more layers of materials which are not connected together, after preparing the sample for the test

3.6 **glove made from several bonded layers**

glove that is made from two or more layers of materials which are connected together (e.g. glued, stitched, dipped, impregnated) after preparing the sample for the test

3.7 **glove providing a specific protection**

glove that is designed to provide an area of improved protection for the whole hand or part of it

Note 1 to entry: For example, palm protection style or protection against impact.

3.8

glove series

single glove style or glove type with the same palm material up to the wrist line where the only variants are size, length, left/right hand and colour

3.9

protective glove against mechanical risks

glove that provides protection against at least one of the following mechanical risks: abrasion, blade cut, tear and puncture

4 Requirements

4.1 General

The protective gloves according to this document shall first meet all the applicable requirements of ISO 21420.

All specimens shall be taken from the palm of different gloves for classification purposes. For arm protectors, specimens shall be taken from the area for which protection is claimed.

A protective glove against mechanical risks shall have performance level of 1 or above for at least one of the properties (abrasion, blade cut, tear and puncture) [Table 1](#) or at least level A of the cut test of [ISO 13997:1999](#) (e.g. TDM) in [Table 2](#).

Gloves meeting the requirements for resistance to puncture may not be suitable for protection against sharply pointed objects such as hypodermic needles.

Table 1 — Levels of performance

Test	Level 1	Level 2	Level 3	Level 4	Level 5
6.1 Abrasion resistance (number of rubs)	100	500	2 000	8 000	—
6.2 Coupe test: Blade cut resistance (index)	1,2	2,5	5,0	10,0	20,0
6.4 Tear resistance (N)	10	25	50	75	—
6.5 Puncture resistance (N)	20	60	100	150	—

Table 2 — Levels of performance for materials tested with ISO 13997

	Level A	Level B	Level C	Level D	Level E	Level F
6.3 Cut resistance (N) (ISO 13997)	2	5	10	15	22	30

NOTE 2 There is no correlation between the levels of performance obtained with the [6.2](#) and [6.3](#) test methods.

NOTE 3 Uncertainty of measurement, see [Annex B](#).

If relevant, additional areas of the protective glove shall be tested (e.g. for gloves providing specific protection or for areas which provide lower protection) and the results shall be reported in the user instructions.

4.2 Additional protection (Optional)

4.2.1 General

A glove, whether made of a single layer or made from several layers (bonded or unbonded), providing a specific protection can be claimed when the gloves conform to the requirements defined in the following clause(s).