
Rubber household gloves — General requirements and test methods

Gants de ménage en caoutchouc — Exigences générales et méthodes d'essai

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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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Rubber household gloves — General requirements and test methods

1 Scope

This document specifies the general requirements and relevant test methods for gloves made of natural rubber latex or synthetic rubber latex or blends of natural rubber and synthetic rubber lattices intended for household use.

This document is intended to serve as a guide to obtain gloves of consistent performance. It does not cover safe and proper application of the gloves with subsequent handling, packaging and storage procedures.

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 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress–strain properties*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3071, *Textiles — Determination of pH of aqueous extract*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical 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:

— IEC Electropedia: available at <http://www.electropedia.org/>

— ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 hand

part of the body from the tip of the middle finger to the wrist

3.2 glove

equipment which protects the *hand* (3.1) or part of the hand against hazards

Note 1 to entry: It can additionally cover part of the forearm and arm.

3.3 glove palm

part of the *glove* (3.2) which covers the palm of the *hand* (3.1), i.e. from the wrist to the base of the fingers

3.4 glove back

part of the *glove* (3.2) which covers the back of the *hand* (3.1), i.e. from the wrist to the base of the fingers

4 Materials and manufacture

Gloves are generally categorized by materials, designs and surface finishes. Materials include natural rubber latex, synthetic rubber latex and blends. The glove outer surface may be smooth or textured, with or without pattern on the surface while the glove inner surface may be with or without flock lining. In any case, the glove shall be either ambidextrous or in pairs (right hand, left hand), single or multi-layers (laminated).

Any glove made of materials and manufactured with designs and finishes described above that meet the requirements of this document is acceptable.

5 Sampling and selection of test pieces

5.1 Sampling

For reference purposes, unless otherwise stated, gloves shall be sampled and inspected in accordance with ISO 2859-1. The inspection levels and acceptance quality limits (AQLs) shall conform to those specified in [Table 1](#).

Table 1 — Inspection levels and AQLs
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Characteristic	Inspection level ^a	AQL ^a
General appearance	S-2	4,0
Dimensions (width, length, thickness)	S-2	4,0
Tensile properties (before and after ageing)	S-2	4,0
Tensile properties after immersion test	$N^b = 3$	PASS ^c
pH value	$N^b = 3$	PASS ^d

- ^a When a lot size cannot be determined, a lot size of 35 001 to 150 000 shall be assumed.
- ^b N means a number of gloves.
- ^c Median value of each glove meets the requirement.
- ^d Average value meets the requirement.

5.2 Selection of test pieces

Where test pieces are required, they shall be taken from the palm or the back or the cuff of glove, the surface being free of embossing.

6 Requirements

6.1 General

The gloves shall have a uniform finish and be free from discoloration, thin spots, air bubbles, embedded particles, tackiness and other blemishes likely to affect serviceability (visual inspection).

6.2 Dimensions

Gloves shall comply with the dimensions for palm width, length and thickness given in [Table 2](#), using the inspection level and AQL given in [Table 1](#).

Table 2 — Dimensions and tolerances

Letter code	Width mm	Minimum length mm	Minimum thickness mm
Extra-small (XS)	< 80	For all sizes: 260	For all sizes: 0,20
Small (S)	90 ± 10		
Medium (M)	100 ± 10		
Large (L)	110 ± 10		
Extra-large (XL)	> 120		

Alternatively for glove sizes in a numeric code, the palm width, length and thickness should follow the dimensions and tolerances as given in [Annex A](#).

6.3 Tensile properties

6.3.1 General

Gloves are classified into class 1A or 1B or 2A or 2B based on their performances, both on their initial and after ageing tensile properties given in [Table 3](#) and tensile properties after immersion in general household liquids given in [Table 4](#), using the inspection level and AQL given in [Table 1](#).

6.3.2 Tensile properties before and after ageing

For class 1 gloves, all the tensile properties shall comply with the requirements given in [Table 3](#), requirement class 1.

For class 2 gloves, the tensile properties shall comply with the requirements given in [Table 3](#), requirement class 2, but some of them may fall into requirement class 1.

Table 3 — Requirements for tensile properties of gloves before and after ageing

Property	Requirement	
	Class 1	Class 2
Tensile strength, MPa	> 15	10–15
Elongation at break, %	> 550	450–550
After ageing		
Tensile strength, MPa	> 12	8–12
Elongation at break, %	> 450	350–450

Testing shall be conducted within two months of the date of receipt by the purchaser of the gloves. For gloves that are older than three months from the date of manufacture or for which the date of manufacture is not known, the tensile properties need only conform to the “after ageing” value in [Table 3](#).

6.3.3 Tensile properties after immersion in test liquids

For class A gloves, all the tensile properties shall comply with the requirements given in [Table 4](#), requirement class A.

For class B gloves, the tensile properties shall comply with the requirements given in [Table 4](#), requirement class B, but some of them may fall into requirement class A.

Table 4 — Requirements for tensile properties of gloves after immersion in test liquids

Property	Requirement	
	Class A	Class B
After immersion in water		
Tensile strength, MPa	> 12	8–12
Elongation at break, %	> 450	350–450
After immersion in diluted surfactant solution		
Tensile strength, MPa	> 12	8–12
Elongation at break, %	> 450	350–450
After immersion in diluted acid solution		
Tensile strength, MPa	> 12	8–12
Elongation at break, %	> 450	350–450

NOTE 1 Performance requirements against test liquids are limited to minimum physical properties, initially, after ageing and after immersion in general chemical liquids used in household application. Other test liquids might be used based on agreement between the manufacturer and purchaser.

NOTE 2 Gloves covered in this document are intended to protect the wearer under the minimal risks circumference which is the risks encountered in the handling of hot components which do not expose the user to a temperature exceeding 50 °C.

6.4 pH value

The pH value for all type of gloves shall be between 5 and 9.

7 Test methods

7.1 Dimensions

7.1.1 The measurement of length shall be the shortest distance between the tip of the middle finger and the middle of the cuff termination.

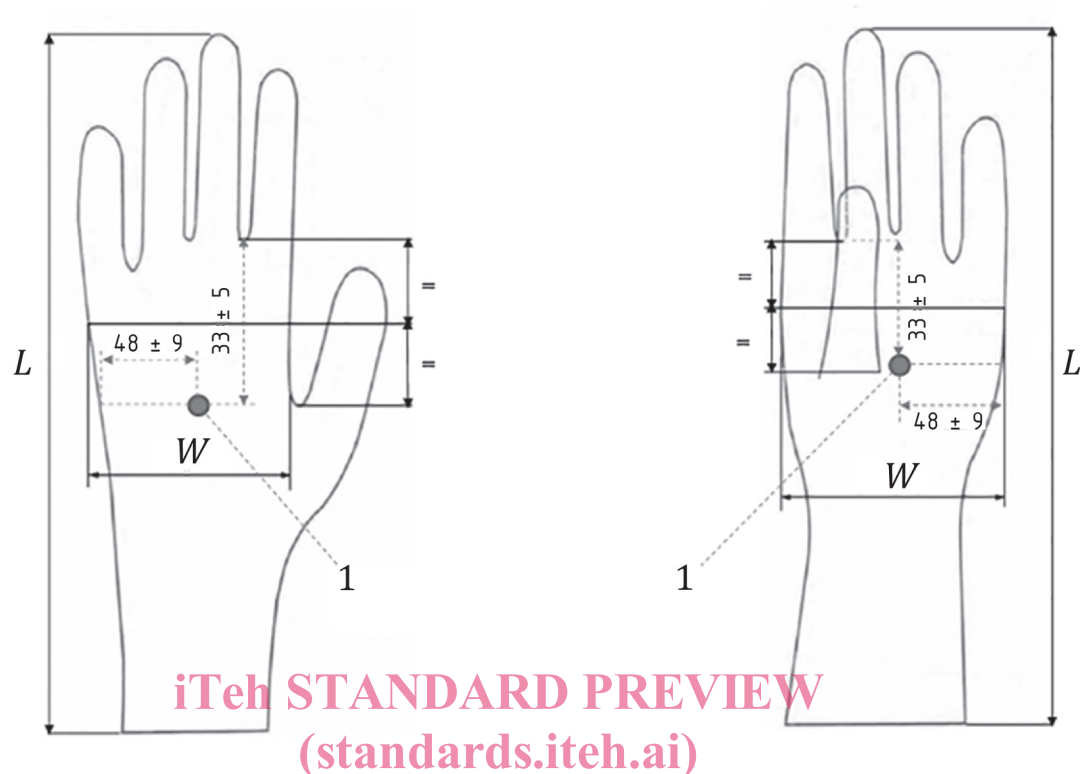
7.1.2 The measurement of width shall be at the midpoint between the base of the index finger and the base of the thumb. The width measurement shall be made with the glove placed on a flat surface.

7.1.3 The thickness of single wall shall be measured in accordance with ISO 23529, with pressure on the foot of 22 kPa ± 5 kPa, at the approximate centre of the palm or the back of the glove avoiding a pattern on the glove surface. Cutting the glove may be necessary to obtain the thickness measurement.

Measurement points for length, width and thickness are shown in [Figure 1](#).

If visual inspection indicates the presence of thin spots or unevenness, the single-wall thickness measurements shall be made in such area. The thickness of this area shall also comply with the dimensions given in [Table 2](#) or [Table 3](#), using the inspection level in [Table 1](#).

Dimension in millimetres



a) Ambidextrous gloves [ISO 20057:2017](https://standards.iteh.ai/catalog/standards/sist/51d4ea59-8206-43f2-af1c-45e5005a5da2/iso-20057-2017)

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b) Hand-specific gloves

Key

L length

W width

1 measurement point for thickness (palm)

NOTE The distance $48\text{ mm} \pm 9\text{ mm}$ locates the approximate centre of the palm for different glove sizes.

Figure 1 — Measurement points for length, width and thickness

7.2 Tensile properties before and after ageing

Tensile strength and elongation at break shall be measured in accordance with ISO 37 using type 1 or type 2 dumb-bell test pieces. One to three test pieces shall be taken from each glove. If one test piece per glove is used, report an individual value as the test result. If two test pieces are used, report an average value and if three test pieces are used, report a median value as the test result. In case of dispute, dumb-bell type 2 shall be used for the referee test.

7.3 Ageing

The tests shall be conducted in accordance with the method specified in ISO 188. Tensile properties after ageing shall be measured in accordance with ISO 37 on the test pieces cut from the gloves using procedure given in 7.2 and subjected to a temperature of $70\text{ °C} \pm 2\text{ °C}$ for $168\text{ h} \pm 2\text{ h}$ or at $100\text{ °C} \pm 2\text{ °C}$ for $24\text{ h} \pm 2\text{ h}$. In case of dispute, test aging at $70\text{ °C} \pm 2\text{ °C}$ for $168\text{ h} \pm 2\text{ h}$ shall be used for the referee test.