
**Protective equipment for martial
arts —**

**Part 7:
Additional requirements and test
methods for hand and foot protectors**

Équipement de protection pour les arts martiaux —

*Partie 7: Exigences et méthodes d'essai complémentaires pour
protecteurs de main et pied*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*, Subcommittee SC 6, *Martial arts*.

A list of all parts in the ISO 21924 series can be found on the ISO website.

Introduction

Hand and foot protectors are used in martial arts to protect the hand or the foot of the user from injuries when strikes are executed against persons or objects by the hand or the foot.

This document does not consider the protective performance of the hand protector or the foot protector for the opponent.

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Protective equipment for martial arts —

Part 7:

Additional requirements and test methods for hand and foot protectors

1 Scope

This document specifies additional requirements and test methods for hand and foot protectors which are used in unarmed martial arts, including boxing, for strikes against other persons or training equipment.

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 21924-1:2017, *Protective equipment for martial arts — Part 1: General 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 <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

hand protector

equipment worn on the hand to protect the user against injuries caused by strikes against other persons or training equipment

3.2

foot protector

equipment to protect the entire foot (without the sole area) against injuries caused by strikes against other persons or training equipment

4 Classification

4.1 Hand protectors

The following classes of hand protectors are defined:

- class A: hand protectors comprising a zone of normal (simple) protection (see [Figure 1](#));
- class B: hand protectors comprising a zone of increased protection (see [Figure 2](#)).

4.2 Foot protectors

There are no different classes specified.

5 Requirements

5.1 Innocuousness

Hand and foot protectors shall comply with the requirements in ISO 21924-1:2017, 4.2.

5.2 Sizing

The manufacturer shall indicate the size range for which the hand or foot protector is designed.

5.3 Combinations

Hand protectors or foot protectors can be used together with other protective equipment for martial arts.

If the combined use is not appropriate, this shall be indicated in the information supplied by the manufacturer.

5.4 Restraint

The restraint system shall meet the requirements defined in ISO 21924-1:2017, 4.3.

A restraint system shall be supplied by the manufacturer which enables the user to attach the foot protector without any assistance. In the case of hand protectors, the assistance of an additional person may be necessary. The protector shall remain in place during use.

Restraint devices shall be so designed that they may not cause unnatural forces or movements or constrict limbs.

Testing shall be carried out according to [6.3](#).

5.5 Zone of protection

5.5.1 General

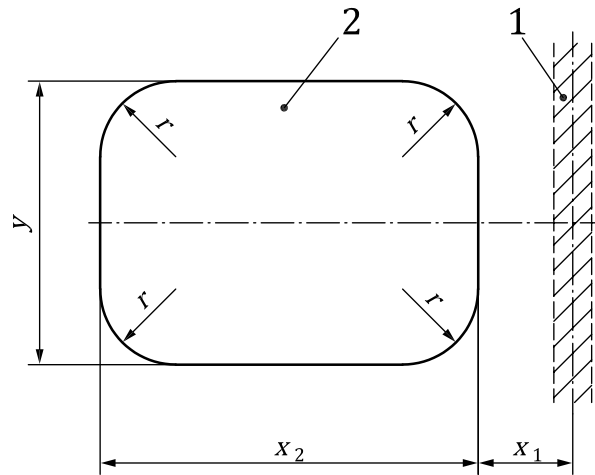
Dimensions and positions with respect of the hand or the foot to the zones of protection of hand protectors and foot protectors are defined by [Figures 1 to 5](#) and by [Tables 1 to 3](#).

5.5.2 Hand protectors

5.5.2.1 Dimensions

5.5.2.1.1 Class A

For dimensions of the zone of protection, see [Figure 1](#) and [Table 1](#).

**Key**

- 1 wrist area
2 zone of protection

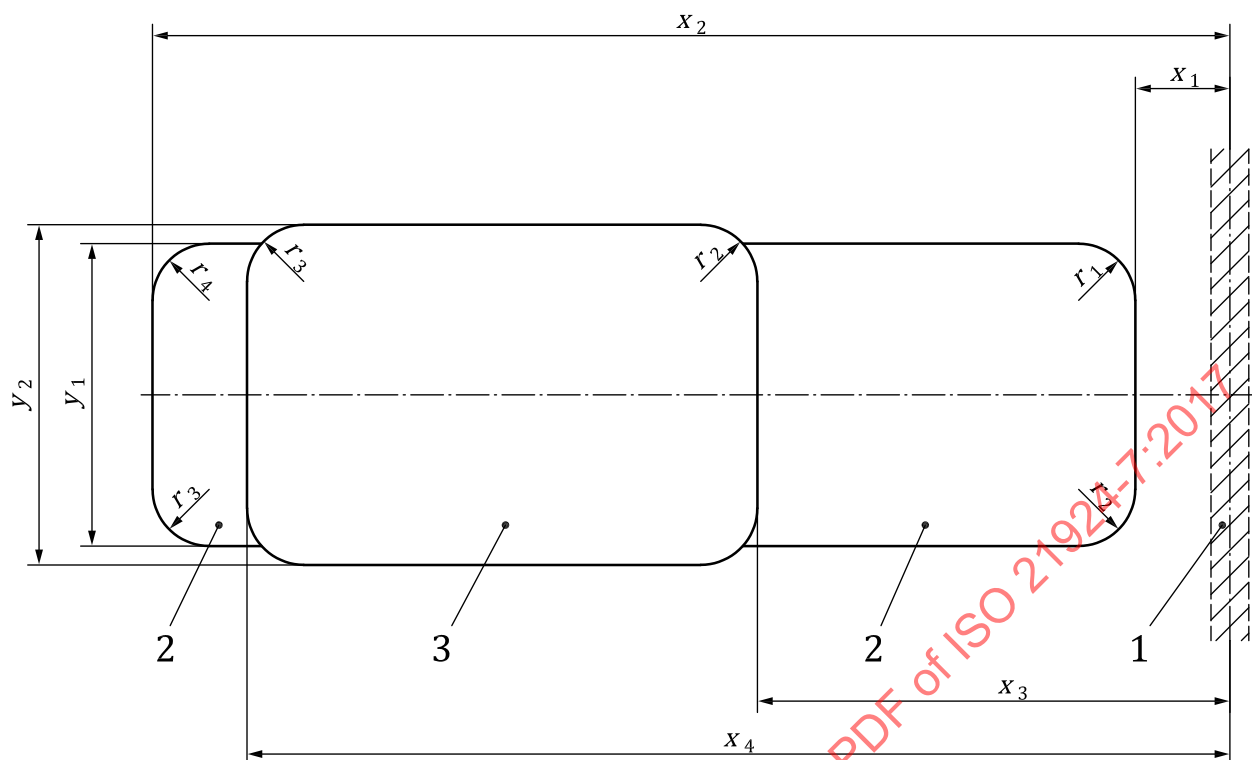
Figure 1 — Dimensions of hand protectors, class A**Table 1 — Dimensions of hand protectors, class A**

Dimensions in millimetres

Size	x_1 maximum	x_2 minimum	y minimum	r maximum
5	10	70	60	20
6	15	80	65	
7	20	90	70	
8	25	100	75	
9	30	110	80	
10	35	120	85	
11	40	130	90	

5.5.2.1.2 Class B

For dimensions of the zone of protection, see [Figure 2](#) and [Table 2](#).



Key

- 1 wrist area
- 2 zone of protection 1
- 3 zone of protection 2

Figure 2 — Dimensions of hand protectors, class B

Table 2 — Dimensions of hand protectors, class B

Dimensions in millimetres

Size	x_1 max.	x_2 min.	x_3 max.	x_4 min.	y_1 min.	y_2 min.	r_1 max.	r_2 max.	r_3 max.	r_4 max.
5	10	230	70	210	65	75	10	10	10	30
6	15	250	90	230	70	80	10	10	10	30
7	20	270	110	245	75	85	10	10	10	35
8	25	285	125	260	80	90	15	15	15	35
9	30	300	140	270	85	95	15	15	15	40
10	35	310	150	280	90	100	15	15	15	40
11	40	320	160	285	95	105	15	15	15	45

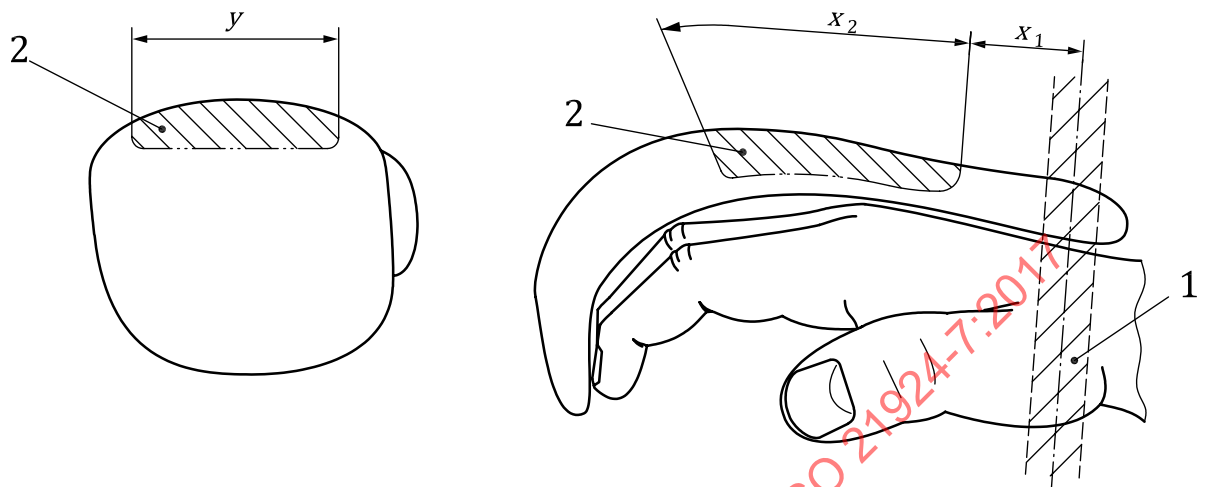
5.5.2.2 Positioning

5.5.2.2.1 General

The dimensions are defined on the outer surface of the upper hand to be along the surface in longitudinal direction of the hand and to be the projection of the surface in square direction.

5.5.2.2.2 Class A

The position of the zone of protection on the hand protector is shown in [Figure 3](#) a) and b).



a) Front view of the hand protector

b) Side view of the hand protector

Key

1 wrist area

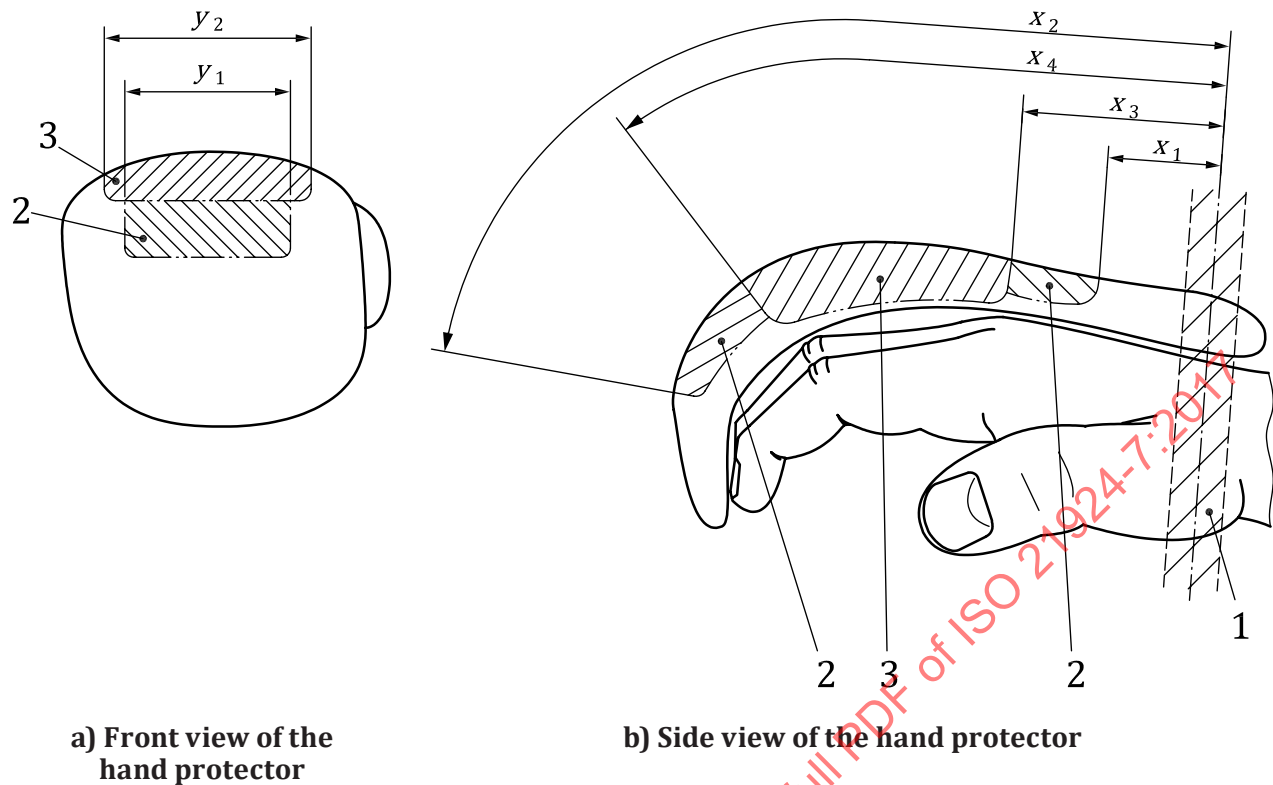
2 zone of protection

x, y dimensions of the hand protector (see [Table 1](#))

Figure 3 — Zone of protection on the hand protector, class A

5.5.2.2.3 Class B

The position of the zone of protection on the hand protector is shown in [Figures 4](#) a) and b).



Key

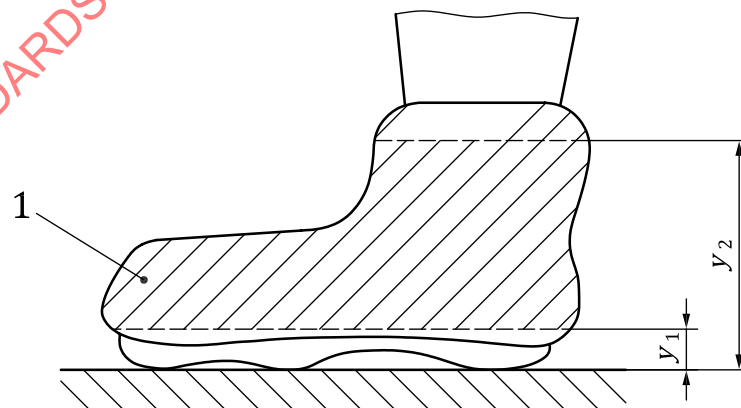
- 1 wrist area
- 2 zone of protection 1
- 3 zone of protection 2

$x_1, x_2, x_3, x_4, y_1, y_2$ dimensions of the hand protectors (see [Table 2](#))

Figure 4 — Zones of protection of the hand protector, class B

5.5.3 Foot protectors

For the positioning and dimensions of the zone of protection, see [Figure 5](#) and [Table 3](#).



Key

- 1 zone of protection

Figure 5 — Positioning of the zone of protection of foot protectors

Table 3 — Dimensions of the zone of protection of foot protectors

Dimensions in millimetres

Size	30	32	34	36	38	40	42	44	46	48	50
y_1	max. 15										
y_2 min.	130		140		150		160		170		

When tested according to 6.5, no part of the outline of the foot shall be outside of the outline of the foot protector in vertical view.

5.6 Impact performance

Hand and foot protectors meet the requirements of this document, if the worst result meets the requirements given in Table 4, when tested according to 6.4.

The maximum peak force measured according to 6.4 shall be below the limit which is specified in Table 4.

Before testing with preference, those positions shall be selected for testing where the worst results may be expected.

Table 4 — Impact performance requirements

Kind of protector	Zone of protection	Minimum number of positions to be tested	Impact energy J	Peak force kN maximum
Hand protectors, class A	1	2	3	2
Hand protectors, class B	1	2	3	2
	2	2	10	2
Foot protector	1	4	3	2

6 Testing

6.1 Sampling

Sampling shall be done according to ISO 21924-1:2017, 5.1.

6.2 Conditioning

Before testing, samples shall be conditioned according to ISO 21924-1:2017, 5.2.

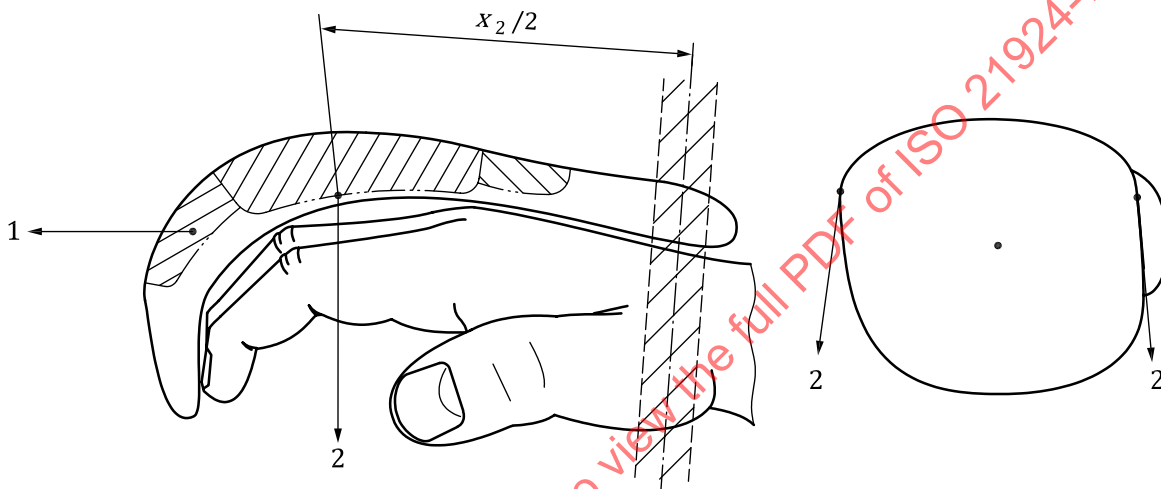
6.3 Effectiveness of the restraint system

Restraint testing shall be carried out according to ISO 21924-1:2017, 5.4. When testing the restraint, the protector shall be attached to the hand or the foot of a test person with the glove or shoe size from the upper part of the size range indicated by the manufacturer. Check by visual and/or tactile inspection that the restraint system does not constrict any limbs.

A test force of 20 N shall be applied at each test position and in each direction shown in [Figure 6](#) and [Figure 7](#). hand (or foot) shall not be moved during the test. The test positions are determined as follows:

a) hand protectors:

- 1) test position 1: With the forearm in horizontal orientation and with a straight wrist, test position 1 shall be the most forward position of the hand protector on the central axis or the continuation of the central axis of the zone of protection. The test force shall be oriented in direction of the axis of the forearm;
- 2) test positions 2 and 3: The test positions are in the centre of the zone of protection (protectors class A) or in the centre of zone 1 of protection (protectors class B) with respect to the longitudinal axis of the zone of protection and as close to the edges of the zone of protection viewed in square direction. The force is directed vertically with respect to the axis of the forearm and parallel to the surface of the hand at the test position.



Key

1 to 3 direction of the force applied

a See [Table 2](#).

Figure 6 — Direction of the force applied on hand protectors

b) foot protector:

- 1) test position 1 is located at the very end of the foot protector and as close as possible to the upper edge of the zone of protection;
- 2) test position 2 is located at the very end of the foot protector and as close as possible to the lower edge of the zone of protection;
- 3) test position 3 is located on the outer side of the foot below the ankle and as close as possible to the lower edge of the zone of protection;
- 4) test position 4 is located vertically above the foot axis and above the toe joint. The force shall be directed vertically if the foot rests on a flat horizontal support;
- 5) test position 5 is located at the most forward position of the foot protector. The force shall be directed in the direction of the foot axis.