

Protective equipment for martial arts —

Part 1: General requirements and test methods

The European Standard EN 13277-1:2000 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 13277-1:2000.

The UK participation in its preparation was entrusted by Technical Committee PH/3, Protective clothing, to Subcommittee PH/3/11, Protective equipment for sports players, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 10, an inside back cover and a back cover.

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Protective equipment for martial arts - Part 1: General requirements and test methods

Équipement de protection pour les arts martiaux - Partie 1:
Exigences et méthodes d'essai générales

Schutzausrüstung für den Kampfsport - Teil 1: Allgemeine
Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 5 August 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

It is one of a series covering requirements and test methods for protective equipment used in martial arts.

Introduction

Protective equipment for martial arts (hereinafter referred to as protectors) protect the wearer against contusion, abrasion, laceration, fractures and physical injuries.

Protectors covered by this European Standard will not necessarily prevent any serious injury caused by the execution of martial arts.

1 Scope

This European Standard specifies the general requirements and test methods for innocuousness, ergonomics, restraint, zone of protection, impact performance as well as provisions for marking and the information supplied by the manufacturer for protective equipment used in martial arts.

The protectors covered by this European Standard are mainly designed for using in unarmed martial arts such as taekwondo, karate, kick-boxing and similar disciplines.

Additional requirements and test methods for components of protectors for specific kinds of martial arts are specified in further parts of this European Standard.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 20105-A02

Textiles – Tests for colour fastness – Part A02: Grey scale for assessing change in colour (ISO 105-A02:1993)

EN 20105-A03

Textiles – Tests for colour fastness – Part A03: Grey scale for assessing staining (ISO 105-A03:1993)

EN ISO 105-E04

Textiles – Tests for colour fastness – Part E04: Colour fastness to perspiration (ISO 105-E04:1994)

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1

protective equipment for martial arts

equipment which is worn on the body and mainly providing protection against the effect of external forces and energies in martial arts.

3.2

zone of protection

zone of protectors primarily intended to ensure the protection of the wearer of martial arts equipment.

4 Requirements

4.1 General

Protectors shall be so designed and manufactured that in the foreseeable conditions of use for which they are intended the user can perform the sporting activity normally whilst enjoying protection at the specified limit.

It shall be possible to clean the protectors in accordance with the manufacturer's instructions without the loss of the ability to fulfil the requirements of this standard.

4.2 Innocuousness

Protectors shall be designed and manufactured to provide protection when used in accordance with the information supplied by the manufacturer, without any harm to the user or others when so used. Materials, incorporated substances, seams and edges and particularly those parts of the protectors in close contact with the user shall not impair the user's health and hygiene.

The colour of protectors or parts of them shall be resistant to perspiration.

For textile materials, when tested in accordance with 5.3.1, this requirement is considered as fulfilled if, using an alkaline and acid solution according to EN ISO 105-E04,

- a fastness grade 3 to 4 according to EN 20105-A02 by the change in colour
- a fastness grade 3 to 4 according to EN 20105-A03 by staining

will be reached.

For other materials these requirements are considered as fulfilled if no staining of the used strips of filter paper is observed when they are tested in accordance with 5.3.2.

4.3 Restraint

The design of the protectors shall enable secure fixation to the body of the user, so that they will remain in place during the normal use for which they are intended. If secure fixation is not provided by restraint systems which are integrated elements or permanently attached to the protector instructions shall be provided by the manufacturer describing a method of secure fixation.

If rigid, sharp edges and abrasive elements are part of the restraint system, they shall be completely covered by a soft padding.

The displacement of the protector from its original position shall be after each individual test less than 15 % of the linear dimension of the zone of protection (see 4.5 and clause 7) measured in the line with the force supplied as specified in 5.4.

When tested according to 5.4, no parts of the restraint system shall break, split, be released or fail in any other way.

4.4 Sizing

Protectors shall be supplied in a number of different sizes to meet the requirements according to different body dimensions of wearers. The size shall be marked on the protector.

The specific sizing is defined in the relevant parts of this European Standard.

4.5 Zone of protection

The dimensions of the zone of protection shall be as defined in the relevant parts of this European Standard.

The manufacturer shall mark the zone of protection on the protector or in the information supplied by the manufacturer.

The zone of protection shall be measured as specified in 5.5.

4.6 Impact performance

When tested according to 5.6 no part of the protector shall break, split or be deformed irreversible.

Specific requirements are defined in relevant parts of this European Standard.

5 Testing

NOTE This clause specifies test conditions that apply to all types of protectors. Test methods for particular types of protectors are as defined in the relevant parts of this European Standard.

5.1 Sampling

Where the protectors are normally supplied as single items, then two single protectors of each size shall be provided for testing.

Where the protectors are normally supplied in pairs then two pairs of protectors of each size shall be provided for testing.

Where only one size of a protector is manufactured then four pairs, if normally supplied in pairs, or four singles, if normally supplied in singles, of that protector shall be provided for testing.

If six or less sizes are manufactured samples of each size shall be provided for testing. If more than six sizes are manufactured the sizes to be provided for testing shall be agreed with the test house to be representative of the whole size range.

The samples shall be supplied to the test house with the information supplied by the manufacturer according to clause 7.

5.2 Conditioning

Before a test is carried out the samples shall be cleaned three times in accordance with the cleaning instructions as detailed in the information supplied by the manufacturer (see clause 7).

All tests shall be carried out at an ambient temperature of (20 ± 2) °C and at a relative humidity of (65 ± 5) %.

Before testing the samples shall be stored at this temperature and humidity for at least 4 h.

5.3 Colour fastness to perspiration

5.3.1 Textile materials

Carry out the test in accordance with EN ISO 105-E04.

If different textile materials or colours are used for protectors test each material and each colour separately.

5.3.2 Non-textile materials

5.3.2.1 General

If the protective equipment is made of different non-textile materials or colours test each material and each colour separately.

5.3.2.2 Apparatus

The apparatus shall consist of

- a) filter paper for qualitative analyses, medium porous;
- b) adhesive tape: colourless self-adhesive plastic tape, approximately 12 mm in width;
- c) test solution consisting of
 - 1) 4,5 g sodium chloride, NaCl;
 - 2) 0,3 g of potassium chloride, KCl;
 - 3) 0,3 g of sodium sulfate, Na₂SO₄;
 - 4) 0,4 g of ammonium chloride, NH₄Cl;
 - 5) 3,0 g lactic acid, CH₃ · CH(OH) · COOH, approximately 90 % absolute;
 - 6) 0,2 g urea H₂N · CO · NH₂;
 - 7) 1 000 cm³ of distilled water or water of equivalent purity;
- d) desiccator;
- e) oven for a temperature of (40 ± 2) °C.

5.3.2.3 Procedure

Cut a strip of approximately 15 mm in width and max. 80 mm in length from the filter paper.

Saturate this strip with the test solution.

Attach the saturated strip of filter paper with the adhesive tape to the specimen such that the specimen contacts the saturated filter paper as closely as possible. The adhesive tape shall cover the strip of filter paper over its whole length and project at least 10 mm beyond both ends of the strip.

Store the prepared specimen in a desiccator for 2 h at (40 ± 2) °C above water. Previously, the desiccator shall be brought to the test temperature in an oven and left in the oven for the period of test.

Subsequently, detach the filter paper from the specimen and examine it for staining.

5.4 Restraint

When testing the restraint the protector(s) shall be attached to an appropriate test subject. The subject shall be of the appropriate body dimensions as defined in the information supplied by the manufacturer for the relevant size of the protector(s).

The attachment shall be made in accordance with the instructions described in the information supplied by the manufacturer.

A force in accordance with the relevant parts of this European Standard shall be applied to the protector(s) for a period of (30 ± 5) s.

The maximum amount of displacement of the protector shall be measured while the force is applied.

At least one test shall be carried out in each test direction. After each individual test the sample shall be returned to its original position.

5.5 Zone of protection

An individual test gauge shall be used for each size of each type of protector. The test gauges shall be designed such that they can be fitted to the surface of the protector.

By placing the test gauge on the zone of protection identified by the manufacturer it shall be tested whether the requirements for shape and size specified in the relevant parts of this European Standard are met.

The test gauge shall be in accordance with the minimum dimensions of the zone of protection specified in the relevant parts of this European Standard.

5.6 Impact performance

If no other method is defined in the relevant parts of this European Standard testing is carried out by a drop test with a striker to be made of steel.

The striker shall be a mass of $(2,5 \pm 0,025)$ kg and of cylindrical form of diameter (80 ± 2) mm. The impact surface of the striker shall be domed having a radius of curvature of (100 ± 2) mm.

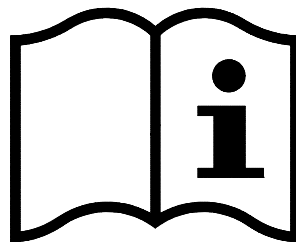
The attachment of the protector to the respective testing device and the kinetic energy are specified in the relevant parts of this European Standard.

The test shall be carried out three times on the same position in accordance with the relevant parts of this European Standard

6 Marking

Protectors shall be durably and clearly marked with the following:

- a) the name or trademark of the manufacturer or his authorized representative within the European Union;
- b) the designation of the protector, commercial name or code that uniquely identifies the protector;
- c) the size of the protector;
- d) the number of the relevant part of this European Standard
- e) a clear indication whether the protector is for left or right fitting, if appropriate;
- f) the year of manufacture (date or code);
- g) the following pictogram instruction the user to see the information supplied by the manufacturer:



7 Information supplied by the manufacturer

All protectors shall be supplied with Information supplied by the manufacturer.

This document shall at least contain the following information in the official language of the country in which the protector is to be sold:

- a) all information required in clause 6 without 6 f);
- b) the address of the manufacturer or his authorized representative within the European Union;
- c) an explanation of the kind of protection provided by the protector;
- d) instructions for selecting of the correct size and fit of the protector(s);
- e) details on the size of the protector(s) related to the body dimensions of the user;
- f) an indication of the zone of protection relative to the overall dimensions of the protector;
- g) instructions for the correct fitting and adjusting of the protector to ensure that it remains in the correct position during normal use;
- h) how to decide that a protector may no longer provide adequate protection due to ageing or use;
- i) a warning about any changes in environmental conditions, such as temperature, that would significantly reduce the performance of the protectors;
- j) a warning that no protector can offer full protection against injuries;
- k) a warning about any contamination, alteration to the protector, or misuse that would dangerously reduce performance.
- l) cleaning instructions

Annex ZA (informative)

Clauses of this European Standard addressing essential requirements or other provisions of EU Directives

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EN Directives 89/686/EEC.

WARNING Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

The following clauses of this standard are likely to support requirements of Directive 89/686/EEC, Annex II:

EU-Directive 89/686/EEC, Annex II	Clause of this standard
1.1 Design principles	4.1 to 4.6
1.1.1 Ergonomics	clause 4
1.1.2.1 Highest level of protection possible	4.5, 4.6
1.1.2.2 Classes of protection appropriate to different levels of risk	4.5, 4.6
1.2 Innocuousness of PPE	4.2
1.2.1 Absence of risks and other nuisance factors	clause 4
1.2.1.1 Suitable constituent material	4.2
1.2.1.2 Satisfactory surface condition of all PPE parts in contact with the user	4.2, 4.3
1.2.1.3 Maximum permissible user impediment	4.1
1.3 Comfort and efficiency	4.4, clause 6
1.3.1 Adaptation of PPE to users morphology	4.1, 4.3, 4.4
1.3.2 Lightness and strength	4.3, 4.6, clause 7
1.3.3 Compatibility of different classes or types of PPE designed for simultaneous use	other parts of standard
1.4 Information supplied by the manufacturer	clauses 6 and 7
2.1 PPE incorporating adjustment systems	4.3
2.2 PPE enclosing the parts of the body to be protected	4.2
2.4 PPE subject to ageing	clause 7

2.9 PPE incorporating components which can be adjusted or removed by user	4.3
2.12 PPE bearing one or more identification or recognition marks directly or indirectly relating to health and safety	clause 6
3.1 Protection against mechanical impact	4.5, 4.6
3.1.1 Impact caused by falling or projecting objects and collision of parts of the body with an obstacle	4.5, 4.6
3.3 Protection against physical injury	4.5, 4.6

Compliance with the clauses of this European Standard provides one means of conforming with the specific essential requirements of the Directives concerned and associated EFTA regulations.

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