BRITISH STANDARD

BS EN
353-2:2002

Personal protective equipment against falls from a height —

Part 2: Guided type fall arresters including a flexible anchor line

The European Standard EN 353-2:2002 has the status of a British Standard

ICS 13.340.99

National foreword

This British Standard is the official English language version of EN 353-2:2002. It supersedes BS EN 353-2:1993 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PH/5, Industrial safety belts and harnesses, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/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.

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This British Standard, having been prepared under the direction of the Health and Environment Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 4 July 2002

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English version

Personal protective equipment against falls from a height - Part 2: Guided type fall arresters including a flexible anchor line

Equipement de protection individuelle contre les chutes de hauteur - Partie 2: Antichutes mobiles incluant support d'assurage flexible

Persönliche Schutzausrüstung gegen Absturz - Teil 2: Mitlaufende Auffanggeräte einschließlich beweglicher Führung

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Ref. No. EN 353-2:2002 E

Contents

Foreword

This document EN 353-2:2002 has been prepared by Technical Committee CEN/TC 160 "Protection against falls from a height including working belts", 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of an identical text or by endorsement, at the latest by November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

This document supersedes EN 353-2:1992. This new edition contains the old text of the standard and incorporates some urgent amendments that are intended to give additional information and clarify inconsistencies. A comprehensive revision of the standard will follow at a later stage.

This document 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 document.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the requirements, test methods, marking, information supplied by the manufacturer and packaging for guided type fall arresters including a flexible anchor line which can be secured to an upper anchor point. Guided type fall arresters including a flexible anchor line conforming to this European Standard are sub-systems constituting a part of one of the fall arrest systems covered by EN 363. Other types of fall arresters are specified in EN 353-1 or EN 360. Energy absorbers are specified in EN 355.

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 354:2002, *Personal protective equipment against falls from a height – Lanyards.*

EN 355:2002, *Personal protective equipment against falls from a height - Energy absorbers.*

EN 361, *Personal protective equipment against falls from a height - Full body harnesses.*

EN 362, *Personal protective equipment against falls from a height – Connectors.*

EN 363:2002, *Personal protective equipment against falls from a height - Fall arrest systems.*

EN 364:1992, *Personal protective equipment against falls from a height - Test methods.*

EN 365:1992, *Personal protective equipment against falls from a height - General requirements for instructions for use and for marking.*

3 Terms and definitions

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

3.1
guided type fall arrester including a flexible anchor line
sub-system consisting of a flexible anchor line, a self-locking guided type fall arrester which is attached to the flexible anchor line and a connector or a connector-terminated lanyard. An energy dissipating function may be installed between the fall arrester and the anchor line or an energy absorber may be incorporated in the lanyard or in the anchor line [EN 363]

3.2
guided type fall arrester
fall arrester with a self-locking function and a guide facility. The guided type fall arrester travels along an anchor line, accompanies the user without requiring manual adjustment during upward or downward changes of position and locks automatically on the anchor line when a fall occurs [EN 363]

3.3
flexible anchor line
connecting element specified for a sub-system with a guided type fall arrester. A flexible anchor line may be a synthetic fibre rope or a wire rope and is intended to for securing to an upper anchor point [EN 363]

3.4
energy absorber
element or a component of a fall arrest system, which is designed to dissipate the kinetic energy developed during a fall from a height [EN 363]

3.5
lanyard
connecting element or component of a fall arrest system. A lanyard may be of synthetic fibre rope, wire rope, webbing or chain [EN 363]

3.6
length of lanyard
length L_l in metres from one load bearing point to the other load bearing point measured in an unloaded, but taut condition of the lanyard [EN 363]

3.7
length of energy absorber including lanyard
total length L_t in metres from one load bearing point to the other load bearing point measured in an unloaded, but taut condition of the energy absorber including lanyard [EN 363]

3.8
braking force
maximum force F_{max} in kilonewtons measured at the anchor point or the anchor line during the braking period of the dynamic performance test [EN 363]

3.9
arrest distance
vertical distance H in metres measured at the mobile load bearing point of the connecting sub-system from the initial position (onset of the free fall) to the final position (equilibrium after the arrest), excluding the displacements of the full body harness and its attachment element [EN 363]

4 Requirements

4.1 Design and ergonomics

The general requirements for the design and ergonomics are specified in 4.1 of EN 363:2002.

4.2 Materials and construction

A flexible anchor line shall be a synthetic fibre rope or a wire rope. The material of a flexible anchor line shall comply with 4.2.2 or 4.2.3 of EN 354:2002.

Flexible anchor lines shall be secured to an upper anchor point and shall be either fitted with an end stop or be capable of being fitted with an end stop to prevent the guided type fall arrester from running off the anchor line unintended.

Guided type fall arresters shall not rely solely on inertia sensing. If a guided type fall arrester has a manual locking feature (i. e. a feature which locks the guided type fall arrester on the flexible anchor line), the lower end of the flexible anchor line shall be secured, e. g. by an attached lower termination or an attachment weight.

Flexible anchor wire ropes shall have an attached lower termination or an attachment weight in every case.

A guided type fall arrester shall be equipped with a connector or a connector-terminated lanyard with a maximum length of 1 m including, if applicable, an energy absorber and connectors. If the fall arrester is only equipped with a connector, it may be permanently attached to the fall arrester or be detachable from the fall arrester. If the fall arrester is equipped with a lanyard, one end of the lanyard shall be permanently attached to the fall arrester and the other end of the lanyard shall be terminated with a connector. The length of lanyard L_l shall be specified by the manufacturer

and be reported in the information supplied by the manufacturer (see 7 c). A lanyard may be made from synthetic fibre rope, webbing, wire rope or chain. The material of a lanyard shall conform to 4.2.2, 4.2.3 or 4.2.4 of EN 354:2002.

A guided type fall arrester may be equipped with an opening device. If the guided type fall arrester is equipped with an opening device, it shall be so designed that it can only be detached or attached by at least two consecutive deliberate manual actions.

An energy absorber for a sub-system with a guided type fall arrester shall conform to EN 355.

Energy absorbers integrated in the lanyard shall conform to EN 355, but need not be tested in accordance with 5.2 of EN 355:2002.

Connectors for a sub-system with a guided type fall arrester shall conform to EN 362.

4.3 Locking

4.3.1 Locking after conditioning

When the guided type fall arrester and the flexible anchor line are conditioned as described in 5.1.2.1 and tested as described in 5.1.2.3 with a test mass of 5 kg, the guided type fall arrester shall in each case lock and remain locked until released.

4.3.2 Locking after optional conditioning

If the information supplied by the manufacturer of the guided type fall arrester (see clause 7) claims a feature concerning the use under specific conditions (see 5.1.2.2), the locking function of the fall arrester shall be tested accordingly.

When conditioned as described in 5.1.2.2 and tested as described in 5.1.2.3 with a test mass of 5 kg, the guided type fall arrester shall in each case lock and remain locked until released.

4.4 Static strength

4.4.1 Anchor line

When tested as described in 5.2.2.1, textile anchor lines shall sustain a force of at least 22 kN and anchor wire ropes shall sustain a force of at least 15 kN.

4.4.2 Guided type fall arrester including lanyard and connector

When tested as described in 5.2.2.2, the guided type fall arrester including lanyard and connector shall sustain a force of at least 15 kN.

4.5 Dynamic performance

When tested as described in 5.3 with a rigid steel mass of 100 kg, the braking force F_{max} shall not exceed 6 kN and the arrest distance H shall be $H < 2\ L + 1$ m with $L = L_t$ for a lanyard including energy absorber, $L = L_l$ for a lanyard without energy absorber and L = length of a connector for a device without lanyard and energy absorber.

4.6 Corrosion resistance

After the test described in 5.4 has been carried out, the component parts of the guided type fall arrester shall be examined. Where necessary to gain visual access to the internal component parts, the device shall be dismantled. The test is classed as a failure if any corrosion is evident that could affect the function of the device. (White scaling or tarnishing is acceptable.)

4.7 Marking and information

Marking of the guided type fall arrester including a flexible anchor line shall be in accordance with clause 6.

Information shall be supplied with the guided type fall arrester including a flexible anchor in accordance with clause 7.

5 Test methods

5.1 Locking test after conditioning

5.1.1 Apparatus

5.1.1.1 Apparatus for conditioning

The conditioning apparatus shall conform to 4.8 of EN 364:1992.

5.1.1.2 Apparatus for the locking test

The locking test apparatus consists of an anchor point and a test mass of 5 kg.

5.1.2 Method

5.1.2.1 Conditioning

The conditioning to heat, to cold and to wet is described in 5.11 of EN 364:1992.

5.1.2.2 Optional conditioning

The conditioning to dust and to oil is optional and described in 5.11 of EN 364:1992.

5.1.2.3 Locking test

The locking test shall be conducted as described in 5.11.6.1 of EN 364:1992.

5.2 Static strength test

5.2.1 Apparatus

The static strength test apparatus shall conform to 4.1 of EN 364:1992.

5.2.2 Method

5.2.2.1 Anchor line

The static strength test for the anchor line shall be conducted as described in 5.5.6 of EN 364:1992.

5.2.2.2 Guided type fall arrester including lanyard and connector

Install the guided type fall arrester in the test machine by a suitable element, e.g. a bolt, and submit the guided type fall arrester including lanyard and connector to the specified static test force. Maintain the force for a period of at least 3 min.

5.3 Dynamic performance test

5.3.1 Apparatus

The dynamic performance test apparatus shall conform to 4.4, 4.5 and 4.6 of EN 364:1992.

5.3.2 Method

The dynamic performance test shall be conducted as described in 5.5.2 or 5.8 of EN 364:1992.

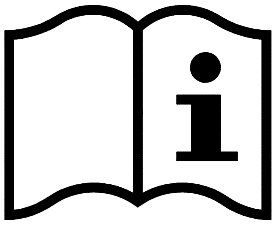
5.4 Corrosion test

The corrosion test shall be conducted as described in 5.13 of EN 364:1992 for a minimum period of 24 h.

6 Marking

Marking on the guided type fall arrester and the flexible anchor line shall conform to 2.2 of EN 365:1992 and any text shall be in the language of the country of destination. In addition to conforming to 2.2 of EN 365:1992 the marking shall include the following.

a) on the guided type fall arrester, a pictogram to indicate that users shall read the information supplied by the manufacturer (see figure);



b) an indication on the guided type fall arrester of the correct orientation in use;

c) an indication e.g. “Use the correct rope only”, that the guided type fall arrester shall only be used on an flexible anchor line, which is specified by the manufacturer;

d) the model/type identification mark of the guided type fall arrester or guided type fall arrester including a flexible anchor line;

e) the number of this European Standard, i.e. EN 353-2.

7 Information supplied by the manufacturer

The information supplied by the manufacturer shall be provided in the languages of the country of destination. It shall conform to 2.1 of EN 365:1992 and in addition shall include at least advice or information as follows:

a) on how to connect to a full body harness, which conforms to EN 361 and includes an attachment point located appropriately in relation to the fall arrester, and a recommendation to use a front attachment;

b) instructions for the correct installation of the flexible anchor line with the guided type fall arrester to a reliable anchor point and how to connect to other components of a fall arrest system;

c) the specific conditions, the length of the lanyard, under which the guided type fall arrester including a flexible anchor line may be used;

d) the characteristics required for a reliable anchor point;

e) on how to ensure the compatibility of any components to be used in conjunction with the guided type fall arrester including a flexible anchor line, e. g. by reference to other European Standards;

f) for the guided type fall arrester, the diameter and model/type of the anchor line and that only the recommended anchor line(s) shall be used;

g) if a complete system is supplied, that components of any complete system shall not be substituted;

h) the correct way of operating the guided type fall arrester on the flexible anchor line;

i) if the guided type fall arrester can be removed from the flexible anchor line, how to attach and detach it;

j) the necessary minimum clearance below the feet of the user, in order to avoid collision with the structure or ground in a fall from a height. This should take into account the arrest distance *H* (see 3.9), the elongation of the anchor line, take-up by the harness and an extra distance of 1 m;

k) the materials from which the flexible anchor line is made;

l) on limitations of the materials in the product or hazards which may affect its performance, e.g. temperature, the effect of sharp edges, chemical reagents, electrical conductivity, cutting, abrasion, UV degradation, other climatic conditions;

m) that before and during use, consideration should be given as to how any rescue could be safely and efficiently carried out;

n) that the product should only be used by a trained and/or otherwise competent person or the user should be under the direct supervision of such a person;

o) on how to clean the product, including disinfection, without adverse effect;

p) if information exists, the expected lifespan of the product (obsolescence) or how this may be determined;

q) on how to protect the product during transportation;

r) on the meaning of any markings on the product;

s) the model/type identification mark of the guided type fall arrester or the guided type fall arrester including a flexible anchor line;

t) the number of this European Standard, i. e. EN 353-2.

8 Packaging

Guided type fall arresters including a flexible anchor line shall be supplied wrapped, but not necessarily sealed, in a material that provides some resistance against the penetration of moisture.

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 EU Directive 89/686/EEC.

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

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

EU-Directive 89/686/EEC, Annex II		clauses of this standard
1.1	Design principles	4.1 and 4.2
1.2	Innocuousness of PPE	4.2
1.3.2	Lightness and design strength	4.6
1.4	Information supplied by the manufacturer	4.7 and 7
2.9	PPE incorporating components which can be adjusted or removed by the user	4.2
2.10	PPE for connection to another, external complementary device	7
2.12	PPE bearing one or more identification or recognition marks directly or indirectly relating to health and safety	4.7 and 6
3.1.2.2	Prevention of falls from height	4 to 8

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

Bibliography

EN 353-1, *Personal protective equipment against falls from a height – Part 1: Guided type fall arresters including a rigid anchor line.*

EN 360, *Personal protective equipment against falls from a height - Retractable type fall arresters.*

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