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Personal fall protection equipment — Rescue lifting devices

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National foreword

This British Standard is the UK implementation of EN 1496:2017. It supersedes BS EN 1496:2006 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PH/5, Personal Fall Protection.

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

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European foreword

This document (EN 1496:2017) has been prepared by Technical Committee CEN/TC 160 “Protection against falls from 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of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1496:2006.

Annex A provides details of significant technical changes between this draft European Standard and the previous edition EN 1496:2006.

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1 Scope

This European Standard specifies requirements, test methods, marking and information supplied by the manufacturer for rescue lifting devices. Rescue lifting devices conforming to this European Standard are used as components of rescue systems.

Rescue lifting devices in accordance with this European Standard may be combined with other components, e.g. descender devices for rescue (EN 341) or retractable type fall arresters (EN 360).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 362:2004, *Personal protective equipment against falls from a height - Connectors*

EN 363, *Personal fall protection equipment - Personal fall protection systems*

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

EN 365, *Personal protective equipment against falls from a height - General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging*

EN 795, *Personal fall protection equipment - Anchor devices*

EN 1891:1998, *Personal protective equipment for the prevention of falls from a height - Low stretch kernmantel ropes*

EN ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227)*

ISO 2232, *Round drawn wire for general purpose non-alloy steel wire ropes and for large diameter steel wire ropes — Specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 363 and the following apply.

3.1
rescue lifting device class A
component of a rescue system by which a person is lifted by a rescuer or lifts himself from a lower to a higher place

3.2
rescue lifting device class B
rescue lifting device class A with an additional hand-operated lowering function intended for lowering a person over a distance limited to 2 m, e. g. to avoid an obstruction

3.3
maximum rated load
maximum mass of the person, including tools and equipment, for the rescue lifting device, as specified by the manufacturer

Note 1 to entry: Maximum rated load is expressed in kilograms.

3.4
braking force
maximum force F_{max} measured at the end termination of the line during the braking period of the dynamic performance test

Note 1 to entry: Maximum force F_{max} is expressed in kilo newtons.

4 Requirements

4.1 General

4.1.1 A rescue lifting device that is incorporated into other personal fall protection equipment (e.g. retractable type fall arrester) shall meet all the requirements of this European Standard when in the rescue mode.

4.1.2 If the rescue lifting device is permanently fitted or intended to be fitted to a tripod or similar anchor device in accordance with EN 795, the whole unit, i.e. the rescue lifting device and the anchor device combined, shall meet the requirements of this European Standard.

4.2 Ergonomics

When tested in accordance with 5.4 with a mass equivalent to the maximum rated load, but at least 100 kg, the operating force for lifting the test mass shall not exceed 250 N.

4.3 Materials and construction

4.3.1 General

Materials used in the rescue lifting device that may come into contact with the skin of a user shall not be known to cause irritating or sensitization effects during intended use.

When checked in accordance with 5.3, the rescue lifting device shall have no sharp edges and burrs that may cause injury to the user.

4.3.2 Lines

Lines shall be made from textile rope or webbing or from steel wire rope.

NOTE To prevent rotation of the rescuee, swivels can be incorporated in the line.

4.3.3 Ropes and webbings

Fibre ropes shall be of a braided construction or a kernmantel construction. They shall conform to EN 1891:1998, 4.1 and 4.5. If they are of a kernmantel construction, they shall also conform to EN 1891:1998, 4.4.

Wire ropes shall conform to ISO 2232.

Webbings and yarns shall be made of virgin filament or multifilament synthetic fibres, suitable for the use intended. The breaking tenacity of the synthetic fibre shall be known to be at least 0,6 N/tex.

Threads used for sewing shall be physically compatible with the rope or webbing and their quality shall be comparable to those of the rope or webbing. They shall, however, be of a contrasting shade in order to facilitate visual inspection.

4.3.4 Connectors

Connectors incorporated in rescue lifting devices shall meet the requirements of EN 362:2004, except 4.6.

4.4 Function for class A rescue lifting devices

When tested in accordance with 5.8.1, the lifting feature shall still function without failure and the test mass shall be arrested within a vertical distance of 100 mm.

4.5 Dynamic performance and function for class B rescue lifting devices

When tested in accordance with 5.5 with a test mass equivalent to the maximum rated load, but at least 100 kg, the test mass shall be held and the braking force F_{max} shall not exceed 6 kN.

When tested in accordance with 5.8.2, the lifting and lowering feature shall still function without failure and the test mass shall be arrested within a vertical distance of 100 mm.

4.6 Static strength

When tested in accordance with 5.6 with a test force equivalent to 10 times the maximum rated load, but at least 12 kN, the rescue lifting device shall withstand the test force applied for 3 min without tearing or rupture.

4.7 Corrosion resistance

After the test in accordance with 5.7, metal parts shall show no evidence of corrosion that would affect the function of the rescue lifting device (white scaling or tarnishing is acceptable if the function is not impaired).

NOTE Conformity with this requirement does not imply suitability for use in a marine environment.

4.8 Marking and information

Marking of the rescue lifting device shall be in accordance with Clause 6.

Information shall be supplied with the rescue lifting device in accordance with Clause 7.

5 Test methods

5.1 Sampling

At least two test samples shall be provided for the tests.

5.2 Test masses

Three test masses are required:

— test mass A: equivalent to the maximum rated load, but at least 100 kg;

— test mass B: equivalent to 1,5 times the maximum rated load, but at least 150 kg;

— test mass C: 30 kg.

The tolerance on the test masses is $\begin{pmatrix} +2 \\ 0 \end{pmatrix}$ %.

5.3 Examination of design

Confirm by reference to appropriate documentation and by visual and/or tactile examination of the rescue lifting device that it meets the requirements of 4.3.

5.4 Operating force test

Fit the rescue lifting device to an anchor point in accordance with the information supplied by the manufacturer.

If the rescue lifting device is intended to be fitted to a tripod or similar anchor device, then test the whole unit.

Withdraw the line by at least 1 000 mm from the rescue lifting device and attach test mass A to the end termination in the line.

Where relevant, engage the rescue mechanism in accordance with the information supplied by the manufacturer.

Hold the test mass by means of the controlling feature.

Apply a force of a maximum of 250 N to the handle of the controlling feature in such a way that it operates as intended.

Check whether the force lifts the test mass.

5.5 Dynamic performance test for class B rescue lifting devices

5.5.1 Apparatus

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

5.5.2 Procedure

Attach the rescue lifting device in the intended position of the rescue lifting device to the anchor point of the test apparatus.

If the rescue lifting device is intended to be fitted to a tripod or similar anchor device, then test the whole unit.

Withdraw the line by $\left(4000^{+50}_{0}\right)$ mm from the rescue lifting device and attach test mass A to the end termination of the line, incorporating a force measurement instrument to measure the braking force.

Raise the test mass by $\left(600^{+50}_{0}\right)$ mm, with a maximum horizontal distance of 300 mm from the centre line (see Figure 1). Hold the test mass by the quick release device. In the case of rescue lifting devices with an automatic retraction function, prevent the line from retracting by a clamp.

Where relevant, engage the rescue mechanism in accordance with the information supplied by the manufacturer.

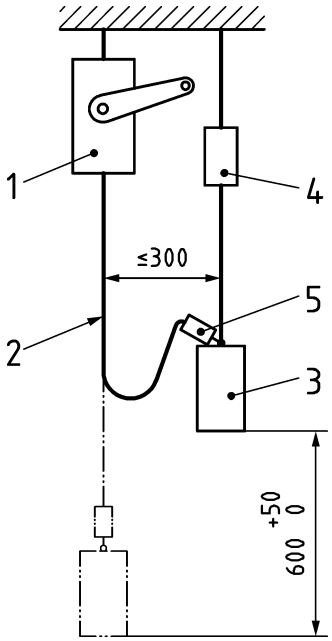
Release the test mass without initial velocity.

Measure the braking force.

Repeat the test for every intended orientation and/or position of the rescue lifting device. Where the manufacturer gives a range of orientations of use for the rescue lifting device, carry out a test at each extreme orientation and one centrally between the two, using an appropriate anchor point.

A new test sample may be used for each test.

Dimensions in millimetres



Key

1 rescue lifting device
2 line
3 test mass
4 quick release device
5 force measurement instrument

Figure 1 — Dynamic performance test procedure for class B rescue lifting devices

5.6 Static strength test

5.6.1 Test apparatus

The test apparatus for the static test shall conform to EN 364:1992, 4.1.

5.6.2 Test sample

The manufacturer shall supply a test sample with a length of line appropriate to enable the test to be carried out and a termination the same as that used on the rescue lifting device to be placed on the market.

5.6.3 Test procedure

If the rescue lifting device is intended to be fitted to a tripod or similar anchor device, then test the whole unit.

Fit the rescue lifting device into the test apparatus by the attachment point of the rescue lifting device at one end and by the attachment point of the line at the other end.

With the line fully withdrawn, apply a force equivalent to 10 times the maximum rated load with a tolerance of $\begin{pmatrix} +0,2 \\ 0 \end{pmatrix}$ kN, but with a minimum of $\left(12^{+0,2}_{0}\right)$ kN, and maintain it for $\left(3^{+0,25}_{0}\right)$ min.

Check whether the test sample holds the force without tearing or rupture.

Where the manufacturer permits different positions of the rescue lifting device on the anchor device, carry out a test at each position.

A new test sample may be used for each test.

5.7 Corrosion resistance test

5.7.1 Test apparatus

The apparatus for testing the corrosion resistance shall be capable of the neutral salt spray test procedure described in EN ISO 9227.

5.7.2 Test procedure

Expose the rescue lifting device (including the line and any fittings) to the neutral salt spray test in accordance with EN ISO 9227 for $\left(24^{+0,5}_{0}\right)$ h. Dry for $\left(60^{+5}_{0}\right)$ min at (20 ± 2) °C. Then repeat the procedure, so that the rescue lifting device is subjected in total to $\left(24^{+0,5}_{0}\right)$ h exposure and $\left(60^{+5}_{0}\right)$ min drying plus another $\left(24^{+0,5}_{0}\right)$ h exposure and $\left(60^{+5}_{0}\right)$ min drying.

Examine the specimen within 90 s after drying and check for signs of corrosion. Where necessary to gain visual access to internal parts, dismantle the rescue lifting device.

NOTE If the rescue lifting device is integrated into an anchor device in accordance with EN 795, it is sufficient to test only the rescue lifting device and not the anchor device.

5.8 Function test

5.8.1 Test procedure for rescue lifting devices class A

5.8.1.1 Carry out the test at the maximum lifting distance as given in the information supplied by the manufacturer.

5.8.1.2 Attach the rescue lifting device to an appropriate anchor point.

Fully extract the line to correspond to the working length of the rescue lifting device. Where relevant, engage the rescue mechanism in accordance with the information supplied by the manufacturer.

5.8.1.3 Attach test mass B to the end of the extracted line.

By means of the controlling feature, lift the test mass until there is (1 000 ± 100) mm of line remaining outside the rescue lifting device.

Release the controlling feature and measure the arrest distance.

Where the manufacturer permits different positions or orientations of the rescue lifting device, repeat the procedure at each orientation / position, by lifting the test mass until there is (1 000 ± 100) mm of line remaining below the point at which the line commences to hang downwards (e.g. the top pulley of a tripod). Where the manufacturer gives a range of orientations of use for the rescue lifting device, carry out a test at each extreme orientation and one centrally between the two.

A new test sample may be used for each test.

5.8.1.4 Repeat the procedure specified in 5.8.1.2 and 5.8.1.3, replacing test mass B with test mass C.

5.8.1.5 Immerse the rescue lifting device including the line in clean, fresh water within a temperature range of (10 to 30) °C for $\left(60^{+5}_{0}\right)$ min. Remove the device including the line from the

water, attach the device as specified in 5.8.1.2, allow to drain for (15 ± 1) min and carry out the tests specified in 5.8.1.3.

5.8.1.6 Repeat the procedure specified in 5.8.1.5, replacing test mass B with test mass C. A new test sample may be used.

5.8.1.7 Where a rescue lifting device has more than one controlling feature, test each one in accordance with 5.8.1.1 to 5.8.1.6.

5.8.2 Test procedure for rescue lifting devices class B

5.8.2.1 After the dynamic performance test procedure in accordance with 5.5.2, replace test mass A with test mass B.

Engage the rescue mechanism in accordance with the information supplied by the manufacturer. By means of the controlling feature, lift the test mass until the line is fully retracted in the rescue lifting device. Then by means of the controlling feature, lower the test mass by (1 000 ± 100) mm.

Release the controlling feature and measure the arrest distance.

Afterwards lower the test mass by a distance corresponding to the working length of the rescue lifting device. Then by means of the controlling feature, lift the test mass until there is (1 000 ± 100) mm of line remaining below the point at which the line commences to hang downwards.

Release the controlling feature and measure the arrest distance.

5.8.2.2 Replace test mass B with test mass C and repeat the test procedure specified in 5.8.2.1, i.e. without the dynamic performance test procedure.

5.8.2.3 Immerse the rescue lifting device including the line in clean, fresh water within a temperature range of (10 to 30) °C for 60 min. Remove the device including the line from the water, attach the device as specified in 5.8.1.2, allow to drain for (15 ± 1) min and carry out the tests specified in 5.8.2.1 and 5.8.2.2.

5.8.2.4 Repeat the procedure specified in 5.8.2.3, replacing test mass B with test mass C. A new test sample may be used.

5.8.2.5 Where a rescue lifting device has more than one controlling feature, test each one in accordance with 5.8.2.1 to 5.8.2.4.

6 Marking

Marking on the rescue lifting device shall conform to EN 365 and, in addition, shall include at least the following:

a) the class of the rescue lifting device;

b) the maximum rated load of the rescue lifting device;

c) the maximum lifting distance in metres;

d) if the line is not integrated into the rescue lifting device, the type, model and diameter range of the lines to be used with the rescue lifting device.

7 Information supplied by the manufacturer

The information supplied by the manufacturer shall conform to EN 365 and, in addition, shall include at least advice or information as follows:

a) that the user should read and understand the information supplied by the manufacturer before using the rescue lifting device;

b) the class of the rescue lifting device;

c) the maximum rated load of the rescue lifting device;

d) the recommended type of body-holding device(s) that are to be used with the rescue lifting device;

e) the correct way to connect the rescue lifting device to the body holding device of the rescuee;

f) that for rescue lifting procedures by a rescuer, there should be direct or indirect visual contact or some other means of communication with the rescuee at all times during the rescue process;

g) a warning that the lifting / lowering function is for rescue purposes only and not for lifting/ lowering loads;

h) the orientation(s) and position(s) in which the rescue lifting device may be used, e.g. vertically, horizontally or inclined;

i) if the rescue lifting device can be disassembled, how to assemble or reassemble the elements to prepare the rescue lifting device ready for use;

j) if the line is not integrated into the rescue lifting device, the model/type and diameter of the lines with which the rescue lifting device may be used and other relevant information necessary to ensure compatibility of the rescue lifting device;

k) for class A rescue lifting devices, that the rescue lifting device shall only be used if an unhindered lifting process is possible and that it shall not be used if obstacles present a hazard;

l) for class B rescue lifting devices, that the lowering function is only intended to lower a person over a maximum distance of 2 m and that for a rescue by descent, a descender device conforming to EN 341 should be used;

m) the number and year of publication of this European Standard, i.e. EN 1496:2017.

Annex A
(informative)

Significant technical changes between this European Standard and the previous edition EN 1496:2006

Table A.1 — Significant technical changes

Clause / Paragraph / Table / Figure	Change
1 Scope	The scope has been modified: Due to the changes of the definition for a rescue system in EN 363:2008.
2 Normative references	EN ISO 1140, EN ISO 1141 have been deleted.
3 Definitions	Due to the changes of the definition for a rescue system in EN 363, 3.1 has been modified. Definition 3.2: The note has been implemented in the definition and in Clause 7 l). Definitions 3.3 and 3.4 have been modified to be in line with EN 363
4.3.3 Ropes and webbings	The requirements on the fibre ropes now related to their performance and not to their construction.
4.3.4 Connectors	Requirements for connectors incorporated in rescue lifting devices have been specified in more detail
5.3 Conditioning to wet	Subclause 5.3 has been deleted. For a better readability the conditioning to wet was implemented in the function test procedures, see 5.8.1 and 5.8.2.
5.8 Function tests 5.8.1.5 and 5.8.2.3	Conditioning to wet was integrated in the function test procedures
Clause 7 l)	Expanding the advice with the aim of the former note to the definition of rescue lifting device.

Bibliography

[1] EN 341, *Personal fall protection equipment - Descender devices for rescue*

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

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