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BSI Standards Publication

Mountaineering equipment — Braking devices

Part 2: Manual braking devices, safety requirements and test methods

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National foreword

This British Standard is the UK implementation of EN 15151-2:2012.

The UK participation in its preparation was entrusted to Technical Committee SW/136/5, Sports, Playground and other Recreational Equipment - Mountaineering Equipment.

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

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Bergsteigerausrüstung - Bremsgeräte - Teil 2: Manuelle Bremsgeräte, sicherheitstechnische Anforderungen und Prüfverfahren

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Foreword

This document (EN 15151-2:2012) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and equipment”, 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of an identical text or by endorsement, at the latest by February 2013, and conflicting national standards shall be withdrawn at the latest by February 2013.

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This European Standard EN 15151 "Mountaineering equipment - Braking devices" consists of:

— Part 1: Braking devices with assisted locking, safety requirements and test methods;

— Part 2: Manual braking devices, safety requirements and test methods.

This standard is one of a package of standards for mountaineering equipment (see Annex A).

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies safety requirements and test methods for manual braking devices used in mountaineering, climbing and related activities for belaying and abseiling, with only manual control, to protect against falls from a height.

This European Standard applies to braking devices which are loaded with one person and which use mountaineering ropes according to EN 892. In case of abseiling and lowering down this standard also applies to braking devices, used with low stretch kernmantel ropes according to EN 1891.

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 892, *Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods*

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

EN 15151-1:2012, *Mountaineering equipment — Braking devices — Part 1: braking devices with manually assisted locking, safety requirements and test methods*

3 Terms and definitions

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

3.1
braking device
mechanical device which generates forces on the rope, to oppose movement of the rope through the device

3.2
manual braking device
device controlled by hand force applied to the free end of the rope, that produces a magnified force in the active rope in a continuous and reversible manner, such that when the force in the free end of the rope is reduced to zero, the braking effect becomes negligibly small

3.3
attachment point
any system which is required and intended for the attachment of a connector according to the information supplied by the manufacturer

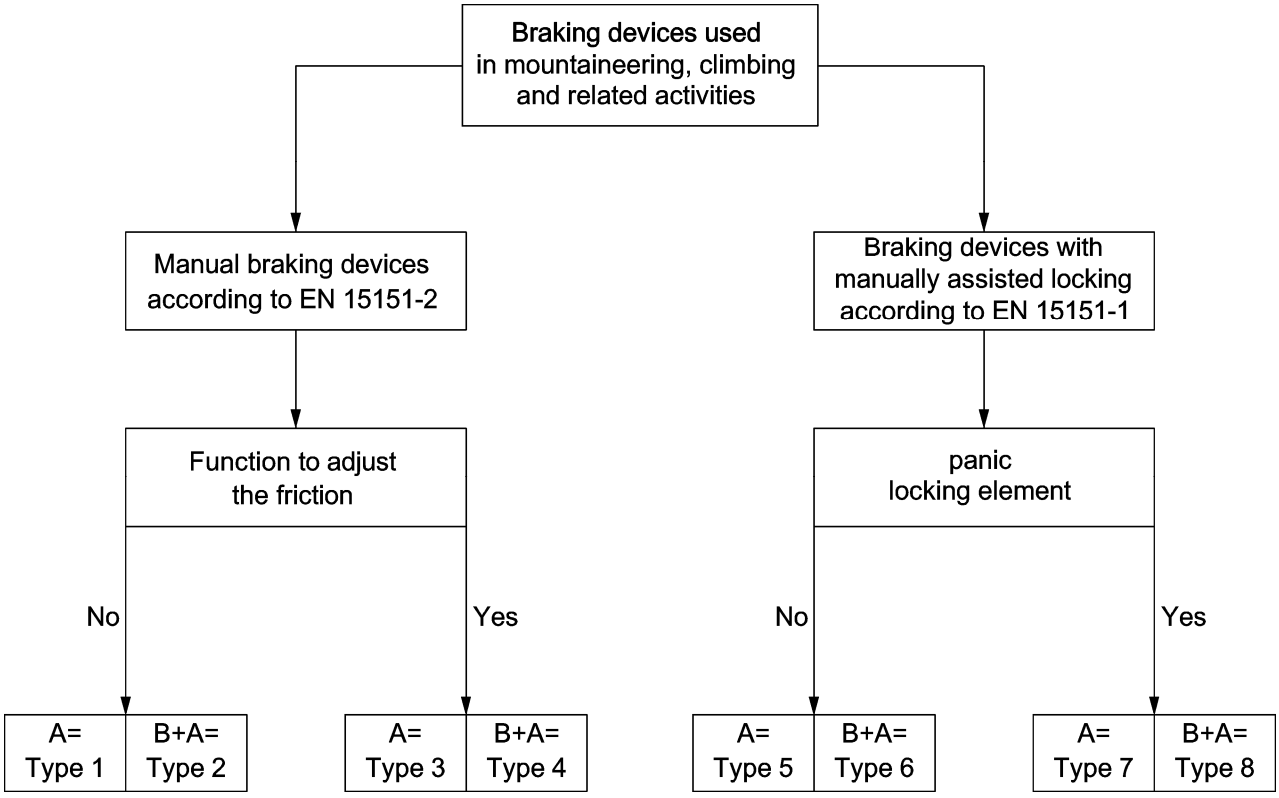
Note 1 to entry: For information on connectors, see EN 12275 or EN 362.

3.4
function to adjust the friction
inherent characteristic of the device that allows the friction to be changed

4 Classification

4.1 General

Figure 1 gives the classification of braking devices used in mountaineering, climbing and related activities. Manual braking devices are classified according to 4.2. Braking devices with manually assisted locking are defined in EN 15151-1:2012, 4.2.



Key
A abseiling
B belaying

Figure 1 — Classification of braking devices

4.2 Manual braking devices

4.2.1 Type 1: devices for abseiling without a function to adjust the friction;

4.2.2 Type 2: devices for belaying and abseiling without a function to adjust the friction;

4.2.3 Type 3: devices for abseiling with a function to adjust the friction;

4.2.4 Type 4: devices for belaying and abseiling with a function to adjust the friction.

5 Safety requirements

5.1 General

5.1.1 An overview of the requirements related to the various types of manual braking device is given in

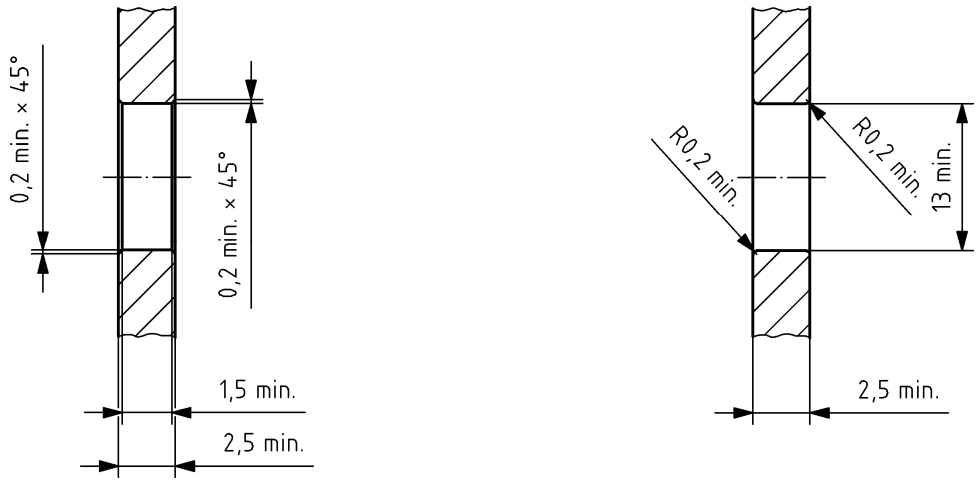
Table 1. Requirements for braking devices with manually assisted locking are given in EN 15151-1:2012.

Table 1 — Overview of requirements related to various types of manual braking devices

Clause	Requirements	Rope diameter/ type of rope	Type 1	Type 2	Type 3	Type 4
5.1	General	—	x	x	x	x
5.2	Static strength	Minimum/maximum EN 892 and/or EN 1891	x	x	x	x

5.1.2 If a braking device has an attachment point, it shall be capable of accommodating a bar of a diameter of $\left(13\ {}^{+0,1}_{0}\right)$ mm. The edges of all openings shall be at least as in Figure 2.

Dimensions in millimetres



a) bevelled edges **b) rounded edges**

Figure 2 — Edges of openings

5.1.3 Braking devices shall not have any sharp or rough edges that may cut, abrade or otherwise damage ropes or cause injury to the user.

5.1.4 When in use as described in the information supplied by the manufacturer the braking device shall function to prevent the rope being detached without at least two consecutive deliberate manual actions.

5.1.5 Braking devices shall be designed to operate with ropes in the diameter range as specified in the information supplied by the manufacturer.

5.2 Static strength

When tested in accordance with 6.5, the test shall be carried out with ropes of the minimum diameter of each type of rope specified in the manufacturer's instructions for use. The braking device shall withstand a force of $\left(7\ {}^{+0,5}_{0}\right)$ kN for single ropes and twin ropes (two strands) and $\left(5\ {}^{+0,5}_{0}\right)$ kN for half ropes (one strand), applied to each attachment point of the device for $(60\ {}^{+5}_{0})$ s and shall not release the loaded rope.

The test shall be repeated with ropes of the maximum diameter of each type of rope specified in the manufacturer's instructions for use. If the device is intended for use with half or twin ropes, it shall be tested with two strands.

If the instructions for use supplied by the manufacturer states that the device has different positions of functioning, each position shall be tested.

If the braking device has an additional attachment to be placed on an anchor for belaying and blocking a second climber, test according to 6.6 with one strand of ropes of the minimum diameter of rope specified in the manufacturer's instructions for use. The braking device shall withstand a force of $\left(8\ ^{+0,5}_{0}\right)$ kN for $(60\ ^{+5}_{0})$ s and shall not release the loop of rope.

5.3 Static strength when used as a belay anchor :

If the braking device is intended for use as a direct belay anchor, it shall be tested in accordance with 6.6.2 with one strand of rope of the minimum diameter as specified in the instructions for use. The braking device shall withstand $\left(8\ ^{+0,5}_{0}\right)$ kN for $(60\ ^{+5}_{0})$ s and shall not release the loop of rope.

The test shall be repeated with the ropes of the maximum diameter of rope specified in the manufacturer's instructions for use.

The test shall be repeated for each possible position of functioning described in the manufacturer's instructions for use.

6 Test methods

6.1 General

The braking device shall be tested in all configurations of use as specified in the information supplied by the manufacturer.

6.2 Test conditions

Carry out the tests at a temperature of (23 ± 5) °C.

6.3 Sampling

Use a new rope for each test. Use a new braking device for each of the tests specified in 6.5.

6.4 Design

6.4.1 Determine the dimension of the attachment point (see 5.1.2) by measuring with a bar of $\left(13\ ^{+0,1}_{0}\right)$ mm diameter.

6.4.2 This test method shall apply to all types of braking devices.

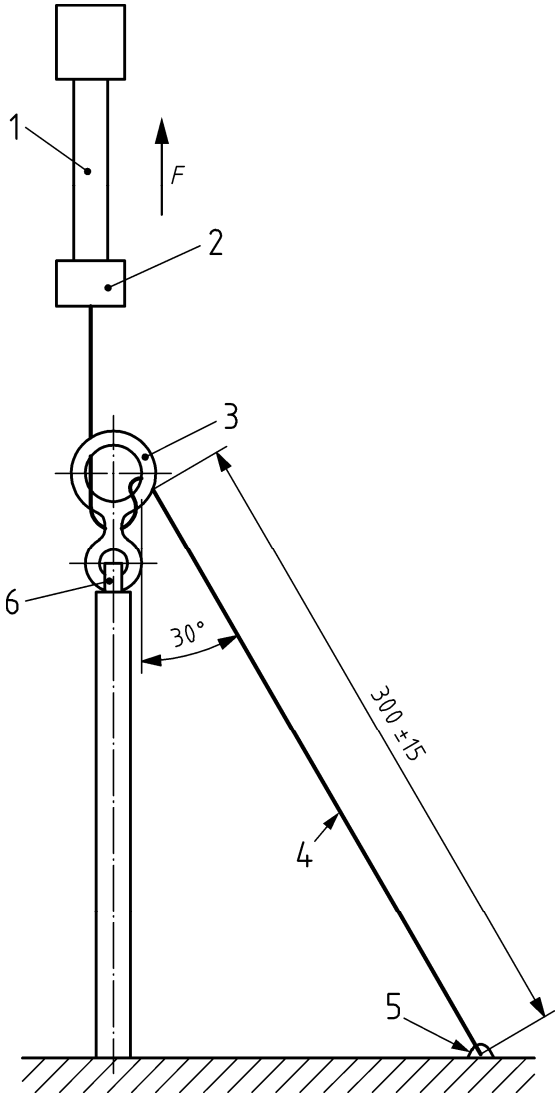
Confirm by reference to appropriate documentation accompanying the braking device and rope(s) and by normal or corrected vision and/or tactile examination and operation of the braking device and the rope(s) that they conform to 5.1.3 and 5.1.4. Dismantle the braking device if necessary to examine internal components.

6.5 Static strength

6.5.1 Apparatus

The test apparatus is shown in Figure 3.

Dimensions in millimetres



Key

1 pulling device
2 load cell
3 braking device
4 rope
5 fixed attachment point of the rope
6 swivelling anchor point
F force

Figure 3 — Apparatus for testing static strength of manual braking devices

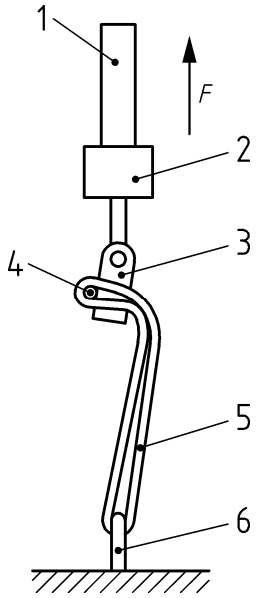
6.5.2 Procedure

Attach the braking device to the rope in accordance with the information supplied by the manufacturer. Connect the attachment point with a swivelling anchor point. Attach the incoming end of the rope at an angle of (30 ± 5)° in direction of tension (see Figure 3). In order to measure (300 ± 15) mm, apply a force sufficient

to keep the device in stable position. Apply the force according to 5.2 within 1 min to 2 min to the outgoing end of the rope and keep it for 1 min.

6.6 Static strength of the additional attachment

6.6.1 Apparatus



Key

1	pulling device	4	Ø 10 mm pin
2	load cell	5	loop of rope
3	braking device	6	anchor point
		F	force

Figure 4 — Apparatus for testing static strength of the additional attachment

6.6.2 Procedure

Attach the braking device with the additional attachment to the test machine.

Attach the braking device as intended for belaying the second climber on stance to a loop of rope in accordance with the information supplied by the manufacturer. If a karabiner is required, use a 10 mm diameter pin.

Connect the loop of rope to the test machine.

Apply a force according to 5.2 within 1 min to 2 min to the outgoing end of the rope and maintain it for 1 min.

7 Marking

Braking devices shall be marked clearly, indelibly and durably, including at least the following:

a) name of the manufacturer or its authorized representative in the Community;

NOTE For a definition of manufacturer and authorized representative see Regulation 765/2008.

b) the number of this European Standard, EN 15151-2;

c) model identifier (if several models are marketed by the manufacturer);

d) minimum and maximum diameters of the rope(s), in millimetres, to one decimal place;

e) the following pictogram, instructing the user to see the information supplied by the manufacturer;

Figure 5

f) visual indication of correct placement of the rope.

8 Information supplied by the manufacturer

The manual braking device shall be supplied with an explanatory leaflet, written in at least the official language(s) of the state of destination within the European Union (EU) and European Economic Area (EEA) containing at least the following items:

a) name and address of the manufacturer or its representative in the Community;

b) number of this European Standard, i.e. EN 15151-2;

c) definition of the braking device according to the classification in 4.2;

d) description of the device's characteristics and of the intended use, including:

1) information that the use of the braking device is intended for mountaineering, climbing and related activities;

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

3) advice on how attachment should be made to any connecting component or sub-system (e.g. for anchoring, belaying, ascending, abseiling or in a rescue situation);

4) advice to the user that the braking effect will be dependent on the rope diameter, slipperiness of the rope, whether the rope is wet, and other factors;

5) advice to the user that it is the responsibility of the user to familiarize himself with the braking effect available before each use;

6) advice to the user that the free end of the rope shall be controlled by hand at all times;

7) minimum and maximum diameters of the rope(s), in millimetres, to one decimal place and type of rope(s) with a statement, that commercially stated rope diameters have a tolerance up to ± 0,2 mm. Rope diameters and other characteristics may vary with use;

8) the meaning of any markings on the product;

9) information about the use of the function to adjust the friction (for types 3 and 4);

10) information on how to maintain and service the product;

11) information on the lifespan of the product or how to assess it;

12) information on the effects of storage and ageing;

13) instruction for the choice of other suitable components for use in the system;

14) advice on the importance of checking the braking device regularly for any damage during use and the necessity to withdraw it from use if any damage or defect is found;

15) advice on the effects of chemical reagents with which the product might come into contact;

16) advice on the effects of humidity, wet and icy conditions.

Annex A
(informative)

Standards on mountaineering equipment

Table A.1 — List of standards on mountaineering equipment

No	Document	*Title*
1	EN 564	*Mountaineering equipment — Accessory cord — Safety requirements and test methods*
2	EN 565	*Mountaineering equipment — Tape — Safety requirements and test methods*
3	EN 566	*Mountaineering equipment — Slings — Safety requirements and test methods*
4	EN 567	*Mountaineering equipment — Rope clamps — Safety requirements and test methods*
5	EN 568	*Mountaineering equipment — Ice anchors — Safety requirements and test methods*
6	EN 569	*Mountaineering equipment — Pitons — Safety requirements and test methods*
7	EN 892	*Mountaineering equipment — Dynamic mountaineering ropes — Safety requirements and test methods*
8	EN 893	*Mountaineering equipment — Crampons — Safety requirements and test methods*
9	EN 958	*Mountaineering equipment — Energy absorbing systems for use in klettersteig (via ferrata) climbing — Safety requirements and test methods*
10	EN 959	*Mountaineering equipment — Rock anchors — Safety requirements and test methods*
11	EN 12270	*Mountaineering equipment — Chocks — Safety requirements and test methods*
12	EN 12275	*Mountaineering equipment — Connectors — Safety requirements and test methods*
13	EN 12276	*Mountaineering equipment — Frictional anchors — Safety requirements and test methods*
14	EN 12277	*Mountaineering equipment — Harnesses — Safety requirements and test methods*
15	EN 12278	*Mountaineering equipment — Pulleys — Safety requirements and test methods*
16	EN 12492	*Mountaineering equipment — Helmets for mountaineers — Safety requirements and test methods*
17	EN 13089	*Mountaineering equipment — Ice-tools — Safety requirements and test methods*
18	EN 15151-1	*Mountaineering equipment — Braking devices — Part 1: Braking device with manually assisted locking, safety requirements and test methods*
19	EN 15151-2	*Mountaineering equipment — Braking devices — Part 2: Manual braking devices, safety requirements and test methods*

Bibliography

[1] EN 362, *Personal protective equipment against falls from a height — Connectors*

[2] EN 12275, *Mountaineering equipment — Connectors — Safety requirements and test methods*

[3] Regulation 765/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93

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