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Interested committees:

Title: Draft BS EN 1651 Paragliding equipment - Harnesses - Safety requirements and strength tests.

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Full document details: 25/30505816 DC

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Paragliding equipment - Harnesses - Safety requirements and strength tests

Équipement pour le parapente - Sellettes pour
parapente - Exigences de sécurité et essais de
résistance

Ausrüstung für das Gleitschirmfliegen - Gurtzeuge -
Sicherheitstechnische Anforderungen und Prüfung der
Festigkeit

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 136.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 1651:2025) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 1651:2018+A1:2020.

This document includes the following significant technical changes with respect to EN 1651:2018+A1:2020:

- a) Terms and Definitions - amended to define the closure system, the additional closure system and integrated accessories to enable additional tests to parts of modern harnesses.
- b) Terms and Definitions - added an anatomical drawing to assist in the identification of the closure system and the additional closure system.
- c) Terms and Definitions - amended the definition of an impact pad to provide greater clarity on pad types.
- d) Terms and Definitions - added and amended definitions for the deployment system, the outer container, the inner container, and dummy emergency parachute.
- e) Terms and Definitions - added a definition for a compatibility check.
- f) Safety requirements - Anti slipping out systems - amended to include an additional anti slipping out test.
- g) Safety requirements - added a Deployment system strength test.
- h) Safety requirements - added a Deployment system opening test for partially opening inner containers.
- i) Test Methods - amended the vertical impact pad test apparatus requirements, including the dummy angle and the vertical axis accelerometer.
- j) Test Methods - amended anti falling-out system test to enable tests of non-structural elements that form part of closure systems.
- k) Test Methods - added a Deployment system strength test.
- l) Test Methods - added a Deployment system opening test for partially opening inner containers.
- m) Test Methods - amended the vertical impact pad test, including the requirements for the preparation for the tests, and a reduction in max peak g.
- n) Test Methods - added a requirement to calculate Spine Impact Criterion (SIC) for impact pads. This has been introduced for future evaluation of the likelihood of spinal injury based on impact severity, using a criterion analogous to the Head Injury Criterion (HIC).
- o) User Manual - added requirements for information to be provided to assist with the correct installation of an emergency parachute.

- p) User Manual - added requirements for information to be provided to assist with repair and maintenance.
- q) Marking - added a requirement to include Spine Injury Criterion marking on integrated and removable impact pads.
- r) Marking - added a requirement to include marking on emergency parachute inner containers supplied with a harness.
- s) Annex A - amended to include minor modifications to adapt the table to the amended definitions.
- t) Annex B - added to supply definitions for inner container types.
- u) Annex C - added to supply example wording to assist with emergency parachute installation.
- v) Annex D - added to supply Spine Injury Criterion calculation.

1 Scope

This document is applicable only to harnesses for paragliders. The intermediate attachment system between the harness and the paraglider / the emergency parachute does not form part of this document.

This document specifies safety requirements and test methods.

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.

EN 12491, *Paragliding equipment - Emergency parachutes - Safety requirements and test methods*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

paraglider

ultra-light foot launched aircraft comprised of a wing with no primary rigid structure and a harness (or harnesses) necessary to support the pilot (and potentially one passenger)

3.2

harness

paraglider sub assembly for supporting the pilot in the seated or semi-recumbent or standing position

Note 1 to entry: The harness is attached to the wing via two rings or connectors, it can also be integral with the wing via risers.

3.3

emergency parachute

emergency device intended to slow the descent of a paraglider pilot in the event of an incident in flight, which is deployed by the pilot by an intentional manual action

3.4

emergency parachute connecting element

element not supplied as an integral part of either a harness or emergency parachute, provided to connect an emergency parachute to a harness

3.5

clip-in weight

total weight in flight excluding the paraglider

3.6

special emergency parachute attachment points

symmetrical locations on the harness structure provided by the manufacturer specifically for the attachment of an emergency parachute

Note 1 to entry: See Figure 2, locations 1 and 2.

3.7

integrated Y-bridle

load distributing component integrated into the harness structure used to connect the harness to a single parachute bridle

3.8

structural element

load carrying element of the harness whilst it is tested according to 4.2.1 to 4.2.9

3.9

crotch strap

harness structural element passing between the legs intended to restrain the pilot

3.10

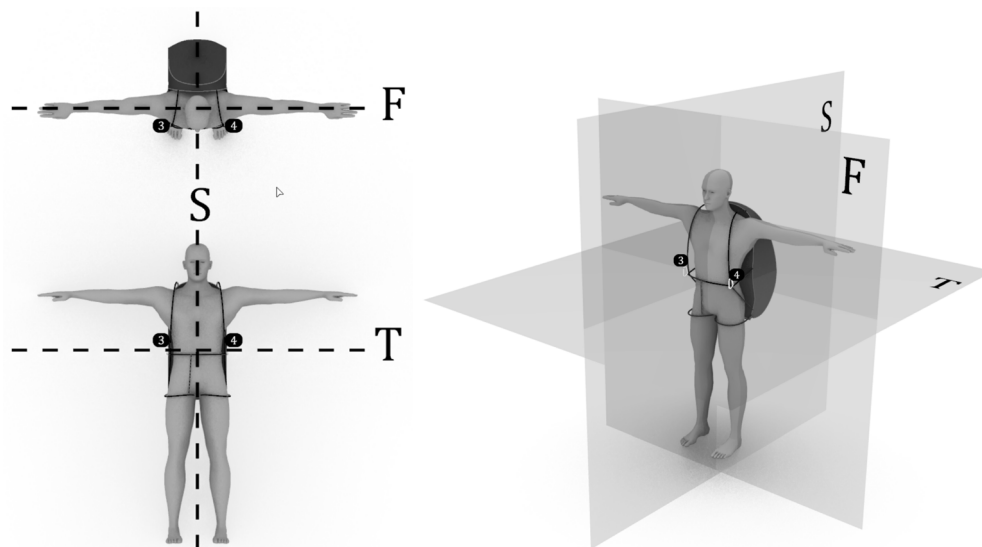
chest strap

Closure system which is a structural element

3.11

closure system

assembly which forms a link between the harness to paraglider riser attachment points (Figure 1, locations 3 and 4) that bisects the sagittal plane, and is in front of the frontal plane



Key

S sagittal plane

F frontal plane

T transversal plane

3,4 harness attachment for paraglider riser(s)

Figure 1 — Anatomical planes

3.12

additional closure system

any non-structural harness closure element, below a transversal plane passing through the carabiners

Note 1 to entry: See Figures 1 and 2, locations 3 and 4.

3.13

integrated accessory

integrated non-structural device fitted to a harness in order to make it more useful, part of which can be detached from the harness by the user

Note 1 to entry: Examples may be a harness “pod”, “cockpit bag” or emergency parachute front container

3.14

impact pad

component of a paraglider harness designed to attenuate the compression force transmitted to the spine of the pilot in the event of a seated vertical fall

Note 1 to entry: Impact pads may consist of rigid, flexible and inflatable parts. Inflatable impact pads are further categorized as:

1 - Airstream Inflatable airbag - requires an airstream to inflate all or part of the impact pad

2 - Air-tight airbag - (to be manually inflated before flight or during flight)

3 - Airbag - all other types, that do not require an airstream or manual pre-inflation.

3.15

deployment system

inner container and the extraction handle system, being either a handle fixed to the inner container, or a free handle and handle attachment point(s) on the inner container

3.16

emergency parachute system

emergency parachute combined with its deployment system

3.17

outer container

external container, that remains attached to the harness after the emergency parachute has been deployed

Note 1 to entry: this can be an integrated outer container (permanently attached to harness) or attached to the harness by the user

3.18

inner container

container of the folded emergency parachute

Note 1 to entry: being either a “fully opening inner container”, or “partially opening inner container” as defined in Annex B

3.19**dummy emergency parachute**

emergency parachute for the purpose of testing, where the volume of the folded emergency parachute (as specified by the emergency parachute manufacturer) is the maximum volume (plus 0% to 20%) of the inner container maximum volume (as specified by the harness manufacturer)

3.20**compatibility check**

a check performed to verify the correct function and the ease of withdrawing the inner container from the outer container

3.21**durable medium**

information given to the user in an unchangeable format that does not allow for unilateral editing or altering by the information provider, and enables the recipient to store the information in a way that is accessible for future reference for as long as the user might reasonably need it

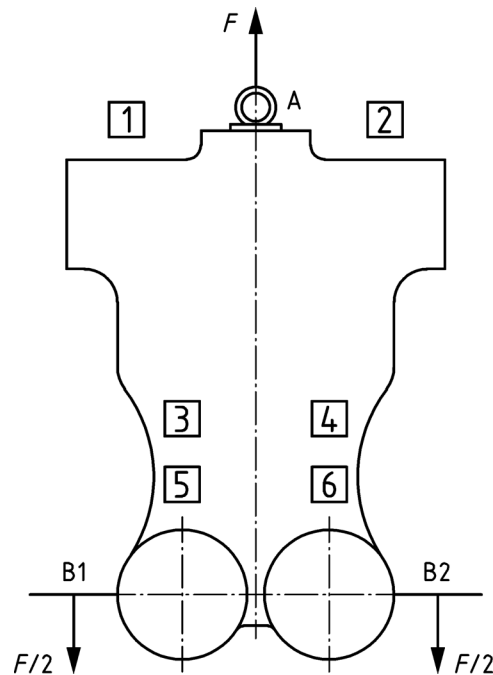
4 Safety requirements**4.1 General**

All free ends of the harness straps shall be finished with a folded hem making it impossible for the straps to pass through the adjustable buckles.

The harness shall be made in accordance with accepted practice for textile assemblies.

All attachment points provided on the harness (see Figure 2) that may be used for attachment of the paraglider or emergency parachute shall be clearly marked in a contrasting colour to the other webbing.

The attachment points for the emergency parachute shall not be in a position lower than the attachment points of the paraglider and shall be positioned symmetrically on the harness.



Key

- 1 special harness attachment for emergency parachute (right)
- 2 special harness attachment for emergency parachute (left)
- 3 harness attachment for paraglider riser(s) (right)
- 4 harness attachment for paraglider riser(s) (left)
- 5 harness attachment for tow release (right)
- 6 harness attachment for tow release (left)
- B1 dummy attachment to anchorage (right)
- B2 dummy attachment to anchorage (left)
- A dummy attachment point
- F pulling force

Figure 2 — Attachment points for the tests

NOTE The numbering system for attachment points in this Figure 2 is retained in all the following figures of this document.

4.2 Requirements

4.2.1 Positive symmetric load applied to the paraglider riser attachment points

When tested in accordance with 5.5.1.1, there shall be:

- a) during the adjustable component slipping test, no slippage of any adjustable element exceeding 10 mm;
- b) no rupture of any essential structural part;
- c) no rupture of the stitching of any essential structural part;
- d) no rupture, slipping or deformation likely to result in the dummy falling out of the harness.

4.2.2 Positive asymmetric load applied to the paraglider riser attachment points

When tested in accordance with 5.5.1.2, there shall be:

- a) no rupture of any essential structural part;
- b) no rupture of the stitching of any essential structural part;
- c) no rupture, slipping or deformation that makes it possible for the dummy to fall out of the harness.

4.2.3 Positive symmetric load applied to the emergency parachute attachment points

For harnesses with special emergency parachute attachment points, and / or an integrated Y bridle, when tested in accordance with 5.5.1.3, there shall be:

- a) during the adjustable component slipping test, no slippage of any adjustable element exceeding 10 mm;
- b) no rupture of any essential structural part;
- c) no rupture of the stitching of any essential structural part;
- d) no rupture, slipping or deformation likely to result in the dummy falling out of the harness.

4.2.4 Negative symmetric load applied to the emergency parachute attachment points

For harnesses with special emergency parachute attachment points, and / or an integrated Y-bridle, which are formed by a separate attached construction which appears to be asymmetric, when tested in accordance with 5.5.1.4, there shall be:

- a) during the adjustable component slipping test, no slippage of any adjustable element exceeding 10 mm;
- b) no rupture of any essential structural part;
- c) no rupture of the stitching of any essential structural part;
- d) no rupture, slipping or deformation likely to result in the dummy falling out of the harness.

4.2.5 Negative symmetric load applied to the tow attachment points

For harnesses with tow attachment points, when tested in accordance with 5.5.1.5, there shall be:

- a) no rupture of any essential structural part;
- b) no rupture of the stitching of any essential structural part;
- c) no rupture, slipping or deformation that makes it possible for the dummy to fall out of the harness.

4.2.6 Negative symmetric load applied to the paraglider riser attachment points

When tested in accordance with 5.5.1.6, there shall be:

- a) no rupture of any essential structural part;
- b) no rupture of the stitching of any essential structural part;
- c) no rupture, slipping or deformation likely to result in the dummy falling out of the harness.