



SLOVENSKI STANDARD
SIST EN 12491:2002
01-september-2002

Jadrarno padalstvo - Varnostna padala - Varnostne zahteve in preskusne metode

Paragliding equipment - Emergency parachutes - Safety requirements and test methods

Ausrüstung für das Gleitschirmfliegen - Rettungsfallschirme - Sicherheitstechnische Anforderungen und Prüfverfahren

Équipement pour le parapente - Parachute de secours - Exigences de sécurité et méthodes d'essai

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Ta slovenski standard je istoveten z: EN 12491:2001

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ICS:

97.220.40

SIST EN 12491:2002

en

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English version

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This European Standard was approved by CEN on 4 February 2001.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 136 "Sports, playground and other recreational 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of an identical text or by endorsement, at the latest by September 2001, and conflicting national standards shall be withdrawn at the latest by September 2001.

This standard is one of a package of standards on equipment for paragliding as follows:

EN 926-1, *Paragliding equipment – Paragliders – Part 1: Requirements and test methods for structural strength.*

ENV 926-2, *Paragliding equipment — Paragliders — Part 2: Requirements and flight tests.*

EN 1651, *Paragliding equipment — Harnesses — Safety requirements and strength tests.*

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

The annexes A, C and D are informative, annex B is normative.

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.

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Introduction

The aim of this standard is to enhance paraglider pilots' safety by testing to confirm that emergency parachutes are likely to be able to perform their intended function.

As it is essential that the complete system of harness and emergency parachute should have no untested components, it has been determined that the interface shall be the two attachment points required to be fitted to any EN 1651 Paragliding harness. Emergency parachutes are supplied by the manufacturer for testing complete with attachments suitable for connection to such a harness, and parachutes will be tested as if they were so connected. These connections are made in such a way, and/or using resistant material, so that they are not subject to friction or heat failure due to the tightening or slipping possible under shock loads. Any metal link is installed in such a way as to minimise any risk of injury to the pilot in an emergency deployment, and to ensure that it will be loaded in the direction of its maximum strength.

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1 Scope

This European Standard is applicable to emergency parachutes deployed by the action of the pilot without any other assistance (mechanical or pyrotechnic), intended for use with single-seater or two-seater paragliders.

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 926-1, *Paragliding equipment – Paragliders – Part 1: Requirements and test methods for structural strength*.

EN 1651, *Paragliding equipment — Harnesses — Safety requirements and strength tests*.

3 Terms and definitions

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

3.1 paraglider

ultralight glider with no primary rigid structure, for with take-off and landing are on foot, the pilot is supported in a harness connected to the wing [EN 926-1]

3.2

emergency parachute

an 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. This may be unsteered or steerable

3.3

rivers

the lowest part of the parachute system, which is connected to the harness

3.4

inverted "V" risers

two risers joined by a fixed loop at the apex for attachment to a bridle, or directly to the suspension lines

3.5

bridle

a webbing or other rope or cord connecting inverted "V" risers to suspension lines

3.6

suspension lines

the multiple cords connecting the emergency parachute canopy to the bridle or risers

3.7

parachute pack or outer container

the external protective container, either supplied as part of the harness, or by the parachute manufacturer for permanent attachment to a harness

3.8

inner container or deployment bag

the inner container which is initially deployed with the parachute, attached to the deployment handle, and contains the folded canopy and suspension lines

3.9

special elements to reduce shock loads

any special component fitted within the parachute system to reduce the opening shock forces on the pilot and parachute in high speed deployments. If fitted they shall be clearly identified, by label and colour, and maintenance (and replacement) instructions included in the user's manual

3.10

drop test device

a rigid test object, of variable mass, with two rigid attachment points for the emergency parachute 30 cm apart.

4 Safety requirements

4.1 Deployment system

When tested in accordance with 5.3.2, there shall be no failure of any component of the deployment system.

4.2 Speed of opening

When tested in accordance with 5.3.3, in both tests the time interval shall be no more than 5 s.

4.3 Descent rate and stability

When tested in accordance with 5.3.4,

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- a) in each test the average rate of descent (corrected to ICAO standard atmosphere, see annex B) shall be not more than 5,5 m/s,
 - b) in each test the average horizontal airspeed (corrected to ICAO standard atmosphere, see annex B) shall be not more than 5 m/s. This requirement is not applicable to parachutes fitted with controls,
 - c) in each test any oscillations shall reduce,
 - d) the emergency parachute system shall not suffer any permanent deformation (except in the case of any special elements to reduce shock loads which are intended to be replaced after any deployment).

4.4 Strength

When tested in accordance with 5.3.5.1 or 5.3.5.2 (at the discretion of the manufacturer),

- a) in both tests the emergency parachute shall open fully, absorb the opening shock, and achieve normal descent rate and stability before the test mass reaches the ground,
- b) in both tests the emergency parachute system shall not suffer any significant failure of the primary structure (except in the case of any special elements to reduce shock loads which are intended to be replaced after any deployment),
- c) in neither test shall the shock acceleration suffered by the drop test device during the parachute opening exceed 15 g (= 15 × 9,81 m/s²). This could be confirmed by the inclusion of a suitable weak link. Availability of suitable weak links may govern the payloads that emergency parachutes can be tested at. It is expected that test houses will initially select commercially available weak links that allow a suitable range of weights to be tested.

For example: By combining 2, 3 and 4 weak links of 6000 N, a test house could conduct tests at maximum payloads of 800 N, 1200 N, 1600 N, etc. As and when alternative weak links or other suitable shock measuring devices become available, test houses will be able to expand the range of tests offered.

4.5 Interaction and stability (piloted)

When emergency parachutes fitted with controls for steering and landing flare are tested in accordance with 5.3.6,

- a) the parachute shall deploy satisfactorily, and a normal descent and landing shall be made without requiring the use of the parachute's controls or influencing the paraglider,
- b) any oscillation shall reduce,
- c) when using the emergency parachute's controls as described in the user's manual, the parachute shall not exhibit any abnormal flying characteristics.

5 Test methods

5.1 Test apparatus

- a) meteorological measuring equipment to check wind speed, temperature, pressure and humidity;
- b) zoom lens video camera and video recorder capable of timed single frame analysis;
- c) drop test device (see annex C for example design);
- d) equipment to measure parachute descent rates (see test 5.3.3);
- e) means to determine the horizontal air speed (readings corrected to true air speed).

5.2 Test conditions

- a) wind shall be less than 20 km/h within the test perimeter;
- b) no thermals and/or air movements due to aircraft within the test perimeter;
- c) relative humidity shall be between 40 % and 80 %.

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5.3 Procedure

5.3.1 General

The parachute shall be presented for testing with a declared maximum payload, m_{dec} (which shall be the total weight (mass) in flight).

In test 5.3.4 the parachute is tested with a corrected payload m_{corr} , rounded up to the nearest 5 kg. This corrected payload shall be calculated from the declared maximum payload and the prevailing atmospheric conditions using the formula shown in annex B.

All the tests shall be recorded on video for analysis of test results. A copy of all video recordings shall be made available to the manufacturer as an aid to research and development.

5.3.2 Deployment system strength test

A load of 700 N is applied between each of the components of the deployment system (including the deployment handle, inner container and security pins).

5.3.3 Speed of opening test

With the risers secured, and at a horizontal airspeed of 8 m/s (± 1 m/s) and a vertical airspeed of less than 1,5 m/s, the parachute (packed in the inner container according to the user's manual instructions) is free dropped.

The time is measured from the instant of free drop until a load of 200 N is sustained (this could be measured with the aid of 200 N weak link). The inner container shall have opened prior to reaching the load of 200 N.

The test is carried out twice.