



SLOVENSKI STANDARD
oSIST prEN 360:2020

01-september-2020

Osebna oprema za varovanje pred padci - Samonavijalna zaustavitvena naprava

Personal fall protection equipment - Retractable type fall arresters

Persönliche Absturzschutzausrüstung - Höhensicherungsgeräte

Équipement de protection individuelle contre les chutes de hauteur - Antichutes à rappel automatique

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Ta slovenski standard je istoveten z: prEN 360

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ICS:

13.340.60 Zaščita pred padci in zdrsi Protection against falling and slipping

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English Version

Personal fall protection equipment - Retractable type fall arresters

Persönliche Absturzschutzausrüstung -
Höhensicherungsgeräte

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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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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prEN 360:2020 (E)

European foreword

This document (prEN 360:2020) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 360:2002.

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 legislation.

For relationship with EU Regulation(s), see informative Annex ZA, which is an integral part of this document.

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1 Scope

This document specifies requirements, test methods, marking, manufacturer's instructions and information for retractable type fall arresters (RTFAs) and applies to a RTFA with a single retractable lanyard and a RTFA with two retractable lanyards (twin RTFA) as components of one of the fall arrest systems covered by EN 363:2018.

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

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

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 10025-2:2019, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10083-2:2014, *Steels for quenching and tempering — Part 2: Technical delivery conditions for non-alloy steels*

EN 10278:1999, *Dimensions and tolerances of bright steel products*

EN 12385-4:2019+A1:2008, *Steel wire ropes - Safety — Part 4: Stranded ropes for general lifting applications*

EN ISO 9227:2017, *Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2017)*

3 Terms and definitions

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

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

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

3.1

retractable type fall arrester

RTFA

fall arrester with a self-locking function and an automatic tensioning and return facility with one retractable lanyard.

Note 1 to entry: Figure 2a, Figure 2b and Figure 2c show directions of use.

Note 2 to entry: An energy dissipating element may be in or at the housing of the RTFA and/or part of the retractable lanyard.

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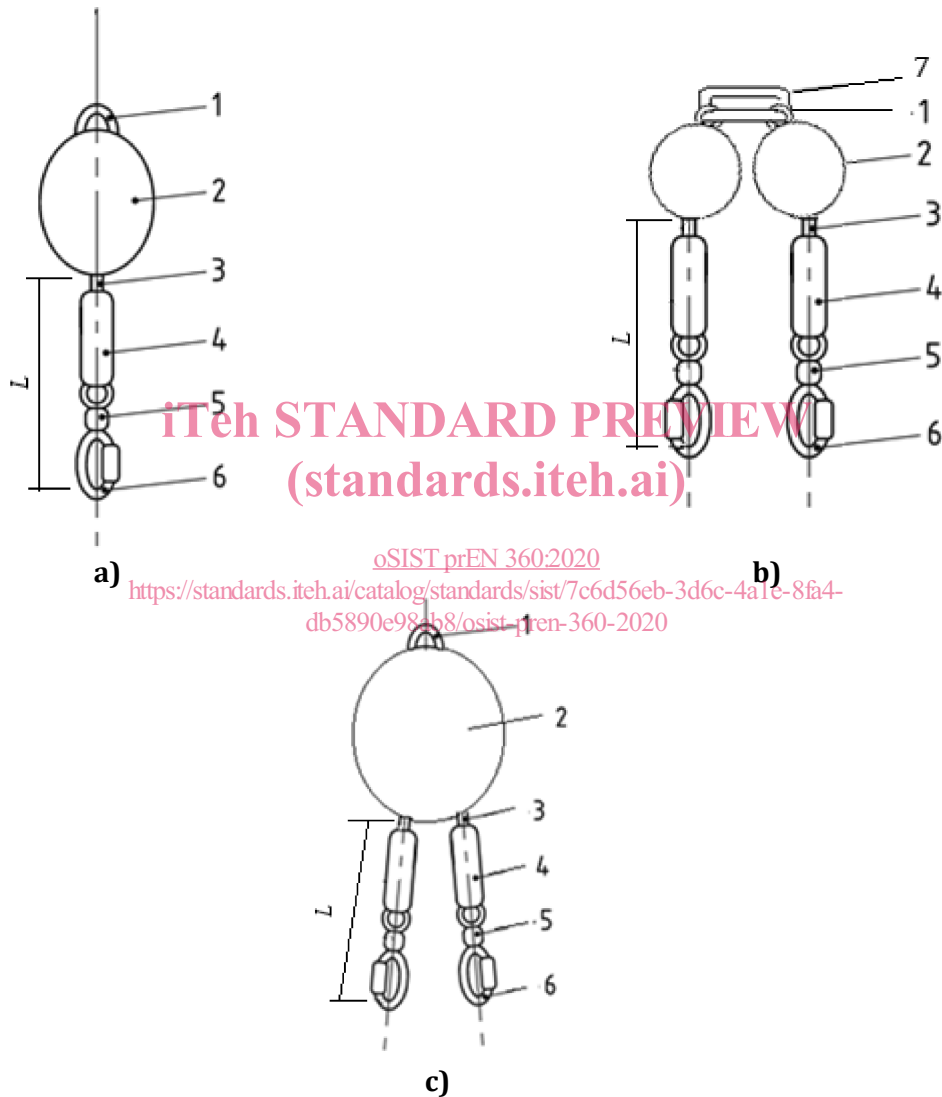
3.2

twin RTFA

fall arrester with a self-locking function and an automatic tensioning and return facility with two retractable lanyards

Note 1 to entry: Twin RTFAs may be two independent devices connected together or may be two retractable lanyards integrated into a single housing. See Figure 1b and Figure 1c.

Note 2 to entry: An energy dissipating element(s) may be in or at the housing of the twin RTFA and/or part of the retractable lanyards

**Key**

L	non-retractable section	4	energy dissipating element (if applicable)
1	attachment point	5	swivel
2	housing	6	connector
3	retractable lanyard(s)	7	permanent connection element

Figure 1 — Examples of RTFAs with one or two retractable lanyards

3.3

retractable lanyard

connecting element of a RTFA, which may be of wire rope, man-made fibre webbing or man-made fibre rope and may include an energy dissipating element

Note 1 to entry: A retractable lanyard may be any length.

3.4

man-made fibre

fibre obtained by a manufacturing process

Note 1 to entry: Man-made fibres refer to ISO/TR 11827:2012

3.5

energy dissipating element

element of a RTFA, which is designed to dissipate the kinetic energy developed during a fall from a height

3.6

braking force

maximum force F_{\max} in kilonewtons measured during the dynamic performance test

3.7

arrest distance

H_{AD}

vertical distance in metres measured from the initial position of the test mass before its release in a dynamic test to its final position after arrest

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3.8

minimum rated load

minimum mass of the person, excluding any tools and equipment carried, for the RTFA, as specified by the manufacturer

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

3.9

maximum rated load

maximum mass of the person, including any tools and equipment carried, for the RTFA, as specified by the manufacturer

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

3.10

connection element

integral element of the RTFA permitting connection between the RTFA and the appropriate fall arrest attachment point on the full body harness conforming to EN 361 and/or the anchor point

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4 Requirements

4.1 Design and ergonomics

4.1.1 When functionally checked in accordance with 5.1.1, the RTFA and twin RTFA shall include at least one integrated element (e. g. a swivel at the end of the lanyard or lanyards) to avoid twisting of each retractable lanyard in the application(s) specified in the manufacturer's instructions and information.

4.1.2 When checked in accordance with 5.1.1, the non-retractable section of the retractable lanyard(s) (e. g. energy dissipating element, connector), including the largest permissible connector or connection element specified by the manufacturer's instructions and information, shall have a maximum length L of 600 mm (see Figure 1).

4.1.3 When checked in accordance with 5.1.1, if the weight of the RTFA or twin RTFA is 15 kg or more its weight shall equal that marked on the device to the nearest 0,5 kg.

4.1.4 When checked in accordance with 5.1.2, a twin RTFA shall have lanyards of equal length and with either lanyard fully extracted the maximum length L_{max} (see Figure 3) shall not exceed 2,5 m.

4.1.5 If the manufacturer permits use of the RTFA or twin RTFA in a Mobile Elevated Work Platform (MEWP) it shall additionally meet the requirements of Normative Annex A.

4.2 Materials and construction

4.2.1 When checked in accordance with 5.1.1, materials used in the RTFA and twin RTFA that may come into contact with the skin of the user including the retractable lanyard shall not be known to cause irritating or sensitization effects when used as intended.

4.2.2 When checked in accordance with 5.1.1, the retractable lanyard(s) shall be a wire rope, a man-made fibre webbing, man-made fibre rope or a hybrid with a man-made content

NOTE 1 A retractable lanyard(s) can include a non-load bearing covering material, e. g. non-metallic sheath.

NOTE 2 A hybrid retractable lanyard(s) can be a combination of man-made fibre and metallic elements

4.2.3 When checked in accordance with 5.1.1, wire ropes for retractable lanyards shall be made either from stainless steel or galvanised steel conforming to EN 12385-4:2019+A1:2008. Terminations (e. g. a swaged ferrule) for a retractable lanyard made from wire rope shall be made from a metallic material and not known to cause an adverse reaction with the material of the wire rope (e. g. dissimilar metal corrosion, cracking).

4.2.4 When checked in accordance with 5.1.1, textile lanyards and sewing threads for retractable lanyards shall be made from man-made fibres with a tenacity of at least 0,6 N/tex.

NOTE 0,6 N/tex is based on the information given in EN ISO 9554:2019, Annex A.

4.2.5 When checked in accordance with 5.1.1, exposed edges or corners of elements shall be relieved either with a radius of at least 0,5 mm or a chamfer of at least 0,5 mm × 0,5 mm.

4.2.6 When checked in accordance with 5.1.1, the termination of the retractable lanyard(s) and the attachment point (see Figure 1) shall be designed such that they either incorporate a connector conforming to EN 362:2004, 4.1 to 4.5, or are of such a design that an EN 362 connector can be fitted or they shall incorporate a specific connection element (e.g. for attachment to a full body harness, tripod) which shall be so designed that it cannot be disconnected unintentionally and shall require at least two different deliberate manual actions to disconnect.

4.2.7 When checked in accordance with 5.1.1, the RTFA shall be fitted with a fall indicator.

4.2.8 When checked in accordance with 5.1.1, the twin RTFA shall be fitted with a fall indicator in the connection element, in or at the housing(s) or in each retractable lanyard.

4.3 Retraction tension and function

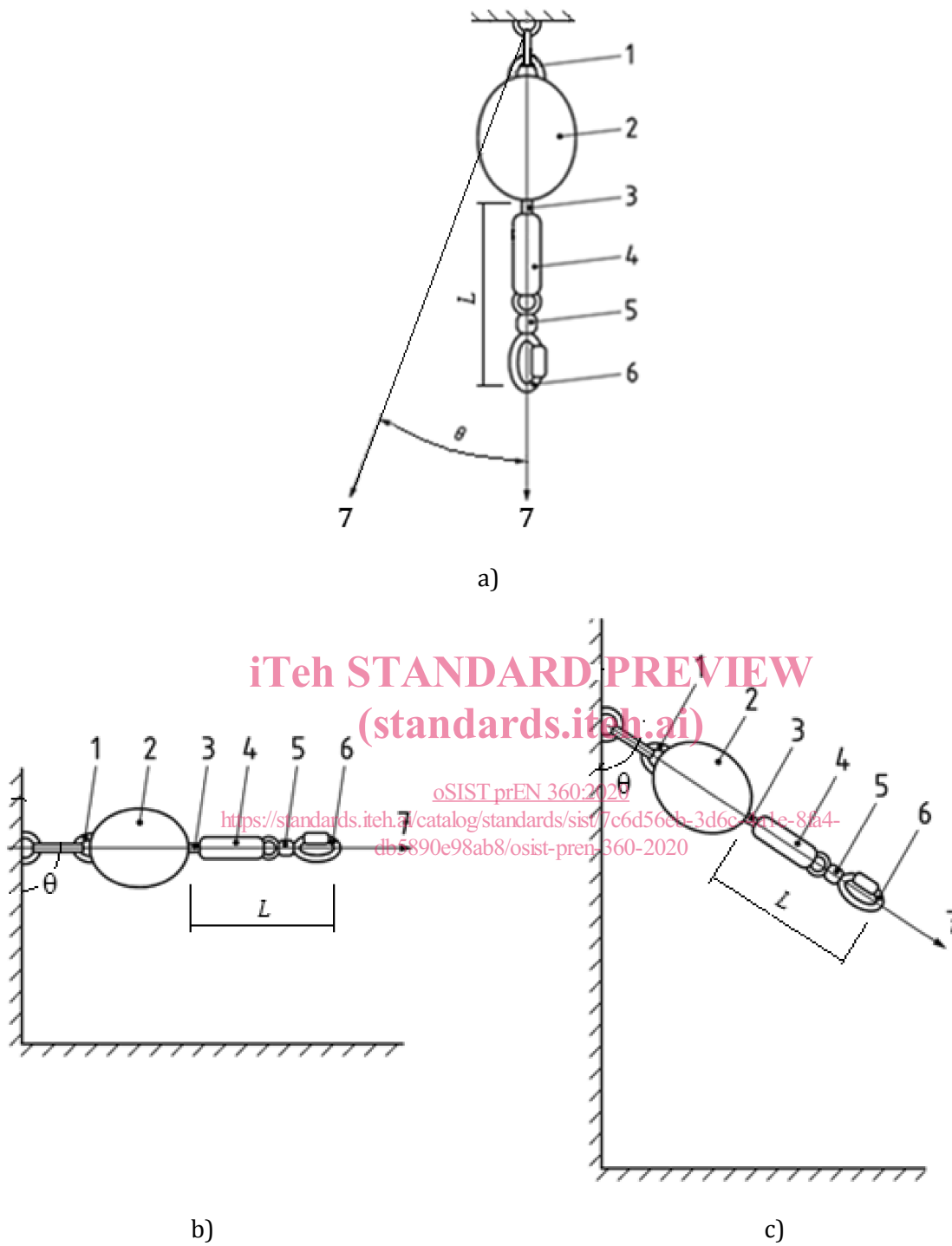
4.3.1 When tested in accordance with 5.3.2, for vertical applications where the maximum angle θ from the true vertical is not greater than 45° (see Figure 2a), the retraction tension in each lanyard shall not be less than 5 N or more than 110 N and the lanyard(s) shall continuously and fully retract to its original position.

4.3.2 If the manufacturer permits use in a horizontal application and where angle θ from the true vertical is greater than 45° (see Figures 2b and 2c) the RTFA and twin RTFA shall be tested as described in 5.3.3. The retraction tension in each lanyard shall not be less than 5 N or more than 110 N and the lanyard(s) shall continuously and fully retract to its original position

4.3.3 For twin RTFAs and for RTFAs where the manufacturer permits attachment of the RTFA housing, i. e. not the retractable lanyard, to the attachment point of the harness, when tested in accordance with 5.3.4 the lanyard(s) shall fully retract to its original position without stopping.

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**Key**

L	non-retractable section	5	swivel
1	attachment point	6	connector
2	housing	7	additional direction of use
3	retractable lanyard	θ	angle from true vertical
4	energy dissipating element (if applicable)		

Figure 2 — Examples of directions of use for a RTFA

4.4 Static strength

4.4.1 RTFAs and twin RTFAs with a retractable lanyard(s) made from man-made fibre rope, man-made fibre webbing or is a hybrid with a man-made content shall sustain a load of at least 15 kN when tested as described in 5.4.2.3.

NOTE A hybrid retractable lanyard(s) can be a combination of man-made fibre and metallic elements

4.4.2 RTFAs and twin RTFAs with a retractable lanyard made from wire rope shall sustain a load of at least 12 kN when tested as described in 5.4.2.2.

4.4.3 If any load-bearing element other than the retractable lanyard(s) of the RTFA or twin RTFA, e.g. an energy dissipating element, is made from non-metallic materials it shall sustain a load of 15 kN when tested in accordance 5.4.2.3.

4.5 Dynamic tests

4.5.1 General

Table 1 — Overview of applications and product related tests

Type of test	Overhead (vertical application)	Foot level attachment (horizontal application)	Foot Level attachment (vertical application)	Twin RTFA	MEWP (RTFA and twin RTFA)
	Dynamic performance, function and strength (overhead attachment, vertical application)	✓	✓	✓	✓
Dynamic performance, strength and integrity (foot level attachment, horizontal application)	×	✓	×	○	✓
Dynamic performance (foot level attachment, vertical application)	×	×	✓	○	✓
Dynamic performance (horizontally opposite arrangement)	×	×	×	✓	×

Type of test					
	Overhead (vertical application)	Foot level attachment (horizontal application)	Foot Level attachment (vertical application)	Twin RTFA	MEWP (RTFA and twin RTFA)
Dynamic performance and integrity (foot level attachment, MEWP application)	×	×	×	○	✓
Key ✓ required × not required ○ required if use is claimed by the manufacturer					

Table 2 — Overview of the dynamic test requirements

	Type of test	Condition(s)	Test mass	Requirements			Clause
				Braking force F_{max} kN	Arrest distance $H_{AD max}$ m	Fall indicator activation	
Dynamic performance, function and strength (overhead attachment, vertical application)	Dynamic performance	Ambient (as received)	100 kg	6	1,4	Yes	4.5.2.1
		Heat, cold, wet & corrosion	Max. rated load	6	1,4	Yes	4.5.2.2
	Dynamic performance at near-full extraction	Ambient (as received)	Max. rated load	6	1,4	Yes	4.5.2.3
	Dynamic function	Ambient (as received)	Min. rated load	Not applicable	1,4	Yes	4.5.3
	Dynamic strength	Ambient (as received)	Max. rated load	Not applicable	Not applicable	Yes	4.5.4

	Type of test	Condition(s)	Test mass	Requirements			
				Braking force F_{\max} kN	Arrest distance $H_{AD \max}$ m	Fall indicator activation	Clause
Dynamic performance, strength and integrity (foot level attachment, horizontal application)	Dynamic performance	Ambient (as received)	Max. rated load	6	4,5	Yes	4.5.5
	Dynamic performance with a lateral offset	Ambient (as received)	Max. rated load	6	4,75	Yes	4.5.5
	Dynamic strength and integrity	Ambient (as received)	Max. rated load	Not applicable	Not applicable	Not applicable	4.5.6
	Dynamic strength and integrity with a lateral offset	Ambient (as received)	Max. rated load	Not applicable	Not applicable	Not applicable	4.5.6
Dynamic performance (foot level attachment, vertical application)	Dynamic performance	Ambient (as received)	Max. rated load	6	4,5	Yes	4.5.7
Dynamic performance (horizontally opposite arrangement)	Dynamic performance with twin RTFA	Ambient (as received)	Max. rated load	6	Not applicable	Yes	4.5.8

NOTE 1 Where specific operating conditions have been identified, additional relevant conditioning and/or endurance tests can be required.

NOTE 2 For MEWP dynamic test requirements, see Annex A.

4.5.2 Dynamic performance – overhead attachment in a vertical application

4.5.2.1 When tested as described in 5.5 with a rigid steel mass of 100 kg, the braking force F_{\max} shall not exceed 6 kN, the arrest distance H_{AD} shall not exceed 1,4 m and the fall indicator shall activate.

4.5.2.2 When tested as described in 5.6, with a rigid steel mass equal to the maximum rated load but not less than 100 kg the braking force F_{\max} shall not exceed 6 kN, the arrest distance H_{AD} shall not exceed 1,4 m and the fall indicator shall activate.

4.5.2.3 When tested as described in 5.7 with the rigid steel mass equal to the maximum rated load but not less than 100 kg, the braking force F_{\max} shall not exceed 6 kN, the arrest distance H_{AD} shall not exceed 1,4 m and the fall indicator shall activate.