SLOVENSKI STANDARD
oSIST prEN ISO 6683:2021

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Stroji za zemeljska dela - Varnostni pasovi in njihova pritrdišča - Zahtevane lastnosti in preskusi (ISO/DIS 6683:2021)

Earth-moving machinery - Seat belts and seat belt anchorages - Performance requirements and tests (ISO/DIS 6683:2021)

Erdbaumaschinen - Sitzgurte und Sitzgurtverankerungen - Anforderungen und Prüfverfahren (ISO/DIS 6683:2021)

Engins de terrassement - Ceintures de sécurité et ancrages pour ceintures de sécurité - Exigences de performance et essais (ISO/DIS 6683:2021)

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Earth-moving machinery — Seat belts and seat belt anchorages — Performance requirements and tests

Engins de terrassement — Ceintures de sécurité et ancrages pour ceintures de sécurité — Exigences de performance et essais

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 6683 was prepared by Technical Committee ISO/TC 127, *Earth-moving machinery*, Subcommittee SC 2, *Safety requirements and human factors*.

This third edition cancels and replaces the second edition (ISO 6683:2005), which has been technically revised.

Earth-moving machinery — Seat belts and seat belt anchorages — Performance requirements and tests

1 Scope

This document establishes the minimum performance requirements and tests for seat belts and seat belt anchorages on earth-moving machinery, necessary to restrain an occupant or rider within a roll-over protective structure (ROPS) in the event of a machine roll-over (see ISO 3471, ISO 12117-2, and ISO 13459), or within a tip-over protection structure (TOPS) in the event of a machine tip-over (see ISO 12117).

This document is not applicable to seat belts and seat belt anchorages manufactured before the date of its publication.

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 undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3411, *Earth-moving machinery — Physical dimensions of operators and minimum operator space envelope*

ISO 5353, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

SAE J386, *Operator Restraint System for Off-Road Work Machines*

UNECE R16 2014, *Uniform provisions concerning the approval of safety-belts and restraint systems for occupants of power-driven vehicles, vehicles equipped with safety-belts*

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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedi.org/

3.1
seat belt assembly
belt, including any buckle, length adjustor, retractor and means for securing to an anchorage, that fastens across the pelvic area to provide occupant restraint during operating and roll-over conditions

3.2
anchorage
provision to transfer forces applied to the seat belt assembly to the machine structure or the seat system

3.3
seat system
total support mechanism between machine and the seated occupant

Note 1 to entry: A seat system is intended to only seat one occupant.

Note 2 to entry: The seat system includes the seat assembly, fixed or adjustable seat support, or seat suspension.

3.4
restraint system
seat belt assembly with anchorages

3.5
polyester fibre
fibres of any long-chain synthetic polymer composed of at least 85 % by weight of an ester of a dihydric alcohol and terephthalic acid

3.6
applicable seat components
all components of the seat or components fastened to the seat whose mass could contribute to loading of the seat mounting to the machine structure during a roll-over event

EXAMPLE Controls or add-on control modules fastened to the seat's armrest or to the seat frame.

3.7
tether
any strap, belt, or similar device (webbing, wire cable, solid link, etc.) that aids in the transfer of seat belt forces

4 Seat belt assembly

The seat belt assembly components shall be in accordance with either

— SAE J386, or

— UNECE R16:2014, Clause 6, but excluding 6.4.

5 Restraint system specifications

5.1 General

The restraint system shall consist of an adjustable seat belt assembly. The seat belt assembly may be self-adjusting or readily adjustable by a means within easy reach of the occupant.

The seat belt assembly shall be designed for use by only one person at any time.

5.2 Belt webbing

The webbing shall have a minimum width of 46 mm. The belt length shall be adjustable to at least accommodate small to large occupants as defined in ISO 3411.

The webbing shall have resistance to abrasion, temperature, mild acids, alkalies, mildew, aging, moisture and sunlight equal to or better than that of untreated polyester fibre.

5.3 Belt buckle

The seat belt assembly shall be provided with a buckle readily accessible to the occupant.

It shall be possible to release the buckle with one mittened hand in a single motion. The buckle shall remain closed until it is intentionally opened. With a force on the belt loop of 670 N ± 45 N, the actuation force required to open the buckle shall be at least 10 N and shall not exceed 130 N.

6 Performance requirements for anchorages and tether

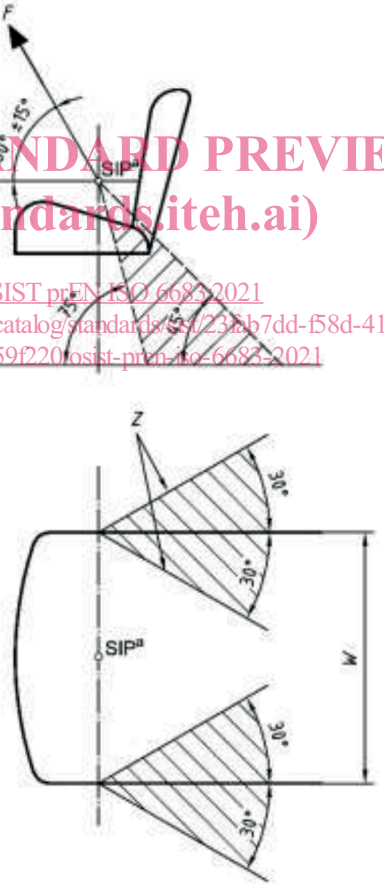
Anchorages shall permit the seat belt assembly to be readily installed or replaced and shall comply with the strength requirements of Clause 7.

If the seat does not swivel or have a suspension system, the anchorages for the seat belt assembly shall be located either on the seat or on the machine at any point within the hatched zones shown in Figure 1.

If the seat does swivel or has a suspension system, the anchorages for the seat belt assembly shall be located on the seat near the rear corners of the seat cushion within the hatched zones shown in Figure 1, such that the seat belt assembly moves with the seat cushion at all times.

Tethers may be used to transfer the seat belt assembly loads from the seat anchorages to the machine.

The seat index point (SIP) shall be determined in accordance with ISO 5353.



Key

F load force

W seat cushion width

Z anchorage zone

[a] Seat index point (see ISO 5353).

Figure 1 — Seat belt assembly anchorage zones

7 Performance requirements and tests for restraint systems

The restraint system shall be tested on-machine or in a manner equivalent to an on-machine condition.

The seat shall be adjusted to the operating position which produces the most severe loading condition to the restraint system, prior to any subsequent structural deflection. The seat back, if adjustable, shall be positioned in its most upright work position.

The installed restraint system shall meet the following requirements when loaded in a forward and upward direction at an angle of 60 ± 15° from the horizontal, with the line of force approximately passing through the SIP (see ISO 5353). See Figure 1.

a) The buckled restraint system shall withstand a testing force *F* of a minimum of 15 000 N. This testing force *F* shall be applied gradually, but shall be attained within 30 s, and shall be maintained for at least 10 s. After the force is applied to the seat system, the force application device shall not be repositioned to compensate for any changes that can occur to the load application angle.

   For machines with seat systems having a mass of applicable seat components (*Msc*) greater than 70 kg and in the event that the force applied to the seat belt assembly is transferred to machine chassis by means of the seat, the seat mounting shall be designed to withstand a testing force *F* of 15 000 N plus 10 times 9,8 N/kg multiplied by the mass of the applicable seat components which exceeds the 70 kg mass, see Formula (1).

$$F = 15\,000 + (Msc - 70) \times 10 \times 9{,}8 \text{ N} \quad (1)$$

   The testing force *F* shall be applied by means of a body block device as shown in Figure 2 or equivalent.

b) The length of the seat belt assembly shall not increase by more than 20 % when subjected to *F*.

c) Permanent deformation of any system component and anchorage area is acceptable under the action of *F*. However, there shall be no failure allowing release of the restraint system or seat system.

d) Once force *F* is removed, the belt buckle shall meet the opening force requirements of 5.3.