



SLOVENSKI STANDARD SIST EN 1459-5:2021

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**Vozila za talni transport - Terenska vozila - Varnostne zahteve in preverjanje - 5.
del: Pripadajoči vmesniki**

Rough-terrain trucks - Safety requirements and verification - Part 5: Attachment interface

Geländegängige Stapler - Sicherheitstechnische Anforderungen und Verifizierung - Teil
5: Zugehörige Schnittstellen

Chariots tout-terrain - Prescriptions de sécurité et vérification - Partie 5 : Interface de
l'accessoire

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EUROPEAN STANDARD

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Rough-terrain trucks - Safety requirements and verification - Part 5: Attachment interface

Chariots tout-terrain - Prescriptions de sécurité et vérification - Partie 5 : Interface de l'accessoire

Geländegängige Stapler - Sicherheitstechnische Anforderungen und Verifizierung - Teil 5: Zugehörige Schnittstellen

This European Standard was approved by CEN on 23 November 2020.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents	Page
European foreword	3
Introduction	4
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Requirements	8
4.1 Manual connection/disconnection	8
4.2 Unintentional detachment	8
4.3 Unintended movement of the attachment	8
4.4 Load-clamping attachment interface	9
4.5 Interface hydraulic system	9
4.6 Design	9
4.7 Mechanical connection of the attachment to the carriage	9
4.7.1 General	9
4.7.2 Fastening and locking	9
4.7.3 Control for powered release of the fastening	10
4.8 Fixing of the attachment on the forks	10
5 Verification of requirements and safety measures	10
6 Information for use	10
6.1 General	10
6.2 Instruction handbook	10
6.2.1 General	10
6.2.2 Operating and maintenance instructions	11
6.3 Marking	11
Annex A (informative) List of significant hazards	12
Annex ZA (informative) Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered	21
Bibliography	24

European foreword

This document (EN 1459-5:2020) has been prepared by Technical Committee CEN/TC 150 “Industrial Trucks - Safety”, the secretariat of which is held by BSI.

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 June 2021, and conflicting national standards shall be withdrawn at the latest by June 2021.

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

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 Directive 2006/42/ EC.

For relationship with EU Directive see informative Annex ZA, which is an integral part of this document.

EN 1459 consists of the following parts, under the general title *Rough-terrain trucks — Safety requirements and verification*:

- Part 1: Variable-reach trucks;
- Part 2: Slewing variable-reach trucks;
- Part 3: Interface between the variable-reach truck and the work platform;
- Part 4: Additional requirements for variable-reach trucks handling freely suspended loads;
- Part 5: Attachment interface;
- Part 6: Application of EN ISO 13849-1 to slewing and non-slewing variable-reach rough-terrain trucks;
- Part 8: Variable-reach tractors.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 1459-5:2020 (E)**Introduction**

This document is a type-C standard as stated in EN ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

All quantities are in metric units.

Tools

Being excluded from interchangeable equipment according to Directive 2006/42/EC (as amended) Article 2 b), tools as such are not subject to the Machinery Directive. Characteristics of tools which may be fitted to the machinery can be found in the instructions for use given by the truck manufacturer according to 1.7.4.2 (n) Directive 2006/42/EC.

Interchangeable equipment

An interchangeable equipment is not part of the truck, according to Directive 2006/42/EC (as amended) Article 2 b), because it is assembled with the truck by the operator himself in order to change its function or attribute a new function. The instructions for machinery allow several uses intended by design depending on the equipment used and the instructions for the interchangeable equipment contain the information necessary for safe assembly and use of the basic machinery and the interchangeable equipment that can be fitted (see Directive 2006/42/EC, 3.6.3.2).

The following items should be taken into account:

- a) identification of a specific point on the truck for the installation of the interchangeable equipment, i.e. truck-related side of the interface (hereafter referred to as “interface”): the carriage;
- b) interface safety-related design and coupling performances:

- avoidance of unintentional displacements: locking (normal operation condition and truck power supply failure condition);
 - strength requirements: calculation and static and dynamic test;
 - controls;
 - information.
- c) interchangeable equipment compatibility in order to be installable on the truck, i.e. choice of approved types of interchangeable equipment, correct usage in combination with the truck, minimum safety requirements.

Guide to application of the Machinery Directive 2006/42/EC states that “The manufacturer of the interchangeable equipment must ensure that the combination of the interchangeable equipment and the basic machinery with which it is intended to be assembled fulfils all the relevant essential health and safety requirements of Annex I and must carry out the appropriate conformity assessment procedure”.

This document considers primary function of the truck the load handling, stacking and lifting function, e.g. with forks.

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EN 1459-5:2020 (E)**1 Scope**

This document specifies requirements for the truck side of the attachment interface of rough-terrain non-slewing and slewing variable reach trucks (hereafter referred to as “trucks”) dealt with in EN 1459-1:2017+A1:2020, EN 1459-2:2015+A1:2018 and EN 1459-4:2020.

This document covers the interface for the attachments fitted to the telescopic boom carriage or mounted on the forks when it is used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer. This document does not cover:

- interface for interchangeable equipment designed for lifting person(s) (covered by EN 1459-3:2015);
- interface for equipment for container handling (e.g. spreader);
- interface for equipment permanently installed on the machine and not intended to be removed by the user.

NOTE In this case, equipment becomes part of the truck.

This document does not give requirements for the completed assembly of a truck fitted with an attachment. This document does not address risks to parts of the truck other than the interface with the attachment.

This document is not applicable to interfaces manufactured before the date of its publication.

2 Normative references (standards.iteh.ai)

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 1459-1:2017+A1:2020, *Rough-terrain trucks - Safety requirements and verification - Part 1: Variable-reach trucks*

EN 1459-2:2015+A1:2018, *Rough-terrain trucks - Safety requirements and verification - Part 2: Slewing variable-reach trucks*

EN 1459-3:2015, *Rough-terrain trucks - Safety requirements and verification - Part 3: Interface between the variable-reach truck and the work platform*

EN 1459-4:2020, *Rough terrain trucks - Safety requirements and verification - Part 4: Additional requirements for variable reach trucks handling suspended loads*

EN 62061:2005/A2:2015¹ *Safety of machinery - Functional safety of safety-related electrical, Electronic and programmable electronic control systems*

EN ISO 2867:2011, *Earth-moving machinery - Access systems (ISO 2867:2011)*

EN ISO 3411:2007, *Earth-moving machinery - Physical dimensions of operators and minimum operator space envelope (ISO 3411:2007)*

¹ As impacted by EN 62061:2005/A1:2013 and EN 62061:2005/A2:2015.

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2015, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2015)*

ISO 5053-1:2020, *Industrial trucks - Terminology and classification - Part 1: Types of industrial trucks*

ISO 7000:2019, *Graphical symbols for use on equipment - Registered symbols*

ISO 15870:2000, *Powered industrial trucks - Safety signs and hazard pictorials - General principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1459-1:2017+A1:2020, EN 1459-2:2015+A1:2018, EN 1459-4:2020, ISO 5053-1:2020 and the following 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 <https://www.iso.org/obp>

3.1 tool

attachment which does not change the primary function of the truck

3.2

interchangeable equipment

device assembled with the truck by the operator which changes the primary function of the truck or attributes a new function to the truck

Note 1 to entry: Interchangeable equipment when assembled does not change the designation of the machinery as variable-reach rough-terrain truck.

3.3

interface

devices and method to mechanically assemble and, if needed, hydraulically and/or electrically connect the attachment to the truck

3.4

attachment

tool or interchangeable equipment

3.5

carriage

specific part of the boom for mounting attachments to the truck

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EN 1459-5:2020 (E)**3.6
type**

one or more interfaces representative of a given design, technical characteristics and application

Note 1 to entry: A type of interface can be produced in series or as a single unit.

Note 2 to entry: One type of interface can have variants; they are considered as belonging to the same type, provided they have the same basic design, present similar hazards and have similar protective measures.

4 Requirements**4.1 Manual connection/disconnection**

The position to perform any manual operation to connect/disconnect or lock /unlock (as applicable) of the attachment to the truck shall:

- be so that they can be performed with the truck switched off;
- be so that they are within the reach of the operator in a standing position on the ground according to EN ISO 3411:2007 or be provided with means of access complying with EN ISO 2867:2011;
- be described in the information for use (see Clause 6).

Verification by visual examination and design check.

4.2 Unintentional detachment

The interface shall be designed such that unintentional detachment of the attachment is prevented, according to 4.7.

Verification by design check.

The interface shall be provided with means to prevent the separation of the attachment in the event of malfunctions in the truck power supply.

Verification by design check.

4.3 Unintended movement of the attachment

Interface shall be designed such that any movement of the attachment shall not occur when the relevant control devices on the truck are in the neutral position.

The safety-related parts of the control system shall correspond to Table 1.

Verification by design check.

Table 1 — Safety-related part of control systems

Description of safety function	PLr (EN ISO 13849-1:2015)	SIL (EN 62061:2005+A2:2015)
Avoidance of unintended movement of the attachment	b	1

4.4 Load-clamping attachment interface

The interface shall allow load-clamping attachment to reach its nominal clamping force and to maintain it when the relevant control devices on the truck are in their neutral position.

To prevent unintentional release of the load, the interface shall allow the opening movement of a load-carrying clamp operated from the truck:

- a) be possible only with a two-action control, positioned or guarded in order to avoid inadvertent activation, and
- b) not be automatically activated when the truck is switched on.

The safety-related parts of a two-action control system shall correspond to Table 1.

Verification by design check.

In case of failure of power supply or engine shut down, the interface shall allow the rated load of the load-clamping attachment to remain clamped.

Verification by design check.

4.5 Interface hydraulic system

If the interface has a hydraulic system, it shall comply with the relevant requirements of EN 1459-1:2017+A1:2020 and EN 1459-2:2015+A1:2018.

4.6 Design

The attachment interface of the truck shall be designed for the most severe forces deriving from truck configuration and load combination expected for the intended use of the truck.

Verification by design check and calculation.

4.7 Mechanical connection of the attachment to the carriage

4.7.1 General

Means shall be provided to pick-up, fasten and lock the attachment to the structural part of the interface which the attachment is mechanically assembled to.

Fastening and locking may be obtained by just one device.

Verification by type test.

4.7.2 Fastening and locking

The means according to 4.7.1 shall meet the following requirements:

- The fastening system and the locking system shall hold the attachment in the working position described in the information for use of the truck.

Verification by design check and visual examination.

- The locking system shall prevent unintended unfastening of the attachment:

- in the case of a fastener put in place manually, the fastener should be locked mechanically (e.g. a pin);