



SLOVENSKI STANDARD

oSIST prEN 1459-5:2017

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Vozila za talni transport - Terenska vozila - Varnostne zahteve in preverjanje - 5. del: Dodatne zahteve za priključke in pripadajoče vmesnike

Rough-terrain trucks - Safety requirements and verification - Part 5: Additional requirements for attachments and attachment interface

Geländegängige Stapler - Sicherheitstechnische Anforderungen und Verifizierung - Teil 5: Anforderungen an Anbaugeräte und zugehörige Schnittstellen

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

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53.060 Industrijski tovornjaki Industrial trucks

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EUROPEAN STANDARD
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ICS

English Version

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

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 150.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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prEN 1459-5:2016 (E)

Foreword

This document (prEN 1459-5:2016) has been prepared by Technical Committee CEN/TC 150 “Industrial Trucks - Safety”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

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Introduction

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

The equipment concerned and the extent to which hazards, hazardous situations or hazardous events are covered as 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 B standards, the requirements of this type-C standard 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), they have to be considered as part of the truck. 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 allowing several uses 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:
 - 1) avoidance of unintentional displacements: locking (normal operation condition and truck power supply failure condition);
 - 2) strength requirements: calculation and static and dynamic test;
 - 3) controls;
 - 4) information;
- c) attachments compatibility in order to be installable on the truck, i.e. choice of approved types of attachments, 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 standard considers primary function of the truck the load handling, stacking and lifting function as defined in prEN 1459-1, EN 1459-2 and prEN 1459-4.

prEN 1459-5:2016 (E)**1 Scope**

This European Standard specifies requirements for the attachments and attachment interface of rough-terrain non-slewing and slewing variable reach trucks (hereafter referred to as “trucks”) dealt with in FprEN 1459-1, EN 1459-2 and prEN 1459-4.

This European standard only covers attachments fitted to the attachment interface on the telescopic boom.

This European standard does not cover:

- attachments designed for lifting person(s);
- power transmission between the truck and the attachment if realized by means other than hydraulic;
- attachments for container handling;
- attachments permanently installed on the machine and not intended to be removed by the user;
- visibility for attachments exceeding dimensional limits defined in C.3.1.

NOTE In this case attachment becomes part of the truck.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

FprEN 1459-1, *Rough-terrain trucks — Safety requirements and verification — Part 1: Variable-reach trucks*

EN 1459-2, *Rough-terrain trucks — Safety requirements and verification — Part 2: Slewing variable-reach trucks*

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

EN 13001-3-1, *Cranes — General Design — Part 3-1: Limit States and proof competence of steel structure*

EN 15830:2012, *Rough-terrain variable reach trucks — Visibility — Test methods and verification*

EN ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components (ISO 4413)*

ISO 2328, *Fork-lift trucks — Hook-on type fork arms and fork arm carriages — Mounting dimensions*

ISO 2330, *Fork-lift trucks — Fork arms — Technical characteristics and testing*

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

ISO 7546, *Earth-moving machinery — Loader and front loading excavator buckets — Volumetric ratings*

ISO 13284, *Fork-lift trucks — Fork-arm extensions and telescopic fork arms — Technical characteristics and strength requirements*

ISO 15870, *Powered industrial trucks — Safety signs and hazard pictorials — General principles*

ISO 22915-10, *Industrial trucks — Verification of stability — Part 10: Additional stability test for trucks operating in the special condition of stacking with load laterally displaced by powered devices*

ISO 22915-14, *Industrial trucks — Verification of stability — Part 14: Rough-terrain variable-reach trucks*

ISO 22915-20, *Industrial trucks — Verification of stability — Part 20: Additional stability test for trucks operating in the special condition of offset load, offset by utilization*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in FprEN 1459-1, EN 1459-2, prEN 1459-4, ISO 5053-1 and the following apply.

3.1

attachment

either a tool or an interchangeable equipment which is installed on the carriage of truck

3.2

tool

attachment which does not change the primary function of the truck

3.3

interchangeable equipment (standards.iteh.ai)

attachment other than the original forks of the truck

3.4

interface

method or mechanism used to mount the attachment to the truck carriage

3.5

rated capacity of an attachment

maximum working load that the attachment is permitted by its manufacturer to handle in normal operation

3.6

actual capacity of an attachment

working load that the attachment is permitted by the manufacturer of the truck to handle at a specified load centre distance, under specified conditions in normal operation

4 Requirements

4.1 Attachments

4.1.1 General

It shall be possible for the operator to perform any manual connection/disconnection between the truck and the attachment from a safe position and without the use of a tool.

Verification by visual examination.

Each attachment shall be provided with load chart(s) for the combination with the truck for which it is intended.

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NOTE Non-load carrying attachments as defined in FprEN 1459-1 and EN 1459-2 do not require a specific load chart.

The load chart(s) can be obtained by physical test, or by calculation according to Annex C.

Verification by visual examination.

4.1.2 Mounting and fixing

The attachment shall be designed such that unintentional unhooking or detachment of the load or sling is prevented.

Verification by design check.

4.1.3 Visibility

The impact on visibility created by the attachment when fitted on the truck for which it is intended, shall be assessed according EN 15830:2012, 7.5.

The impact on visibility for a limited range of attachment as specified in C.3.1, may be evaluated also according Annex C.

Verification by design check.

4.1.4 Mechanical strength

Attachments, excluding non-load equipment, shall be designed in order to withstand their rated capacity.

Verification by type test (see 5.2).

4.1.5 Interchangeable equipment**4.1.5.1 General**

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All interchangeable equipment shall be provided with means to prevent the load displacing in the event of malfunctions in the truck power supply to the interchangeable equipment. This requirement may be fulfilled by means of non-return valves or any other positive system installed on the interchangeable equipment if designed for that purpose.

Verification by design check.

4.1.5.2 Load-carrying interchangeable equipment

Load-carrying interchangeable equipment shall be provided with means such that any movement of the interchangeable equipment shall not occur with the relevant control devices on the truck in their neutral position.

Verification by design check.

4.1.5.3 Clamping interchangeable equipment

Load-clamping interchangeable equipment shall be provided with “positive” systems such that they are able to provide their nominal clamping force in different specified positions of the clamp with the relevant control devices on the truck in their neutral position.

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

- a) be possible only with a two-action control, and
- b) not be automatically activated when the truck is switched on.

Verification by design check.

In case of failure of power supply or engine shut down, the rated load of the clamping interchangeable equipment shall remain clamped for at least 15 min with the oil in the hydraulic system at the normal working temperature.

Verification by type test.

In case of failure of power supply or engine shut down, the rated load of the clamping interchangeable equipment shall remain clamped for at least 15 min with the oil in the hydraulic system at the normal working temperature.

Verification by type test.

4.1.5.4 Interchangeable equipment hydraulic system

If an interchangeable equipment has a hydraulic system, when connected to the truck, it shall comply with the following requirements:

4.1.5.4.1 General

Hydraulic circuit shall comply with EN ISO 4413.

Verification by design check.

Hoses, piping and connections subject to internal pressure shall be capable of withstanding, without bursting or permanent deformation, a pressure equal to at least three times of the maximum working pressure. Pipes and hoses shall be so located and restrained to minimize deterioration, sharp edges, and other damage-causing sources. The hydraulic system shall be designed and installed such that its performance and reliability are not reduced or its components damaged as a result of external stresses, vibration or movements of the truck or its components.

Verification by type-test, design check, measurements and visual examination.

4.1.5.4.2 Pressure control

Hydraulic systems shall include a device(s) that prevents the pressure in the systems from exceeding a pre-set level. The device shall be designed and fitted so that unintentional loosening or adjustment is avoided and a tool or key is required to alter the pressure setting.

Verification by design check.

4.1.5.4.3 Load holding

Interchangeable equipment, excluding clamps, fitted with a hydraulic system for load holding it shall be provided with means to maintain the load for 15 min, in the event of a leakage, a fault or interruption of the power supply, a failure in the hydraulic circuit of the interchangeable equipment.

Verification by design test.

4.1.5.5 Emergency stop

If fitted, the emergency stop shall stop all movements of the interchangeable equipment.

Verification by visual examination and test.

4.1.6 Tools

4.1.6.1 Fork arms

Fork arms shall be manufactured, tested and marked in accordance with ISO 2330.

Verification by design check.

prEN 1459-5:2016 (E)**4.1.6.2 Fork arm extensions**

Fork arm extensions shall be designed to prevent accidental disengagement from the fork arms, and comply with the requirements of ISO 13284.

Verification by design check.

4.1.6.3 Fork carriers

Means shall be designed according to ISO 2328.

Verification by design check.

4.1.6.4 Load retention device

Fork carriers shall be designed in such a way that they can be equipped with load retention devices such as load backrest extensions.

The load backrest extension shall have height, width and strength to minimize the possibility of the load falling towards the boom when the fork arms are in a position of maximum backward tilt.

Verification by design check.

The size of the openings in the load backrest extension shall not exceed 150 mm in one of the two dimensions.

Verification by design check and measurement.

4.2 Attachment interface iTeh STANDARD PREVIEW (standards.iteh.ai)

4.2.1 Design

The attachment interface shall be designed to comply with one of the design standards for lifting appliances with the worst truck configuration and load combination for each attachment installed on the truck. The calculated stresses shall not exceed the permissible values with the required safety factors.

EN 13001-3-1 may be taken as a basis for calculation.

Verification by design check and calculation.

4.2.2 Quick coupler**4.2.2.1 General**

Quick coupler shall be provided with means to engage and lock interchangeable attachments.

Verification by design check.

4.2.2.2 Locking

The engagement and locking system shall meet the following requirements:

- The engagement system shall be able to withstand the working forces applied to the attachment.

Verification by calculation.

- The engagement system and the locking system shall hold the attachment in the working position.

Verification by design check.

- The locking system shall prevent disengagement of the attachment. A loss of power or malfunctions to the locking/unlocking actuation system shall not result in the loss of the locking function.

Verification by type test.

- It shall be possible to verify (e.g. by automatic sensing, visual indication, testing) from the primary operator's position that the system is fully engaged and locked to retain the attachment in its working position.

Verification by design check and visual examination.

4.2.2.3 Controls

The activation of the unlocking function shall only be possible by activation of at least two independent controls which may not be simultaneously operable by one hand.

The initiating control shall be protected against inadvertent activation or be of the hold-to-run type.

Verification by design check and visual examination.

5 Verification of requirements and safety measures

5.1 General

In order for an attachment to be fitted to the truck, the attachment manufacturer shall verify a representative sample of a serial production to the requirements of this Standard, by one or more of the following:

- a) design check, e.g. verification of drawings and documents, or calculation;
- b) visual examination, e.g. no permanent deformation after tests, verification of the marking;
- c) specific tests, e.g. type tests.

5.2 Load carrying attachments testing

The load carrying attachments shall be tested with a static load equal to 125 % of the rated capacity of the attachment for 15 min. The test is fulfilled if the attachment does not show any permanent deformation.

6 Information for use

6.1 Marking of interchangeable equipment

NOTE Information on attachments designated as interchangeable equipment is given in Annex B.

Interchangeable equipment shall be permanently marked with the following information:

- a) manufacturer's name and address;
- b) type denomination (e.g. part no. / model no.);
- c) serial number (if any);
- d) year of construction;
- e) CE marking;