



SLOVENSKI STANDARD

SIST EN 16842-1:2018

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Vozila za talni transport - Gnana vozila za talni transport - Vidno polje voznika - Preskusna metoda in preverjanje - 1. del: Splošne zahteve

Powered industrial trucks - Visibility - Test method and verification - Part 1: General requirements

Kraftbetriebene Flurförderzeuge - Sichtverhältnisse - Testmethoden und Verifikation - Teil 1: Allgemeine Anforderungen

Chariots de manutention automoteurs - Visibilité - Méthodes d'essai et vérification - Partie 1 : Prescriptions générales

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EUROPEAN STANDARD

EN 16842-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2018

ICS 53.060

English Version

Powered industrial trucks - Visibility - Test methods and verification - Part 1: General requirements

Chariots de manutention automoteurs - Visibilité -
Méthodes d'essai et vérification - Partie 1 :
Prescriptions générales

Kraftbetriebene Flurförderzeuge - Sichtverhältnisse -
Testmethoden zur Verifikation - Teil 1: Allgemeine
Anforderungen

This European Standard was approved by CEN on 9 July 2017.

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

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 16842-1:2018) 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 November 2018 and conflicting national standards shall be withdrawn at the latest by November 2018.

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.

EN 16842 consists of the following parts under the general title "*Powered industrial trucks – Visibility – Test methods and verification*":

- *Part 1: General requirements;*
- *Part 2: Sit-on counterbalance trucks and rough terrain masted trucks up to and including 10 000 kg capacity;*
- *Part 3: Reach trucks up to and including 10 000 kg capacity (in preparation);*
- *Part 4: Variable reach industrial trucks up to and including 10 000 kg capacity (in preparation);*
- *Part 5: Variable reach industrial trucks greater than 10 000 kg capacity (in preparation);*
- *Part 6: Sit-on counterbalanced trucks and rough terrain masted trucks greater than 10 000 kg capacity (in preparation);*
- *Part 7: Variable reach and masted container handler (in preparation);*
- *Part 8: Stand on counterbalanced trucks up to and including 10 000 kg capacity (in preparation).*
- *Part 9: Order-picking, lateral- and front-stacking trucks with elevating operator position*

It is intended to develop additional parts related to the following machinery:

- *Pallet stacking trucks (rider controlled);*
- *Burden carrier;*
- *Tractor (IND Truck);*
- *Single side loader;*
- *Multi-directional forklift truck;*
- *Articulated counterbalanced lift truck;*
- *Low lift straddle carriers (as defined in ISO 5053-1:2015, 3.18);*
- *High lift straddle carriers (as defined in ISO 5053-1:2015, 3.19).*

For specific machines covered by other parts in this standard, this European Standard is intended for use in combination with relevant other parts in the series.

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According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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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.

EN 16842-1:2018 (E)**1 Scope**

This part of the EN 16842 series gives the common test requirements for powered industrial truck visibility testing and is intended to be used in conjunction with EN 16842 parts 2 to 17.

The EN 16842 series specify requirements and test procedures of all around visibility of self-propelled industrial trucks (herein after referred to as trucks) in accordance with ISO 5053-1 with a sit-on or stand-on operator, without load, and equipped with fork arms or load platform.

The truck specific requirements in EN 16842 parts 2 to 17 supplement or modify the corresponding clauses of this part EN 16842-1 and provide the relevant requirements for the specific truck.

The visibility test requirements of the applicable part of EN 16842 for each truck type are used to fulfil the visibility requirements of the EN 16307 series.

This European Standard does not apply to:

- industrial, rough terrain variable reach or rough terrain masted lorry mounted trucks;
- trucks with elevating operator position, when the operating position is elevated above 500 mm;
- rough terrain variable reach trucks – within the scope of EN 15830;
- centre controlled order picking trucks (in accordance with 3.16 of ISO 5053-1:2015);
- pallet truck end controlled (in accordance with 3.15 of ISO 5053-1:2015).

NOTE 1 The following trucks in normal operation have excellent 360° visibility and therefore will not be part of this series of standards:

- ride on pallet truck;
- pedestrian controlled pallet truck.

NOTE 2 For trucks equipped with attachments (e.g. clamp), see Clause 9 "Information for use".

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.

EN ISO 3691-1:2015, *Industrial trucks - Safety requirements and verification - Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks (ISO 3691-1:2011, including Cor 1:2013)*

EN ISO 3691-2, *Industrial trucks - Safety requirements and verification - Part 2: Self-propelled variable-reach trucks (ISO 3691-2)*

EN ISO 3691-3, *Industrial trucks - Safety requirements and verification - Part 3: Additional requirements for trucks with elevating operator position and trucks specifically designed to travel with elevated loads (ISO 3691-3)*

EN ISO 3691-6, *Industrial trucks - Safety requirements and verification - Part 6: Burden and personnel carriers (ISO 3691-6)*

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

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

ISO 16001, *Earth-moving machinery - Object detection systems and visibility aids - Performance requirements and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5053-1, EN ISO 3691-1, ISO 3691-2, EN ISO 3691-3 and EN ISO 3691-6, together with the following apply.

3.1

truck profile

contour which is determined by the largest rectangular width and length parallel to the longitudinal axis of the truck, including the front vertical surface of the fork arms

Note 1 to entry: The blades of the fork arms are not taken into account.

Note 2 to entry: Excludes external projections such as, rail guidance systems, stabilizers or attachments that extend beyond the profile of the truck.

Note 3 to entry: For width dimension, see Figure A.1 key W.

3.2

standing index point

STIP

perpendicular projection of the mid-axis of the standing operator in the normal operating position in which the operator is able to control all functions for driving and load handling

Note 1 to entry: Applicable to stand on trucks only, determination of STIP is defined in the applicable parts of this series of standards.

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3.3

adjusted standing index point

ASTIP

location relative to the STIP to simulate body movement of the operator during truck operation

Note 1 to entry: Applicable to stand-on trucks only, determination of ASTIP is defined in the applicable parts of this series of standards.

3.4

manoeuvring of an industrial truck

motion of an industrial truck at slow speed and for short distances

Note 1 to entry: Manoeuvring may include movements such as operation in narrow aisles, when turning, passing objects close by, load pick-up and put down, approaching and retreating from loads, and other operations not included when travelling.

3.5

travelling of an industrial truck

movement of the truck over relatively long distance and open areas at faster speeds than manoeuvring up to maximum speed

3.6

lighting equipment

system of lights that represent the range of vision including head and body movement

Note 1 to entry: The configuration of the lighting equipment is shown in Figure 4 or Figure 5.

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3.7

test body

rectangular body with 3 sides and top surface that simulates an obstacle, e.g. a person in a stooped position, and with which the visibility conditions are evaluated

Note 1 to entry: The dimensions of the test body are shown in Figure 2.

3.8

test screen

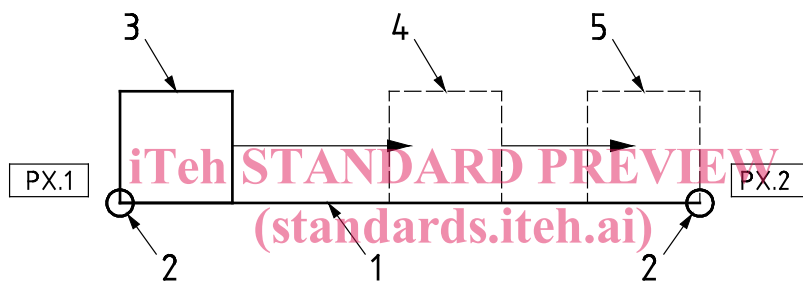
single surface that simulates an obstruction with which the visibility conditions while travelling forward are evaluated

3.9

test path

path marked on the floor around the industrial truck to be tested and on which the test body is moved for the visibility measurement tests

Note 1 to entry: Examples of test paths are shown in Figure 1 and Figure A.1.

**Key**

- 1 test path
- 2 test path end point
- 3 test body at end point PX.1
- 4 test body is moved along entire length of test path, not extending past end points
- 5 test body at end point PX.2

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Figure 1 — Example top view of test path

3.10

illuminated area

surface on the test body or test screen that is illuminated by at least one switched-on light of the lighting equipment

3.11

dark shadow

surface on the test body or test screen that is not illuminated by any switched-on light of the lighting equipment

Note 1 to entry: When checking for dark shadows on the test body or test screen the shadow cast by an object, e.g. clipboard, hand, may help to identify dark shadow areas.

3.12

direct visibility

visibility of the test body and test screen without the use of auxiliary equipment such as mirrors or cameras

3.13**indirect visibility**

visibility of the test body and test screen with the use of auxiliary equipment such as mirrors or cameras

3.14**auxiliary equipment**

equipment used to compensate for the limitation of direct visibility by, e.g. mirrors or camera/monitor systems

4 Truck configuration**4.1 General**

The test shall be conducted with an unladen truck on a level, horizontal floor. The truck shall be equipped with a load platform or two fork arms of a length up to dimension "A" as indicated in the appropriate part of the EN 16842 series, centrally spaced at an outside distance within the normal fork adjustment range of the specific configuration tested.

The test method of this standard applies to all configurations, including additional tests for various types of masts, external fuel tanks, counterweights, cabs, etc. that adversely affect visibility.

Where a configuration has no adverse effect on visibility the test may not need to be repeated.

The test shall be valid for the determined configurations as specified in the test report in Clause 8.

Information about mast tilt and/or retractable mast position can be found in the applicable truck specific part in this series.

4.2 Fork height and mast tilt configuration**4.2.1 Fork height during test**

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If applicable, the load carrying surface of the fork arms, measured at the heel end, up to 300 mm above the floor.

NOTE The dimensions above are to enable the operator to adjust height of the fork arms for maximum visibility of fork tips.

4.2.2 Mast and fork tilt during test

During the various stages of the test the mast may be tilted as follows:

a) Travelling tests

The mast or load carrying surface shall be tilted rearward to the maximum, but not more than 10°, for all travelling tests. If the means of tilting the mast or load carrying surface is accomplished by tilting the truck chassis, these tests shall be performed with the chassis horizontal.

b) Manoeuvring tests

The mast shall be vertical or the load carrying surface shall be horizontal for all manoeuvring tests.

c) Fork arms or load platform tests

The load carrying surface of the fork arms or of the load platform shall be horizontal.