
Vozila za talni transport - Gnana vozila za talni transport - Vidno polje voznika - Preskusne metode in preverjanje - 8. del: Čelni viličar s stoječim upravljavcem in z nosilnostjo do 10 000 kg

Powered industrial trucks - Visibility-test methods and verification - Part 8: Stand-on counterbalance trucks up to and including 10 000 kg capacity

Kraftbetriebene Flurförderzeuge - Sichtverhältnisse - Prüfverfahren und Verifikation - Teil 8: Gegengewichtstapler mit stehendem Bediener bis einschließlich einer Nenntragfähigkeit von 10 000 kg

Chariots de manutention automoteurs - Visibilité - Methodes d'essai et vérification - Partie 8 : Chariots en porte-à-faux à conducteur debout ayant une capacité jusqu'à 10 000 kg inclus

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EUROPEAN STANDARD

EN 16842-8

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Powered industrial trucks - Visibility-Test methods and verification - Part 8: Stand-on counterbalance trucks up to and including 10 000 kg capacity

Chariots de manutention automoteurs - Visibilité -
Méthodes d'essai et vérification - Partie 8 : Chariots en
porte-à-faux à conducteur debout ayant une capacité
jusqu'à 10 000 kg inclus

Kraftbetriebene Flurförderzeuge - Sichtverhältnisse -
Prüfverfahren und Verifikation - Teil 8:
Gegengewichtstapler mit stehendem Bediener bis
einschließlich einer Nenntragfähigkeit von 10 000 kg

This European Standard was approved by CEN on 6 December 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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European foreword

This document (EN 16842-8:2021) 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of an identical text or by endorsement, at the latest by July 2021, and conflicting national standards shall be withdrawn at the latest by July 2021.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 is intended to be used in combination with the requirements in EN 16842-1.

The EN 16842 series 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;
- Part 4: Industrial variable reach trucks up to and including 10 000 kg capacity;
- Part 5: Industrial variable reach trucks greater than 10 000 kg capacity;
- Part 6: Sit-on counterbalance trucks and rough terrain masted trucks greater than 10 000 kg capacity;
- Part 7: Variable reach and masted container trucks handling freight containers of 6 m (20 ft) length and longer;
- Part 8: Stand on counterbalance trucks up to and including 10 000 kg capacity;
- Part 9: Order picking lateral- and front stacking trucks with elevating operator position;
- Part 10: Towing and Pushing tractors and Burden carrier.

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

- Pallet stacking trucks (rider controlled);
- Single side loader;
- Multi-directional forklift truck;
- Articulated counterbalance lift truck;
- Non-stacking low-lift straddle carrier (as defined in ISO 5053-1:2020, 3.18);
- Stacking high-lift straddle carrier (as defined in ISO 5053-1:2020, 3.19).

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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.

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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 16842-8:2021 (E)**1 Scope**

This document specifies the requirements and test procedures for 360° visibility of stand-on counterbalance trucks with a capacity up to and including 10 000 kg in accordance with ISO 5053-1 (herein after referred to as trucks) without a load and it is intended to be used in conjunction with EN 16842-1.

Where specific requirements in this part are modified from the general requirements in EN 16842-1, the requirements of this part are truck-specific and to be used for stand-on counterbalance trucks with a capacity up to and including 10 000 kg.

This part of EN 16842 deals with all significant hazards, hazardous situations or hazardous events, relevant to the visibility of the operator for applicable machines when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

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 16842-1:2018, *Powered industrial trucks - Visibility - Test methods and verification - Part 1: General requirements*

EN ISO 3691-1:2015¹⁾, *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)*

ISO 5053-1:2020, *Industrial trucks - Vocabulary - Part 1: Types of industrial trucks*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16842-1:2018, EN ISO 3691-1:2015¹⁾ and 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 forward direction

<for stand-on counterbalance trucks where the operator is not facing the line of travel> load trailing is the forward direction

Note 1 to entry: For other kinds of trucks, definition on forward direction is given in EN ISO 3691-1:2015¹⁾.

4 Truck Configuration**4.1 General**

For truck test configuration, EN 16842-1:2018, Clause 4 shall apply.

1) As impacted by EN ISO 3691-1:2015/AC:2016 and EN ISO 3691-1:2015/A1:2020.

4.2 Fork arm dimensions

The test truck shall be equipped with fork arms of the following nominal lengths:

- Truck < 1 000 kg rated capacity: 800 mm,
- Truck \geq 1 000 kg and < 5 000 kg rated capacity: 1 000 mm, and
- Truck \geq 5 000 kg and \leq 10 000 kg rated capacity: 1 200 mm.

Other fork arm lengths shall be tested if these adversely affect visibility (e.g. shorter fork arms).

Lengths of forks arms shall be noted in the test report, see Clause 8.

NOTE Fork arm lengths in millimetres are given as two times the length of the standard load centre distance as defined in EN ISO 3691-1:2015, A.2.3.

5 Test equipment

For test equipment, EN 16842-1:2018, Clause 5 shall apply.

6 Test procedures for direct visibility

6.1 General

The visibility from the truck shall be determined from the normal operating position with lighting equipment and test body or screen. The lighting equipment simulates the range of eye positions of the operator. The test body or test screen simulates an obstacle to be seen.

6.2 Lighting equipment position

The lighting equipment shall be positioned relative to the standing index point (STIP).

The STIP is given for a stand-on operator in the normal operating position, with the operator standing at the platform and controlling all functions.

Procedure for locating the STIP:

- a) determine the appropriate foot positions for the truck being evaluated;
- b) determine the position of the ankle pivot point by the shoe outline and the data given in Figure 1;
- c) determine the mid-point of the line connecting the ankle pivot points to establish the STIP;
- d) the 0° position (before any rotation of the operator's head, shoulders, or torso) is a line through the STIP perpendicular to the line connecting the ankle pivot points as shown in Figure 1; the row of lights may be rotated $\pm 135^\circ$ as shown in Figure 2;
- e) measure the height of the STIP above the floor as well as the location of the STIP relative to a permanent feature of the truck and record.

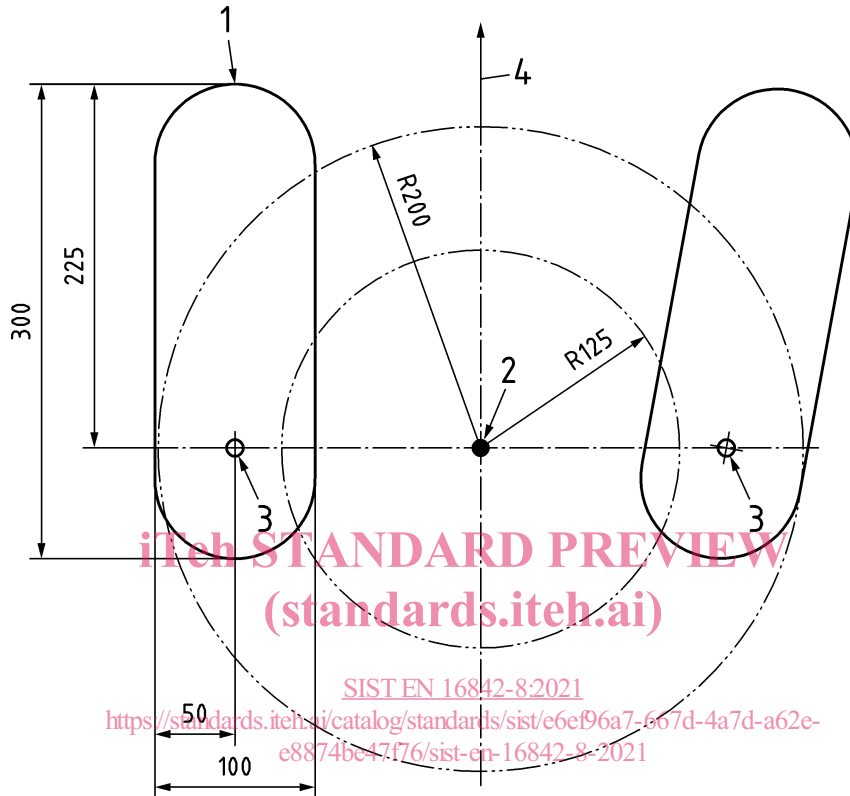
To simulate body movement during truck operation, an adjusted STIP (ASTIP) may be positioned within an area circumscribed by:

- a 125 mm radius about the STIP for a stand-up rider truck with defined compartment space where the operator's feet/lower body movements are limited due to truck design;
- a 200 mm radius about the STIP for stand-on operated truck with space for movement.

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When the STIP for a truck has been established, the location of the STIP shall remain fixed throughout the visibility evaluation. The ASTIP of the test fixture for a particular test may be relocated as defined above, and shown in Figure 1 and Figure 2, i.e. Tests 1 to 9 (see Table 1 and Table 2) may have different locations for the axis of rotation. Each test shall have only one location for the ASTIP which shall be referenced from the STIP and recorded.

Dimensions in millimetres



Key

- 1 foot/shoe profile
- 2 STIP
- 3 ankle pivot points
- 4 0° direction

Figure 1 — Determination of stand index point (STIP)