
**Industrial trucks — Safety requirements
and verification —**

**Part 7:
Regional requirements for countries
within the European Community**

iTeh STANDARD PREVIEW
*Chariots de manutention — Exigences de sécurité et vérification —
Partie 7: Exigences régionales pour les pays de la Communauté
européenne*
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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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 3691-7 was prepared by Technical Committee ISO/TC 110, *Industrial trucks*, Subcommittee SC 2, *Safety of powered industrial trucks*.

ISO 3691 consists of the following parts, under the general title *Industrial trucks — Safety requirements and verification*:

- *Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks*
- *Part 2: Self-propelled variable-reach trucks*
- *Part 3: Additional requirements for trucks with elevating operator position and trucks specifically designed to travel with elevated loads*
- *Part 4: Driverless industrial trucks and their systems*
- *Part 5: Pedestrian-propelled trucks*
- *Part 6: Burden and personnel carriers*
- *Part 7: Regional requirements for countries within the European Community [Technical Specification]*
- *Part 8: Regional requirements for countries outside the European Community [Technical Specification]*

Introduction

The ISO 3691 series has been developed to provide globally relevant International Standards for industrial trucks. This goal was achieved with most of the issues. Where divergent regional requirements remain, these are addressed by this part of ISO 3691 and by ISO/TS 3691-8.

This part of ISO 3691 addresses those legal requirements related to European Directives which could not be accepted worldwide; ISO/TS 3691-8 addresses requirements related to regulations in force in other countries that are not applicable elsewhere.

Annex A presents a list of significant hazards not covered exhaustively by ISO 3691-1, ISO 3691-2, ISO 3691-3, ISO 3691-4, ISO 3691-5 or ISO 3691-6.

This part of ISO 3691 does not repeat all the technical rules which are state of the art and are applicable to the material used to construct the industrial truck. For these, see ISO 12100.

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Industrial trucks — Safety requirements and verification —

Part 7:

Regional requirements for countries within the European Community

1 Scope

This part of ISO 3691 gives regional requirements specific to the countries within the European Community (EC) and European Economic Area (EEA) for the types of industrial trucks specified in the scopes of ISO 3691-1, ISO 3691-2, ISO 3691-3, ISO 3691-4, ISO 3691-5 and ISO 3691-6, respectively.

Additional significant hazards, not covered by the above-mentioned parts of ISO 3691, are defined in Annex A.

It is intended to be used in conjunction with each of those parts of ISO 3691.

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2 Normative references (standards.iteh.ai)

The following referenced documents are indispensable for the application 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.

ISO 3691-1:2011, *Industrial trucks — Safety requirements and verification — Part 1: Self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks*

ISO 3691-2:—¹⁾, *Industrial trucks — Safety requirements and verification — Part 2: Self-propelled variable-reach trucks*

ISO 3691-3:—¹⁾, *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 3691-4:—¹⁾, *Industrial trucks — Safety requirements and verification — Part 4: Driverless industrial trucks and their systems*

ISO 3691-5:2009, *Industrial trucks — Safety requirements and verification — Part 5: Pedestrian-propelled trucks*

ISO 3691-6:—¹⁾, *Industrial trucks — Safety requirements and verification — Part 6: Burden and personnel carriers*

ISO 5053:1987, *Powered industrial trucks — Terminology*

ISO 6292:2008, *Powered industrial trucks and tractors — Brake performance and component strength*

ISO/TR 11688-1:1995, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning*

1) To be published.

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ISO 13564-1—²⁾, *Powered industrial trucks — Test methods for verification of visibility — Part 1: Sit-on and stand-on operator trucks up to and including 10 t capacity*

ISO 22915-21:2009, *Industrial trucks — Verification of stability — Part 21: Order-picking trucks with operator position elevating above 1 200 mm*

EN 360:2002, *Personal protective equipment against falls from a height — Retractable type fall arresters*

EN 361:2002, *Personal protective equipment against falls from a height — Full body harnesses*

EN 363:2008, *Personal fall protection equipment — Personal fall protection systems*

EN 795:1996, *Protection against falls from a height — Anchor devices — Requirements and testing*, together with Amendment 1, 2000

EN 953:1997, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*, together with Amendment 1, 2009

EN 1175-1:1998, *Safety of industrial trucks — Electrical requirements — Part 1: General requirements for battery powered trucks*, together with Amendment 1, 2010

EN 1175-2:1998, *Safety of industrial trucks — Electrical requirements — Part 2: General requirements for internal combustion engine powered trucks*, together with Amendment 1, 2010

EN 1175-3:1998, *Safety of industrial trucks — Electrical requirements — Part 3: Specific requirements for the electric power transmission systems of internal combustion engine powered trucks*, together with Amendment 1, 2010

EN 1755:2000, *Safety of industrial trucks — Operation in potentially explosive atmospheres — Use in flammable gas, vapour, mist and dust*, together with Amendment 1, 2009

EN 12053:2001, *Safety of industrial trucks — Test methods for measuring noise emissions*, together with Amendment 1, 2009

EN 12895, *Industrial trucks — Electromagnetic compatibility*

EN 13059:2002, *Safety of industrial trucks — Test methods for measuring vibration*, together with Amendment 1, 2008

EN 13490, *Mechanical vibration — Industrial trucks — Laboratory evaluation and specification of operator seat vibration*

EN 15000:2008, *Safety of industrial trucks — Self-propelled variable reach trucks — Specification, performance and test requirements for longitudinal load moment indicators and longitudinal load moment limiters*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5053, ISO 3691-1, ISO 3691-2, ISO 3691-3, ISO 3691-4, ISO 3691-5 and ISO 3691-6 apply.

2) To be published.

4 Safety requirements and/or protective measures

4.1 European requirements additional to ISO 3691-1

4.1.1 General

The following applies to the self-propelled industrial trucks, other than driverless trucks, variable-reach trucks and burden-carrier trucks, dealt with in ISO 3691-1. These are additional to the requirements of ISO 3691-1 and, in certain instances, replace them.

4.1.2 Electrical requirements

Electrical systems and equipment shall be in accordance with EN 1175-1, EN 1175-2 and EN 1175-3.

4.1.3 Travel speed

The travel speed of variable-speed pedestrian-controlled trucks operating on level ground shall not exceed 6 km/h.

The maximum speed on level ground of stand-on trucks and pedestrian-controlled trucks fitted with a foldable platform when the operator is on the platform shall not exceed 16 km/h.

See ISO 3691-1:2011, 4.2.3.

4.1.4 Brakes

The parking and service brakes of trucks that can travel with an elevated operator position and/or elevated load above 500 mm, and up to and including 1 200 mm, are subject to the following requirements:

- for travel speeds up to and including 9 km/h, parking brakes shall be in accordance with ISO 6292:2008, 6.1.2 a), and service brakes shall comply with the specifications of ISO 6292:2008, Table 2, Group C;
- for travel speeds above 9 km/h, parking brakes shall be in accordance with ISO 6292:2008, 6.1.2 b) and service brakes shall comply with the specifications of ISO 6292:2008, Table 2, Group A1.

See ISO 3691-1:2011, 4.3.1.

4.1.5 Additional operation from alongside pedestrian-controlled and stand-on trucks

Low-lift order-picking trucks provided with a system that allows operating while walking alongside the truck are subject to the following requirements:

- activation of the travel control device from outside of the truck shall only be possible when the truck is stationary;
- the travel control shall be a hold-to-run control and the speed shall not exceed 4 km/h while operating the travel control from outside of the truck;
- the braking function shall be automatically applied when travel control device is released.

See ISO 3691-1:2011, 4.4.2.7.

4.1.6 Lift chains

The minimum safety factor, K_1 , of the lifting mechanism shall be as follows:

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— for trucks $\leq 10\,000$ kg rated capacity:

$$K_1 \geq 5$$

— for trucks $> 10\,000$ kg rated capacity:

$$K_1 \geq 5 - 0,2(Q' - 10), \text{ but not less than } 4$$

where Q' is the rated capacity of the truck, in tonnes.

See ISO 3691-1:2011, 4.6.1.

4.1.7 Mast tilt and carriage isolation

For ride-on trucks, the movement of powered attachments shall not be possible through operation of the control when the operator is not in the normal operating position.

See ISO 3691-1:2011, 4.6.3.5.

4.1.8 Operator's seat

The operator's seat shall be specified and marked in accordance with EN 13490.

See ISO 3691-1:2011, 4.7.4.

4.1.9 Protection against crushing, shearing and trapping

4.1.9.1 General

Where fixed and/or removable guard systems are needed, the requirements of EN 953 shall be met.

When a fixed guard is removed, its fixing system shall remain on the guard or truck. This requirement applies to any fixed guards that are liable to be removed by the user with a risk of loss of the fixings, e.g. fixed guards that are liable to be removed during routine maintenance or setting operations carried out at the place of use.

See ISO 3691-1:2011, 4.7.7.1.

4.1.9.2 Pedestrian and stand-on end-controlled trucks with mast

The mast shall be guarded at the side facing the operating controls, e.g. by a transparent cover. The guard shall, as a minimum, cover the whole width of the hazardous zone and the full length of the non-elevated mast, or up to 2,2 m from the ground, whichever is less.

4.1.10 Load control

NOTE Taking into account the state of the art, it is not possible to meet the objectives for load control and load moment indicators.

See ISO 3691-1:2011, 4.8.1.

4.1.11 Lateral stability

NOTE The European standard under development, prEN 16203, provides the procedure for performing dynamic tests for the verification of lateral stability while travelling, applicable for counterbalanced lift trucks that have a centre control, sit-down, non-elevating operator, with a rated capacity up to and including 5 000 kg.

See ISO 3691-1:2011, 4.8.1.

4.1.12 Visibility

See ISO 3691-1:2011, 4.10.1, which makes normative reference to ISO 13564-1.

Replace the requirement given in ISO 13564-1:—, 9.2.2 a) 1) with the following:

forward direction

25 % of the vertical surface of the test body

rearward direction

20 % of the vertical surface of the test body

Replace the minimum illuminated area of the test surface required by ISO 13564-1:—, Table 3, Test No.1, with the following:

25 % of the vertical surface of the test body

4.1.13 Reduction of noise by design

4.1.13.1 General

Industrial trucks shall be designed and constructed such that risks resulting from the emission of airborne noise are reduced according to the state of the art.

When noise is a significant hazard, there is need for a low-noise design. In this case, the methodology for low-noise design given in ISO 11688-1 shall be considered.

NOTE ISO 11688-2 gives useful information on noise-generation mechanisms in machinery.

Normally, noise is not a significant hazard for battery-powered trucks.

4.1.13.2 Main source of noise

On industrial trucks, the main sources of noise are components, such as the following, in a high-speed operation mode:

- combustion engines, including air intake, cooling fan and exhaust system;
- hydraulic pumps/motors.

4.1.13.3 Measures to reduce noise at the operator's position

Typical measures to reduce noise include the following:

- selection of low-noise components;
- use of elastic mountings that prevent the transmission of structure-borne noise from the components to the structures;
- the use of improved noise insulation in the cabin, if fitted.

These and other measures of identical or better efficiency may be used.