
**Vozila za talni transport - Energijska učinkovitost - Preskusne metode - 3. del:
Vozila za delo z zabojniki**

Energy efficiency of Industrial trucks - Test methods - Part 3 : Container handling lift trucks

Energie Effizienz von Flurförderzeugen - Testmethoden - Teil 3: Container Stapler

Efficacité énergétique des chariots de manutention - Méthodes d'essai - Partie 3 :
Chariots élévateurs porte-conteneur

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EUROPEAN STANDARD

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Energy efficiency of Industrial trucks - Test methods - Part 3: Container handling lift trucks

Efficacité énergétique des chariots de manutention -
Méthodes d'essai - Partie 3 : Chariots élévateurs porte-
conteneur

Energie Effizienz von Flurförderzeugen -
Testmethoden - Teil 3: Container Stapler

This European Standard was approved by CEN on 13 August 2016.

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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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European foreword

This document (EN 16796-3:2016) 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of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

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 16796 consists of the following parts, under the general title *Energy efficiency of Industrial trucks — Test methods*:

- *Part 1: General;*
- *Part 2: Operator controlled self-propelled trucks, towing tractors and burden-carrier trucks;*
- *Part 3: Container handling lift trucks.*

The following parts are under preparation:

- *Part 4: Rough-terrain trucks;*
- *Part 5: Trucks with elevating operator position and trucks specifically designed to travel with elevated loads.*

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

EN 16796-3:2016 (E)**1 Scope**

This European Standard specifies the method of energy consumption measurement for container handling lift trucks, as defined in ISO 5053-1.

This part is intended to be used in conjunction with EN 16796-1.

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 16796-1:2016, *Energy efficiency of Industrial trucks - Test methods - Part 1: General*

ISO 668, *Series 1 freight containers — Classification, dimensions and ratings*

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

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

ISO 22915-9:2014, *Industrial trucks — Verification of stability — Part 9: Counterbalanced trucks with mast handling freight containers of 6 m (20 ft) length and longer*

ISO 22915-12:2015, *Industrial trucks — Verification of stability — Part 12: Industrial variable-reach trucks handling freight containers of 6 m (20 ft) length and longer*

3 Terms and definitions

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For the purposes of this document the terms and definitions given in ISO 5053-1 and EN 16796-1 apply.

4 Test conditions**4.1 General**

The travelling position shall be such that the bottom of the container is no higher than 0,9 m above the seat index point (SIP) as defined in ISO 5353 (see ISO 22915-9:2014, 4.2 and ISO 22915-12:2015, 4.2), and at a height ensuring that the operator has sufficient forward visibility.

In the travelling position the boom shall be fully retracted.

Additional requirements for test conditions are given in EN 16796-1.

4.2 Laden container handler

A laden container handler shall be tested with a test load of 70 % of the rated load.

4.3 Empty container handler

An empty container handler shall be tested with an empty container according to ISO 668.

A container with a height of 8' 6" and a length of 20' (20 ft) shall be used in the test. (weight of 20 ft container minimum 2 200 kg)

5 Measurement procedure

5.1 General

The appropriate requirements of EN 16796-1:2016, Clause 5 apply together with the following clauses which describe specific information for container handling lift trucks.

5.2 Test set-up

Measurement shall start with the machine loaded and fully supported, with twist locks engaged at the travelling position height, at position A.

It is permissible for variable reach container handling trucks to be tested using simultaneous lifting and extension of the boom.

Table 1 — Test specification for container handling lift trucks

	Variable reach container handler / Counterbalance container handler	
	Empty container handler	Loaded container handler
Rated capacity Q	Q ≤ 10 t	Q > 10 t
Test duration [h]	1	1
No. of cycles [1/h]	30	20
Distance l [m]	100	100
Lift at B and D [m]	4	4

5.3 Operating sequence

The cycle shall be performed according to Figure 1 and Table 1.

The sequence of the cycle shall be carried out with the following actions:

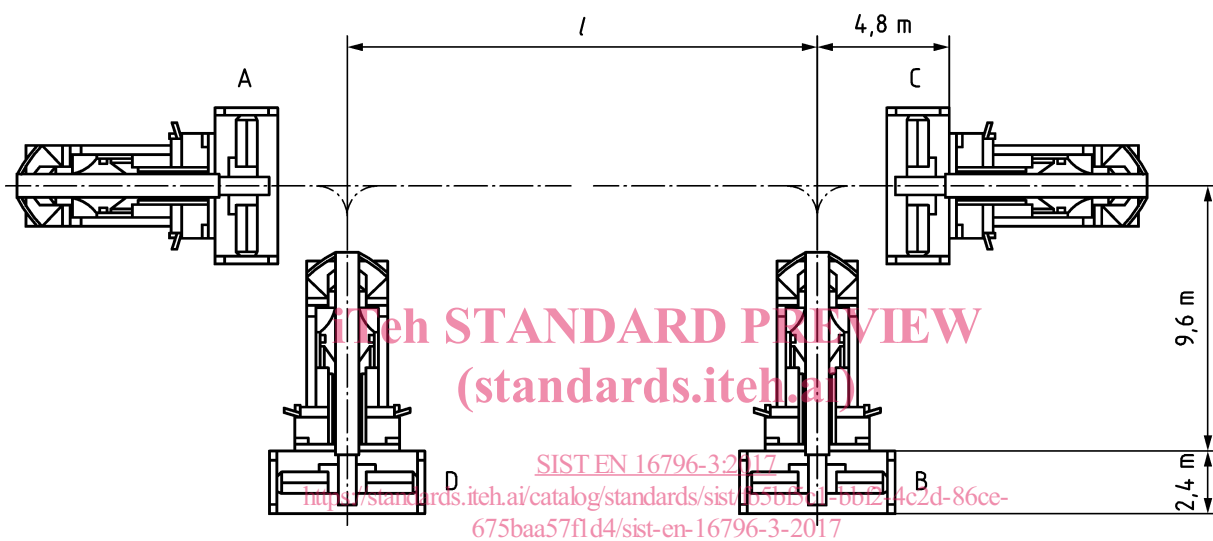
- Start at position A (travelling position);
- travel in forward direction to position “B” by turning through 90° and advance to position of container stack;
- return the backward tilt to the vertical position (only Counterbalanced container handler);
- lift the load as specified in Table 1;
- lower to the travelling position height;
- tilt back to maximum (only Counterbalanced container handler);
- drive backwards to position “C”;
- travel in forward direction to position “D” by turning through 90° and advance to position of container stack;
- return the backward tilt to the vertical position (only Counterbalanced container handler);

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- lift the load as specified in Table 1;
- lower to the travelling position height;
- tilt back to maximum (only Counterbalanced container handler);
- drive backwards to position “A”;
- end of cycle.

The travel speed shall be so adapted to reach the specified number of cycles per hour. The load shall be lifted and lowered, without depositing the load.

Travelling is not permitted while lift/lowering, or reach/retracting operations.

**Key**

- A, B, C, D truck position
l distance

Figure 1 — Test layout energy consumption