Energy efficiency of Industrial trucks - Test methods - Part 2: Operator controlled self-propelled trucks, towing tractors and burden-carrier trucks



# EESTI STANDARDI EESSÕNA

#### NATIONAL FOREWORD

See Eesti standard EVS-EN 16796-2:2016 sisaldab Euroopa standardi EN 16796-2:2016 ingliskeelset teksti.	This Estonian standard EVS-EN 16796-2:2016 consists of the English text of the European standard EN 16796-2:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.11.2016.	Date of Availability of the European standard is 02.11.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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# EUROPEAN STANDARD NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16796-2

November 2016

ICS 53.060

#### **English Version**

# Energy efficiency of Industrial trucks - Test methods - Part 2: Operator controlled self-propelled trucks, towing tractors and burden-carrier trucks

Efficacité énergétique des chariots de manutention -Méthodes d'essai - Partie 2 : Chariots automoteurs commandés par l'opérateur, tracteurs et chariots transporteurs de charge Energieeffizienz von Flurförderzeuge, - Testmethoden -Teil 2: Bedienergeführte selbstangetriebene Flurförderzeuge, Schlepper und Lastentransportfahrzeuge

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

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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

European foreword  Scope  Normative references  Terms and definitions  Measurement procedure  General  Operating requirements and sequence for counterbalance lift trucks and comparable truck designs  Operating requirements for other types of self-propelled trucks  Operating sequence for reach trucks  Operating sequence of straddle trucks and pallet stacking trucks.  Operating sequence for pallet and stillage trucks, pallet trucks end controlled, centre controlled order picking trucks.  Operating sequence for towing tractors and burden carriers	
Normative references  Terms and definitions  Measurement procedure  Test layout  Operating requirements and sequence for counterbalance lift trucks and comparable truck designs  Operating requirements for other types of self-propelled trucks  A.1 General  Operating sequence for reach trucks  Operating sequence for reach trucks  Operating sequence of straddle trucks and pallet stacking trucks  Operating sequence for pallet and stillage trucks, pallet trucks end controlled, centre controlled order picking trucks	2
Normative references  Terms and definitions  Test conditions  Measurement procedure  1 General  2 Test layout  3 Operating requirements and sequence for counterbalance lift trucks and comparable truck designs  4 Operating requirements for other types of self-propelled trucks  4.1 General  4.2 Operating sequence for reach trucks  4.3 Operating sequence of straddle trucks and pallet stacking trucks  4.4 Operating sequence for pallet and stillage trucks, pallet trucks end controlled, centre controlled order picking trucks	
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# **European foreword**

This document (EN 16796-2:2016) 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 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.

# 1 Scope

This European Standard specifies the method of energy consumption measurement for the following types of industrial trucks as defined in ISO 5053-1:

- counterbalance lift truck;
- articulated counterbalance lift truck;
- lorry-mounted truck;
- reach truck (with retractable mast or fork arm carriage);
- straddle truck;
- pallet-stacking truck,
- pallet truck;
- platform and stillage truck;
- pallet truck end controlled;
- order-picking truck;
- centre-controlled order-picking truck;
- towing, pushing tractor and burden carrier;
- towing and stacking tractor;
- side-loading truck (one side only);
- lateral-stacking truck (both sides);
- lateral-stacking truck (three sides);
- non-stacking low-lift straddle carrier;
- multi-directional lift truck.

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

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)

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

#### 3 Terms and definitions

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

#### 4 Test conditions

The test conditions are given in EN 16796-1:2016, Clause 4.

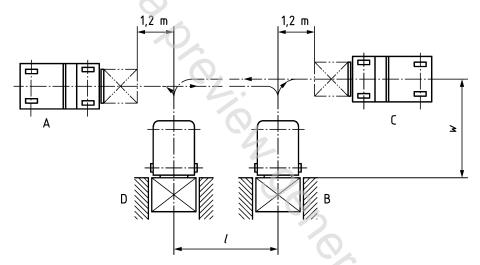
# 5 Measurement procedure

#### 5.1 General

EN 16796-1 applies together with the following sub-clauses that are describing specific information for the respective truck type.

#### 5.2 Test layout

Figure 1 shows the general test layout to perform the consumption test-cycle for self-propelled trucks within the scope of this standard. Figure 2 shows the cycle for towing tractors and burden carriers.



#### Key

- $\it w$  distance between the longitudinal centre plane of the truck and the simulated leading edge of the rack
- l distance

Figure 1 — Cycle for energy consumption test of self-propelled trucks