SLOVENSKI STANDARD
SIST EN 16796-6:2020

01-april-2020

Vozila za talni transport - Energijska učinkovitost - Preskusne metode - 6. del: Kontejnersko luško dvigalo

Energy efficiency of industrial trucks - Test methods - Part 6: Container Straddle Carriers

Energieeffizienz von Flurförderzeugen - Testmethoden - Teil 6: Container Portalhubwagen (Container Straddle Carrier)

Efficacité énergétique des chariots de manutention - Méthodes d'essai - Partie 6 : Chariots cavaliers porte-conteneur

Ta slovenski standard je istoveten z: **EN 16796-6:2020**

ICS:

27.015	Energijska učinkovitost. Ohranjanje energije na splošno	Energy efficiency. Energy conservation in general
53.060	Industrijski tovornjaki	Industrial trucks

SIST EN 16796-6:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16796-6

January 2020

ICS 53.060

English Version

Energy efficiency of Industrial trucks - Test methods - Part 6: Container straddle carrier

Efficacité énergétique des chariots de manutention - Méthodes d'essai - Partie 6 : Chariot cavalier porte-conteneur

Energieeffizienz von Flurförderzeugen - Prüfverfahren - Teil 6: Container-Portalhubwagen

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Ref. No. EN 16796-6:2020 E

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European foreword

This document (EN 16796-6:2020) 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of an identical text or by endorsement, at the latest by July 2020, and conflicting national standards shall be withdrawn at the latest by July 2020.

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*

— *Part 4: Rough-terrain trucks*

— *Part 6: Container straddle carrier*

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1 Scope

This part of EN 16796 specifies the methods of energy consumption measurement for stacking high-lift straddle carrier (hereafter referred to as straddle carrier), as defined in ISO 5053-1:2015, 3.19.

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

ISO 5053-1:2015, *Industrial Trucks — Terminology and classification — Part 1: Types of Industrial Trucks*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5053-1:2015 and EN 16796-1:2016 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
automatic container detection
automatic positioning of the spreader on the container

3.2
n – high
numbers of containers which could be stacked by the truck

Note 1 to entry: Usually the numbers of containers which could be stacked by the truck are 2-high, 3-high or 4-high.

Note 2 to entry: For travelling, the container is usually in the position 1-high.

4 Test conditions

4.1 General

The test conditions given in EN 16796-1:2016, shall be modified as follows.

4.2 Test load

The test load shall be 30,48 t according to ISO 668[1].

A container with a height of 2,59 m (8‘6“) and a length of 6 m (20‘) shall be used in the test.

[1] Under preparation. Stage at the time of publication: ISO/FDIS 668.

If a different container size and/or a different load is used, this should be documented in the test report.

The travelling position shall be in 1-high position, meaning lower corner of spreader at a hoisting height of 3,4 m to 3,6 m above ground.

4.3 Truck conditions

The following truck equipment shall be switched off:

— air-conditioning system;

— running light;

— working light.

If the test truck does have a stability-control system, it shall be switched on.

4.4 Environmental conditions

The measurement shall be carried out at an environmental temperature range between 10 °C and up to 30 °C.

The maximum wind speed shall not exceed a maximum of 10,8 m/s.

5 Measurement procedure

5.1 General

EN 16796-1:2016, Clause 5 applies together with the following subclauses, which describe specific information for container handling lift trucks.

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

5.2 Operating sequence

The cycle shall be performed according to Figure 1 and Table1.

Table 1 —Test specification for container straddle carriers

Requirement	n – high (2-, 3- and 4-high)
Rated capacity Q [t]	30 < Q < 60
Test duration [h]	1
Number of cycles [1/h]	5
Truck speed [km/h]	To be adapted
Test load [t]	30,48
Distance [m]	200

The sequences of one cycle simulates following actions:

— Travelling with and without load, e.g from waterside to container storage area or other way round.

— Travelling in the row (container storage) to lower and to raise the load.

— Acceleration and deceleration with and without load.

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

— Start at position "A" (travelling position).

— Loaded machine standing for 2 min in engine idle without a start/stop function or loaded machine standing still for 2 min with a start/stop function.

— Travel to position “B” by driving 200 m straight and turning 180°.

— Stop travelling at position “B”.

— Travel forward to position “C” by driving 100 m straight and lift the load simultaneously.

— The maximum height shall be reached at position "C" at the latest.

— Stop travelling at position “C”.

— Lower load to ground and unlock container at position “C”.

— Lift empty spreader to one container height lower than maximum height (e.g. 4-high trucks to 3-high position) and travel forward to position “D” by driving 50 m straight.

— Stop travelling at position “D”.

— Travel to position “A” by driving 50 m straight and turning 180° and lower the load simultaneously.

— The travelling position shall be reached at position "A" at the latest.

— Stop travelling at position “A”.

— Empty machine standing for 2 min in engine idle without a start/stop function or empty machine standing still for 2 min with a start/stop function.

— Travel to position “B” by driving 200 m straight and turning 180°.

— Stop travelling at position “B”.

— Travel forward to position “C” by driving 100 m straight and lift the empty spreader simultaneously to one container height lower than maximum height (e.g. 4-high trucks to 3-high position).

— This height shall be reached at position "C" at the latest.

— Lower empty spreader to container on ground and lock container at position “C”.

— Lift load to maximum height and travel forward to position “D” by driving 50 m straight.

— Stop travelling at position “D”.

— Travel to position “A” by driving 50 m straight and turning 180° and lower the load simultaneously.

— The travelling position shall be reached at position "A" at the latest.

— Stop travelling at position “A”.

— End of cycle.

Simultaneous operations of load handling and travelling functions are permissible.

NOTE This reflects the state of the art of safe operation of straddle carriers.

Dimensions in metres

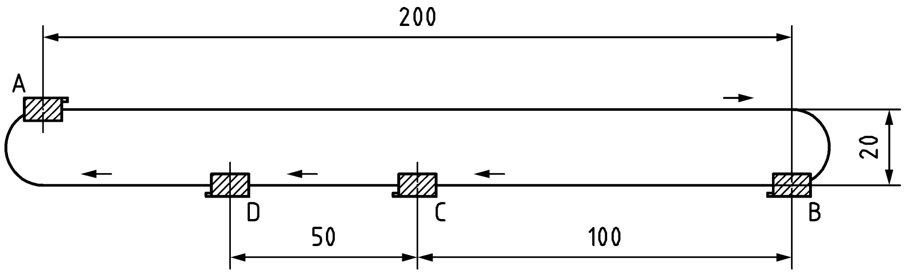

Figure 1 — Test layout straddle carrier energy consumption

6 Documentation

6.1 General

The manufactures shall document the following information.

6.2 Test report

The test report shall be in accordance with EN 16796-1:2016 and shall contain additionally the following details:

a) time needed for 5 complete cycles (if more or less than 1 h is needed);

b) where the verification of the truck design is made by other methods, e.g. simulation, the report shall reasonably be adapted to that specific method.

6.3 Declaration

The declaration shall be in accordance with EN 16796-1:2016.