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Intermodal loading units and commercial vehicles – Lashing points for cargo securing – Minimum requirements and testing; English version EN 12640:2019, English translation of DIN EN 12640:2020-05

Intermodale Ladeeinheiten und Nutzfahrzeuge – Zurrpunkte zur Ladungssicherung – Mindestanforderungen und Prüfungen; Englische Fassung EN 12640:2019, Englische Übersetzung von DIN EN 12640:2020-05

Unités de transport intermodal et véhicules utilitaires – Points d'arrimage et systèmes d'arrimage – Prescriptions minimales et essais; Version anglaise EN 12640:2019, Traduction anglaise de DIN EN 12640:2020-05

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In case of doubt, the German-language original shall be considered authoritative.

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National foreword

This document (EN 12640:2019) has been prepared by Technical Committee CEN/TC 119 “Intermodal Loading Units and Cargo Securing (ILUCS)” (Secretariat: DIN, Germany).

The responsible German body involved in its preparation was *DIN-Normenausschuss Automobiltechnik* (DIN Standards Committee Road Vehicle Engineering), Working Committee NA 052-00-38 AA “Freight containers”.

The DIN document corresponding to the international document referred to in this document is as follows:

ISO 27956 DIN ISO 27956

Amendments

This standard differs from DIN EN 12640:2001-01 as follows:

a) in Clause 3, terms and definitions have been updated;

b) in Clause 4, the following content has been added:

- vehicles with a gross vehicle mass under 3 500 kg;
- lashing angles have been updated;
- defined reference hook;
- minimum strength of lashing points has been adapted;
- number and arrangement of lashing points has been adapted.

c) in Clause 5, verifications have been adapted;

d) in Clause 6, test methods have been added;

e) in Clause 7, marking has been updated;

f) the following clauses and annexes are new:

- Clause 8;
- Annex A;
- Annex B.

Previous editions

DIN 75410-1: 1990-04
DIN EN 12640: 2001-01

National Annex NA
(informative)

Bibliography

DIN ISO 27956, *Road vehicles — Securing of cargo in delivery vans — Requirements and test methods*

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12640

December 2019

ICS 55.180.99

Supersedes EN 12640:2000

English Version

Intermodal loading units and commercial vehicles - Lashing points for cargo securing - Minimum requirements and testing

Unités de transport intermodal et véhicules utilitaires – Points d'arrimage et systèmes d'arrimage – Prescriptions minimales et essais

Intermodale Ladeeinheiten und Nutzfahrzeuge – Zurrpunkte zur Ladungssicherung – Mindestanforderungen und Prüfungen

This European Standard was approved by CEN on 23 September 2019.

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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 12640:2019) has been prepared by Technical Committee CEN/TC 119 “Intermodal Loading Units and Cargo Securing (ILUCS)”, the secretariat of which is held by DIN.

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 June 2020, and conflicting national standards shall be withdrawn at the latest by June 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.

This document supersedes EN 12460:2000. The main technical changes are:

a) in clause 3, the terms and definitions were updated;

b) in clause 4, the following content was added:

   — vehicles GVM under 3.500 kg;

   — lashing angles were updated;

   — defined reference hook;

   — strength of lashing points updated;

   — number and arrangement of lashing points updated.

c) in clause 5, verifications were updated;

d) in clause 6, testing was updated;

e) in clause 7,marking was updated;

f) the following clause and Annexes are new:

   — clause 8;

   — Annex A;

   — Annex B.

Annex A is normative and Annex B is informative.

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.

1 Scope

This document specifies the minimum requirements and test methods for lashing points for cargo securing on commercial vehicles and intermodal loading units for cargo transport.

This document does not apply to:

— Vehicles and intermodal loading units manufactured before publication of this standard;

— Vehicles and intermodal loading units designed and constructed exclusively for the transport of bulk materials;

— Vehicles and intermodal loading units designed and constructed exclusively for the transport of specific cargo with particular securing requirements;

— Vehicles (delivery vans) in conformance to ISO 27956;

— ISO series 1 freight containers.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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
CTU
Cargo **T**ransport **U**nit
commercial vehicle and intermodal loading unit

3.2
cargo securing devices
components, which are form-fit, and / or force-fit acting in combination with the cargo and the vehicle or the vehicle structure (e.g. plug stakes/ stanchions, transverse beams, wedges)

3.3
lashing angles

3.3.1
longitudinal lashing angle βx
angle between lashing device and longitudinal axis (x-axis) of a CTU in the plane of the loading area

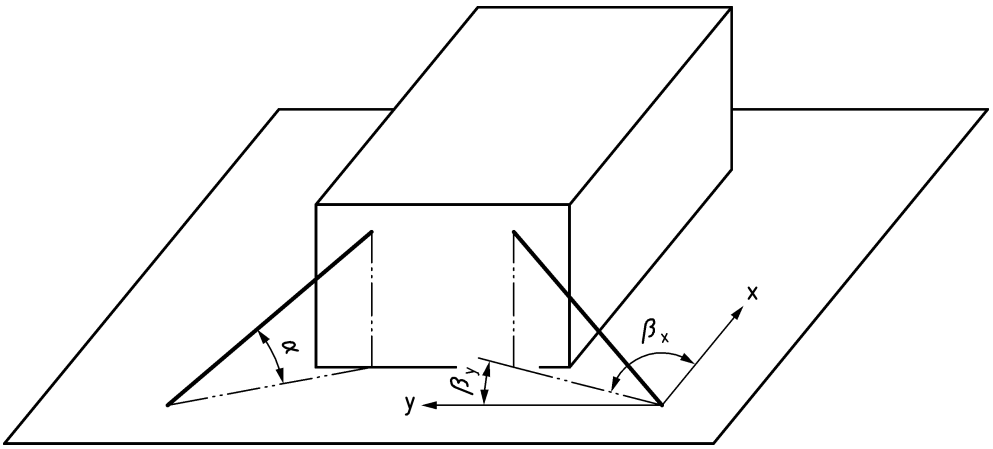
Note 1 to entry: See Figure 1.

3.3.2
transverse lashing angle βy
angle between lashing device and transverse axis (y-axis) of a CTU in the plane of the loading area

Note 1 to entry: See Figure 1.

3.3.3
vertical lashing angle α
angle α between lashing device and the horizontal plane of the loading area

Note 1 to entry: See Figure 1.



Key
- α vertical lashing angle
- β_x longitudinal lashing angle
- β_y transverse lashing angle

Figure 1— Definition of lashing angles

3.4
lashing capacity (LC)
maximum allowed force that a lashing point is designed to sustain in use

3.5
lashing device
device designed not to be permanently attached to the CTU in order to secure the cargo

Note 1 to entry: Lashing devices as described in e.g. EN 12195-2/ EN 12195-3/EN 12195–4.

3.6
lashing points
securing devices to which lashing devices may be directly attached

3.6.1
single lashing points
securing devices spaced according to 4.5 which may be e.g. an oval link, a hook or a ring

3.6.2
multiple-point lashing systems
lashing rail or multi-point lashing systems in the outer frame, or multiple attachment and continuous lashing systems at walls and/or floor/roof with a longitudinal distance smaller than that described in 4.5

4 Requirements

4.1 General

Lashing points shall be designed such that they transmit the forces they receive into the structural elements of the CTU. They shall be located as near as possible to the platform's longitudinal edges and/or integrated in the outer frame.

For vehicles with GVM < 3500 kg the described location is not mandatory.

For special load securing optional lashing points and/or load securing devices may be fixed.

Lashing points defined in 3.6 should not be directly mounted in structure materials (e.g.wood, plastic), where the structure is subject to damage from normal loading operations.

4.2 Design requirements of single lashing points

When mounted on top of the loading platform, in rest position they shall not project above the horizontal level of the loading platform.

The recesses in the loading platform required to accommodate the lashing points should be as small as possible.

Lashing points shall be available to withstand the lashing forces according to Table 1 applied from any direction within the conical area determined as follows (see Figure 1):

— vertical lashing angle α from about 0° to 90°, deviation of 5° is allowed;

— longitudinal lashing angle (β_x) from 0° to at least 180°, deviation of 5° is allowed.

The angle requirements may be fulfilled by combination of different single lashing points and/or multi-point lashing systems.

Lashing points shall be able to take hooks as defined in Figure 2, when GVM of the CTU is more than 7 500 kg.

4.3 Design requirements of multi-point lashing systems

Multi-point lashing systems shall be able to fulfil:

— vertical lashing angle α from 0° to 90°, deviation of 5° is allowed;

— longitudinal lashing angle (β_x) from 0° to at least 180°, deviation of 5° is allowed.

Multi-point lashing systems shall be able to take hooks as defined in Figure 2.

Continous lashing systems not able to use the reference hook, shall be able to fulfil the requirements of lashing angles and forces.

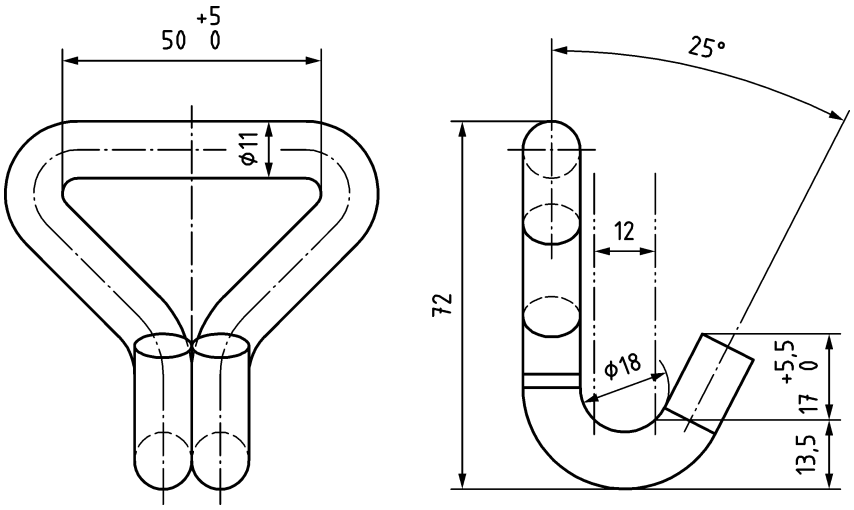


Figure 2— Reference hook

Multi-point lashing systems shall be able to withstand the lashing forces according to Table 1 on a length of 1 m at 3 positions at the same time in the same direction.

The angle requirements may be fulfilled by a combination of different single lashing point and/or multi-point lashing systems.

4.4 Strength of the lashing points

Each lashing point according to 3.6 shall be designed for a minimum lashing capacity as specified in Table 1.

Table 1 — Minimum lashing capacity

Gross vehicle mass (m) in kilogram [kg]	Minimum lashing capacity (LC) for lashing points in deka Newton [daN][a]
m ≤ 750	400
750 < m ≤ 3500	600
3500 < m ≤ 7500	800
7 500 < m ≤ 12 000	1000
m > 12000 or Intermodal loading units	2 000
[a] 100 daN = 1 kN.	

4.5 Number and layout of the lashing points

4.5.1 Number of lashing point pairs

The number of lashing point pairs n shall be determined by the highest result of the following:

— loading length in meters divided by 0,85;

— the payload in daN multiplied by 0,75 divided by LC in daN.

The number of lashing point pairs *n* shall be rounded down to next integer but not less than 2.

4.5.2 Arrangement of lashing point pairs

The lashing point pairs shall be arranged in such a way that:

— the lashing point pairs are distributed evenly along the length of the CTU;

— the distance between two adjacent lashing points is not greater than 1000 mm;

— in the area above the axles, the distance between two adjacent lashing points is as close to 1 000 mm as practicable but in any case ist not greater than 1200 mm;

— the distance from front or rear end wall is not greater than 500mm.

4.6 Lashing points in the front wall

The front wall of a CTU should be equipped with at least two single lashing points or a multi point lashing system mounted symmetrically to the vehicle centre line. If so, the lashing points shall be located such that:

— the vertical distance of the two lashing points measured from the surface of the loading platform is 1 000 mm ± 200mm (see Figure 1);

— the distance measured in transverse direction from the side of the front wall should be as small as possible and in any case not more than 250 mm.

Each lashing point on the front wall shall be able to withstand the lashing forces according to Table 1 but need not exceed 1000 daN. Instead of lashing points also multi-point lashing systems can be fixed. Lashing capacity and operational angles shall be tested and labelled.

4.7 Optional single lashing points or multi-point lashing systems

CTU may be equipped with optional single lashing points or multi-point lashing systems. Lashing capacity and operational angles shall be tested and labelled.

5 Verification

The reference test method for compliance with this standard shall be as specified in Clause 6. Upon completion of the test:

— up to 1,00 x LC, there shall be no visible deformation;

— up to 1,25 x LC, there shall be no permanent deformation which could impair the function of the lashing point.

The strength of the lashing points may also be determined by calculation, provided that the equivalence of the calculation to the reference test method can be demonstrated.

6 Testing

One of each type of the single lashing points or multi-point lashing systems and, if available, one of each type of optional single lashing points or multi-point lashing systems with lashing devices suitable to the systems connected to CTU shall be used for testing. Test shall be carried out on lashing points mounted at the weakest position.

The test force *F* to be applied shall be in first step 1,00 x LC and in the second step 1,25 x LC. In the test, the lashing point shall be connected to a suitable lashing hook, for example see Figure 2.

— The direction of application of the test force shall lie within the ranges of angles defined in 4.1 or 4.2. One test shall be performed in each of the three most unfavourable directions of application;

— the test force shall be applied for at least 3 min;

— a circle with radius of 500mm ± 30 mm with the test lashing point in the centre shall be kept free from reaction forces.

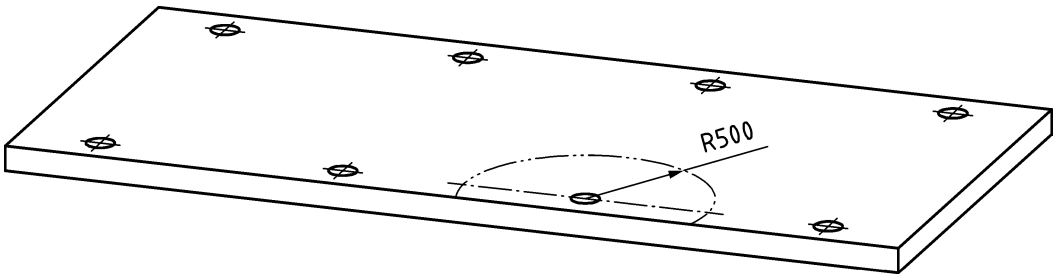


Figure 3 — Radius around test lashing point to be kept free from reaction force

7 Marking, identification and user instructions

CTU with lashing points in compliance with this standard shall be fitted with one or more marking labels in accordance with Figure 4 in a clearly visible place. The LCs in [daN] related to the corresponding lashing point shall be indicated on the label. The operational angles differing from Subclauses 4.1 and 4.2 as well as differing LCs by drawing and figures shall be indicated on the label.

The label shall have a blue background, white lettering and white border and a minimum size of 150mm x 100mm.

The manufacturer shall give user information about the single lashing points or multi-point lashing systems and lashing devices if needed for specific continous rails, including type, LCs and operational angles in user instructions.

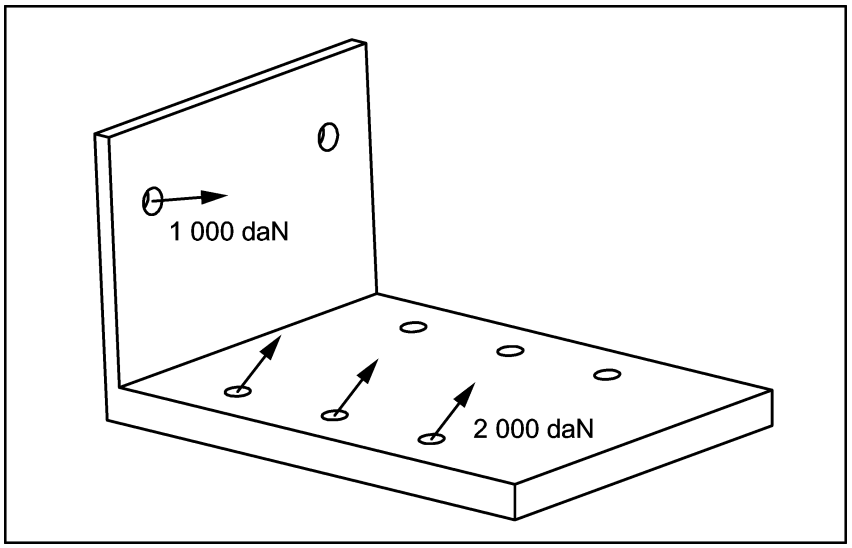


Figure 4 — Example for label

8 Maintenance

The manufacturer shall give user instructions for maintenance of the lashing points.

Annex A
(normative)

Test certificate of lashing points tested according to EN 12640

Test certificate of lashing point and/ or multi-point lashing system tested according to EN 12640

After a lashing point or multi-point lashing system has been tested according to the test procedures described in this document, a test certificate shall be issued and signed by the person responsible for the tests. The information shall be provided in English, further language versions are allowed. The certificate shall have a layout and contents as shown below:

1) manufacturer, name, address, phone number and e-mail address;

2) manufacturer or test organization, name, address, phone number and e-mail address of the person responsible for the tests;

3) test report number;

4) test method (e.g. calculation or static test);

5) identification of manufacturer of the CTU;

6) type, GVM and dimensions of the tested CTU body and identification number

7) type of the tested lashing points including type of end fitting (dimensions, position, operational angles and LC);

8) other relevant information can be added;

It is hereby certified that the tested lashing point or multi-point lashing system complies with the test requirements set up in EN 12640.

9) place and date;

10) signature of the person responsible for the tests (and printed name);

11) signature of the person responsible for compliance (and printed name).

Annex B
(informative)

Test report

Test report of lashing points tested according to EN 12640

After a single lashing point or multi-point lashing system has been tested according to the test procedures described in this standard, a test report shall be issued and signed by the person responsible for the tests. The report shall have the content as shown below:

1) identification of manufacturer of the CTU;

2) manufacturer or test organization, name, address, phone number and e-mail address of the person responsible for the tests;

3) test report number;

4) test method (e.g. calculation or static test);

5) type and dimensions of the tested CTU body and identification number;

6) type of the tested lashing point or multi-point lashing system (dimensions, position, operational angles and LC, test equipment);

7) test result;

8) other relevant information;

9) place and date;

10) signature of the person responsible for the tests;

11) printed name of the person responsible for the tests.

Bibliography

[1] EN 12195-2, *Load restraint assemblies on road vehicles — Safety — Part 2: Web lashing made from man-made fibres*

[2] EN 12195-3, *Load restraint assemblies on road vehicles — Safety — Part 3: Lashing chains*

[3] EN 12195-4, *Load restraint assemblies on road vehicles — Safety — Part 4: Lashing steel wire ropes*

[4] ISO 27956, *Road vehicles — Securing of cargo in delivery vans — Requirements and test methods*