BRITISH STANDARD

BS EN
12640:2001

Securing of cargo on road vehicles — Lashing points on commercial vehicles for goods transportation — Minimum requirements and testing

The European Standard EN 12640:2000 has the status of a British Standard

ICS 43.080.10; 55.180.99

National foreword

This British Standard is the official English language version of EN 12640:2000.

The UK participation in its preparation was entrusted to Technical Committee TW/1, Freight containers and swap bodies, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 12, an inside back cover and a back cover.

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This British Standard, having been prepared under the direction of the Consumer Products and Services Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 February 2001

ISBN 0 580 37067 4

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12640

July 2000

ICS 43.080.10; 55.180.99

English version

Securing of cargo on road vehicles — Lashing points on commercial vehicles for goods transportation — Minimum requirements and testing

Arrimage des charges à bord des véhicules routiers — Points d'arrimage à bord des véhicules utilitaires pour le transport des marchandises — Prescriptions minimales et essais

Ladungssicherung auf Straßenfahrzeugen — Zurrpunkte an Nutzfahrzeugen zur Güterbeförderung — Mindestanforderungen und Prüfung

This European Standard was approved by CEN on 30 June 2000.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 12640:2000 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 119, Swap bodies for combined goods transport, 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 January 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Annex A is informative.

1 Scope

This standard specifies the minimum requirements and test methods for lashing points fitted to commercial vehicles and trailers with flatbed body construction of maximum total mass above 3,5 t and intended for general use.

The standard does not apply to:

- vehicles designed and constructed exclusively for the transportation of bulk materials;
- vehicles designed and constructed exclusively for the transportation of specific cargo with particular securing requirements.

2 Terms and definitions

For the purpose of this standard the following terms and definitions apply.

2.1 lashing point

securing device on a vehicle, to which a lashing may be directly attached

A lashing point can be e.g. an oval link, a hook, a ring, a lashing shoulder.

2.2 lashing equipment

device designed to be attached to the lashing points in order to secure the cargo on the vehicle. The lashing equipment consists of tensioning elements (e.g. belt, chain, cable), tensioning device (e.g. wrench, ratchet, spanner, tension jack) and connections, if required (e.g. hook, eyelet)

2.3 angle of inclination ß

angle between a vertical line through the lashing point and the direction of application of the lashing force (see Figure 1)

2.4 Angle of rotation α

smallest angle between a plane through the lashing point parallel to the vehicle's longitudinal centre plane and a vertical plane through the direction of application of the lashing force (see Figure 1)

3 Identification

To comply with this standard the lashing points shall be identified by reference to the number of this standard and the permissible tensile load according to 4.3.

EXAMPLE: Identification of a lashing point for a permissible tensile load of e.g. 20 kN:

lashing point EN 12640-20.

4 Requirements

4.1 Design requirements

4.1.1 Lashing points shall be designed so that they transmit the forces they receive into the structural elements of the vehicle. They shall be fixed in the loading platform and in the vertical front end wall. In their position of rest they shall not project above the horizontal level of the loading platform nor beyond the vertical surface of the front end wall into the loading space.

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

4.1.2 Lashing points shall be designed to accommodate lashing forces applied from any direction within the conical area determined as follows (see Figure 1):

- angle of inclination ß from 0° to 60°;
- angle of rotation (α) from 0° to 180° for lashing points with a transverse distance from the side wall and the lashing points ≤ 50 mm;
- angle of rotation (α) from 0° to 360° for lashing points within a transverse distance from the side wall and the lashing points ≥ 50 mm but ≤ 250 mm.

4.1.3 If the lashing point has a round inside profile then the useable inside diameter shall be $\geq$ 40 mm. If it is oval then the clearance in the most unfavourable angle position shall have a width of $\geq$ 25 mm and a length of $\geq$ 40 mm.

The material cross section of the ring or of an oval link shall fit into a circle with a diameter of $\leq$ 18 mm (see Figure 2).

Rings which can move around their complete perimeter when lashed shall not be permitted.

4.1.4 The lashing points shall be designed so as not to compromise the splash protection and the customs security of the cargo area.

4.2 Number and layout of the lashing points

4.2.1 Lashing points on the floor

4.2.1.1 The number of lashing points shall be determined by the highest result of the following:

- length of the loading platform (see 4.2.1.2);
- maximum distance between lashing points (see 4.2.1.3);
- permissible tensile load (see 4.2.1.4).

4.2.1.2 For vehicles with an effective cargo loading length not exceeding 2 200 mm there shall be at least 4 lashing points, at least 2 on each side.

For vehicles with an effective cargo loading length greater than 2 200 mm there shall be at least 6 lashing points, at least 3 on each side.

4.2.1.3 The lashing points are to be arranged in such a way that:

- with the exception of the area above the rear axle, the distance between two adjacent lashing points on one side shall be not more than 1 200 mm. In the area above the rear axle the distance between two adjacent lashing points shall be as close to 1 200 mm as practicable but in any case shall not be more than 1 500 mm;
- the distance from front or rear end wall shall not be greater than 500 mm;
- the distance from the side walls of the loading area should be as small as possible and in any case shall not be greater than 250 mm.

4.2.1.4

a) For vehicles with a maximum authorised total mass greater than 12 tonnes, the number of lashing points X shall be calculated by use of the formula (1):

$$X = \frac{1{,}5 \times P}{20} \qquad (1)$$

In this case *P* is the inertial force in kN resulting from the maximum payload.

b) for vehicles with a maximum total mass exceeding 7,5 tonnes, but not greater than 12 tonnes, the number of lashing points X shall be calculated by using the formula (2):

$$X = \frac{1{,}5 \times P}{10} \qquad (2)$$

c) for vehicles with a maximum total mass exceeding 3,5 tonnes, but not greater than 7,5 tonnes, the number of lashing points X shall be calculated by using the formula (3):

$$X = \frac{1{,}5 \times P}{8} \qquad (3)$$

4.2.2 Lashing points in the front wall

The front wall of a vehicle shall be equipped with at least 2 lashing points mounted symmetrically on either side of the vehicle centre line. The lashing points shall be located such that:

a) the vertical distance of the two lashing points measured from the surface of the loading platform is 1 000 mm $\pm$ 200 mm (see Figure 1);

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

4.3 Strength of the lashing points

4.3.1 Each lashing point on the loading platform shall be designed for a permissible tensile load as specified in Table 1.

Table 1

Maximum allowed mass (*m*) of the vehicle t	**Permissible tensile load for lashing point** kN *
$3,5 < m \leq 7,5$	8
$7,5 < m \leq 12$	10
$m > 12$	20
* 1 kN = 100 daN	

4.3.2 Each lashing point on the front wall shall be designed for a permissible load of 10 kN.

4.4 Verification

The reference test method for compliance with this standard shall be as specified in clause 5. Upon completion of the test 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.

5 Testing

5.1 One lashing point on the loading platform and one lashing point on the front end wall shall be used for testing. The test force F to be applied shall be 1,25 times the permissible tensile force. In the test, the lashing point shall be connected to a suitable lashing hook in accordance with the manufacturers instructions.

5.2 The direction of application of the test force shall lie within the ranges of angles defined in 4.1.2. One test shall be performed in each of the three most unfavourable directions of application.

5.3 The test force shall be applied for at least 3 min.

5.4 To apply the test forces a test frame shall be used which shall be fixed appropriately to the load area (see Figure 3) or the bulkhead (analogous). This frame shall be fitted with its longitudinal edge 500 ± 30 mm from the lashing point being tested, parallel to the longitudinal axis of the vehicle. The width of the frame corresponds to the distance between the lashing points arranged in pairs less 1 000 mm. The width of the frame sections is ≥ 50 mm.

6 Marking

Vehicles with lashing points in compliance with this standard, shall be fitted with a marking plate in accordance with Figure 4 in a clearly visible place. For the convenience of the users the tensile load should be indicated in daN. The plate shall have a blue background, white lettering and a white border.

Annex A (informative)

Example of calculation

Example to determine the number of lashing points in accordance with 4.2.

Semi-trailer

Length of loading platform:	12,6 m
Payload max.:	28 tonnes

A.1 Determination of the number of lashing points

a) According to the requirements of item 4.2.1.2:

at least 6 lashing points

b) According to the requirements of item 4.2.1.3:

$12{,}6 - (2 \times 0{,}5) = 11{,}6 : 1{,}2 = 9{,}67$
rounded up = 10 compartments
= 11 pairs of lashing points
= 22 lashing points

c) According to the requirements of item 4.2.1.4:

$$X = \frac{1{,}5 \times P}{2\,000}$$

pay load: 28 000 kg $\times$ 10 m/s^2 (rounded value of the acceleration due to gravity 9,806 665)

force of the pay load = 280 000 kgm/s^2
= 280 000 N
= 280 kN

$$X = \frac{1{,}5 \times 280}{20}$$

X = 21 lashing points

A.2 Result

The highest value determined as per A.1 is established according to item b). The semi-trailer selected is to be equipped with 22 lashing points, 11 on each side.

Dimensions in millimetres

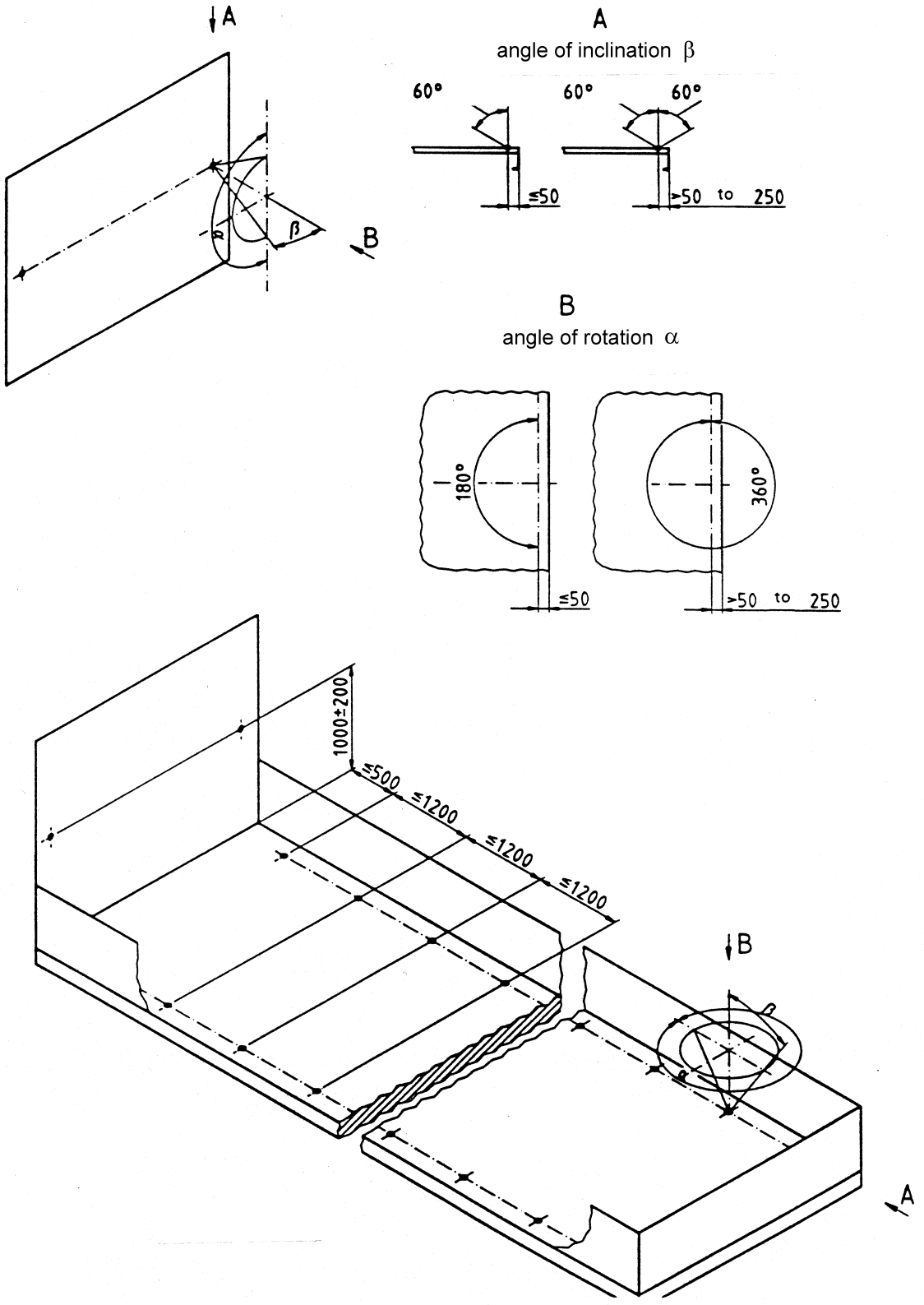


Figure 1

Dimensions in millimetres

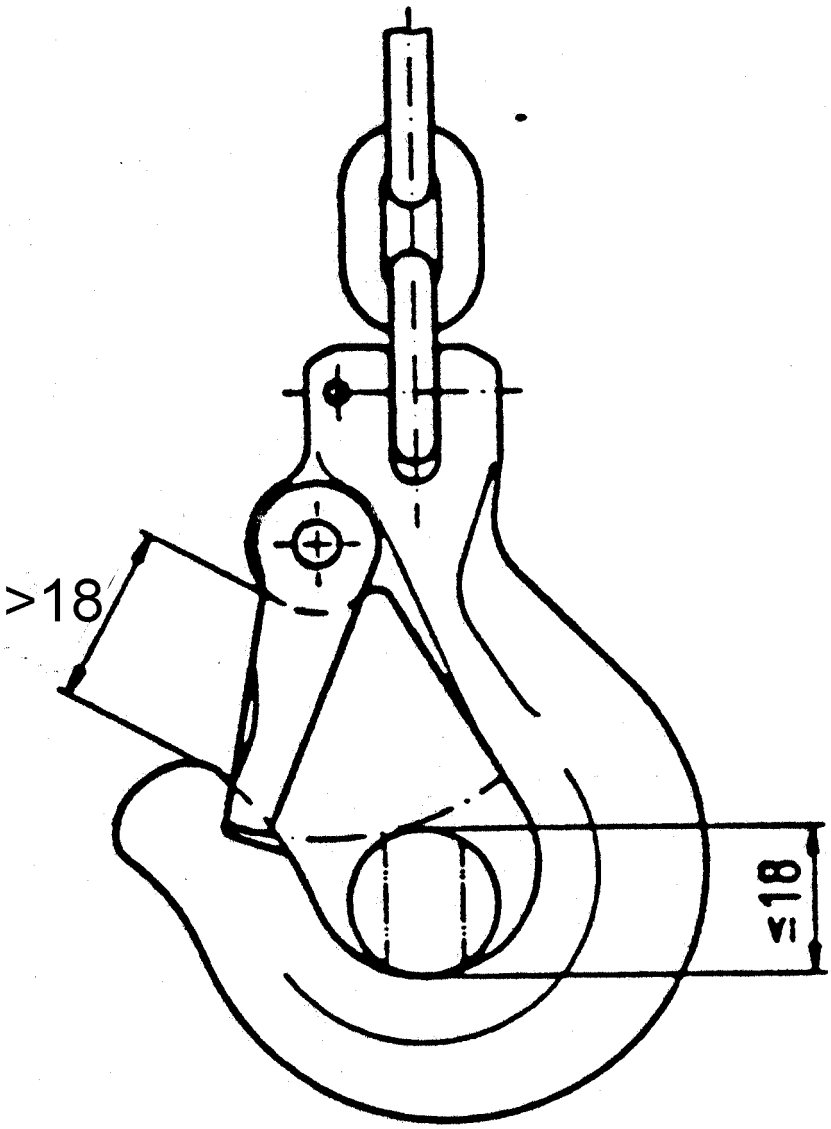
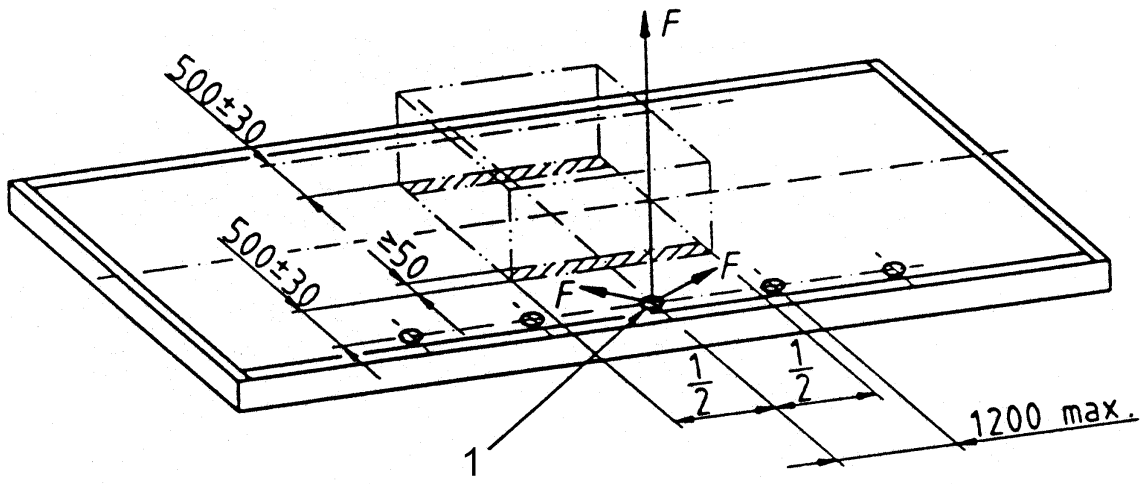


Figure 2

Dimensions in millimetres



Key

1 Lashing point to be tested

Figure 3

Dimensions in millimetres

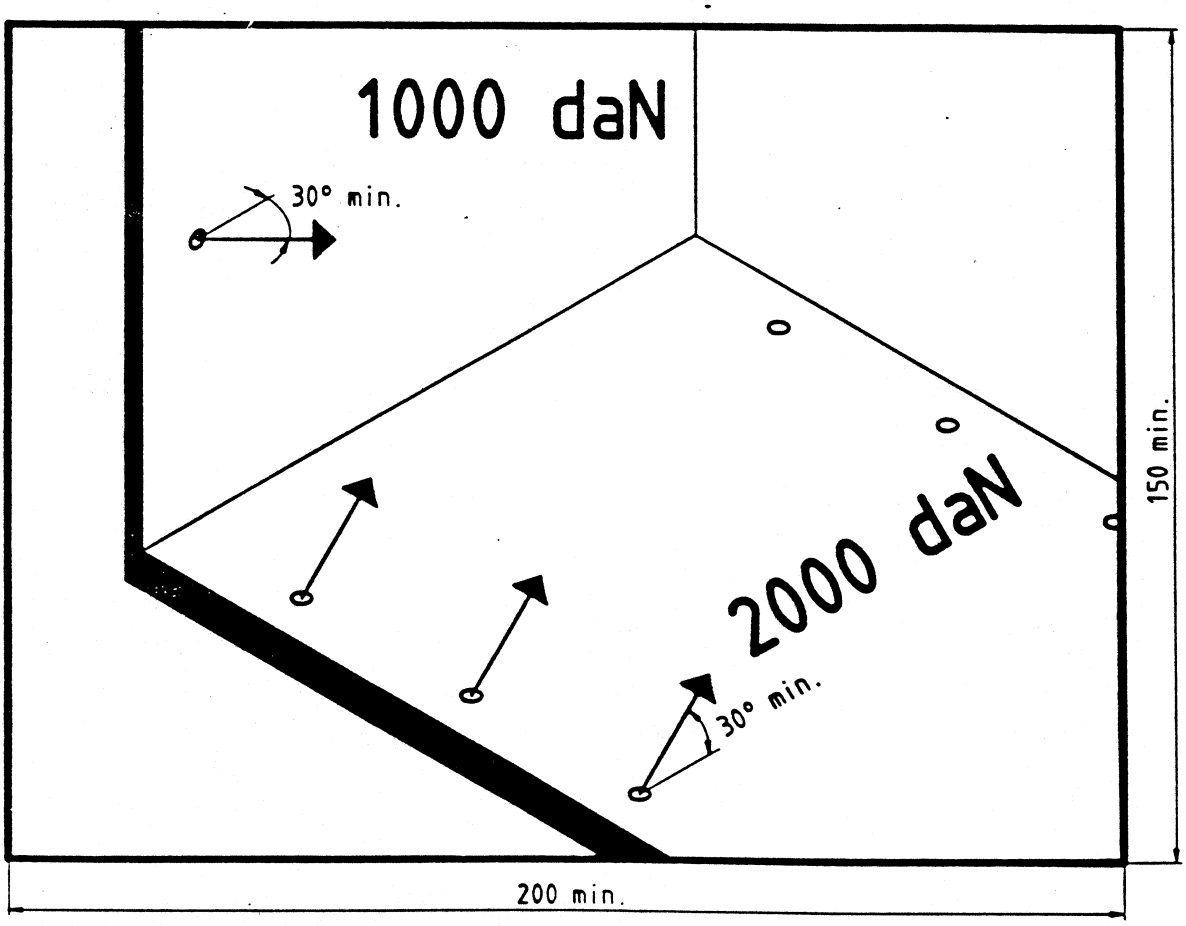


Figure 4

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