Load restraint webbing net

Installation and operating instructions

Lashing net for restraining loads

Article No.

- 300-25-xxx
- 150-25-xxx

- 300-50-xxx

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Please pay attention to the explanations and to the abbreviations and symbols.
If you have any queries, please contact the manufacturer.

1 Foreword – Load restraint webbing net

The task of making road transport safer places great demands on people, vehicles and roads.

It is very important to secure loads properly on road vehicles, particularly because people are often unaware of just how dangerous an inadequately secured load can be.[1]

Given the importance of securing loads safely in road traffic, those personnel responsible – particularly lorry drivers and loaders – need to be competent.

2 Safety instructions

Before use, attention must be paid to the following safety instructions and accepted codes of practice (VDI 2700 ff).

The securing of loads is a measure designed to prevent other road users or passers-by from being put at risk in normal traffic situations. Goods being transported should also be protected from damage. Even when measures have been taken to secure loads, the load should be driven at an appropriate speed in keeping with the loading condition.

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These operating instructions must be read in full. The use and limitations of the protection system, as well as the risks associated with its use, are to be understood and accepted.
- These operating instructions should be kept with the product.
- Particular attention should be paid to ensuring that the lashing net is not damaged by sharp edges.
- The load is to be stowed in such a way that the entire load's centre of gravity is on the vehicle's load centre point as far as is possible. This centre of gravity is to be kept as low as possible.
- Lashing nets and the tension belts that go with them may only be used to tie down loads. They may not be used to lift loads.
- The lashing net, tension belt and lashing points may not be loaded above their permissible lashing capacity (LC).

[1] VDI 2700

- The additional use of anti-slip mats can lead to a reduction in the force needing to be absorbed and therefore enhances safety.
- The load is to be stowed as far as possible without any gaps. Positive-lock securing is to be given preference over friction-lock securing.
- The components which have been individually checked and approved may only be put together in accordance with the information contained in these operating instructions and the vehicle information with regard to the lashing points' capacity for withstanding stress. Incorrect use can impair safe operation.
- The lashing net may no longer be used if there is any apparent damage to the equipment, the lashing strap, the ratchets etc. This also applies when defects are spotted during regular inspections.
- In principle the securing devices used to secure loads are subject to an annual check by a qualified person.

3 Components, dimensions, material, application

Net components and dimensions:

(a) Webbing net XX m x XX m
(b) Lashing straps

Material

Webbing net and lashing strap: polyester PES

Ratchet: galvanised steel

Application

Place the webbing net without wrinkling over the load.
Brace the webbing net with the associated lashing straps, according to the sketches and tables in Chapter 4, with the specified lashing angles α und β.

4 Load calculation, maximum permitted load

There are maximum loads for a net depending on the vehicle (maximum permissible weight, the lashing point's LC and the webbing net used). The friction between the load and the load area has a large influence on the maximum transport load as well as the angle of the lashing straps.

The following tables have been produced in accordance with the calculation guidelines contained in DIN EN 12195 and in accordance with VDI 2700.

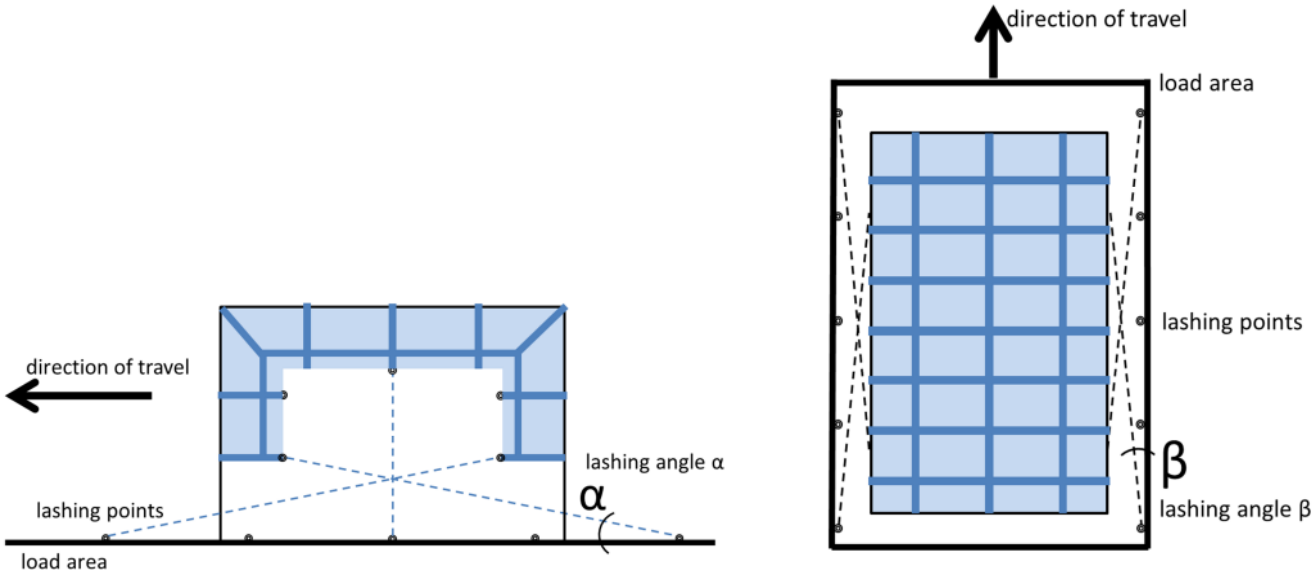

Image 1: Example using 2 tension belts in each direction

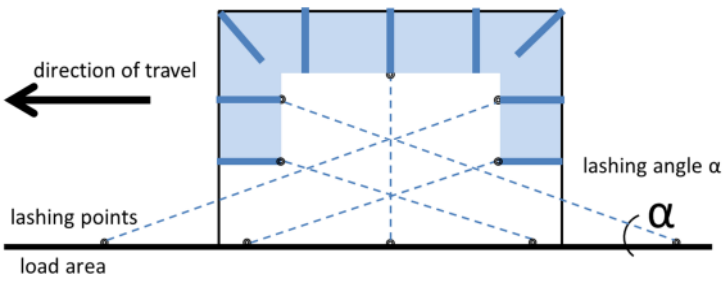

Image 2: Example using 4 tension belts in each direction

Table 1: Net 300-25-350 and 150-25-350: Maximum loading weight

LC lashing point: 350 daN
LC net, total: 1,300 daN

Calculation for 4 tension belts, 2 in each direction

Coefficient of friction µ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	230	580	240	330
Wood on wood Metal on wood	0.2	390	720	530	500
Anti-slip mat	0.5	2,600	1,600	2,000	1,600
Anti-slip mat	0.6	4,000	2,600	3,400	2,800

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 2: Net 300-25-400 and 150-25-400: Maximum loading weight

LC lashing point: 400 daN
LC net, total: 1,300 daN

Calculation for 4 tension belts, 2 in each direction

Coefficient of friction µ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	270	660	270	380
Wood on wood Metal on wood	0.2	450	820	610	570
Anti-slip mat	0.5	3,000	1,900	2,300	1,800
Anti-slip mat	0.6	4,600	3,000	3,900	3,200

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 3: Net 300-25-500 and 150-25-500: Maximum loading weight

LC lashing point: 500 daN
LC net, total: 1,300 daN

Calculation for 4 tension belts, 2 in each direction

Coefficient of friction µ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0,1	330	830	340	480
Wood on wood Metal on wood	0.2	560	1,000	760	720
Anti-slip mat	0.5	3,700	2,400	2,900	2,300
Anti-slip mat	0.6	5,800	3,700	4,900	4,000

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 4: Net 300-25-800 and 150-25-800: Maximum loading weight

LC $_{lashing\ point}$: 800 daN, (actual load in the lashing strap however max.600 daN)
LC $_{net,\ total}$: 1,300 daN

Calculation for 4 tension belts, 2 in each direction

Coefficient of friction μ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	405	1,000	410	580
Wood on wood Metal on wood	0.2	670	1,200	910	860
Anti-slip mat	0.5	4,500	2,800	3,500	2,800
Anti-slip mat	0.6	6,900	4,500	5,800	4,800

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 5: Net 300-25-800 and 150-25-800: Maximum loading weight

LC $_{lashing\ point}$: 800 daN, (load in lashing strap however max. 575 daN)
LC $_{net,\ total}$: 2,300 daN

Calculation for 8 tension belts, 4 in each direction

Coefficient of friction μ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	770	1,900	790	1,100
Wood on wood Metal on wood	0.2	1,300	2,300	1,700	1,600
Anti-slip mat	0.5	8,600	5,500	6,800	5,400
Anti-slip mat	0.6	13,300	8,700	11,300	9,200

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 6: Net 300-50-800: Maximum loading weight

LC lashing point: 800 daN,
LC net, total: 3,600 daN

Calculation for 4 tension belts, 2 in each direction

Coefficient of friction µ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	500	1,300	500	700
Wood on wood Metal on wood	0.2	900	1,600	1,200	1,100
Anti-slip mat	0.5	6,000	3,800	4,700	3,700
Anti-slip mat	0.6	9,000	6,000	7,800	6,400

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 7a: Net 300-50-1000: Maximum loading weight

LC lashing point: 1,000 daN,
LC net, total: 3,600 daN

Calculation for 4 tension belts, 2 in each direction

Coefficient of friction µ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	675	1.650	680	970
Wood on wood Metal on wood	0.2	1.100	2.000	1.500	1.400
Anti-slip mat	0.5	7.500	4.800	5.900	4.700
Anti-slip mat	0.6	11.600	7.500	9.800	8.000

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 7b: Net 300-50-1000: Maximum loading weight

LC lashing point: 1,000 daN,
LC net, total: 5,600 daN

Calculation for 8 tension belts, 4 in each direction

Coefficient of friction µ		Max. loading weight [kg] per net where			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	1,300	3,300	1,300	1,900
Wood on wood Metal on wood	0.2	2,200	4,100	3,000	2,800
Anti-slip mat	0.5	15,000	9,600	11,800	9,400
Anti-slip mat	0.6	23,000	15,100	19,600	16,000

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 8a: Net 300-50-2000: Maximum loading weight

LC lashing point:	**2,000 daN,** (load in lashing strap however max. 1,400 daN)				
LC net, total:	**3,600 daN**				
Calculation for 4 tension belts, 2 in each direction					
Coefficient of friction µ		**Max. loading weight [kg] per net where**			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	945	2.300	960	1.350
Wood on wood Metal on wood	0.2	1.580	2.850	2.100	2.000
Anti-slip mat	0.5	10.518	6.500	8.300	6.500
Anti-slip mat	0.6	16.000	10.500	13.500	11.000

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

Table 8b: Net 300-50-2000: Maximum loading weight

LC lashing point:	**2,000 daN,** (load in lashing strap however max. 1,400 daN)				
LC net, total:	**5,600 daN**				
Calculation for 8 tension belts, 4 in each direction					
Coefficient of friction µ		**Max. loading weight [kg] per net where**			
		α=20°, β=6°	α=20°, β=55°	α=65°, β=6°	α=65°, β=55°
Metal on metal	0.1	1,800	4,600	1,900	2,700
Wood on wood Metal on wood	0.2	3,100	5,700	4,200	4,000
Anti-slip mat	0.5	21,000	13,000	16,000	13,000
Anti-slip mat	0.6	32,000	21,000	27,000	22,000

Comments:
Lengthwise acceleration coefficient: 0.8; Crosswise acceleration coefficient: 0.5
The permissible angular range of the lashing points on the vehicle, particularly in the case of α = 20 ° is to check.

5 Standards, regulations

The Huck load restraint webbing net has been inspected and certified in compliance with DIN EN 12195-2 and VDI 2700 ff

DIN EN 12195:	Load restraint assemblies on road vehicles – Safety
VDI 2700 ff:	Securing of loads on road vehicles
DIN EN 12640 and	
DIN EN 75410:	Load bearing capacity of lashing points
BGV D29:	Accident prevention regulations for vehicles

6 Symbols and markings

Load securing in compliance with DIN EN 12195-1 and VDI 2700 (net, lashing straps)

LC $_{net, fixing\ point}$: Permissible maximum load of the vehicle's lashing point

LC $_{net, total}$: Net's permissible maximum load when tension belts are used in accordance with regulations

The net's permissible maximum load does not correspond to the maximum loading weight.

Production and sales

Manfred Huck GmbH, Asslarer Weg 13-15, D-35614 Asslar-Berghausen

Notified body involved in the prototype test

Inspection and certification centre at DGUV Test, Ottenser Hauptstr. 22765 Hamburg

7 Accessories

- Anti-slip mats
- Tension belts