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Information about REMA cargo lashing

REMA cargo lashing are manufactured according to the European standard EN 12195-2. This standard specifies the LC (Lashing Capacity) in daN.

The primary requirements in the EN 12195-2 standard are:

- The hardware, i.e. the ratchet and hooks, must have a safety factor of at least to have 2x the LC value.
- The strap, unmodified, must have a safety factor of at least 3x the LC value.
- The entire lashing system must have a failure rating of at least twice the LC value.

Explanation of REMA lashing strap label

According to the EN 12195-2 standard, tension straps must be provided with a label with instructions shown on it. This label must be attached to both the ratchet part (the strap fabric that is attached to the ratchet) and the tension part of the tension strap. For polyester tension straps, the label must be blue.

The blue label that is attached to the tension strap contains certain fixed pieces of information:

1. LC1 = Lashing capacity (for tension in straight line)
2. LC2 = Lashing capacity (by strapping)
3. SHF = Standard Hand Force
4. STF = Standard Tension Force
5. Material type of the strap (as a rule PES, polyester)
6. Stretch percentage of the strap material (max. 7% permissible)
7. Length (of the ratchet part or the tension part; the example illustrates the ratchet part)
8. S/N = serial number (of the relevant lashing strap)
9. Warning: "not for lifting"
10. Name or logo of the manufacturer
11. EN 12195-2: all REMA cargo lashing are produced to the European Standard EN 12195-2
12. Production month/year

Option 1: Diagonal lashing

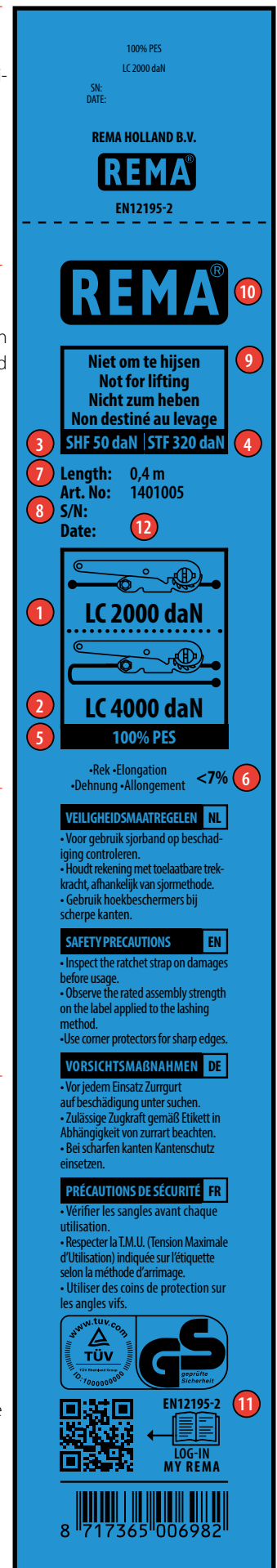
The LC value is important.

- The LC value is only important for diagonal lashing.
- With this securing method, at least four lashing systems must be used (Fig. 2).
- The LC value in combination with the vertical lashing angle and the horizontal angle β are important.
- The vertical lashing angle α between the load floor and the lashing system must be between 20° and 65° (Fig. 1).
- The horizontal lashing angle β between the long axis of the load and the lashing system must be between 6° and 55° (Fig. 2).

Option 2: Lashing down

The Stf value is crucial.

- The most common method of fixing down loads is lashing down; by this means, the load is 'pressed firmly' on to the load floor (Fig. 3).
- Important with this method of lashing down is the amount of force used for this, in other words how much tension can be build up in the lashing system.
- The LC (Lashing Capacity) plays no role in this, but the tensioning of the system is important; this is indicated on the blue REMA label of the lashing system by Stf in daN (Standard tension force).
- This Stf value is measured with an Shf (Standard hand force) of 50 daN.
- The Stf value must be between 10% and 50% of the LC value of the lashing system (it is mainly determined by the quality and type of the ratchet).
- When lashing down, at least two lashing systems must be used, and the angle α should be kept as large as possible (Fig. 3). Angle α must be between 35° and 90°.

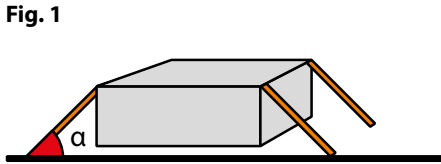


Load securing and coefficient of friction

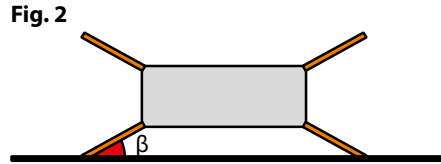
The way in which the load is secured - diagonal lashing or lashing down - determines whether the **LC (lashing capacity)** or the **Stf (standard tension force)** is important.

The coefficient of friction - between the load and load floor - and the angles α and β determine to a large extent the number of lashing systems to be used (this is explained in detail in EN 12195-1).

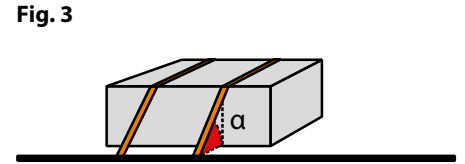
Vertical lashing angle α



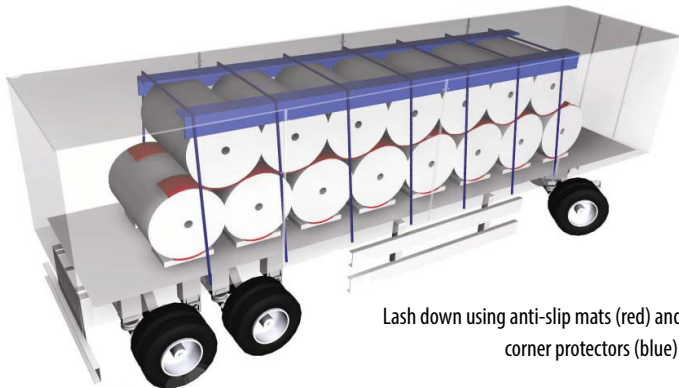
Horizontal lashing angle β



Vertical lashing angle α



Increase the coefficient of friction with REMA anti-slip mats



Anti-slip mats (also called friction mats) are essential for proper load security. Anti-slip mats serve to increase the friction between the load unit and load carrier such that the load cannot shift any more. Proper use of an anti-slip mat and thus increasing the frictional resistance leads directly to the use of **less cargo lashing**.

REMA anti-slip mats
 - tested according to German VDI 2700 standard
 - coefficient of friction $\mu > 0.6$

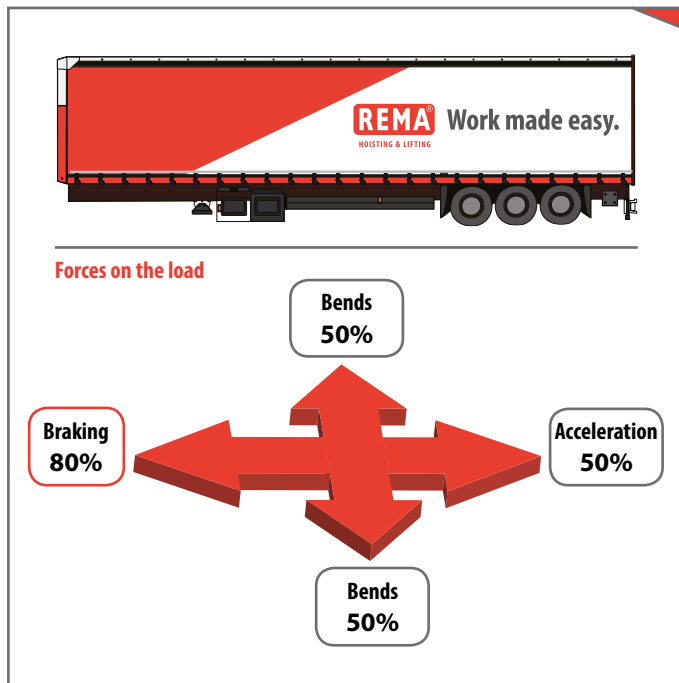


Indicative calculation for lashing down with REMA cargo lashing

A truck carries a load of 6000 kg. The centre of gravity is in the centre of the load. The load is lashed down with a lashing angle α of between 83 and 90 degrees (Fig. 3). By coefficient of friction is meant the friction between the load and the load floor.

The greatest forces arise during braking. During braking, 80% of the load wants to go forwards, while 50% of the load wants to break out to the right, left or backwards.

Coefficients of friction:
 metal to metal: $\mu = 0.2$
 metal to wood: $\mu = 0.4$
 rubber anti-slip mat: $\mu = 0.6$



Example 1: metal to metal

80% of 6000 kg	4800
0.2 (coefficient of friction) x 6000 kg	1200
Total force to take up	3600 daN

Divide 3600 daN by the tension force (Stf) of the lashing strap to give the number of cargo lashing. $3600 \div 320 = 11.25$ so **12** cargo lashing.

Example 2: with anti-slip mat

80% of 6000 kg	4800
0.6 (coefficient of friction) x 6000 kg	3600
Total force to take up	1200 daN

Divide 1200 daN by the tension force (Stf) of the lashing strap to give the number of cargo lashing. $1200 \div 320 = 3.75$ so **4** cargo lashing.

Correct and safe lashing of the load

The competent securing of a load must be learnt; it is more than simply putting a tension strap round the load. Standard securing is not a skill, because it is usually inadequate to be considered proper load fixation.

Simply to throw a tension strap around the load and tension it up is a very dangerous way to secure the load. We can teach you how to make this easier, safer and faster!

✓ CHECKLIST for correct and safe lashing of the load

Those responsible for the transport of loads on the public road are the owner of the truck or trailer, the loader/dispatcher and the driver.

- Has the driver been educated/trained for his work/job and does he possess the correct papers and documents?
- Is the truck or trailer suitable for the load and the public road? (owner)
- Is the load surface free of dirt, grease, oil, sand, ice, snow etc.?
- Has the order, distribution and way of loading been planned in the correct way by the responsible person? (dispatcher)
 - When using arrester equipment, pay attention to the maximum force this can take up (wooden beams, blocks, wedges etc.).
 - Determining centre of gravity of the load.
 - Avoid empty spaces in among the load.
 - Pay attention to the stability of the load.
 - Lash the load fast according to the EN standard.
- The weight of the load is below the maximum load weight of the truck and the loading requirements as defined by the truck or trailer manufacturer.
- Is the lashing gear attached to lashing points/eyes suitable for the purpose?
- Does the lashing gear including label meet the EN requirements? (LC capacity, producer, serial number etc.)
- Has the lashing gear been inspected annually by a person authorised to do so?
- Is the lashing gear protected against friction, wear and cutting by means of corner protectors?
- Are there extra resources available to secure the load, e.g. beams for filling in spaces?
- Is the lashing and/or lifting gear undamaged?
- Are there anti-slip mats present?
- Is the load secured such that acceleration, braking and sideways forces can be taken up?
- Is any load that extends outside the truck marked according to the rules?
- Has the driver assured himself that the load is secured according to the requirements, after every stop?
- Only use lashing equipment that meets EN standards.

✓ CHECKLIST according to European Standard EN 12195-2

- The inspected lashing strap must be put out of use if any of the points **(1 to 18)** cannot be ticked off.
- The lashing strap put out of service must be returned to the manufacturer for possible service/repair.
- If the lashing strap is not offered for service/repair, it must be destroyed such that it cannot be used any more.
- The lashing strap must be inspected at least once a year by a person authorised to do so.

Label

1. Does the lashing strap and/or the loose section have a label?

2. Is the label legible and does it show:

- | | |
|--|-----------------------------------|
| - LC lashing capacity | - Length in meters. |
| - SHF 50 daN | - STF (only for the ratchet part) |
| - Text; only for lashing not for lifting | - Material of the lashing strap |
| - Name of manufacturer | - Serial number/section code |
| - The standard (EN-12195-2) | - Production year |
| - Elongation in % (at LC) | |

3. Does the label have the following colour?

- Blue (PES, polyester)

Label



Strap

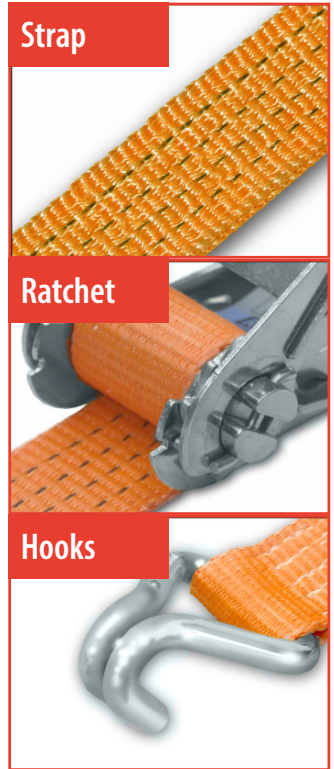
- 4. Is all the stitching free of damage?
- 5. Is it still within the maximum service life of 6 years? (REMA recommendation)
- 6. Free of damage to the strap caused by heat or friction?
- 7. Free of cuts, breaks to strands and/or protruding threads?
- 8. Free of damage caused by exposure to chemicals?
- 9. Free of signs of unauthorised repair?

Ratchet

- 10. Does the ratchet have an LC value?
- 11. There is no distortion visible on the tension element.
- 12. The lever can move freely and the locking plate is free of wear.
- 13. The tension element does not show any corrosion and/or splits and cracks.

Hooks

- 14. Do the hooks have an LC value?
- 15. The hooks do not display any corrosion and/or splits and cracks.
- 16. The deformation is not greater than 5%.
- 17. The hook displays no signs of torsion or deformation caused by overloading and/or incorrect use.
- 18. For hooks with a safety catch, the catch must operate properly and be undamaged.



Features of REMA cargo lashing

- According to EN 12195-2.
- Robust, corrosion-resistant ratchet.
- Long lever for better force transfer.
- Minimal stretch in the strap reduces the chance of having to re-tension.
- User designation, apart from IG systems.



Important

- Never use cargo lashing for lifting.
- Attach cargo lashing so that the strap is not twisted.
- Never load the hooks on the point.
- The ratchet may not be tensioned at an angle to the load.
- With loads with sharp edges and/or rough surfaces, always use protective gear.
- Never use polyester cargo lashing in an alkaline environment.
- Permitted working temperature is -40°C to +100°C.

REMA Lashing strap hooks

- 1. Claw hook
- 2. Triangle-carabiner hook
- 3. Grab hook
- 4. Twisted snap hook
- 5. Triangle



Cargo lashing 50 force Stf 400 daN / LC 5000 daN



Lashing strap 50 mm wide with extended ratchet giving a higher prestressing force.

Properties

- Robust, corrosion-resistant ratchet.
- Handle length 265 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
50F/2-VR	400	2500	5000	-	50	9	grab hook 419	1450015

Cargo lashing 50 Stf 320 daN / LC 4000 daN



Properties

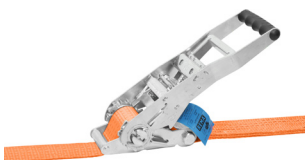
- Robust, corrosion-resistant ratchet.
- Handle Length 230 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
50/2-411-9m	320	2000	4000	-	50	9	twisted snap hook 411	1401005
50/2-420-9m	320	2000	4000	-	50	9	triangle 420	1402005
50/2-409-9m	320	2000	4000	-	50	9	triangle-carbiner hook 409	1403005
50/2-419-7m	320	2000	4000	-	50	7	grab hook 419	1405003
50/2-419-8m	320	2000	4000	-	50	8	grab hook 419	1405004
50/2-419-9m	320	2000	4000	-	50	9	grab hook 419	1405005
50/2-419-10m	320	2000	4000	-	50	10	grab hook 419	1405007
50/2-419-12m	320	2000	4000	-	50	12	grab hook 419	1405009
50/2-400U-9m	320	2000	4000	-	50	9	claw hook 400U	1407005
50/1-6m	320	-	-	4000	50	6	endless	1408001

Cargo lashing 50 EBC Ergo Belt Stf 450 daN / LC 5000 daN



The EBC ratchet is a very safe ratchet because the load of the lashing belt can be obtained step by step and controlled when unloading loads, so that dangerous situations can be prevented (with standard ratchets the tension is released at once). The EBC ratchet is tensioned by a pulling movement, resulting in a larger force span and a higher Stf value of 450 daN.

Properties

- Robust, corrosion-resistant ratchet.
- Handle length 300 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
50EBC/2-419-9m	450	2500	5000	-	50	9	grab hook 419	1409003

Cargo lashing 50 Ergo Stf 500 daN / LC 5000 daN



The ERGO ratchet with long handle is tensioned by a pulling movement, resulting in a larger power transmission (standard systems are equipped with a push ratchet). Due to the high prestressing force Stf of 500 daN, much less strapping is required.

Properties

- Robust, corrosion-resistant ratchet.
- Handle length 325 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
50R/2-419-9m	500	2500	5000	-	50	9	grab hook 419	1450001

Cargo lashing 35 Stf 180 daN / LC 2000 daN



Properties

- Robust, corrosion-resistant ratchet.
- Lever length 134 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
35/2-419-9m	180	1000	2000	-	35	9	grab hook 419	1452001
35/2-410-9m	180	1000	2000	-	35	9	carabiner hook 410	1452003
35/1-6m	180	-	-	2000	35	6	endless	1452005
35/2-419-7m	180	1000	2000	-	35	7	grab hook 419	1452007
35/2-419-6m	180	1000	2000	-	35	6	grab hook 419	1452009
35/1-12M	180	-	-	2000	35	12	endless	1452011

Cargo lashing 25B Stf 135 daN / LC 1500 daN



Properties

- Robust, corrosion-resistant ratchet.
- Lever length 131 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
25B/2-402-7m	135	750	1500	-	25	7	narrow wire hook 402	1416001
25B/2-402-5m	135	750	1500	-	25	5	narrow wire hook 402	1416003
25B/2-402-3m	135	750	1500	-	25	3	narrow wire hook 402	1416005
25B/1-6m	135	-	-	1500	25	6	endless	1416007

Cargo lashing 25A Stf 120 daN / LC 800 daN



Properties

- Robust, corrosion-resistant ratchet.
- Lever length 112 mm.
- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Stf values (daN)	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
25A/2-402-7M	120	400	800	-	25	7	narrow wire hook 402	1416011
25A/2-402-5M	120	400	800	-	25	5	narrow wire hook 402	1416013
25A/2-402-3M	120	400	800	-	25	3	narrow wire hook 402	1416015
25A/1-6M	120	-	-	800	25	6	endless	1416017
25A/1-3M	120	-	-	800	25	3	endless	1416019
25A/1-4M	120	-	-	800	25	4	endless	1416021

Cargo lashing IG LC 250 daN / SBIG LC 400 daN



Properties

- Minimal elongation in the belt reduces the chance of re-tensioning.

Norm:

- EN12195-2

Type	Lashing capacity LC (daN)	Lashing capacity LC reeved (daN)	Lashing capacity LC endless in (daN)	Webbing width (mm)	Length (m)	End fittings	ProductId
IG-001-2.5M	-	-	250	25	2.5	endless	1432001
IG-002-3.5M	-	-	250	25	3.5	endless	1432002
IG-003-4.5M	-	-	250	25	4.5	endless	1432003
SBIG-103	-	-	400	25	3	endless	1433001
SBIG-105	-	-	400	25	5	endless	1433002
SBIG-107	-	-	400	25	7	endless	1433003

Heavy duty edge protectors



H3

Specially developed for protection of both the belt and the object to be fixed.

Properties

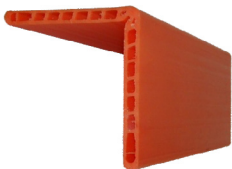
- Suitable for straps of 50 and 75 mm width.
- Cast from one piece.
- Good practice for lashing.
- Protection of the product by spreading to load (pressure point reduction).
- Does not tear / retains its shape, even at lower temperature.
- Form-retaining and reusable.
- Made of high quality plastic.



H1

Type	Dimensions (mm)	Webbing width (mm)	ProductId
H3	100 x 100	50	1460083
H1	150 x 190	50	1460085

Heavy duty edge protectors - model 2



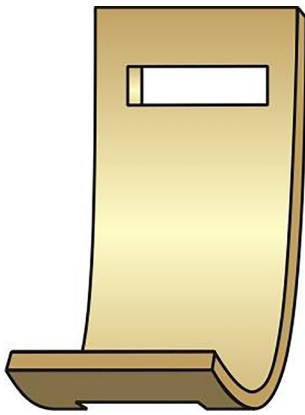
Heavy duty corner protectors are suitable for use with cargo lashing and / or lashing chains.

Properties

- Protection of both the product and the tire.
- Pressure distribution over the product.
- Keeping loads together.

Type	Dimensions (mm)	Length (mm)	ProductId
H2-0.3	190 x 190 x 20	300	1460091
H2-0.8	190 x 190 x 20	800	1460093
H2-1.0	190 x 190 x 20	1000	1460095
H2-1.2	190 x 190 x 20	1200	1460097

Rema DF polyurethane protective sheet



REMA protective equipment for safe and trouble-free lifting.

Protective devices for webbing slings, round slings and cargo lashing are especially important when hoisting products with rough surfaces and sharp edges.

Rema DF polyurethane protection plate.

Suitable for Rema slings types S1.



Type	For cargo lashings	Inside dimensions A x B (mm)	Outside dimensions L x H (mm)	ProductId
DF-25	25	25x10	250x80	1105025
DF-35	30	35x10	250x80	1105035
DF-55	50	55x10	300x100	1105055
DF-80	75	80x30	450x120	1105080

Anti-slip mats



Forces which are required to hold cargo's in place are determined by the coefficient of friction between the different surface materials and, in some cases, dependable on temperature and humidity. Anti-slip mats, used in conjunction with REMA lashings, reduces the lashing load required and adds to cargo safety.

Properties

- Tested according to German VDI 2700 standard.
- Available in different thicknesses and dimensions.
- Friction coefficient > 0.6.

AS-0.25 / 0.5

- Application: Between load floor and load or between the loads.

AS-2.4

- Price-conscious anti-slip mat.
- Application: In the width of the loading floor of trucks.

AS-5

- The popular anti-slip mat.
- Application: Between load and loading floor.

AS-13.6 Thin non-slip mat (3 mm),

- Advantage: Cut to size yourself.
- Application: Between loads.

Type	Length (mm)	Dimensions (mm)	ProductId
AS-0.25	250	250 x 8	1460101
AS-0.50	500	500 x 8	1460103
AS-5.0	5000	250 x 8	1460105
AS-2.4	2400	200 x 8	1460107
AS-13.6	13600	130 x 3	1460108