Loading Guidelines

Truck loading

cargo safetytec Ladungssicherung

SLC stahl logistik center

Content

Legal notice

The load securing regulations are based on the following sets of rules:

1. **StVO** (Road Traffic Act)
2. **KFG** (Motor Vehicle Act)
3. **KDV** (Motor Vehicle Implementing Regulation)
4. **CMR** (International Agreement on Contracts for the Carriage of Goods by Road)
5. **VbVG** (Association Responsibility Act)
6. **Criminal Code**
7. **Standards**:

EN 12195 ff / EN 12640 / EN 12642 / VDI 2700 ff

and

applicable reference literature

as a general rule, in the version valid at the time of authoring.

Deviating provisions in the Loading Guidelines are based on tests carried out in the company.

Important NOTICE:

For combined transport, the driver is instructed to adjust the load securing devices appropriately before the vehicle is embarked on the rail vehicle!

➔ **Additional load securing devices: 100% to front and rear**

*Combined transport:
The loaded vehicle (semitrailer, entire truck or container) is loaded along with its cargo onto a rail car and covers a large part of the distance by rail.

Legal notice

Possible legal consequences:

Laws	StVO	KFG	VbVG	StGB	AschG	DHG	Transport insurance (CMR)	Dangerous goods / ADR	KHVG	AKKB	FSG
Max. penalty***	€ 726,00	€ 10 000,00	€ 1 800 000,00	Prison sentence up to 5 years	ER € 8,324.00 EE € 250.00 *	Damage amount **	Damage amount	€ 50,000.00 Driver € 6,000.00	Damage amount	Damage amount	Suspension of driving l.
Police vehicle check											
Driver	X	X						X			X
Loader - Person authorised to issue instructions		X						X			
Registration owner		X						X			
Transport damage											
Driver						X					
Transport company							X				
Freight forwarding company							X				
Packer						X					
Loader						X					
Sender - company							X				
Accident due to inadequate load securing (damage to property)											
Driver	X	X				X		X			X
Loader		X				X	X	X			
Person authorised to issue instructions		X					X	X	X		
Packer							X	X	X		
Registration owner		X					X	X	X	X	
Head of shipping/logistics						X	X		X		
Freight forwarding company							X				
Sender - company							X	X	X		
Accident with criminal consequences (injury to persons or environmental damage)											
Driver	X	X		X	X						X
Registration owner		X		X							
Transport company			X		X						
Freight forwarding company			X		X						
Dispatcher				X							
Loader		X		X	X						
Packer				X	X						
Sender - company			X		X						
Head of shipping/logistics				X							
Other entities involved in transport Action or failure to act caused accident				X							

* In case of repetition up to ER € 16,659.00 / EE € 413.00

** In case of minor and gross negligence: judicial right of moderation; / no liability in case of excusable error.

*** Not listed: Substitute prison sentences

Loading procedure – Checklist

	Procedure	WER? WHO?	
		Loader	Fahrer
	Check before loading		
1	Truck meets the requirement profile ➔ otherwise, do not load	X	
2	Check truck for obvious damage	X	X
3	Load securing devices	X	X
4	Certificates where applicable	X	X
	Preparation / loading		
5	Sweep load area clean		X
6	Load	X	
7	Secure the load after loading		X
8	Finish securing the load		X
	Dispatching / Documentation		
9	Load securing random check	**3rd person**	
10	Document load securing – photographs	**3rd person**	
11	Have correct handover of load signed off	X	X
12	Hand over freight documents	X	

For your personal safety!

Adhere to the following rules!

THE FOLLOWING ALWAYS APPLIES!

Requirements for Trucks

The following MINIMUM EQUIPMENT is required for loading trucks. It can differ depending on the load type and must be accurately defined by the scheduler.

In the case of loads with several unloading points, consult SLC for details of load securing

1. Truck registration – registering a loading time slot

a) Registration for loading must be effected **using the SLC delivery note number by 12:00 noon of the previous working day**.

b) The link for registration is: **slcd.slc-wien.at**

c) Registration data is provided by the customer

2. Vehicle / body type / load area / stanchions where applicable

a) Must be **SWEPT CLEAN** by the driver **prior to loading**

b) Stanchion length (if present) height **min. 1 m from floor**

c) All equipment and securing gear (stanchions without load, square timbers, pallets and similar) must be secured after loading (e.g., lashed down or chocked using appropriate means) to prevent sliding around during travel.

3. The following securing equipment must be on board

a) Lashing straps as per EN 12195-2

LC ≥ 2000daN / STF ≥ 500 daN **25 items.**

Special or partial loads can require a higher number or special type of lashing equipment. This is indicated separately in the relevant order.

a) Anti-slip mats μ_{min} = 0.6 / minimum thickness **6 mm**

- Size: **100 x 500 mm** **40 items.**
- Other materials with manufacturer certification for wood screen printing

b) Protective material for lashing equipment and goods

Edge protectors **60 items.**

c) Euro pallets **6 items.**

4. Rejection of trucks

SLC reserves the right,

a) not to load trucks which do not have sufficient load securing devices on board, or

b) to randomly check the load securing of trucks and to refuse to hand over the freight documents to trucks that do not comply with the load securing requirements or to unload these trucks, and charge for doing so, following consultation with the dispatcher.

Requirements for the driver

The driver MUST

1. Use the following **PPE** (personal protective equipment) **at the SLC site**
   a) Safety shoes
   b) Gloves
   c) Protective cap (safety helmet)
   d) High visibility vest

2. Observe the loading procedure
   a) Registration for loading
      Use the registration PC in the factory building near the truck check-in point. If the registration program is not available, use the registration form, which is available in several languages.
   b) Prepare for loading
      The driver's side wall of the semitrailer and the roof must be opened for the loading procedure. Loading is handled by overhead cranes; except for quarto plates (→ loaded by forklift trucks).
   c) Free side walls
      The side walls of the semitrailer must be free of straps, edge protectors, etc!
      It must be ensured that the package lifting grabs can be extended without obstruction.

3. Complete load securing work after loading in line with the SLC Loading Guidelines in the space assigned to them.

4. Comply with the customer's safety requirements!

5. Know and be able to apply the principles of load securing according to EN 12195ff or VDI 2700.

6. Check the load securing devices and readjust / retighten if needed:
   - at regular intervals and
   - always after abrupt braking and steering manoeuvres

Vehicle rejection report

(This report only needs to be completed if the vehicle is rejected)

NO

YES

	Third-party cargo	
O	Third-party cargo – obvious securing deficiencies	NOT detectable / condition OK
	Vehicle	
O	EN12642 Code XL: Certificate	present / condition OK
O	Vehicle's load area	swept clean / condition OK
O	Lashing points, sufficient	present / condition OK
O	Stanchions	present / condition, height OK
	Securing equipment	
O	Anti-slip mats (ASMs)	sufficient / condition OK
O	Lashing equipment as per EN 12195-2	sufficient / condition OK
O	Protective material lashings/material	sufficient / condition OK
O	Pallets	sufficient / condition OK

DO NOT LOAD TRUCK!!

(PHOTOGRAPHIC DOCUMENTATION!)

You can load!

According to the loading guidelines for the goods to be loaded

! LOADING IS REJECTED in line with QM requirements!

O Vehicle is rejected due to defects identified above

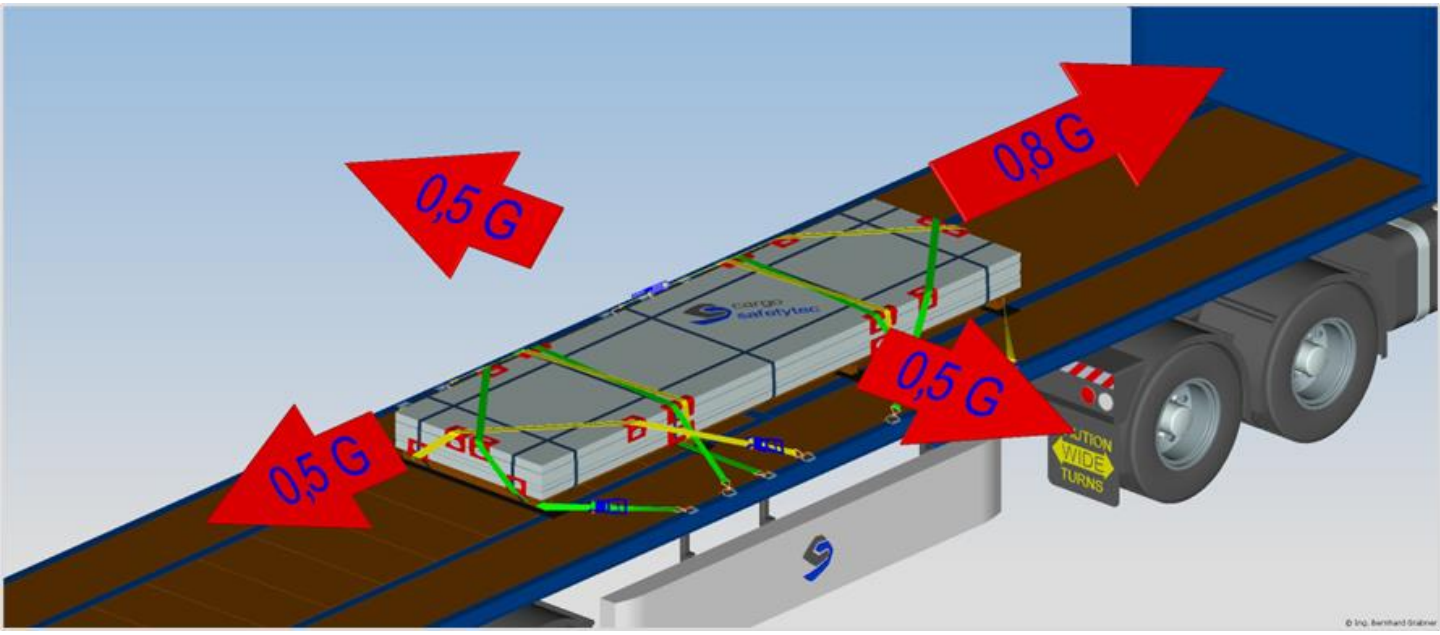
O Obvious technical defect of truck was detected: …….. – Photos taken

O Driver rejected due to negative personal appearance appearance: ……..…….…. witness: ……..

Delivery note no.	Freight carrier/License plate	Customer
Loader	Date	Driver / witness

Occurring forces according to EN 12195

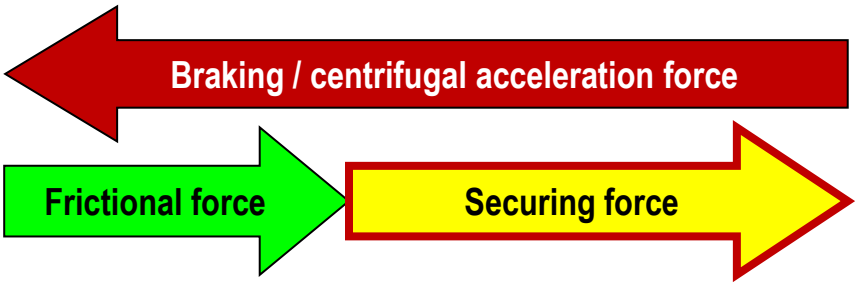
The following acceleration forces can
occur during normal driving operation as per EN 12195-1



In direction of driving
0.8 G = 80% of load weight

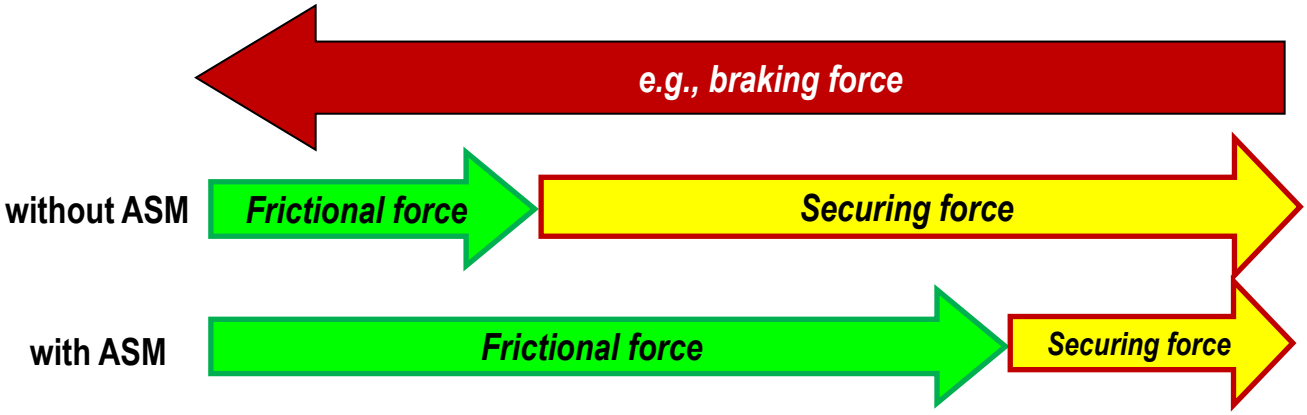
Transverse to the direction of driving and **to the rear**
0.5 G = 50% of load weight

The principle of load securing:
The sum total of the securing forces must be at least equivalent to the acceleration forces in the respective direction, minus the friction force.



Friction – principles

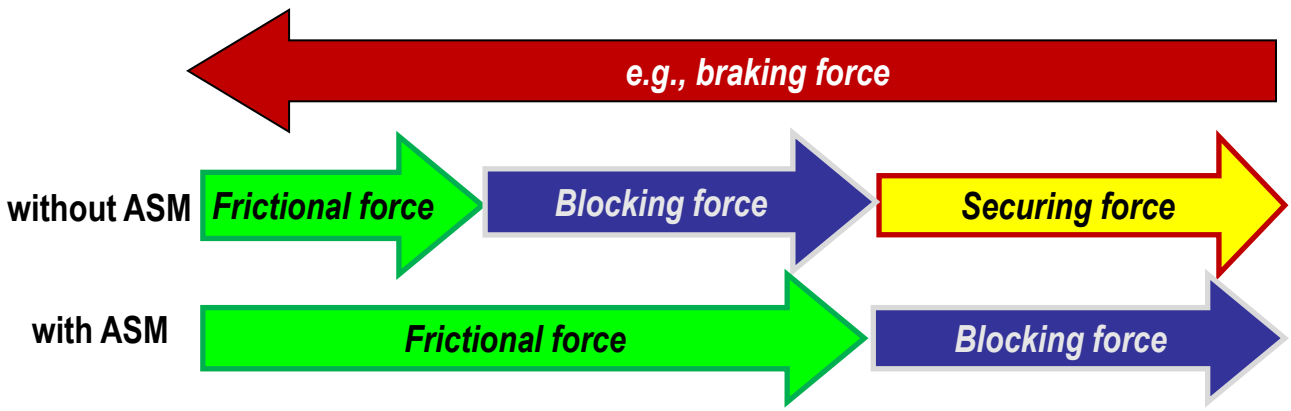
Effect of friction on the required securing overhead free standing



Tip:

**The higher the friction,
the lower the securing overhead!**

Effect of friction on the required securing overhead in combination with positive locking



Tip:

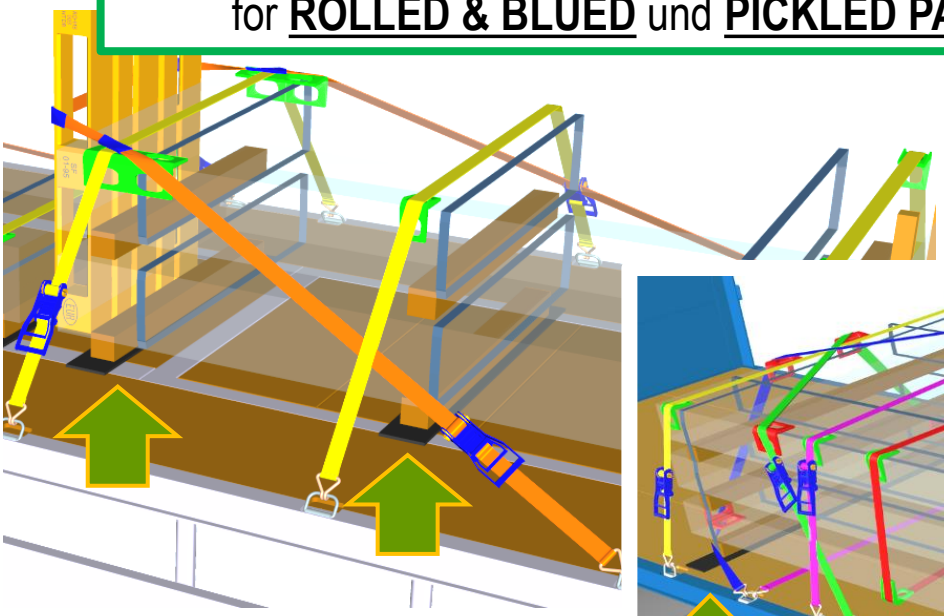
High friction in combination with positive locking can save the need for additional required load securing measures!

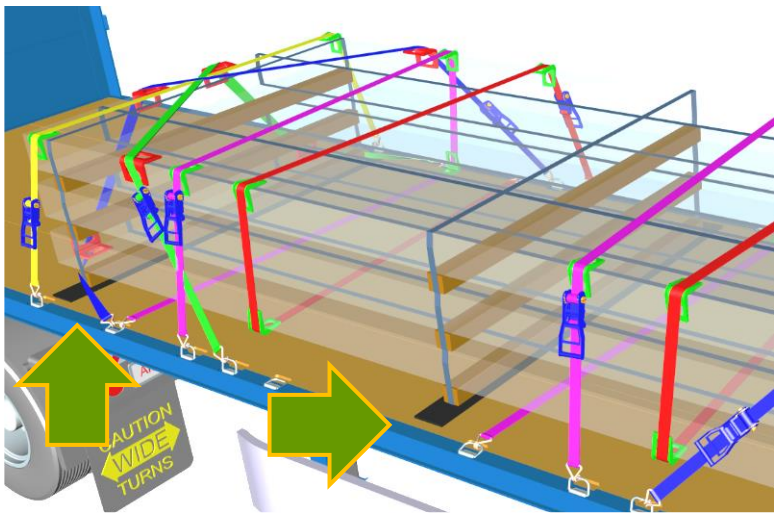
Friction – principles

<u>The vehicle's load area MUST be swept clean</u>
→ Dirt prevents friction (acc. to the standard max. 0.2)

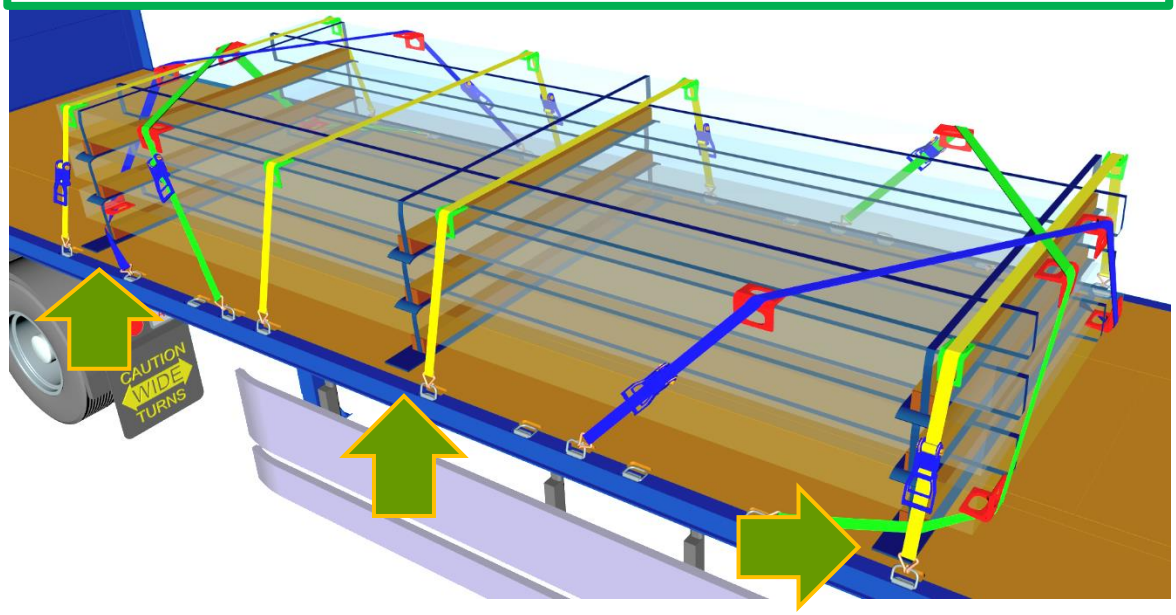
Laying pattern for anti-slip mats (ASMs)

Variant 1: Only **<u>between load area and 1st supporting timber</u>** for **<u>ROLLED & BLUED</u>** und **<u>PICKLED PACKAGED</u>**





Variant 2: **<u>In any position</u>** for **<u>PICKLED PACKAGED</u>**



Lashing straps

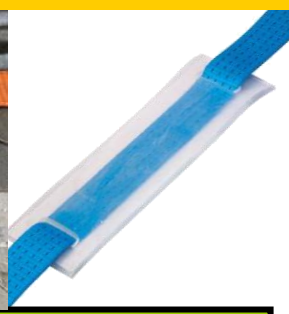
!! DAMAGED LASHINGS MUST !!
!! NOT BE USED !!

LACK OF SAFETY → PENALTIES → RISK OF ACCIDENT



✓ **Sharp edges! Rough SURFACES → Protect lashing equipment!!**
✓ **Always place protective material (e.g., felt) under lashing equipment**



With MARKING only!

Legible at least.

LC – value

STF – value

Lashing straps

Lashing straps

- discontinue use in case of:

- Missing or illegible marking
- Incisions > 10% strap cross section; also multiple incisions all told
- Damaged seams
- Thermal deformation
- Obvious damage
- Holes in the belt strap
- Fluffy strap
- Ratchet bent, broken or corroded
- Pronounced corrosion on the ratchet or end fittings

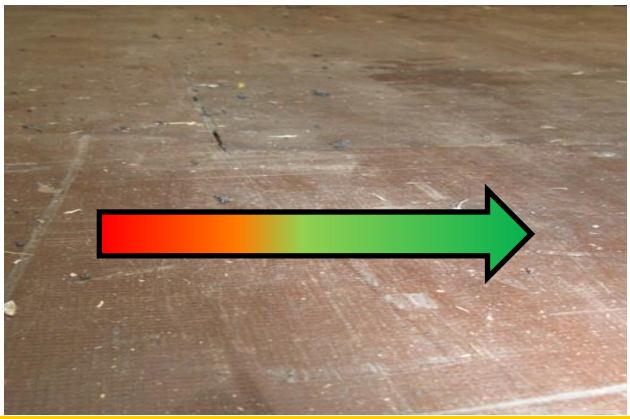
- MUST NOT:

- be knotted
- twisted excessively
- used with extensions
- be routed over sharp edges
- be routed over rough surfaces

- INFO:

- There is no EXPIRY DATE
- TARGET: 1x annual check by an EXPERT
- Missing marking is not a problem if LS are OK
  and there are several of SAME type on board the vehicle

Vehicle



Load area SWEPT CLEAN!!
Oil- and grease-free!!

Examples = STOP!

NO LOADING in case of:

- ✓ **obvious defects**
- ✓ **safety-relevant defects**

Obvious = Defects detectable without special inspection of the vehicle and technical expertise!

Vehicle

Pallets

1. 

$$\frac{3 \times 3\ m}{2 \times 4\ m} = I$$

2. 

$$= \frac{4 \times 2{,}5\ m}{}$$

3. 

$$= \frac{2 \times 6\ m}{}$$

Loading with crane

GENERAL RULES:

1. The crane operator must check the function of the brakes, the operating or emergency limit switches and the warning devices daily on starting up the crane for the first time.
2. Use the following PPE (personal protective equipment)
   a. Safety shoes
   b. Long clothes
   c. Helmet
   d. Gloves
3. NEVER access the area under the suspended load
4. If you do need to access the area under the suspended load:
   a. Lift the load only as far as absolutely essential
   b. LINE OF SIGHT to the crane operator
5. ESCAPE ROUTES = i.e., NEVER walk between the suspended load and a fixed object
6. Watch your hands when inserting timber underlays!

Loading with crane

LOADER:

1. Must assign a waiting position to the driver
2. Must not remove crane hooks/slinging equipment from the load until they have ensured that the load has been safely deposited.

TRUCK DRIVER:

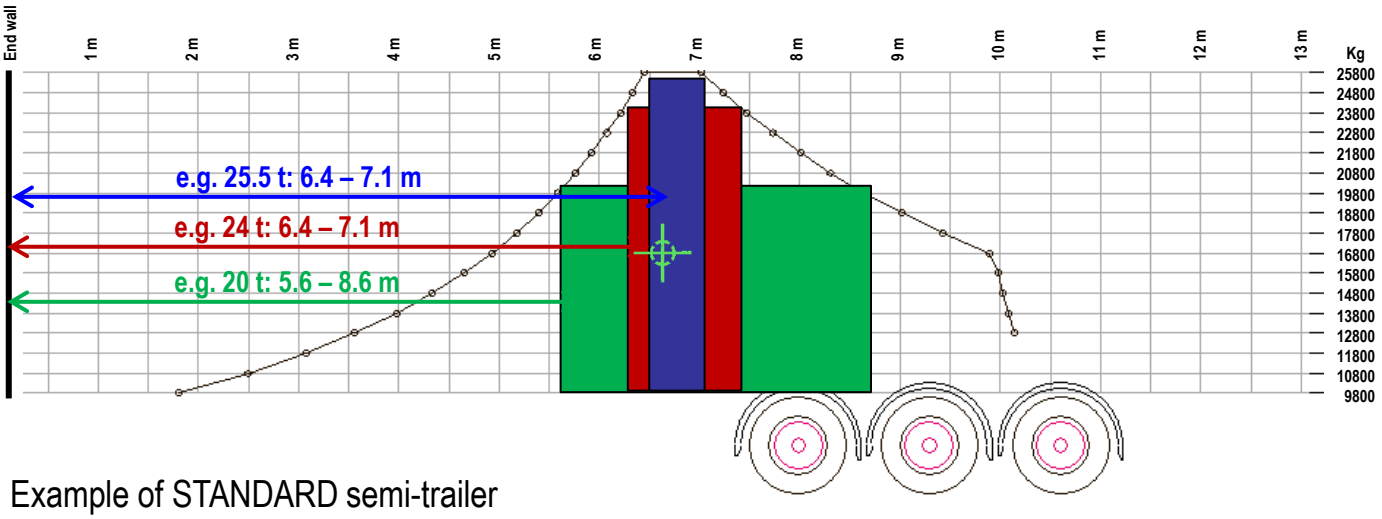
1. Must always follow the instructions of the loading personnel
2. Must use PPE: safety shoes, helmet, gloves, high-visibility jacket
3. Must maintain the position
   a. When lifting in up to immediately in front of the final position:
      Next to vehicle, maintaining an appropriate safety distance,
      In line with instructions
   b. For final positioning of the load
      In line with the loader's instructions to provide support during the loading procedure
4. Must secure the load

Load distribution

The driver must specify the load position!

✓ The **LOADER** must communicate **the centre of gravity of the complete load**

✓ The **DRIVER defines** the **area in** which the **overall centre of gravity of the load** must be



Example of STANDARD semi-trailer

Load t		Position (distance to end wall) of overall centre of gravity
25.5		6.4 – 7.1 m
24.0		6.3 – 7.3 m
20.0		5.6 – 8.6 m

Please note:

Offsetting results from the spare wheel, lift trucks, crane, tank.

The driver should know this plan of their vehicle!

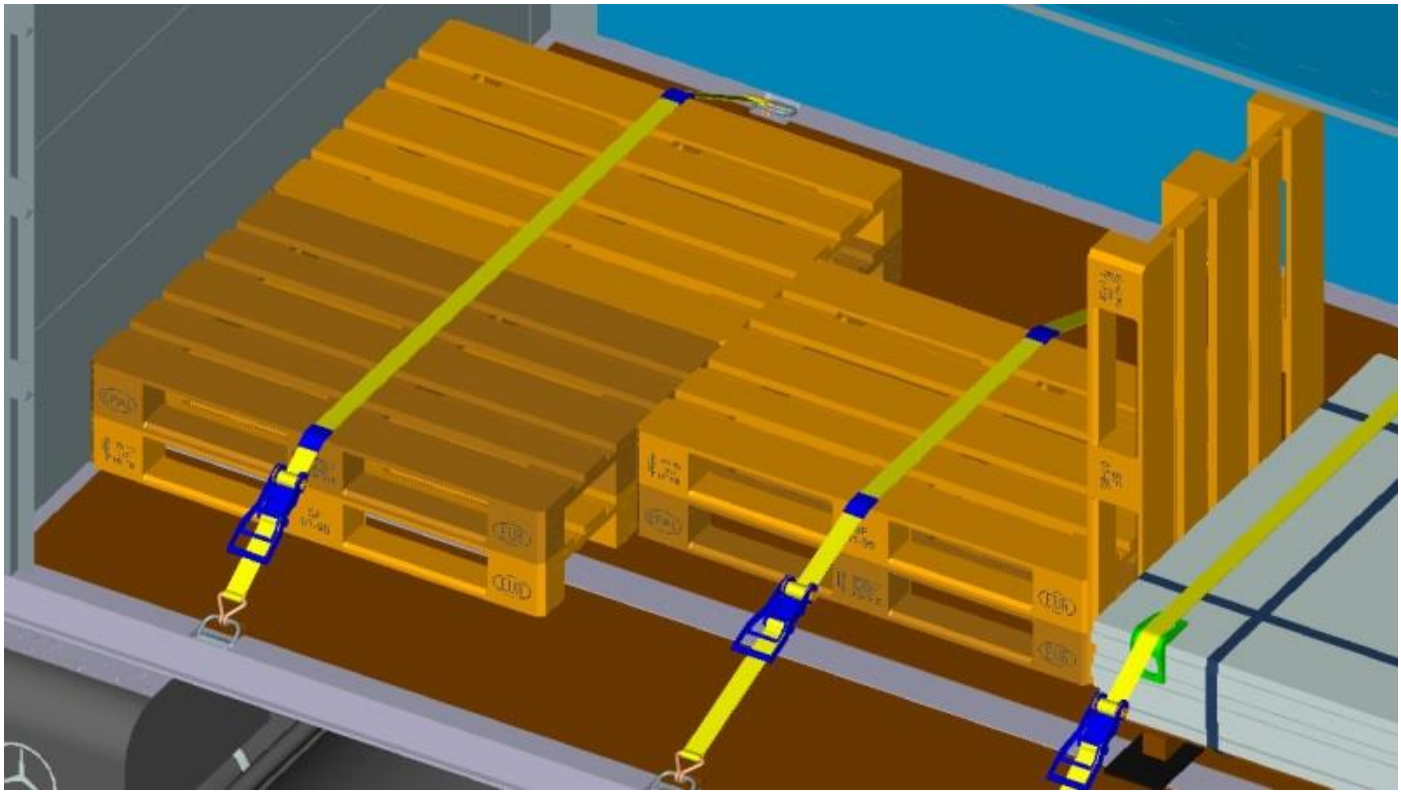
PRINCIPLES
of the Loading Guidelines

These rules apply for all loads!!

- ✓ **Clean the load area** - brush clean
- ✓ The following coefficients of friction were used to calculate the necessary safeguarding measures:
  - Anti-slip mats (ASMs) in place **0.6**
  - Sheet metal rolled & blued / black: **0.42**
  - Sheet metal oiled, pickled **0.16**
- ✓ Packets / pallets are **packed suitably for transport** as load units
- ✓ Lay **square timbers flat**
- ✓ **Anti-slip mats (ASMs)** between load area and square timbers
- ✓ **Only lashing equipment in good condition** as per

  Lashing straps: EN 12195-2
- ✓ Use **protective material** for lashing equipment
- ✓ Check load securing during the journey **and readjust / retighten if needed:**
  - ✓ at **regular intervals** and
  - ✓ Always after **abrupt braking** and **steering manoeuvres**

Support at the end wall

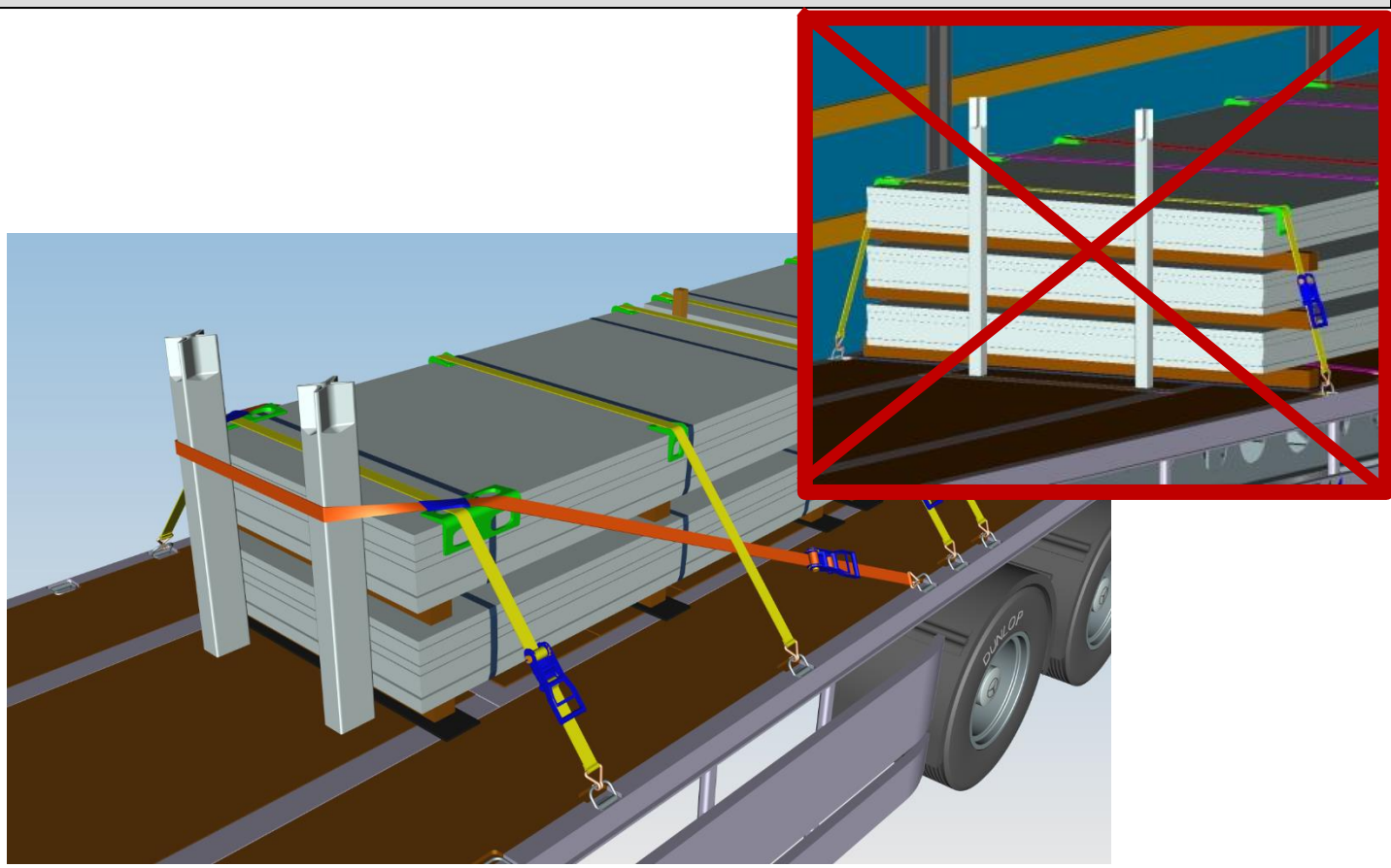


- ✓ Use only pallets in good condition!
  - ✓ of a design and thickness comparable to EURO pallet quality
- ✓ Ensure contact well distributed across end wall!
- ✓ Pallet stack at least as high as sheet stack!
  (otherwise use additional head lashing)
- ✓ Hold down the pallets to prevent them lifting off!

Secured load for bodywork as per EN 12842

			Code L	Code XL
- for	μ = 0.42	(rolled & blued / black)	13.0 t	25 t
- for	μ = 0.16	(oiled, pickled)	7.5 t	20 t

Support at stanchions

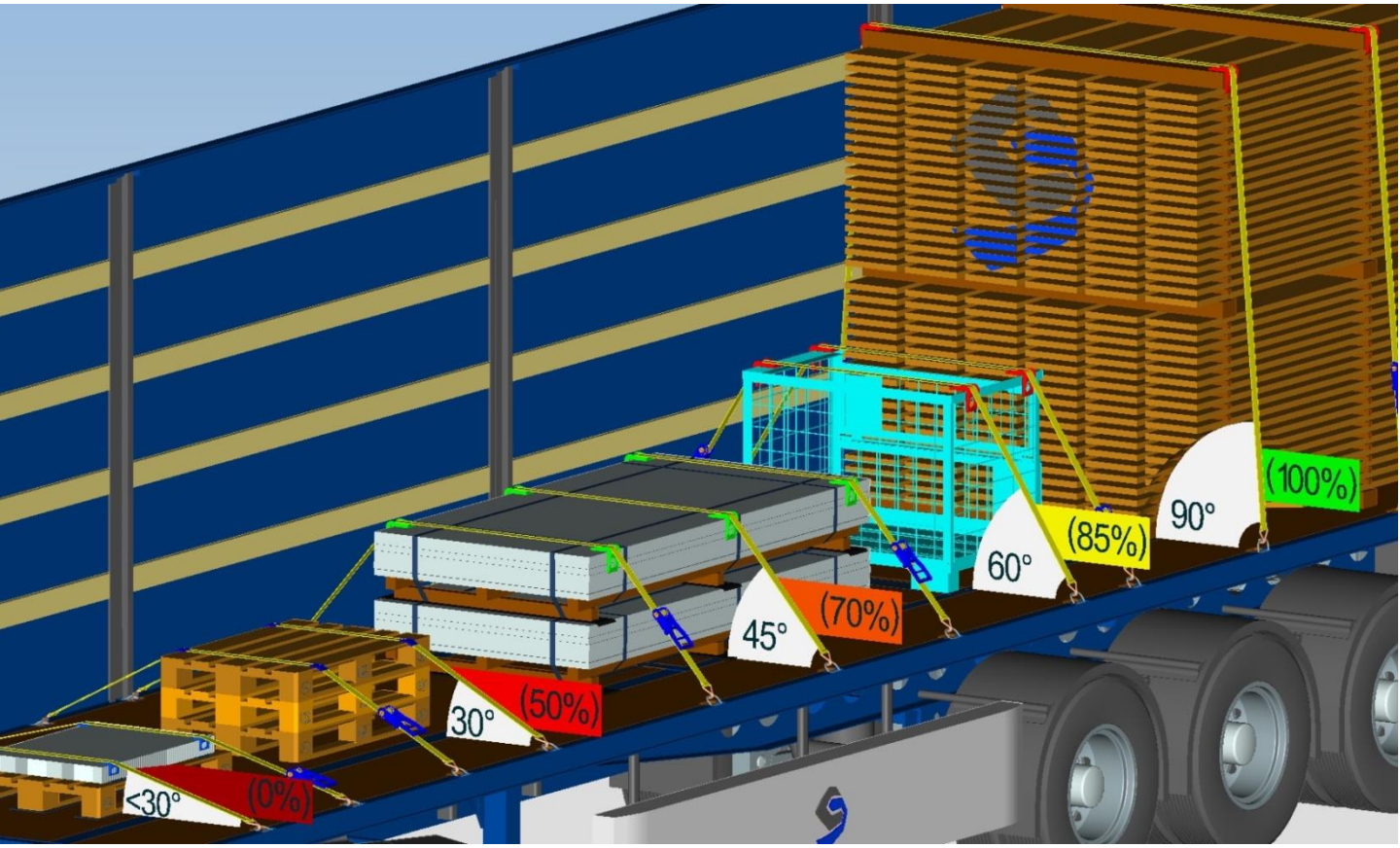


- ✓ Stanchions must not be bent or torn
- ✓ Position sheet metal packets DIRECTLY against the stanchions!
- ✓ Stanchions must be taller than sheet metal stacks
- ✓ **Additionally secure STANCHIONS with head lashing!!**

Secured load with STANCHIONS

			additional securing	
			without	**WITH**
-	**for**	**μ = 0.42** (rolled & blued / black)	2.5 t	**25 t**
-	**for**	**μ = 0.16** (oiled, pickled)	1.5 t	**25 t**

Principles of lashing down



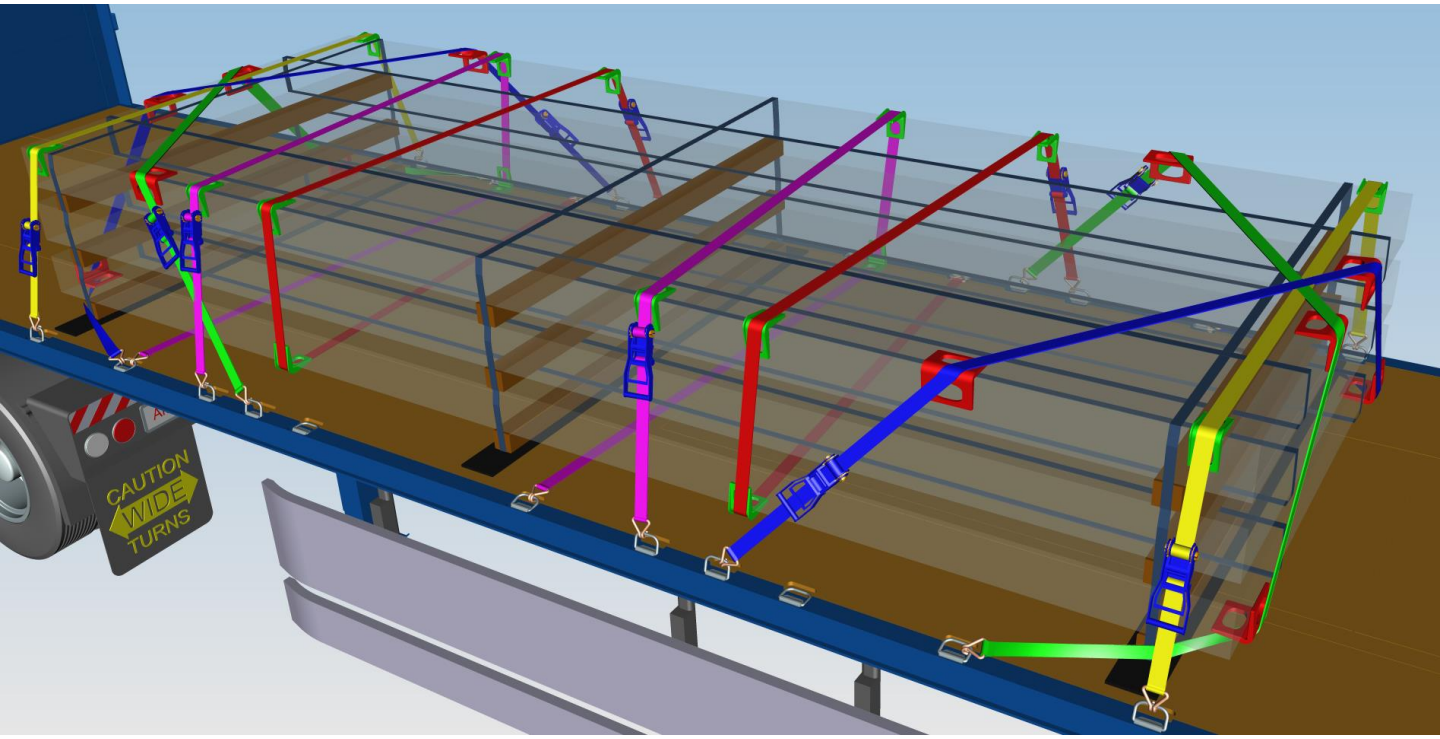
Tighten the lashing equipment firmly!!

- ✓ Place the load **on anti-slip mats (ASM)** if possible
- ✓ **Positive locking** or **head lashing** in **direction of travel** ist useful and defines the number of lashing devices
- ✓ Use EDGE PROTECTORS
- ✓ Fit the lashing strap as close to timber underlays as possible
- ✓ For free-standing loads at least 2 lashing devices
- ✓ The effect is greater for a steeper angle of application
- ✓ Apply ratchets alternately LEFT and RIGHT

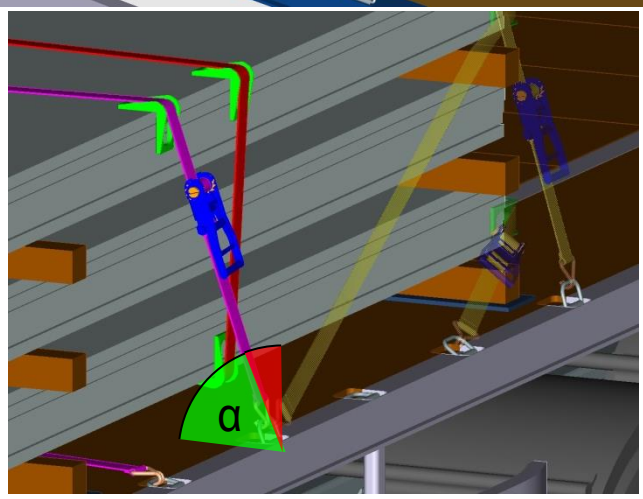
Load secured for each lashing strap STF_{min} = 500 daN (without positive locking)

			Direction of driv.	at sides
- for	μ = 0.42	(rolled & blued / black)	0.0 t	3.0 t
- for	μ = 0.16	(oiled, pickled)	0.0 t	0.0 t

Loop lashing – principles



- ✓ Lay the lashing straps out on the ground before loading
- ✓ Do NOT deposit the load on the lashing equipment!
- ✓ Lashing equipment must NOT go up VERTICALLY. Angle α max. 75°
- ✓ If possible, use two lashing points per item of lashing equipment!
- ✓ Secure hook against unhooking (hook safety device)



Minimum number of lashing devices:

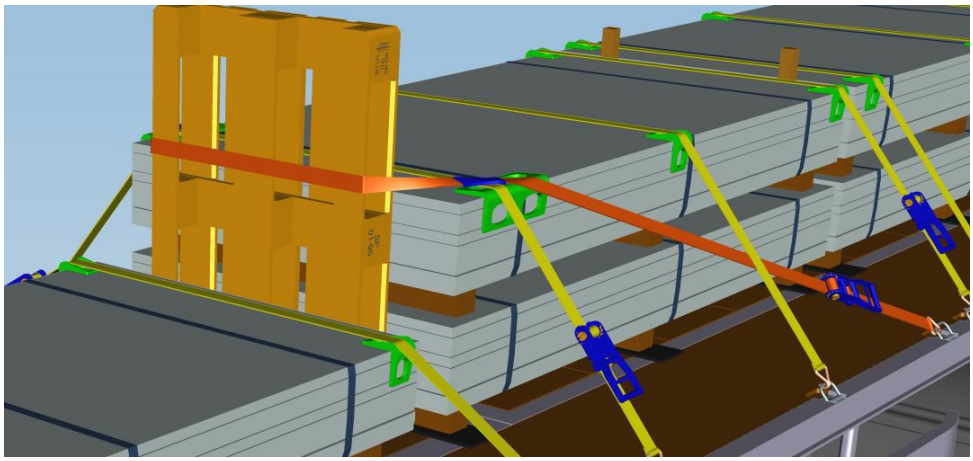
2 x left / 2 x right

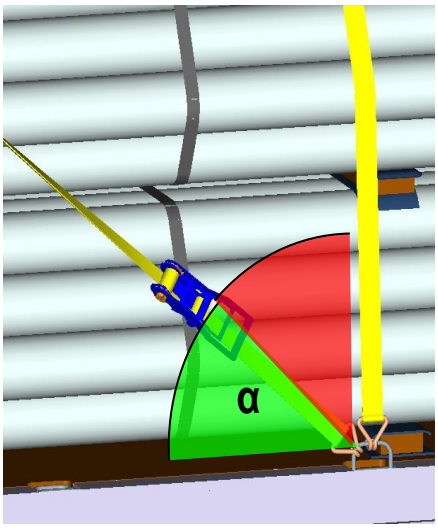
Secured load

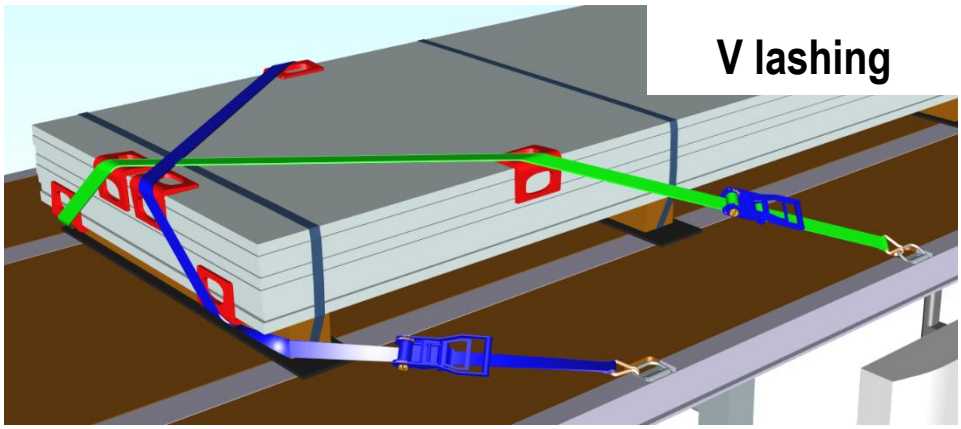
- **for μ = 0.42 (rolled & blued / black) 25 t**
- **for μ = 0.16 (oiled, pickled) 16 t**

Observe lashing point strength! Tighten the lashing equipment HAND TIGHT!!

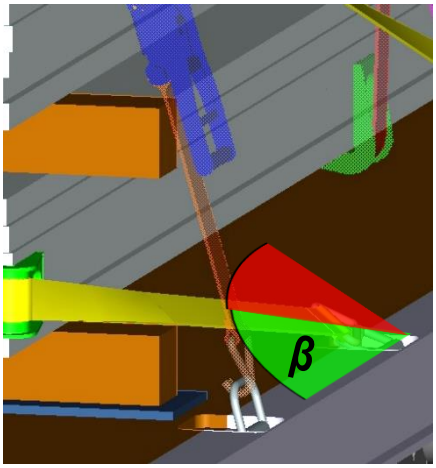
Head lashing – Principle







V lashing



- ✓ Observe angle
  - α max. 45°
  - β max. 45°
- ✓ Protect lashing strap at edges (e.g., protective hose)
- ✓ Secure hook against unhooking (hook safety device)

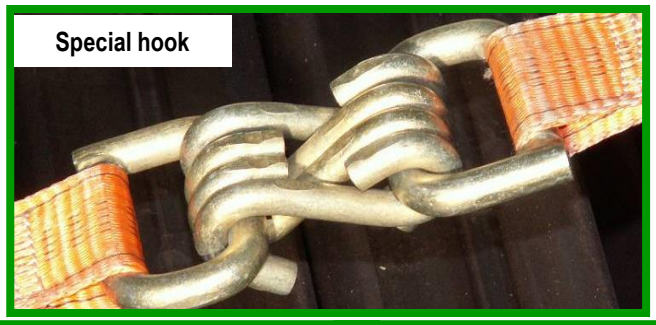
Number of lashing devices: **2 lashing straps for each direction**

Secured load		**IN**	**OPPOSITE**	**CFT RAIL**
		Direction of driving		
- **for**	**μ = 0.42**	**16.5 t**	**25 t**	**11.0 t**
- **for**	**μ = 0.16**	**7.5 t**	**14 t**	**5.5 t**

Observe lashing point strength! Tighten the lashing equip. HAND TIGHT!

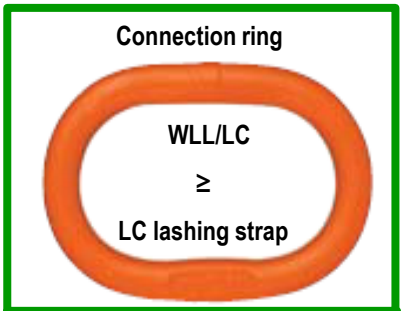
Bundling – hook connection – principles

TOP VERSION! One-piece lashing straps for bundling!



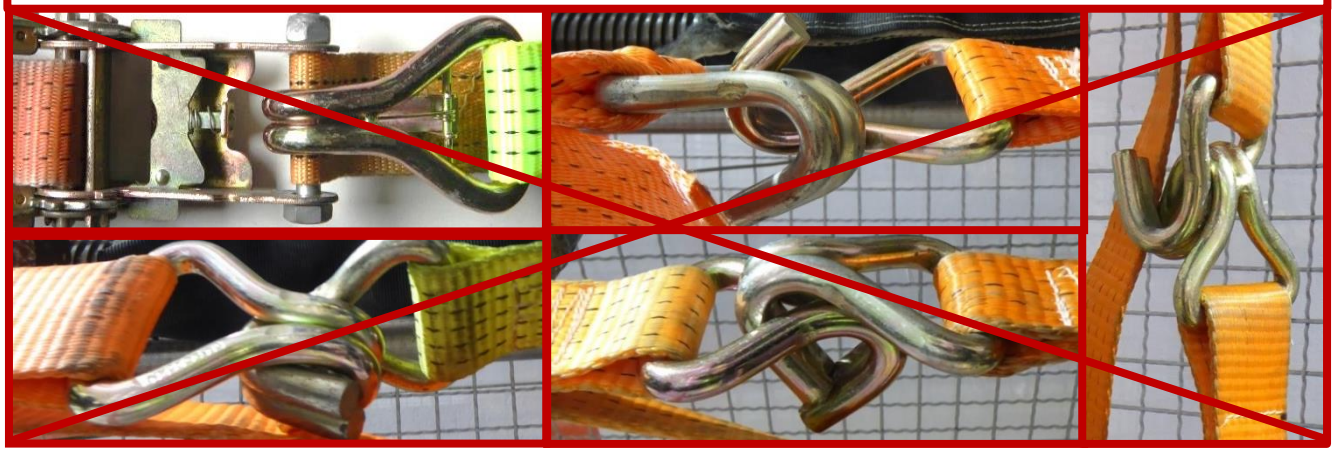
Use for bundling!
- ✓ One-piece lashing straps
- ✓ Triangular hook
- ✓ Special hook

Permitted alternatives
- ✓ Connection ring
- ✓ Lifting sling
- ✓ Hook



Only hook with welded hooks of the same size!

TOTALLY IMPERMISSIBLE!



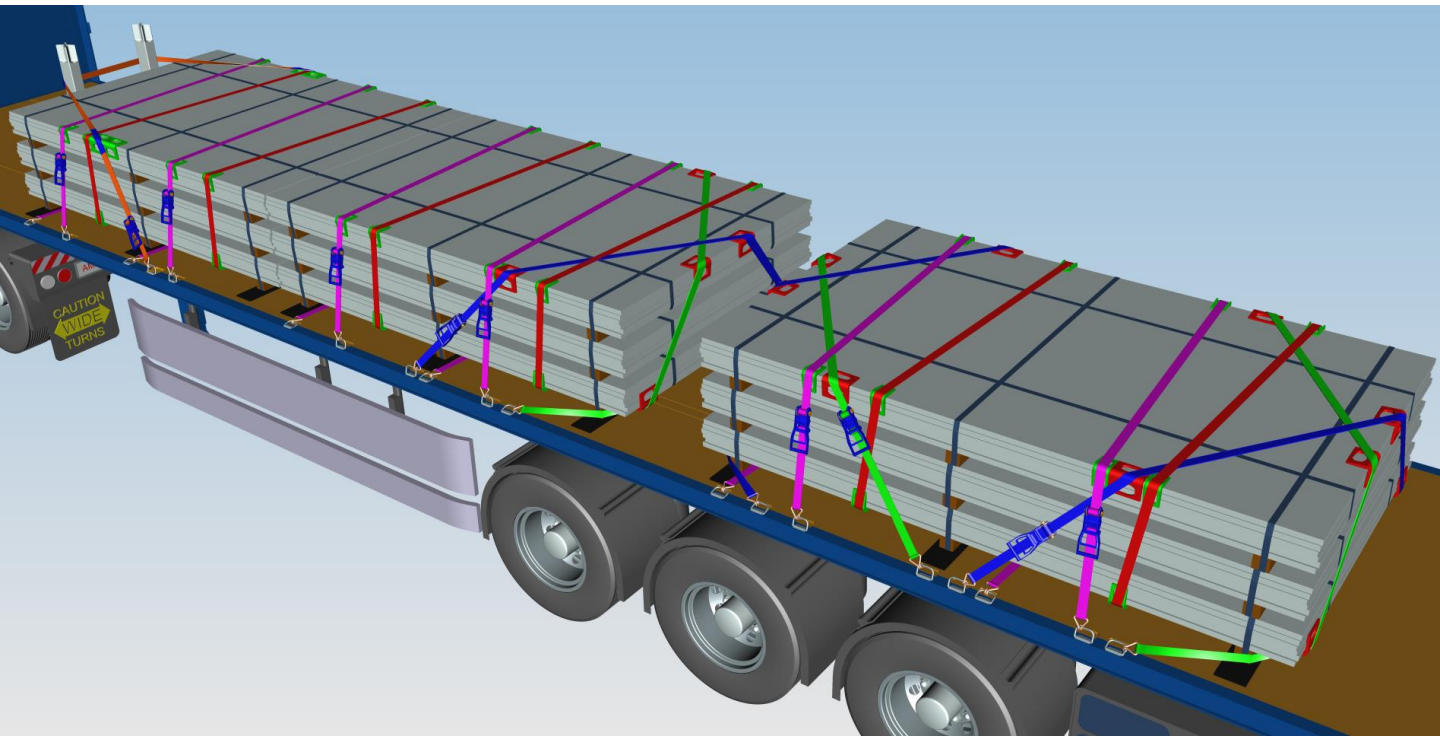
Loading gaps

Avoid loading gaps wherever possible!

If a gap between the packets is required on request from the customer

Place pallets between the packets!

LOADING SHEET METAL



Category based on coefficient of friction

μ = 0.42

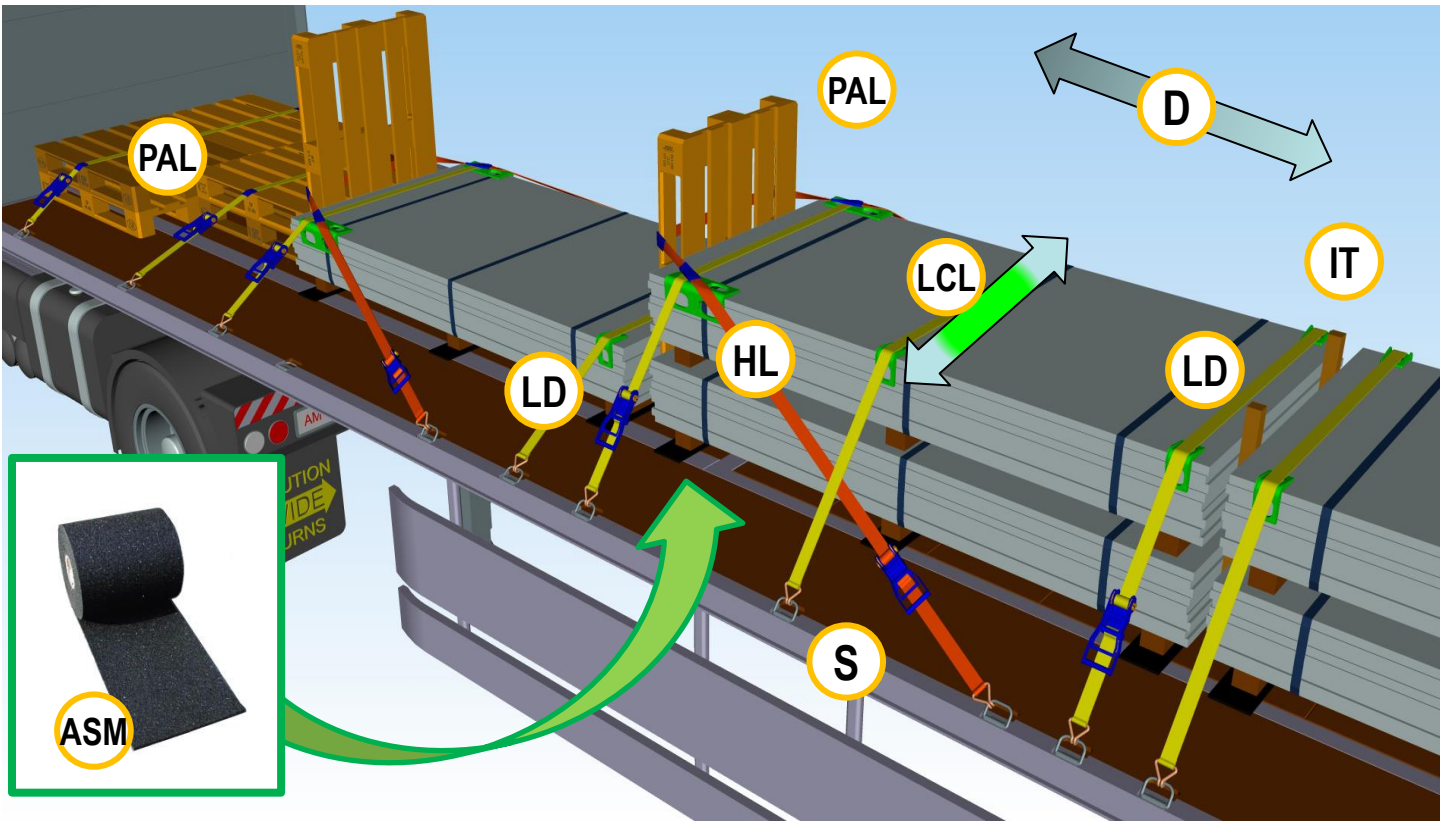
- Sheet metal – rolled & blued/black packaged
- Sheet metal – pickled – packaged

ONLY if ASMs are used in ALL POSITIONS!

μ = 0.16

- Sheet metal – pickled – packaged

Sheet metal- rolled & blued/black -packaged
coefficient of friction μ = 0.42



Required cargo securing means

40 x ASM μ_{min} = 0.6
6 x 100 x 500 mm

6 x Euro pallets or comparable / good condition

25 x lashing straps (LS) as per EN 12195-2
LC_{min} = 2000 daN
STF_{min} = 500 daN

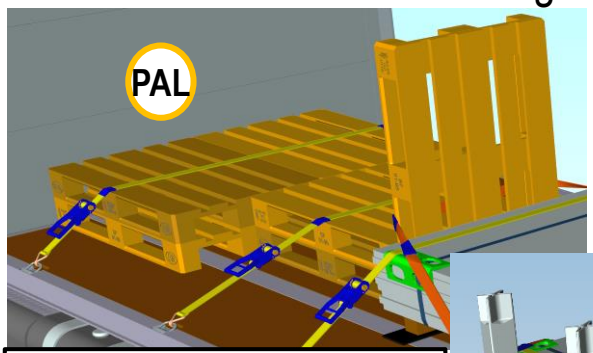
Required measures

S	Sweep load area clean
ASM	Insert Anti-Slip Mats
LCL	Place lengthwise centred on load area
D	Driver defines Distance to end wall
PAL	Insert PALlets as spacer
HL	Head lashing where needed
LD	Lash down
IT	Use intermediate timbers / PALlets

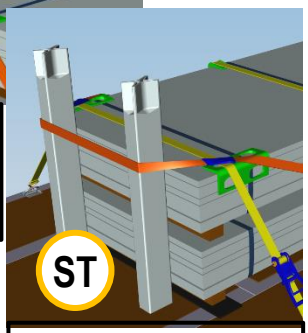
Sheet metal- rolled & blued/black- packaged
coefficient of friction μ = 0.42

Secure to **FRONT** (0.8)

Positive locking



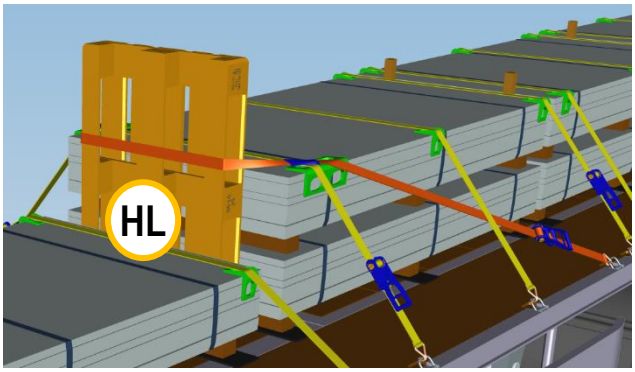
Code XL: max. 25 t
Code L: max. 13 t

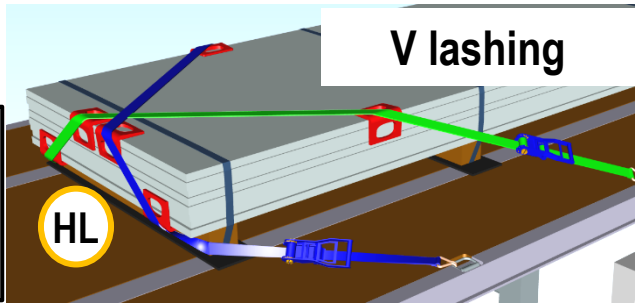


max. 25 t

OR / AND

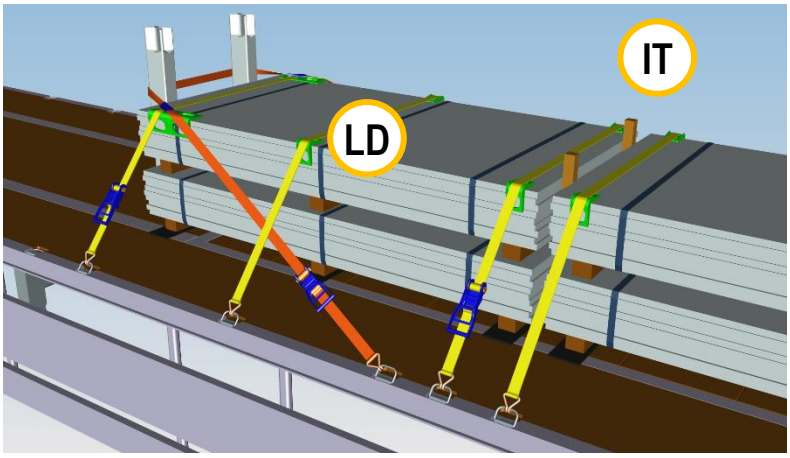
Head lashing





LC 2000 daN
2 x in direction of travel
max. 16.5 t

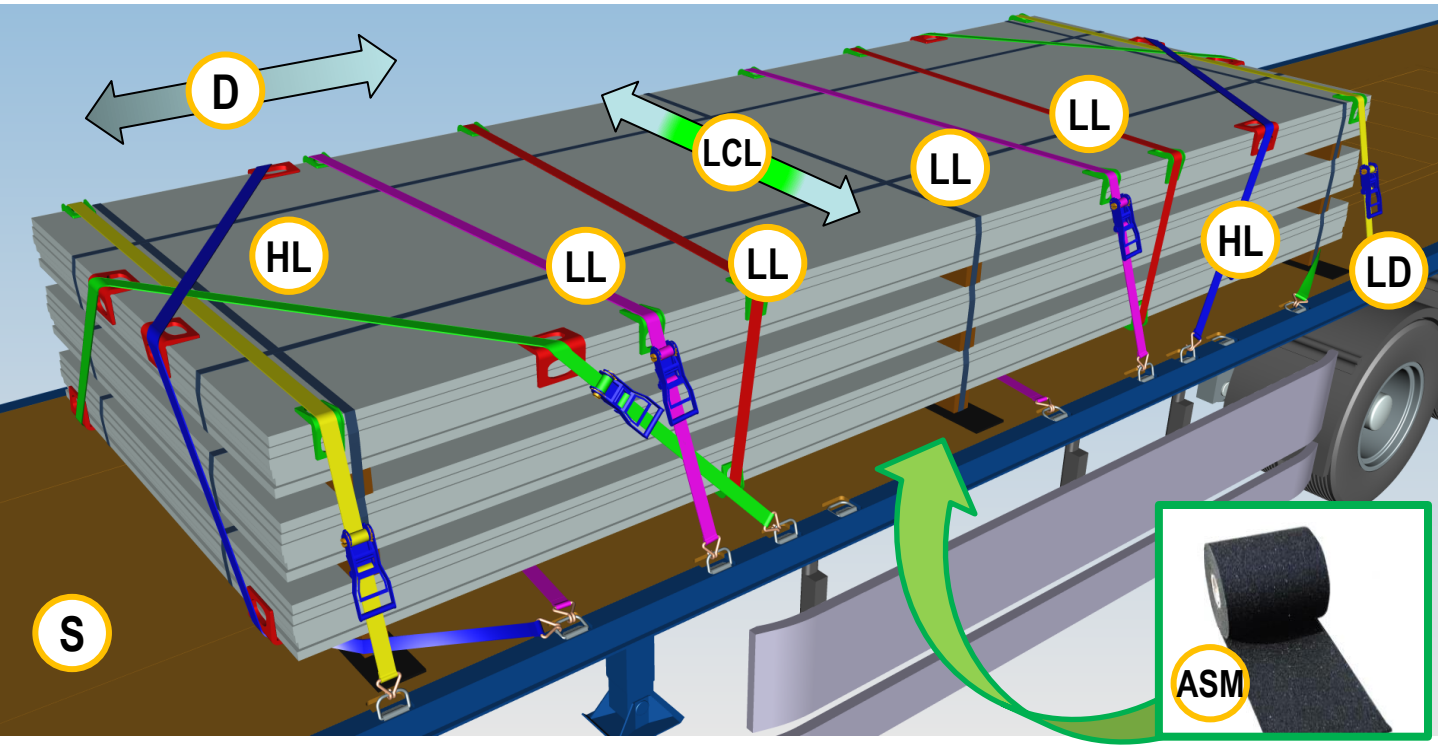
Securing to **SIDE** (0.5) and to **REAR** (0.5)
Lash down



1 x STF 500 daN

max. 3 t each

Sheet metal – pickled – packaged; coefficient of friction **μ = 0.16**



Required cargo securing means

40 x ASM μ_{min} = 0.6
6 x 100 x 500 mm

6 x Euro pallets or comparable / good condition

25 x lashing straps (LS) as per EN 12195-2
LC_{min} = 2000 daN
STF_{min} = 500 daN

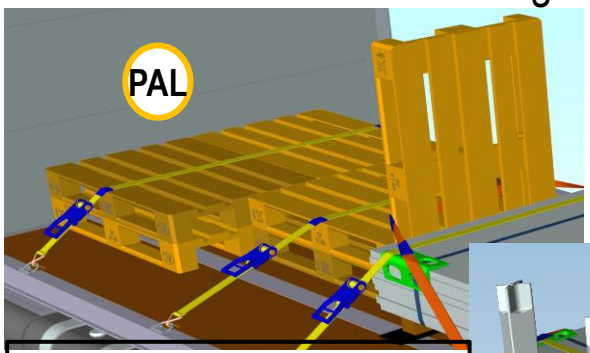
Required measures

S	Sweep load area clean
ASM	Insert Anti-Slip Mats
LCL	Place lengthwise centred on load area
D	Driver defines Distance to end wall
PAL	Insert PALlets as spacer
HL	Head lashing where needed
LL	Loop lashing
LD	Lash down
IT	Use intermediate timbers / PALets

Sheet metal – pickled – packaged; coefficient of friction **μ = 0.16**

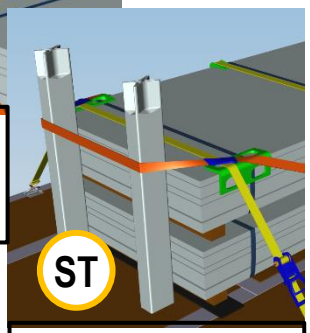
Secure to **FRONT** (0.8)

Positive locking



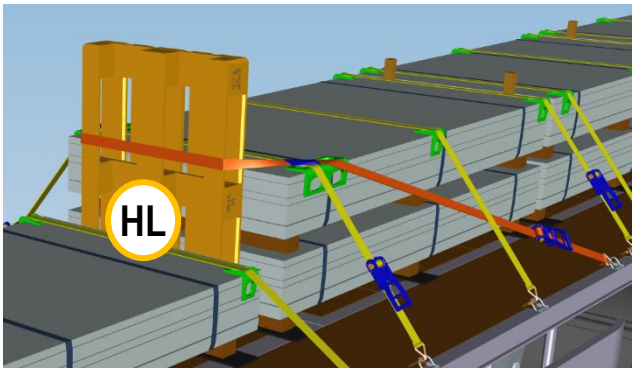
Code XL: max. 20.0 t
Code L: max. 7.5 t

OR / AND



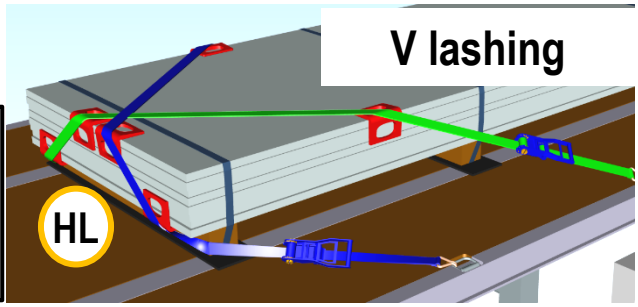
max. 18 t

Head lashing

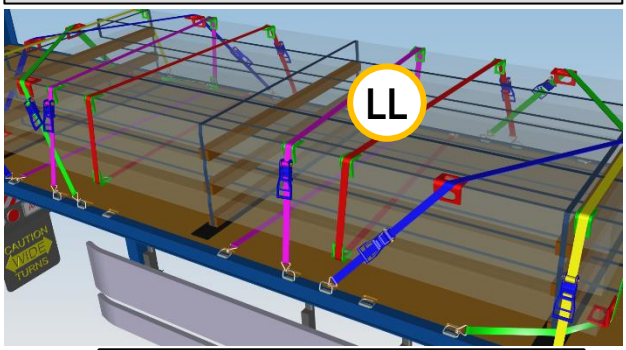


LC 2000 daN
2 x in direction of travel
max. 7.5 t

V lashing

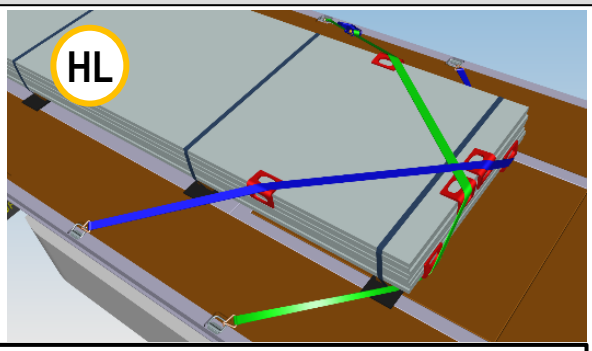


Securing to **SIDE** (0.5)
Loop lashing



LC 2000 daN
2 x left / **2 x** right
max. 16 t

Securing to **REAR** (0.5)
Head lashing



LC 2000 daN
2 x opposite direction of travel
max. 14 t

List of changes

• VRL_SLC_V1-1_2023_UK	Published	2023-05-01
• VRL_SLC_V1-2_2023_UK	Addition (Pallets)	2023-10-01

Signs and symbols / abbreviations

Directory for all descriptions, for example

AS	Abstützung
S	Sweep load area clean
BC	Blockierung
BD	Bündeln
LL	Loop lashing
D	Driver defines distance to end wall
HL	Head lashing
LCL	Place lengthwise centred on load area
LD	Lash down
PAL	Insert pallets as spacer
ST	Stanchions
ASM	Anti-slip mats

Abbreviations

-	up to
=	is equal to
%	percent
..°	degrees (angle)
~	approx. / circa.
€	Euros
<	lesser than
>	greater than
≤	lesser than or equal to
≥	greater than or equal to
§	Section
µ	"mu" – symbol for coefficient of friction
ADR	European agreement concerning the International Carriage of Dangerous Goods by Road
AKKB	General Conditions for Comprehensive Motor Vehicle Insurance
ASchG	Austrian Health and Safety at Work Act
CMR	International Agreement on Contracts for the Carriage of Goods by Road
i.e.	that is
daN	Deca-Newtons
ER	Employer
DHG	Employee Liability Insurance Act
EE	Employee
EN	European standard
ff	following

Abbreviations

FSG	Driving Licence Act
W	Weight
acc. to	according to
Poss./poss	possibly
KDV	Motor Vehicle Implementing Regulation
KFG	Motor Vehicle Act
KHVG	Motor Vehicle Liability Insurance Act
CFT	Combined freight transport
LASI	Load securing
LC	Lashing capacity
HGV	Heavy goods vehicle
Acc. to./ acc. to	according to
m	metre
Max. / max.	maximum
Min. / min.	minimum
mm	millimetre
PC	Personal Computer
PPE	Personal protective equipment
QM	Quality management
ASM	Anti-slip material / mats also "Anti-slip mats"
SLC	Stahl Logistik Center
STF	Standard Tension Force
STGB	Criminal Code
Pcs.	Pieces/items/units
StVO	Road Traffic Act
t (to)	tonne(s)
& sim.	and similar
VbVG	Association Responsibility Act
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
LG	Loading Guidelines
WLL	Working load limit
f.	for
e.g.	for example
LS	Lashing strap
α	angle α - vertical angle – projecting from the ground
β	angle β - horizontal angle – deviation from the direction of travel