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General Principles

- Vehicle Requirements
- Report on vehicle rejection / weight
- Requirements for lashings / edge protection
- Loading with a crane
- Tie down / Tight fit – Spring lashing Principles
Vehicle requirements

The following MINIMUM EQUIPMENT is required for loading trucks. This can differ depending on the load type and must be defined accurately by the scheduler. Failure to comply means that the truck must leave the loading site and must line up again after remedying the equipment’s shortcomings. The resultant costs will be charged.

THE MINIMUM REQUIREMENTS ACCORDING to the TYP OF CARGO are stated in THE RESPECTIVE CHAPTERS!

1. Lashings
   1. Lashing straps as per EN 12195-2
   2. If applicable, lashing chains as per EN 12195-3 to be used with special protective mats

2. Anti-Slip Mats (ASM) $\mu_{\text{min}} = 0.6$ - DRY
   1. Rubber (in case of localized load – e.g. heavy-duty mats)
   2. Other materials with manufacturer certification for
      - Steel – Screen floor
      - Wood – Screen floor

3. Protection material for lashings and goods

4. Stanchions – See Chapters for loading of coils / slit strips

5. Vehicle / Loading area / where applicable trough
   1. Must be swept COMPLETELY CLEAN by the driver prior to loading
   2. Troughs must be fully cleaned – no residues from other loads
   3. All equipment and securing means (stanchions without load, squared timbers, pallets and similar) must be secured after loading to prevent sliding around during travel. LASH DOWN or block with corresponding means.

6. Driver
   1. The driver must know and be able to apply the principles of load securing according to EN 12195ff or VDI 2700.
   2. After leaving the plant, the driver must regularly check and, if necessary, retighten the lashings. In case of strong braking or steering maneuvers the driver MUST obligatorily CHECK and RETIGHTEN the lashings.
Notice at production

Safety equipment of the driver

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Legal note

The rules for cargo securing comply with the legal regulations for

**ROAD TRANSPORT**

All guidelines are based on the following regulations:

- EN 12195 ff;
- ÖNORM V5750;
- VDI 2700 ff;
- EN 12640;
- EN 12642;
- relevant literature

... in the version valid at the effective date of authoring the underlying Guidelines.

Loading Guidelines which may deviate from these regulations are based on tests conducted in the company.

**Important Note:**

In case of intermodal transport, the driver must adapt the cargo securing measures accordingly, before the vehicle is loaded for rail transport.

→ Additional securing:

100% in and against driving direction
Report on vehicle rejection
(This report is required, if the vehicle is rejected)

<table>
<thead>
<tr>
<th>Third-party load</th>
<th>NOT noticeable / condition OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third-party load – obvious deficit in securing</td>
<td>NOT noticeable / condition OK</td>
</tr>
<tr>
<td>Loading area</td>
<td>swept clean / condition OK</td>
</tr>
<tr>
<td>Vehicle body</td>
<td>Lashing points available / condition OK</td>
</tr>
<tr>
<td>Stanchions</td>
<td>Height: ………… Meters available / condition OK</td>
</tr>
<tr>
<td>Payload acc. certificate (attached weight report)</td>
<td>adequate / condition OK</td>
</tr>
<tr>
<td>Cargo securing means</td>
<td>Anti-slip mats (ASM) adequate / condition OK</td>
</tr>
<tr>
<td></td>
<td>Lashing means: Straps (EN 12195-2) adequate / condition OK</td>
</tr>
<tr>
<td></td>
<td>Protection material adequate / large-area</td>
</tr>
</tbody>
</table>

DO NOT LOAD THE TRUCK!!
FOTO-DOCUMENTATION!

You can load!
acc. to the loading guidelines for the respective cargo

! LOADING WAS REJECTED (due to quality criteria)!

O The vehicle has been rejected due to the deficiencies stated above
O Obvious technical deficiencies at the truck have been detected: ………………………………………. – photos were taken
O The Driver was rejected owing to negative personal appearance: ………………………………………. Witness: …………………..

Loader
Carrier / number plate
Date
Driver / Witness

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Load distribution-general principles

The **position** of the load must be determined **by the driver** (acc. operation manual)!

✓ **THE LOADER** delivers the **center of gravity** of the **deadweight cargo**!

✓ **THE DRIVER** defines the area, where the **overall center of gravity** must be positioned.

The driver must know this load distribution plan of his vehicle!

Example for a standard semitrailer:

<table>
<thead>
<tr>
<th>Cargo (t)</th>
<th>Distance to headboard (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25,5 t</td>
<td>6,4 – 7,1 m</td>
</tr>
<tr>
<td>24,0 t</td>
<td>6,3 – 7,3 m</td>
</tr>
<tr>
<td>20,0 t</td>
<td>5,6 – 8,6 m</td>
</tr>
</tbody>
</table>

Please note: Deviations will be caused by the spare wheel, the tank, a crane, fork lifts, …
Procedure:
1. Approval certificate – read off EMPTY WEIGHT/TARE WEIGHT / drawing vehicle and trailer/ semitrailer
2. Add reserve (500 kg)
3. Third –party load Weight indicated by the driver/ documents/ check / note obvious deviation (e.g. driver indication: 300 kg – realistic 3000 kg)
4. Final control Empty weight of vehicle + third-party load + reserve + planned load max.:
   Road transport 40 t
   Combined traffic/Intermodal transp. 44 t (or max. perm. load as per certificate)

Note: Intermodal is marked with I in column B of the materials handling list!

---

| Empty/ TARA | .......................... kg |
| Calculation reserve | 500 kg |
| Load THIRD-PARTY | .......................... kg |
| Total weight | .......................... kg |

O Road (40 t) / O Intermodal (44 t)

---

Loader

---

Date

---

Driver

---

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---

Bill of lading - no.: ...............
Lashing points

DON‘T USE THESE ANY MORE!

PERMITTED USE!

Attach the hooks correctly!

Force 1 +

Force 2 ≤ max. permitted pulling force of lashing point
Lashing straps - IMPORTANT!

!! DAMAGED LASHING STRAPS MUST NOT BE USED!!
NOT SAFE → DANGER OF FINES → DANGER OF ACCIDENTS

Do not use straps any more, if:
- Missing or unreadable labels
- Cuts > 10% of strap width
  also for the sum of several cuts
- Damages of the seams
- Thermic deformations
- Obvious visible damages
- Holes in the strap
- Fluffy webbing
- Deformed, broken or rusted ratchets
- Intense corrosion on the ratchet or end fittings
  … are detected

MUST NOT:
- be knotted
- be applied over sharp edges
- be applied over rough surfaces
- be tensioned with extended lever

INFO:
- There is no DATE OF EXPIRY
- SHOULD be checked yearly by a qualified person
- Missing label does not matter if
  the strap is ok + several similar straps are in use

!! DAMAGED LASHING STRAPS MUST NOT BE USED!!
NOT SAFE → DANGER OF FINES → DANGER OF ACCIDENTS

Do not use straps any more, if:
- Missing or unreadable labels
- Cuts > 10% of strap width
  also for the sum of several cuts
- Damages of the seams
- Thermic deformations
- Obvious visible damages
- Holes in the strap
- Fluffy webbing
- Deformed, broken or rusted ratchets
- Intense corrosion on the ratchet or end fittings
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- Holes in the strap
- Fluffy webbing
- Deformed, broken or rusted ratchets
- Intense corrosion on the ratchet or end fittings
  … are detected

MUST NOT:
- be knotted
- be applied over sharp edges
- be applied over rough surfaces
- be tensioned with extended lever

INFO:
- There is no DATE OF EXPIRY
- SHOULD be checked yearly by a qualified person
- Missing label does not matter if
  the strap is ok + several similar straps are in use
Lashing chains – IMPORTANT!

!! DAMAGED LASHING CHAINS MUST NOT BE USED!!
NOT SAFE → DANGER OF FINES → DANGER OF ACCIDENTS

Do not use chains any more, if:
- Missing or unreadable labels
- Wear > 10% of nominal diameter
- Elongation (lengthening) > 3%
- Knotted or bolted chain links
- Surface cracks
- Visible deformations
- Corrosion (on connecting parts or the tensioner)

... are detected

MUST NOT:
- be knotted
- be strongly twisted
- be tensioned with extended lever
- be applied over sharp edges
- combine chain parts with different LC

INFO:
- There is no DATE OF EXPIRY
- MUST be checked yearly by a qualified person
- Demand a “chain-book” at purchase
- Since 2001 = securing of hooks is mandatory
- Up to 2000 = securing hooks not required
- Must be short linked (3d)
Principles of Edge and Lashing Protection

**NOT ALLOWED!!**

- Edge protectors should redirect the tension in the strap without friction losses!
  - Due to the inside rubber coating a fire hose is NOT adequate for edge protection!
  - Plastic edge protectors are only limited suitable!

**CORRECT!!**

Damage is inevitable!

**NOT for COIL HOLE and CHAINS**

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Alteration service: Hubert Pletz
VRL_Wuppermann

13
Forming a loading unit - bundling

TOP VERSION! One-piece lashing straps for bundling!

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

Alternatives in case of emergency!
✓ Connection ring
✓ Lifting sling

Connection ring
WLL/LC > 2000 kg/daN

Lifting sling

Only hook with welded hooks of the same size!

ABSOLUTE NO GO!

Triangular hook

Special hook
Loading with a crane

GENERAL:
1. The crane operator must check the function of the crane every day before it is put into operation the first time.
2. The operating staff and the truck driver must wear their PPE (personal protective equipment):
   - long clothing, helmet, gloves, safety shoes
3. NEVER step under floating load
4. If floating load must be approached:
   a. Lift the load only as high as absolutely necessary
   b. KEEP EYE CONTACT with the crane operator
5. ESCAPE WAY = never step between floating load and fixed infrastructure
6. The truck driver must absolutely obey to the instructions of the loading personnel
7. The truck driver must secure the load

LOADER:
1. Must assign a waiting position to the truck driver – the truck driver must follow the instructions
   a. From lifting the the load until the final position is nearly reached – beside the vehicle with sufficient safety distance
   b. For the final positioning of the load – accurate instructions and hazard notes (e.g. danger of crushing)
2. Crane hooks/lifting accessories must not be removed from the load until stable standing of the load is ensured
   Load that is endangered of tipping over (e.g. slit strips) must be lashed to the stanchion on both sides (or secured in another sufficient way) before it is released from the crane.
Visitors with a cardiac pacemaker

Wuppermann Moerdijk und Judenburg use magnet cranes in production and for loading. This can cause troubles for persons with an Implantable Cardioverter Defibrillator (ICD) or with a cardiac pacemaker. Closer to the magnet, the magnetic field becomes stronger. For your own safety, don’t stay in the immediate vicinity of a magnet on the Wuppermann premises.

Essential for truck drivers:

Directly after loading, the coils will still have a magnetic field of 10-20 Gauss, which may cause discomfort. The magnetic field will be reduced significantly after a waiting time of 5 minutes.

Due to safety reasons it is recommended that persons with an ICD or cardiac pacemaker wait shortly before securing the load on the vehicle.

For 5 minutes after the magnet crane has left the truck!
Loading with a crane

Instrukcja bezpieczeństwa
Rozładunek zwojów
Biztonsági utasítás
Tekercs kirakodás

instrukcja:
Coil-rozladovac

инструкция
Coil - выгружать

Sicherheitsanweisung
Coil – Entladung
Safety Instructions
Coil – Unloading

Veiligheidsaanwijzing
Coil – uitladen

Prohlášení
Coil-Stáhnout

asignacija
Coil-iskrcati

анвеисунг
Coil-абладен

naročilo
Coil-raztovarjati

instrukcija
Coil-Skladat
Loading with a crane
Tie-down lashing

High tension in the lashing means required!!

- Place the load on Anti-slip Mats (ASM).
- **Tight fit or spring lashing in the driving direction** is beneficial and reduces the number of needed lashings.
- Use EDGE PROTECTION /EDGE SLIDER
- If possible, place lashings in the middle of the pallets
- Use min. 2 lashings for free-standing cargo
- Apply the lashings as steeply as possible
- Apply the ratchets alternately on the right and on the left side.
Tight fit

- Place every cargo package DIRECTLY on the headboard
- Distances of max. 1-2 cm, caused by handling (e.g. loading with the crane) are acceptable
- Larger gaps must be filled
- If pallets are placed in between the cargo packages, apply SPRING LASHINGS at the pallets
- Avoid gaps between cargo packages!
  If necessary, fill with timber!
Spring lashing

**PALLET -WALL**

- Only use pallets of VERY HIGH QUALITY!
- Interleave pallets – consider the stacking pattern
  For better stabilization squared timber can be inserted or used for blocking!
- Lead the strap CLOSE TO THE CARGO through the pallets!

**LIFTING SLING**

- To secure coils the lengths of the lifting sling must allow for the horizontal part of the sling to be positioned preferably the middle of the coil.
Upright Cargo

- Coils / Rings
Vehicle requirements – coils/slit strips upright

The following MINIMUM EQUIPMENT is required for loading trucks. This can differ depending on the load type and must be defined accurately by the scheduler. Failure to comply means that the truck must leave the loading site and must line up again after remediyaing the equipment’s shortcomings. The resultant costs will be charged.

1. **Lashings** (LC ≥ 2000daN / STF ≥ 500daN)
   - Lashing straps as per EN 12195-2
   - If applicable, lashing chains as per EN 12195-3 with special protective mats
   - **18 pc**
   - **12 pc**

2. **Anti-Slip Mats (ASM) μ\text{min} = 0.6 - DRY**
   - Rubber (in case of localized load – e.g. heavy-duty mats)
   - **12 pc**

3. **Protection material** for lashings and goods – **CUT-RESISTANT HOSES!**

4. **Stanchions** - Height of stanchions minimum 1,85m from loading platform – See Chapters for loading of coils / slit strips
   - Every stanchion must be equipped with a lift point at the top to apply a chain or lashing strap in order to fix the stanchion in and against driving direction.
   - If alternative measures to fix the stanchions/slit strips are adopted, the securing effect must be proven!

5. **Vehicle / Loading area / trough**
   - Minimum 17 lashings points on each side
   - Must be swept COMPLETELY CLEAN by the driver prior to loading
   - Troughs must be fully cleaned – no residues from other loads
   - All equipment and securing means (stanchions without load, squared timbers, pallets and similar) must be secured after loading to prevent sliding around during travel. LASH DOWN or block with corresponding means.

6. **Driver**
   - The driver must know and be able to apply the principles of load securing according to EN 12195ff or VDI 2700.
   - After leaving the plant, the **driver must regularly check and, if necessary, retighten** the lashings. **In case of strong braking or steering maneuvers the driver MUST obligatorily CHECK and RETIGHTEN the lashings.**
The **position** of the load must be determined **by the driver** (acc. operation manual)!

- In driving direction, the coil must be positioned directly on a stanchion in the area.

- Examples from trailer manuals (not obligatory):
Coil trough

- Must be adapted to the size of the coil (diameter)!
  (see operation manual of the truck)
- CLEAN = free from dirt, dust and small parts
- The side walls must not be deformed
- The coil must not touch the bottom – min 20 mm clearance
- ASM inserted – distance between the strips max. 300 mm
Length of stanchions (min. 1.8 m above loading platform)

1. Principally, the stanchions **must be higher than the slip strips**!

2. **Exceptional** – Length of stanchions: between upper coil hole -Ø and outer ring-Ø!

3. With shorter stanchions upright slit strips MUST NOT be loaded!

**ADDITIONAL MEASURES, e.g. spring lashing are required!**
Length of stanchions – Exceptional measures!

- Principally, the stanchions must be higher than the slit strips!
- **EXCEPTIONAL CASE!**
  Stanchions length: **MINIMUM above the coil hole**

Special measures
For this exceptional case are **ABSOLUTELY REQUIRED!!**

- **Bundle** the slit strip **4x to the stanchions**
- **Spring lashing in and against** driving direction
- Apply the bundling lashings in a way that prevents the spring lashing from slipping down
- Apply **protective material at the contact areas**
- Check, if lashing means are ok.
**Coil**

Coil-width (B) < 0.7 x Coil-Ø (D) ➔

Not stable (danger of tilting)

(valid for truck and flat wagon TRAIN)

<table>
<thead>
<tr>
<th>ø &gt; width</th>
<th>ø &lt; width</th>
</tr>
</thead>
<tbody>
<tr>
<td>stable</td>
<td>Not stable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coil Ø (D) (mm)</th>
<th>Coil-width (B) (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>&gt; 560 &gt;</td>
</tr>
<tr>
<td>1000</td>
<td>&gt; 700 &gt;</td>
</tr>
<tr>
<td>1200</td>
<td>&gt; 840 &gt;</td>
</tr>
<tr>
<td>1600</td>
<td>&gt; 1120 &gt;</td>
</tr>
<tr>
<td>1800</td>
<td>&gt; 1260 &gt;</td>
</tr>
<tr>
<td>1900</td>
<td>&gt; 1330 &gt;</td>
</tr>
</tbody>
</table>

See loading guideline for **COIL**

See loading guideline for **SLIT STRIP**

Revision no.: V 12/2019 GB

Alteration service: Hubert Pletz
The strength of the stanchions must be sufficient for the loaded weight!

Manufacturer information → Operator manual

Revision no.: V 12/2019 GB

The strength of the stanchions must be sufficient for the loaded weight!

Manufacturer information → Operator manual
The strength of the stanchions must be sufficient for the loaded weight!

Manufacturer information → Operator manual

Required measures
- C: Loading space swept Clean
- ASM: Anti-Slip Mats applied
- D: Driver defines Distance to headboard
- TF: Tight Fit to STanchion
- BD: Bundle to STanchion
- SL: Spring Lashing acc. provided table

Required cargo securing means
- Anti-slip mats: $\mu_{min} = 0.6$
- Lashing Straps (LS): $LC_{min} = 2000$ daN, $STF_{min} = 300$ daN
The strength of the stanchions and the trough cover must be sufficient for the loaded weight!

Manufacturer information → Operator manual

Required measures
- C: Loading space swept Clean
- ASM: Anti-Slip Mats applied
- D: Driver defines Distance to headboard
- TF: Tight Fit to STanchion
- TF: Tight Fit to Trough Cover
- BD: Bundle 1st Coil to STanchion
- SL: Spring Lashing acc. provided table

Required cargo securing means
- Anti-slip mats: $\mu_{\min} = 0.6$
- Lashing Straps (LS): $LC_{\text{min}} = 2000$ daN
- STF$_{\text{min}} = 300$ daN

Several coils
The strength of the stanchions must be sufficient for the loaded weight!

Manufacturer information → Operator manual
Coil data

Securing **IN DRIVING DIRECTION** (0.8)

<table>
<thead>
<tr>
<th>Tight fit</th>
<th>OR</th>
<th>Spring lashing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 24 t</td>
<td>Max. 12 t</td>
<td>No. of lashing means</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>LC 2000</th>
<th>5 t</th>
</tr>
</thead>
</table>

**Sideward** securing (0.5)

Trough:
Only applicable for Coil Ø 900 mm – 2100 mm

**Backward** securing (0.5)

bundle + spring lashing (+ tie down)

<table>
<thead>
<tr>
<th>No. of lashing means</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC 2000</td>
<td>24 t</td>
</tr>
</tbody>
</table>

Direction of application
Slit strips–upright–stanchions with mounted lashing point

Lashing point capacity: min. 2000 daN

Bundle to stanchions with lashing straps $L_{C_{min}} \geq 2000$ daN!

- Up to 16 t: 2 belts (once per stanchion)
- 16–25 t: 4 belts (twice per stanchion)

Anchor stanchions diagonally!

$L_{C_{min}} \geq 2000$ daN

Loop lashing through center hole: $L_{C_{min}} \geq 2000$ daN
Slit strips – upright – stanchions with mounted lashing point

**Lashing point capacity:** min. 2000 daN

**Bundle to stanchions**
- with lashing straps $LC_{\text{min}} \geq 2000$ daN!
- Up to 16 t: 2 belts (once per stanchion)
- 16–25 t: 4 belts (twice per stanchion)

**Anchor stanchions diagonally!**
- $LC_{\text{min}} \geq 2000$ daN

**TIE DOWN!**
- Tie Down the coil min. 2 x strap
- $STF_{\text{min}} \geq 500$ daN
Slit strips—upright—with stanchion support by firm Mayer

Bundle to stanchions with lashing straps $LC_{\text{min}} \geq 2000$ daN!

- Up to 16 t: 2 belts (once per stanchion)
- 16–25 t: 4 belts (twice per stanchion)

Tie down the coil min 2 x!
Use straps with $STF_{\text{min}} \geq 500$ daN

ODER or loop lashing through the center hole

$LC_{\text{min}} \geq 2000$ daN

Fixed connection!

EP = Edge Protection

Bundle to stanchions with lashing straps $LC_{\text{min}} \geq 2000$ daN!

Up to 16 t: 2 belts (once per stanchion)
16–25 t: 4 belts (twice per stanchion)

Tie down the coil min 2 x!
Use straps with $STF_{\text{min}} \geq 500$ daN

ODER or loop lashing through the center hole

$LC_{\text{min}} \geq 2000$ daN

Fixed connection!

EP = Edge Protection

Bundle to stanchions with lashing straps $LC_{\text{min}} \geq 2000$ daN!

Up to 16 t: 2 belts (once per stanchion)
16–25 t: 4 belts (twice per stanchion)

Tie down the coil min 2 x!
Use straps with $STF_{\text{min}} \geq 500$ daN

ODER or loop lashing through the center hole

$LC_{\text{min}} \geq 2000$ daN

Fixed connection!

EP = Edge Protection

Bundle to stanchions with lashing straps $LC_{\text{min}} \geq 2000$ daN!

Up to 16 t: 2 belts (once per stanchion)
16–25 t: 4 belts (twice per stanchion)

Tie down the coil min 2 x!
Use straps with $STF_{\text{min}} \geq 500$ daN

ODER or loop lashing through the center hole

$LC_{\text{min}} \geq 2000$ daN

Fixed connection!

EP = Edge Protection
Slit strips – upright

**Use:**

- Prefer one-piece lashing straps!
- Edge protectors > 3 mm
- Rubber
- Examples

**Notice at production**

**Minimum**

- LC = 2000 daN
- STF = 500 daN

**Bundle to stanchions:**

- Up to 16 t: 2 belts (once per stanchion)
- 16–25 t: 4 belts (twice per stanchion)

**Var. 1**

**Var. 2**

**Var. 3**

Fixed connection!

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Slit strips – upright

Use:

Prefer one-piece lashing straps!

Examples

Rubber
> 3 mm

Edge protectors

minimum

LC = 2000 daN
STF = 500 daN

Bundle to stanchions:

Up to 16 t:
2 belts (once per stanchion)

16–25 t:
4 belts (twice per stanchion)
Slit strips – upright

**Use:**

- Prefer one-piece lashing straps!
- Edge protectors
- Rubber > 3 mm
- LC = 2000 daN
- STF = 500 daN

**Bundle to stanchions:**

- **Up to 16 t:**
  - 2 belts (once per stanchion)
- **16–25 t:**
  - 4 belts (twice per stanchion)
Slit strips – upright

Use:

- Prefer one-piece lashing straps!
- Examples
- Edge protectors > 3 mm
- Rubber

minimum

LC = 2000 daN
STF = 500 daN

Bundle to stanchions:

Up to 16 t:
2 belts (once per stanchion)

16–25 t:
4 belts (twice per stanchion)
**Slit strips – upright**

**Use:**

- Prefer one-piece lashing straps!

- Edge protectors

- Rubber

  > 3 mm

- Minimum

  - LC = 2000 daN
  - STF = 500 daN

**Bundle to stanchions:**

- Up to 16 t:
  - 2 belts (once per stanchion)

- 16–25 t:
  - 4 belts (twice per stanchion)

**Variant 7**

Revision no.: V 12/2019 GB

Alteration service: Hubert Pletz
Use:

**Hooks with securing** or prevent unhooking differently!

Minimum

- LC = 2000 daN
- STF = 500 daN

Max.

- 8 t

**Rubber**

- > 3 mm

Examples

Kantenschoner

Max.

- 8 t

MIND THE LASHING DIRECTION!!
Lying Cargo

- Coils / Rings
Vehicle requirements – slit strip lying

The following MINIMUM EQUIPMENT is required for loading trucks. This can differ depending on the load type and must be defined accurately by the scheduler. Failure to comply means that the truck must leave the loading site and must line up again after remedying the equipment’s shortcomings. The resultant costs will be charged.

1. **Lashings** (LC ≥ 2000daN / STF ≥ 500daN / length min. 8m)
   1. Lashing straps as per EN 12195-2 15pc

2. **Anti-Slip Mats (ASM) μ_{min} = 0.6 - DRY**
   1. Rubber (in case of localized load – e.g. heavy-duty mats)
   2. Other materials with manufacturer certification for
      - Steel – Screen floor
      - Wood – Screen floor

3. **Protection material** for lashings and goods

4. **Vehicle / Loading area**
   1. Minimum 17 lashings points on each side
   2. Must be swept COMPLETELY CLEAN by the driver prior to loading
   3. Troughs must be fully cleaned – no residues from other loads
   4. All equipment and securing means (stanchions without load, squared timbers, pallets and similar) must be secured after loading to prevent sliding around during travel. LASH DOWN or block with corresponding means.

5. **Driver**
   1. The driver must know and be able to apply the principles of load securing according to EN 12195ff or VDI 2700.
   2. After leaving the plant, the **driver must regularly check and, if necessary, retighten** the lashings. **In case of strong braking or steering maneuvers the driver MUST obligatorily CHECK and RETIGHTEN the lashings.**
Slit strips – lying (without tight fit)

Consider the CORRECT POSITION of the straps!

The pallet and the timber are used to place the strap correctly! Lace the strap only around the middle board of the pallet!
Slit strips – lying

Consider when using pallets:
Guide the straps as close to the cargo as possible through the pallets!
Slit strips – lying (tight fit)

- TIMBER or PALLETS to distribute the PRESSURE

CHECK TIGHT FIT:
- TIGHT FIT OK: 1 lashing strap per row
- WITHOUT TIGHT FIT: See respective page

ASM for EVERY layer

Revision no.: V 12/2019 GB
Alteration service: Hubert Pletz

VRL_Wuppermann
Slit strips – lying

Different possibilities to DISTRIBUTE the PRESSURE

Stack of pallets

straight bracing
Slit strips – lying
(rough surfaces)

Use:
rubber > 3 mm

Notice at production

Edge protectors

Examples

minimum
LC = 2000 daN
STF = 500 daN

minimum
1 TIE DOWN LASHING per row
slit strips
1 SPRING LASHING per 15 t

Var. 1
Var. 2
Var. 3
Var. 4: STANCHIONS = SPRING LASHING!

= DO NOT ENTER!

Revision no.: V 12/2019 GB
Alteration service: Hubert Pletz
Long Goods

- Tubes / Profiles
Vehicle requirements – slit strip lying

The following MINIMUM EQUIPMENT is required for loading trucks. This can differ depending on the load type and must be defined accurately by the scheduler. Failure to comply means that the truck must leave the loading site and must line up again after remedying the equipment’s shortcomings. The resultant costs will be charged.

1. **Lashings** (LC \( \geq \) 2000daN / STF \( \geq \) 500daN / length min. 8m)
   - Lashing straps as per EN 12195-2
   - For oiled goods: 2 one-piece lashing straps per stack!

2. **Anti-Slip Mats (ASM)** \( \mu_{\text{min}} = 0.6 \) - DRY
   - Rubber (in case of localized load – e.g. heavy-duty mats)
   - Other materials with manufacturer certification for
     - Steel – Screen floor
     - Wood – Screen floor

3. **Protection material** for lashings and goods

4. **Vehicle / Loading area**
   - Minimum 17 lashings points on each side
   - Must be swept **COMPLETELY CLEAN** by the driver prior to loading
   - All equipment and securing means (stanchions without load, squared timbers, pallets and similar) must be secured after loading to prevent sliding around during travel. **LASH DOWN or block with corresponding means.**

5. **Driver**
   - The driver must know and be able to apply the principles of load securing according to EN 12195ff or VDI 2700.
   - After leaving the plant, the **driver must regularly check and, if necessary, retighten** the lashings. **In case of strong braking or steering maneuvers the driver MUST obligatorily CHECK and RETIGHTEN the lashings.**
Spring lashing

- Alternative securing method to tight fit in and against driving direction

- Consider the angles
  - $\alpha$ max. 45°
  - $\beta$ max. 30°

- Avoid unhooking of lashings (use hook securing)

- Protect lashing straps at sharp edges (protective hose)

- Consider the capacity (LC) of the lashing points!

- Possibilities to use pallets as walls
  - Interleave 5 pallets
  - Strengthen with timber

- Consider the guidance of the lashings!

**Number of lashing straps**

1 SPRING LASHING max. per 15 t

(LC = 2000daN / ASM applied)

**Tension the straps HAND-TIGHTLY!!**
Loop lashing

- **SIDEWARD securing**
- **Consider the angles**
  - $\alpha_1$: 5° - 30°
  - $\alpha_2$: 45° - 75°
  - $\beta$: 80° - 90°
- **Min. 2 straps in both directions**
- **Protect lashing straps at sharp edges (protective hose)**
- **Don't place the load directly on the straps!**
- **Avoid unhooking of lashings (use hook securing)**
- **Use 2 lashing points for one strap -> double LC**
- **Consider the capacity (LC) of the lashing points!**

**Number of lashing straps (24 t)**
- 3 LOOP LASHINGS (without ASM)
- 2 LOOP LASHINGS (with ASM) per package
  (LC = 2000daN)

**Tension the straps HAND-TIGHTLY!!**
Loop lashing

Path of the lashing straps

Layers with different width  
Layers with identical width

Layers with different width

–

apply loop lashing for every layer!
Use:

Rubber > 3 mm
minimum

LC = 2000 daN
STF = 500 daN

minimum:
1 TIE DOWN LASHING per 5 t

stacking:
TIE DOWN
after 2nd layer

1 SPRING LASHING per 15 t
Profile tubes – bracing with pallets

Variant 1 – profiles > 9,5 m

Variant 2 – profiles < 9,5 m

Secure pallets to avoid shifting or buckling!

TIE DOWN with lashing straps

Notice at production
Profile tubes – bracing with timber

Lateral timber on the headboard can be omitted, if a strong enough base plate is available – acc. vehicle body producer!

→→→
min. 3 pcs timber

Secure bracing timber to avoid shifting or buckling!

Nail the connections
OR
TIE DOWN with lashing straps

Notice at production
Profile tubes – bracing 1500mm

Attention!

Bracing and lashing means respective pages!
Notice at production

Profile tubes – bracing 1500mm

Attention!

Bracing and lashing means respective pages!
Profile tubes – bracing 2400mm

Attention!

Bracing and lashing means respective pages!
Profile tubes – bracing 2400mm

Attention!

Bracing and lashing means respective pages!

Notice at production
Profile tubes – bracing 1100/1200mm

Attention!
Bracing and lashing means respective pages!

Notice at production

Revision no.: V 12/2019 GB
Alteration service: Hubert Pletz
Cargo

- Pallets, barred boxes, stacking frames
Vehicle requirements – pallet goods

The following MINIMUM EQUIPMENT is required for loading trucks. This can differ depending on the load type and must be defined accurately by the scheduler. Failure to comply means that the truck must leave the loading site and must line up again after remedying the equipment’s shortcomings. The resultant costs will be charged.

1. **Lashings**  \( (LC \geq 2000\text{daN} / STF \geq 500\text{daN} / \text{length min. 8m}) \)
   
   1. Lashing straps as per EN 12195-2  
   20 pc

2. **Anti-Slip Mats (ASM) \( \mu_{\text{min}} = 0.6 \) - DRY**
   
   1. Rubber (in case of localized load – e.g. heavy-duty mats)
   2. Other materials with manufacturer certification for
      - Steel – Screen floor
      - Wood – Screen floor

3. **Protection material** for lashings and goods

4. **Vehicle / Loading area**
   
   1. Minimum 17 lashings points on each side
   2. Must be swept COMPLETELY CLEAN by the driver prior to loading
   3. All equipment and securing means (stanchions without load, squared timbers, pallets and similar) must be secured after loading to prevent sliding around during travel. LASH DOWN or block with corresponding means.

5. **Driver**
   
   1. The driver must know and be able to apply the principles of load securing according to EN 12195ff or VDI 2700.
   2. After leaving the plant, the **driver must regularly check and, if necessary, retighten** the lashings. In case of strong braking or steering maneuvers the driver **MUST obligatorily CHECK and RETIGHTEN the lashings**.
If EUR-pallets show the below illustrated defects, the pallets are not exchangeable any more and must be repaired as per the UIC-code 435-4:

- A single upper or lower edge board is damaged so that more then one nail or screw shank is revealed.
- The EUR mark on the right and the EPAL symbol on one web on the left is missing.
- A board is missing.
- A block is missing or split to the point where more than one nail shank is visible.
- A board is broken transversely or diagonally.
- More than two lower or upper edge boards are damaged so that more then one nail or screw shank is revealed.

Other characteristics (Poor overall condition):
- The loading capacity can no longer be guaranteed (wood worm-eaten or rotten, many splinters)
- Contamination is such that products may be soiled.
- Large splinters are coming away from a number of blocks.
- There is evidence that inadmissible construction elements have been used, e.g. boards and blocks that are too weak.

LOAD LIMITS

- **in the rack or on the fork lift**
  - 1000 kg
    - Load distributed randomly
  - 1500 kg
    - Load distributed evenly
  - 2000 kg
    - compact load all-over the pallet
- **in the stack**
  - max. 4000 kg
    - on flat, horizontally fixed surface
    - imposed load applied horizontally and all-over
Connect cargo and pallet **safe for transport**

„Covers“ should preferably the **same format** as the pallets to allow for tight fit
**Pallets loading 1**

- **APPLY ASM**, if not bundled-ASM for every layer required

- **Fill empty spaces** oder put cargo together
  - Tight fit in driving direction should be affected!

- **BUILD LOADING UNITS** – bundle stacked pallets with pallet frames
If it is not possible to have a COVER of the SAME FORMAT, the empty space must be filled with appropriate filling material.

Depending on the weight possible filling materials are: styrofoam, foam material, paperboard, dunnage airbags, and similar materials (protective for coating)
Pallets loading 3

- **Vehicles WITHOUT headboard:**
  - ✓ Tight fit to headboard/in driving direction
  - ✓ Min. 1x tie down/pin down per row

- **Vehicles WITH headboard and/or CODE XL:**
  - ✓ Tight fit to headboard and side wall
  - ✓ Last row: min 1x tie down or use clamping bar with sufficient strenght

- **Tight fit in driving direction is not possible?**
  - ✓ Spring lashing with pallets
  - ✓ Stacking: apply ASM between layers
  - ✓ Min. 1x tie down/pin down per row
Fill empty spaces!

NEVER put pallets on third-part load!

EVERY single pallet MUST BE SECURED:

By TIGHT FIT

or

with LASHING MEANS
Pallets loading 5

Vehicles with side board / CODE XL

Secure load against third-party load!

All other vehicles / no tight fit

ASM

6

7

8
Shifting possible

Height of headboard up to 2\textsuperscript{nd} pallet \rightarrow o.k.

Vehicles with side board / CODE XL

All other vehicles / no tight fit
<table>
<thead>
<tr>
<th>Document Name</th>
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<tr>
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<td>42</td>
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