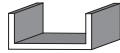


1. This guideline applies to:

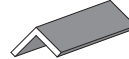
- Structural sections secured in bundles with either tie wires or steel bands.



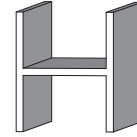
Universal beams



Parallel flange channels



Angles



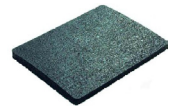
Universal columns

- Mill finish steel-on-steel friction factor $\mu = 0.49$; tested according to EN 12195-1:2010 Annex B.1.2.
- Mill finish steel-on-timber friction factor $\mu = 0.59$; tested according to EN 12195-1:2010 Annex B.1.2.

Note: If steel is painted or galvanised it is classed as low friction and additional restraint is required.

2. Essential requirements

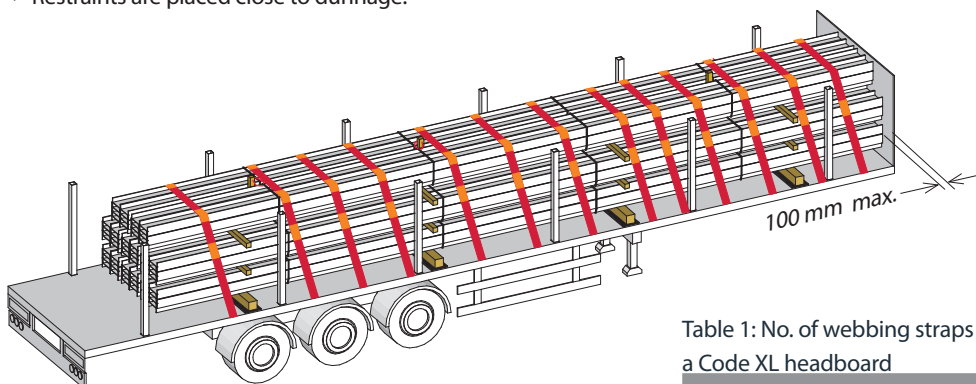
- All restraints must be compliant with EN 12195-2, minimum lashing capacity LC 2000 daN.
- Edge protection must be used on all sharp edges, including trailer side raves.
- Base dunnage must be a single layer of square section timber.
- Anti-slip matting must be placed between base timbers and the trailer deck for ALL loads.
- Minimum 4 x base dunnage on standard trailers and 5 x base dunnage on extendable trailers.
- Headboard to cover the height of the load (max. 1500 mm) with a minimum load bearing capacity of 13.5 tonnes when product is loaded against it (e.g. EN 12642 Code XL).
- Side pins are mandatory (6 pairs recommended).



3. Overview of restraint systems

3.1 Product blocked against the headboard

- ✓ Loaded to the headboard - maximum gap 100 mm.
- ✓ Up to 28 tonnes on a Code XL rated trailer restrained using over-the-top webbing straps as shown in Table 1.
- ✓ Restraints are placed close to dunnage.



Shown for a 28 t load against a Code XL headboard



Typical plaque on a trailer with a headboard to EN 12642 Code XL

Table 1: No. of webbing straps required when loaded to a Code XL headboard

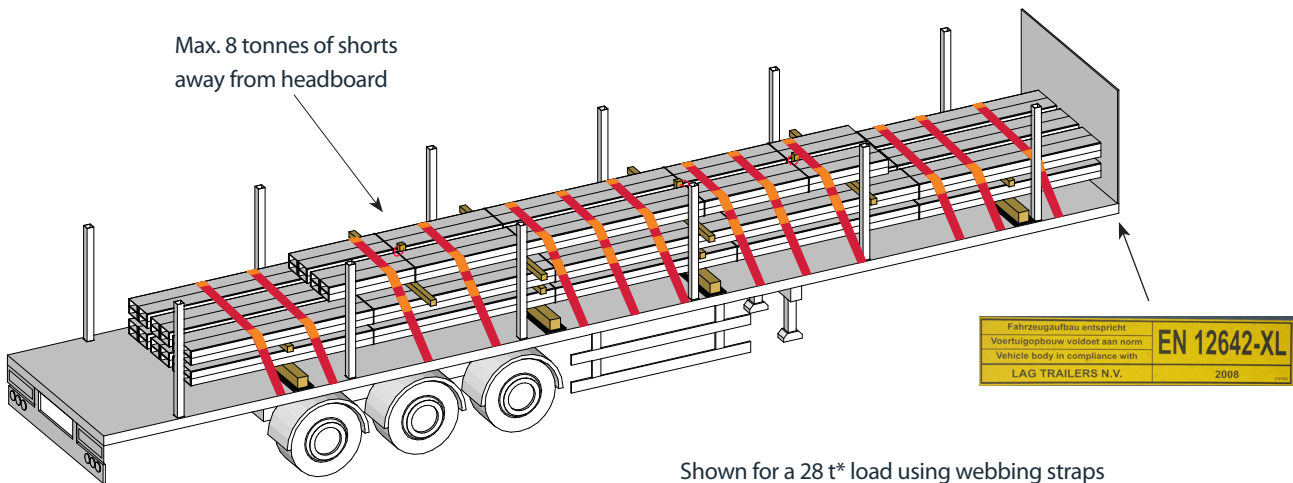
Load weight	10 tonne headboard
0-20 t	9
20-25 t	12
25-28 t	13

Valid for 2000 daN and 2500 daN webbing straps.

This Load Restraint Guideline is designed and tested to meet the forces for road and sea transport as stated in EN 12195-1:2010 and VDI 2700.

3.2 Product part loaded to the headboard

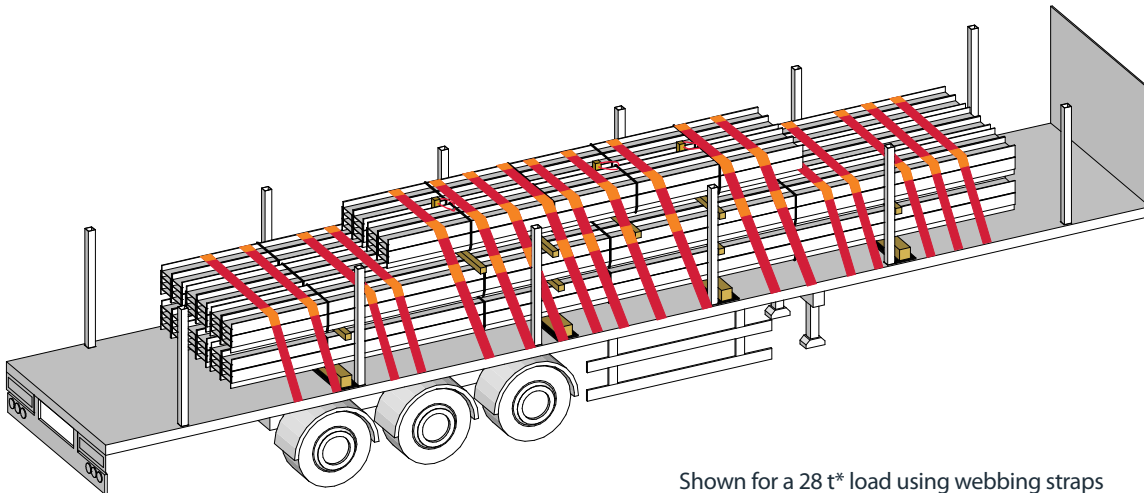
Up to 8 tonnes in the top layer restrained with **8 over-the-top** webbing straps - remainder of load blocked to the headboard and restrained with the remaining **5 over-the-top** straps for a full 28 tonne load.



Shown for a 28 t* load using webbing straps

- ✓ Pyramid load build, maximum of 2 bundles on top tier.
- ✓ Shorter bundles placed on top tier.
- ✓ Lower tiers loaded to XL rated headboard (max gap 100 mm - see Section 3.1).
- ✓ 8 over-the-top webbing straps to restrain 8 tonnes in the top layer, remaining straps from Table 1 to restrain the lower layers.
- ✓ Restraints are placed close to dunnage.

3.3 Product loaded away from the headboard



Shown for a 28 t* load using webbing straps

- ✓ Pyramid load build, maximum of 2 bundles on top tier.
- ✓ Shorter bundles placed on top tier.
- ✓ Restraints are a minimum of 500 mm from front and rear of load.
- ✓ Restraints are placed close to dunnage.
- ✓ All gaps to be blocked with timber dunnage.

Table 2: No. of webbing straps required when loaded away from the headboard

Load weight	Over-the-top straps
0-20 t	13
20-25 t	16
25-28 t	18

Valid for 2000 daN and 2500 daN webbing straps.



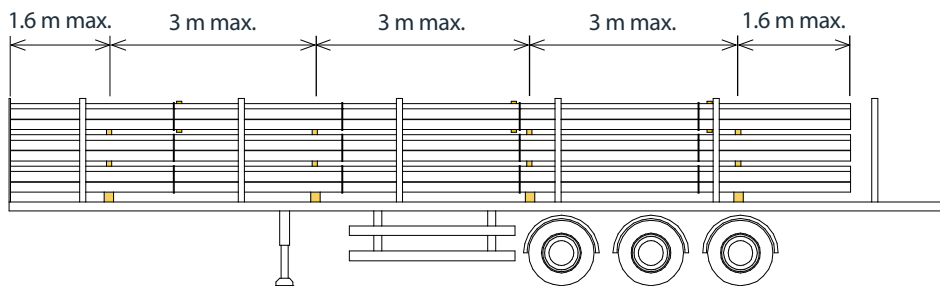
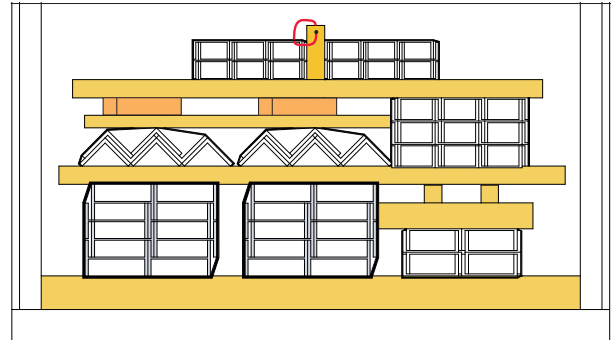
* Note: 28 tonne loads are only allowed in certain European countries and will require 3 axle tractor units. Refer to Technical Information Sheet TIS-0012 Axle weights and load distribution for more details.



4. Pyramid load building

All bundles within the load must be adequately clamped down by the webbing straps. This will be achieved if timber dunnage is applied carefully during the load build.

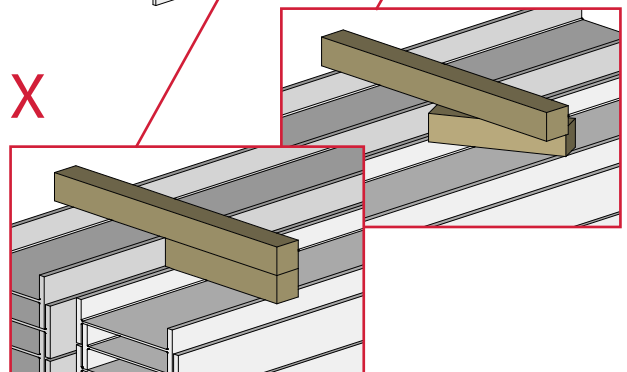
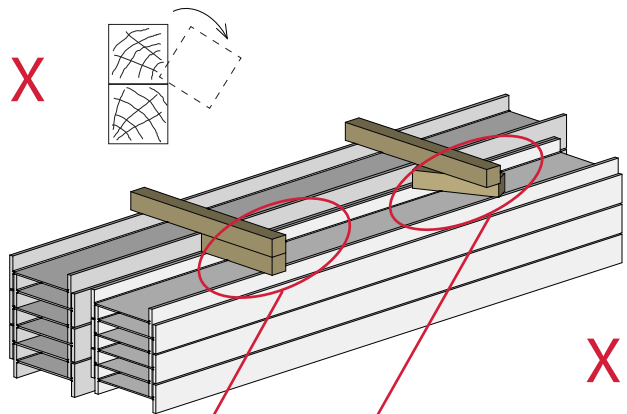
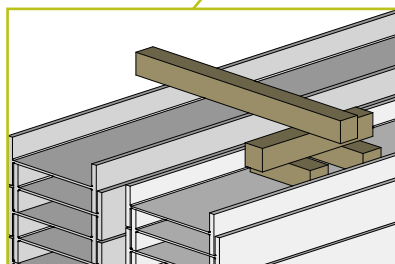
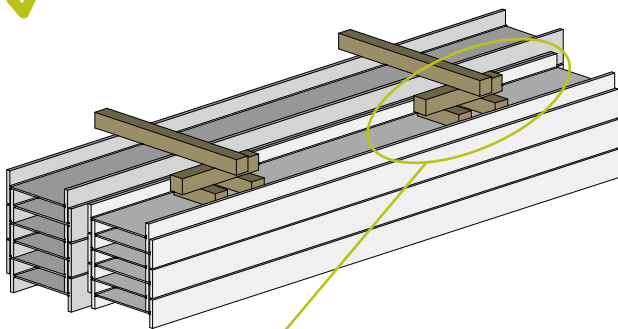
- ✓ Maximum of two bundles on top tier.
- ✓ Vertical gaps in the top tier must be blocked.
- ✓ Intermediate timbers must be a minimum of 75 x 75 mm square cross-section and span the full trailer width.
- ✓ Intermediate timbers must be spaced a maximum of 1.6 m from the end of the product and a maximum of 3 m apart.



5. Dunnage and grillage examples

- ✓ Square cross-section only, no rounded corners.
- ✓ Recommended 75 mm x 75 mm minimum.
- ✓ Dunnage must span the width of the item it is on.
- ✓ Create a grillage to even out stacks of different heights.

- ✗ Do not balance the corner of timbers on beam flanges.
- ✗ Do not double stack timbers - risk of toppling.

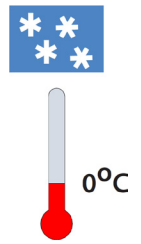


6. Severe winter weather advisory periods

During severe winter weather advisory periods when the air temperature is below 0°C and there is a risk of frost, ice or snow the following restraint system must be used for all loads:

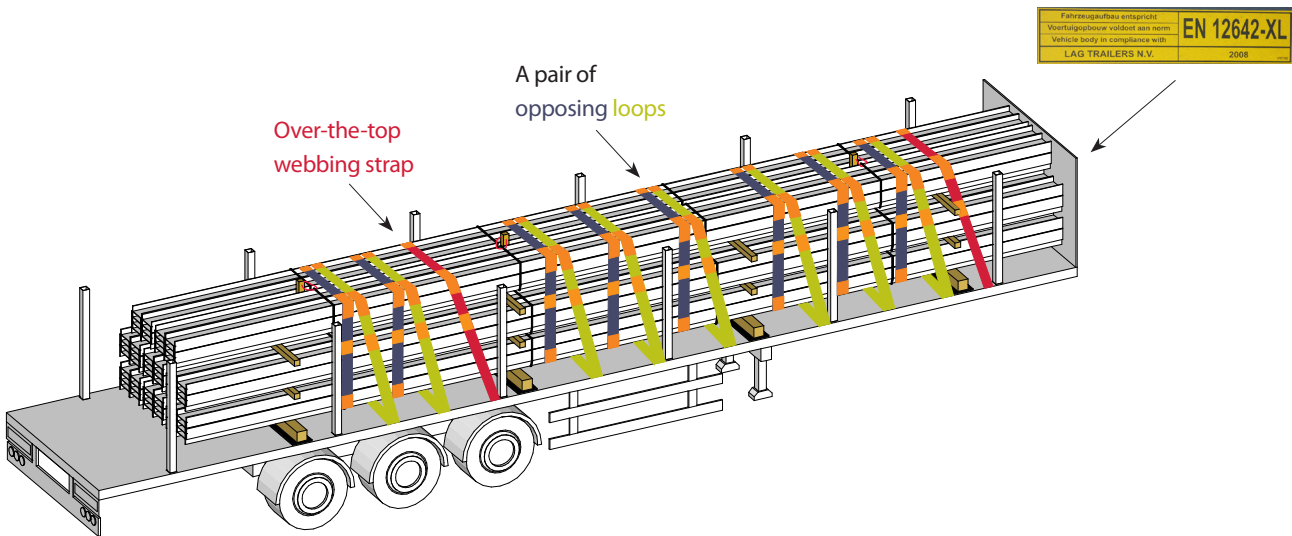
- ✓ Always load to the headboard.
- ✓ Pyramid load build.
- ✓ Use correct number of intermediate timbers

- ✓ Block any vertical gaps in the top tier.
- ✓ Use timber grillages to create level stacks.
- ✓ Opposing loops must be used with the over-the-top webbing straps.



6.1 Product loaded up to a Code XL headboard

The number of restraints required for loads in freezing conditions when loaded up to a Code XL headboard is shown in Table 3.



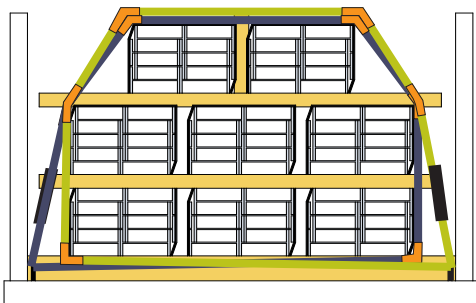
Shown for a 28 t load using webbing straps

Table 3: No. of webbing straps required with a Code XL headboard in freezing conditions

Load weight	Over-the-top straps		Pairs of opposing loops		Total
0-20 t	2	+	6	=	14
20-25 t	2	+	7	=	16
25-28 t	2	+	8	=	18

Note: Trailer decks must be clear of snow and ice before loading.

6.2 Opposing loop webbing straps



A pair of opposing loops using webbing straps and tensioners.

- ✓ Opposing loops must be applied in pairs.
- ✓ Opposing loops to be placed around the full load.
- ✓ A pair of opposing loops requires two tensioners; one for each webbing strap.
- ✓ Avoid any excess slack in the lashing.

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LRG-0017-SS Structural Sections: Bundled using webbing straps British Steel Issue 1

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