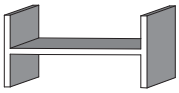
Load Restraint Guideline

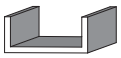
LRG-0016-SS Structural Sections: Bundled using chains

1. This guideline applies to:

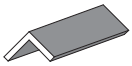
- Structural sections secured in bundles with either tie wires or steel bands.



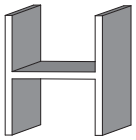
Universal beams



Parallel flange channels



Angles



Universal columns

Mill finish steel-on-steel friction factor μ = 0.49; 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 transport chains compliant with EN 12195-3, minimum 8 mm Grade 8, LC 40 kN.
- Base dunnage must be a single layer of square section timber.
- 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 5 tonnes.
- Side pins are mandatory, 6 pairs recommended.

3. Overview of restraint systems

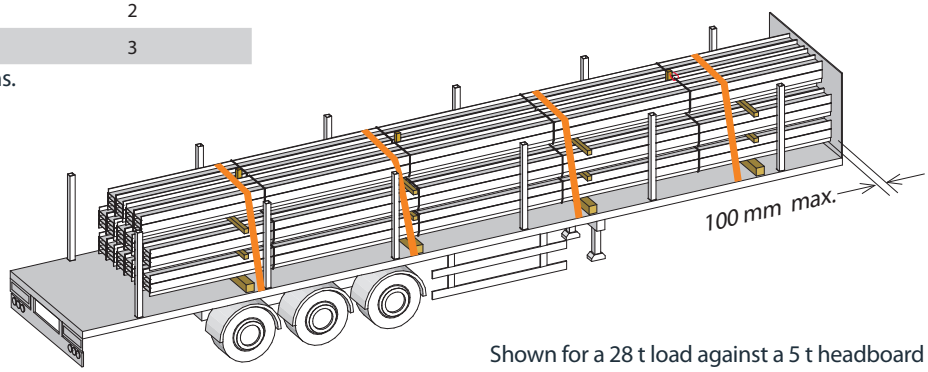
3.1 Product blocked against the headboard

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

Table 1: No. of over-the-top chains when loaded to trailer headboard

Load weight	5 tonne headboard	10 tonne headboard
0-20 t	2	2
20-25 t	3	2
25-28 t	4	3

Valid for both 8 mm and 10 mm chains.

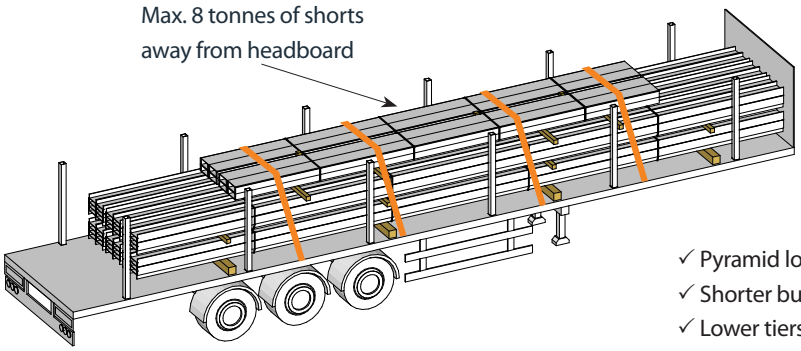


Shown for a 28 t load against a 5 t headboard

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

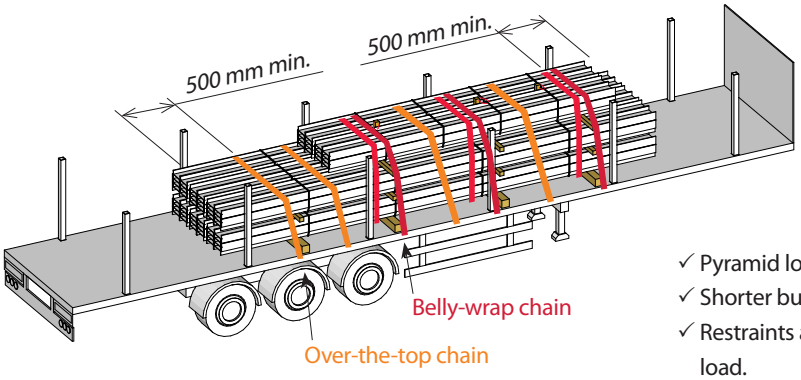
Up to 8 tonnes in the top layer restrained with 4 over-the-top chains - remainder of load blocked to the headboard.



- ✓ Pyramid load build, maximum of 2 bundles on top tier.
- ✓ Shorter bundles placed on top tier.
- ✓ Lower tiers loaded to the headboard (max gap 100 mm - see Section 3.1).
- ✓ 4 over-the-top chains (8 or 10 mm) regardless of headboard strength.
- ✓ Restraints are placed close to dunnage.

3.3 Product loaded away from the headboard

When more than 8 tonnes are loaded away from the headboard restrain using belly-wrap and over-the-top chains as shown in Tables 2 and 3.



- ✓ 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.

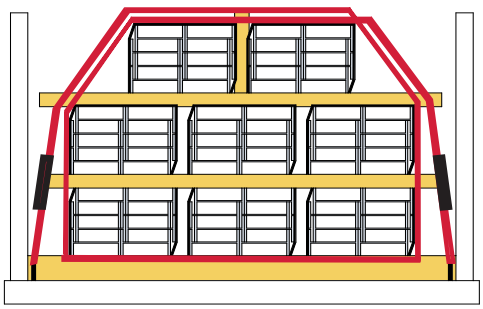
Table 2: 8 mm chains (LC 40 kN)

Load	Belly-wrap		Over-the-top		Total
0-15 t	3	+	1	=	4
15-20 t	3	+	2	=	5
20-25 t	3	+	3	=	6
25-28 t	3	+	4	=	7

Table 3: 10 mm chains (LC 63 kN)

Load	Belly-wrap		Over-the-top		Total
0-15 t	2	+	0	=	2
15-20 t	2	+	1	=	3
20-25 t	2	+	2	=	4
25-28 t	2	+	3	=	5

3.4 Belly-wrap chains



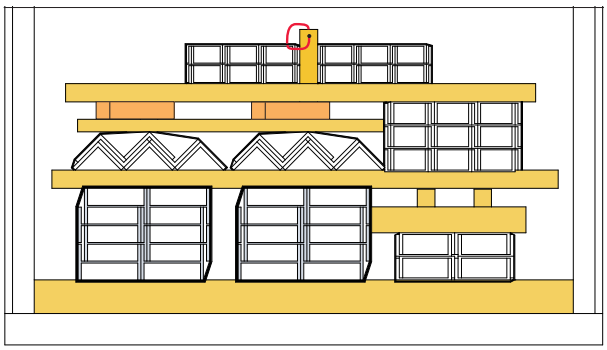
Belly-wrap chain showing tensioners on both sides

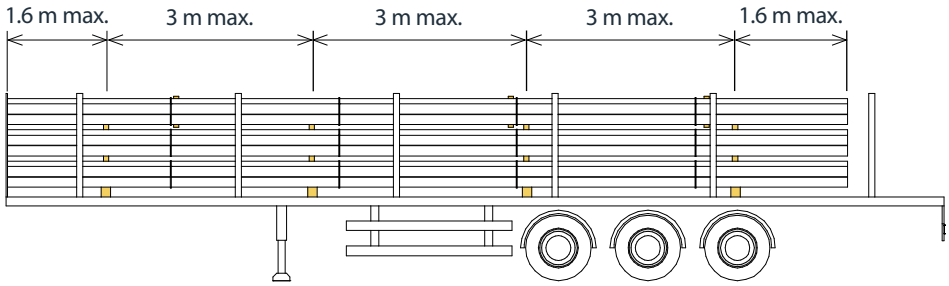
- ✓ A belly-wrap requires two tensioners; one on each side of the product.
- ✓ Belly-wraps to be placed around all tiers of product.
- ✓ Avoid any excess slack in the lashing. If lashing sags and touches the trailer deck, re-tension.
- ✓ Re-check tensions en-route.

4. Pyramid load building

All bundles within the load must be adequately clamped down by the chains.
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.

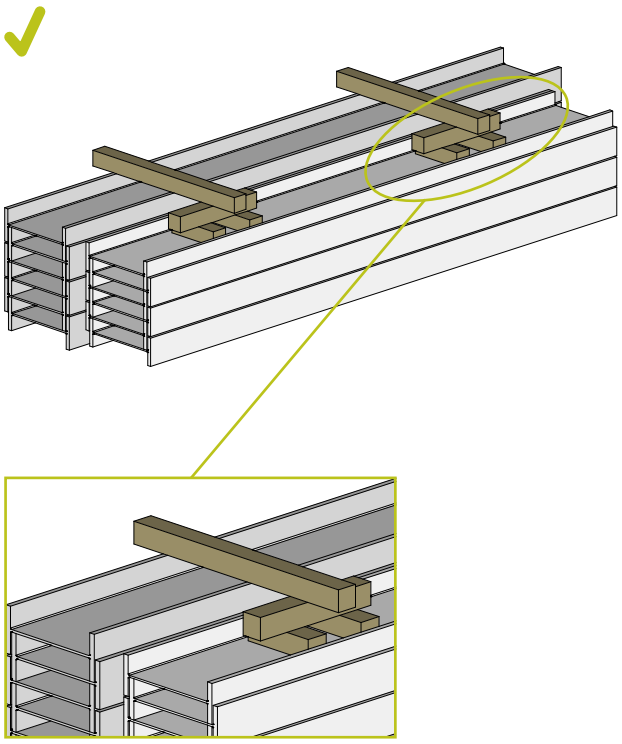


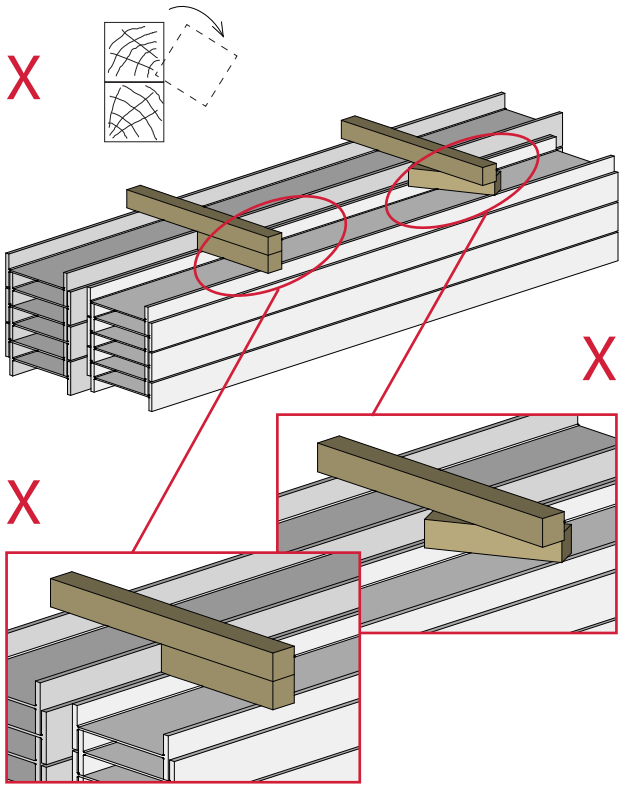


5. Dunnage and grillage examples

- ✓ 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.

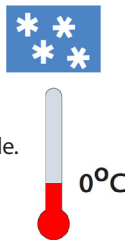
- × Do not balance the corner of timbers on beam flanges.
- × Do not double stack timbers - risk of toppling.





6. Severe winter weather advisory periods

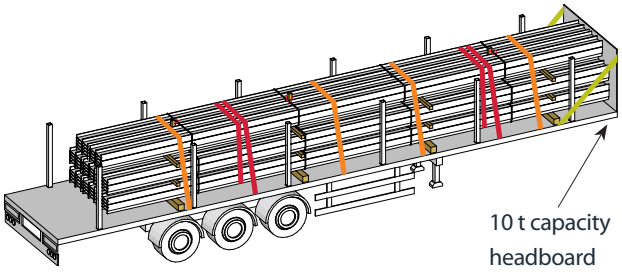
During severe winter weather advisory periods when the air temperature is below 0°C and there is a risk of frost, ice or snow the following restraint system must be used for all loads:



- ✓ Load to the headboard where possible.
- ✓ Pyramid load build.
- ✓ Use correct number of intermediate timbers
- ✓ Block any vertical gaps in the top tier.
- ✓ Use timber grillages to create level stacks.
- ✓ Apply belly-wrap chains with tensioners each side.

6.1 Product loaded up to a 10 tonne capacity headboard

The number of restraints required for loads in freezing conditions when loaded up to a 10 tonne capacity headboard is shown in Table 4.



Shown for a 28 t load using 8 mm chains

Table 4: 8 mm chains required in freezing conditions when loaded to a 10 t headboard

Load	Belly-wrap		Over-the-top		Total
0-15 t	2	+	0	=	2
15-20 t	2	+	1	=	3
20-25 t	2	+	3	=	5
25-28 t	2	+	4	=	6

6.2 Product loaded away from a headboard (or headboard capacity is less than 10 tonnes)

The number of restraints required for loads in freezing conditions when either loaded away from the headboard, or the headboard strength is less than 10 tonnes capacity, is shown in Tables 5 and 6 below.

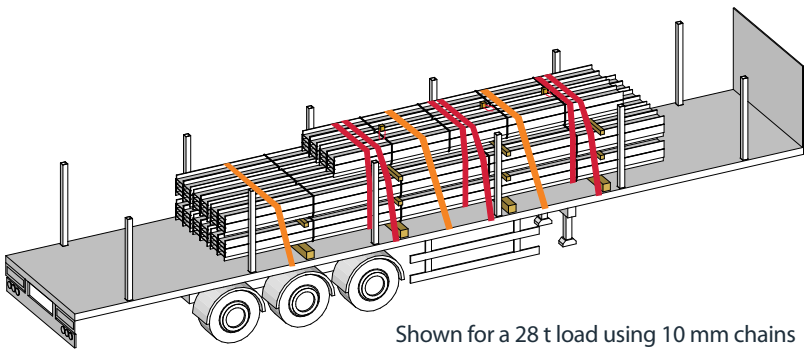
Table 5: 8 mm chains required in freezing conditions

Load	Belly-wrap		Over-the-top		Total
0-15 t	4	+	1	=	5
15-20 t	4	+	2	=	6
20-25 t	4	+	3	=	7
25-28 t	4	+	4	=	8

Table 6: 10 mm chains required in freezing conditions

Load	Belly-wrap		Over-the-top		Total
0-15 t	3	+	0	=	3
15-20 t	3	+	1	=	4
20-25 t	3	+	2	=	5
25-28 t	3	+	3	=	6

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



Shown for a 28 t load using 10 mm chains

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