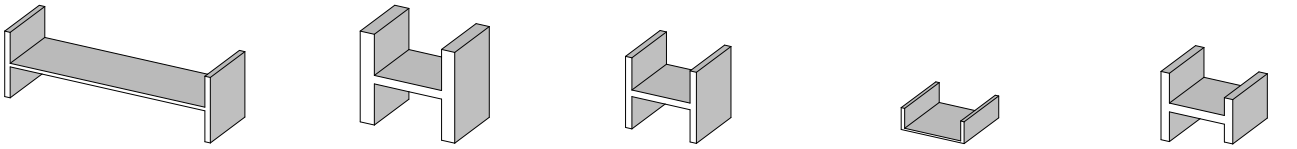
LOAD RESTRAINT GUIDELINE

Non-Bundled Sections using chains
LRG-0102 (Issue 1)

BUILDING STRONGER FUTURES 04/2025

1. This guideline applies to:

- Structural sections as listed below, loaded web horizontal in vertical tiers on timber dunnage.



Universal beams | Universal columns | Universal bearing piles | Parallel flange channels | Asymmetric beams

- Mill finish steel-on-steel static coefficient of friction as determined as per *EN 12195-1:2010 Annex B.1.2 is μ=0.42*

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

2. Essential requirements

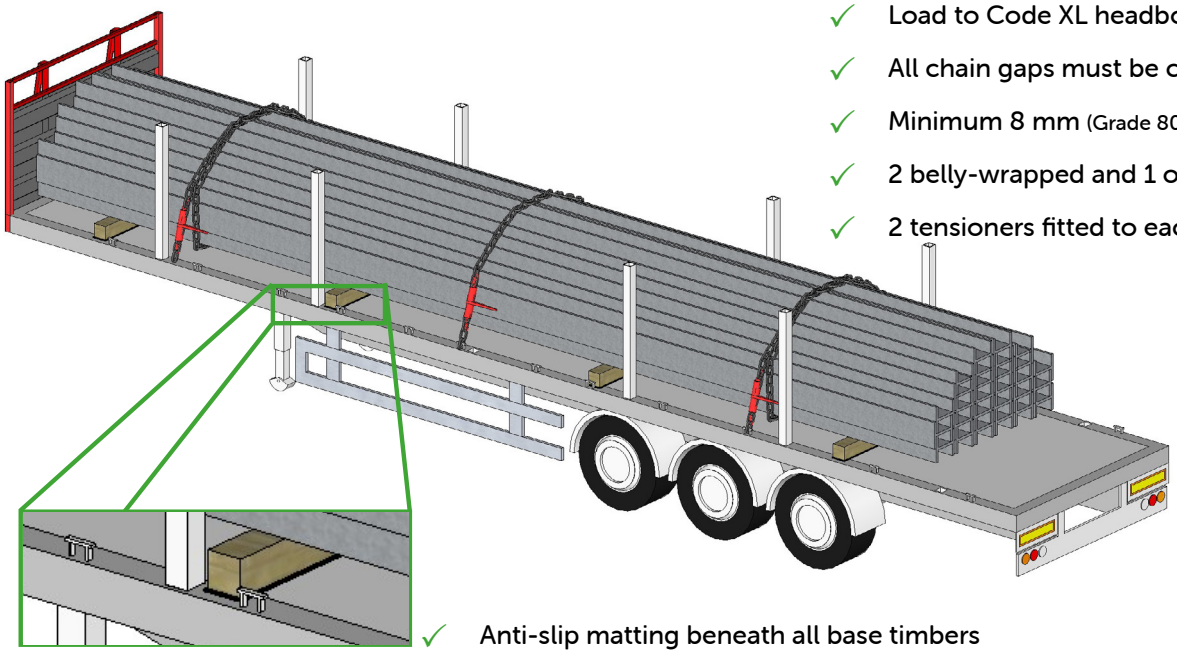
- Trailer headboards must be rated to EN12642 Code XL with a minimum height of 1500 mm.
- Anti-slip matting (minimum of 8mm thick) to be placed beneath ALL base timbers.
- A minimum 4-off full width base timbers with a cross section of 150 mm x 150 mm on standard loads and 5-off on extendable trailers.
- All restraints must be a minimum of 8mm LC 40kN Transport Chains (Grade 80) and must be compliant with EN 12195-3.
- Belly-wraps **MUST** have 2 tensioners applied to each restraint.
- Chain gaps must be controlled at all times as per *TIS-0007 Controlling chain gaps in loads*.
- Side pins fitted for loading and unloading safety on all loads.
- Refer to *TIS-0012 Axle weights and load distribution* for correct product positioning.

3. Overview of restraint system

3.1 UK Road & Export loads (up to 28 tonnes) loaded to a Code XL trailer headboard

For ALL loads up to 28 tonne loaded to Code XL headboard using 8 mm transport chains:

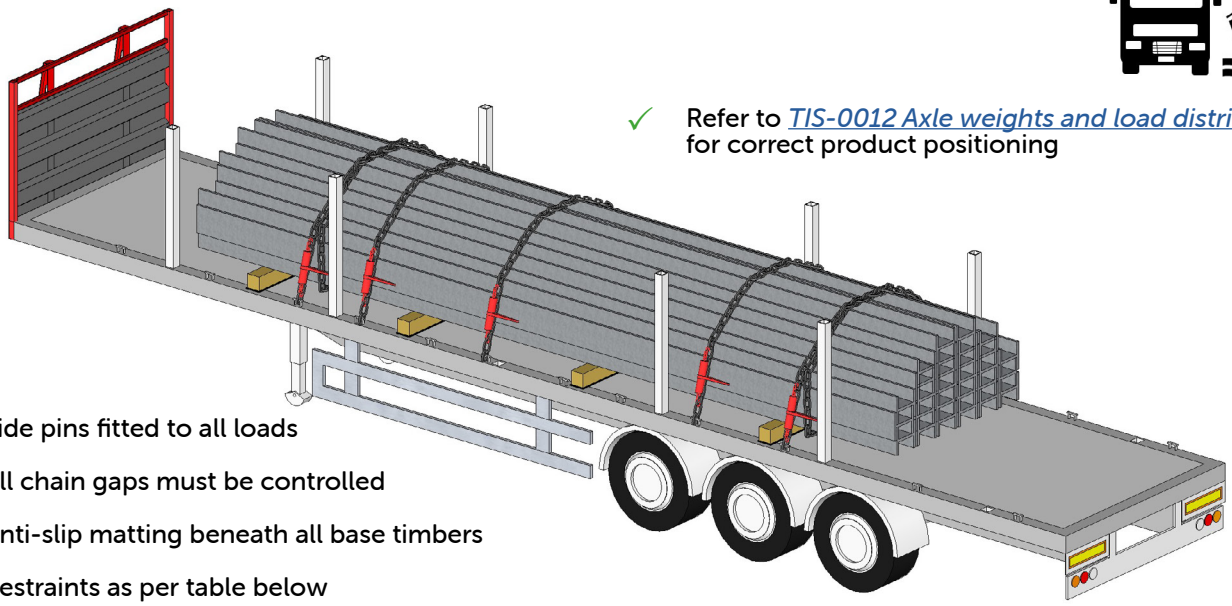
- Restraints are a minimum of 500 mm from front and rear of product.
- Load a maximum of 100 mm from the headboard.



- ✓ Side pins fitted to all loads
- ✓ Load to Code XL headboard
- ✓ All chain gaps must be controlled
- ✓ Minimum 8 mm (Grade 80) LC 40kN chains
- ✓ 2 belly-wrapped and 1 over-the-top chain
- ✓ 2 tensioners fitted to each belly-wrap
- ✓ Anti-slip matting beneath all base timbers

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

3.2 Full UK Road & Export loads (up to 28 tonnes) loaded away from the headboard



✓ Refer to *TIS-0012 Axle weights and load distribution* for correct product positioning

- ✓ Side pins fitted to all loads
- ✓ All chain gaps must be controlled
- ✓ Anti-slip matting beneath all base timbers
- ✓ Restraints as per table below

Example load: 28t secured with 10mm LC 63kN transport chains

Table 1: 8 mm (Grade 80) LC 40kN transport chains

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 2: 10 mm (Grade 80) LC 63kN transport chains**

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

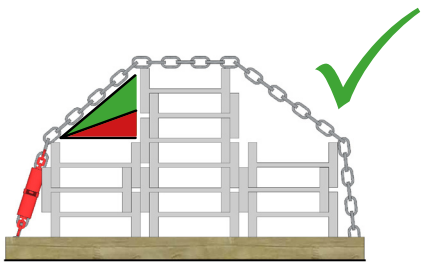
**Painted or galvanised products will require 1 additional belly-wrap restraint applied to the load in addition to the tables above.*
*** For the use of high tensile restraints, the haulier is responsible to ensure the correct grade of chains are being used and must have documented evidence available at the request of British Steel.*

4. Load configuration

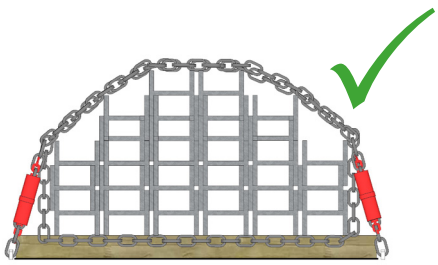
4.1 Pyramid load build

A pyramid load will consist of a maximum of 2 tiers of product in the middle of the load and must have good lashing angles between all tiers.

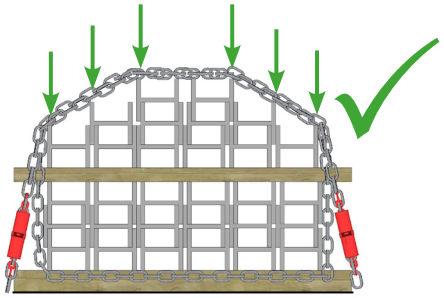
- The chain must deflect by a minimum of 20 degrees from one tier to the next.
- All tiers within the load must be built in a pyramid configuration.
- Where mixed section sizes are loaded in tiers, all product must be able to be restrained.
- Beams and columns must not be loaded together in the same tier.
- Do not load above the height of the headboard.
- Multi-layer loads must maximise the trailer width on lower layers to form a pyramid load build.
- Intermediate timber dunnage must be a minimum of 100 mm x 100 mm square section, and span the full width of the product below.



1 high tier centre of load

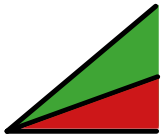


2 high tiers centre of load



Pyramid load with intermediate timbers

Lashing angles between tiers must be 20° or more to prevent product sliding under the restraints!



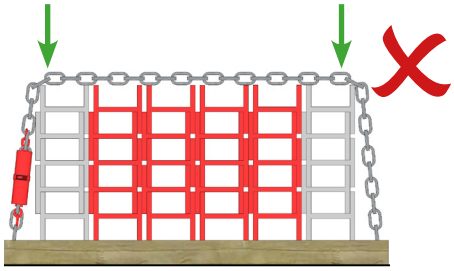
30° and more = **INCREASED CLAMPING**

Less than 20° = **DANGER**

All material within the load must be adequately restrained at all times.

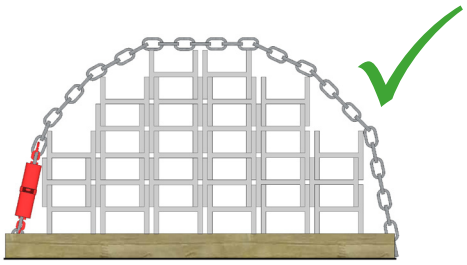
4.2 Square/block load build

- Square/block load configurations are not covered by this Load Restraint Guideline, and therefore this load building method <u>MUST NOT</u> be used.
- Square/block loads must be reconfigured to allow downward clamping to be applied to all products in all tiers. This can be accomplished by introducing intermediate timber dunnage to the load build, or utilising a pyramid load build.



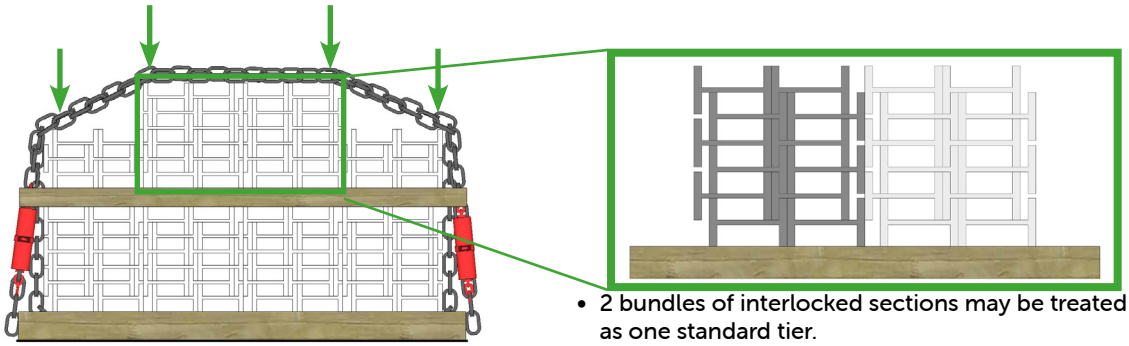
3 or more flat tiers across the load provide no means of securing the load effectively

- Reconfigure the load so that ALL material can be adequately secured.



Redistribute the product to create a pyramid load build

4.3 Interlocked section loads



- 2 bundles of interlocked sections may be treated as one standard tier.
- Maximum of 2 tiers on the top layer of any load.

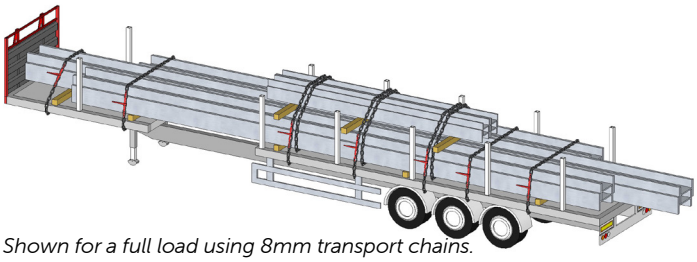
- Testing of this specific load configuration has shown that the belly-wrapped chains in combination with the over-the-top chains will restrain a full load to the forces specified in EN 12195-1:2010 and VDI 2700.

5. Alternative load builds

All loads must comply with the following requirements:

- Evenly distribute the load along, and across the trailer bed.
- Anti-slip matting must be placed beneath all base timbers (minimum of 5-off 150 mm x 150 mm x 2400 mm).
- Trailer headboards must b erated to Code XL.
- Do NOT build the load above the height of the headboard.
- Shorter lengths may be loaded one behind the other.
- Each group of product is to be treated separately to determine the restraint requirements.
- When loading short product on top of long products, belly-wrap restraints must be applied to cover the short product in the load.
- Restraints must NOT be applied across the extended gap of the trailer.

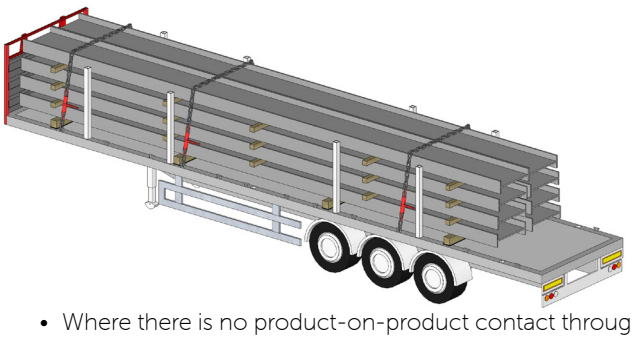
✓ Extender loads



Shown for a full load using 8mm transport chains.

- Do not overload the extended opening of the trailer.
- This can lead to trailer damage and difficulty supporting short lengths adequately.
- Mixed length loads with short length material must be within the *Long Products 6m Rule Guidanace*.

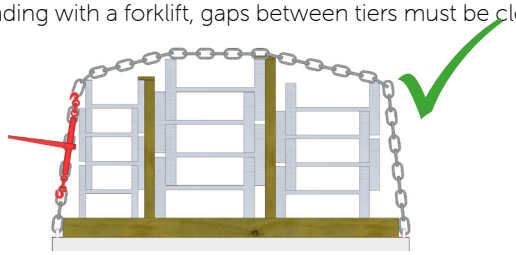
✓ Multi-layer or "Cake-layer" loads



- Where there is no product-on-product contact through the load, 3-off over-the-top restraints can be used to secure the load when blocked to a Code XL headboard.
- Otherwise, belly-wrap restraints <u>MUST</u> be used.

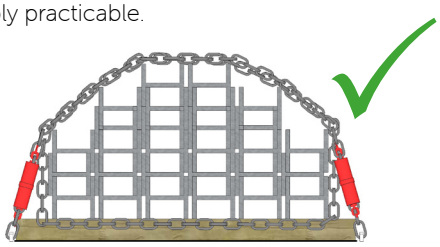
6. Load gaps

- When gaps between tiers are required for loading/unloading, suitable means of controlling the chain gaps must be implemented.
- Vertical dunnage must be securely fixed in place to prevent coming loose in transit.
- When loading with a forklift, gaps between tiers must be closed as far as is reasonably practicable.



All chain gaps fully controlled with suitable timber

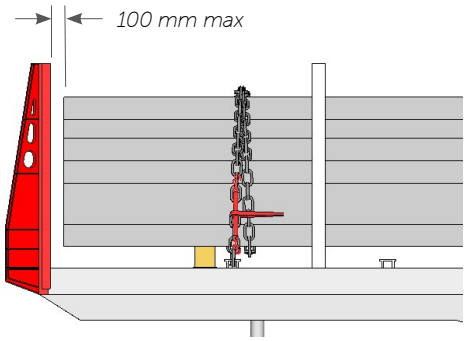
OR

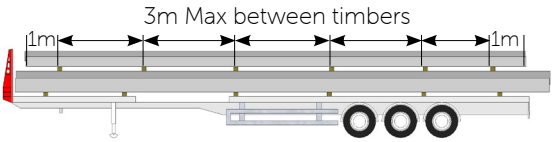


All gaps within the load are closed up

7. Other loading considerations

- For loads blocked to the headboard, a maximum gap to the headboard of 100 mm is permissable to allow the application of lifting equipment for off-loading operations.
- Anti-slip matting must be placed beneath all base timbers (minimum of 4-off 150 mm x 150 mm x 2400 mm) for all loads.
- Product may be loaded away from the headboard to achieve correct axle loadings where belly-wrap restraints **MUST** be used - Refer to TIS-0012 Axle weights and load distribution for further guidance.
- Maximum load height above the trailer deck of 1500mm.
- Where product-on-product contact occurs within the load build, belly-wrap restraints **MUST** be applied to the load.
- Where there is no product-on-product contact through the load, over-the-top restraints can be used to secure the load when **blocked** to a Code XL headboard.
- Intermediate dunnage to be placed 1 metre from ends of the shortest product, with a maximum spacing of 3 metres between each timber.

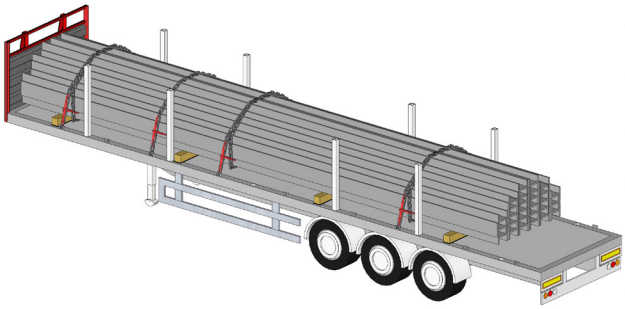




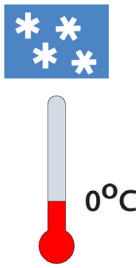
8. Winter weather advisory periods

During Winter Weather Advisory Periods, additional restraints must be applied to compensate for any build up of ice on the product or within the load.

8.1 Blocked to a Code XL headboards



- ✓ Side pins fitted to all loads
- ✓ Load to Code XL headboard
- ✓ Anti-slip matting beneath all base timbers
- ✓ All chain gaps must be controlled
- ✓ 3 belly-wraps and 1 over-the-top restraint
- ✓ 2 tensioners fitted to each belly-wrap



8.2 Loaded away from the headboard

Table 1: 8 mm (Grade 80) LC 40kN transport chains

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 2: 10 mm (Grade 80) LC 63kN transport chains**

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

**Painted or galvanised products will require 1 additional belly-wrap restraint applied to the load in addition to the tables above.*

*** For the use of high tensile restraints, the haulier is responsible to ensure the correct grade of chains are being used and must have documented evidence available at the request of British Steel.*

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