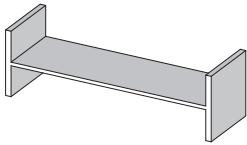
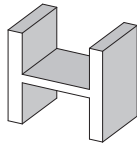


1. This guideline applies to:

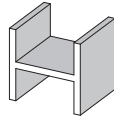
- Structural sections as listed below, mill finish only, loaded web horizontal in vertical tiers on timber dunnage.



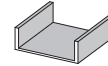
Universal  
beams



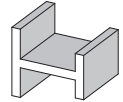
Universal  
columns



Universal  
bearing piles



Parallel flange  
channels



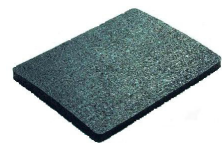
Asymmetric  
beams

Mill finish steel-on-steel static coefficient of friction  $\mu = 0.42$ ; tested according to EN 12195-1:2010 Annex B.1.2.

Note: With base timbers on anti-slip matting, the effective coefficient of friction for sideways forces is taken to be 0.6 due to the fact that the sections will mechanically lock into the softwood timbers, and are interlocked within each stack.

2. Essential requirements

- All restraints must be webbing straps compliant with EN 12195-2, minimum lashing capacity LC 2000 daN.
- Anchor points rated to same capacity as the lashing equipment as a minimum.
- Edge protection must be fitted at all points of contact with the steel sections and chassis.
- Base dunnage must be a single layer of square section timber, sat on anti-slip matting.
- Minimum 4-off base dunnage.
- Side pins fitted. (Omitted for clarity on some images).



3. Overview of restraint system

- ✓ Pyramid load build - see Section 4.
- ✓ **Over-the-top** webbing straps - see Table 1 or Table 2.
- ✓ Ratchets placed on alternating sides.
- ✓ Straps can be attached to the chassis if there is insufficient number of lashing points.

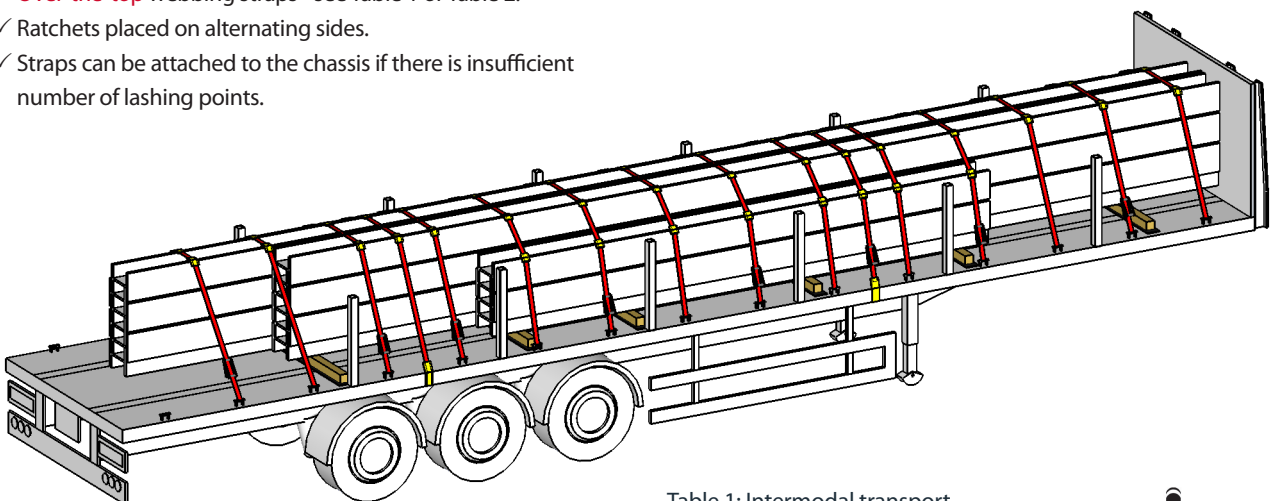


Table 1: Intermodal transport  
(road, ferry and rail).

Number of straps required.



Load	LC 2000 daN	LC 2500 daN	LC 5000 daN
15-20 t	11	9	5
20-25 t	14	11	6
25-28 t	16	13	7

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

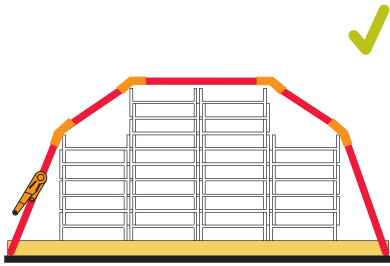
#### 4. Load configuration

##### 4.1 Block

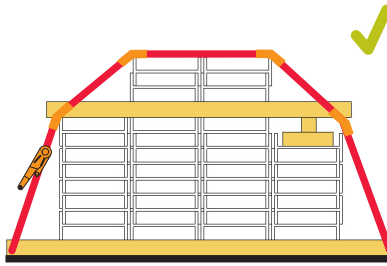
× Block configuration loads cannot be restrained using over-the-top lashings alone. Only the 2 outer tiers are clamped down, leaving the middle tiers to slide.



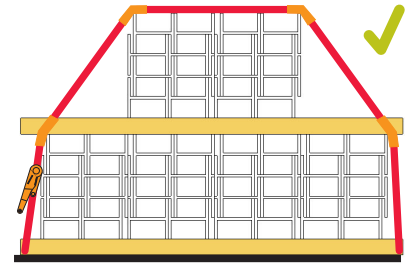
##### 4.2 Pyramid



Pyramid load build

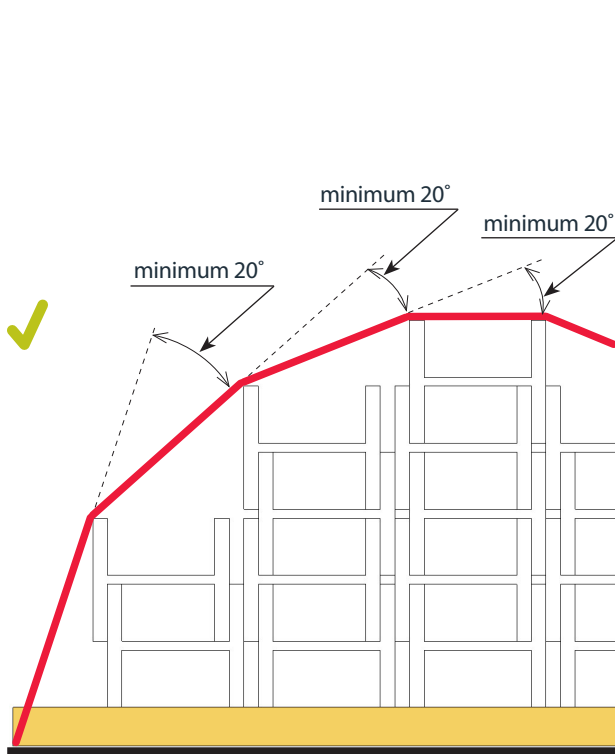


Pyramid load with intermediate dunnage

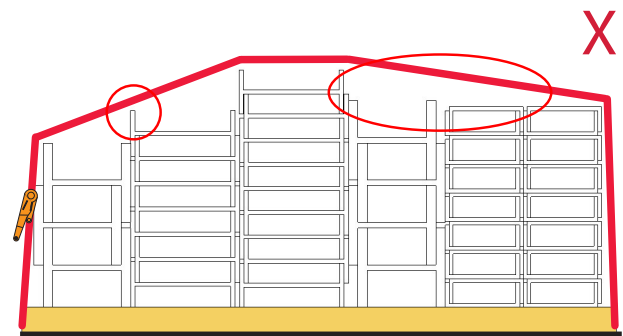
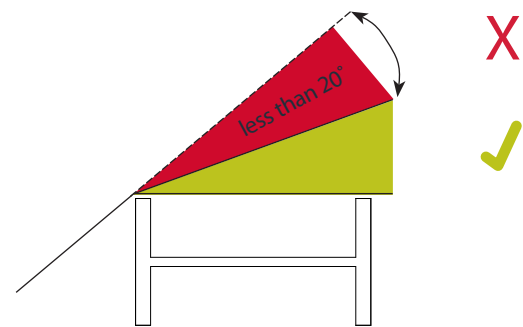


Pyramid load of interlocked section bundles

- ✓ Loads must be built to achieve clamping on all tiers/bundles.
- ✓ Maximum of 2 tiers, or 2 bundles of interlocked sections, may be placed on top of the intermediate dunnage.
- ✓ When using intermediate dunnage, ensure that any differences in tier heights are adequately packed with timber grillages.
- ✓ The lashing must deflect by a minimum of 20 degrees from one tier/bundle to the next:



Edge protection omitted for clarity.



Edge protection omitted for clarity.

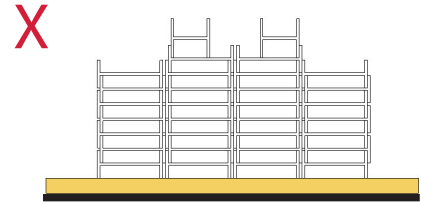
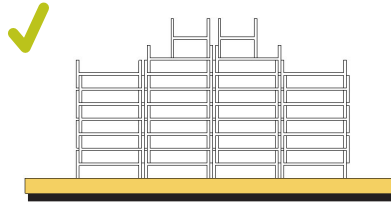
- ✓ The lashing must deflect by a minimum of 20 degrees from one tier to the next.

- × No contact with some tiers and negligible lashing deflection on others.

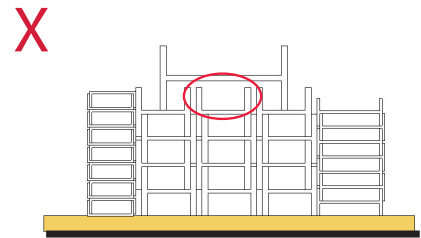
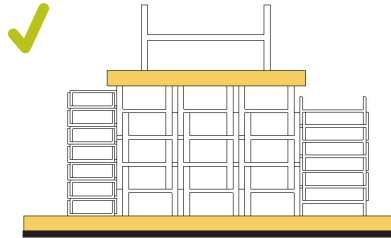


#### 4.3 Load build do's and don'ts

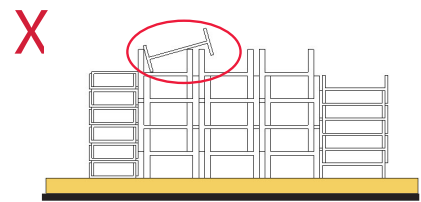
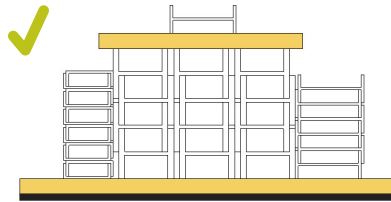
✓ Narrow sections placed on top must be positioned towards the centre of the trailer.



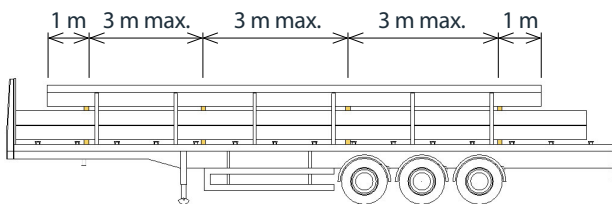
✓ Wide beams placed on top must only span two tiers or be positioned on the intermediate dunnage.



✓ Product placed on top must sit with both its flanges on the webs of the 2 tiers below it or be positioned on intermediate dunnage.

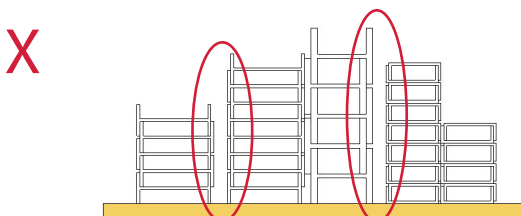
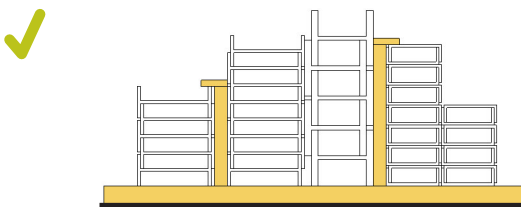


#### 5. Intermediate dunnage



- ✓ Intermediate timber dunnage must be a minimum of 100 x 100 mm square section and span the full width of the product below it.
- ✓ Intermediate dunnage to be placed 1 metre from ends of shortest product and a maximum spacing of 3 metres between each.

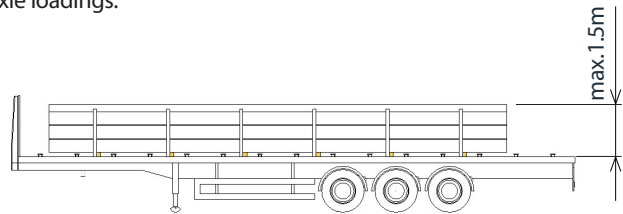
#### 6. Gaps between tiers



- ✓ When gaps between tiers are required for loading/unloading, then suitable means of controlling the gaps must be implemented.
- ✓ Vertical dunnage must be securely fixed in place to prevent this coming loose in transit.
- ✓ When loading with a forklift, gaps between tiers must be closed as far as is reasonably practicable.
- ✗ Do not leave any uncontrolled gaps in the load - this will cause straps to come loose in transit.

## 7. Other loading considerations

- ✓ Maximum product height above the trailer deck is 1.5 metres.
- ✓ Product may be loaded away from headboard to achieve correct axle loadings.



## 8. Edge protection

- ✓ Suitable edge protection is required at all points of contact between webbing strap and product.
- ✓ Heavy duty webbing sleeves are recommended.



- ✗ Thin PVC webbing sleeves do not provide sufficient protection on steel products.
- ✗ Cardboard and plastic angles are not suitable; the webbing strap slides off and does not tension up.
- ✗ Anti-slip matting is not an acceptable form of edge protection.



## 9. 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 present in the load, the following restraints are required:

- ✓ Use dry timbers where possible.
- ✓ Use number of straps as specified below:

Table 2: Winter intermodal transport (road, ferry, rail).  
Number of straps required.

Load	LC 2000 daN	LC 2500 daN	LC 5000 daN
15-20 t	14	12	6
20-25 t	17	14	7
25-28 t	19	15	8



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