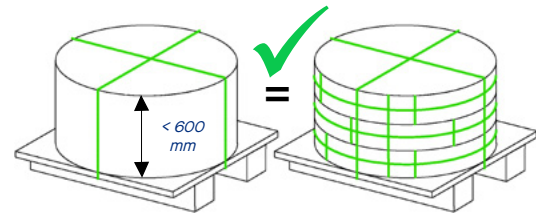


# Load Restraint Guideline

## Mini Top Hats

### 1. This Guideline applies for:

- Restraint of bore vertical, slit coils, less than 600 mm wide, strapped securely to timber pallets. These coils are commonly known as “Mini Top Hats”.
- Mini Top Hats may consist of a single slit coil or multiple slit coils strapped together on a pallet, with or without dunnage in-between.



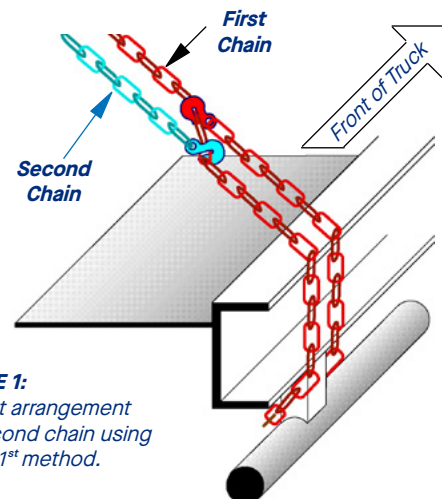
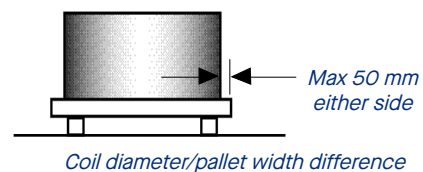
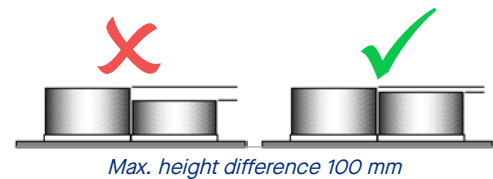
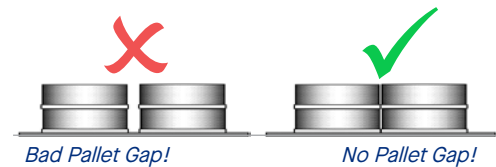
(Thin slits strapped together should be considered as one slit of equal width when palletised).

### 2. Essential Requirements

- ✓ The coil(s) must be strapped securely to the timber pallet and act as one unit.
- ✓ All restraints must be 8 mm transport chain, assumed 3.0 tonnes lashing capacity.
- ✓ Coils may be stacked two abreast, two high maximum (see Section 3.1), or any combination there under e.g. pyramid stacks (see Section 3.2); or two abreast, single high (see Section 3.3).
- ✓ **No stack is to exceed the maximum weights shown in Table 1** on page 2 (i.e. the total of all coils may be up to the weight shown).
- ✓ Coils must be positioned side by side over the centre of the trailer, with the pallets butted against each other.
- ✓ The height variation between adjacent, two abreast stacks must not exceed 100 mm. Both stacks should be similar in diameter and the coils on each side to be essentially equal in weight.
- ✓ For coils where the coil diameter is smaller than the pallet width (maximum 50 mm difference allowed), a polyurethane corner or other wedge should be placed between the top of the two coils. This will stop the coils moving together and the chains loosening, or the steel strapping from breaking.
- ✓ If two chains are required, they **must** be applied by the “2<sup>nd</sup> off 1<sup>st</sup>” chaining method, as per Figure 1 opposite. Refer also to the guideline “Chaining - 2<sup>nd</sup> off 1<sup>st</sup> Method”.
- ✗ Webbing lashings must NOT be used. Their stretch and the curved top of the coils make them unsuitable.
- ✓ For additional essential requirements specific to each stack configuration see the relevant section on the following pages.



**Two abreast, two high maximum!** Stacks above this are NOT suitable using this guideline and require special restraint methods.



**FIGURE 1:** Correct arrangement for second chain using 2<sup>nd</sup> off 1<sup>st</sup> method.

### 3. Restraint System

**Table 1. Maximum Weight per Stack\* (Sum of All Coils)**

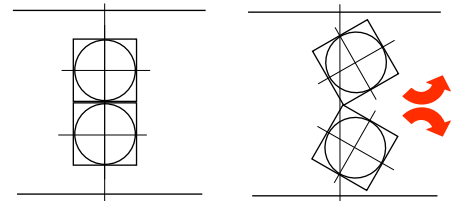
Number of Chains	Weight Limit# (Tonnes)
One (1) chain	0 to 3.4
Two (2) chains	3.4 to 6.8

\* For key assumptions in Table 1 see page 3 opposite. **Limits in Table 1 apply to all stack configurations in Sections 3.1, 3.2 and 3.3.**

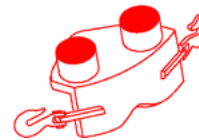
# Limits for 8 mm chain of either 3.0 or 4.0 tonnes Lashing Capacity. If using 7.3 mm chain of 2.3 tonnes LC, all values should be 75% of those shown.

#### 3.1 Two Abreast, Two High Stacks

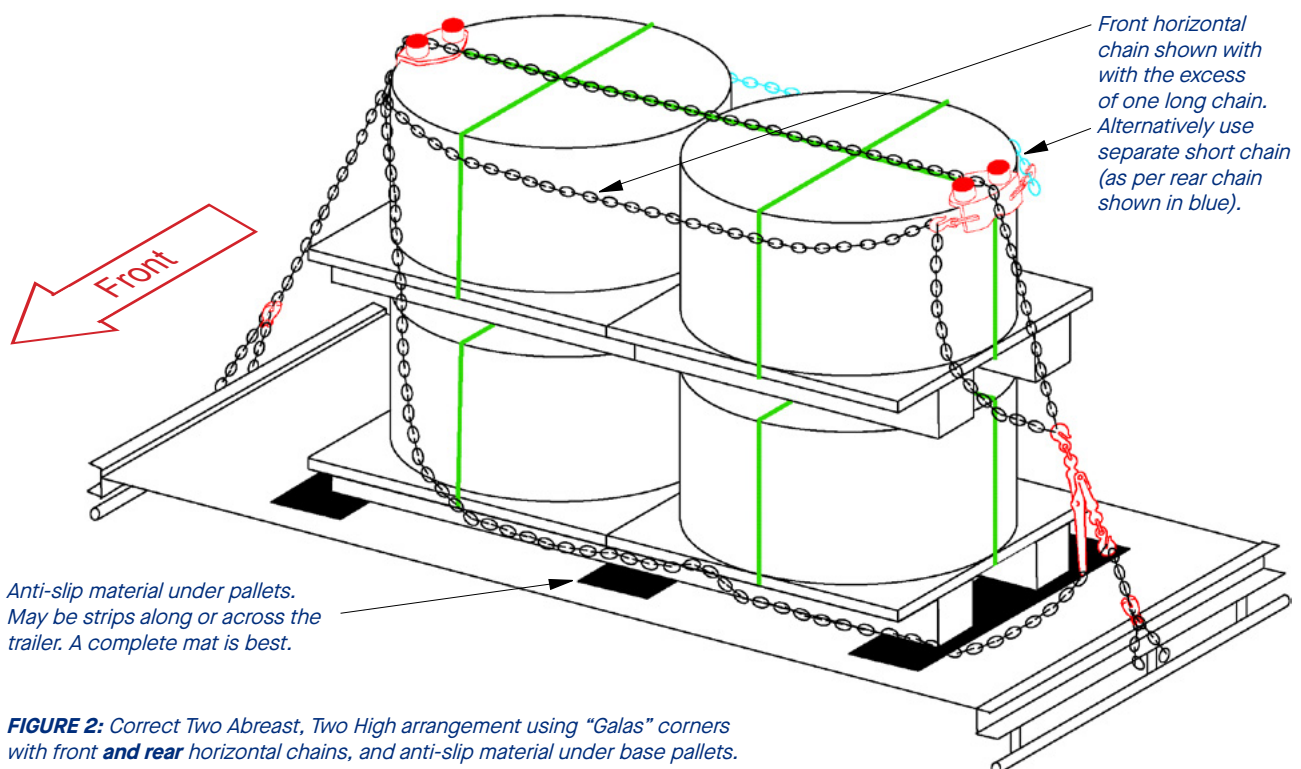
- ✓ To stop the base coils “rotating out” during heavy forward braking, anti-slip material **must** be placed under the pallets between the trailer deck (see Figure 2 below). Conveyor belting is not suitable.
- ✓ To stop the top coils “diving under” chains or “rotating out” under force, **Galas corners with a front and rear horizontal chain must be used.** (See Figures 2 and 3).



Use anti-slip and Galas corners to stop rotation



Galas corners must be used with a horizontal chain to stop sliding and rotation



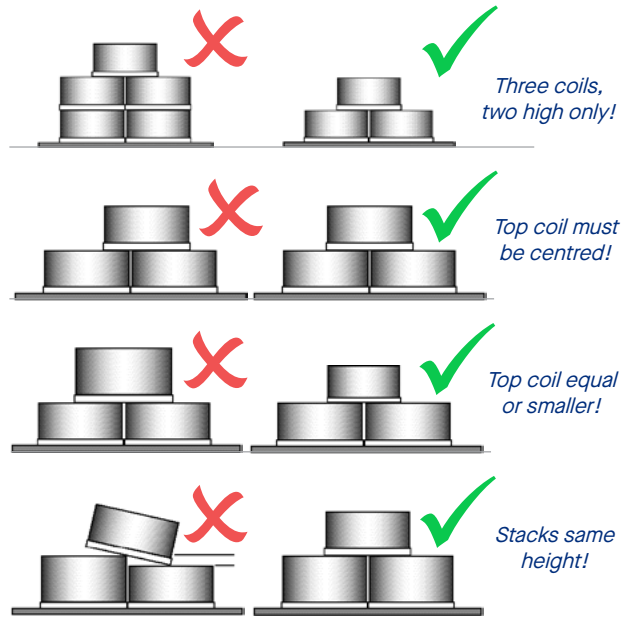
**FIGURE 2:** Correct Two Abreast, Two High arrangement using “Galas” corners with front **and** rear horizontal chains, and anti-slip material under base pallets.

### Key Assumptions in Table 1

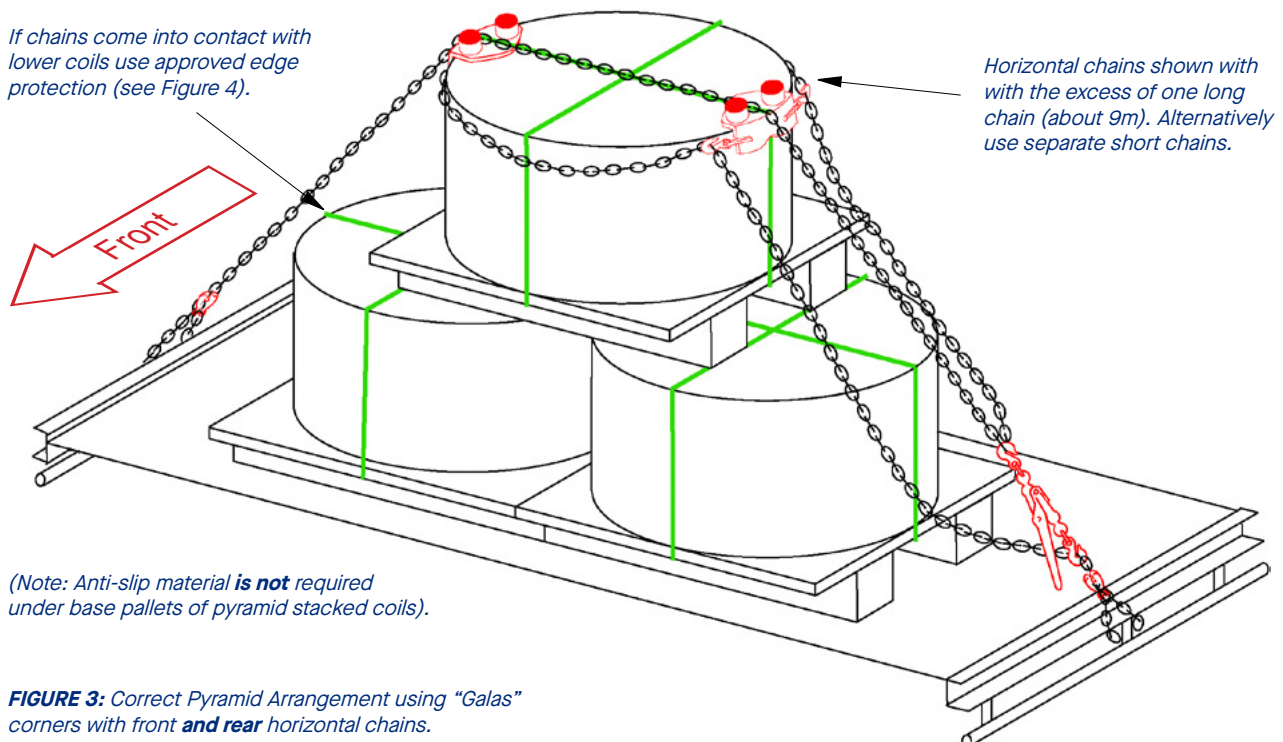
1. All coils are equal weight OR lightest coils on top, heaviest on bottom. Coils on each layer are the same size.
2. Tops of coils covered with corflute with low friction, under forward forces: dynamic  $\mu = 0.32$ , under sideways forces: static  $\mu = 0.40$ .
3. Base of pallet is raw hardwood, dynamic  $\mu = 0.40$ .
4. All chains dogged to minimum 750 kgf (firm tension).
5. Assumed lashing angle is 60° minimum.
6. Chain lashing capacities have been down rated by 50% under dynamic conditions to minimise movement of coils. Under braking up to 100 mm of forward movement is acceptable.
7. Allowable mass limits for 8 mm chain of either 3.0 or 4.0 tonnes lashing capacity are the same for the above reason.

### 3.2 Pyramid Stacks

- ✓ Three coils, two high i.e. two coils on the bottom side by side (two abreast) and one coil on top.
- ✓ To stop the top coil “diving under” the chains under force, **Galas corners with a front and rear horizontal chain must be used.** (See Figures 2 and 3).
- ✗ Ordinary polyurethane corner protectors without the horizontal chain do not comply and are NOT to be used in place of Galas corners.
- ✓ The top coil must be centred over the lower two abreast coils. And must be smaller than, or equal to, the coils underneath it.
- ✓ The height of adjacent two abreast stacks must be the same and both stacks should be similar in diameter.



If chains come into contact with lower coils use approved edge protection (see Figure 4).



(Note: Anti-slip material **is not** required under base pallets of pyramid stacked coils).

**FIGURE 3:** Correct Pyramid Arrangement using “Galas” corners with front **and** rear horizontal chains.

### 3.3 Two Abreast, Single High Coils

- Mini Top Hats not secured with Galas corners, as per sections 3.1 and 3.2, must be loaded two abreast, single high only.**
- To stop the coils “rotating out” during heavy forward braking, anti-slip material **must** be placed under the pallets between the trailer deck (see Figure 4 below). Conveyor belting is not suitable.
- Approved corner protectors e.g. polyurethane corners, must be placed between the chains and the top of the coil.
- For more details refer to the BlueScope Steel Load Restraint Guideline for ‘Two Abreast Bore Vertical Coil’. (See picture opposite for example).

BV

BV

**Load Restraint Guideline**  
Bore Horizontal Coil – Two Abreast

**1. This Guideline applies for:**

- Restraint of bore vertical, sheet metal coils strapped securely to timber pallets in accordance with BlueScope procedure (ACSPPS-Q044). These coils are commonly known as “Top Hat”.

**2. Essential Requirements**

- ✓ All restraints must be 8 mm transport chain, assumed 3.0 tonnes Lashing Capacity (see AS/NZS3844 for details).
- ✓ Position coils about the centre of the vehicle deck, with pallets butted against each other.
- ✓ The height variation between adjacent two abreast coils must not exceed 100 mm. Both coils must be similar in diameter.
- ✓ No coil to be loaded the maximum coil weights shown in Table 1 or 2 for the given chain arrangement (shown in Section 3).
- ✓ Coils should be equal to, or slightly smaller than, the pallet with a maximum 50 mm difference (eg. 25 mm either side).
- ✓ Webbing lashings must NOT be used. Their stretch and the curved top of the coil makes them unsuitable.
- ✗ Do NOT load coils if the packaging is not in a sound condition. There should be 2 tight steel straps around the coil and pallet, at 90 degrees to one another.
- ✗ Timber pallets must NOT have visible faults such as broken bearers or corners.

**3. Restraint System**

**3.1 Poly Corners - Non Preferred Method**

- ✓ Where Poly corners are used two chains are required, they MUST be applied by the “2nd off” method, as per Figure 2.
- ✓ Chains are to be placed as close to the centre of the pallet as possible.
- ✓ Anti-slip rubber must be used under both pallets, as per Figure 3.

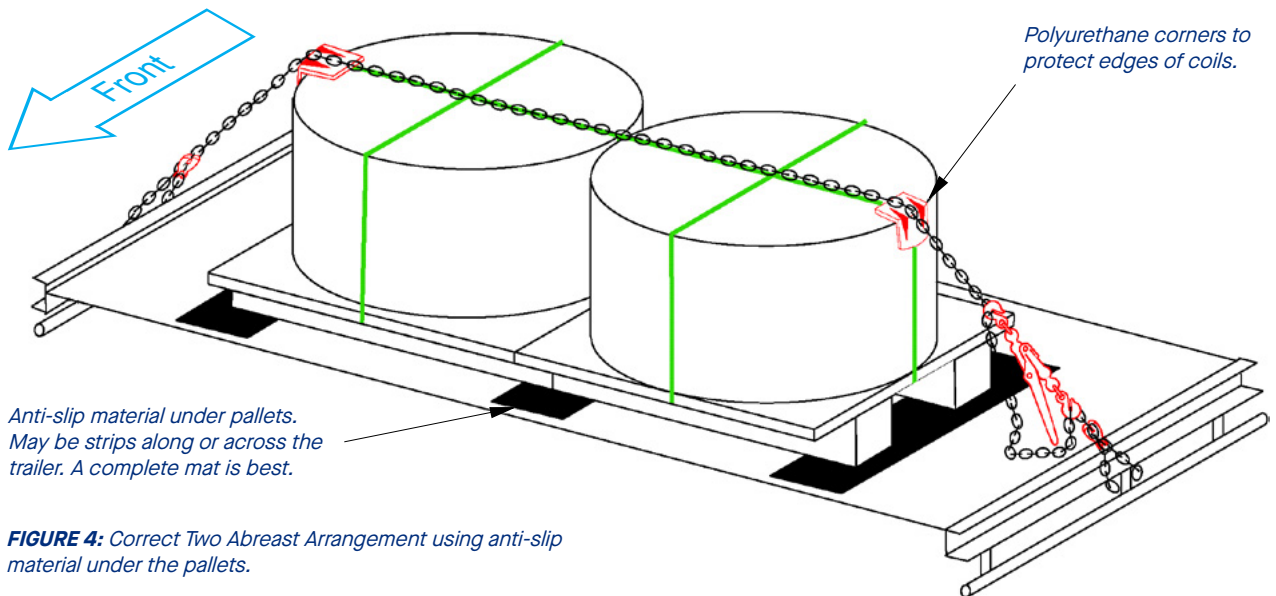
**Table 1. Maximum Individual Coil Weight (Tonnes)\*\***

Coil height or Sheet width (mm)	2 Chains 2nd off 1st Only
600 to 950	0-4.5
951 to 1100	0-4.6
1101 to 1200	0-3.9
1201 to 1300	0-3.3 <sup>†</sup>
1301 to 1500	0-3.3 <sup>†</sup>

\*\*Notes: † For coils greater than 1200 mm high or 1200 mm wide. ‡ Corner protectors, Table 2. †† Only when used with the 2nd off method. ††† Must be used under both pallets.

Page 1 of 2

© 2008 to 2024 BlueScope Steel  
Copyright © BlueScope Steel  
10 April 2024



**FIGURE 4:** Correct Two Abreast Arrangement using anti-slip material under the pallets.

#### Warning!

- Coils greater than 600 mm wide or exceeding the specified weight limits in Table 1 are NOT suitable using this guideline. Larger coils as such, must be restrained according to the BlueScope Steel Load Restraint Guideline for ‘Two Abreast Bore Vertical Coil’ or ‘Single File Bore Vertical Coil’.
- Coils stacked more than two abreast, two high, are NOT suitable using this guideline and require special restraint methods. For further information contact the Technical Services Group - Logistics, on +61 2 8707 2350.

*“These guidelines are provided to you by BlueScope Steel for guidance only, and compliance with applicable laws and standards remains your responsibility. Whilst BlueScope Steel, in cooperation with transport operators, has taken considerable care to develop load restraint guidelines that are effective and comply with all requirements, BlueScope Steel makes no warranty as to the applicability of these methods in all circumstances. It remains your responsibility at all times to ensure that the methods you use are adequate for the particular situation and where appropriate you should take further precautions. The contents of these guidelines are confidential to and the property of BlueScope Steel, and you may only use these guidelines with permission from BlueScope Steel.”*