

LOAD RESTRAINT GUIDELINE

Building Envelope Panels - UK

1. This guideline applies to:

- Building Envelope Panels film wrapped.
- Lowest packaged product on product friction factor $\mu = 0.36$; tested according to EN 12195-1:2010 Annex B.1.2.

2. Equipment requirements

- All webbing straps must be compliant with EN 12195-2, minimum lashing capacity LC 2000 daN.
- Hammock straps can be used for the **over-the-top** and **opposing loop** restraints on panels if preferred.
- Headboard or forward blocking to cover the front of the load or facilities available to apply cross-over straps, see Section 4.
- Headboard must be capable of withstanding a force of 100 kN i.e. approximately 10 tonnes. See Technical Information Sheet *TIS-0010 Trailer headboards* for more information.
- Side pins are recommended for loading and unloading safety.
- Plastic wrapping/ cling film must be sufficient in quantity to withstand transportation and movement of the load.

3. Overview of restraint system for road transport panel loads

- ✓ Load against the headboard.
- ✓ When loading product behind a stack in front, keep the gap between 50 - 100 mm.
- ✓ Apply 4 **over-the-top** restraints and 2 pairs of **opposing loop** restraints.
- ✓ Edge protection must be used on bottom corners.

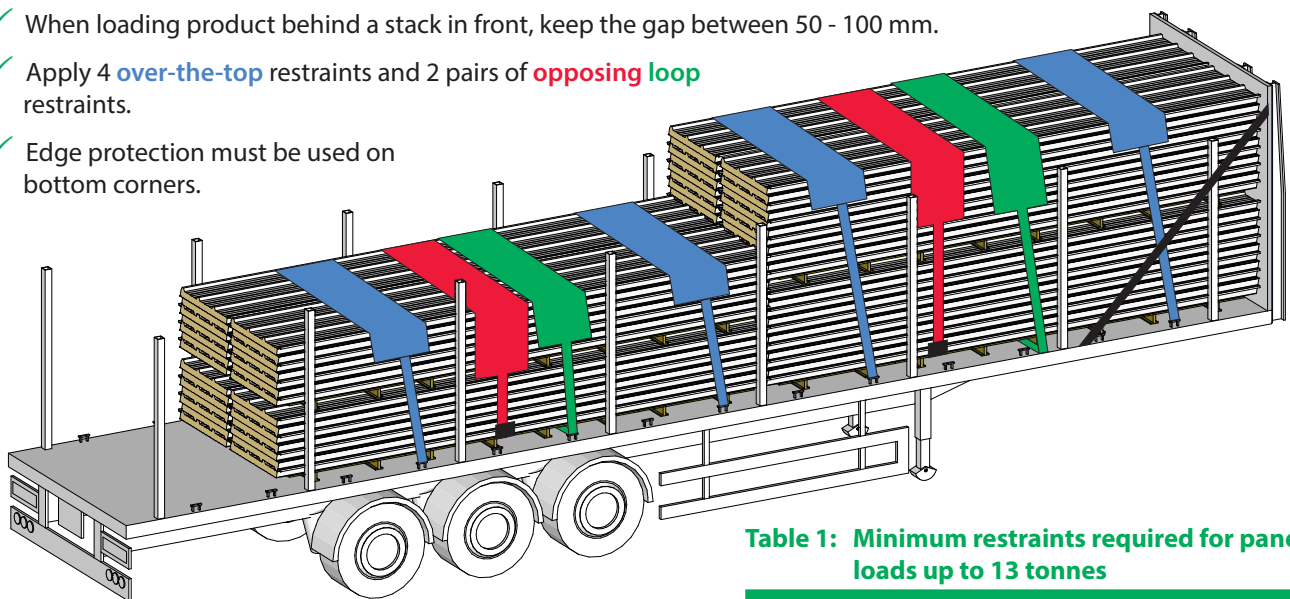


Table 1: Minimum restraints required for panel loads up to 13 tonnes

| Transport method | Over-the-tops | Pairs of opposing loops | Total straps |
|------------------|---------------|-------------------------|--------------|
| Road | 4 | + | 2 = 8 |

Shown for a 13 t load against a 10 t headboard road transport only.

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. Due to the nature of the product the Standard Tension Force is assumed to be 100 daN or higher.

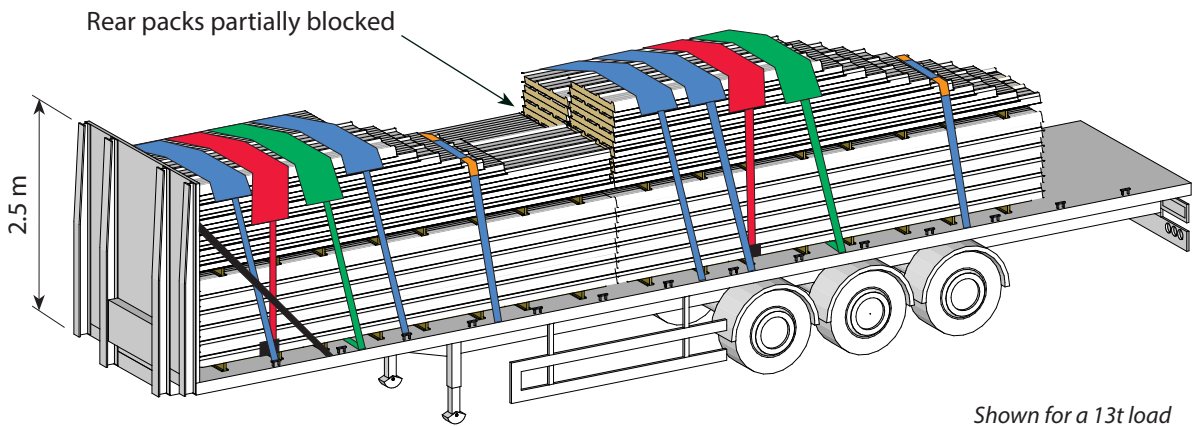
LOAD RESTRAINT GUIDELINE

Building Envelope Panels - UK

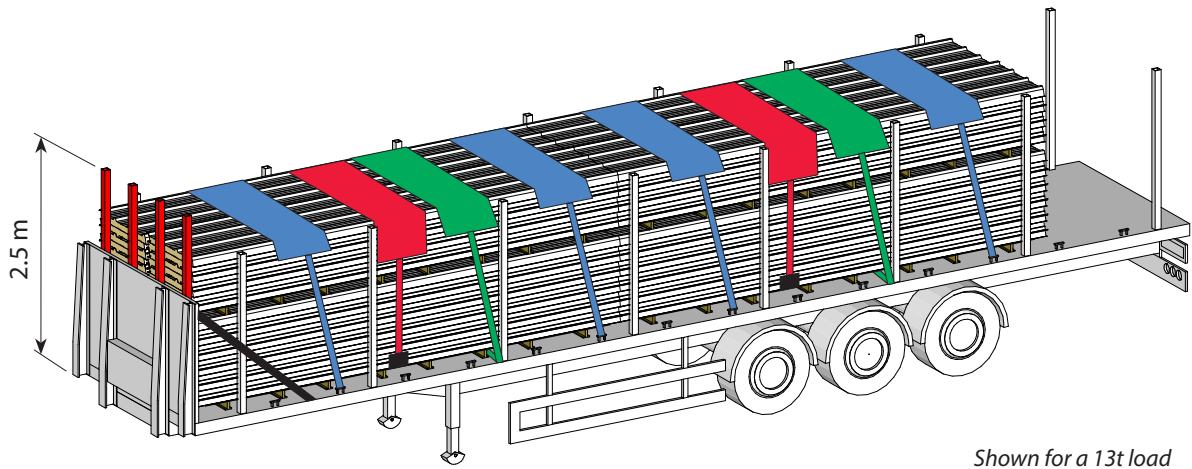
4. Forward restraint options

The following options can be used for forward blocking of the load.

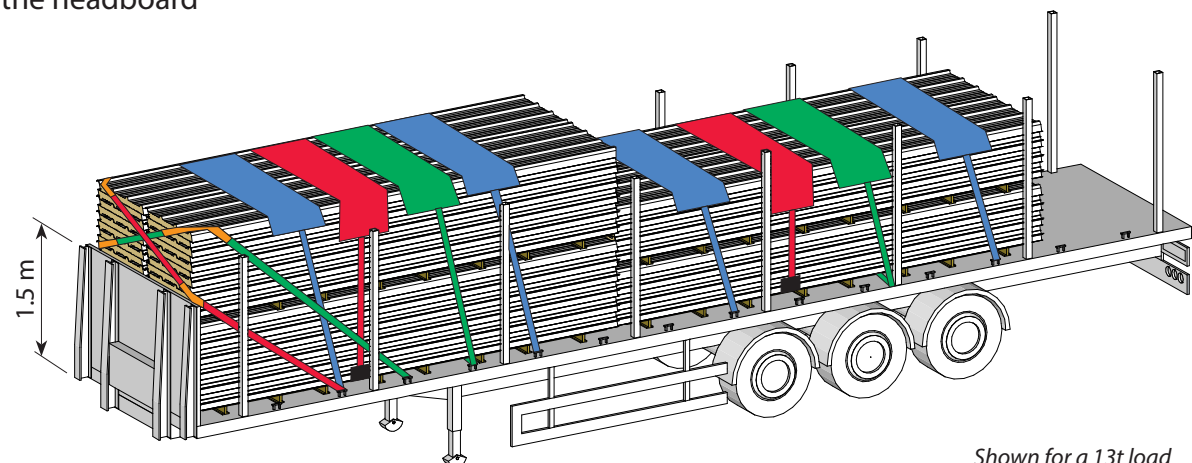
4.1 Staggered load with rear packs partially blocked, front pack loaded up to the headboard



4.2 Product blocked against 2.5 metre headboard posts



4.3 Product blocked against a 1.5 metre headboard with cross-over straps around the product above the headboard



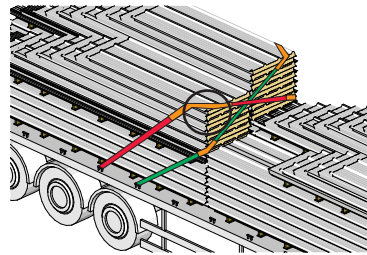
LOAD RESTRAINT GUIDELINE

Building Envelope Panels - UK

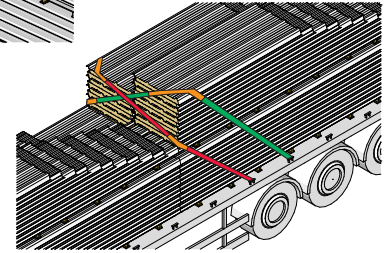
5. Strapping arrangements

5.1 Cross-over webbing straps

- ✓ Wrapped around all unblocked packs of product.
- ✓ Edge protection must be used.
- ✓ Webbing strap must locate on the top corner of the product to ensure it does not slip off.
- ✓ At least two webbing straps must be used.
- ✗ Not to be used as a substitute for over-the-top restraints or opposing loops.

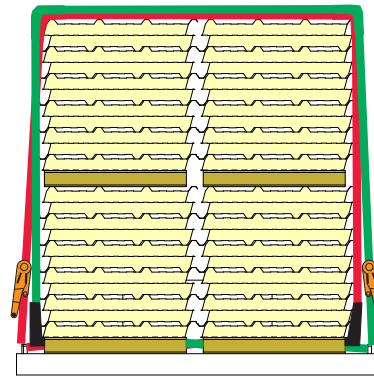


Note: Other restraints and side pins omitted for clarity



5.2 Opposing loop webbing straps

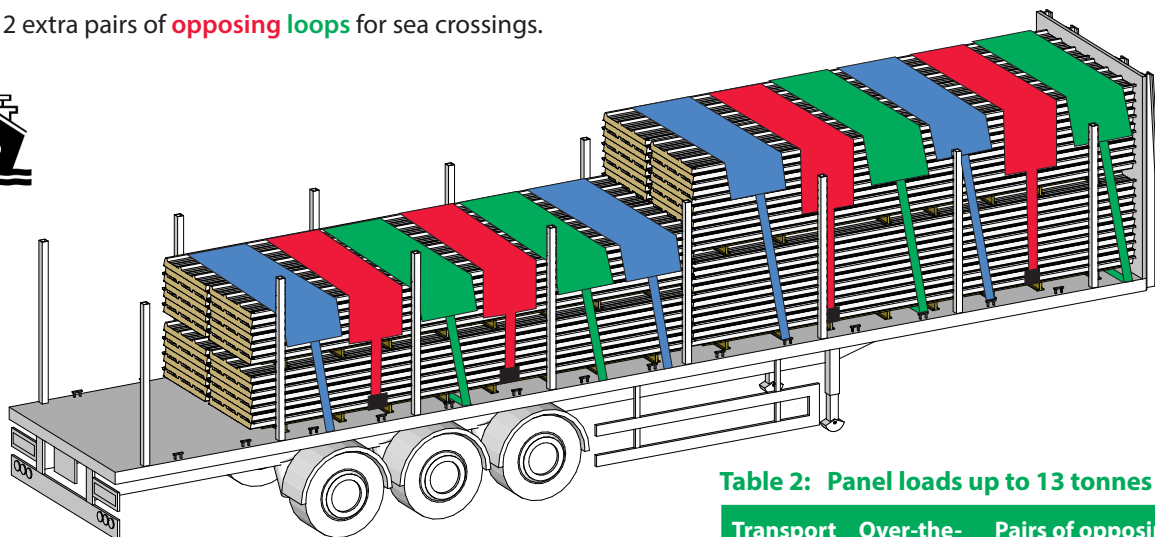
- ✓ Wrapped around all product.
- ✓ Edge protection must be used on bottom corners.
- ✓ **Opposing loops** must be applied as a pair.
- ✗ Not to be used as a substitute for over-the-top restraints.



Opposing loop webbing straps with tensioners

6. Sea crossings

Add 2 extra pairs of **opposing loops** for sea crossings.



Shown for a 13 t load against a 10 t headboard

Table 2: Panel loads up to 13 tonnes

| Transport method | Over-the-tops | Pairs of opposing loops | Total straps |
|------------------|---------------|-------------------------|--------------|
| Sea | 4 | + 4 | = 12 |

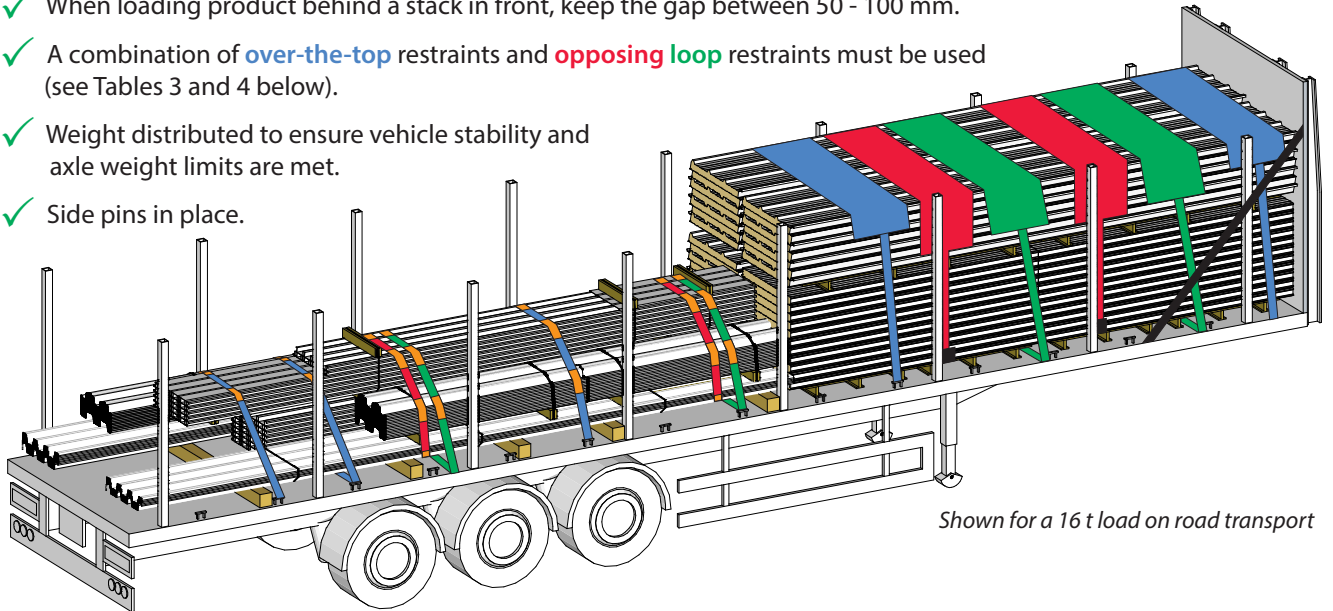
LOAD RESTRAINT GUIDELINE

Building Envelope Panels - UK

7. Mixed loads

7.1 General considerations

- ✓ Load against the headboard.
- ✓ When loading product behind a stack in front, keep the gap between 50 - 100 mm.
- ✓ A combination of **over-the-top** restraints and **opposing loop** restraints must be used (see Tables 3 and 4 below).
- ✓ Weight distributed to ensure vehicle stability and axle weight limits are met.
- ✓ Side pins in place.



Shown for a 16 t load on road transport

Table 3: Minimum restraints required for road transport mixed loads

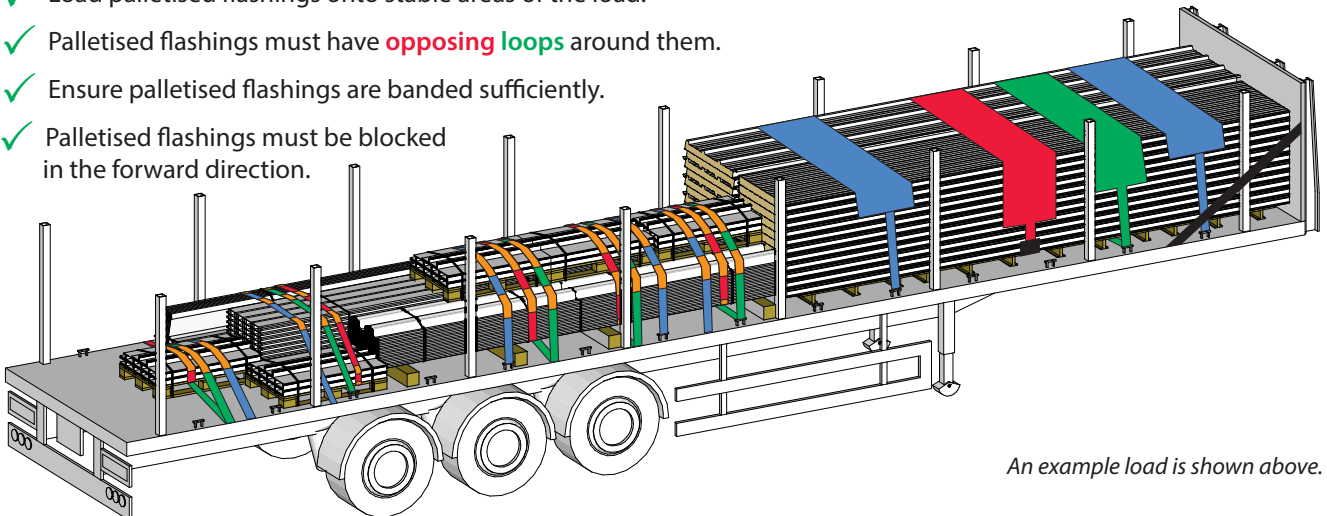
| Load weight | Over-the-tops | Pairs of opposing loops | Total |
|-------------|---------------|-------------------------|--------|
| 0 - 15 t | 3 | + | 3 = 9 |
| 15 - 20 t | 5 | + | 3 = 11 |
| 20 - 26 t | 6 | + | 4 = 14 |

Table 4: Minimum restraints required for sea transport mixed loads

| Load weight | Over-the-tops | Pairs of opposing loops | Total straps |
|-------------|---------------|-------------------------|--------------|
| 0 - 15 t | 2 | + | 5 = 12 |
| 15 - 20 t | 2 | + | 7 = 16 |
| 20 - 26 t | 2 | + | 8 = 18 |

7.2 Palletised components

- ✓ Load palletised flashings onto stable areas of the load.
- ✓ Palletised flashings must have **opposing loops** around them.
- ✓ Ensure palletised flashings are banded sufficiently.
- ✓ Palletised flashings must be blocked in the forward direction.



An example load is shown above.

The information and guidance contained in this document is intended for use only by Tata Steel UK Limited and its associated and subsidiary companies ("Tata Steel") in relation to its operations. All information and guidance in this document is based on Tata Steel's interpretation of prevailing legislation and best practice. Tata Steel gives no warranty or representation as to the accuracy of the information or for the guidance being for, or suitable for, a specific purpose. The information and guidance does not constitute legal or professional advice. All implied warranties and conditions are excluded, to the maximum extent permitted by law. Use of this document by any third party is at your own risk. Save to the extent that liability cannot be excluded by law, Tata Steel is in no way responsible or liable for any damage or loss whatsoever arising from the use of or reliance on the information and guidance contained in this document.