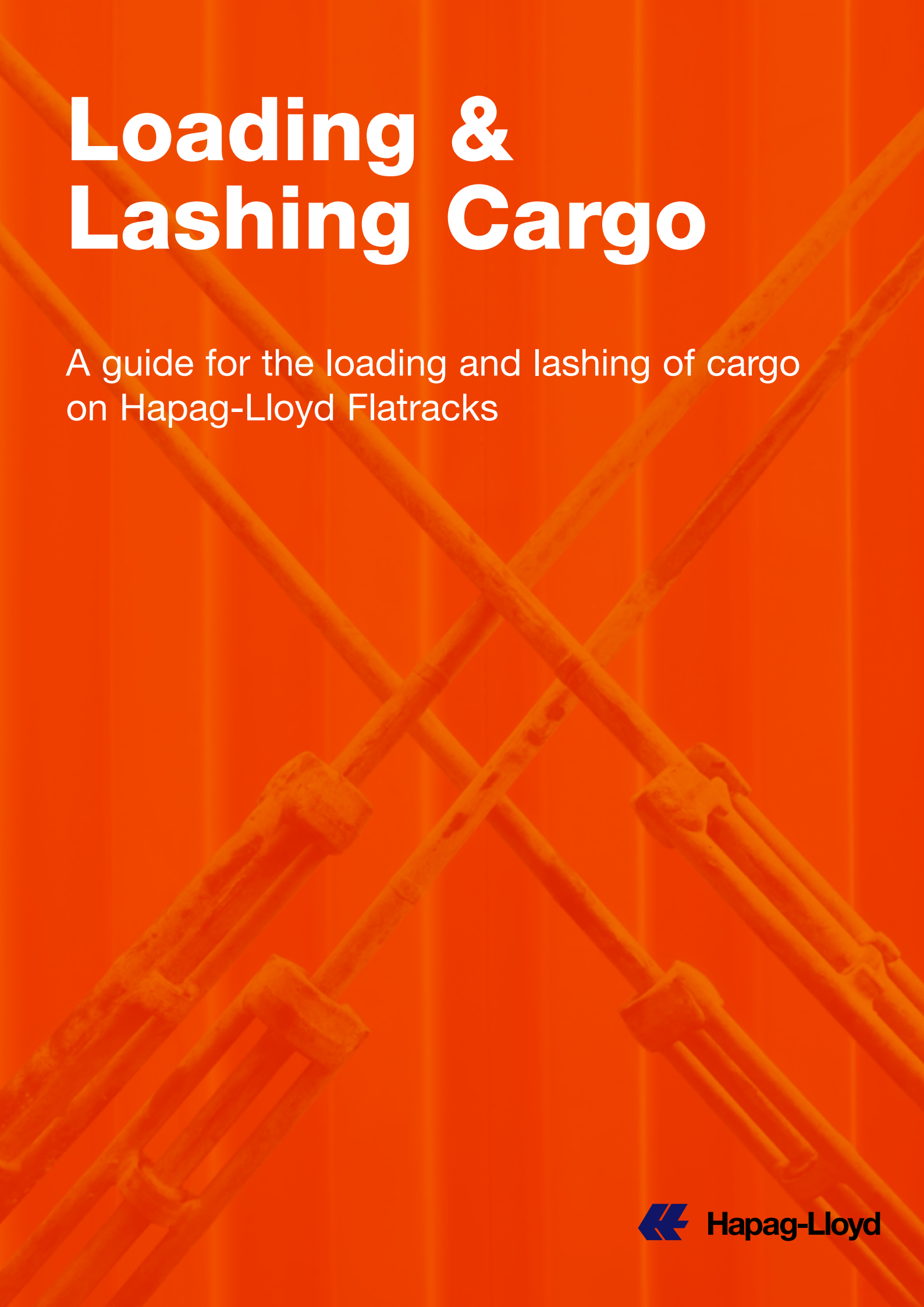
Loading & Lashing Cargo

A guide for the loading and lashing of cargo on Hapag-Lloyd Flatracks



Hapag-Lloyd

Loading and lashing cargo on Hapag-Lloyd Flatracks

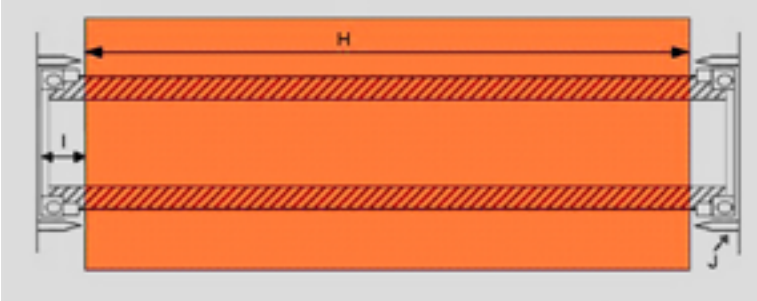
This guide is for your information and guidance concerning the stuffing and securing of cargo on Hapag-Lloyd flatracks. It contains basic requirements only, which may differ from cargo to cargo. In case of questions please contact the Hapag-Lloyd Special Cargo Department as follows: special.cargo@hlag.com.

This guide is based on the CTU code and our experience – it is made to guide you and improve cargo securing. We do not overrule and do not raise the lashing requirements of the IMO/ILO/UNECE CTU Code of Practice and IMO Code of Safe Practice for Cargo Stowage and Securing. Both provide more detailed guidance regarding cargo securing and calculation.

In the interest of the safety of crew, handlers and vessel – Hapag-Lloyd reserves the right to inspect flatracks prior to loading and to refuse loading in cases where stowage and/or securing is not fulfilling CTU Code requirements or not deemed safe.

Stuffing: Cargo should be positioned on the flatrack to ensure suitable weight distribution both along length and width. The aim is to have the centre of gravity not too far „off-centre“.

Due to cell guide structures, over-width cargo and respective blocking and bracing materials should not be stowed within 30cm (12“) of the front end of a flatrack as this prevents loading under deck. Such cargo would need to be loaded on deck with additional cost.



No.	Explanation	20’Flat	40’Flat
H	Max. allowed length for over wide cargo	550 cm	1160 cm
I	Min. distance to flatracks outer end	30 cm	30 cm
J	Cell guides of the vessel under deck		

It is important that out-of-gauge measurements are accurate and include the lashing equipment. Incorrect declaration can lead to misrating and short shipment. The width of the floor is less than the container‘s outer width (244 cms; 96″). Therefore cargo might overlap the flatrack‘s floor, but still be in-gauge. Only those parts of the cargo or lashing materials which overlap a virtual horizontal line between the outer edges of the corner posts need to be counted as over-width.

Welding: Any kind of welding, drilling holes or modification of a flatrack‘s structure is strictly forbidden.

Weight distribution. Hapag-Lloyd flatracks are constructed to carry heavier and more concentrated loads than standard equipment. The main strength of a flatrack is in the two outer bottom rails, so cargo must either rest on these rails or have weight transferred to the rails by cross timbers. Although a maximum payload is marked on each flatrack, the maximum weight which can be carried depends on the length of the cargo resting on the bottom rails. The maximum payload can be utilized only when the cargo is distributed over the complete length of the flatrack‘s bottom rails. Shorter resting length leads to less allowed load. Half of payload can be loaded in any way independently of the cargoes length.

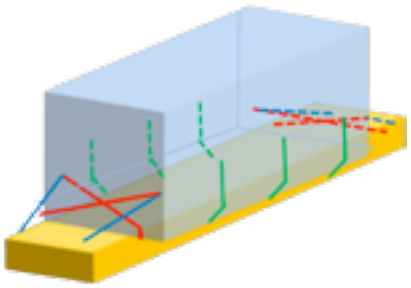
A specific load calculation including special bedding arrangement (e.g. point load) can be verified with the Hapag-Lloyd Special Cargo Department. (special.cargo@hlag.com)

Bedding: Cargo is to be positioned on the flat with its centre of gravity in the middle of the flat, in length and cross direction. Heavy weights are not allowed to be placed exclusively on the wooden floor of the flats. The bedding is usually to be laid out across the flat and needs to reach the main girders.

Antislip material: Any contact between metal to metal must be avoided. Wood dunnage or similar anti-slip materials (rubber) have to be placed between cargoes of metal material and the flatrack bottom rails. Using anti-slip material with high friction coefficient decreases the number of lashings required. A detailed table of friction factors between a wide variety of materials can be found in the CTU code Annex 7 (Appendix 2 and 3).

Lashing eyes: Hapag-Lloyd‘s flatracks are fitted with numerous lashing eyes (D rings) with a capacity of 5000kgs. Hapag-Lloyd‘s latest flatracks with series numbers HLXU or FANU 368..., 668... and 868... have stronger lashing eyes with a diameter of about 30mm and higher lashing strength, though they do require use of shackles, special hooks with wide opening, or use web lashings directly. Please note that leased equipment might have reduced strength.

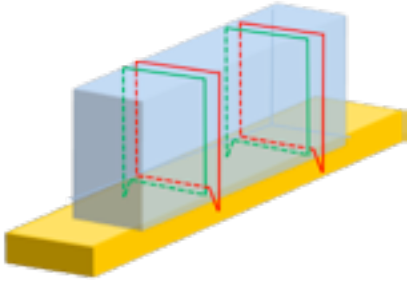
Lashing in general: All cargo must be secured by using materials, which are suitable for the size, construction and weight of the load. Web lashings require edge protection on sharp edges. We recommend not mixing different lashing materials like wires and web lashing on the same cargo, at least for securing in the same lashing direction. Different materials have different elasticity and create unequal lashing forces. Knotting in web lashing should be avoided as breaking strength is reduced by at least 50%. Turnbuckles and shackles should be secured, so that they will not spin off. The strength of a lashing system is given by different names like breaking strength (BS), lashing capacity (LC) or maximum securing load (MSL). For chains and web lashings the MSL/LC is considered 50% of the BS. The manufacturer will provide you with **linear** BS / MSL for direct lashing like cross lashings and/or **system** BS / MSL for loop lashings. Every part in a lashing system must have the similar MSL. Otherwise the weakest can be counted only. Remember bad lashing angles, sharp edges or small radii will reduce these figures.



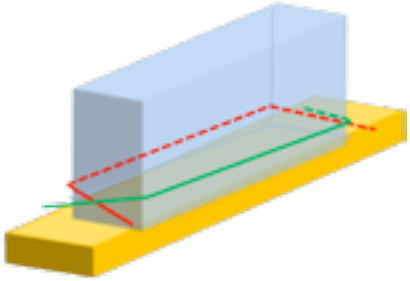
direct lushing - across, down and length

Lashing methods for cargo with lashing eyes: The task of the lashings is to prevent moving of the cargo against side and length direction and against tipping to side. The most lashings must be set against moving to side. For this purpose the cross lashings (red) are the most efficient method. Additionally direct lashings downwards (green) to increase friction and lengthwise (blue) to stop moving in length direction need to be installed. For calculation purposes use the **linear** MSL figures for each direct lashing.

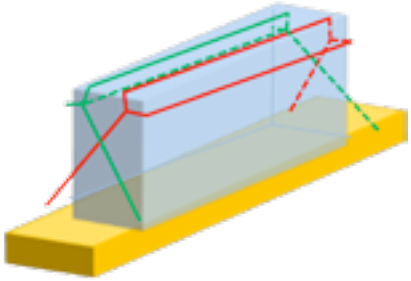
Lashing methods for non over-width cargo without lashing eyes, transverse: The recommended lashing methods for not over wide cases against moving sidewards are the vertical half-loop lashings, horizontal half loop lashings and the cross head lashings.



vertikal half loop lashing at not ow case



horizontal half-loop lashing at not ow case



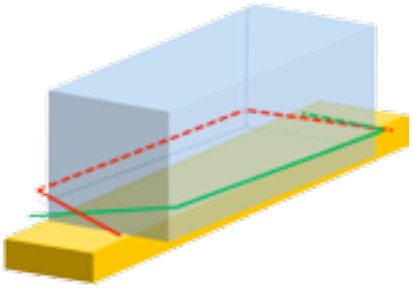
cross head lashing at not ow case

The simple top over lashings can be used as well but not solely and should be combined with one of the above methods.

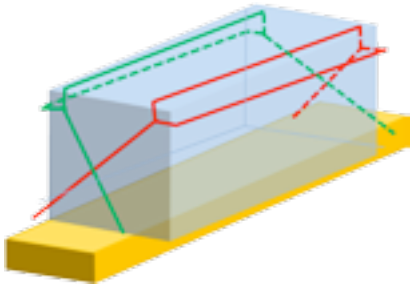
For calculation purposes use the **system** MSL figures provided by the lashing material manufacturer.

Additionally the cases must be secured in length direction, which is explained further down.

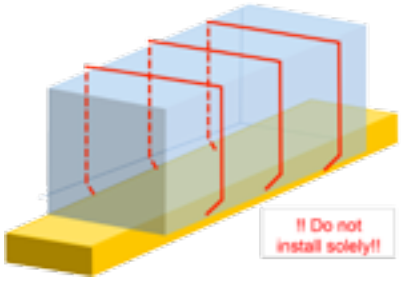
Lashing methods for over-width cargo without lashing eyes, transverse: The recommended lashing methods for over wide cases to secure against moving sidewards are the horizontal half-loop lashings and the cross head lashings in combination with the top-over lashings.



horizontal half-loop lashing against moving to side



cross head lashing against moving to side

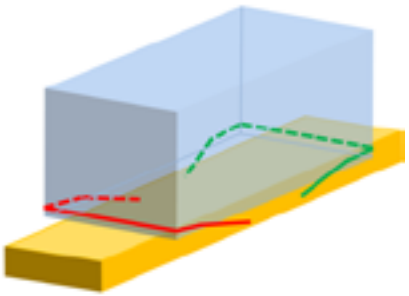


top-over lashing, friction lashing

The top-over lashing must not be installed solely, but can be used in combinations best with horizontal half loop lashing. Not recommended are vertical half loop lashings.

For calculation purposes use the **system** MSL figures provided by the lashing material manufacturer for horizontal half loop lashing and cross head lashing. And for top-over lashings, a calculation must be made using the applied tension values as supplied by the manufacturer, along with friction and acceleration factors.

Additionally the cases must be secured in length direction, which is explained in the next paragraph.



horizontal half loop lashing against moving length

Lashing methods for cargo without lashing eyes, lengthwise: Securing cargo in length direction can be achieved by blocking and bracing with timbers or by a lashing system. Timber bracing is more common when cargo is crated. The heavier the cargo, the stronger the bracing needs to be. Blocking should be braced against corner posts.

If a lashing system like the horizontal half-loop lashings can be installed, then no further bracing is necessary.

Lashing calculation: As a recognised „Rule of Thumb“ the number of lashings on each side of the cargo multiplied by the **linear** or **system** MSL, must be higher than the weight of the cargo. This is valid for an optimum lashing system and the number of lashings must be increased when the lashings have bad angles, are bent around narrow radii (wire) or when there are other aspects of less than optimal lashing methods.

Lashing example: A wooden case of 18 tons is to be secured with web lashings, with 8500daN (8.5 tons) **system** BS and loop lashings system. Then the **system** MSL will be 4.25 tons. 18 tons dived by 4.25 tons is 4.2. Rounding-up a minimum 5 pairs of loop lashing are required each side for a total of 10 lashings.

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