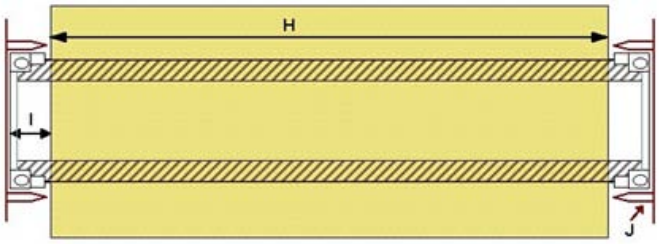
A Guide for the Loading and Lashing Cargo on Hapag-Lloyd Flatracks

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

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

Stuffing. Cargo should be positioned on the flatrack to ensure suitable weight distribution both along length and width so that centre of gravity is not too far "off-centre".

Over-width cargo and respective blocking and bracing materials should not be stowed within 30cm (12“) of the corner posts of a flatrack as this prevents the flatracks being loaded under deck. Any such cargo would have to be loaded on deck at additional cost.



No.	Explanation	20’Flat	40’Flat
H	Max. allowed length for over wide cargo	550cm	1160cm
I	Min. distance to flatracks outer end	30cm	30cm
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 result in mis-rating and short-shipment. The width of the floor is less than the container's outer width (244cms; 96"). Therefore cargo might overlap the flatracks 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-wide.

Welding. Any kind of welding, drilling holes or modifying flatracks structure is strictly forbidden.

Weight distribution. Hapag-Lloyd flatracks are designed to carry heavier and more concentrated loads than standard equipment. The main strength of a flatrack lies in the two 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 they can each carry is also dependant on the length the cargo is resting on the rails. The maximum payload can only be utilized when the cargo is spread over the complete length of the flatracks bottom rails. Only half of payload is allowed for very short cargo, for example standing on about 1m length only. Please check with Hapag-Lloyd for specific requirements and or bedding advice.

Bedding. Any bedding must be laid out across the flat and needs to reach the main girders. Heavy weights are not allowed solely to be place on the wooden floor of the flats. Cargo is to be positioned on the flat with its centre of gravity in the middle of the flat, lengthwise and across.

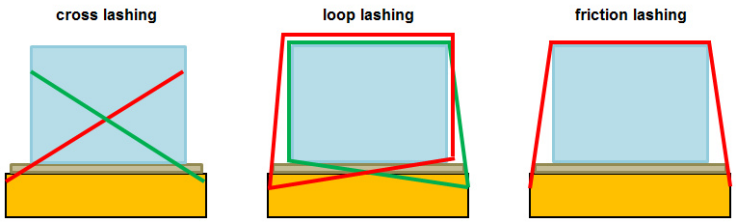
Antislip material. Any contact of metal to metal should be avoided. Wood dunnage or similar anti-slip materials (rubber) should be placed between cargoes of metal material and the flatrack bottom rails. Using anti-slip material with high friction coefficient decreases the number of lashings required.

Lashing eyes. Hapag-Lloyd's flatracks are fitted with numerous lashing eyes (D rings) with a capacity of 5000kgs but remember, leased equipment might have reduced strength. Hapag-Lloyd's upgrade 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.

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. Don‘t mix 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 don’t spin open. 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. Remember bad lashing angles, sharp edges or small radii will reduce these figures.

Securing in length direction. 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. Unpacked cargoes with suitable lashing points can be secured in length direction more effectively with direct lashings and no further bracing is necessary.

Securing in transverse direction. For securing against transverse and tipping forces, the best recommended lashing method is securing with **cross lashings**. This requires lashing eyes on the cargo for direct lashing systems. For calculation purposes use the linear MSL figures. The preferred lashing method for cargo without lashing eyes is the (half) **loop lashing**, also called C-lashing system. Every lashing must be installed in pairs, with one half of the pair starting and returning to the same side. The other half of the pair starts and return from the opposite side. For calculation purposes use the system MSL figures provided by the lashing material manufacturer. **Friction** or "over the top" **lashings** are not acceptable as this system does not prevent transverse motion.



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 cargo. This is valid for optimum lashing system and the number of lashings must be increased when the lashings have bad angles, are bend 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.