



Out Of Gauge

TECHNICAL BROCHURE

"Stuffed right, shipped safe"



FOREWORD

Early engagement with CMA CGM Project Cargo teams ensures the safest and most efficient transport solution, reflecting your choice of CMA CGM for a professional approach and best-in-class safety standards.

This document is intended to provide guidance and practical information to our valued customers who wish to ship their oversized cargo stuffed on **open top** and **flat racks** containers onboard vessels operated by CMA CGM Group, in the interest of the safety of crews, cargo handlers, vessels, and shippers.

This document does not replace the applicable IMO regulations, in particular:
the **IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTU Code)**,
the **IMO Code of Safe Practice for Cargo Stowage and Securing**.

We kindly remind you of the respective responsibilities of each stakeholder:

 Shipper is responsible for the proper packing and securing of the cargo inside or on the container. Shipper must ensure that your cargo is safe for carriage by sea and complies with the applicable regulations mentioned above. Shipper may choose to perform the packing or rely on the expertise of a professional packer.

 CMA CGM (as CTU operator), is responsible for providing cargo transport units that are fit for purpose.

 CMA CGM (as carrier) is responsible to secure the CTU on the means of transport, to transport the CTU in compliance with contractual agreements and all applicable regulations, and to provide trained personnel capable of handling all cargo types.

Thanks to our experience in this specific segment, we reserve the right to refuse loading in any case where packing and/or securing does not comply with the CTU Code requirements or is otherwise deemed unsafe.

Always refer to CMA CGM 's terms and conditions.



SELECT THE PROPER EQUIPMENT

Upon reception of the equipment, it is important to make sure containers are CSC plated, the general condition of the equipment is satisfactory (check ISO corners, end walls, locks, wooden floor cleaned, lashing points must be in sufficient quantity according to the cargo mass).

When stuffing your cargo in special containers (Open Top & Flat Rack), the weight of your cargo — including dunnage and lashing material — must never exceed the maximum payload of the equipment used.

Like any other CTU, these containers must have a Verified Gross Mass (VGM).

Open Top containers

Open Top containers are similar in all respects to general purpose containers, except for the roof, which is replaced by a movable tarpaulin cover normally supported by roof bows. These containers are equipped with movable or removable top end transverse members above the end doors to allow stuffing by crane or overhead travelling bridge. Once stuffing is completed, the door header must be reinstalled. As many roof bows as possible must be reinstalled. Any roof bows that cannot be refitted, as well as the tarpaulin and the TIR rope, must be left inside the container.



Cargo stuffing and securing in Open Top containers



Cargo units must be lashed together and secured to the container using:

- lashing rings on the bottom side rails,
- bars or other suitable securing points in the corner posts and the floor

The securing rings provide multiple lashing points, each with a resistance of up to 1.5 tons.

The weight of the cargo must be borne by the container floor, not by the side rails nor side walls.

Cargo must be centered with even weight distribution

Maximum allowed weight concentration :

- 20'OT: **Max payload 28,2 tons/** 5,89m (internal length) → 4,8t per linear meter
- 40'OT: **Max payload 26,6 tons/** 12,03m (internal length) → 2,2t per linear meter

Over those values, table rule below is applicable:

Cargo distribution over container length	50%	66%	75%	100%
Max admissible container payload	66%	75%	80%	100%

Whenever necessary, the cargo must be placed on additional supports or longitudinal members to comply with the above recommendations.

Flat Rack containers

Flat Rack containers are dedicated to the carriage of heavy and/or bulky items, including over-height and/or over-width cargo. The flat rack base structure is designed to transport heavy material. More than 85% of CMA CGM's 40' flat rack fleet can carry up to 47.4 metric tons of cargo. Flat racks with collapsible end walls also allow the transportation of over-length cargo.

General considerations for stuffing

Shipper/packer must always ensure that the following conditions are met:

It is recommended to use friction-enhancing material to improve securing and to avoid any metal-to-metal contact.

Corner castings must always remain visibly free from above to allow vertical lifting.



End walls in vertical position

The top corner castings must be accessible for top lifting, using an over-height frame or slings/chains connected to the top aperture of the ISO corner (end walls erected).



End walls collapsed

The bottom corner castings must be accessible for side or end lifting using appropriate equipment (slings or chains).

In this handling configuration, underdeck stowage is not possible.

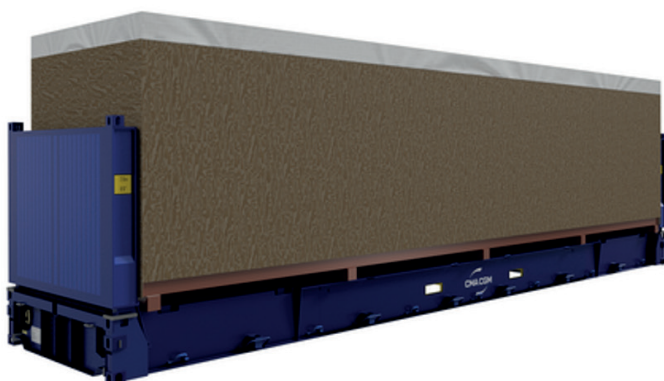


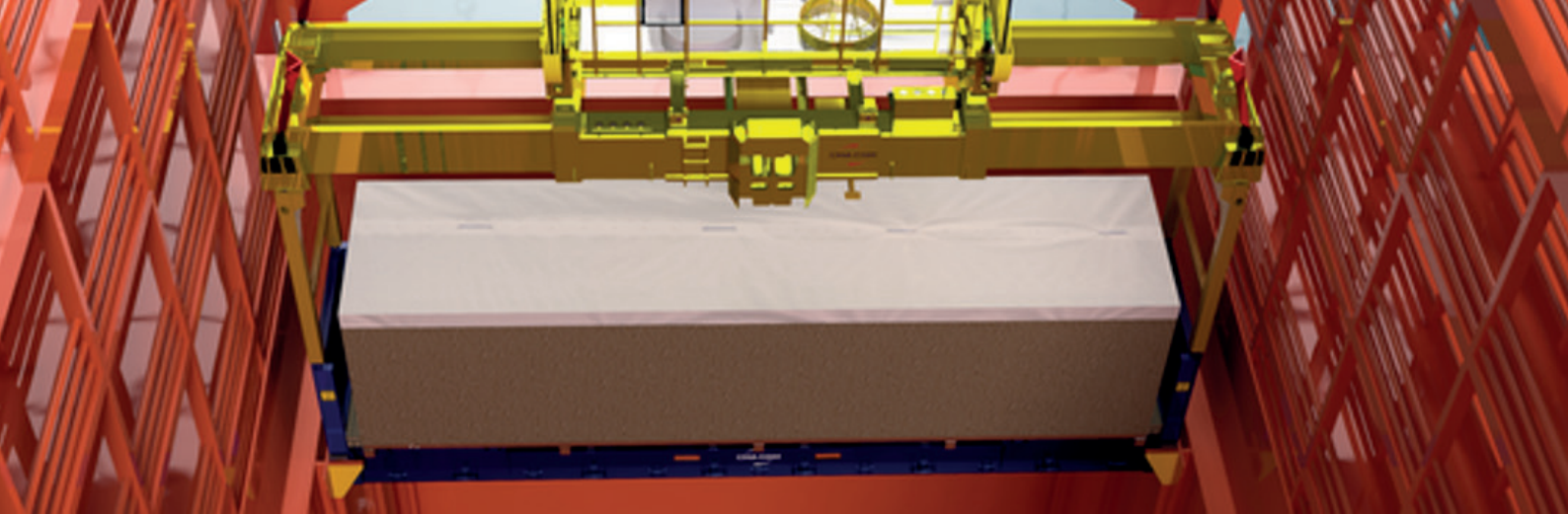
Flat racks with end walls in collapsed position will not be stowed underdeck

General considerations for stowage on board

To allow safe underdeck stowage, the over-width cargo must remain at least 30 cm inside each outer end of the equipment.

If this clearance is not respected, the cargo may obstruct the entry of cell guides and cause damage. To avoid any damage to the cargo and vessel cell guides, such flat rack stuffed with insufficient clearance will be stowed on deck.





Center of Gravity (CoG) positioning

CoG positioning is a critical parameter for ensuring safety during handling and sea transport, in the longitudinal and transverse axes. CoG centering is essential for safe handling.

A CoG eccentricity of up to 5% is acceptable, and up to 10% only in exceptional cases.

For over-length (OL) cargo, the CoG must be perfectly centered, with no longitudinal or transverse eccentricity.

In the vertical axis, the CoG position is limited to the level of the end walls (when in vertical position).

For a container with a gross mass not exceeding 30 tons MGW, the CoG height may be allowed up to 50 cm above the end wall level, subject to technical assessment and validation.

When end walls are collapsed, the CoG height from container floor should be checked and approved case by case.



Load charts for Flat Rack containers

The applicable load chart depends on the cargo footprint configuration and the number of effective supporting beams in contact with the load.

The critical parameter is the longitudinal distance between supports.

There are two possible methods to distribute the load along the longitudinal axis of the flat rack:

1. Continuous load distribution, or “Uniform Distributed Load”

The cargo is supported along a continuous length (e.g. skids, beams or longitudinal running over several cross members and side girders), resulting in a more uniform distribution of the weight.

2. End point load also called “Point Load”

The cargo rests on a limited number of concentrated support points (e.g. feet, pads, saddles) with defined distances between them.

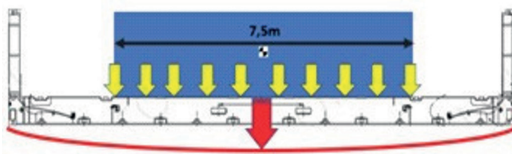
In this case, the load chart must be checked specifically against the distance between these support points and their surface area.

Only load configurations that comply with the relevant load chart (according to support pattern and spacing) are acceptable.

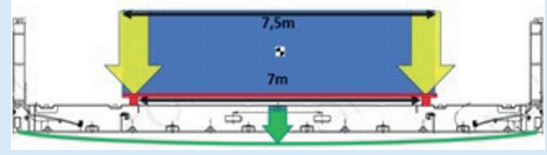
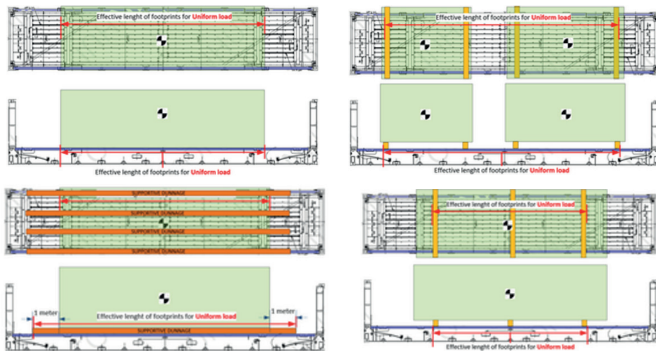
End point load vs Uniform load

Under **UDL (Uniformly Distributed Load)** conditions, the maximum payload is reached when the cargo is supported over the full length of the container floor.

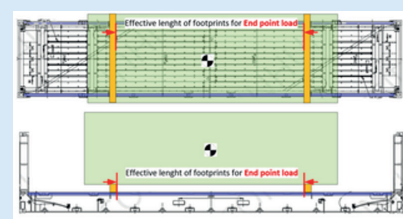
Under **EPL (End Point Load)** conditions, the maximum payload is reached when the longitudinal distance between the supporting footprints is 6m.



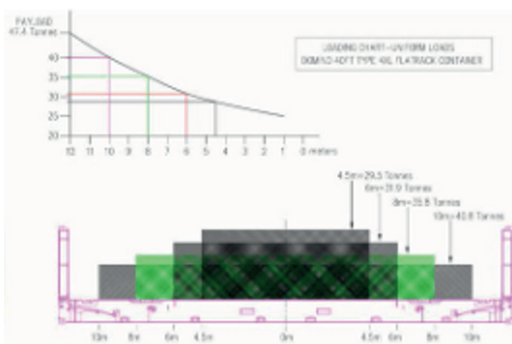
Uniform Distributed Load



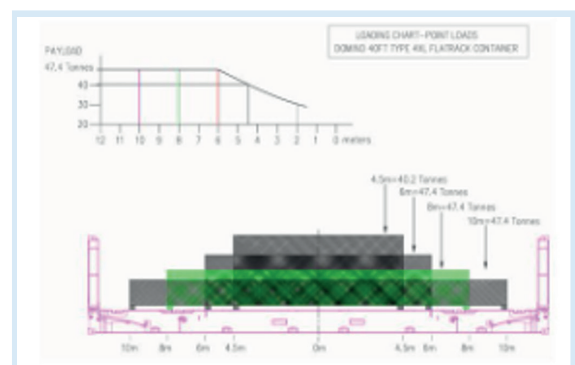
End Point Load



The load charts below indicate the **maximum admissible concentrated load** as a function of the longitudinal span between cargo footprints.



40'FR max payload 47,4t



40'FR max payload 47,4t

40'FR Heavy Tested/ Payload 47,2 tons - MGW 52,5 tons			
Uniform Distributed Load (Centered Cargo)		End Point Load (Centered Cargo)	
Footprint length (m)	Max Cargo Weight (kg)	Distance between point load (m)	Max Cargo Weight (kg)
2	25700	2	28300
3	26900	3	31400
4	28300	4	35400
5	29800	5	40400
6	31400	6	47200
7	33300	7	47200
8	35400	8	47200
9	37600	9	47200
10	40400	10	47200
11	43500	11	47200
12	47200	12	47200

40'FR Heavy Tested/ Payload 44,9 tons - MGW 50 tons			
Uniform Distributed Load (Centered Cargo)		End Point Load (Centered Cargo)	
Footprint length (m)	Max Cargo Weight (kg)	Distance between point load (m)	Max Cargo Weight (kg)
2	24400	2	26900
3	25600	3	29900
4	26900	4	33600
5	28300	5	38400
6	29900	6	44900
7	31600	7	44900
8	33600	8	44900
9	35900	9	44900
10	38400	10	44900
11	41400	11	44900
12	44900	12	44900

20'FR / Payload 31,2 tons - MGW 34 tons			
Uniform Distributed Load (Centered Cargo)		End Point Load (Centered Cargo)	
Footprint length (m)	Max Cargo Weight (kg)	Distance between point load (m)	Max Cargo Weight (kg)
2	18700	2	23400
3	20800	3	31250
4	23400	4	31250
5	26700	5	31250
6	31250	6	

Example with a rotor on a skid

Overall lenght: 4m

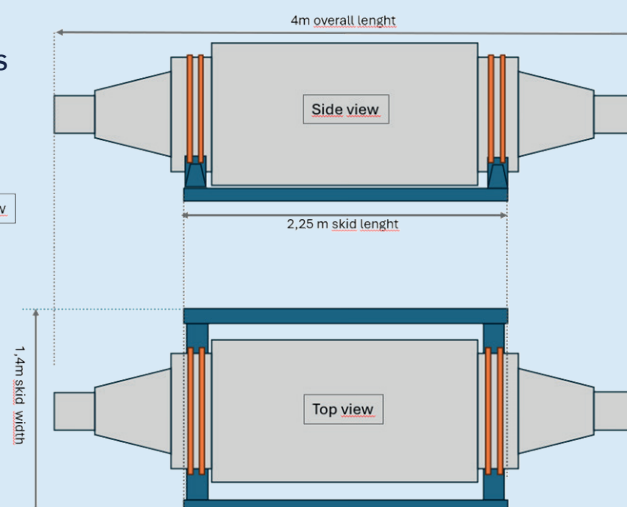
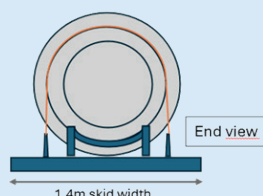
Diameter: 1,24m

Mounted on a skid:

- 2,25m long x 1,40m width

Total cargo weight: 33 tons

Rotor on skid 33 tons



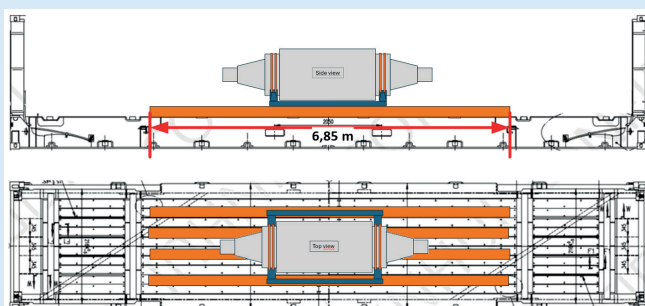
Too heavy for a 20'FR (payload 31,2 t)

Stuffed on a 40' FR **47,2 tons** Payload

Too concentrated for 2,25m x 1,4m skid only

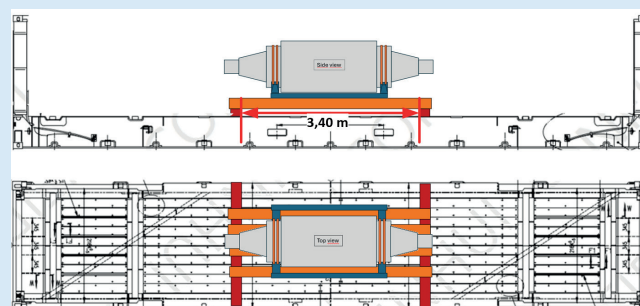
Workable with

Extended uniform load 6,85m (minimum)



UNIFORM LOAD (extended)

End point load, 3,4m between transverse supports



END POINT LOAD

Blocking – Lashing – Securing

Onboard container vessels, containers are stowed oriented along the longitudinal axis. To withstand the accelerations generated by vessel motions in any navigation area and under various stability conditions, cargo must be independently and firmly secured to the CTU against:

- Transverse and longitudinal **shifting**,
- Transverse and longitudinal **tipping**.

See below recommendations related to blocking / lashing / securing:

- **Any welding, drilling, or other modification of the flat rack structure is strictly prohibited.**
- Longitudinal blocking on a flatrack is effective only when it transfers load into the flatrack's end structures (corner posts/end walls), not just into deck planks or loose dunnage.
- At least 12 and up to 19 lashing points are always accessible on the side girders, plus 2 lashing points at each end, all designed with an individual lashing capacity of 49 kN.
- Stake pocket closing bars are not lashing points and must not be used as such.
- As a rule of thumb, IMO recommends that the total Maximum Securing Load (MSL) of the securing devices on each side (port and starboard) of a unit of cargo should be equal to the weight of that unit.
- When lashings work in the same direction, it is preferable not to mix different lashing materials due to their different elasticity characteristics.
- Sharp edges must be protected when using web lashings.
- Knotting of web lashings should be avoided.
- Shackles and turnbuckles must be properly secured or blocked to prevent loosening due to vibrations.
- Nailing wedges to the container wooden floor is permitted; however, the effectiveness of this method depends on the quality of the floor, the direction of the wood grain in both the floor and the wedges/wooden sections. For this reason, the blocking capacity is limited.
- Instead of relying on wedges or wooden sections nailed to the floor, it is recommended to extend the dunnage all the way to the end walls.
- Crated cargo may provide good protection for the commodity itself, but it makes it more difficult to assess the effectiveness of the lashing.
- Ensure that the packing company complies CTU Code requirements. Whenever possible, for crated cargo, allow access to the cargo lashing points inside the crate.

Before stuffing cargo on a flat rack container, you must first ensure that the equipment is suitable for your specific project (dimensions, weight, footprint, lifting points, securing options, etc.).

You can consult the types and characteristics of equipment available [here](#)

The carriage of cargo is subject to CMA CGM's terms and conditions, available [here](#)

In case of doubt, you are invited to present your project by email: projectcargodivision@cma-cgm.com

Direct link to CMA CGM's XXL Project Cargo page (for out-of-gauge and heavy-lift projects) available [here](#)



OOG TECHNICAL BROCHURE

CONTACT THE CMA CGM PROJECT CARGO DIVISION
projectcargodivision@cma-cgm.com

CMA CGM, Boulevard Jacques Saadé - 4 Quai d'Arenc CS 30154 - 13235
Marseille Cedex 02 – France Tel: +33 (0)4 88 91 90 00

