



LOAD SECURING V6

March 2021

INTRODUCTION

This document describes the requirements to ensure that all Polymers carried in vehicles on behalf of INEOS Olefins & Polymers Europe are properly secured so that these can neither endanger persons nor goods and can not drag or fall of the vehicles.

This Code of Practice is based on the

- EN Norm 12195-1 (2010)
- “European Best Practice Guidelines on cargo securing for Road Transport”, issued by the European Commission Directorate-general for energy and transport

This document is published on the INEOS O&P Alfresco website accessible at:
<https://eudoc.ineos.com/share/page/site/ope-she-logistics/documentlibrary#filter=path%7C%2FCodes%2520of%2520Practice&page=1>

and on the INEOS O&P Europe “Logisticsmatters” web site which is an extranet site and available to external companies:
<http://www.logisticsmatters.info/>

Distribution List

Copy No : **Issue To :**
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Main Revision Details

<u>Rev No:</u>	<u>Details of Change</u>	<u>Date</u>
6	Section 5.2 Straps required for octabins.	Nov 2020
7	Attachment 4 and 5: Checklists for loading pallets/octabins	March 2021

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1. LEGAL REQUIREMENTS

Most of the EU countries, with the exception of Germany, Netherlands, Belgium, the UK and the Scandinavian countries, do not have detailed legislation on load securing requirements for road transport. Most of the national regulations only describe some general principles : trucks must have headboards, sufficient lashing rings etc....

All parties in the supply chain have a role to play in ensuring that cargo is properly packed, loaded and secured on the vehicle.

The responsibilities for cargo securing are based on international conventions and regulations, national legislation and/or contracts between involved parties.

The party who is responsible to do the load securing can differ from country to country.

e.g.	In France:	the loader
	in Italy:	the driver
	in Belgium and Germany:	both the driver and the loader

Ineos O&P have defined in the contracts with their hauliers, that the driver is responsible for doing the load securing. However, Ineos O&P has also the responsibility to:

To provide the right info about the packages to be loaded/secured

To provide to the driver the required load securing method

To do spot checks after the load securing

To provide material in order to do a proper load securing (with the exception of straps). This is the case for Octabins where wooden frames are used.

To provide assistance in cases where the load securing can not be done by the driver alone (e.g. securing octabins)

The EU have developed some NORMS on load securing, the main ones are:

STANDARD ⁵	SUBJECT
- EN 12195-1	Calculation of lashing forces
- EN 12640	Lashing points
- EN 12642	Strength of vehicle body structure
- EN 12195 -2	Web lashings made from man-made fibres
- EN 12195-3	Lashing chains
- EN 12195-4	Lashing steel wire ropes
- ISO 1161, ISO 1496	ISO container
- EN 283	Swap bodies
- EN 12641	Tarpaulins
- EUMOS 40511	Poles - Stanchions
- EUMOS 40509	Transport Packaging

The calculation methods according to EN 12195-1 only apply for rigid cargoes. For non-rigid cargoes like bags and octabins the compliance with the EN norm can be checked by means of tests.

1: Inclination test:

In an inclination test, the loading platform is tilted. A tilting angle of 27° corresponds to an inertia force of 0,5g and a tilting angle of 43 ° corresponds to 0,8g



2: acceleration test (on a testing unit)

This applies inertia forces for at least 0,3s

3: acceleration test at vehicle level:

A vehicle is driven in an S curve to generate inertia forces of 0,5g including the dynamic effect. An emergency brake is performed to generate an inertia force of 0,8g.

In the absence of any international legislation on load securing, the EU have developed 'European Best Practice Guidelines on Cargo Securing for Road transport'. This document is available on

Alfresco: <https://eudoc.ineos.com/share/page/site/ope-she-logistics/documentlibrary#filter=path%7C%2FLoad%2520securing%2FEU%2520cargo%2520securing%2520guidelines%25202015&page=1>

And Logisticsmatters:

<http://www.logisticsmatters.info/Useful%20Documents/European%20Best%20Practice%20Guidelines%20cargo%20securing%202015%20Eng.pdf>

2. GENERAL TRANSPORT EQUIPMENT REQUIREMENTS

To ensure a proper loading and transport process, all the equipment should be selected, assembled and used in such a way that the loaded vehicle withstands the forces under normal transport conditions. Normal transport conditions include emergency brakes, sudden maneuvers, shunting operations (during intermodal carriage), handling and container terminal operations.

The following general specifications should apply:

- All transport vehicles, trailers and containers must be in a road-worthy condition, clean and odour-free inside, fit for purpose, compliant with all relevant legislation and well maintained.
- For vehicles constructed according to EN 12642-XL, there must be a system that allows verification that they are constructed according to this standard.
- The strength of the headboard of trailers described in section 3. and must as a minimum be in accordance with EN12642/EN 283.
- Although most trailers built after 2001 are coded EN12642 and hence the headboard must have strength of minimum 5000 daN, it is recommended to have a confirmation of the strength of the headboard available for every trailer type.
- The floor must be solid and capable of supporting fork-lift trucks (with maximum total weight of 5740 kg) entering the loading space (in accordance with standard EN 283).
- The floor must be flat, level and free of objects (e.g. protruding nails) and holes or other damage that might either cause risk to loading/unloading staff or damage to the cargo.
- The surface of the load floor must be swept clean (no oil, grease or product), free from odor and free from frost/ice or snow. The friction factor should as a minimum be according to the normative table B1 of EN 12195-1.
- The roof, walls and tarpaulin/curtain must be free of holes and protect the cargo against normal weather conditions.
- All transport equipment must be sealable and easy to lock tightly from ground level.
- Lashing points must be in accordance with EN12640 and must have a minimum strength of 2000daN. The number of lashing points should be sufficient to allow appropriate cargo securing methods.

Lashings and ratchets must be in accordance with EN12195-2, labeled and in good condition. Lashings should have a LC of at least 2500daN, and a minimum length of 9m.

It is highly recommended that all newly purchased equipment are constructed in compliance with EN 12642-XL. This should be marked on the equipment with a specific sign.

3. VEHICLE REQUIREMENTS ACCORDING TO EN 12642

This section gives an overview of the main types of transport equipment used for packed cargo, with a short description of each type.

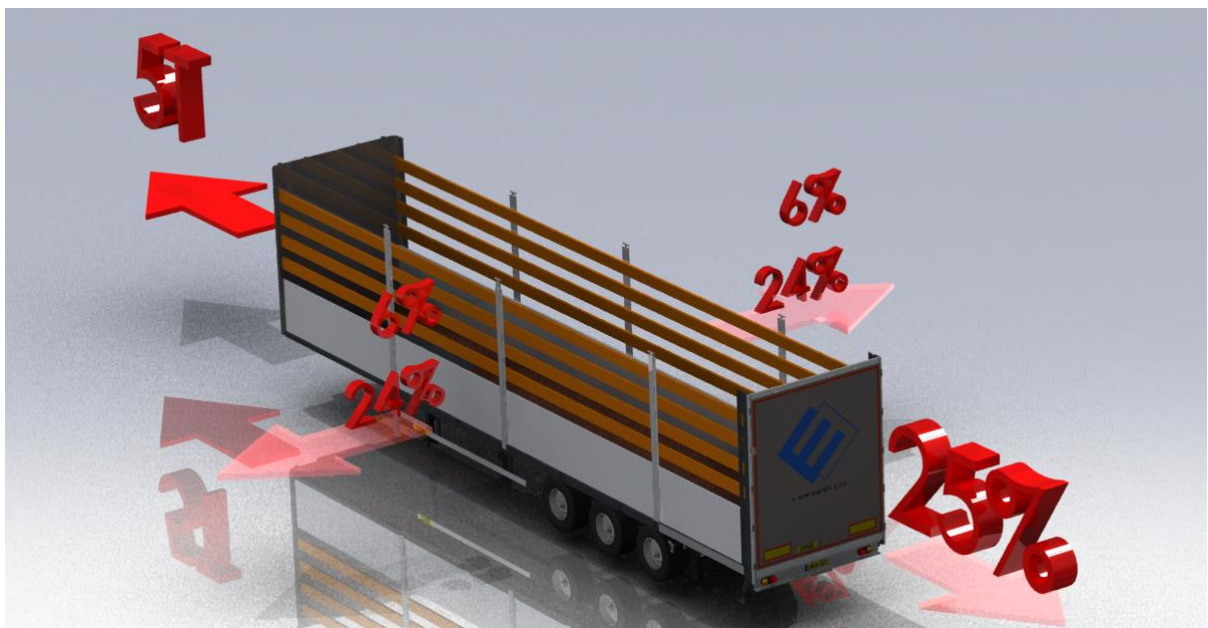
Vehicles of the tilt trailer type with removable stanchion poles and whereby the tarpaulin has to be put on the trailer roof for side loading are no longer allowed by Ineos O&P.

3.1 COVER STAKE VEHICLE WITH SIDEBOARDS constructed according to EN 12642

Tilt trailers are trailers with tarpaulins on both sides and with sideboards which are fixed to the floor frame and can be tilted in order to allow loading and unloading from both sides as well as from the back. The dimensions are in general as follows: 13, 60 m length and 2, 44 m internal width.

A tilt-trailer according norm EN 12642L has a blocking capacity of:

- Front direction: 40% of the load-capacity, with a **maximum of 5 Tonnes**;
- Side directions, 30% of the load-capacity (24% to the side gates and the remaining 6% to the aluminium or wooden planks).
- Rear direction: 25% of the load-capacity and a **maximum of 3.1 Tonnes**.

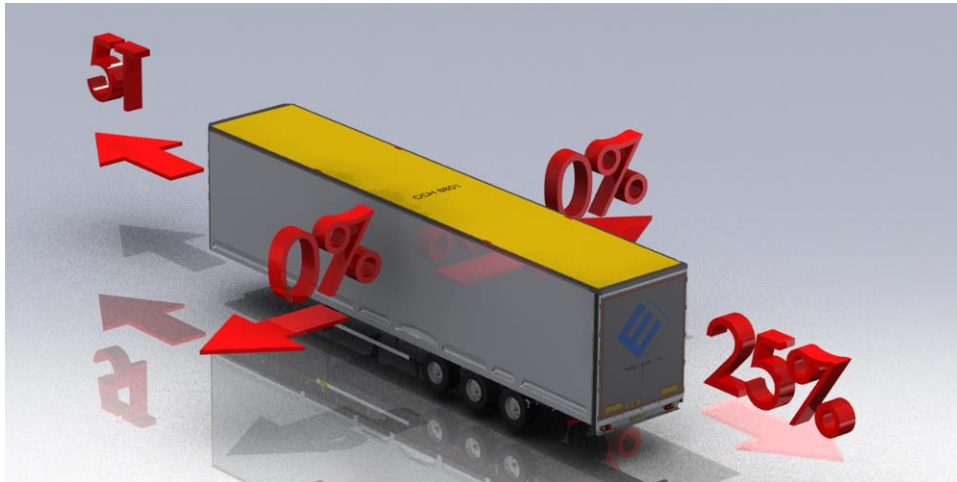


3.2 CURTAIN SIDER (VEHICLE WITHOUT SIDEBOARDS) constructed according to EN 12642

A curtain sider is based on the same construction as the cover stake trailer but without sideboards fixed to the floor frame. Its tarpaulin sides can be moved easily by pushing them aside like a curtain.

The tarpaulin is meant to protect the cargo against weather conditions, but is not suitable for cargo securing.

The blocking capacity of a curtain sider trailer is similar to trailer as described in section 3.1 with the exception that the sidewalls have NO blocking capacity.



3.3 VEHICLES CONSTRUCTED ACCORDING TO STANDARD EN 12642-code XL

EN 12642-XL refers to reinforced body structures.

Vehicles constructed according to the standard EN 12642-XL need to fulfill certain minimum requirements regarding stability criteria and test conditions of the front wall, rear wall and side walls. Vehicle body structures in compliance with the requirements of this standard have a certificate and are in general marked with a specific sign.



3.4 BOX TRAILER

As opposed to the above-described vehicle types, the box trailer does not have flexible tarpaulin sides but is completely surrounded by a stable metal or steel construction. The closed unit offers improved stability and cargo securing for different types of packaging. Because its sides cannot be opened, only loading and unloading from the back of the vehicle is possible. This requires a fixed ramp or a movable ramp ('loading bridge') for the cargo to be moved in or out of the box trailer.

3.5 SWAP BODY constructed according to EN 283

Swap bodies have nearly the same constructional characteristics as the above described four vehicle types, but need to be put on a chassis for any kind of movement. They are typically used for intermodal transport and drop and swap operations.

3.6 CONTAINER

ISO containers have a solid closed construction as defined in ISO standards (e.g. ISO 830 and ISO 1496-1) including requirements such as:

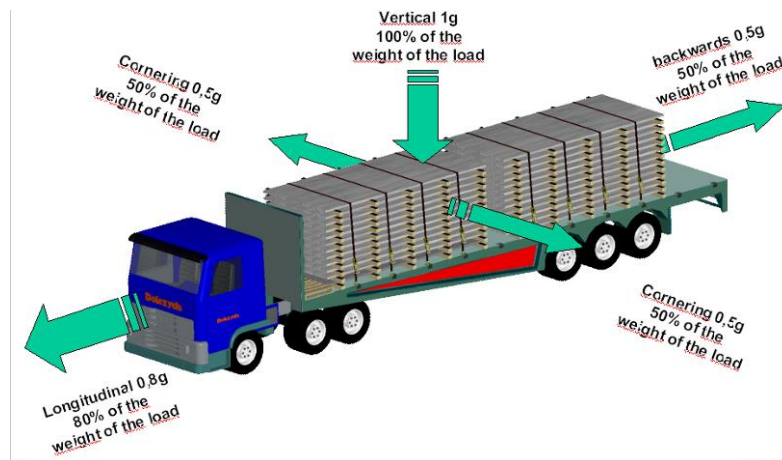
- a rigid construction for repeated use, trans-loading and terminal operations;
- a design to facilitate the carriage of goods by one or more means of transport;
- fittings permitting its easy stowage, handling and stacking.

ISO containers with a length of 20 or 40 foot and an internal width of 2,34 m are most used. In addition there are 40 and 45 foot containers with an inner width of 2,44 m (pallet wide) which are not constructed according to an ISO standard.

4. CARGO SECURING METHODS

4.1 GENERAL

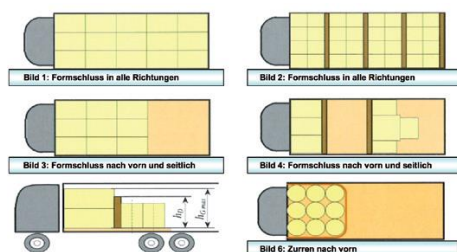
For ROAD transport, the normal acceleration and deceleration forces to be considered are: **80% of the weight of the load in forward direction and 50 % of the weight of the load in sideward and backward directions**



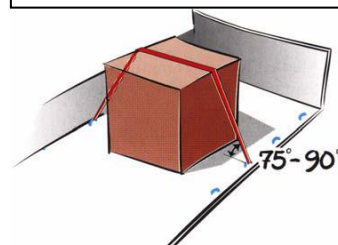
In some countries like Scandinavia, the requirements are even more stringent: here one must take into account to secure against a force of 100% of the weight in forward direction. (also for Sea transport regulations)

4.2 MAIN PRINCIPLES

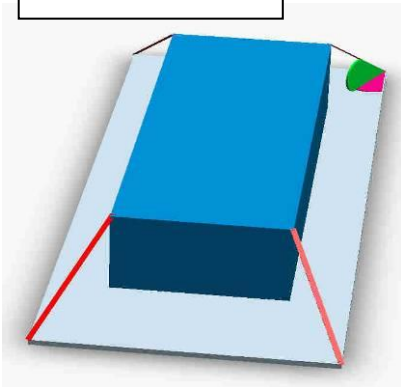
Form locking



Strength interlocking ,
Top over lashing



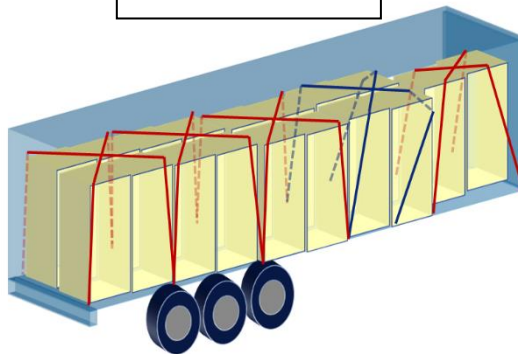
Direct lashing



Spring lashing



Combination of
cross- and spring
lashing



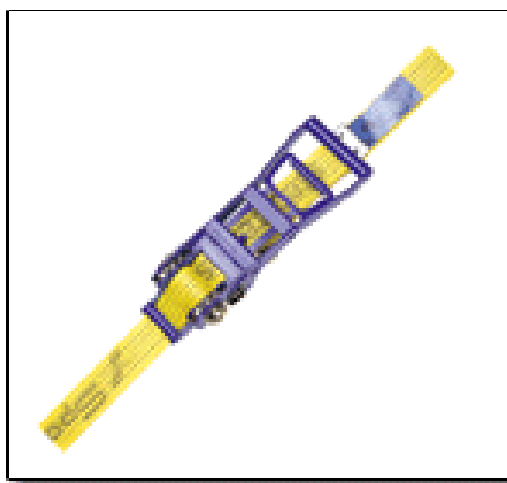
5. LASHING EQUIPMENT

5.1 STRAPS / WEBBING ASSEMBLIES

It is a requirement to use assemblies made according to standard EN12195-2 or equivalent.

The tension force, which can be achieved by a hand force of 50 daN is given on the label as the standard tension force for the webbing assembly (Lashing Capacity LC, Standard Hand Force S_{HF} , Standard Tension Force S_{TF})
Standard ratchets can achieve a tension force up to 400daN per side (is totally 800 daN for a top over lashing)

Webbing assemblies are suitable for securing many types of load. They usually consist of a webbing strap with some form of end fittings and incorporate a tensioning device ('ratchet').



: Ratchet



Label in accordance with standard EN12195-2

Straps can be made from different materials.

The table below shows the different types and colours of the labels

Material	Colour of label	Marking on Label
polyester	Blue	PES
polypropylene	brown	PP
polyamid	green	PA
others	white	individual

5.2 STRAP REQUIREMENTS AND NUMBERS NEEDED:

- Straps may never be tied to each other in case they are too short
- Straps may not be damaged
- Straps must be labelled according to 5.1
- Straps must be replaced when they have any damage



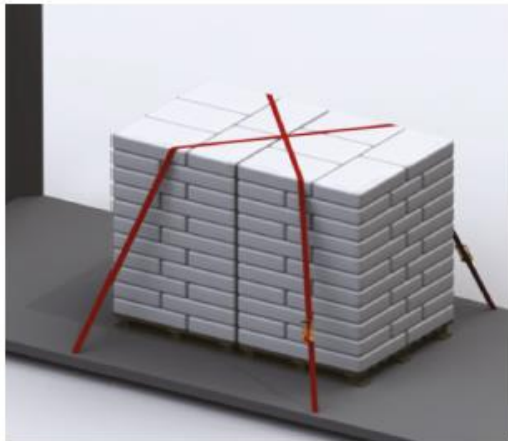
Number needed:

- For a full load of palletised bags: depending on load scheme
- For a full load of Big Bags: one strap per row
- For a full load of Octabins: **14** straps (4 of which with a minimum length of 12 m)

6. INEOS O&P LOAD SECURING REQUIREMENTS

6.1 BAGS ON PALLETS

For transport of palletized bags, well packed with a shrink- or stretch hood, a specific combination of lashings is used. This combination is called 'cross lashing' and combines the securing effects of grouping, of top over lashing and of direct lashing. It can be used for full truck loads as well as partial loads.



2 pallets with cross lashing



4 pallets with cross lashing

The effectiveness of the cross lashing method for deformable products can not be calculated, therefore it is validated by testing according to EN 12195-1

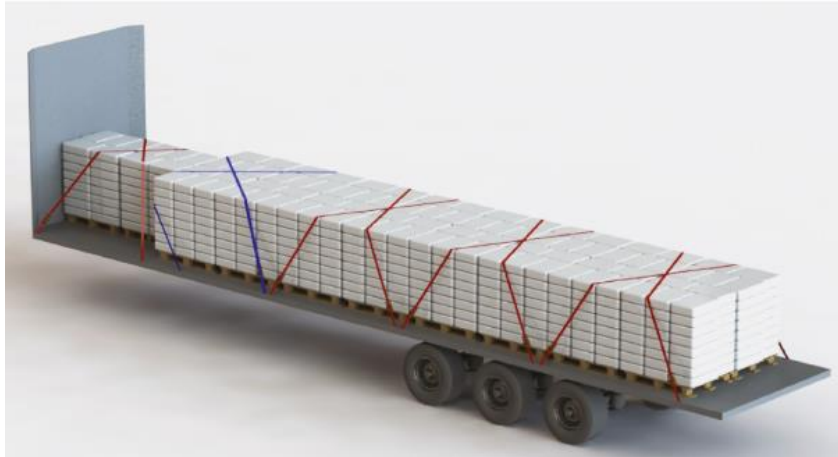
The cross lashing is often insufficient to withstand the inertia forces in the driving direction, therefore a 'spring lashing' is applied on the first block of 4 pallets. Such a spring lashing generates a restraining force in the driving direction.



Cross spring lashing

The main Polyolefins producers have agreed to use a combination of cross- and cross spring- lashings in combination with blocking by the headboard as standard method for securing bags on pallets.

The method is also recommended in the European Best Practice Guidelines for cargo securing.



6.2 FOR OCTABINS

For Octabins the current load securing method is described in attachment 3

6.3. FOR BIG BAGS

See load securing plans in attachment 3

Exception:
In case of 'land transport only' of Bags on pallets or Big Bags, strapping is not required if the following requirements are met:

- * The vehicle has an EN 12642-XL certification and
- * The load is completely form locked (pallets adequately constrained by the side lathwork, head board and rear board and max 8 cm free space between the sides)

Example of labels EN 12642-XL certification of trailer



7. INEOS O&P PACKAGING REQUIREMENTS

The specification and condition of the packages (bags on pallets, Big bags and Octabins) have an influence on the load securing properties.

7.1 BAGS ON PALLETS

- It is recommended to secure the bags to the pallet with the shrink- or stretch wrap (overlap).
- Shrink wrapping gives better stability than stretch wrapping (especially recommended for slip grades)
- Gluing the bags gives better stability of the pallet

7.2 OCTABINS

- It is recommended to shrink- or stretch wrap the octabin.
- It is recommended to secure the octabin to the pallet with the shrink- or stretch wrap (overlap).
- Octabins must be stored in a dry area to avoid weakening of the cardboard by moisture.



8. RESPONSIBILITIES

All involved parties must ensure that the packages are stowed and secured in accordance to the current legislation and that the requirements defined in this Code of Practice are met.

If load securing responsibilities are not defined in writing, it is assumed that the driver is responsible if he has the technical means to do this:

- He must know the load securing plan
- He must have the right equipment to secure according to the plan.

Therefore, the load securing arrangements must be made available to hauliers and drivers before the loading starts.

However the driver must indicate how the truck must be loaded taking into account axle weight restrictions. This can be indicated on a document: see attachment 2.

Based on that info, the exact **load securing arrangements marked and signed by the driver** on the **load securing document** (see attachment 3).

Responsibility Operator	Responsibility Haulier/ Driver
Check if trailer meets the requirements of this Code of Practice and is safe to load	Offer a trailer which meets the requirements of this Code of Practice and which is safe to load and provide adequate number of straps.
Load the truck according to the agreed load plan	Communicate loading plan according to the axle weight restrictions (if applicable)
Supply additional cargo securing material (air bags, sheets, corner protectors, pallets, ...)	Apply blocking/bracing and lashing according to the agreed load securing plan .
Check the final cargo securing (blocking/ bracing, lashing)	Close the trailer

9. BOX CONTAINERS

Containers must be loaded in such a way that there is no free space between the packages and the container walls/doors (Form locking).

This can be obtained by using dunnage material (e.g. air cushions, honey combs). At the back, there is generally some free space between the load and the container doors. Suitable material should be used to prevent that the load shifts to the back (e.g. locking bars..).

Examples:

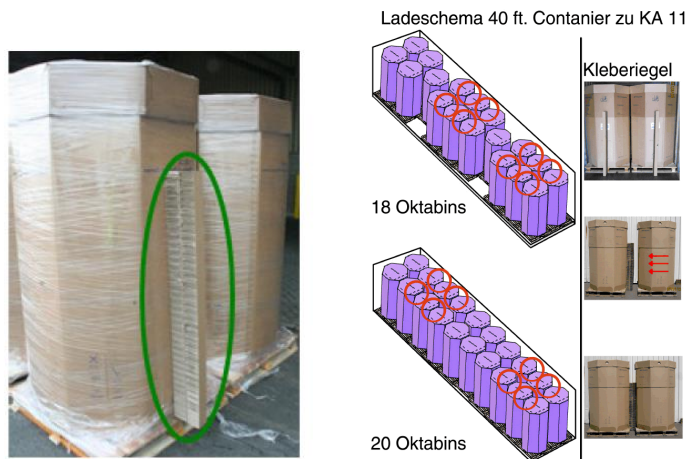
Air cushions



Locking bars:



Cardboard honey combs glued to the octabins:



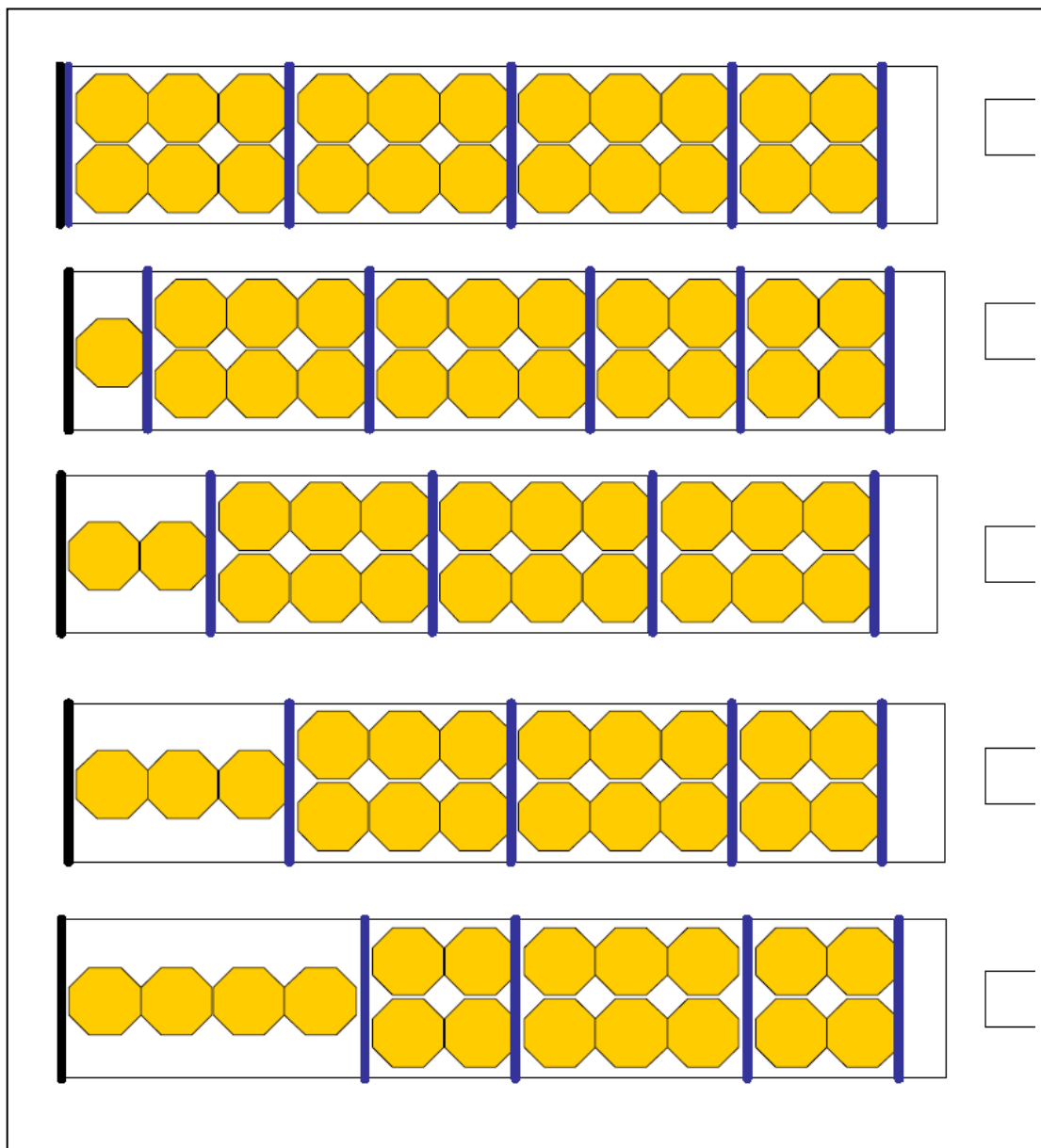
10. TRAINING ON CARGO SECURING


The EU directive 2003/59 on the initial and periodic training of drivers came into force in 2009 and requires an initial training of 280 hours followed by a 5-yearly refresher training of 35 hrs. This training must include load securing techniques.

Loading personnel must be properly trained in cargo securing.

ATTACHMENT 1: LOAD PLANS TRUCKS

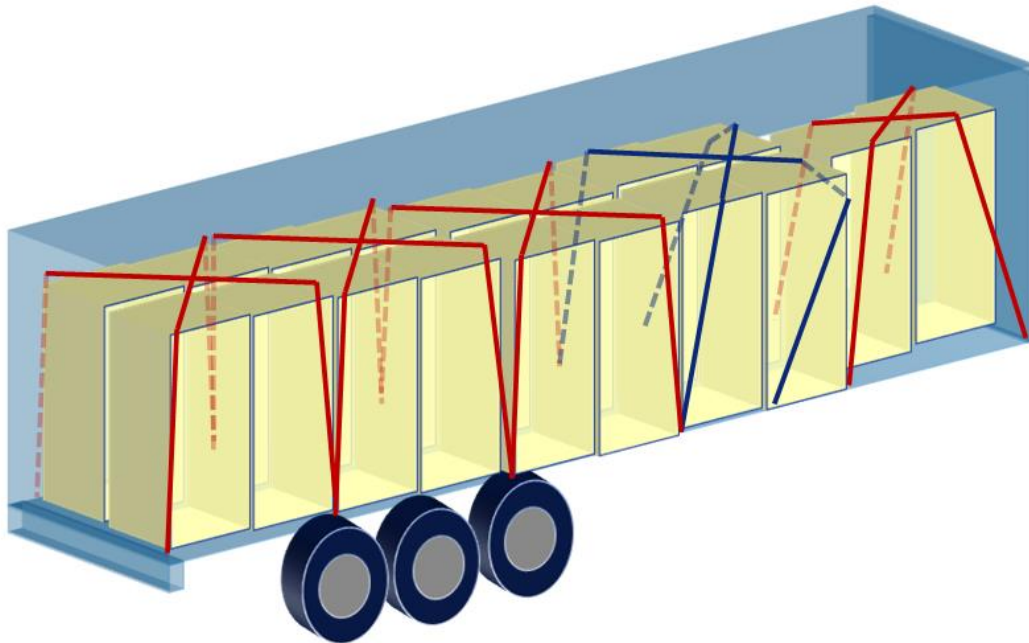
Octabins

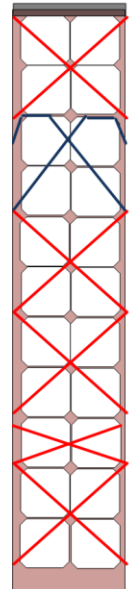
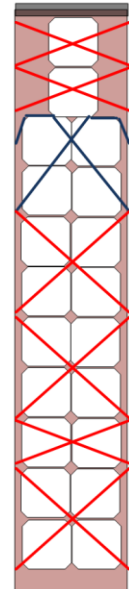
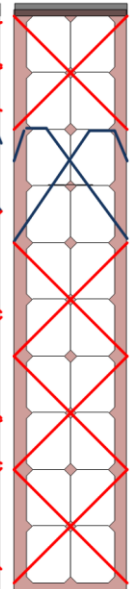
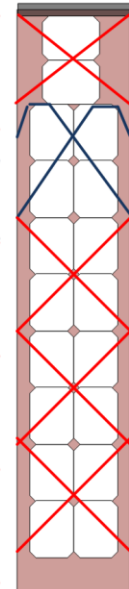
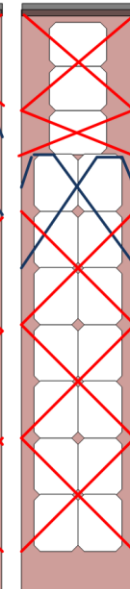
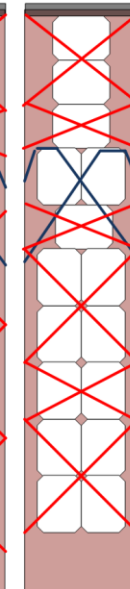
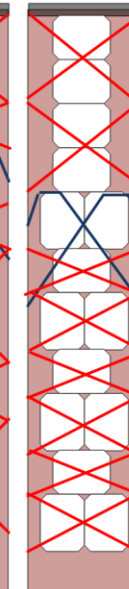
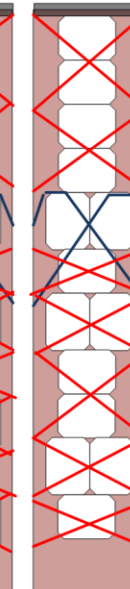


 Frames placed

ATTACHMENT 2: LOAD SECURING PLANS TRUCKS

1: Bags on pallets



22 pallets	20 pallets	20 pallets	18 pallets	17 pallets	16 pallets	15 pallets	14 pallets
							

Guidance:



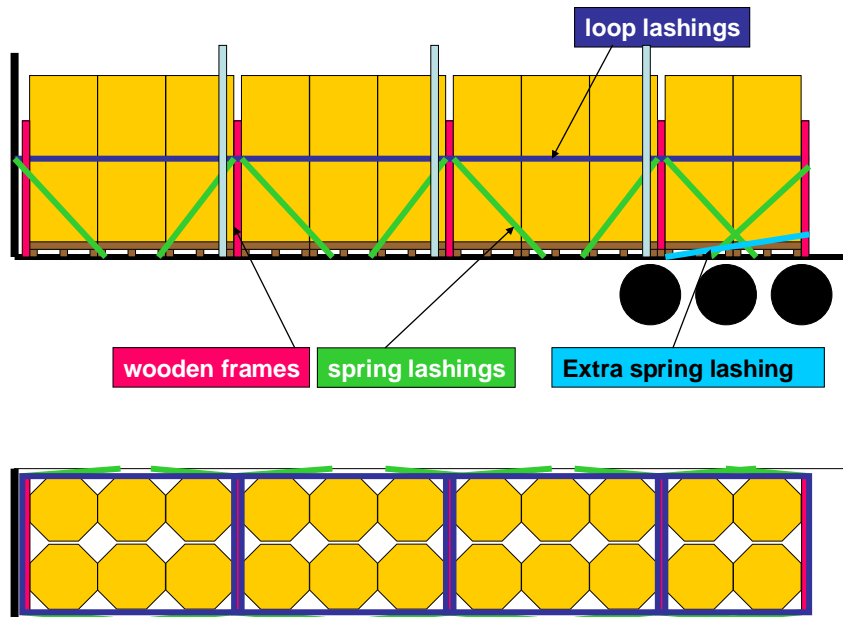
fix the straps close to the end / beginning of a pallet (good angle)



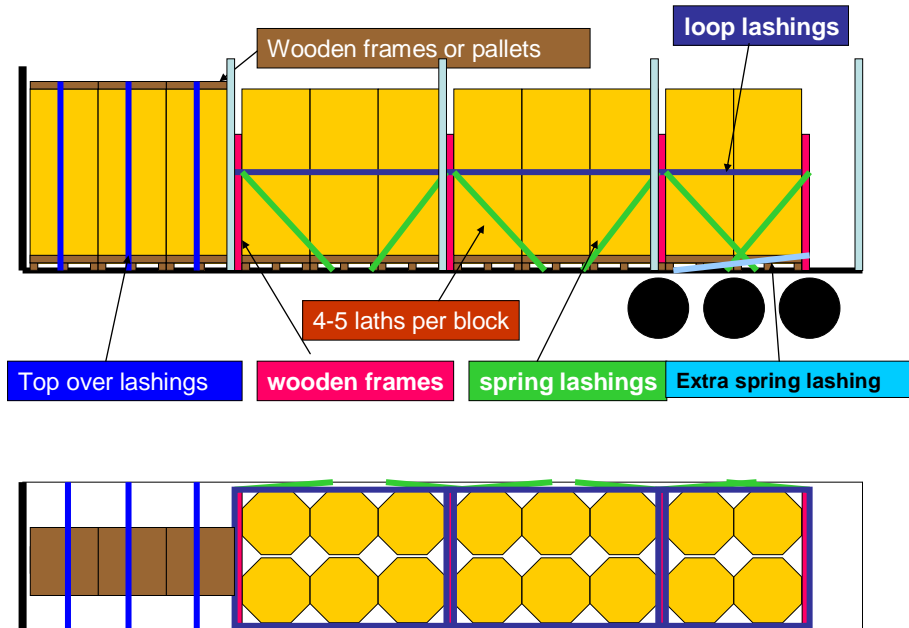
no space between pallets

2: Octabins

Full load: Octabins in curtain sider without side boards

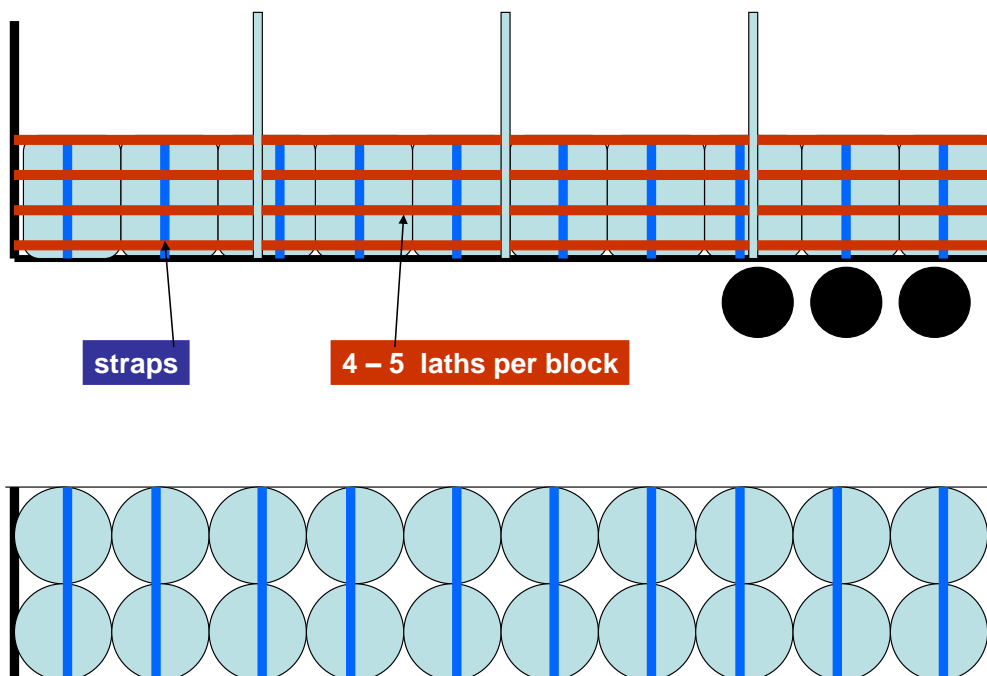


Partial load: Octabins in curtain sider without side boards



3: BIG BAGS

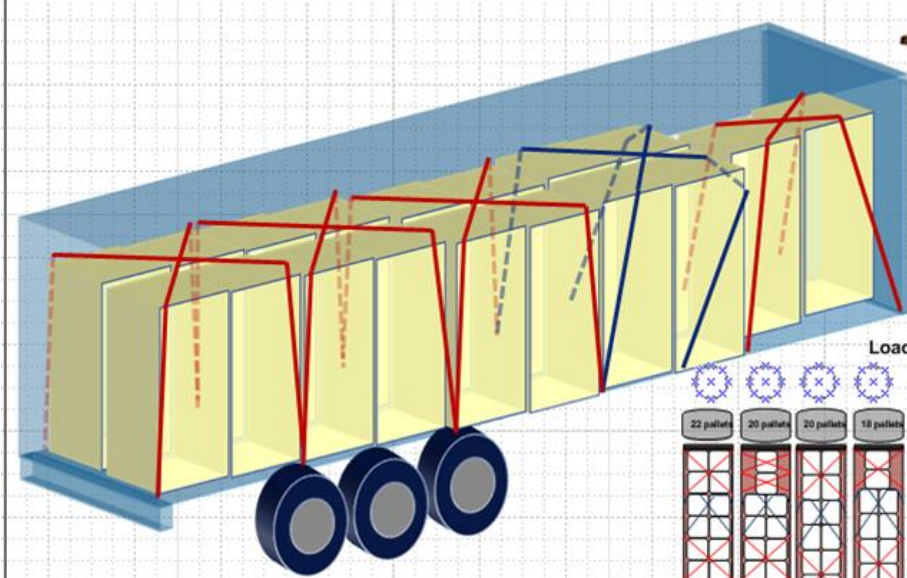
Full load of Big Bags in curtain sider without side boards



ATTACHMENT 3:

LOAD SECURING DOCUMENT FOR BAGS ON PALLETS

(TO BE FILLED IN AND SIGNED BY THE DRIVER)




LC \geq 2500daN

Loading configuration

22 pallets	20 pallets	20 pallets	18 pallets	17 pallets	16 pallets	15 pallets	14 pallets	


Instruction based on cargo securement verification protocol for non-rigid packages for chemical products and inclination tests of different stock keeping units. Protocol and test certificates are available on request.

* Diese Angaben sind entsprechend dem Untersuchungsprotokoll für Ladesicherung von nicht-starren Verpackungsgebünden für chemische Produkte und durchgeführten Kippversuchen von verschiedenen Gebindeeinheiten. Untersuchungsprotokoll und Versuchszeugnisse sind auf Anfrage verfügbar.*

LOAD SECURING INSTRUCTION			Shipment nr. :	
Based on EN12195-1	Rev. Nr. 3	Rev. date 04-04-2010	Signature truck driver 	Date / /
			acceptance and understanding instruction / /

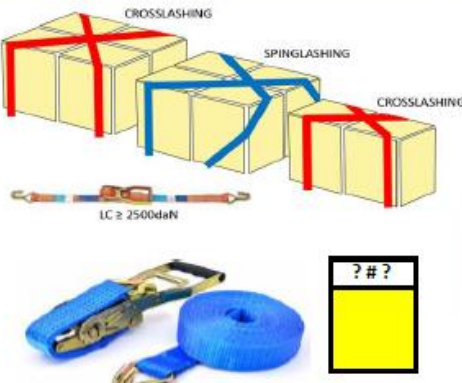
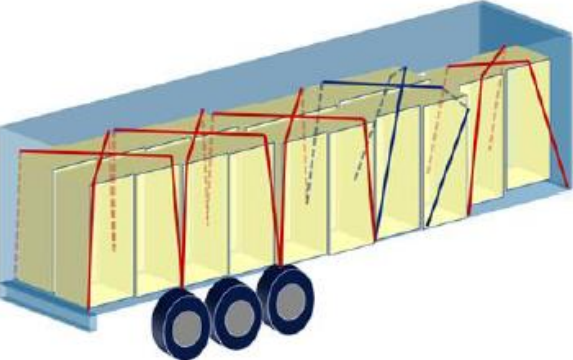
ATTACHMENT 4:


LOAD SECURING CHECKLIST FOR PALLETS. (TO BE FILLED IN AND SIGNED BY THE DRIVER BEFORE LOADING)



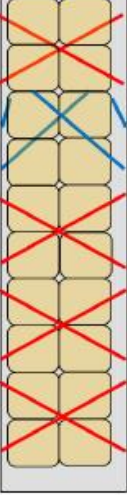




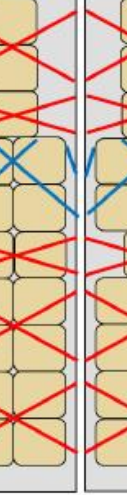
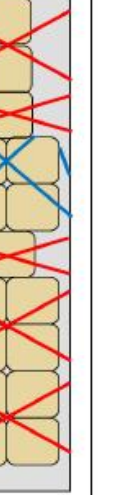

Packed goods loading

Date:	Shipment nr:	Name and signature driver:




= 1 Pallet 1375 kg 1,3m x 1,1m x 2 m

20	19	18	18	18	17	16
						
	# 10	# 12	# 10	# 14	# 10	# 12


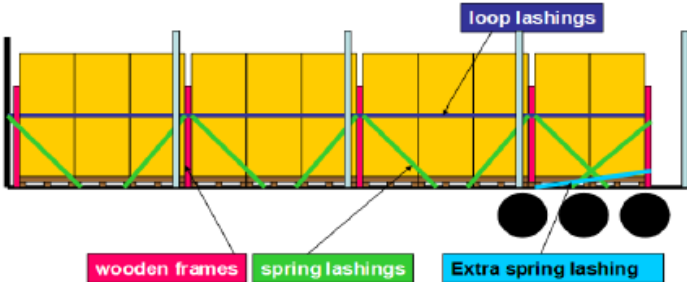
ATTACHMENT 5:

LOAD SECURING CHECKLIST FOR OCTABINS (TO BE FILLED IN AND SIGNED BY THE DRIVER BEFORE LOADING)



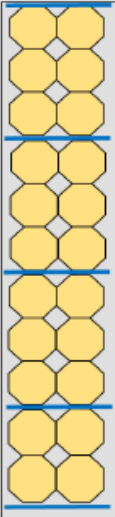
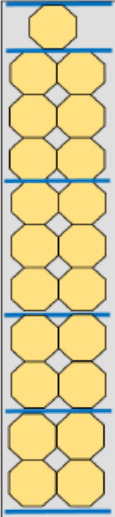
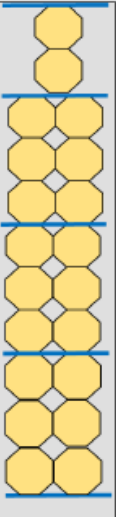

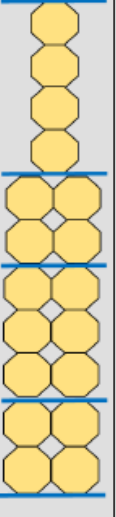
Packed goods loading

Date:	Shipment nr:	Name and signature driver:

? # ?

= 1 Octabin 1100 kg 1,3m x 1,1m x 2 m

22	21	20	19	18	
					
# 14	# 14	# 14	# 14	# 14	#