



**GUIDELINES
FOR SAFE UNLOADING OF
20 FOOT LINED
ISO BOX CONTAINERS
V1
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GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

CONTENTS

1: INEOS O&P – CUSTOMER COMMITMENT	3
2: INEOS O&P – SAFETY POLICY	4
3:TYPE OF DELIVERY	5
4:RISKS	8
4: UNLOADING	10
5. INEOS O&P CUSTOMER SUPPORT	13

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

1: INEOS O&P – CUSTOMER COMMITMENT

The Polyolefins referred to in this booklet are Polyethylene (Linear Low Density, Low Density and High Density) and Polypropylene.

Quality and Safety are one of the keywords of INEOS O&P strategy. All the Company's European Polyolefins production centres are registered to ISO 9001 standards. This demonstrates the commitment by the Company to the product manufacturing and distribution network, performing to specification – first time and every time. But to you, the customer, this simply means material delivered on-specification and on-time.

Bulk handling has long been recognised in other volume industries as the most effective method of distribution. In developing its bulk handling systems, INEOS O&P is committed to improving its service and supporting its customers. Improvements include more efficient distribution and easier product handling, both at source and during the customer's processing. This booklet, which outlines some of the principal requirements for the bulk handling of INEOS O&P products, is published as part of the Company's service to its customers. The recommendations are designed to help minimise disruption to the converters' plant operations and maximise the overall efficiency of the service. It outlines some of the industry standards of practice, the more specific requirements of the Company's bulk Polyolefins delivery services and other relevant information. Whilst the information is of a general nature, further details and technical support are available from INEOS O&P.

These guidelines are available on the Ineos O&P public website:

<http://www.logisticsmatters.info/default.aspx>

In this document, reference is made to other related guidelines developed by the European Chemical Transport Association (ECTA):

“Best Practice Guidelines for safe use of “lined” iso box containers for movement of dry bulk products” see also:

http://www.ecta.com/resources/Documents/Best%20Practices%20Guidelines/best_practice_guidelines_for_the_safe_use_of_lined_iso_box_containers_for_movement_of_dry_bulk_products.pdf

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

2: INEOS O&P – SAFETY POLICY

It is Ineos O&P policy that safety of operations must be paramount.

These guidelines are issued in order to fulfil this aim.

Ineos Group maintain a very high safety standard and have developed 10 Behaviour Safety principles and 7 Life Saving Rules.

BS principles:

1. We believe all incidents and injuries can be prevented
2. Everyone's first responsibility is to ensure they work safely
3. Everyone has the duty to stop work if they feel the situation is unsafe
4. The expectations and standards are the same for everyone on the site
5. Rules and procedures must be observed and respected
6. We should look out for each others safety and unsafe situations
7. All injuries and incidents /near misses must be reported and investigated
8. Risk assessment must be carried out prior to, during and on completion of work
9. All team leaders have a special responsibility for promoting and upholding these principles
10. We must always work within the limit of our competency and training

Life Saving Rules:

- 1: No consumption or being under the influence of alcohol or drugs on company property.
- 2: No smoking outside dedicated smoking areas.
- 3: No work on live equipment/machines to commence without authorisation.
- 4: Safety critical devices/interlocks must not be disabled or overridden without authorisation
- 5: Persons working at height must use proper fall protection
- 6: No entry to confined space without authorisation and gas test
- 7: Lifting & hoisting – no unauthorised person to enter the defined danger zone where objects can fall.

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

3:TYPE OF DELIVERY

For this type of deliveries, ISO box containers are used.

These ISO box containers are not specifically designed for the movement of dry bulk products but with the right equipment, an ISO box container can be converted to a bulk solids container which can be loaded and unloaded all over the world.

The ISO box container is fitted with a polyethylene inner liner and with a bulkhead which consists of 4 steel retaining bars at the back.



On our loading sites, the product is loaded into the container by means of a belt thrower or by gravity by tilting the container.

The unloading is done by tipping (or 'tilting') the container. The most commonly methods used are

- **Tilting the container on a trailer with a tipping ram.**



Pivot point of tipping chassis is close to the rear axle of the trailer – no stabilizing legs needed

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

- The advantage is that the tipping is done by the delivery vehicle and that the container must not be transferred onto another chassis.
- As the tilting trailer is generally not owned by the unloading site, it must be checked to ensure that it is in good condition and that some minimum requirements are met:
 - The pivot point of the tipping chassis must be close to the rear axle, if this is not the case, the tipping chassis must be equipped with stabilising legs.
 - The front- and rear bolsters on the chassis should preferably be linked by means of side beams (to ensure that the bolsters rotate simultaneously).



- The left and right bolsters on the rear bolster bar (the point on which the container/ twist locks rotate), should preferably be connected to each other because, if one of the bolsters would fail to rotate whilst the other is rotating, this can give rise to twisting and potential tip over. So a full width bolster bar or split bolster bars which are linked to each other by means of a torsion bar are preferred.
- It is recommended to install 'twist lock indicators' on the twist locks of the tipping chassis. These allow to see, even from a distance, whether or not the twist locks are engaged (indicators do not come out of the frame) or not (indicators come out of the frame)



Indicator at the front

Indicator at the back

In both cases is the twist lock not engaged

- Heel plates on the twist locks are recommended

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS



Twist locks on bolsters fitted with heel plates
Both bolsters are connected by means of a torsion bar

- The tipping must be done in several stages. It is preferred that the tipping mechanism can be operated from a remote location, away from the 'danger zone' in case the container would tip over. The buttons on this remote control box need to be pushed down while raising or lowering the container. This is a safety design to ensure that the operator remains in control during the tipping process at all times.



- The trailer must be fitted with an earthing point/ earthing wire.

- **Tilting the container on a tilting frame**



This requires a lifting device (e.g. Reach Stacker).

Tilting frames are generally more robust and more stable than tilting trailers so there is less risk of the container tipping over or sliding off the chassis.

Most of the elements as described above under 'tilting trailers' (except for the stabilizing legs) may however apply as well.

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

4:RISKS

Before a first unloading is done, the unloading site must carry out a risk assessment.

The main risks of tipping a 20' (or 40') container are:

1: Failure of the bulkhead when the container is in tipped position. The liner may be pushed out of the container and the product may hit an operator standing at the back of the container.



This risk can be mitigated by:

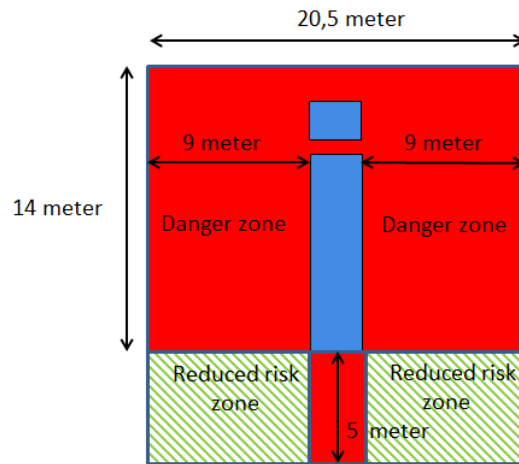
- 1: Tipping the container slowly, in different steps, in order to keep the pressure on the steel bars as low as possible, and
- 2: Keep one container door closed during the tipping, and unload via the discharge spout at the other side. (e.g. keep left door closed and unload via right discharge spout)

2: The container slides off the chassis or tips over to the side whereby people working at the back of the container or passing by, could be crushed by the container.



The zone in which the tractor/ trailer combination can tip over is the 'danger zone'

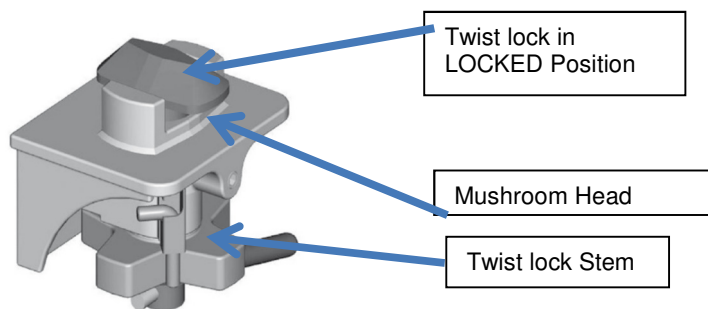
GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS



This risk can be mitigated by:

- 1: Always make sure that the 4 twist locks on the tipping chassis are in good condition, engaged and locked BEFORE starting the tipping

The mushroom head of the bolt should be completely embedded (at 90deg – see below) in the twist lock when the twist lock is closed properly. This means that the bolt is properly inserted, also check and ensure that the Twist Locks are engaged and secured, with locking pin in place



Before unloading the driver must screw down the hand nut of all twist locks tightly (no spanner needed).

- 2: In case of using a tipping trailer:

- It is standing on an even, solid underground.
- There are no vehicle movements or other dangerous activities close to the trailer.
- There is no strong wind that could impact the stability of the trailer.
- Stabilising legs (if fitted) are lowered.
- The traction unit and trailer are positioned in a straight line
- There is no overhead obstruction that can be hit by the container

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

4: UNLOADING

1: Check the visual condition of the container.

Check the container walls. If containers have been handled roughly in transit e.g. by smashing it hard to the ground, the side walls can deform which could give more slack to the steel bars causing the steel bars to shift.

2: Make sure the unloading equipment is clean.

When cleaning the rotary valve, do not insert your hand inside the valve while it is energized. It is suggested to install a safety grid on top of the rotary valve with an interlocked sensor that cuts the energy when the safety grid is removed.



3: Open the container doors carefully

There is always the risk that, because of rough handling of the container in transit, the cargo may be resting against the doors. As the door opens, be prepared to step back if the door appears to be pushing you. It is strongly recommended to keep one door closed for unloading.

4: Check the condition of the steel bars and their correct position

5: Earth the container and the unloading equipment.

6: Check that the 4 twist locks are engaged and in locked position

7: In case of a tilting trailer, check that:

- It is standing on an even, solid underground.
- There are no vehicle movements or other dangerous activities close to the trailer.
- There is no strong wind that could impact the stability of the trailer.
- Stabilising legs (if fitted) are lowered.
- The traction unit and trailer are positioned in a straight line
- There is no overhead obstruction that can be hit by the container
- The vehicle is immobilized (e.g. by means of wheel chocks)



8: It is recommended to unload from the left or right discharge spout and to keep the door at the other side closed. This gives a better protection in case the bulkhead would fail during the tipping process.

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS



- 9: Lock the open door by means of the door- retaining-strap or another device, to prevent that the door will suddenly swing during the tipping, and possibly hit the operator..



GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

10: Connect the discharge spout to the rotary feeder.



Ensure that the discharge spout remains straight without a kink in it. If necessary, straighten the spout during the discharge process.

11: Connect the hose to the silo inlet. Use safety clamps to prevent that the hose separates from the coupling because of the vibrations during the unloading.



12: Unload through progressive tilting, while taking into account the flow characteristics of the product. Keep the centre of gravity of the container as low as possible.

Start the unloading in horizontal position, then tilt the container up to 1 ram section after 20 minutes.

Extend the ram further to 2 sections after 40 minutes.

Extend the ram to the maximum after 60 minutes.

If tipping is done too quickly, the liner may come out of the bulkhead above the upper steel bar. Polyethylene and polypropylene granules have excellent flow characteristics but for products which are cohesive (powders), in combination with other factors (moisture..) can form agglomerates or even cohesive masses which can possible 'surge' during discharge (avalanche effect). This could cause sudden movement of the product, such that it can flow over the top bar of the bulkhead or, in

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

worst case scenario, can cause the bulkhead giving way, emptying the complete contents of the container on the floor.



Any discharge operator standing behind the container would be in serious danger in such an event. Therefore, the operator must remain outside the 'danger zone' as much as possible, especially when the container is raised to a higher position.

- 13: Supervise the unloading process the whole time. Stop the unloading in case of high wind speed or gusts.
- 14: At the end of the unloading, there may be some remaining product in the liner at the opposite side of discharge sleeve. In that case, cut a hole in the liner and use a metal scraper to move the material to the discharge spout. Always use a safe working platform for this operation.



For cutting the liner, always use a safety knife ! This can be a swan-neck type knife or a spring-loaded, self-retracting knife.



- 15: at completion of the unloading, lower the container, stop the rotary feeder and remove liner and steel bars.

5. INEOS O&P CUSTOMER SUPPORT

For further information about INEOS O&P products or technical advice about product handling, please contact your local Regional Sales Representative or the Ineos O&P Customer Service Center in Köln.

GUIDELINES FOR SAFE UNLOADING OF 20' LINED BOX CONTAINERS

This document and other Logistics HSE information of INEOS O&P can be found on the following web site: <http://www.logisticsmatters.info/>

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