



PATRAM 2010

Patented Solution of
Handling Features
blocked by rotation

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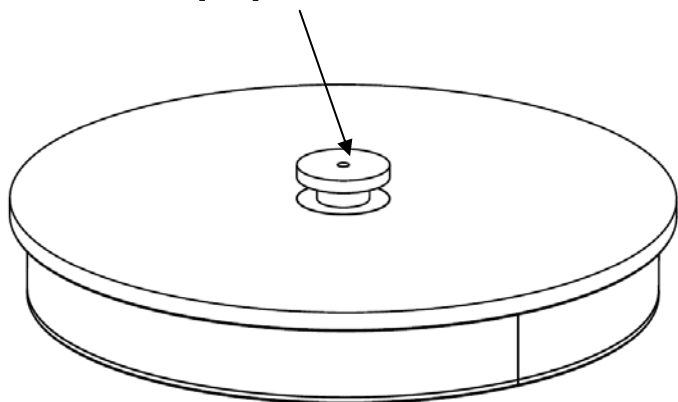


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1. Specification for handling features
2. Existing handling features with remote connection
3. New patented DAHER solution
4. Decontamination
5. Manufacturing
6. Inspection for manufacture and maintaining (remote)
7. Conclusion

- Handling, transport and storage of radiological materials:
 - ⇒ tested and inspected handling features
 - ⇒ remote connection (no possible human access & respect of ALARP principle)
- Loading in contaminated environment:
 - ⇒ external decontamination
 - ⇒ control of external residual contamination
- Handling features are the area of main contamination transfer by contact with handling means:
 - ⇒ collected from the loading cell
 - ⇒ transferred to control, decontamination facilities
 - ⇒ transferred during transport, storage ...

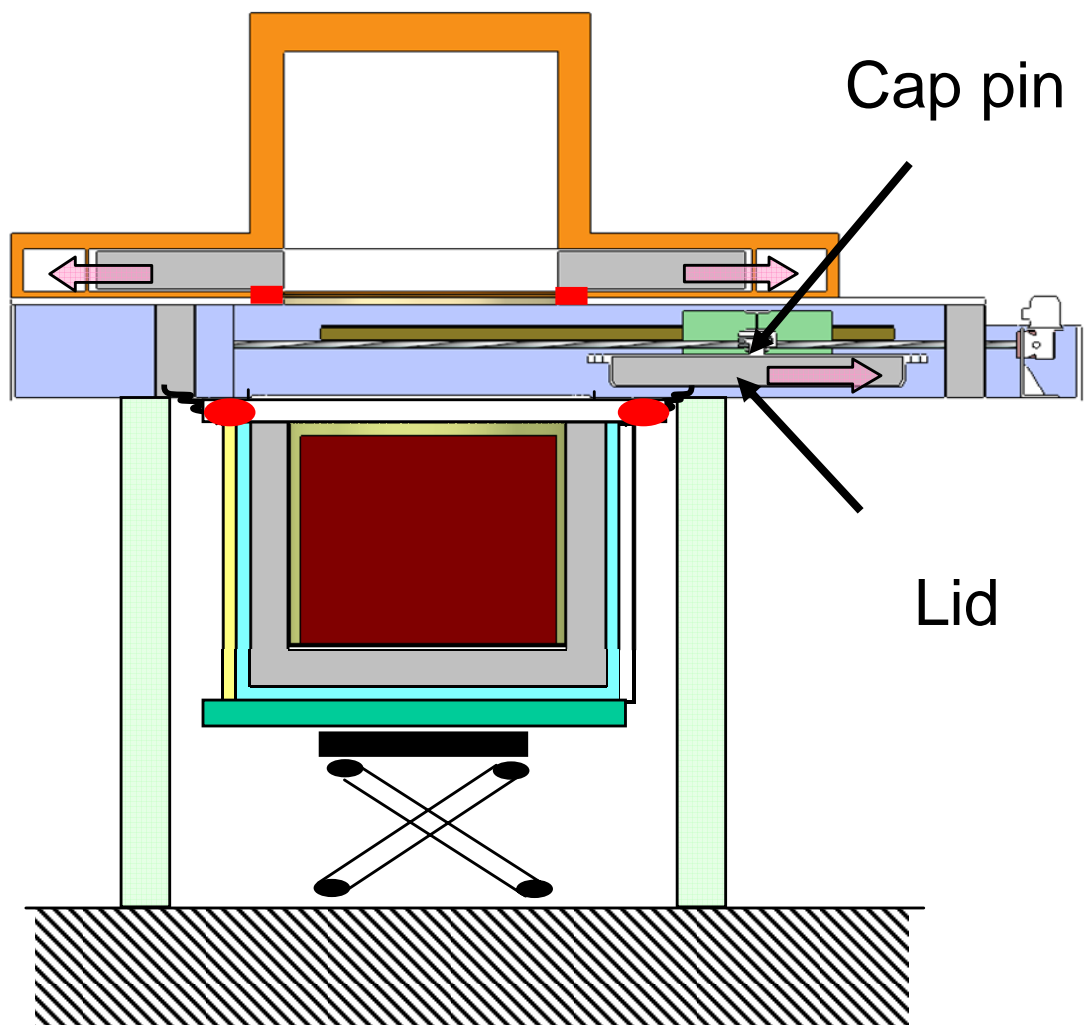
Cap pin: lid



Simple handling interface
used only for handling

- part of containers (lid, removable shielding)
- content (canisters, sources)

⇒no stacking



Cap pin

Lid

Trunnions: transport cask



Trunnions
to tilt and
handle
casks

Cask fixed
by trunnions
on trailer

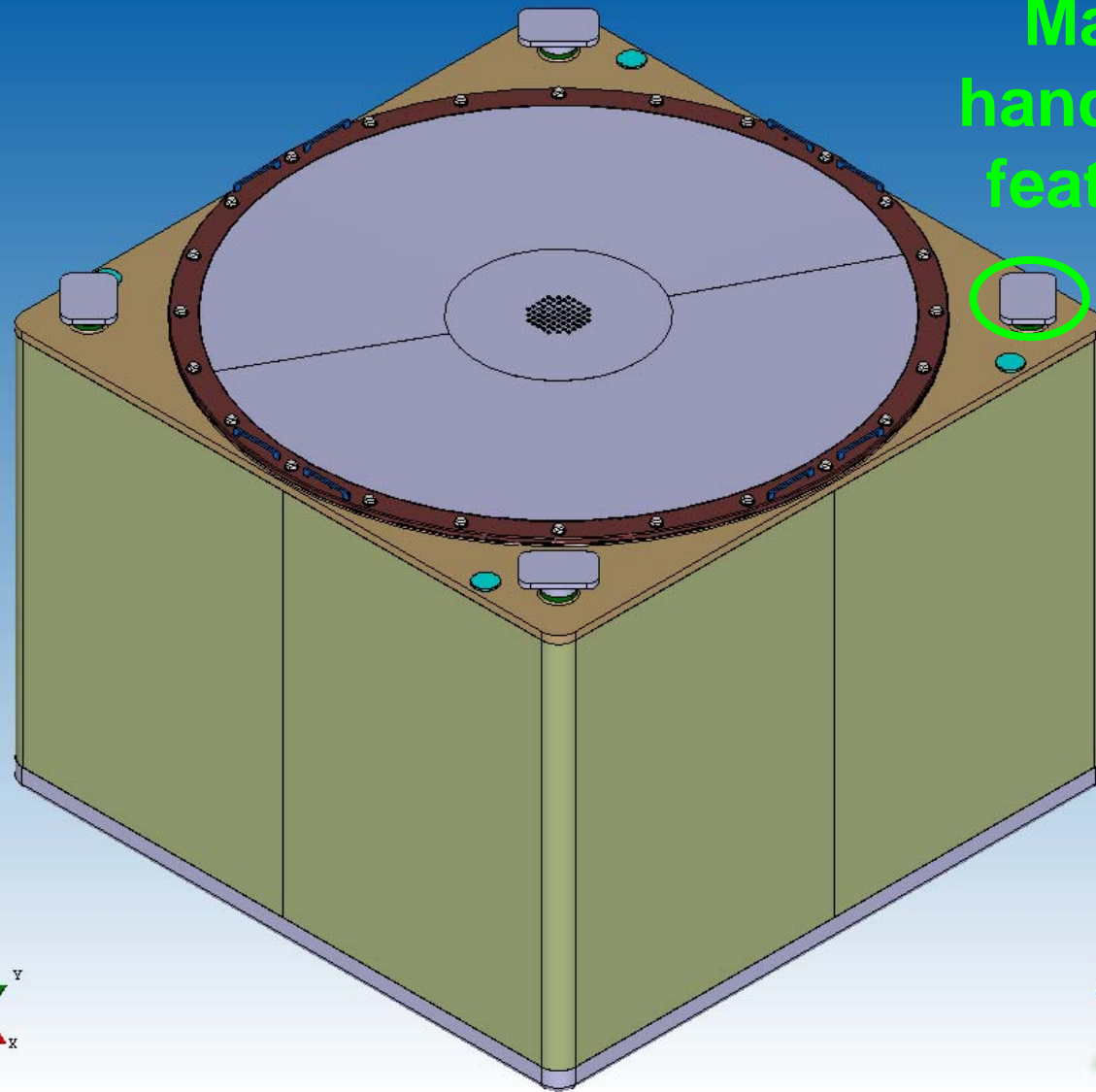


Used for transport casks that need to be tilted
⇒vertical loading & horizontal transport
⇒no stacking

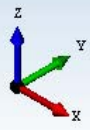
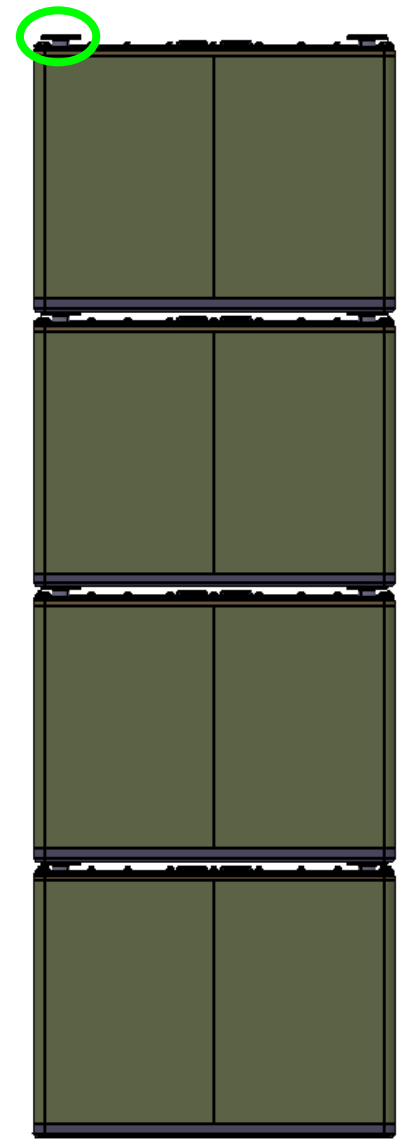
<p>Twistlock pocket</p>	<p>Containers with ISO corners</p>	
	<p>3m3 ILW containers</p>	

Twistlock pockets enable stacking but are uneasy for:

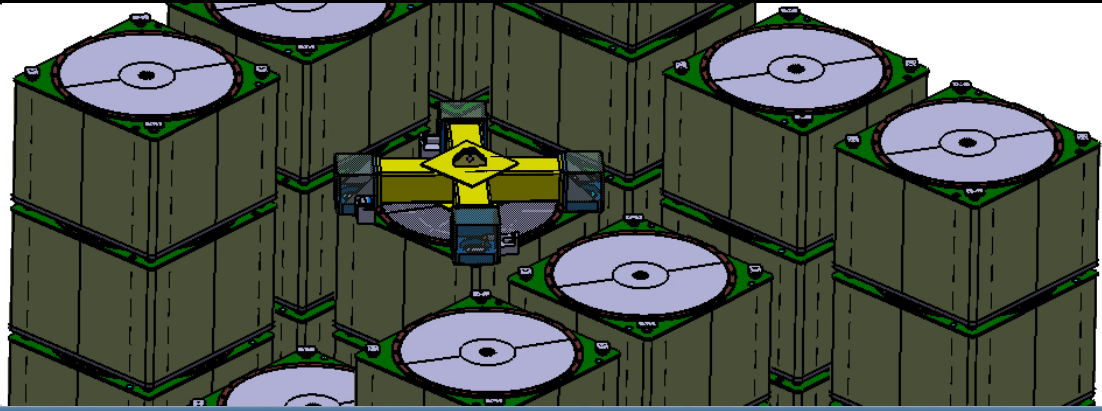
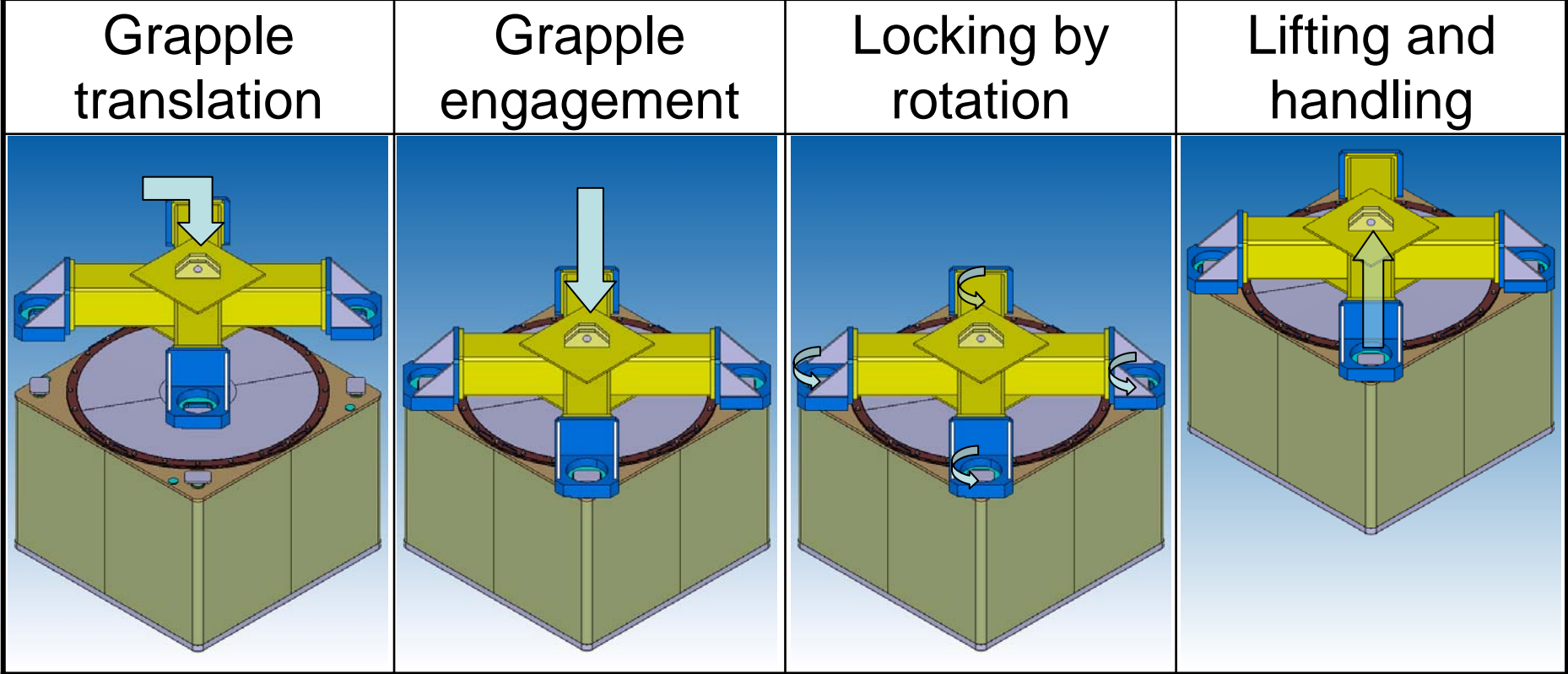
- decontamination and decontamination control
- implementation on container inspection



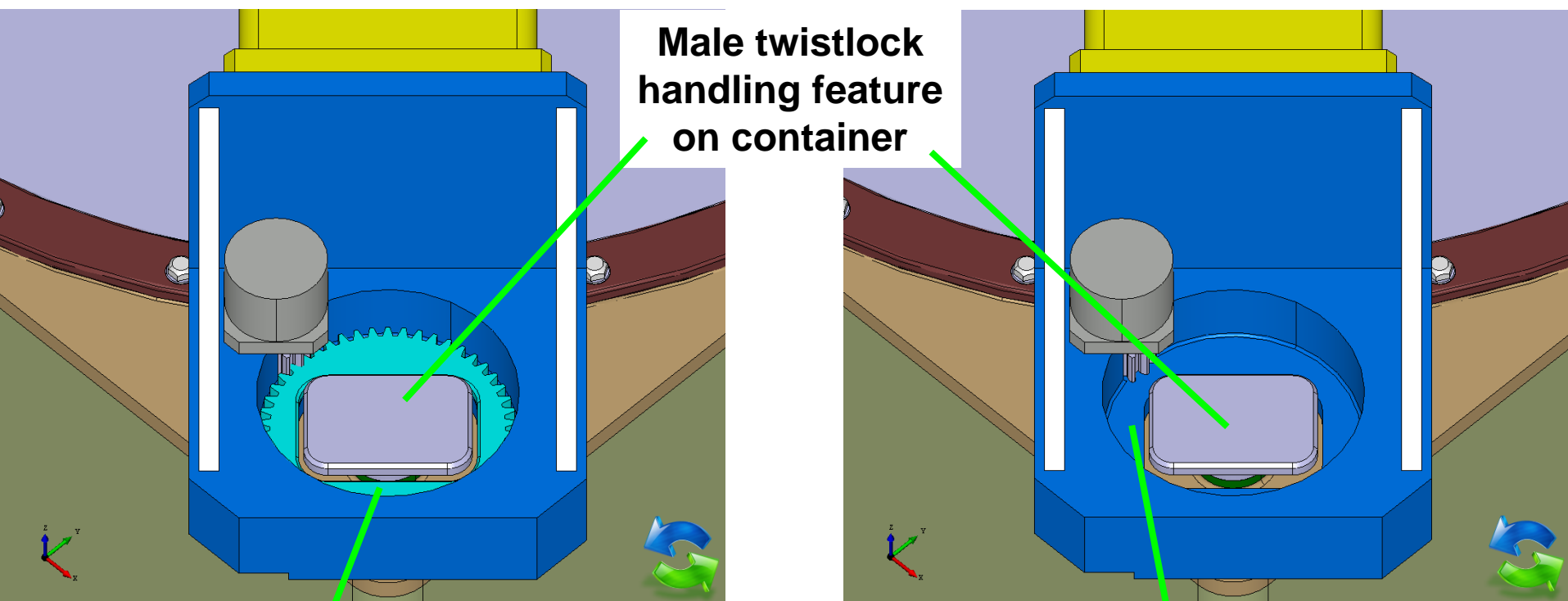
Male
handling
feature



Patented DAHER solution for stackable containers



Patented DAHER solution for stackable containers



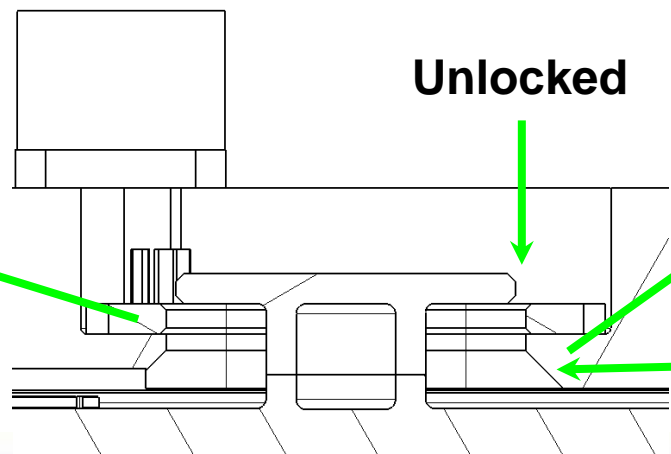
Male twistlock handling feature on container

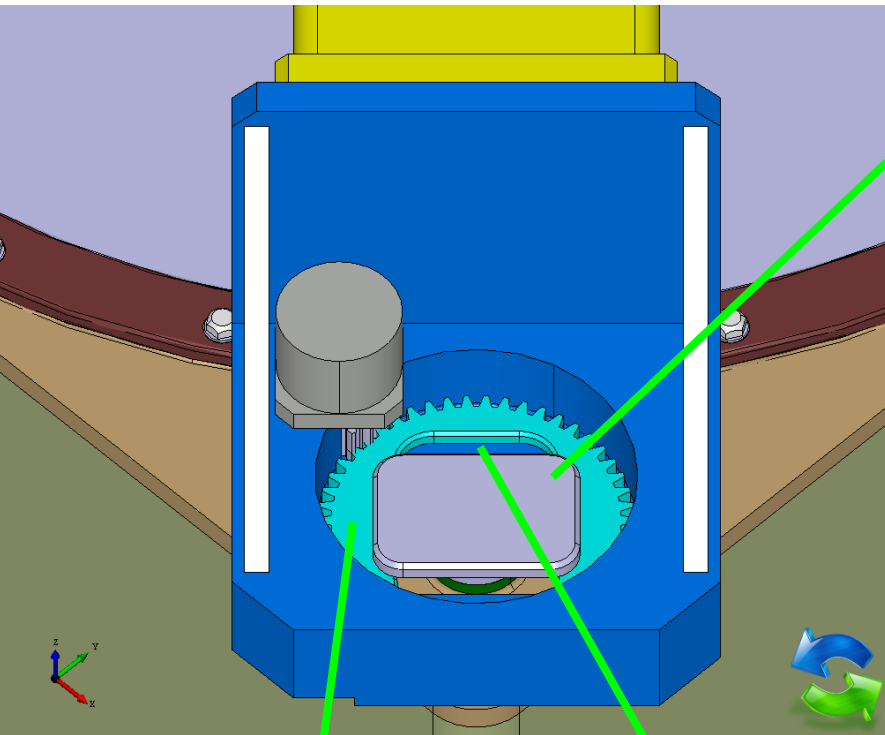
Fail safe principle: Rotating eye supported by the grapple

Rotating eye on grapple

Unlocked

Chamfer to center the grapple

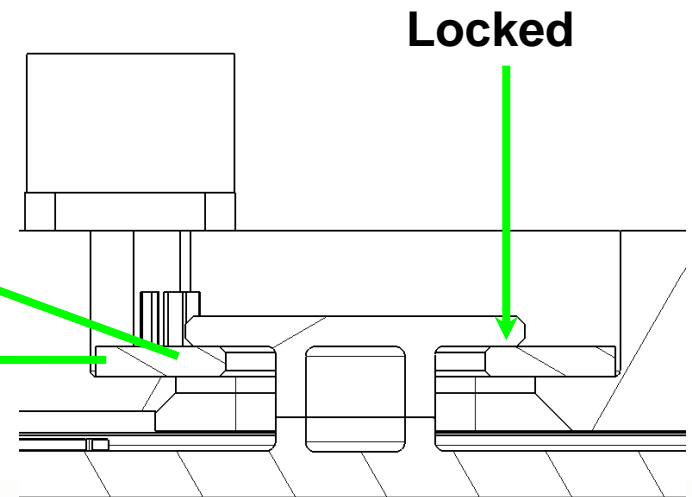




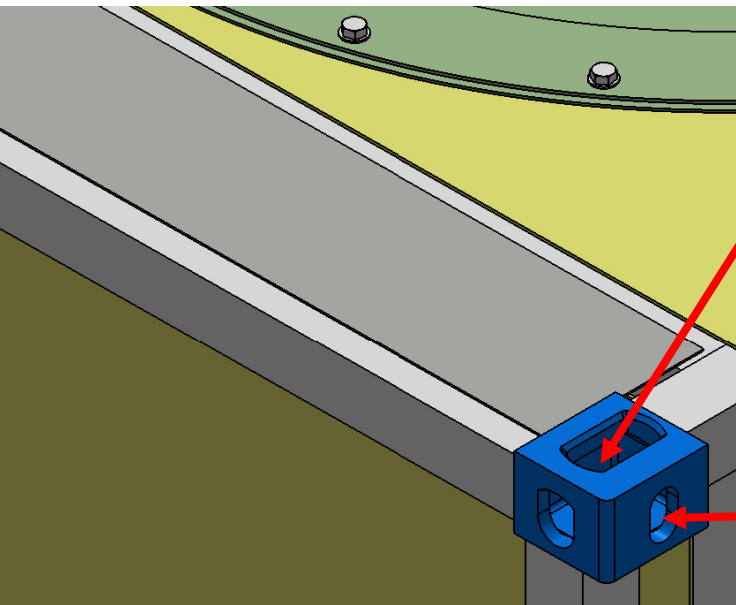
**Male twistlock
handling feature
on container**

**Fail safe principle:
Rotating eye supported
by the grapple**

**Rotating eye
on grapple**



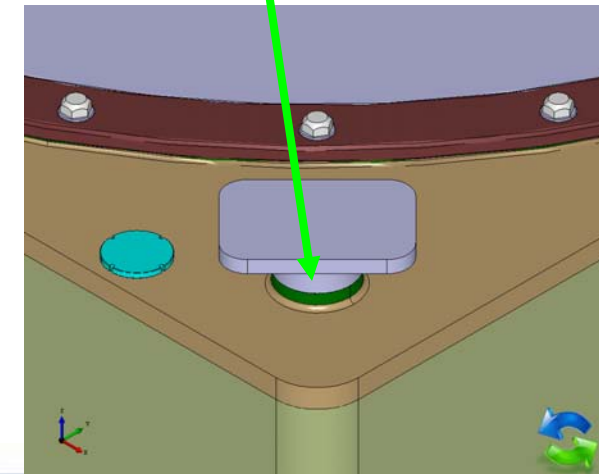
- Reduce transfer and release of contamination:
 - make easier and more efficient decontamination
 - reduce decontamination effluent due to more efficient decontamination
 - make easier decontamination control
- ⇒ reduce time process and so increase process availability
- ⇒ reduce generated waste (decontamination effluent) to treat



Internal
surface finish
difficult to
obtain

Water hold-up
pending ground
horizontality

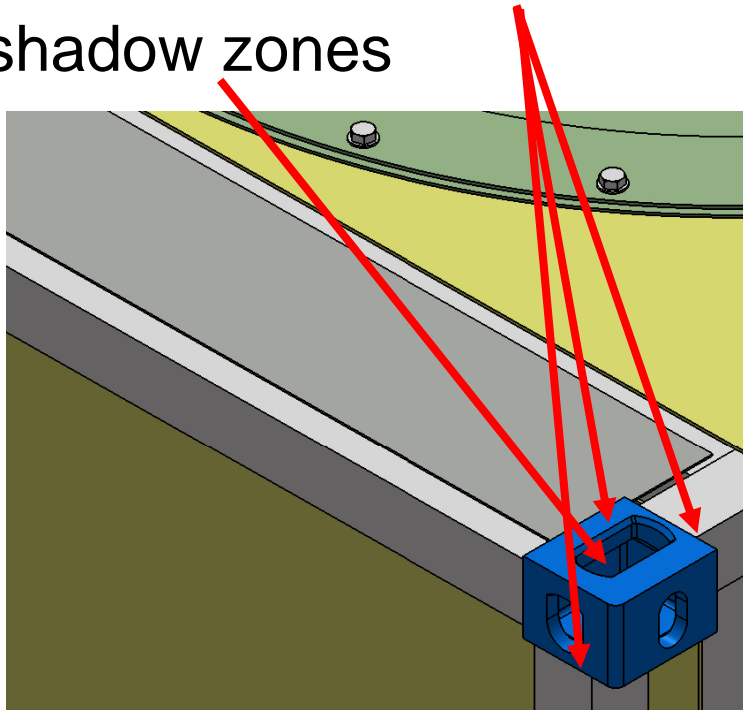
Surface reduction
and better access



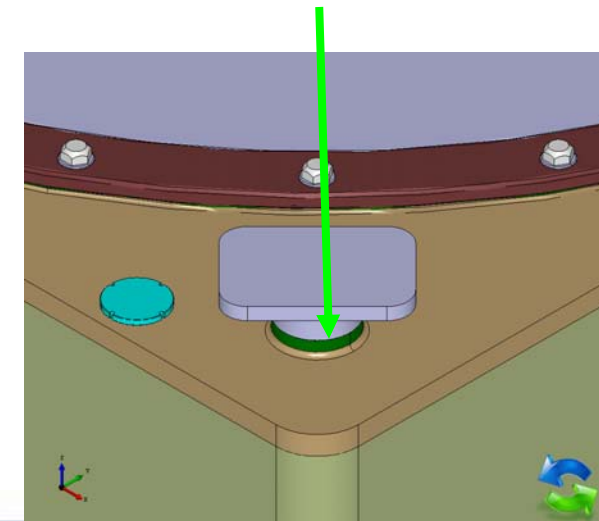
- Respect ALARP principle:

- reduce radiological exposure of workers due to more efficient decontamination.
- reduce inspection and maintenance operation

Several areas to control & shadow zones



Direct visual access & single area to control

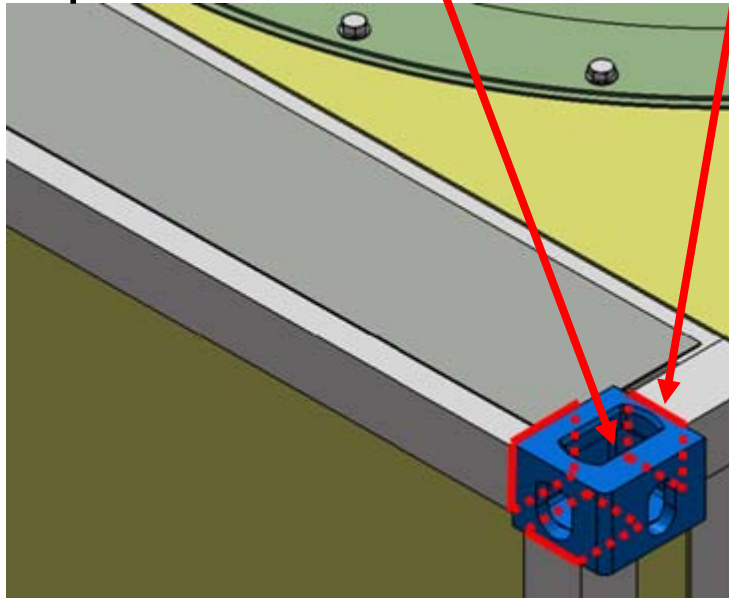


- Increase robustness:

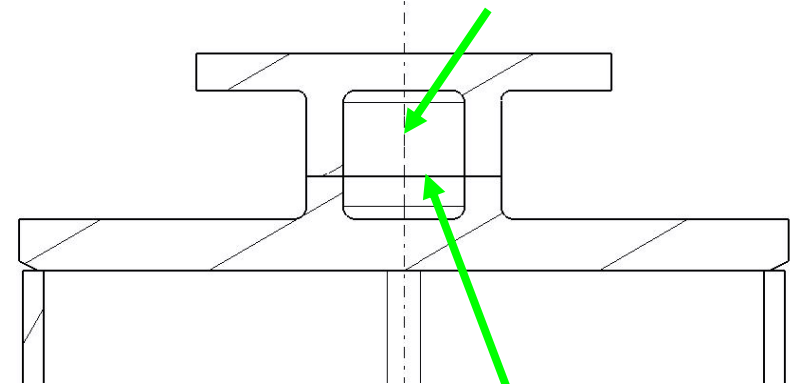
- improve the quality of the package fixation
- make easier inspection
- allow replacement of defective handling feature

Cannot be fully inspected nor replaced

Several difficult welds



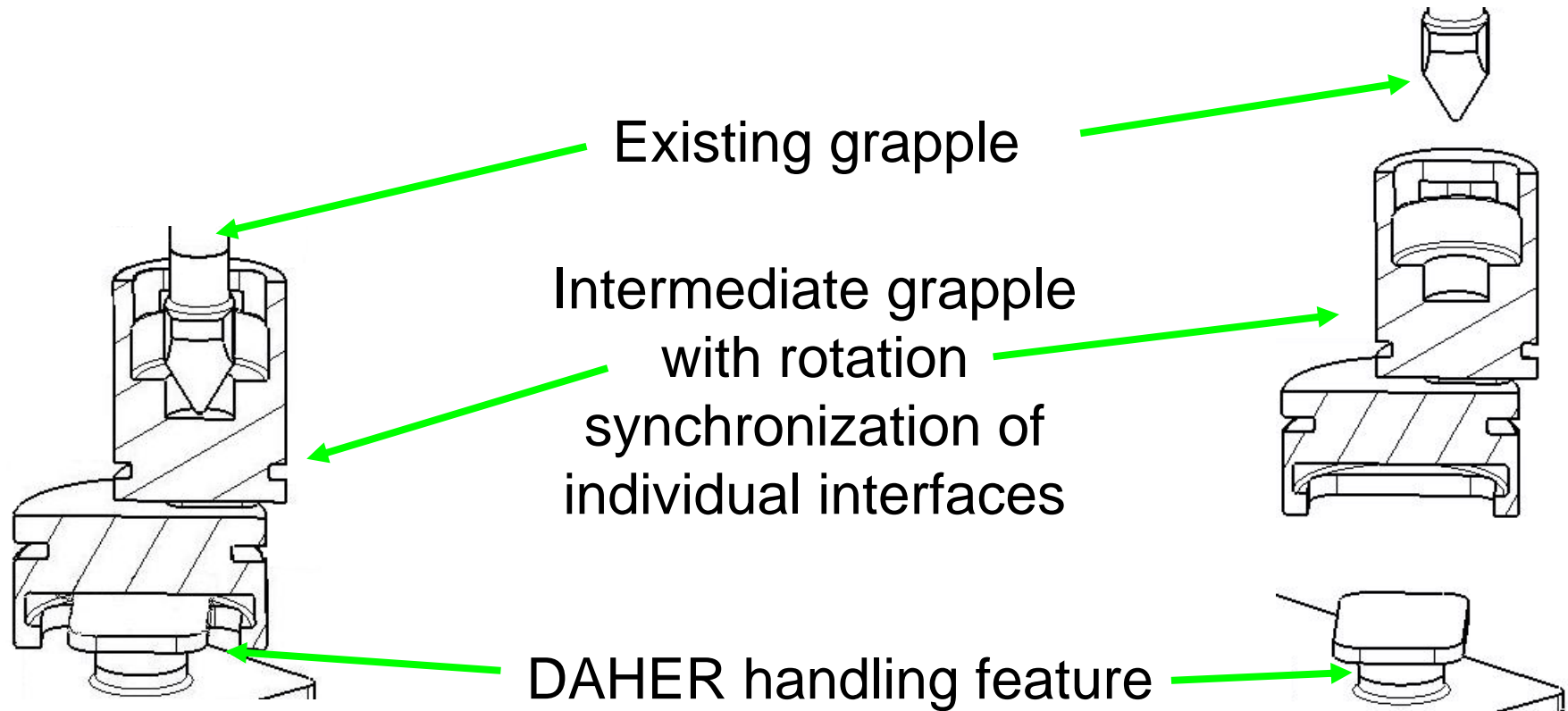
Can be welded by friction then machined



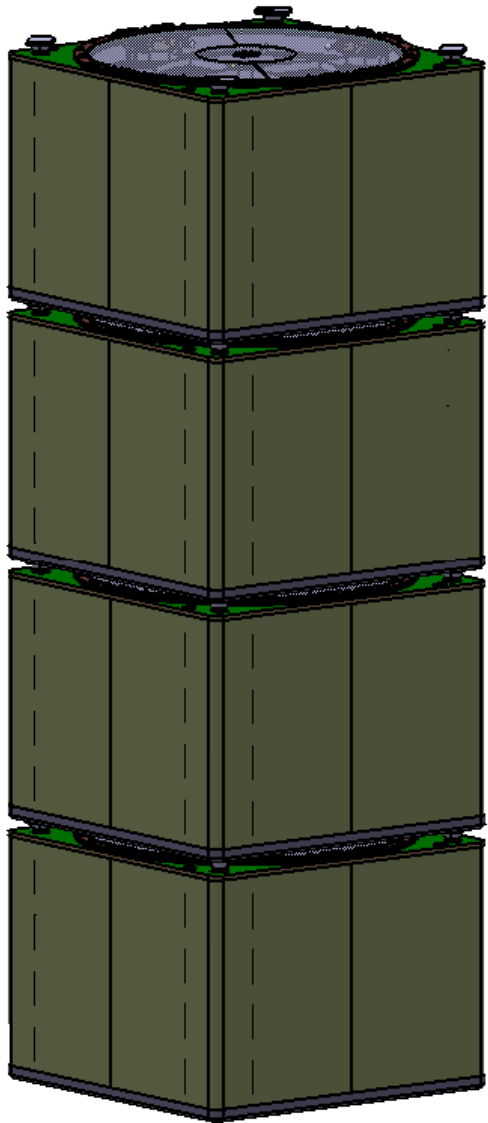
Can be easily radiographed
Can be cut, rewelded
and remachined

- Adaptation possibilities:

- use of removable intermediate grapple (can be motorised by existing motorised grapple)
- use of removable locking devices (fixation on trailers)



	Twistlock pockets	DAHER patented handling feature
Decontamination	Restricted access Water jet splashes	Full access Better surface finish
Manufacturing	Difficult to implement	> -60% of weld length vs twistlock pockets Use of friction welding
Control - inspection	Partial	Full (direct visual access – one shot radiography)
Other advantages		Replacement Location



Thank you
for your
attention

