



Commission on Phytosanitary Measures | 20th Session

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CPM
20

Sea Container Design Changes

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Optimisation versus Re-Design

Current container designs already highly optimised in terms of:

- Mass
- Strength
- Ease of manufacture and repair
- Compliance e.g. Customs
- Cost
- Asset life

Design change (re-design) for some components is necessary and beneficial for pest reduction

❑ Retrofit of existing containers is uneconomical and highly impractical

- GP containers comprise 85% - 90% of the worldwide fleet
- Worldwide fleet estimated at 40 – 50 M units in 2025
- In Excess of 250 M container trips annually
- Dry containers (by virtue of design) have greatest pest contamination possibility and correspondingly a greater potential benefit from re-design

Focus is on Dry Containers

- also known as GP (General Purpose) containers

- Design changes have the potential to negatively affect:
 - Tare weight
 - Build materials cost
 - Build productivity
 - Repairability esp. exotic materials
 - Availability
 - Asset life

- Neutrality in all these is desirable but difficult to achieve

What effects could design changes have?

2024 Rotterdam Symposium considered these components:

- Side & Front Wall connections to Bottom Side Rail & Front Sill
- Floors
- Door Gaskets
- Vents
- Understructure
 - Cross-members, Bolster, Sills, Bottom Side Rails
- Forklift pockets and Corner Fittings

Components prone to pest contamination



Focus on highest risk components - Symposium consolidated feedback

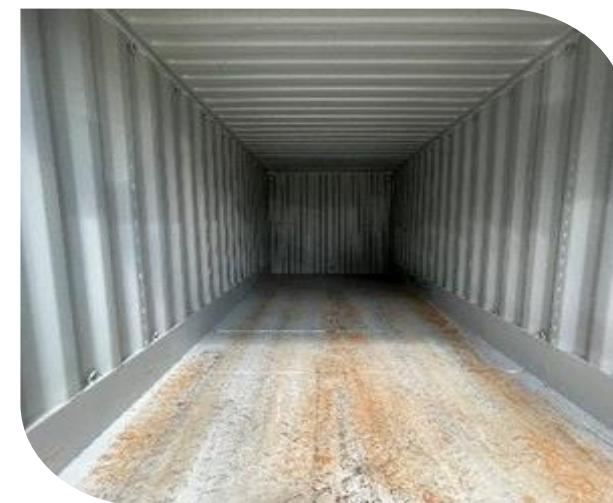
Component	Pest Risk	
Floors	High	Priority to solve “gaps” problem
Understructure incl. Forklift pockets	High	Priority to solve “ledges” problem
Wall connections	Medium	Important but not urgent
Vents	Medium	Important, smaller risk
Door Gaskets	Medium	Difficult to solve quickly
Corner Fittings	High	No practical design solution
Coatings*	Low	Long term efficacy in doubt
* Bitumastic coatings exempt	High	Priority to solve “stickiness” issue

Post-Rotterdam: Industry Design Work Group and priorities

- Current:
 - Floors
 - Base structure
 - Bitumastic coatings
- ISO standard proposal for “pest free” container
- WG lifetime beyond that of FGSC (subject to CPM endorsement of design changes)

Steel Floors – in service designs

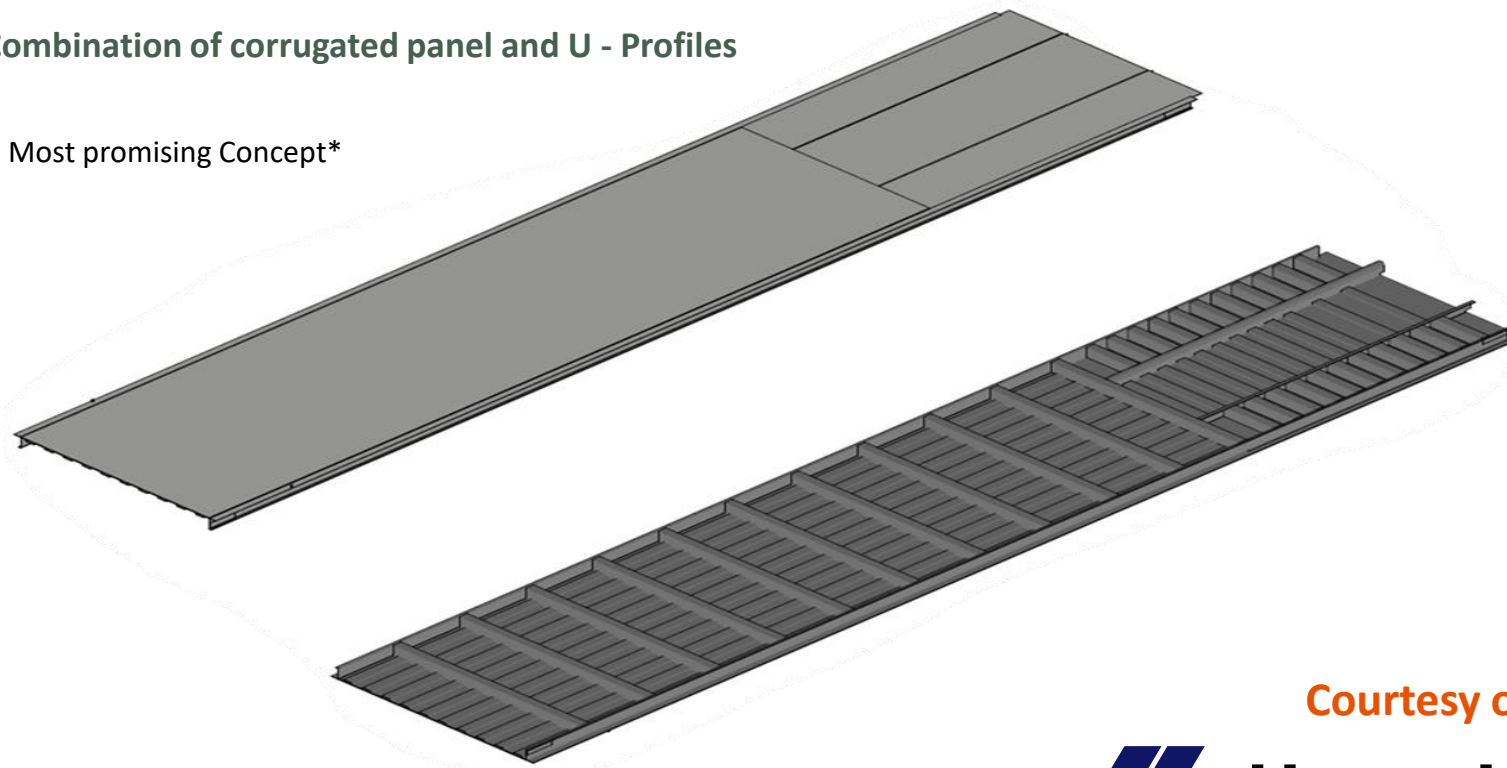
- Steel floors are fully welded at ends, sides and joins and offer no opportunity for pest infiltration from inside or outside
- There are advantages for repair and cleaning
 - However
- Steel floors require modifications to base structure. An overall tare weight increase may be involved.
- Customer resistance is often given as a reason for non-adoption.



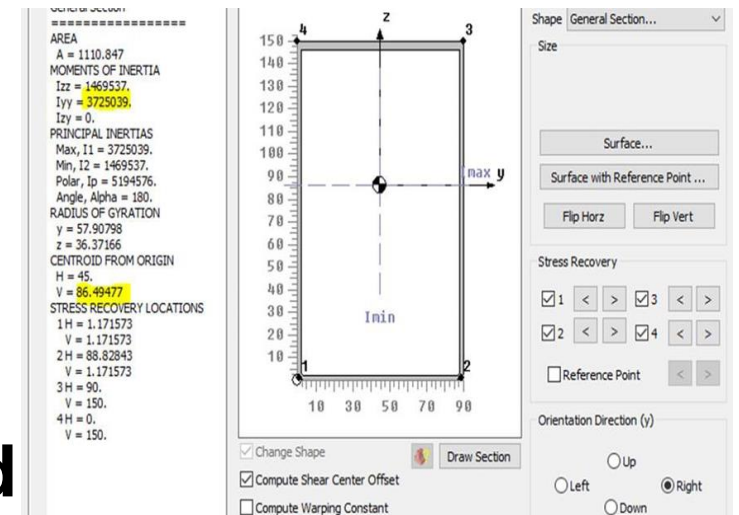
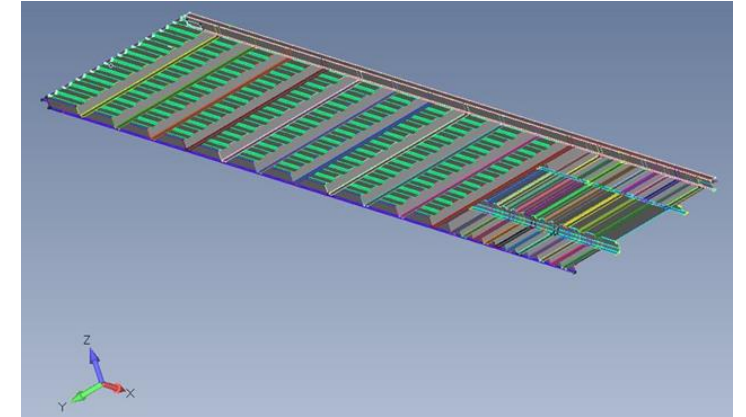
Steel Floors the Next Generation

Combination of corrugated panel and U - Profiles

Most promising Concept*



*patent pending



Courtesy of



Hapag-Lloyd

Understructure design changes

- Dry container cross-member design under-structure provides opportunities for pest hitch-hikers and soil contamination
- Modified design, similar to reefer under-structure, uniform smooth surface to reduce pest hitch-hiker opportunities and soil contamination



Bitumastic undercoating of base-frames

Apparent “Quick Win”

- Owners to sign up to a “pledge” to cease usage of bitumastic coatings
- Noted initial adverse effect on manufacturing productivity
- Support of authorities sought (similar to VOC borne coatings ban)



But - Preference for “market forces” currently prevails

Therefore - Owners, industry groups and manufacturers collaboration required to effect change to coated (painted) base-frames.

ISO Standard “Pest free” container

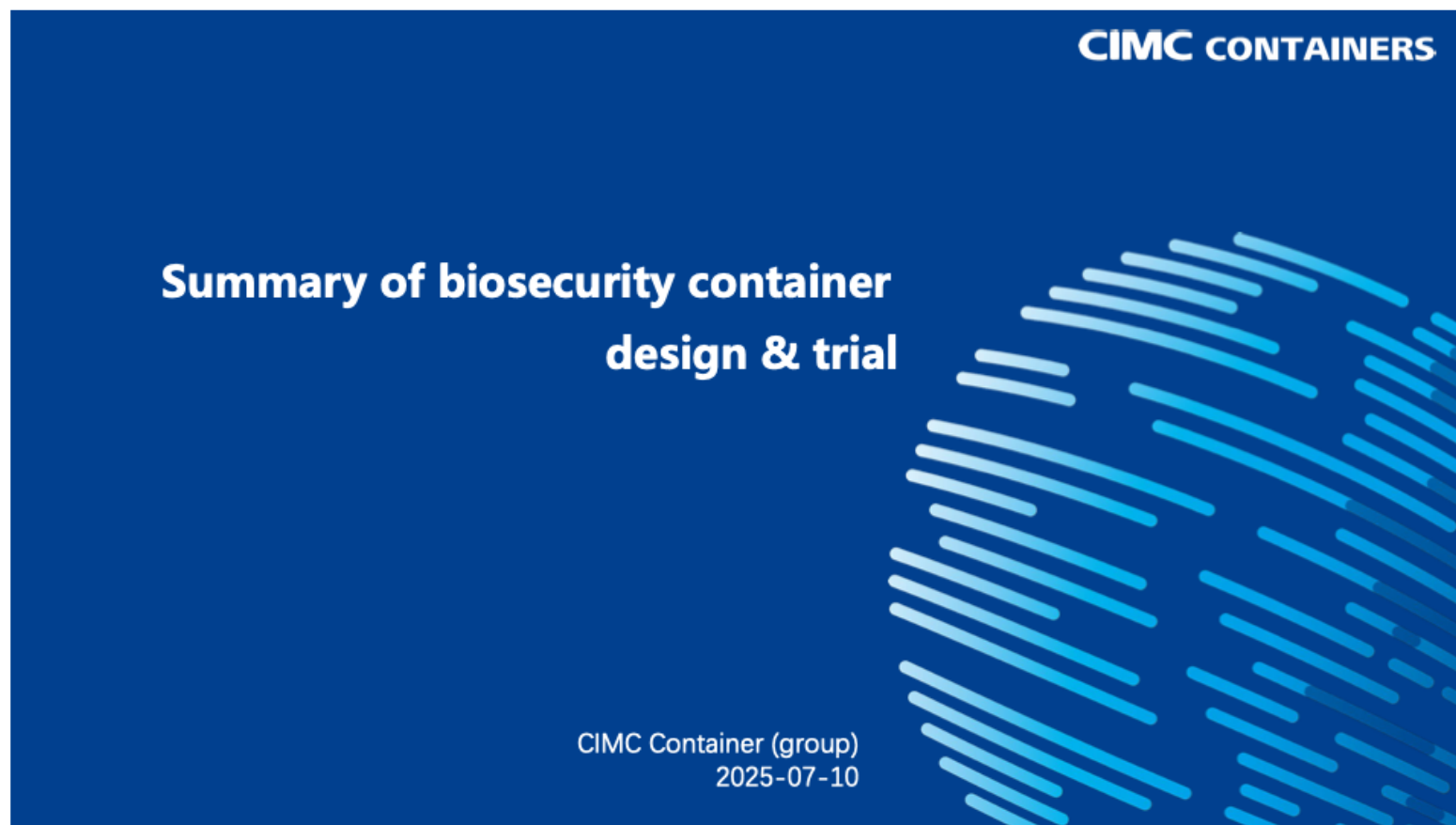
ISO 1496 series standards are applicable to sea containers

- ISO 1496-1 applies to GP containers

New Work Item Proposal required

- subject to approval of participating countries

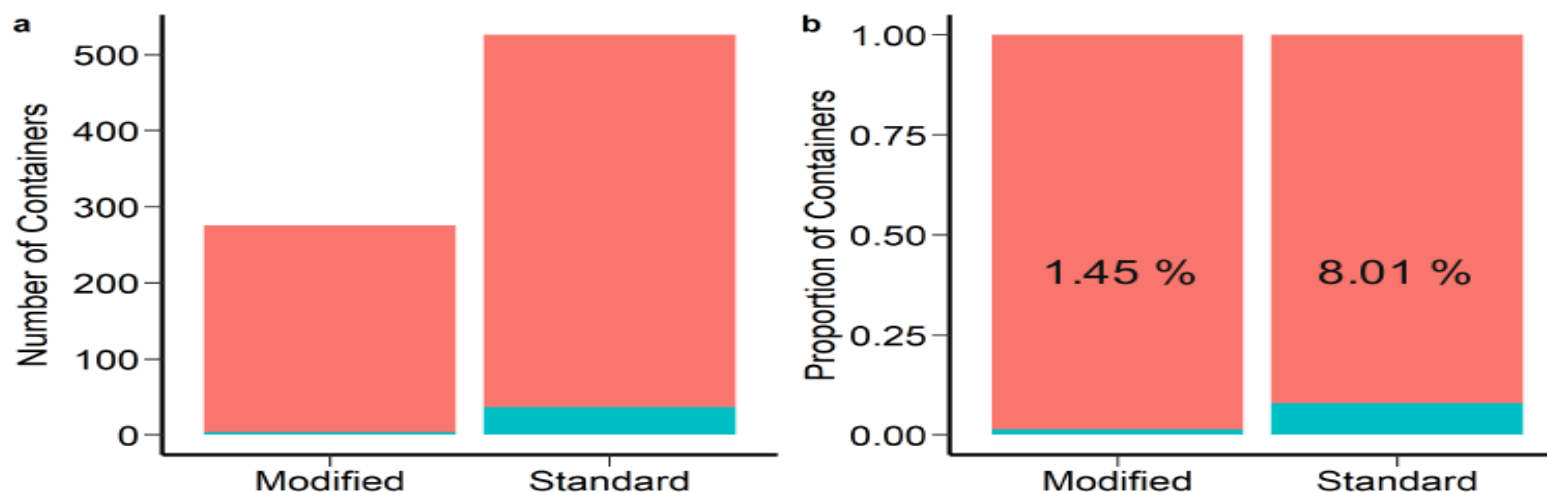
Modified design container trials – China



Modified design container trials – Australia

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Contamination rate is higher in standard containers than in modified containers



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Sea Container Design changes - Pros & Cons

Pros

- permanent and long-lived
- will “stick”
- work passively and effectively
- do not materially affect world trade
- do not require regulation – just goodwill

Cons

- Cost to industry, manufacturers and owners
- Substantial time to fully implement
- Incentives currently lacking
- Maintaining focus post FGSC tenure
- NPPO interest and support required

Conclusion

- Over a period of many years container designs have been optimised in terms of mass, strength, ease of manufacture and cost, with the unintended consequence of facilitating pest migration along trade routes.
- Now, with the cooperation of both regulators and industry, we can facilitate container design changes to minimise opportunities for pests to hitchhike in the future.



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Thank you

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