Container Design Innovations for Pest Minimization











• Current design

Popularly used as bamboo-wood composite with bare bottom surface.

Proposed design

1. Steel floor

Steel floor is continuously welded around on base structure with no gap between floor and base, and can help reduce cracks and concaves, which prevent insects/pests invading effectively.

And unlike the bamboo-wood floor, insects/organism are hard to "stick" or "penetrate" on steel floor surface.

2. Plastic floor

Same as steel floor, insects/organism are hard to "stick" or "penetrate" on plastic floor surface.

3. Bamboo-wood composite with CFRP film on top & bottom surface

CFRP(Continuous Fiber Reinforced Plastic) film on top & bottom surface, insects/organism are hard to "stick" or "penetrate" on the surface.



Steel floor





Bamboo-wood composite with CFRP top/bottom face





Floor connections around to steel structure

• Current design

Waterborne sealant or MS sealant

- Proposed design
- 1. Prefer MS sealant for reducing shrinkage. More sealant and make sure all floorboard contact area are sealed fully, which reduces pest invasion risk.
- 2. Other high-quality sealants



Insufficent sealant



Sufficent sealant





• Current design

Waterborne coating system

- Proposed design
- 1. Special coating system

Adding insect repellent functions like pepper to coating used for ships.Paint with pepper powder in quite higher spicy Scoville is able to kill pest or avoid pest's sticking, which could be used on the top surface of steel and floor. Maybe we can approach the paint suppliers for consultation on this.

2. Eco-composite panels

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Eco-compostie panels(side/front/roof) with **no painting** are smooth and easy to clean. CIMC has made prototype containers with CCS certificates.

It could help to reduce the "stickiness" and thus "adhesion" of undesired soil/bugs.

No corrugation of side/front/roof panels inside container.

Strong wear-resisting and anti-impact.

Emission reduction of carbon dioxide for a container from cradle to grave.



Container in Eco-composite panels



Container in Eco-composite panels

******CIMC holds patents to designs of container in Eco-composite panels.

Understructure coating

• Current design

Bitumastic coating for understructure.

- Proposed design
- 1. Powder coating+CFRP bottom floor

CIMC has developed a kind of powder paint. Idea of "Powder paint + CFRP bottom floor" combined design doesn't need undercoating, and result could be as similar as steel floor structure.

Also, the steel floor center rail can be updated to CFRP floor center rail which have already applied in many of our customers' productions.

2. Other kinds of coating+CFRP bottom floor

High solid coating under trial...





Powder paint



CFRP floor center rail

CFRP top/bottom face+CFRP floor center rail





• Crossmember/sill profiles

• Current design

- 1. C type of crossmember
- 2. Open style for door sill/front sill

which are easier to collect soil/bugs.

• Proposed design

1. Crossmember

All crossmembers change to "V" section or other type that is difficult to collect soil/bugs.

2. Door sill/front sill

Add one additional "L" plate to form a closed type door sill/front sill.

Above 2 updates can reduce soil/bugs collecting on lower flanges of container.

******CIMC holds some patents to the designs.



Door sill/front sill



Bottom side rail profile

Current design

Current bottom side rail has a lower flange which is easier to collect soil/bugs.

Proposed design

We propose to add one more plate to form a closed section or directly remove the lower flange to minimize the soil/bugs collecting.



**CIMC holds some patents to the designs.

Bottom side rail





Tunnel bolster profile

• Current design

Up to now, some customers still apply open type tunnel bolster which is easier to collect soil/bugs.

• Proposed design

All customer's tunnel bolster unified as closed type to reduce soil/bugs collecting on lower flanges of container.

C" section with lower flange

Box section without lower flange



Open type tunnel bolster



Closed type tunnel bolster



Tunnel bolster update





• Current design

Normal design with "straight way" inside that insects/bugs can easily invade.

• Proposed design

Complex inside ventilator labyrinth structure design such as "Smile" mold that insects/bugs hard to invade.

Or use net to reduce the holes and get insects out as much as possible.



Normal ventilator





"Smile" mold ventilator



Thank you!



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