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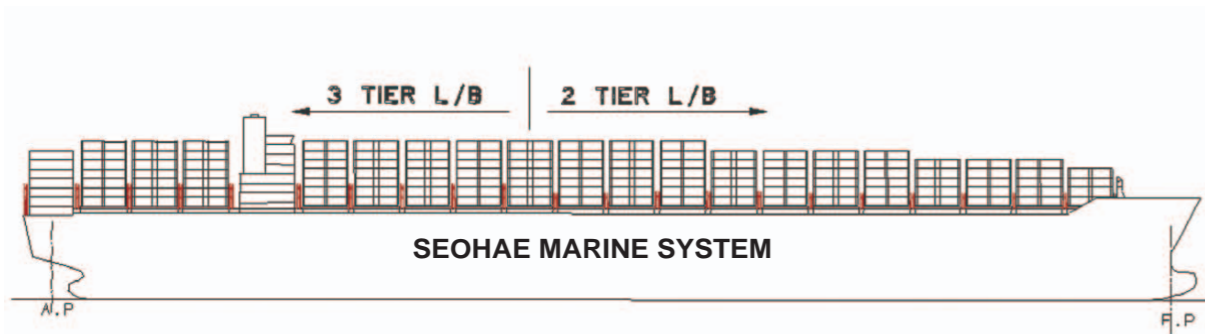
## Hatch Cover and Lashing Bridge For Containership

**Innovative Partner**  
Leading you into advanced cargo access systems



To find out more, visit [www.seohae-ms.com](http://www.seohae-ms.com)

## Innovative systems for Mega Containership



The increasing demand of mega containership, with capacity exceeding 10,000 Teu, has motivated Seohae to innovate the designs of our systems to meet the high standards of these type of vessels. With the experience and know-how which we gained over the last 14 years we are constantly applying the latest technology to the designs of our pontoon hatch cover systems and lashing bridges. Together with our good service this has kept the trust of our respected clients.

With deliveries to many reputable shipyards all over the world our systems are applied to more than 500 vessels, many for respected owners like AP Moller, NYK, MOL, CMA CGM, MSC etc. Due to our advanced technology we have achieved remarkable projects and are receiving orders for the latest state of the art projects for mega containerships with capacity exceeding 10,000 Teu.

Seohae has provided complete turn-key solutions from initial design to delivery. This enables customers to eliminate the additional costs, liability issues and time delays which will inevitably occur when having multiple vendors for different parts of the project. Together with a uniform quality and a guarantee for concrete access we trust we are offering our clients the best value for money.

Our state of the art design and high quality products are delivered from our modern design office and factory in Korea. Through our world-wide service network we are able to deliver fast and reliable after sales and service for our systems.



## Hatch Cover System



For cargo hold access on container carriers generally pontoon hatch covers are used. Pontoon hatch covers are available as single or multi-panel units with non-sequential operation using flap sealing systems.

Pontoon hatch covers have to be able to accommodate stack loads up to 90T/20' & 10T/40' or 45' while the panel weight is limited by the capacity of the port crane. Seohae's pontoon hatch cover panels are specifically designed to accommodate higher container stack loading while keeping the weight within limitations.

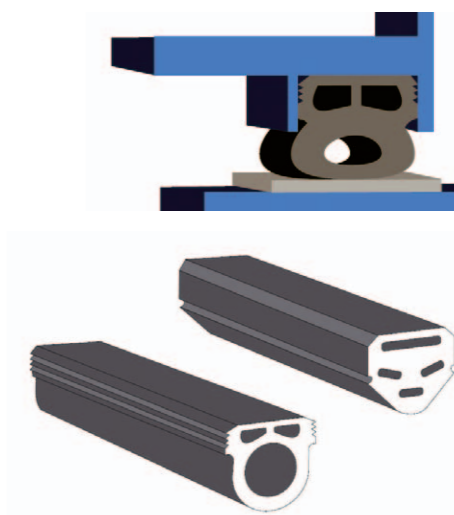
Non-uniform loading of containers in a very dynamic environment will develop a big downward force on the hatch cover. Especially around the hatch cover split line, where the panel is not support by the coaming, an enormous torsion load will be generated. To solve these issues Seohae has improved that hatch cover's structure and rearranged the main girder. This has led to better productivity and less welding distortion.

Furthermore, Seohae has applied limited 20' container loading to 40' or 45' loading hatch cover for mega containership. It has brought 20~30% weight saving and achieved the quality innovation in hatch cover system.

## Rubber Sealing

Sealing between hatch covers and coaming can be achieved by many different types of rubber packing. The larger the ship is, the bigger the movement between the hatch cover and coaming will be. This issues was solved with sliding rubber packing.

Sliding rubber packing is pressed against a flat surface to be more flexible to bigger hull deformations. Seohae sliding rubber offers flexibility for better sliding together with a minimum wear. Also the rubber packing is UV radiation resistant.

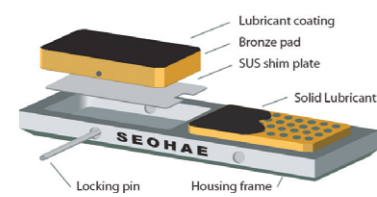


## Hatch Cover Support Pads

Larger ships are naturally subjected to larger torsional deformation which in return causes horizontal friction between hatch covers and the coaming. Support pads are a critical area which can lead to high maintenance costs during service life.

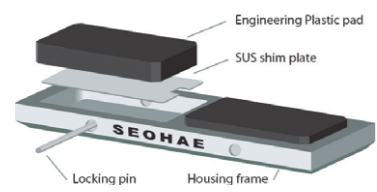
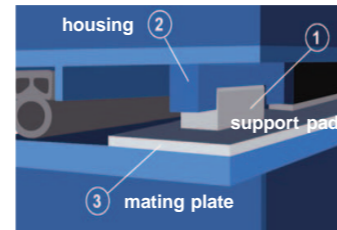
Seohae's support pads are designed to have a minimal wear-down, reducing the maintenance costs.

## Lashing Bridge System



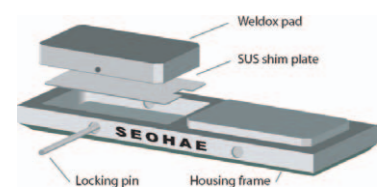
### Bronze / Teflon Pad

- >> Pad Material : Bronze (AIBC3)
- >> Practical life time : 10 ~ 15 years
- >> Elastic cushion Vulkoran V92 (options)
- >> Max. friction factor : 0.1 without lubrication
- >> Allowable load : 85 ~ 130 Tons
- >> Mating plate : SUS 316



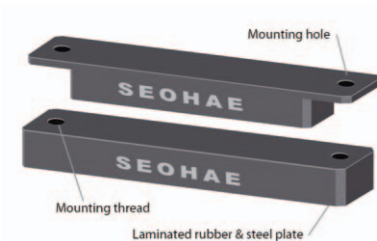
### Engineering Plastic Pad

- >> Pad Material : Engineering plastic
- >> Practical life time : 5 ~ 10 years
- >> Max. friction factor : 0.1 without lubrication
- >> Allowable load : 85 ~ 130 Tons
- >> Mating plate : SUS 316



### Hardox / Weldox Pad

- >> Pad Material : Weldom 700
- >> Practical life time : 5 ~ 10 years
- >> Max. friction factor : 0.5 (0.3 with Never-seez)
- >> Allowable load : 85 ~ 130 Tons
- >> Mating plate : HARDOX 400 (HB>360 ~ 400)



### Sandwich Pad

- >> Practical life time : 10 years
- >> Max. shear deformation :  $\pm 100\text{mm}$
- >> Allowable elastic shear :  $\pm 60\text{mm}$
- >> Vertical elastic compression : 5 ~ 6mm
- >> Allowable load : 80 ~ 130 Tons
- >> No mating plate required
- >> Rubber (Hardness  $65 \pm 3$ ) with steel pieces

Lashing bridges are equipped on large ships over 5,000 Teu and designed to restrain racking forces from container stack loads and create free maintenance space for reefer containers. Seohae has concentrated on the development of lashing bridges for easy loading/unloading of containers and hatch covers.

Recently Seohae has developed a new type of lashing bridge which saves costs on the initial investment as it improves some of the operational aspects on installation.

To avoid resonance from the engine and the propeller Seohae has improved the vibration mode and the natural frequency in designing an innovative tall and slim lashing bridge for the aft ship. In order to investigate the vibration characteristics of our lashing bridges a free vibration analysis was carried out. After numerous calculations, an in-depth discussion with the shipyards and a testing period the new type of lashing bridge was finally applied on a mega-containership.

We always provide consistent service to our customers from design to fabrication taking lashing, hatch cover maintenance and specific requirements into consideration.

