

Marine Selfunloaders

Gravity system



TECHNICAL INFORMATION

*Gypsum Integrity
Gypsum Centennial*

MacGregor gravity system

Custom-designed MacGregor gravity self-unloading systems have been installed on two Gypsum Transportation vessels *Gypsum Integrity* and *Gypsum Centennial* to maximise cargo flow efficiency

In 2006, Gypsum Transportation Ltd, Monaco, specified a MacGregor self-unloading gravity system for its second self-unloading bulk carrier, the 47,800 dwt *Gypsum Integrity*. The vessel was built at Estaleiro Ilha SA (EISA) in Rio de Janeiro, Brazil and delivered to the owner in 2009.

The first vessel, the 47,800 dwt *Gypsum Centennial*, was commissioned in 2001 and since its delivery, has mainly been operating along the US East Coast carrying gypsum rock, coal and other coarse materials.

Both ships feature a similar custom-designed self-unloading conveyor system including gate arrangement, hold conveyors, cross conveyors, a C-conveyor for vertical transportation, a slewable and hoistable boom conveyor, and the necessary hydraulic and electrical equipment to operate the system. The discharge rate is variable to a maximum of 3,000 t/h or 2,500m³/h.

A special feature of the conveyor system is the gate arrangement with its 'moving hole' feeders, which have been designed by Canadian company Kamengo Technology

Inc to handle sticky and high moisture content materials. Another feature is the telescopic boom conveyor with its exceptionally long shuttle distance.

System description

Each vessel has four cargo holds that are loaded through eight hatch covers. The holds have sloping bases, providing a gravity flow for material down to two parallel longitudinal slots in the bottom. Attached to each of the longitudinal slots are nine 'moving hole' feeders.

These units feed the material at a constant rate to two hold conveyors, which incline in the aft part of the cargo hold area and discharge material onto the cross conveyors. From the cross conveyors, material is transferred to a C-conveyor located on the ship's centreline, just in front of the engine room superstructure. The C-conveyor elevates material to the main deck and discharges it onto a slewable and hoistable boom conveyor. The telescoping boom is designed for easy positioning and transferring of the material to the receiving arrangement ashore.

To meet the IMO regulations for maximum security and water integrity during a voyage, the vessels are also fitted with MacGregor watertight bulkhead doors. These have been installed where each hold conveyor penetrates a bulkhead and is approved by the classification society.

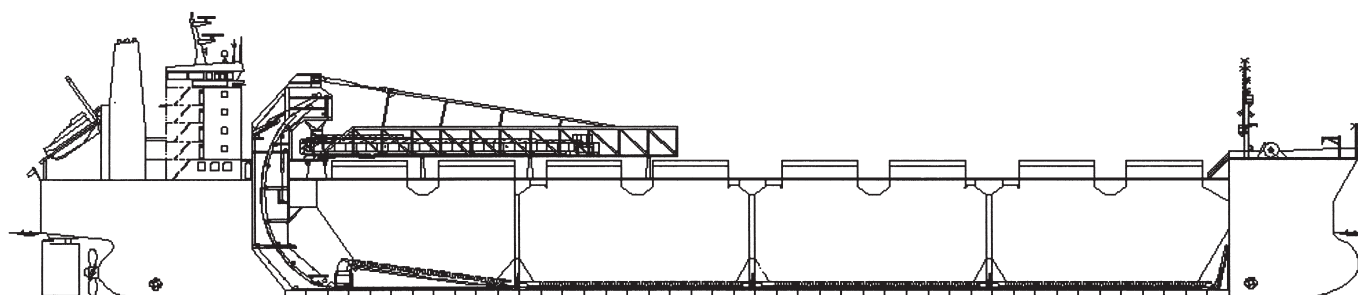
The operation of all 'moving hole' feeders and belt conveyors are remotely controlled from the operation room on A-deck. Each conveyor and 'moving hole' feeder can be manually operated from a local position for maintenance purposes.

Vessels dimensions

Length	197.10m
Length between p.p.	188.40m
Width	32.20m
Depth	17.75m
Draft	9.75m
Deadweight	47,800 dwt

System data

Discharge capacity	3,000 t/h or 2,500m ³ /h
Maximum length of boom conveyor	76.20m
Minimum length of boom conveyor	40m



Design principle of the gravity self-unloading system installed on *Gypsum Integrity* and *Gypsum Centennial*

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