

Deo Volente

The Need for Speed



DEO VOLENTE

BUILDERS	Hartman Marine B.V.
OWNERS	Hartman Seatrade B.V.
YARD NUMBER	001
IMO NUMBER	9391658

Hartman Seatrade is a modern shipping company specializing in the carriage of all kind of dry cargoes with special emphasis on voluminous project cargoes and heavy lift transports. With a vast experience in deep sea shipping for more than two centuries the Urk based company recently inaugurated its new 'mini' heavy lift vessel – Deo Volente. The new build vessel is a surpass of the previous Deo Volente with an accent on operating terms as speed and heavy lift capabilities.



Photo courtesy of Flying Focus

Right from the beginning the two Hartman brothers had a pretty good idea of how their new vessel should look like and be able to. They designed a novel concept for a small and fast heavy lift vessel which would fall just in the 3000 gross tonnage and 3000 kW installed power category. These criteria are of significant effect on the operating costs with regard to the required number of crew and manning certification. However, the shipyards which were applied to for building the vessel were not too interested. They were too busy with series building. There was no interest for a one-off new building project. Convinced of the economic advantages of their own ideas and ship design the Hartman brothers soon decided to take the new building in own hands. They completed the draft design into detail in close collaboration with Conoship, Vuyck Engineering,

MARIN and Wolfards. Construction of the hull was ordered from CIG group who built her on her Polish location, and was transferred to the Netherlands for outfitting under management of Hartman Marine BV.

High Service Speed

The Deo Volente is proof of nowadays need for speed. She is the fastest heavy lift cargo ship in the 3000 GT class. The high service speed of 18 knots – similar size ships sail 12 knots – means that transport jobs can be carried out in an up to 30% shorter time span. The increased service speed results in a reduction of the running costs per job and an increase of average transport jobs on annual base. Striking feature is that the higher speed is mainly due to an optimized hull shape and not to more installed propulsion power, which means that the fuel costs per job remain more or





less the same. The hull form design has been optimized in close cooperation with hydrodynamic research institute MARIN and resulted in a favorable block coefficient of 0.59, which is considerably lower than the 0.75 comparable vessels have. To achieve this characteristic the Deo Volente features a longer and wider body than other vessels with similar displacements. She also has an optimized entry on the waterline and, last but not least, the main propulsion plant has been adapted for varying loads by the application of a controllable pitch propeller.

Side Effect

A welcome side effect benefited with service speeds of well over 15 knots is that the hull could be treated with the silicon-based anti-fouling coating SigmaGlide, instead of a coating harmful to the environment. SigmaGlide is a revolutionary approach to fouling control. Unlike any other fouling protection technology, it uses absolutely no biocides. SigmaGlide is a coating with radically different characteristics; once applied it produces a slick, slippery hull surface to which macro and algal fouling have difficulty adhering. This fouling may settle, but once the vessel moves, water motion will cause the fouling to detach. Due to this effect the total resistance has been reduced by 3 per cent.

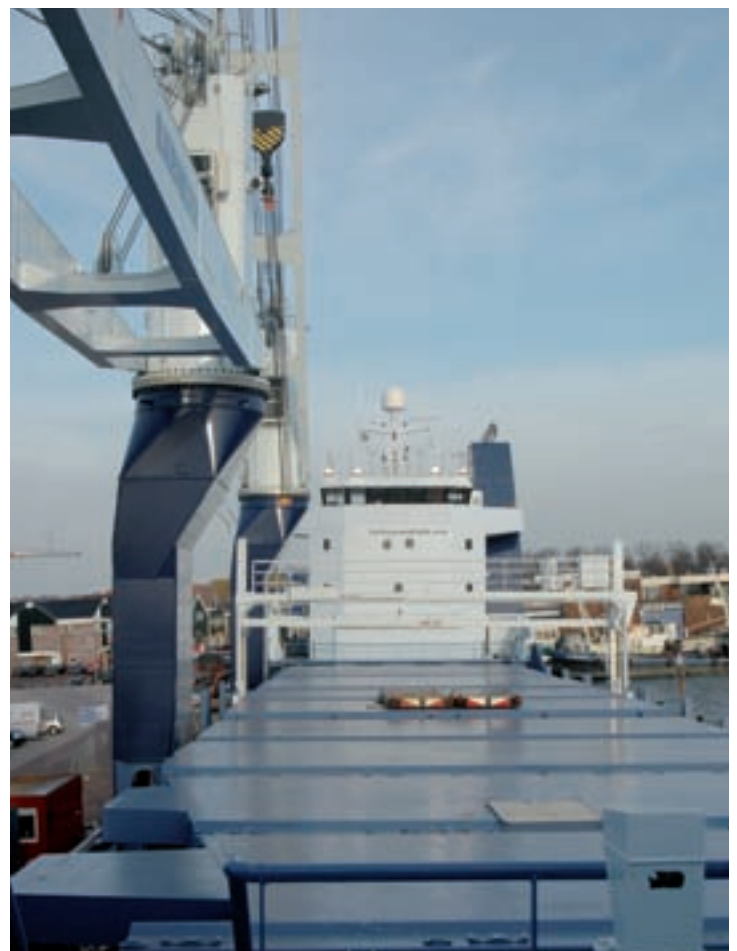
Next to the optimized hull form and treatment an ample number of additional measures have been taken to minimize maintenance and operating costs. All

outdoor hardware, for instance, are made of stainless steel. A novel detail is the fully recessed pilot ladder which has been built-in into the hull side thus avoiding the repeat positioning of a rope ladder by the crew and providing a safe boarding and disembarking for the pilot. Placing and removing the gangway has been automated to such an extent that it can be performed by a single person.

Cargo Handling

The vessel features a large single hold divided by a tweendeck in a 31.5 meter long lower hold and a 63.6 meter long upper hold. The lower hold is 0.5 m smaller than the upper hold allowing the tweendeck hatches to be positioned on the rims. With the tweendeck in place the loading floor measures 63.6 by 11.5 meters, with a flush access to the lashing store in the forecabin. The tweendeck elements can be utilized as grain bulkheads dividing the hold in separated compartments.

Loading and unloading of cargo is carried out with two large Liebherr cranes type CBB situated on starboard side enabling the vessel to be fully self-supporting. Each Liebherr crane has a maximum swl of 120 tons at a radius of 16 meter and a swl of 81 tons at a maximum outreach of 24 meter. When operated in tandem the cranes are able to lift 240 tons at once. The cranes have been equipped with Litronic automation systems controlling the crane motions and the complete crane system. Crane operating data such as pressures, lifting loads, checking of safety systems and





wiring control are automatically recorded. The Litronic system also provides the possibility to remotely diagnose the cranes through a modem connection. Operating data such as actual lifting capacity, operating outreach and the utilization of the crane system is visualized on a monitor in the control cabin. The electro-hydraulic drive, with closed hydraulic systems for individual crane motions in combination with the control system, allows precise positioning during loading and unloading operations. It even makes the crane very suitable for assembly works of partial components in ports of destination and for utilizing the vessel as a floating crane. The installed power of 240 kW per crane allows high handling speeds during normal cargo operations. Due to an additional control system in the crane, higher speeds for maximum loads up to 45 tons capacity (abt. 20 m/min lifting speed) can be achieved easily. This way berthing times for the vessel can be considerably reduced.

Propulsion Plant

The machinery installation has been laid out for use of heavy fuel oil HFO 380. The entire propulsion train consists of a single medium-speed trunk type Wärtsilä

main diesel engine, type 8L32, a reduction gearbox with power take off for a shaft generator, and a controllable pitch propeller installation. The main engine can develop 3,600 kW, but has been derated to 3,000 kW for reasons of certification. Technical sea trials revealed that the vessel attained a record speed of 18.8 knots at 3,600 kW output and still 17.9 knots with the output reduced to 3000 kW, both speeds were realized at a displacement of 4000 tons. The fuel consumption has been estimated at approximately 14 tons per day. Maneuvering capacity is enhanced by the installation of a 300 kW HRP bow thruster. The spacious engine room features a spacious layout with good overview and has been installed by Wolfard en Wessels.

Marine Electronics

The vessel has been equipped with navigational aids and communications systems from Imtech Marine & Offshore/Radio Holland. Main components include an integrated Blue Line bridge system incorporating radar systems, Inmarsat, a Navtex, an echo sounder, an EPIRB, and two Jotron radar transponders. Satellite communications are carried out with a Seatel Wavecall





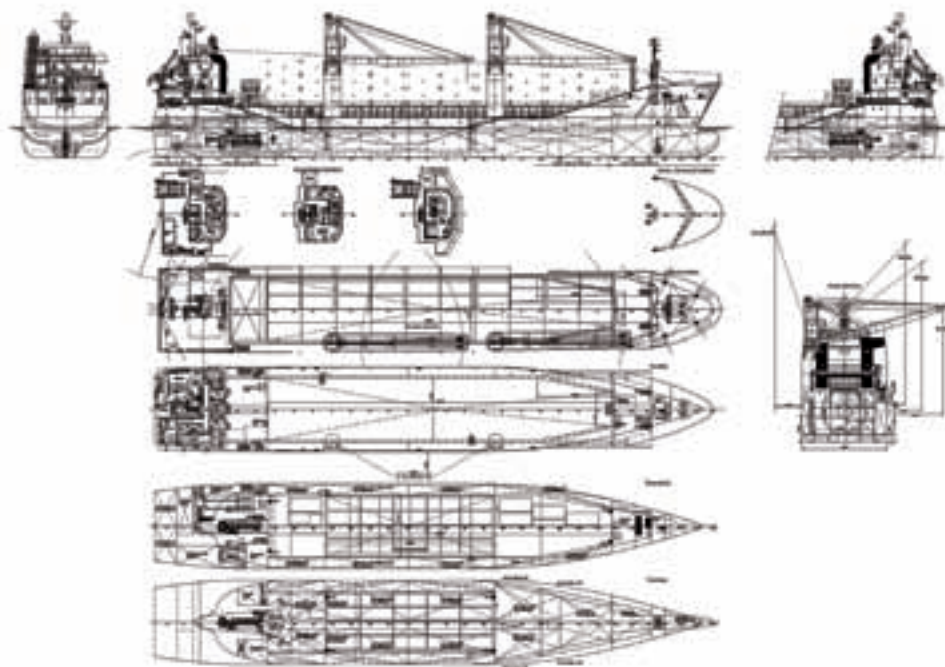
4003 installation and include a 512 kbps broadband internet connection that is always open. Alarm and monitoring is Marble PLC based and can be viewed and controlled from different locations on board. It allows monitoring of all safety and engine operating parameters but also control of the ballast system, anti-heeling system, generator sets, navigation lights, ventilation, etc.

Intact Stability

A Frank Mohn anti-heeling tank system safeguards the vessel's maximum heeling angle during cargo handling operations. A rectangular barge measuring 10 by 5.5 meter functions as a stabilizer and is stored on deck aft of the cargo hold section. When lifting heavy loads the stabilizer is launched into the water and connected by a stiff arm to the side of the vessel thus functioning as a counter weight. In addition to providing extra stability it also reduces unwanted roll motions.

A Locopias loading computer takes care of necessary intact stability calculations. The loading computer calculates damage stability, shear forces as well as bending and torsional moments of the hull. The crane loading module in Locopias has been enhanced to allow dual crane operations. If one crane is moved, the position of the other crane is determined automatically and in such a way that both crane cables will stay fully vertical, accounting for heel and trim as per that condition. Ballasting and deballasting operations can be defined on the same screen. The defined crane movements are logged allowing crane operations to be stored for future reference.

Deo Volente is a sound example of Dutch entrepreneurship. The new build vessel is without doubt a new benchmark in the 3000 GT class.



Facts & Figures Deo Volente

Principal Particulars

Length o.a.	104.80 m
Beam o.a.	15.60 m
Depth	7.40 m
Design Draught	5.81 m

Tonnage

Deadweight	3750 t
Gross Tonnage	2981 t
Nett Tonnage	1199 t
Displacement	5486 t
Trial Speed	17.9 knots

Tank capacities

Water ballast	2560 m ³
Fresh water	49 m ³
Fuel oil	420 m ³
Gas oil	84 m ³
Lubricating oil	15 m ³

Cargo Hold

Height (total)	8.15 m
Length (upper)	63.60 m
Width (upper)	11.50 m

Container capacity

In hold	73 TEU
On hatch covers	163 TEU
Total capacity	236 TEU

Classification

Bureau Veritas BV I 3/3 E #+ Deepsea #+ Mach #
+ AUT-MS General Cargo/Container Ship
Heavy Cargo (15 t/m²)
Unrestricted Seagoing Service.

ACV Nederland Central heating unit | Ajax Fire Protection Systems Fire-fighting system | Alfa Laval Benelux Separators, freshwater generator, plate heat exchanger | Het Anker Windows & portholes | Atlas Copco Ketting Marine Center Air compressors | Belkoned Marine Service Speed measurements | Benes Machinefabriek Stern tube | Bot-Groningen Rudders; rudder stock and trunk | Breman Shipping Installation Stainless steel drain system engine room, AC overpressure system, hold and ER fans, sanitary system, water pressure booster installation, fresh water boiler, BSI UV system, central heater for HFO | Piet Brouwer Elektrotechniek Electrical installation | Bureau Veritas Classification | Caldic Techniek Stamford generators | Castrol Marine Lube oils | Conoship International Ship design and stability | Coöperatie (CIV) Urk General outfitting | Container Technics Lashing- and container equipment | Datema Life saving, fire-fighting and medical equipment, digital charts & books | Frank Mohn Framo anti-heeling pumping system | HRP Thruster Systems Bow thruster unit | Hoenderop Wheelhouse chairs | Imtech Marine & Offshore Integrated bridge & ECDIS | Intersona Noise and vibration calculations | Kroon TNF-INEXA accommodation system, Alvedoor fire doors, ships hardware, manhole covers and rings, and control system | MARIN Model testing | Materiaal Metingen Europe (MME) Gangways and platforms | Mennens Schiedam Lifting wires and shackles | Navicom Paintwork | OAG/CIG Hull | Reikon Azcue pumps | Radio Holland Netherlands Navigation & communication systems | Roden Staal Pontoon hatch covers, tweendeck hatch covers, hatch cover crane, stabilization pontoon | Rolls-Royce Marine Benelux Tenfjord steering gears | Sandfirden Technics Scania/Stamford generator sets | SARC LOCOPIAS loading computer software | Sealink Telenor V-sat communication system | Ship's Equipment Centre (SEC) Life boats & davits, winches, anchors & anchor chains, store crane | Sigma Coatings SigmaGlide coating systems | Snijder Schilderwerken Paintwork | Tjamme Vis Scheepsstoffering Upholstery | T.B. Uittenbogaart B+V Turbulo® separator, Megator sludge pump | Vuyk Engineering Groningen Section drawings, plans and strength calculations, hull piping | Wärtsilä Nederland Main engine and reduction gearbox | Wärtsilä Propulsion Netherlands Lips CP-propeller and propeller shaft | Wolfard & Wessels Werktuigbouw 3D cadmatic engine room design, design HFO-380 fuel system, engine room components, piping, installation works | Winel Watertight GRP and steel doors, hatches, louvres, Bolero ventilation cowls