



Specialist marine segments

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MAN Diesel Powers Record-Setting Fall-Pipe and Rock-Dumping Vessel

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Five MAN Diesel 32/40 engines send Simon Stevin into service

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Construcciones Navales del Norte (La Naval de Sestao) of Spain's Basque country delivered the "Simon Stevin" to Jan de Nul in February. Driven by a diesel-electric propulsion system comprising a series of MAN Diesel 32/40 engines, the new addition to the Belgian group's fleet is the world's largest fall-pipe and rock-dumping vessel with a capacity of 19,500 m³.

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Construction of the ship lasted 26 months, with keel-laying taking place in April 2008 and launching in March 2009. The Simon Stevin recently departed for Australia for its first commercial projects.

The MAN Diesel 32/40 engine

The Simon Stevin is powered by five MAN Diesel nine-cylinder 32/40 main engines. Each delivers 4,500 kW at 720 rpm and is manufactured by STX Engine Co., Ltd., MAN Diesel's Korean licensee. The five engines comprise a diesel-electric power plant that generates enough electricity to power a city of 130,000 people, according to the ship owner.

The Simon Stevin

The Simon Stevin will mostly be deployed in offshore applications, such as the laying of oil and gas pipes at great depths; the vessel can level the seabed and dump rocks down to a depth of 2,000 m. According to Jan de Nul, the fall pipe can process rocks with a diameter up to 400 mm, a figure greater than any other fall-pipe vessel in service.

The fall pipe has an advanced, fully automatic unfolding system, featuring an ROV (Remotely Operated Vehicle) at its bottom that accurately corrects its position. The 191-metre-long vessel has a 33,500 tons loading capacity, some 25% greater than the previous record-holder, and is capable of dumping 2,000 tons of rock per hour. The Simon Stevin can accommodate more than 70 persons and has its own helipad.



32/40 capabilities

The four-stroke engines run on HFO and are capable of continuous operation at loads down to 20%; running at even lower loads is possible for limited periods, thanks to the engine's optimised design. The 32/40 can also accept overloads of 10% in conditions characterised by frequency variation.

As the Simon Stevin is subject to a dynamic load demand, high and sharp load variations can also occur. Accordingly, each engine is fitted with a so-called "jet assist" device that enables a quick response to such variations by injecting compressed air directly into the compressor wheels of the turbochargers.

MAN Diesel's 32/40 type is characterised by an optimised, operational economy and minimal maintenance requirements. One of its stand-out characteristics is its low lube-oil consumption of approximately 0.5 – 0.8 g/kWh, a figure that was considered as a design parameter for the piston liners, covers and rings.

Another stand-out characteristic is the 32/40's stepped piston. Here, the crown is forged with high-quality, stable steel (with shaker cooling), while the skirt is cast in spheroidal graphite cast iron. This kind of piston, together with a fire ring, prevents bore polishing of the cylinder liner and reduces lube-oil consumption. Furthermore, the chromium-ceramic composition of the first piston ring provides a resistance that contributes to long periods between maintenance.

As with all MAN Diesel engines, NO_x emission levels for 32/40 engines fall below the upper limits specified by the IMO without negatively affecting fuel consumption or operation. The 32/40 type can also take advantage of SCR (selective catalytic reduction) technology to meet even more stringent NO_x limits.

La Naval de Sestao

The La Naval de Sestao shipyard is currently finishing the construction of the dredger "Leiv Eriksson", a sister ship to the record-breaking "Cristóbal Colón" and due for delivery in April this year. Ordered by Dredging and Maritime Management S.A., a Jan de Nul subsidiary, these twin vessels feature two MAN Diesel 16/48B main engines and are, by some distance, the largest trailing suction hopper dredgers in the world in



terms of capacity. They can dredge up to a depth of 155 m, a technical feat that only Jan de Nul is currently capable of achieving.

These two dredgers, combined with the construction of the Simon Stevin, demonstrate La Naval de Sestao’s expertise in building complex and highly specialised ships, and show the confidence that cutting-edge, specialist marine segments have in MAN Diesel’s efficient and powerful engines.

Jan de Nul

The Belgian Jan De Nul Group provides global services within the construction and maintenance of maritime infrastructure and its ship-owning arm specialises in services for the offshore oil and gas industry. The construction of vessels at La Naval de Sestao is part of a construction programme running between 2007-2011 worth EURO 1.8 billion. The programme aims to create the largest and most modern dredging fleet in the world, capable of carrying out even the most demanding offshore dredging, rock dumping and construction works, in the process cementing the Jan de Nul Group’s position as a leader within international dredging and offshore niche markets.

SIMON STEVIN PRINCIPAL DATA	
Deadweight	36,000 tons
Length	191.5 m
Breadth	40.0 m
Draught loaded	8.5 m
Propulsion power	5 x MAN Diesel 32/40 (4,500 kW at 720 rpm each)
Rock storage capacity	19,500 m ³
Speed	15.5 kn
Accommodation	70
Fall-pipe data	
Maximum dumping depth	Max. 2,000 m
Maximum dumping capacity	2,000 tons/hr
Fall-pipe diameter	1,000 mm
Rock size	Max. 400 mm

Press Release MAN Diesel & Turbo



Press Release
Page 4 / 5



MAN Diesel 32/40 engines pictured within the Simon Stevin's engine room



Aerial view of La Naval de Sestao shipyard



The Simon Stevin

Press Release

MAN Diesel & Turbo



Press Release
Page 5 / 5

MAN Diesel & Turbo

MAN Diesel & Turbo SE, based in Augsburg, Germany, is the world's leading provider of large-bore diesel engines and turbomachinery for marine and stationary applications. It designs two-stroke and four-stroke engines that are manufactured both by the company and by its licensees. The engines have power outputs ranging from 47 kW to 97 MW. MAN Diesel & Turbo also designs and manufactures gas turbines of up to 50 MW, steam turbines of up to 150 MW and compressors with volume flows of up to 1.5 million m³/h and pressures of up to 1,000 bar. The product range is rounded off by turbochargers, CP propellers, gas engines, engines for locomotives and chemical reactors. MAN Diesel & Turbo's range of goods includes complete marine propulsion systems, turbomachinery units for the oil & gas as well as the process industries and turnkey power plants. Customers receive worldwide after-sales services marketed under the MAN PrimeServ brand. The company employs around 12,500 staff, primarily in Germany, Denmark, France, Switzerland, the Czech Republic, Italy, India and China; it has a presence in around 150 countries. MAN Diesel & Turbo is a company of the Power Engineering business area of MAN SE, which is listed on the DAX share index of the 30 leading companies in Germany.