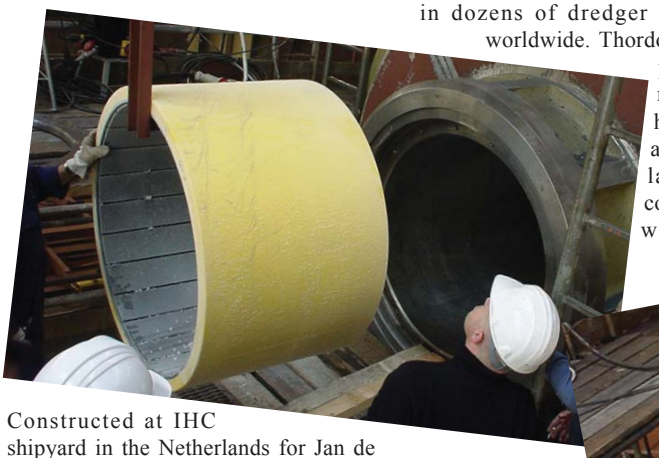
COMPOSITE A KEY COMPONENT OF THE MOST ADVANCED DREDGER IN WORLD

When Caesar conquered Egypt in 48 B.C., he used dredgers to clear the way for his ships into the Alexandra Harbour. No one knows for sure what these dredgers looked like or how they worked. We can speculate, however, that if the Roman engineers who built them could see into the future, they would be astonished by the size and power of the *J.F.J. de Nul*.



Constructed at IHC shipyard in the Netherlands for Jan de Nul of Belgium, the *J.F.J. de Nul* is the most advanced self-propelled cutter suction dredger ever built. Her 6,000kW cutter drive, 30% more powerful than cutters currently in use, is capable of dredging from a depth of 6.5 m to 35 m (21 ft. to 115 ft.). According to IHC, the vessel incorporates the latest advances into dredging systems, engineering, and materials technology.

These advances included specifying Thordon Composite as the bearing material for the 950 mm (37.4") diameter cutterhead drive shaft.

"Thordon was selected for a number of reasons," says Marc Butzelaar, Sales Manager for Sandfirden Technics BV, a Netherlands-based company that, in addition to being a Thordon Distributor, specializes in engineered products for industrial and marine applications. "Dredging systems are exposed to extreme underwater forces and unpredictable torque peaks. The *J.F.J. de Nul* needed a cutterhead bearing that not only performs well, but also has a long wear life in dirty, sandy water."

Introduced in 1977, Thordon Composite was first installed as a cutterhead bearing on the dredger, *Gouda*. Since that time the product has been installed in dozens of dredger applications worldwide. Thordon Composite performs reliably in highly loaded and abrasive laden water conditions - its wear life is typically twice that of rubber or more.

"Dredge vessels often work in remote locations, dredging new ports and waterways," says Butzelaar. "They can often be hundreds of miles away from an airport or commercial port where a bearing can be replaced. That's why reliability and long wear life is so crucial."

Portability is also an issue. Because dredgers can work in isolated areas around the globe, they must stow most of the materials they need for maintenance and repair onboard. At 958 mm (38") ID x 1084 mm (42.7") OD x 3475 mm (136.8") long, the required size of the cutter bearing for the *J.F.J. de Nul* was huge. So, to accommodate the need for both ease-of-maintenance and portability, the Thordon Composite bearing was engineered into five, 695 mm (27") long bearing tube segments. Each was shipped to the construction location, placed in dry ice, then inserted one by one into the 1080 mm (42.4")-cutterhead housing. "At installation, there was a 3 mm to 4 mm (0.1181" to 0.1574") gap left between the frozen bearing segments so that as the bearings reached ambient temperature, they would have room to expand and fit in place," says Butzelaar.

Although the overall size of the cutter bearing is the largest ever for a dredger, each individual segment weighs a manageable 258 kg (570 lbs.). The smaller bearing tubes are easier to transport and, if necessary, easy to stow aboard the *J.F.J. de Nul*.

*Thordon Composite bearing freeze-fit installation on **J.F.J. de Nul** cutterhead drive shaft*

Advanced materials like Thordon Composite are enabling dredge vessels to operate more productively with less down time. Sea trails for *J.F.J. de Nul* are planned to be completed by the end of November and handed over to Jan de Nul in the spring of 2004.