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TRANSACTIONS OF JIANGSU PROVINCIAL SOCIETY OF NAVAL ARCHITECTURE AND MARINE ENGINEERING

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To meet the demand for the gradual development of offshore engineering construction towards offshore and deepwater areas, based on the summary of existing research results on pile drivers, a 140-meter class pile driver with the highest pile frame, the largest pile lifting capacity, the most extended pile driving length, and the strongest wind and wave resistance in the world has been developed. Through research on the main dimension selection, ship positioning technology, and lightweight technology for hull and pile frame structures, key technical issues have been resolved, which meet the specific operational needs of shipowners.
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- JS 2023-1-05 Research and Development of New ACD320 Series Engine** XU Xianjin, ZHU Shulin, MEI Jiahua, GAO Shende(14)
Aiming at the problem that high-power engines using natural gas fuel are prone to misfire and detonation, and it is difficult to achieve lean combustion, the ACD320 series of medium-speed natural gas and dual fuel engines are taken as the research object to carry out ignition technology research. Firstly, the technical schemes of pre-chamber spark plug ignition and micro pilot oil compression ignition are proposed, and the highly universal structural design of the two prototypes is carried out; Then, combined with thermodynamic performance calculations, engine performance and emissions methods are optimized. The results show that achieving lean combustion of gaseous fuels is feasible by increasing ignition energy.
- JS 2023-1-06 Research on Speed Optimization of Tramping Ship Based on Voyage Operation Benefits** MAO Mujia, WANG Qi, MA Laihao, LU Ping(18)
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- JS 2023-1-09 Research Progress of Thermal Insulation Materials for LNG Liquid Cargo Tank** XU Na, MA Jianqing, XU Xiao(28)
To effectively block the heat transfer between the liquid cargo tank of LNG carriers and the outside world, and to reduce the loss of LNG during storage and transportation, as well as the low-temperature freezing damage to hull structures caused by the gas release and leakage, thermal insulation materials for the liquid cargo tank of LNG carriers are studied. Firstly, several mainstream LNG cargo tank technologies are summarized. Then, several physical properties of thermal insulation materials are analyzed from the perspective of reducing cold loss, improving safety and saving energy, and four main thermal insulation materials, namely expanded perlite, glass wool, polystyrene foam and polyurethane foam, are compared and analyzed from the perspective of thermal insulation performance, construction cost and material advantages and disadvantages. Finally, the application feasibility of new thermal insulation materials for the next-generation LNG cargo tanks is discussed. The research shows that the new aerogel thermal insulation material will be the development direction of LNG liquid cargo tank thermal insulation material, which conforms to the environmental protection (green) standard. Composite material products with integrated thermal insulation and waterproofing will become the star of the thermal insulation material market.
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