

Creep and stiffness of HMPE fiber for permanent deepwater offshore mooring

M. Vlasblom, J. Boesten, S. Leite, P. Davies

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Abstract

For a number of years, the creep performance of standard High Modulus Polyethylene (HMPE) fiber types has limited their use in synthetic offshore mooring systems. In 2003, a low creep HMPE fiber was introduced and qualified for semi-permanent MODU moorings. This paper reports on a new High Modulus Polyethylene fiber type with significantly improved creep properties compared to other HMPE fiber types, which, for the first time, allows its use in permanent offshore mooring systems, for example for deep-water FPSO moorings. Results on fiber and rope creep experiments and stiffness measurements are reported. Laboratory testing shows that ropes made with the new fiber type retain the properties characteristic of HMPE such as high static strength and stiffness, and illustrate that stiffness properties determined on HMPE fiber or rope are dependent on the applied load and temperature.

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