

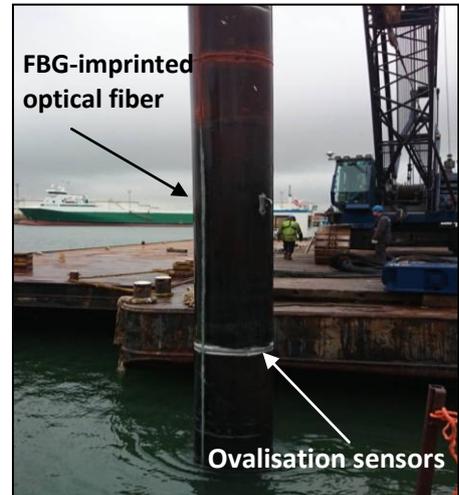
EXPERIMENTAL TESTS ON FLEXIBLE DOLPHINS.

The objective of this testing programme organised by the Rotterdam Port Authority was to obtain a more in-depth knowledge on the structural behaviour of tubular steel mooring and breasting dolphins.

For this purpose 8 sensor instrumented tubular piles having a diameter of 914mm and a length varying from 20 to 22m were vibration driven into the bottom of the Beneluxhaven in Rotterdam. Subsequently each of the piles was loaded horizontally both dynamically and statically and finally brought to failure (i.e. buckling). Throughout the testing programme Inventec was responsible for monitoring the deformation of the piles as well as the resulting geotechnical effects on the subsoil.

The monitoring performed by Inventec comprised four phenomena:

- Bending strain along the length of the pile by means of glued-on FBG-imprinted optical fibers.
- Ovalisation of the pile's cross section also using fiber optic technology.
- Deformation of the pile with a SAAF mounted in a tubular profile welded to the inside of the pile.
- Deformation of the subsoil in the vicinity of the pile using a number of SAAFs. These were contained in PVC pipes that had been placed in the harbour bottom beforehand.



For more information see application sheet [Experimental tests on flexible dolphins](#) under "Projects".