FEMEM

CHARACTERIZING FATIGUE AND AGEING IN MARINE ENVIRONMENT ELASTOMERS

Industry experience shows that the two principal types of elastomer failure in the marine environment are associated with rupturing through fatigue or ageing. The aim of the FEMEM project, officially recognised in May 2007, has been to improve understanding of how this material evolves when exposed to fatigue and a challenging environment, and to integrate the resulting parameters into a support tool for establishing the dimensions of elastomer components. Achieving this aim has been important both for manufacturers, concerned with issues of safety and competitiveness and anxious to offer reliable products based on extensive modelling, and for users, looking to optimise maintenance and minimise risk.
The project's initial phase involved perfecting a method for accelerating the ageing process to verify the life expectancy of existing products, and to put forward research aimed at developing reasonable life expectancies. A second aspect of the FEMEM project sought to accelerate the process for characterizing elastomers exposed to fatigue. Using infrared thermography and x-ray tomography, a method for rapidly determining the characteristics of fatigue was thus devleoped and tested on industrial materials.
Extensive correspondence and numerous articles have been published attesting to the scientific rigour and the relevance of the project's various achievements. Similarly, the protocols defined by the project have been integrated into the design processes of industrial partners. As has been highlighted by those commentating on the project's thesis, its aims were extremely ambitious. And while it is true that new questions have been raised and not all have been answered, the majority of the stated aims has nonetheless been attained. This has been due to the extensive involvement of the various partners and the highly efficient running of the project's technical management committee. Collaboration between partners will, moreover, continue beyond the end of the project.
Industry partners have obtained scientifically verified data and processes relating to the phenomena of ageing and fatigue in these materials, with the result that it is now possible to optimise elastomer maintenance schedules and design processes.
Lastly, it should be noted that the scientific and industrial excellence of the project's outcomes have been further acknowledged by the fact that ANR (French research agency) funding has been secured for one of FEMEM's developments, despite fierce competition (only 15% of projects submitted to the ANR receive funding).

Partners

Companies

Naval Group, Brest et Nantes
Trelleborg-Modyn, Nantes

Research centers

ENSTA Bretagne, Brest [Project Developer]
Ifremer, Brest
UBO, Brest

Funders

- Conseil régional de Bretagne
- Conseil régional des Pays de la Loire
- Conseil départemental du Finistère
- Brest métropole

Labelisation

25/05/2007

Overall budget

591 K€