

METRI

Contract No: HPRI-CT2001-00156

Project duration: 11/2001 - 02/2004

Project budget: € 466 667

Website: www.ifremer.fr/metri

12 research projects selected

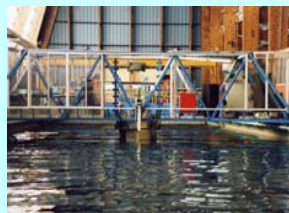
161 days of test offered

32 researchers

9 European countries

The Infrastructure includes 5 installations

The deep wave basin is the deepest seawater basin in Europe (20 metres) and the only one which may accept several types of activities such as marine hydrodynamics, submarine acoustics and tests on underwater intervention vehicles.



The water circulation basin whose speed is one of the most rapid in E.U. Its hydrodynamic characteristics are excellent and allow, with its laser velocimeter, varied activities such as submarine vehicle drag measurement, fishing gears behaviour tests.



The hyperbaric testing tanks allow the immersion simulation beyond 10 000 metres. Due to their dimensions, capabilities and associated means, they are unique in Europe. Filled with fresh or natural sea water, they can be temperature and dissolved gas controlled.



The marine materials laboratory has the capability to take into account the measurement of the whole parameters of marine environment which may have an influence on the ageing or the behaviour of materials used at sea.



The evaluation and calibration of marine sensors laboratory is the first which has been created, equipped and now experienced in the evaluation of the influence of various sea water parameters on the accuracy of marine sensors and in the development of new calibration methods.





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Results of the research teams

- The **University of Bremen** in Germany tested a profiling, shallow, underwater instrument carrier system, called OKTOPUS, particularly designed to withstand heavy sea conditions and suited for arctic deployments.
- The **University of Cranfield** (UK) validated a model to predict the performance of a laser stripe imaging system for use on an Autonomous Underwater Vehicle (AUV).
- The **University of Cranfield** also studied the influence of pressure on the mechanical behaviour and fracture of composite and sandwich panels. The mechanical tests carried out into a pressure tank allowed concluding that a hydrostatic pressure of 300 bar does not affect the Mode I delamination toughness of the CFRP composite tested.
- The **SUBEO Ltd Company** (UK) tested a ¼ scale 3-person submarine and a 2-person craft called GEMINI. This submarine vehicle, designed for leisure and coastal scientific research was successfully tested and will be proposed to customers very soon.
- The **University of Goteborg** (Sweden) evaluated in pressure, temperature and at different salinity rates a conductivity cell newly developed to be not sensitive to marine conditions. AANDERAA Company will use the results of this study.
- The **University of Cranfield** studied the cathodic disbondment of protective coatings at high hydrostatic pressures. Steel panels coated with varied types of paint were tested in natural seawater at a pressure of 250 bar. The results demonstrate that an increase of pressure and the application of cathodic overprotection both accelerate the natural degradation process that occurs in paint films.

- The **University of Copenhagen** (Denmark) tested 8 different current meters operating by 4 measurement principles on the same moorings in order to understand why, at sea, they do not deliver the same data in low current. The results show the influence of the vane and the suspended solid in water on the gap noticed.
- The **SYSTEA Company** (Italy) evaluated a newly developed deep-sea nutrient analyser. The test allowed noticing and solving some technical problems and adjusting parameters depending on the pressure. This new analyser can now be proposed to customers.
- The **University of Plymouth** (UK) validated an innovative system to recover wave energy. The results, according to the research team, could be crucial for the development of a commercially viable device for the generation of renewable electricity from wave energy.
- The **National Institute of Geophysics and Vulcanology** (Italy) tested a new bottom station network for deep-sea research. The tests allowed assessing the scientific instruments, simulating the operational sequences for the deployment and recovery of seafloor observatories and testing new acoustic communication systems.
- The **National Centre for Sensor Research of the University of Dublin** (Ireland) characterised the behaviour of a new radiometric fluorescence intensity-based dissolved oxygen sensor. The effect of temperature, generation of chorine (fouling protection) and depth were investigated.
- The **University of Madrid** (Spain) characterised in temperature and pressure the behaviour of a new radiometric salinity sensor.

Relevance for Society

These research projects allowed accelerating the development and the qualification of sensors (salinity, dissolved oxygen sensors, nutrient analyser, current meters), instruments (profilers), measurement systems and techniques (bottom station network, laser stripe imaging system), underwater vehicles (manned submarine), materials for marine use (composite and sandwich), anticorrosion method, wave energy recovery method...

These developments will be used by the marine scientific community and by companies involved in sea research and exploitation and seismic monitoring. They also allowed "SMEs" launching more rapidly new products.