

# PRESS RELEASE

---

PRESS RELEASE

May 25, 2023 | Page 1 | 4

---

## Offshore test infrastructure in the North Sea enables application-oriented development of marine protective coatings

**Marine benthic organisms colonize all available hard substrates – including offshore foundations, leading to altered flow conditions, increased loads, and more difficult inspection tasks. In order to realistically test the development of fouling-control coatings for this application, a test infrastructure was anchored on the seabed in a specially marked research area off the offshore island of Helgoland within the "ROBUST" project. Material and coating samples for the maritime industry can be tested and further developed on the cubic, metallic underwater lander. A research network of regional partners provides this unique testing opportunity.**

When the wind whips up the sea and a salty spray blows over the waves, it becomes very clear just how harsh this application environment is. These extreme conditions impose numerous challenges on materials and technologies that must be met in order to endure in the long term. For the maritime industry, shipping and for use in coastal and offshore areas, the development of robust materials for sustainable use is of essential importance. Coatings in particular are central for the protection of materials and the preservation of technical functionality for the development of future technologies, such as floating solar parks as well as tidal and wave power plants.

### **Unique inspection and testing infrastructure for offshore applications on and off Helgoland is being expanded with underwater lander**

Laboratory tests alone cannot fully represent the highly demanding and complex offshore environment. Application-oriented field tests are therefore an essential component in the qualification of newly developed materials and coatings. For this reason, Fraunhofer IFAM maintains a maritime test center on the offshore island of Helgoland for several years. Here, the institute's scientists test and develop various application profiles for the maritime industry. For research and development, there is an aging rack connected to the harbor pier for corrosion and materials testing, an outdoor area for atmospheric weathering, a floating raft for static biofouling tests, and the offshore test field for maritime technologies located off the island.

---

**Editor:**

Dipl.-Biol. Martina Ohle | Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM | Wiener Straße 12 | 28359 Bremen |  
Phone +49 421 2246-256 | [martina.ohle@ifam.fraunhofer.de](mailto:martina.ohle@ifam.fraunhofer.de) | [www.ifam.fraunhofer.de](http://www.ifam.fraunhofer.de)

**FRAUNHOFER INSTITUTE FOR MANUFACTURING TECHNOLOGY AND ADVANCED MATERIALS IFAM**

In addition, the "MarGate" underwater test site was established in 2009 by the AWI Center for Scientific Diving on Helgoland to create an easily accessible marine underwater test area. The area is approximately 270 x 100 meters in size, in five to ten meters water depth and is marked by six red surface buoys as a maritime exclusive zone for ship traffic. With the support of the Helgoland and Cuxhaven staff of the Elbe-North Sea Waterways and Shipping Authority, the crew of the workboat "Lumme", the multi-purpose vessel "Neuwerk" and the research divers of the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), employees of Fraunhofer IFAM have now deployed a cubic lander weighing around 300 kilograms made of hot-dip galvanized steel at a depth of nine meters on Helgoland's "Felssockel", the rocky seafloor made of sandstone that surrounds the island.

---

**PRESS RELEASE**May 25, 2023 | Page 2 | 4

---

The newly developed lander enables the simultaneous testing of up to 64 coating and material samples measuring 20 x 40 centimeter. The suspended support frames, secured by a bolt, allow a high degree of flexibility. They facilitate installation and de-installation by divers directly on the seabed and, if necessary, can be adapted to customer-specific geometries with custom-made adapter solutions. The "MarGate" underwater test site also has its own sensor data acquisition system so that important test-related environmental parameters such as temperature, salinity and current conditions can be incorporated into a holistic evaluation of the samples.

The lander expands the existing maritime test infrastructure of Fraunhofer IFAM on Helgoland and will contribute important findings to industry-related research and development work in the future. The seafloor test environment exerts a different profile of requirements than the frequently performed near-surface tests. The practical relevance of the results for, for example, the design of pipelines, transformer platforms and offshore foundation structures is thus significantly higher. Thanks to the good accessibility of the test field, regular inspection by AWI research divers is also possible.

**Outlook: Deployment of another lander at greater depth planned for summer 2023**

In the three-square kilometer research test field operated by Fraunhofer IFAM, another lander will be deployed in the summer of 2023. The test field is also only a few nautical miles away from the island of Helgoland. The special feature: It has a water depth of 45 meters, so that completely different conditions prevail compared to the "MarGate" underwater test field. This includes physical water parameters as well as the biofouling community. Thus, in the near future, a variety of questions can be addressed in the research areas off Helgoland.

---

**Contact:**

Tim Heusinger von Waldegge | Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM | Wiener Straße 12 | 28359 Bremen | Phone +49 421 2246-7377 | [tim.heusinger@ifam.fraunhofer.de](mailto:tim.heusinger@ifam.fraunhofer.de) | [www.ifam.fraunhofer.de](http://www.ifam.fraunhofer.de)

**Project funding**

The project "ROBUST" (FKZ: 03SX490) was funded by the Ministry of Economics and Climate Protection of the Federal Republic of Germany (BMWK) based on a resolution of the German Parliament. The project consortium would also like to thank the staff of the Project Management Jülich (PtJ) for their good administrative and technical support of the project.

**Project partners**

- Fraunhofer IFAM,
- Dr. Brill & Partner GmbH,
- Momentive Performance Materials GmbH

Duration: 01.11.2019 - 30.04.2023

**Further information**

[www.ifam.fraunhofer.de/en.html](http://www.ifam.fraunhofer.de/en.html)

[www.awi.de/en/science/special-groups/scientific-diving/margate.html](http://www.awi.de/en/science/special-groups/scientific-diving/margate.html)

**Picture**

© Fraunhofer IFAM, Publication free in conjunction with coverage of this press release.

Download:

[www.ifam.fraunhofer.de/en/Press\\_Releases/Downloads.html](http://www.ifam.fraunhofer.de/en/Press_Releases/Downloads.html)

---

**Contact:**

Tim Heusinger von Waldegge | Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM | Wiener Straße 12 | 28359 Bremen | Phone +49 421 2246-7377 | [tim.heusinger@ifam.fraunhofer.de](mailto:tim.heusinger@ifam.fraunhofer.de) | [www.ifam.fraunhofer.de](http://www.ifam.fraunhofer.de)

FRAUNHOFER INSTITUTE FOR MANUFACTURING TECHNOLOGY AND ADVANCED MATERIALS IFAM

**PRESS RELEASE**

May 25, 2023 | Page 4 | 4



Deployment of the underwater lander off the island of Helgoland. © Fraunhofer IFAM



Locations of the test field for maritime technologies of Fraunhofer IFAM and "MarGate" AWI Center for Scientific Diving both near Helgoland. © openseamap

The Fraunhofer-Gesellschaft, based in Germany, is the world's leading organization for application-oriented research. With its focus on key technologies of relevance to the future and on the exploitation of results in business and industry, it plays a central role in the innovation process. As a guide and stimulus for innovative developments and scientific excellence, it helps shape our society and our future. Founded in 1949, the organization currently operates 76 institutes and research facilities in Germany. Around 30,000 employees, most of them trained in the natural sciences or engineering, generate an annual research volume of 2.9 billion Euros. Of this, 2.5 billion Euros are spent on contract research.