

# Validation of the long-term behaviour of the SIF Skybox system

OCAS

Philippe Legros & Marc Vanderschueren



Skybox is a pre-assembled access and service platform installed directly on top of the monopile of an offshore wind turbine using a slip-joint connection. It replaces the traditional transition piece, making foundation installation simpler and faster, reducing the amount of steel required, lowering costs and providing maintenance teams with safer access. To avoid non-structural welded connections on the monopile, polyurethane elastomer (PUR) pads are bonded between the platform and the monopile using a polyurethane adhesive. The main objective of the study was to evaluate the durability of this system in a marine environment and generate the data required for future DNV certification.

**ageing methodology** combining temperature cycles and salt spray to simulate a long service life. OCAS demonstrated the excellent stability of the polyurethane. Mechanical tests, including **compression tests** and **lap shear tests** (overlap shear testing), made it possible to characterise the behaviour of the PUR material, the coatings and the bonded interfaces.

relevant data to support certification and the future commercialisation of this innovative technology.

This study was carried out in close cooperation with Stefan Erents of SIF and his team. On behalf of all OCAS colleagues involved in the project: Philippe Legros and Marc Vanderschueren.

## OCAS' CONTRIBUTION TO THE SIF SKYBOX PROJECT

OCAS applied its unique multidisciplinary expertise to support the development and validation of SIF's Skybox concept. Thanks to its recognised expertise in **corrosion, polymer testing, coated steel and bonded joints**, OCAS was able to thoroughly evaluate the durability of the connection under representative offshore conditions. The team developed an accelerated

In addition, OCAS' knowledge of **DNV** requirements and extensive experience in the **off-shore wind sector** contributed to generating

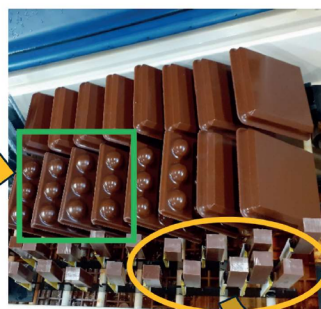
# Skybox



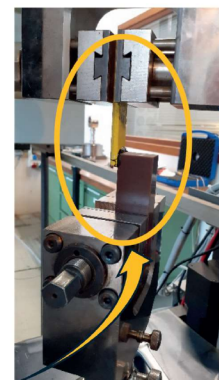
Skybox: visualisation of PUR pads



Skybox after installation



PUR pads: ageing test



Lap shear test: PUR pad bonded to painted steel

