FUTURE MATERIALS

NORWEGIAN CATAPULT CENTRE

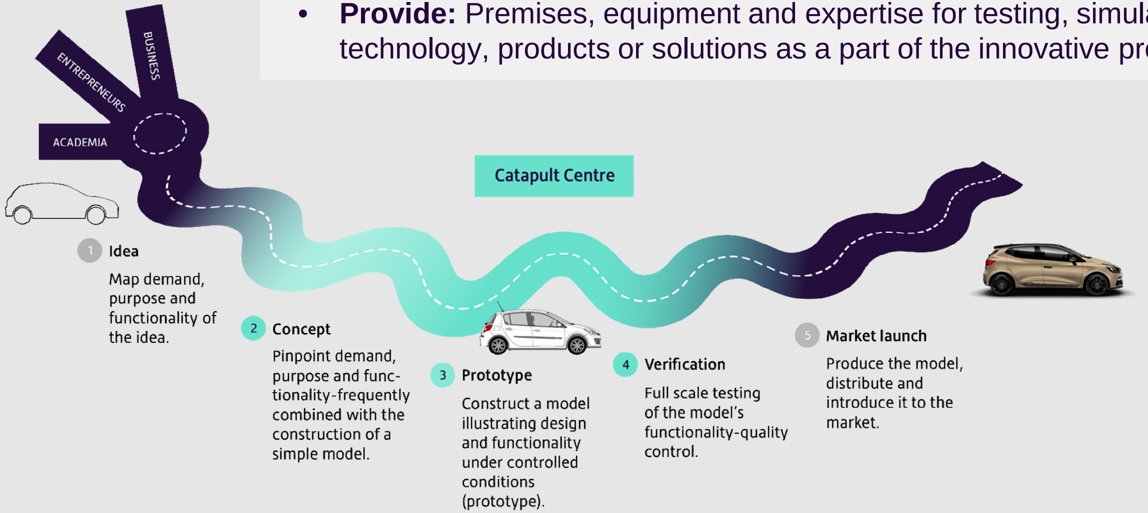
Norwegian Catapult Centres

February 16th 2022

EU and Norwegian Soft Funding of R&D Activities and Financing of Projects

Norwegian Catapult Centres

- **Purpose:** Assist a concept or prototype in order to be introduced to the marked
- **Target group:** Small-medium businesses, but also bigger companies and entrepreneurs.
- **Provide:** Premises, equipment and expertise for testing, simulation and visualisation of technology, products or solutions as a part of the innovative process



Accuracy,

Reduced risk,

Easier market access

siva Forskningsrådet Innovasjon Norge

Norwegian Catapult Centres

FUTURE MATERIALS | NORSK KATAPULT SENTER

OCEAN INNOVATION | NORSK KATAPULT SENTER

SUSTAINABLE ENERGY | NORSK KATAPULT SENTER

MANUFACTURING TECHNOLOGY | NORSK KATAPULT SENTER

DIGICAT | NORSK KATAPULT SENTER

NORWEGIAN CATAPULT

Testing of subsea equipment at seabed

Develogic develops and manufactures custom data collection and telemetry solutions for marine monitoring applications.

In this project Develogic needed access to a seabed area with known properties to test and calibrate sensors on landers for phase II of the Lofoten Vesterålen Observatory (LoVE).

Through its partner NUI AS, Ocean Innocation Norwegian Catapult Centre has access to test facilities at a seabed area specially adapted for testing subsea equipment.

Develogic received assistance in setting up and successfully monitored testing and calibration of Node II for LoVE.

develogic subsea systems

OCEAN INNOVATION
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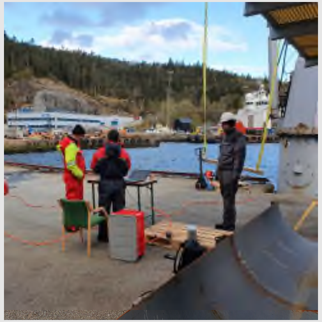


MET Centre
KARSTEN MOHOLT
Main brg Rad
Main brg Axial
Gear Input Rad
Gear Output Rad
Gen DE Ax
Gen DE Rad
Gen NDE Rad
SUSTAINABLE ENERGY
NORWEGIAN CATAPULT CENTRE
spoor
Flagship
TetraSpar Demonstrator
Island Clipper
4INSIGHT® FOR WIND ENERGY
FRANCE ENERGIES MARINES
DIMPACT

The Energy House - Stord

SUSTAINABLE ENERGY
NORWEGIAN CATAPULT CENTRE

In The Energy House you can test single components or systems for:

- High power solutions
- Battery systems
- Hybrid systems
- Future fuels as Ammonia, Hydrogen, Bio-gas, synthetic fuels, etc.

Additive Manufacturing – Material combination

MH Wirth wanted to test a new material for wear pads to increase the life of a hard-wearing component.

We used a *laser deposition welding printer* to produce a test series of the component, printing tool steel grooves on a regular steel pipe. The new design, material and production method resulted in much higher durability and increased service life.

Using additive manufacturing as production method for the component, different materials could be combined in a way significantly reducing the raw material costs.

mhwirth

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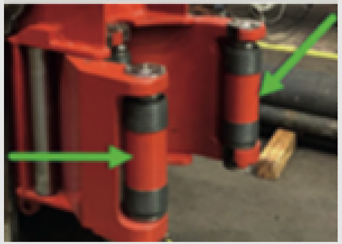

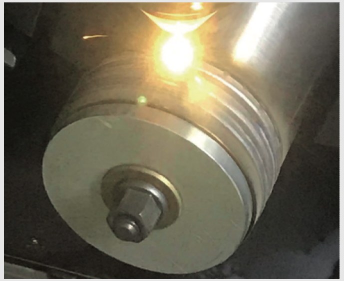

Elkem · MIL Mechatronics Innovation Lab · norner The Polymer Explorers · ReSiTec

Aging in ammonia and salt mist

This valve shall be used in an environment with exposure to both ammonia and salt spray, and our customer wanted to test whether the choice of material for the valve is suitable for these conditions.

The requirement is less than 2.5% rust after completion.

The valves were placed in ammonia for 14 days at 25°C (with pressure of approximately 4 bar) and then in salt mist for 96 hours (35°C and 5% saline).

After exposure of ammonia and salt mist the valves were inspected carefully. The test results showed little or no rust after ammonia exposure, but severe rust attack after exposure to salt mist.

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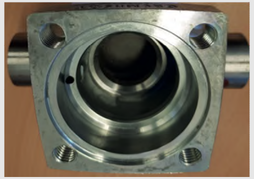
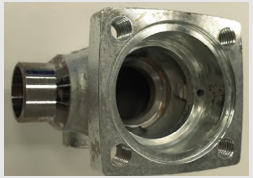
Standard sample before testing



After exposure of ammonia for 14 days



After 96 hours in salt mist chamber

Elkem Mechatronics Innovation Lab norner The Polymer Explorers ReSiTec

Failure analysis of stud bolt with cracks

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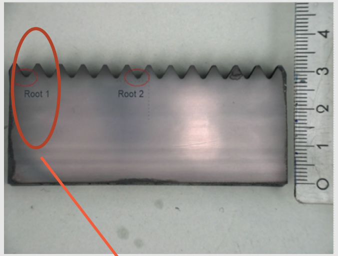
Elkem received a sample for examination in a scanning electron microscope (SEM). The bolt was known to have cracks in the thread roots.

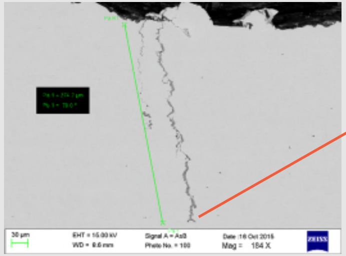
The analysis discovered two visible cracks in the root referred to as “Root 1” in the upper left picture. The longest crack was approximately 370 microns.

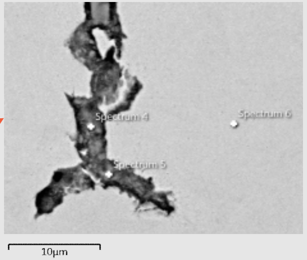
In the bottom of the crack we found evidence of zinc (Zn) and oxides (O).

Zink in the bottom of crack indicates that the bolt was fractured before galvanizing, therefore not during torqueing of the bolt.



Result Type	Weight %		
Spectrum Label	Spectrum 4	Spectrum 5	Spectrum 6
O	26.01	23.13	
Si	0.32	0.29	0.22
Ca	0.14	0.14	
Cr	0.69	0.61	2.55
Mn	0.39	0.36	0.79
Fe	67.82	70.25	94.02
Ni	1.20	1.32	2.04
Zn	3.43	3.89	
Mo			0.38
Total	100.00	100.00	100.00





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norner The Polymer Explorers
ReSiTec

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Foto: Norsk Katapult

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