Prototech organization

- Established: 1988
- Managing director: Bernt Skeie
- Owner: NORCE (100%)
- Turnover: NOK ~59 mill (2018)
- Employees: 40
- Departments: Research & Development, Parts & Services

ISO Certified 9001:2015
Prototech - in short

- Dates back to CMI/ Odd Dahl
- Established as legal entity in 1988
- Part of NORCE
- 40 employees from 7 countries
- Prototype development – from idea to product
- Highly skilled workforce and spectacular projects from space to the seven seas

SPACE
- Energy systems
- Mechanisms and structures
- Space research/ ISS

Green Energy
- Zero Emission Energy systems
- Fuel Cells
- Hydrogen

Oil & Gas
- Energy systems
- Inspection tools
- Mechanical production
- Test and repair

Maritime
- Energy systems
- (Standards)


From Space to the Seven Seas

1988 2018
From Space to “The Seven Seas”...

We use our Space expertise and bring it down to Earth
Research & Development

• 25+ years of experience in the development and testing of different energy systems using a variety of fuels.
• Combined expertise to create fuel cell and electrolyser systems for the future.
• Core expertise:
  – Fuel cells (SOFC, PEM)
  – Electrolysers (SOFC, PEM)
  – Energy conversion
  – Energy optimisation
  – Space research

1 kW/kg
HT PEM Fuel Cell

SOFC
• Thorough knowledge and expertise in the field of mechanical engineering and related disciplines.
• Solid theoretical foundation and excellent practical understanding.
• Core expertise:
  – Advanced mechanical design
  – Thermal and mechanical analysis (FEM)
  – Aero and hydrodynamic analysis (CFD)
Parts & Services

• Extensive experience and knowledge of high quality precision machining
• Wide variety of materials ranging from lightweight metals to high temperature hard steel finishes and ceramics
• Core expertise:
  – Machining of complex structures
  – Small and medium series
  – Prototype production
  – High quality measurement laboratory
Parts & Services

• Highly qualified technicians
• Modern workshop equipment with service and repair facilities
• Various test and measurement facilities
• Core expertise:
  – Vibration testing
  – Pressure testing
  – Temperature testing
  – Service and repair
  – 3D printing
Prototech Prototyping
– from idea to product

- Concept and bread-boarding
- Prototype and Product
- Design and Analyses
- Assembling, Inspection and Test
- Documentation and Drawings
- Manufacturing and Measurements
- Prototype and Product
Prototech - Core areas of expertise

• Structural components for satellites and launchers
• Experimental modules for unmanned and manned space flights
• Thermal & mechanical analysis (FEM) and Aero- & hydrodynamic analysis (CFD)
• Special equipment and tools to client specifications for the oil & gas and offshore industry
• Concept studies of energy conversion processes
• Development and demonstration of fuel-cell-based energy processes
• Extensive expertise in developing advanced and special tools for pipeline inspection
Manufacturing and Test Facilities

- **Workshop Equipment**
  - 6 milling machines (3- to 5-axes)
  - 3 turning lathes (2 with 3-axer)
  - Manually operated milling and turning lathes are available
  - Tig, Mig/Mag welding

- **3D printing/ Rapid Prototyping**
  - Objet Eden 250
  - Ultimaker 3

- **Test Equipment**
  - Material test laboratory
  - Pressure test laboratory
  - Vibration test laboratory
  - Vacuum chamber
  - Pressure chambers (50 and 350 bar)
  - Numerical Controlled Measurement Bench
  - Electronic Weights, CoG recorder, Surface finish
  - Clean Rooms (classes 10 000 & 100 000)
  - High quality measurement laboratory
Machines

- **DMG Mori DMF-180**
- 1800x700x700
- 5 axis
- C axis: nx 360
- B axis: +/-110
- Spindle: 20 - 15,000 revs/min
Machines

- 4 of Quaser MV154EL
  - 1000x500x500
  - 12000 revs/min

- PUMA 300 LM
  - 260x590x450
  - C-axis
Machines

- **OKUMA LB 3000 EX**
  - Ø 200x1000x500
  - C-axis

- **OKUMA LB 35**
  - Ø 400x2000
Measurement

- **DEA Measurement Bench**
- 3D Numerical Controlled Measurement
  Bench of type DEA Performance
- 700x1000x460 mm

- Specification:
- ISO 10360-2 $E = 1.7+/333$ (um) $R = 1.9$ (um)
3D Printing

- Rapid Prototyping Objet Eden 250
  - Print volume: X-250mm, Y-250mm, Z-200mm
  - Resolution: 2/1000" or approx. 0.05mm
  - Colours: white, black, blue and transparent

- Ultimaker 3
  - Print volume: X-215mm, Y-215mm, Z-200mm
  - Layer resolution: up to 20micron
For more information:

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