



University
of Exeter

Dynamic Marine Component
Test Facility (DMaC)

RESEARCH
FACILITIES

DMaC

**Investigating
reliability** in harsh
dynamic offshore environment

Dynamic Marine Component test facility

Control Centre

- Fully autonomous control and data logging
- Programmable test design
 - Force driven
 - Displacement driven
- NI Compact RIO / Labview
 - Data acquisition and control channels
 - 32 analogue inputs
 - 8 differential strain gauge inputs
 - 64 digital inputs
 - 32 Digital Outputs
 - 16 Analogue Outputs
 - Sampling frequency (combined) 250 kHz
 - Position control frequency 120 kHz
- Replicate any measured marine induced force and motion cycle
- Simulate marine component response to real sea state conditions in a controlled environment
- Internet enabled for real time viewing and control

Tailstock: Z Actuator

- Z actuator dimensions
 - Stroke 1 m
 - Rod diameter 70 mm
 - Bore diameter 160 mm
- Maximum Dynamic Force 30 Tonnes
- Equal area actuator
- 2 Stage Servo-hydraulic control valve 462 l/min
- Preload force 14 Tonnes
- Frequency at 1m stroke) 0.1 Hz
- Frequency (at 0.1m stroke) 1 Hz
- Frequency (at 0.01m stroke) 10 Hz

Test Bed

- Maximum specimen dimensions
 - Length 6 m
 - Diameter 800 mm
 - Weight (including tether) 1000 kg
- Wet or dry operation
- Full fresh water submersion operation
- Watchdog system with safety interlocks
- 6mm Polycarbonate safety shield
- Spare data acquisition inputs for specimen specific data recording applications
- Adjustable Z position

Hydraulic Power Supply

- Electrical Power Supply
 - Power 130 kW
 - Voltage 415 V
- Hydraulic Power Unit
 - 2off 55kW induction motors
 - 2off variable displacement pumps
 - Drive Circuit Pressure 140 Bar
 - Flow Rate 362 l/min
 - Pilot Circuit Pressure 210 Bar
- Hydraulic Accumulators for average flow
- Oil tank capacity 1700 litres

Headstock: Bending Moment Gimbal

- X and Y bending
 - Displacement $\pm 30^\circ$
 - Frequency 0.25 Hz
 - Off-axis load 10 kNm
- Maximum specimen properties
 - Diameter 800 mm
 - Base to pivot point 300 mm
 - Weight 500 kg