



TESTING WITH ACTIVE COOLING & LUBRICATION SYSTEM

Location: Flanders Make - Leuven

DESCRIPTION

With the need for compact, higher performant & energy efficient electrical drivetrains, machines & vehicle, extensive research on cooling methods is needed to evacuate the heat in a smaller volume whilst delivering the same power. That is why we developed this flexible cooling & lubrication infrastructure which offers the possibility to test & evaluate several novel cooling/sealing & lubrication architectures & concepts in a powertrain (motor(s), gearbox, inverter, etc.).

SPECIFICATIONS

- Temperature conditioning via cooling (2x60kW) & heating power (2x16kW)
- Several thermal/lubrication architectural liquid circuit choices (parallel/serial)
- Several fluid circuits (Oil & Water&Glycol circuits)
- Several circuit measurements (temperature; thermal camera; flow rate; absolute & differential pressure; density)
- Rapid prototype platform for temperature conditioning; thermal load emulation & active cooling & lubrication control strategies (Simulink; Speedgoat)

Further details can be found in the Figure 1 & 2.

Flexible oil and water&glycol circuit frame

Example load motor (250kW)

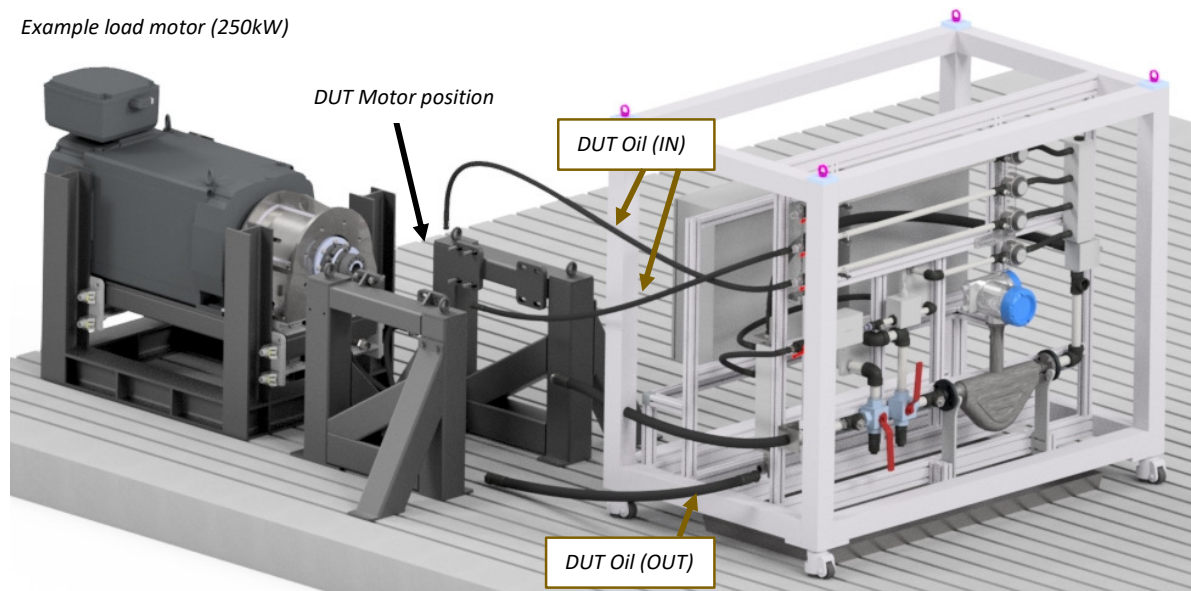


Figure 1: Example of Load to DUT drivetrain configuration connected to 2 parallel hydraulic oil lines. The full schematic of the flexible cooling & lubrication circuits can be found in Figure 2.

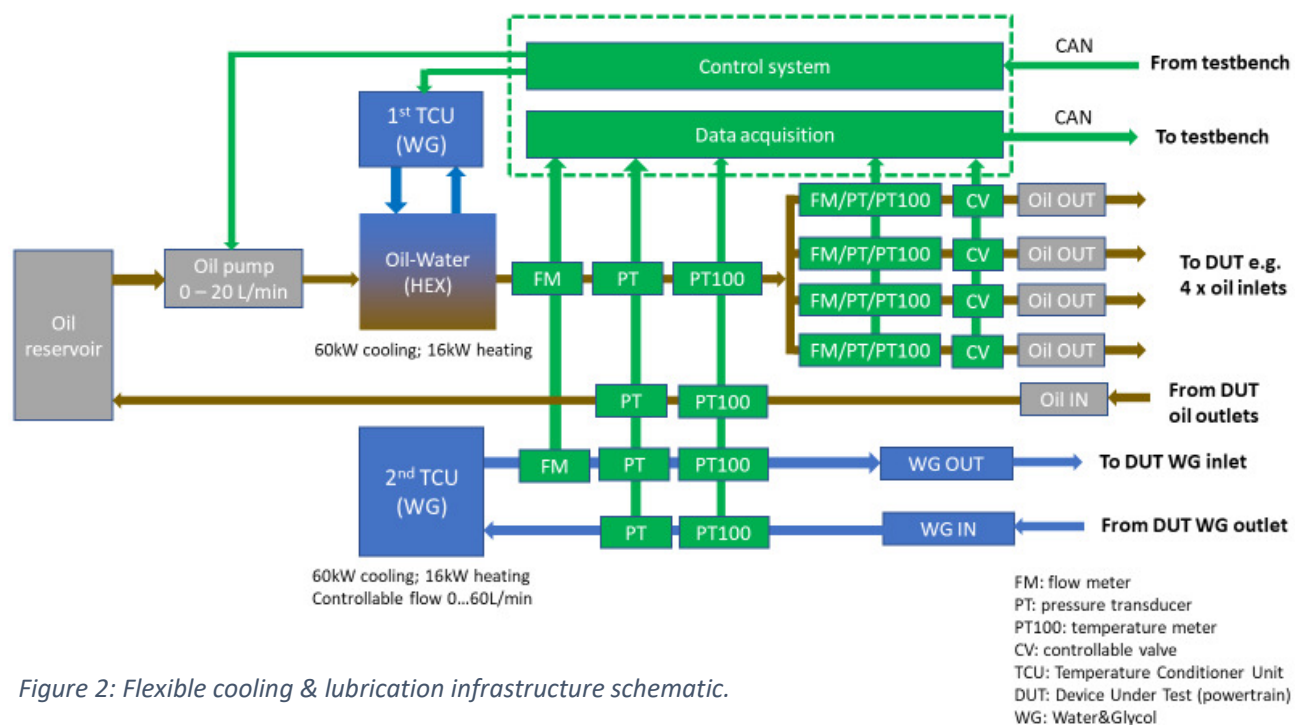


Figure 2: Flexible cooling & lubrication infrastructure schematic.

COMPATIBLE EQUIPMENT

- [Multi-load modular drivetrain setup](#) for emulating powertrain loads
- Validated custom SimScape library for the validation of thermal concepts & architectures

OUR OFFER

- Flexible cooling & lubrication infrastructure for thermal performance testing of multiple thermal powertrain architectures (parallel/serial; combined)
- Drivetrain, (multi-) motor, gearbox & inverter oil/water glycol cooling & lubrication testing
- Testing & validation of new E-motor cooling designs
- Testing & validation of new seal designs in e.g. electrical motors
- Testing thermal control strategies
- Testing thermally emulated load scenarios (e.g. oil warm up scenarios) from cold to hot conditions
- Above can be combined with initial model-based feasibility studies using our custom simcape library (HYPERTHERM) which consists of advanced cooling methods. This library is embedded in our HyperDrivetrain MotionS toolbox to optimize the overall drivetrain performance.