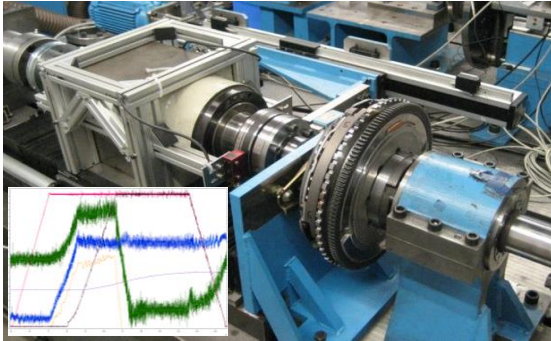
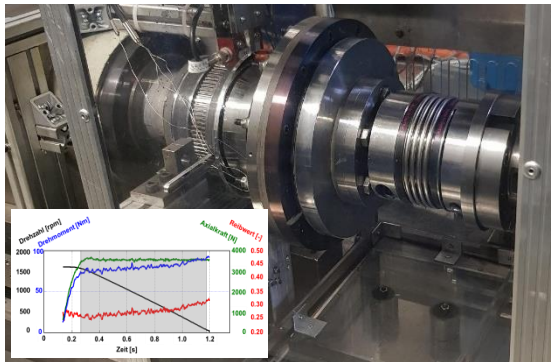


## Exemplary research

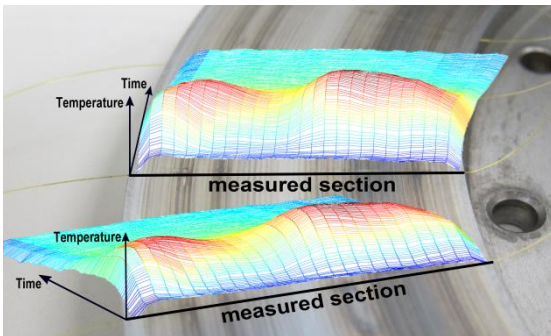
### Testing of entire clutch and brake systems



### Testing reduced to the friction contact



### Measurement of the temperature distribution using fiber optic sensing technology with high spatial measurement density



## Contact

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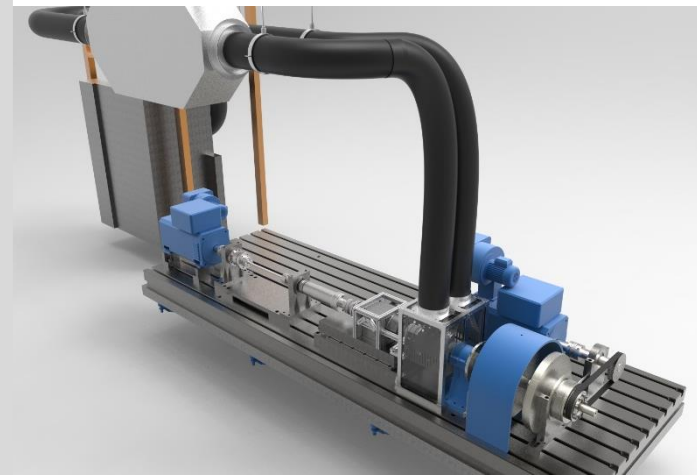
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# TRP Dry Friction Test Bench



IPEK ▪ Institute of Product Engineering



## Test Bench Specifications

### Engines

- nominal power: 124 kW
- rotational speed: 3000 rpm
- Torque  $M_R$ : 400 Nm

### Setup

- Torsional stiffness adjustable from 6-50 Hz
- Clamp Force up to 10 kN

### Air Conditioning System

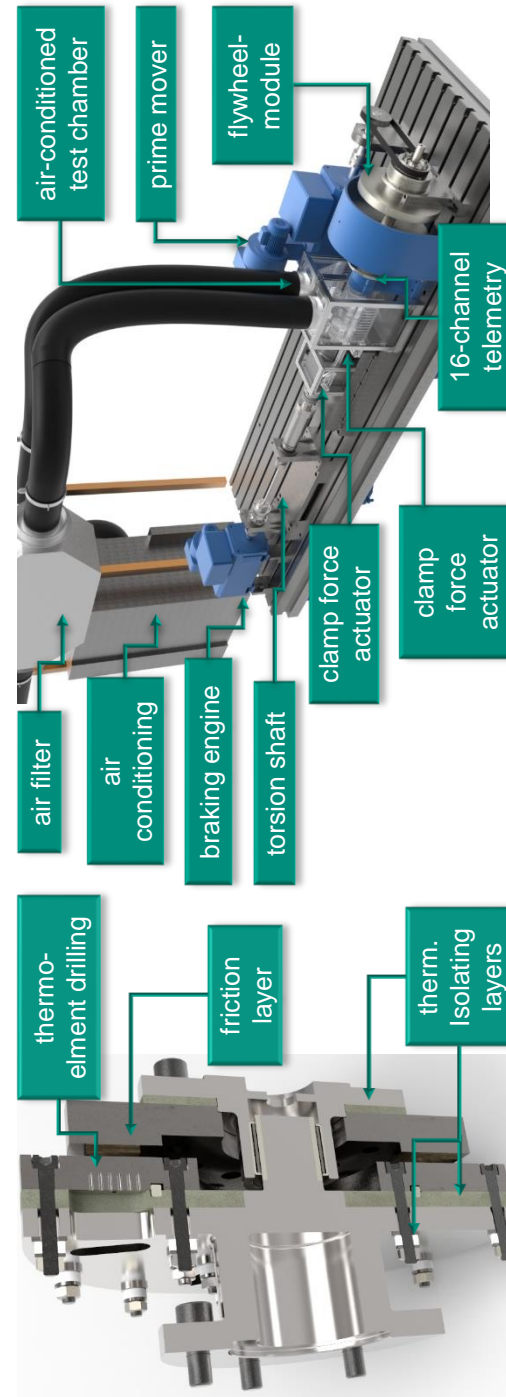
- Temperature between -40 - 160 °C
- Relative humidity from 10% to 95 %

### Measurement Equipment

- Clamp Force and Torque Flange
- Axial force and torque measuring hub
- 16 - Channel Telemetry for Temperature Measurement
- Distributed fiber sensing
- Thermal camera
- Incremental encoder

### Control Modes

- Control of rpm, torque, axial force, friction work and temperature in the friction contact and in the pressure plate.



## Research Focus

- Investigation of friction linings (organic, ceramic, sinter) in dry friction systems
- Testing of entire clutch and brake systems
- Clutch characterization
- Comparative Benchmark of friction facings
- Investigation of the dynamic behavior of the friction system
- Investigation of the influence of environmental conditions in clutch and brake systems
- Measurement of the temperatures near to the friction contact by using 16-Channel Telemetry, fiber sensing technology or a thermal camera
- Investigation of the thermo-mechanical behavior of the friction system during the slipping phase

## Test Programs

- Synchronization
- Braking
- Break-away
- Speed ramps, load or torque controlled
- Continuous slip at constant load, torque or drive
- Continuously adjustable mass simulation
- Non-stop operation