Technologie in Kunststoff

TiK - Technologie in Kunststoff GmbH

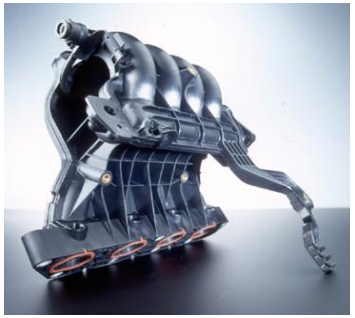
Technology in Plastics

TiK-Technologie in Kunststoff GmbH
e-mail: info@tik-center.com
Internet: www.tik-center.com

Part Development

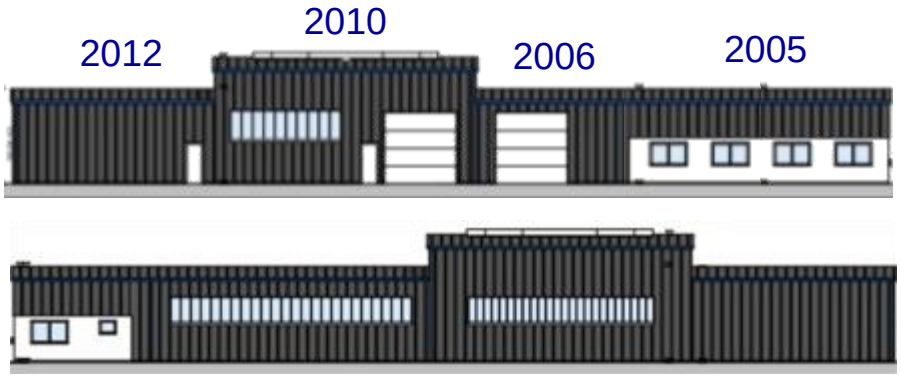
Approval

Processing



TiK - Technologie in Kunststoff GmbH Technical Center

Technologie in Kunststoff



- 2003 Establishment Engineering Office
- 2004 Establishment
  TiK-Technologie in Kunststoff GmbH
- 2005 Start in an own Technical Center
- 2010 Enlargement of Technical Center
- 2012 Enlargement of Technical Center
- 2013 Approval according to ilac and DAkkS

ilac-MRA

DAkkS Deutsche Akkreditierungsstelle D-PL-18828-01-00

- Technical Center: 600 m²
- Employees: 10
- Experience: 25 Years
  - Cam Covers, Air Intake Manifold, Cooling Units, Exterior, Interior, Kitchen Stuff, Tooling, Processing (GIT, WIT), FEA-Simulation…

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Idea of Success

Technologie in Kunststoff

Part Development

Part Approval

Process Knowledge

From idea to serial product – one package!

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Strength Factors

Technologie in Kunststoff

- Wide range of know-how in the field of plastic technology, mould manufacturing and special machine engineering, automotive industry
- Sales and marketing
- Efficient networking
- Cooperations (Schmidt-Kranz-Gruppe, Cinpres Ltd, IKV Aachen)
- Huge top-level customer portfolio:

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Philosophy

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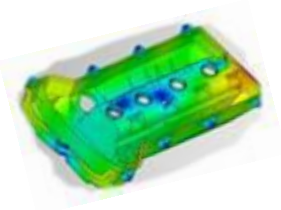

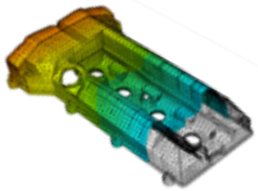

Projektmanagement

- Concept study - Selection of process
- Part construction
- CAE-Calculation
- Process simulation
- Mold design and construction
- Prototype parts
- Process optimization in customer plant
- Part testing
- Release for serial production

Projektmanagement

TiK - Services
FEM Part development

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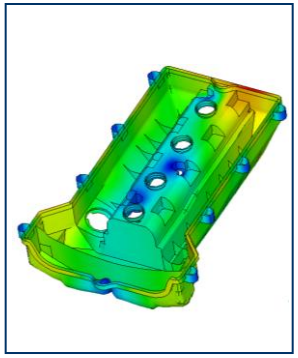
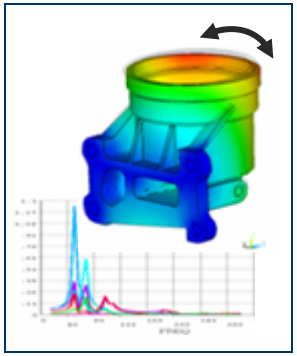
- **mesh generation**
- **static structure analysis**
- **dynamic structure analysis**
- **process simulation**
- **acoustic calculation**
- **flow analysis CFX**

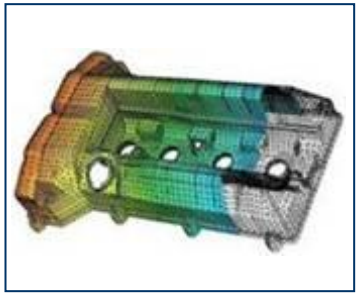
statical



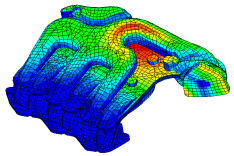
dynamical

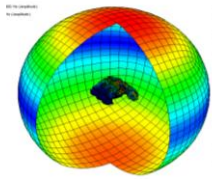


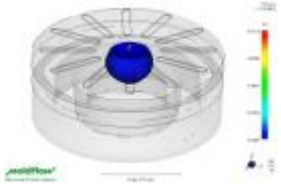
process simulation

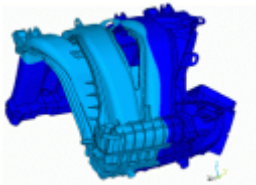


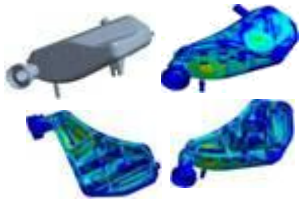
acoustics

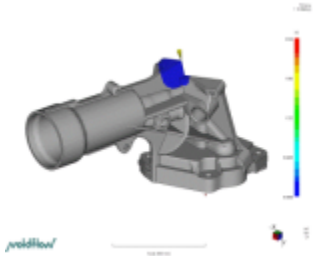












TiK - Services
Testing Facilities

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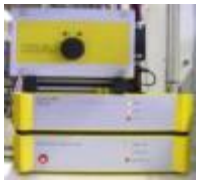

- Vibration test bench (Shaker)
- Plasma oil separation measurement
- Oil spray test bench
- circular flow testing (cooling circuit)
- Flow rate measurement (air, water and oil)
- Pressure pulsation testing (oil, glykol, water)
- Pressure pulsation testing (air and vacuum)
- Hot air pressure pulsation testing turbo charger tubes)
- Back-Fire-testing bench Temperature shock test
- Aging (up to 300 °C)
- Climatic chamber
- Leakage testing device
- static burst pressure testing
- acoustics measurements
- GMW 3155 (certified by GM world-wide)
- special testing on demand

TiK - Services
Process technology - Project management

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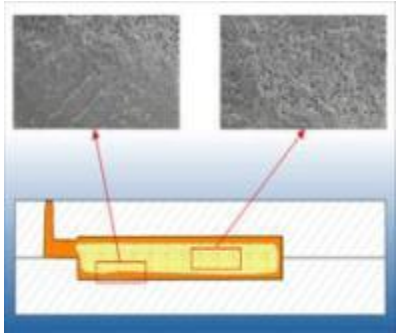
- Project management
- Process based consulting service
- Conception and design studies regarding GIT, WIT, PIT and foaming.
- moulding trials in own technical lab
- part, mold design and manufacturing
- on site process optimisation



TiK - Services
Injector technology for GIT, WIT und PIT

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For every technology the right injector

- Process optimized injector technology
- Active and non active injectors
- Special materials (type of steel)
- Low abrasion
- Low effects of contamination

WIT — **TiK-WIT®** — **GIT**

DN 16 Z

DN16 ZH

DN 5 st

DN 3 st

M10-N6 / M6-N2

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Technology in Plastic

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Part Validation and Boundary Conditions

Leakage Tests

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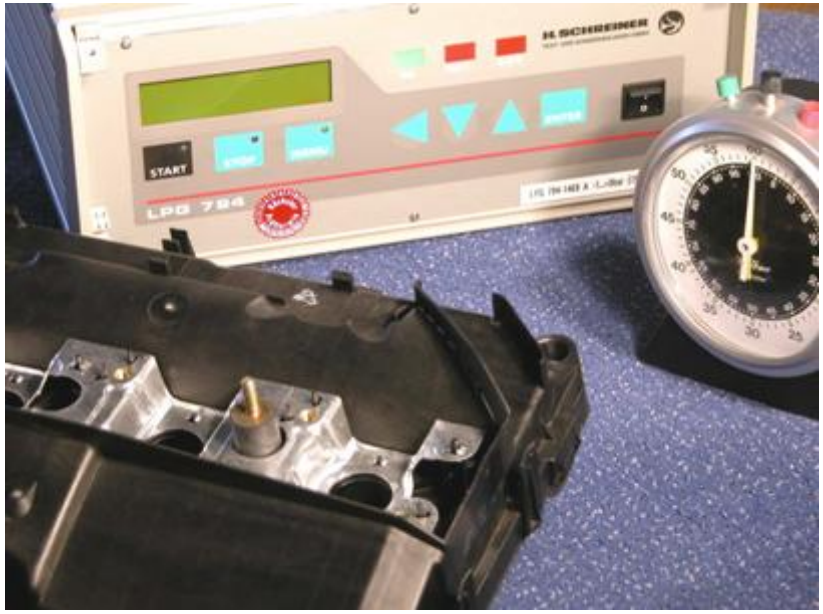

Leakage Test

- Measuring of leakage behavior
  - Pressure loss
  - Pressure increase
  - Leak rate
- Pressure range (absolute): 0,1 to 6 bar

Tensile Machine

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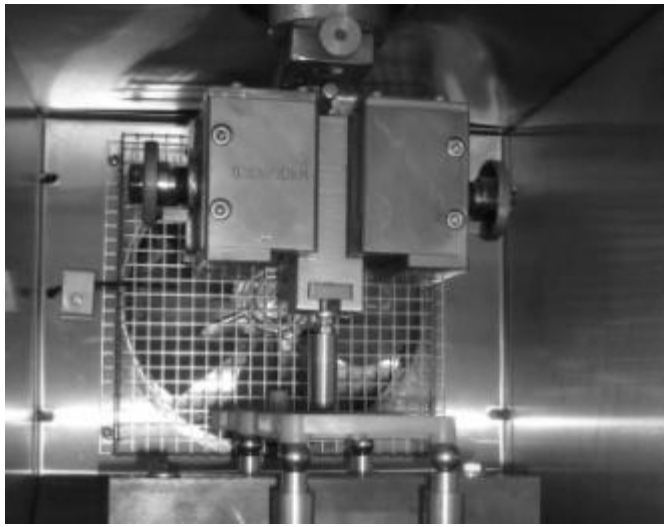
Tensile Machine

- Temperature: -40 °C / 180 °C
- Up to F = 50KN
- Material data
- Insert pull-out force
- Bushings



Aging Tests
e.g. Air intake manifolds, rocker covers, cooling parts

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Heat Aging

- Aging of parts at different temperatures
- Temperature: 23°C to 300 °C
  - Constant and
  - Temperature Profiles

Climatic Chamber

- Testing of parts at different conditions
- Temperature: -70 to 200 °C
  - Constant
  - Temperature Profiles
- Rel. Humidity: 10% to 98%
  - Constant
  - Humidity profile

Temperature Shock Test

e.g. Air intake manifolds, rocker covers, cooling parts

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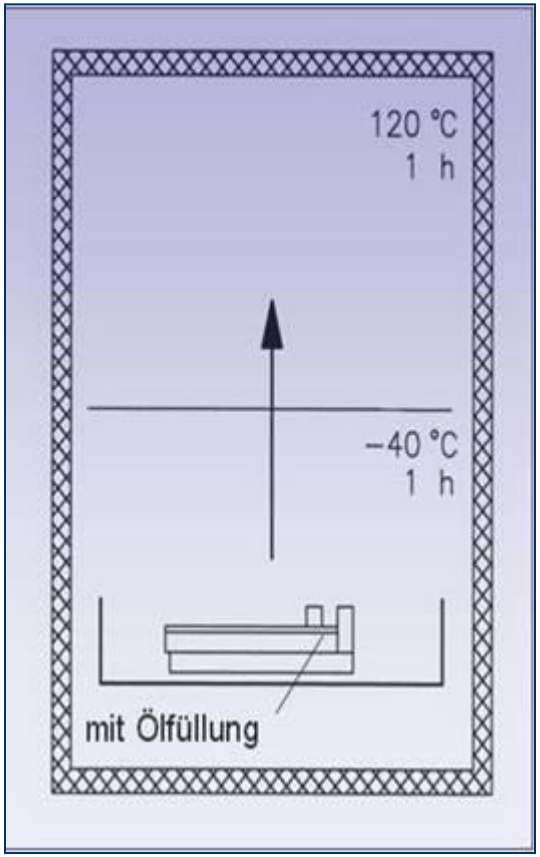
Temperature Shock Test

- Max. Temperatur: 180 °C
- Min. Temperatur: -40 °C
- Integrated elevator



Glycol aging and Pressure loss Devices

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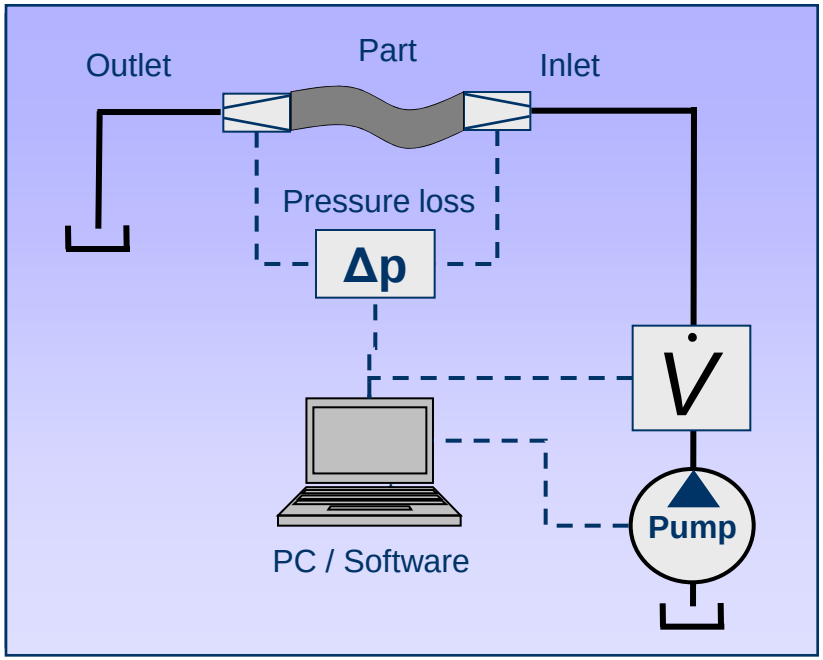

Glycol aging

- Max. Volume: 1000 l/min
- Max. Pressure: 20 bar
- Medium Temperature: 23 to 200 °C
- Medium: glycol, water

Flow rate measurement

- Max. Volume: 1000 l/min
- Max. Pressure: 5 bar
- Medium temperature: 23°C
- Medium: Water

Glycol aging
Thermocycle with negative cold cycles

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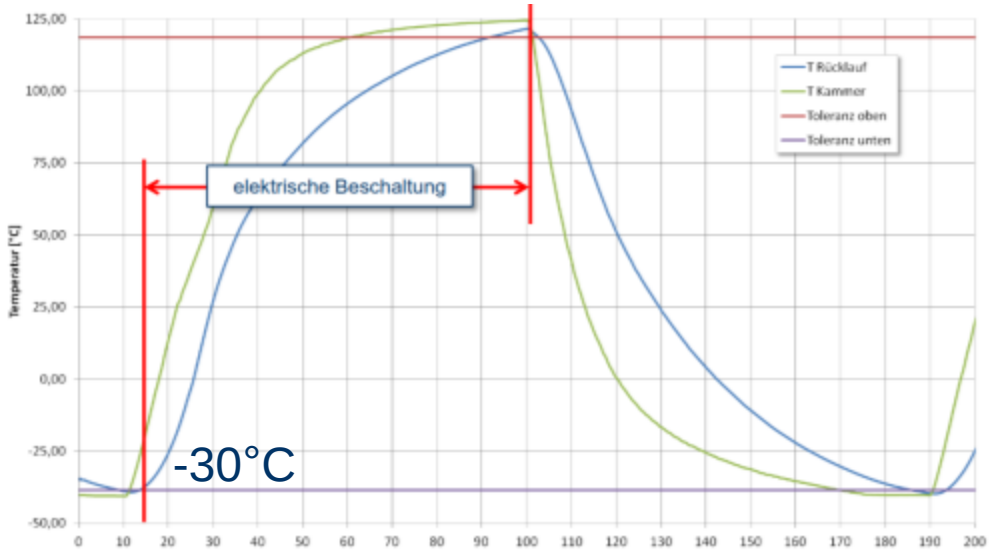

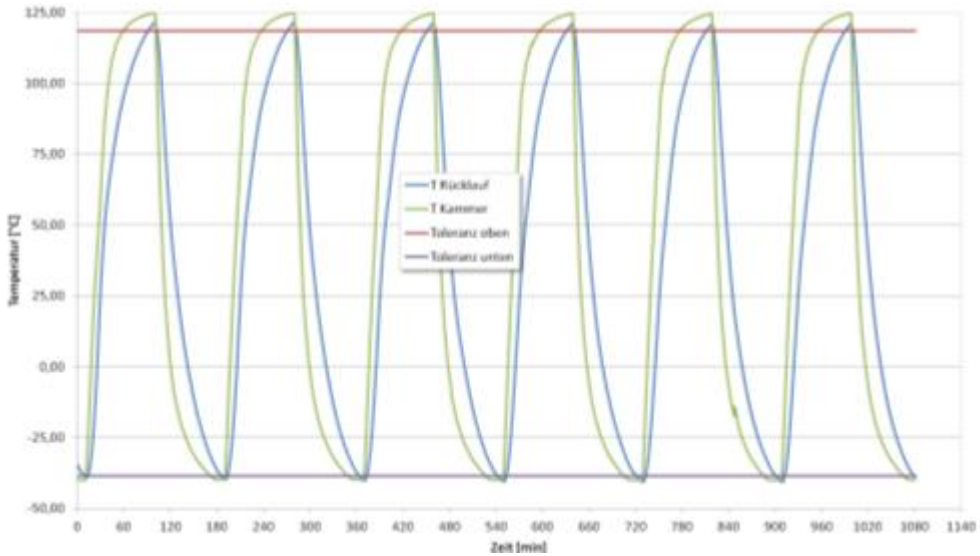

Glycol aging

Max. Volume: 1000 l/min
Max. Pressure: 20 bar
Medium Temperature: -40 to 200 °C
Medium: glycol, water

Oil ageing

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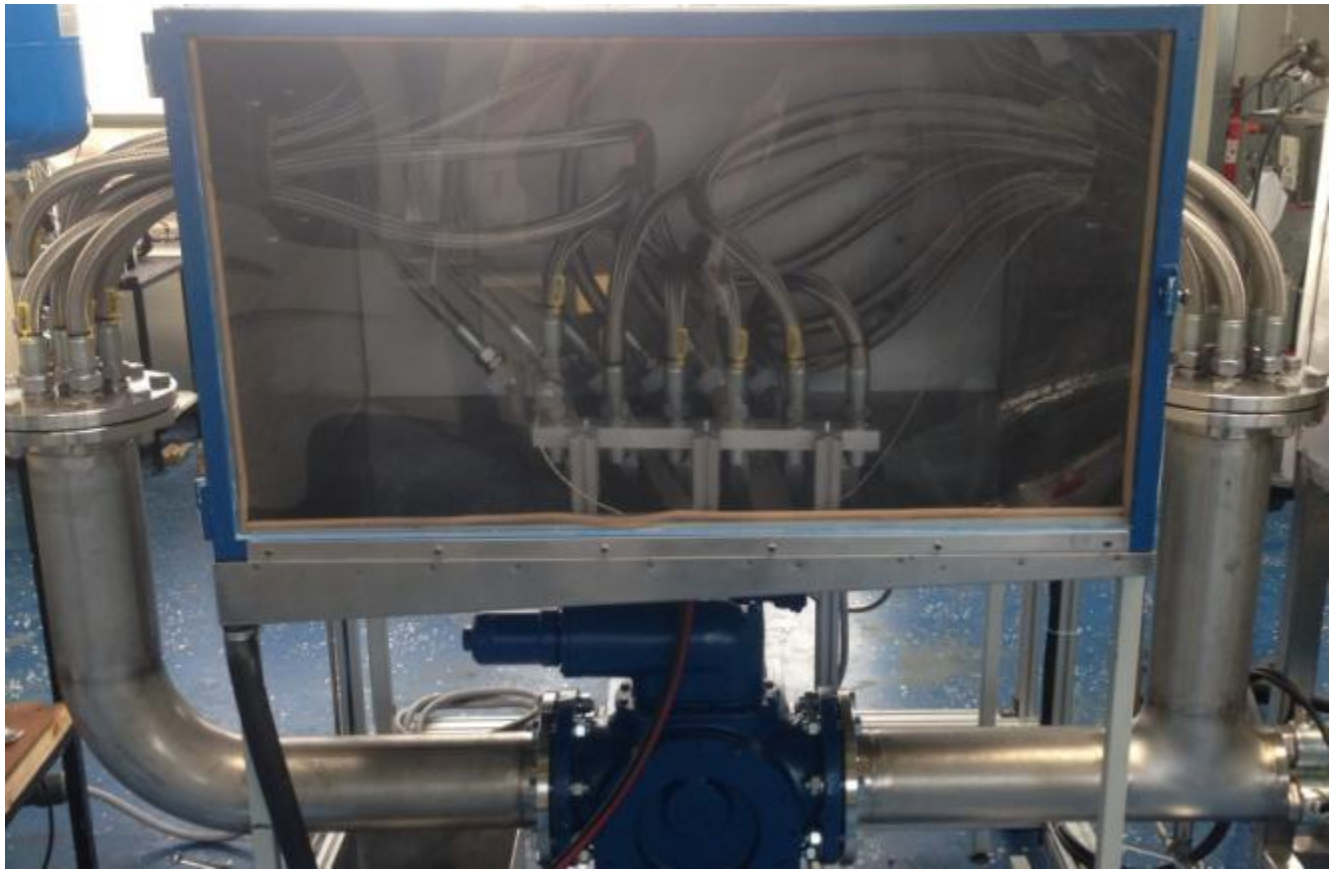

Oil aging

Max. Volume:	840 l/min
Max. Pressure:	20 bar
Medium Temperature:	150°C
Medium:	oil

Pulsation Pressure Devices

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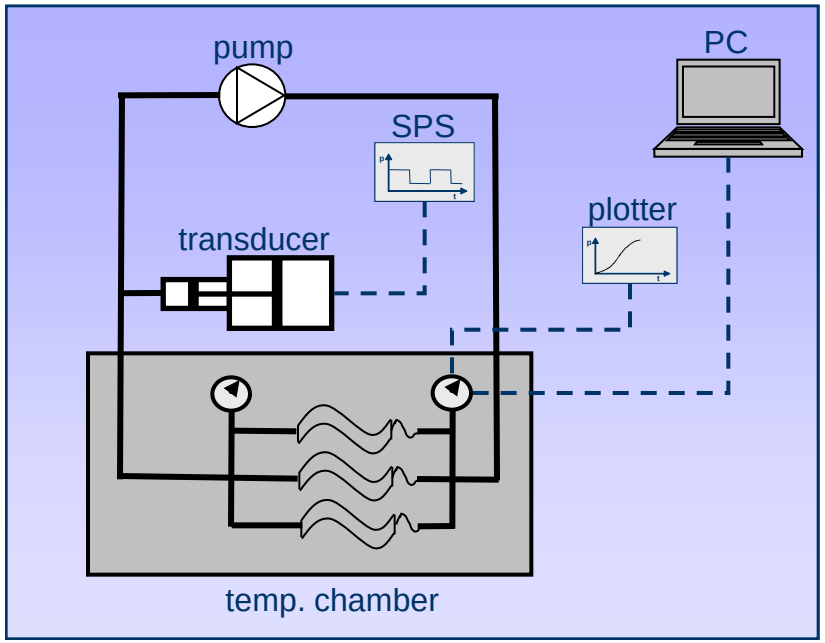

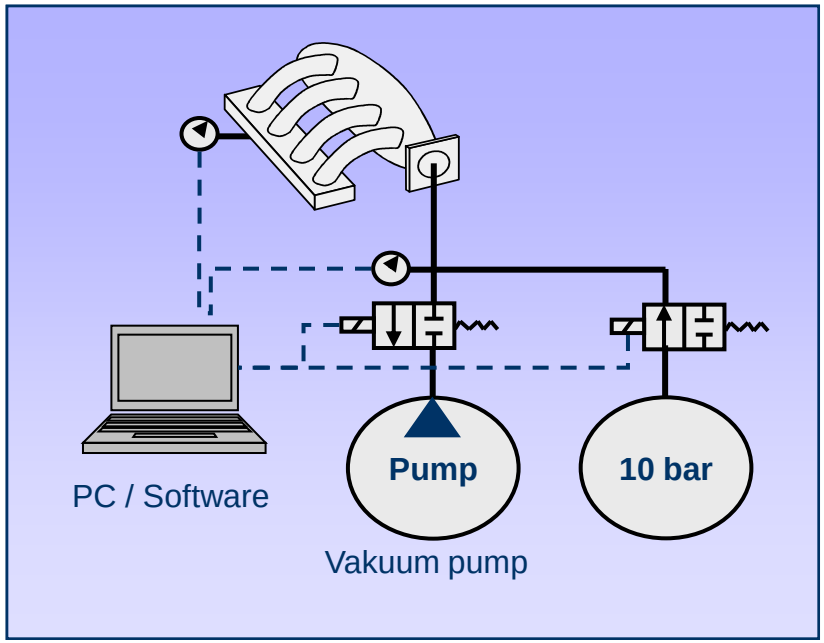

Pulsation with Liquids

- Max. Volume: 60 l/min
- Max. Pressure: 20 bar
- Medium Temperature: -40 to 160 °C
- Medium: glycol, water, oil, …

Pulsation with Air and Vacuum

- Max. Under Pressure: -0,95 bar
- Max. Over Pressure: 10 bar
- Temperature: -40 to 300 °C
- Medium: all

Hot Air Pulsation Pressure Devices

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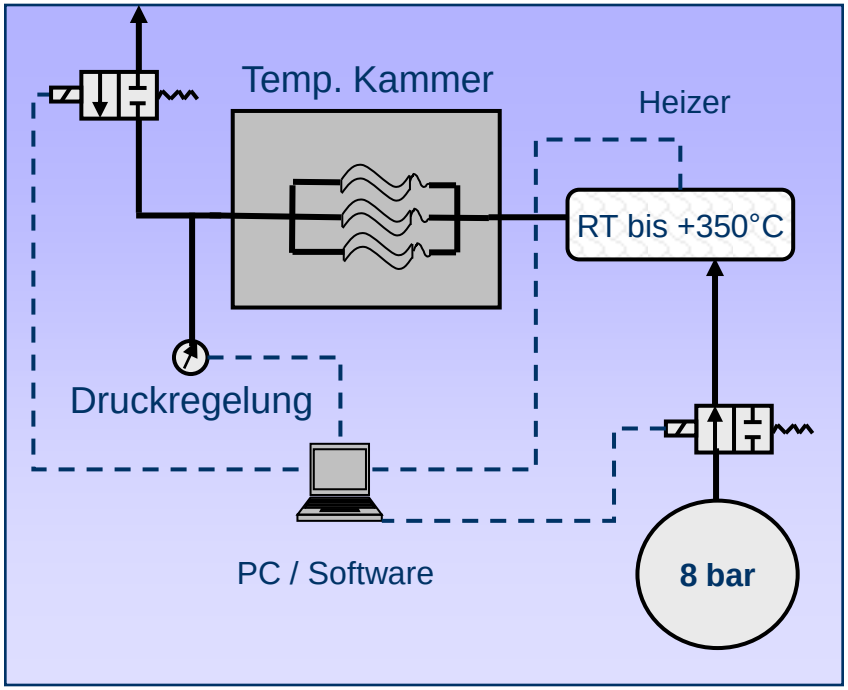

Pulsation with hot air

- Max. over pressure: 8 bar
- Temperature of the air: RT to 350 °C
- Temperature of the chamber: RT to +300°C
- Medium: air

Testing of charged air duct parts

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Hot air pressure pulsation

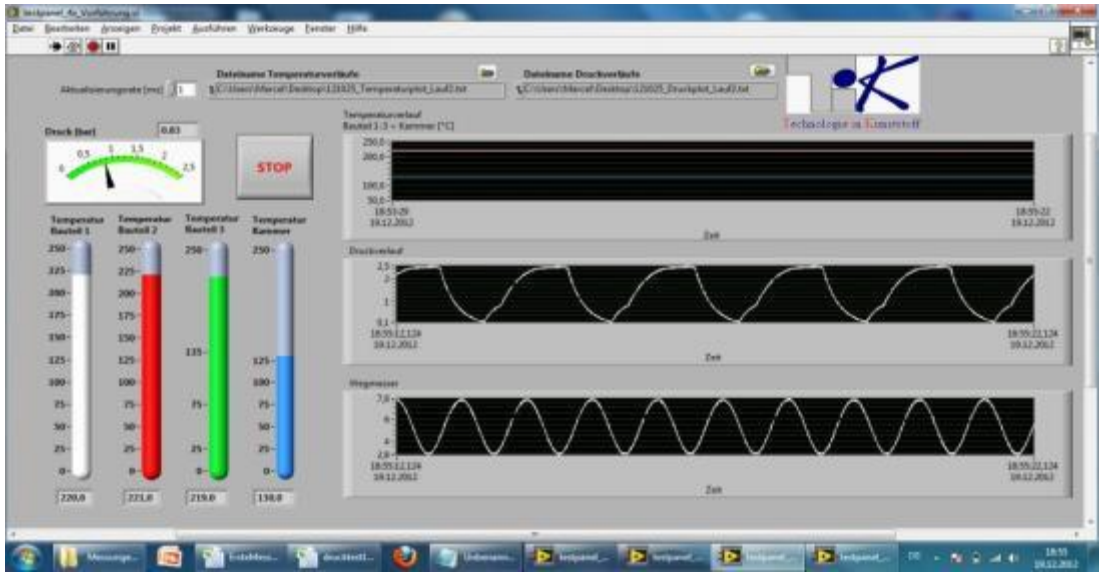
- Air temperatures up to 350 °C
- Pulsating pressure from 0 to 4 bar (relative)
- Integrated movement of parts

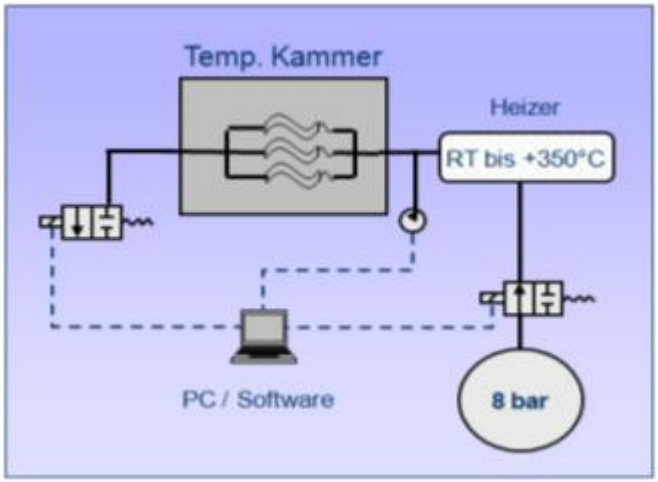
Testing of charged air duct parts

Technologie in Kunststoff

Hot air pressure pulsation

- Air temperatures up to 350 °C
- Pulsating pressure from 0 to 4 bar (relative)
- Integrated movement of parts





Hot Air Pulsation Pressure Vibration

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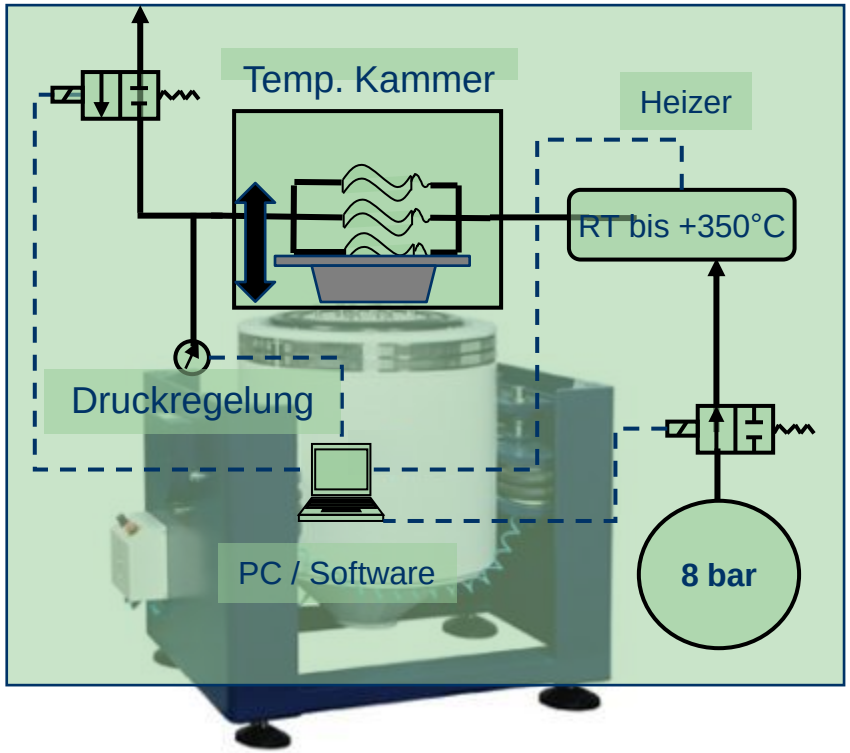

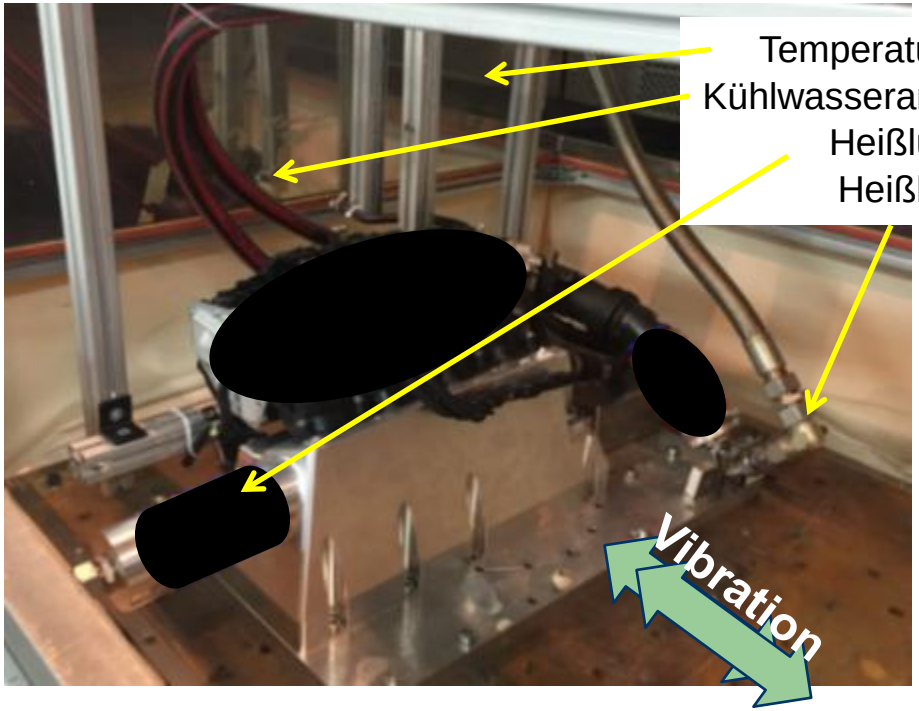

Pulsation with hot air on a shaker system

- Max. over pressure: 8 bar
- Temperature of the air: RT to 350 °C
- Temperature of the chamber: RT to +300°C
- Medium: air

Vibration test bench (Shaker) ETS

- With temperature chamber (-40°C bis 180°C)
- Sine force vector: 70 KN
- Frequency: 5 Hz – 2,5 KHz

Hot Air Pulsation Pressure (HAPP)
Air Intake Manifold with integrated air cooler

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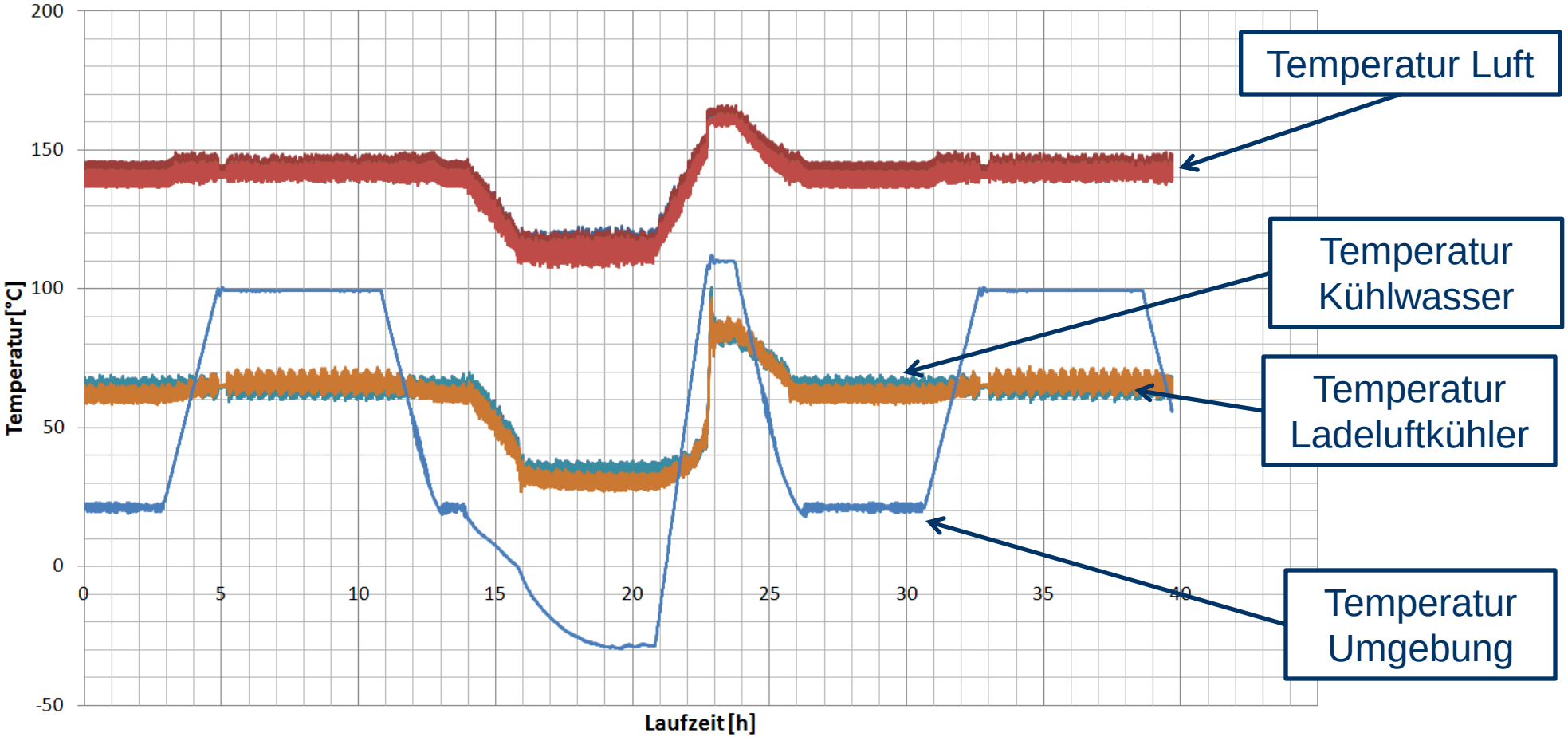
Heißluftpulsationsprüfung mit wechselnden Temperaturen

- Regelung von Umgebungs-, Luft- und Wassertemperatur (Ladeluftkühler)



Oil-Spray Test including Temperature Cycle
e.g. rocker covers, oil pan

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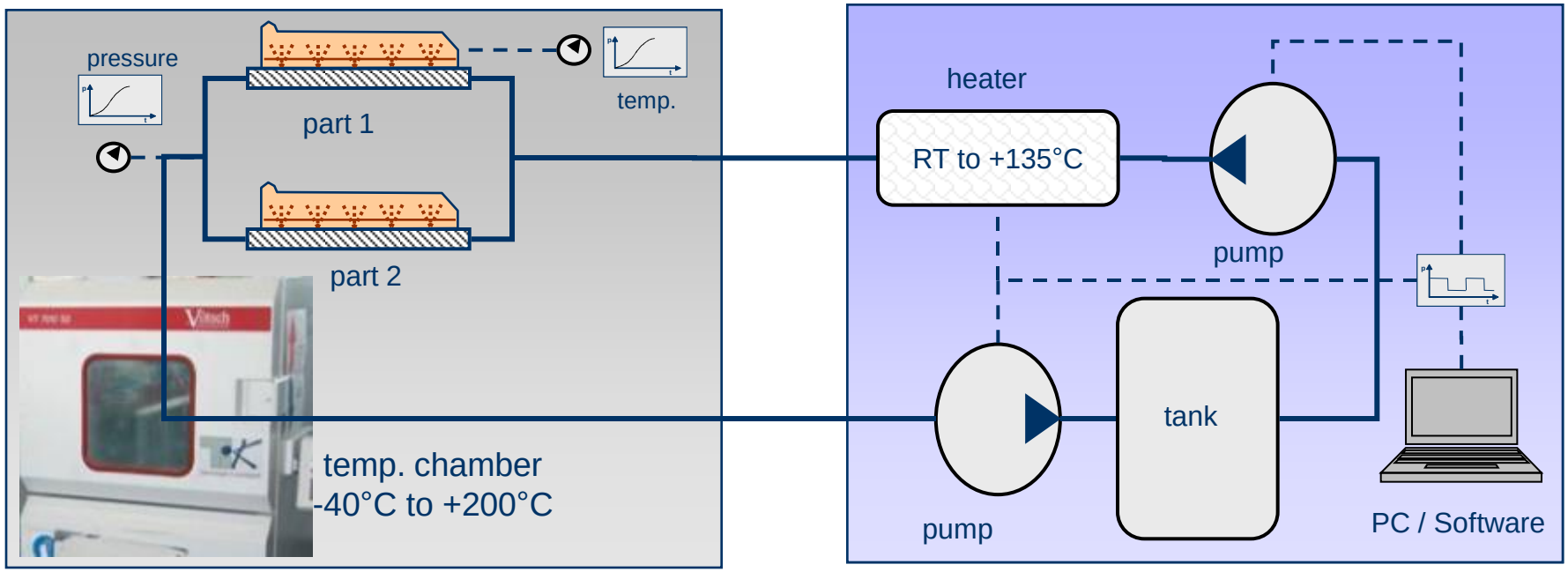

Device for Oil-Spray-Test (GMW 3155 certified!)

- oil flow and spraying of oil onto inner surface of **rocker cover**
- ambient temperature: -40 to 200 °C
- oil temperature: RT to 150 °C
- according to all OEM specifications

Static Pressure Tests

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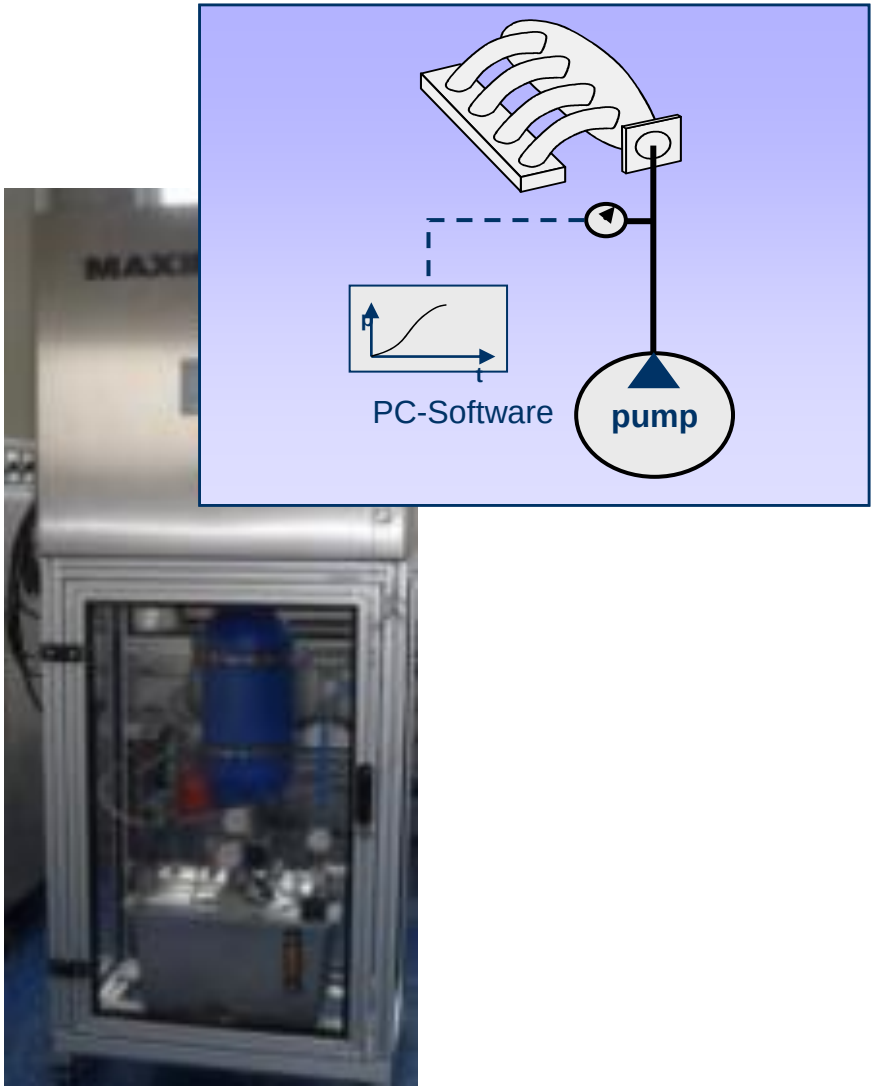
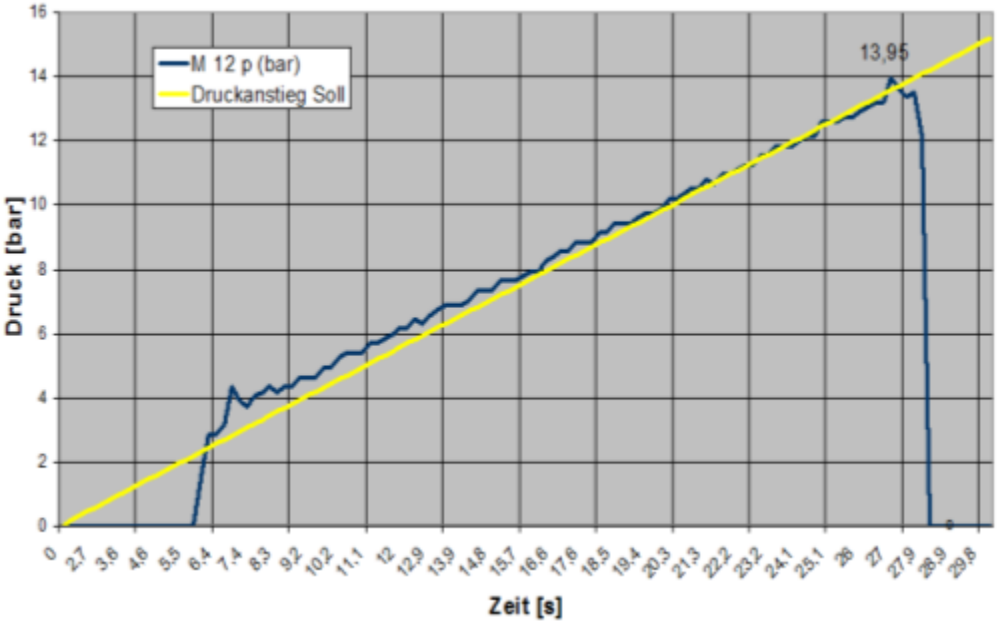


Static Burst Pressure

- Maximum pressure: 200 bar
- Medium temperature: 23 to 150°C
- Pressure increase variable
- Medium: water, glycol, oil



Back-Fire-testing bench (dynamic burst pressure) e.g. Air Intake Manifolds

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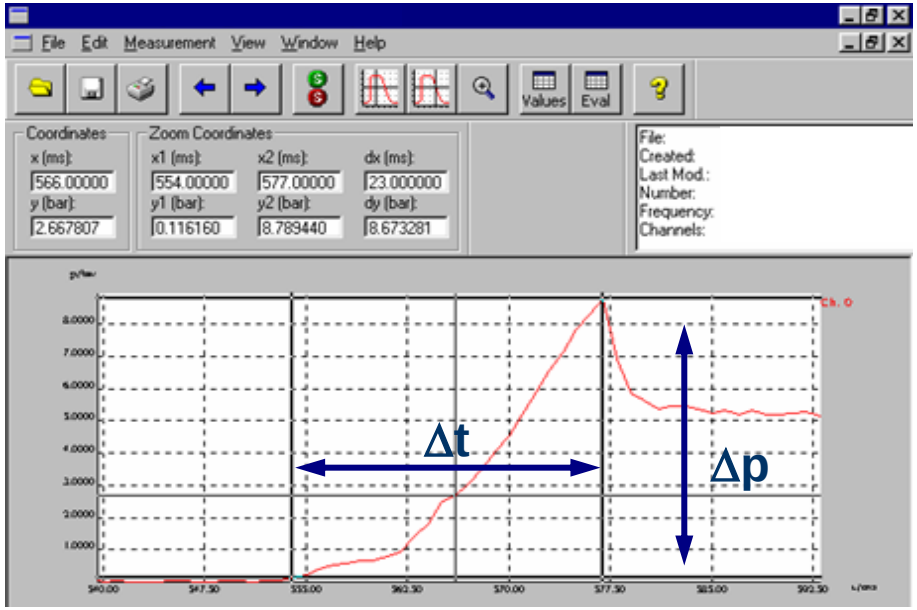

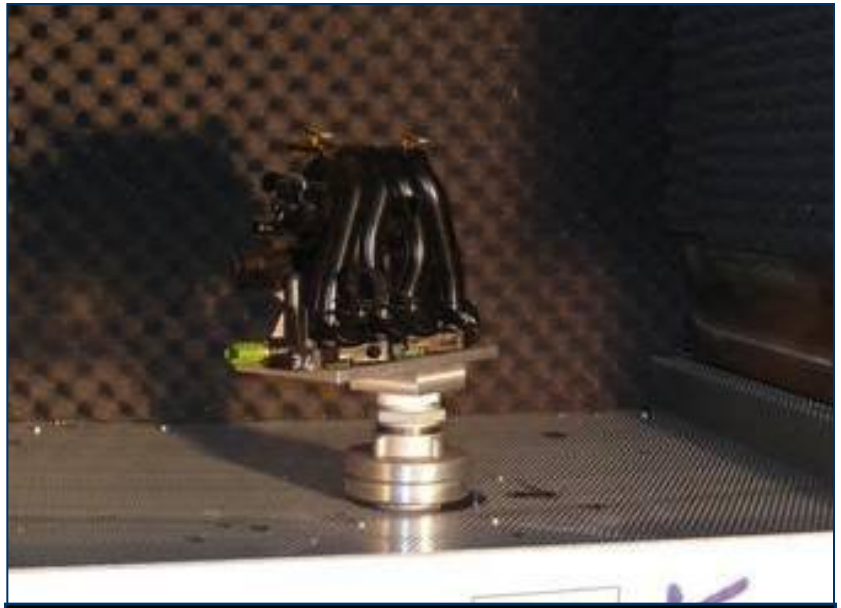

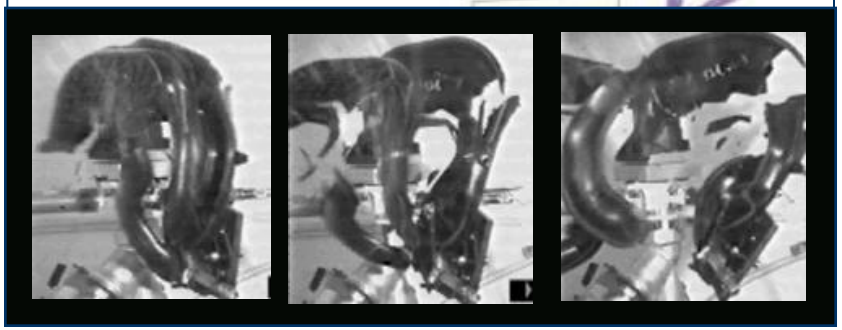

- Back- Fire- testing bench
  - Max. pressure ramp: 1 bar/ms
  - Max. pressure: 20 bar
  - Ambient temperature: -40 °C to 200 °C
  - Medium: air

Back Fire Device, multi cycle
e.g. Air intake manifolds

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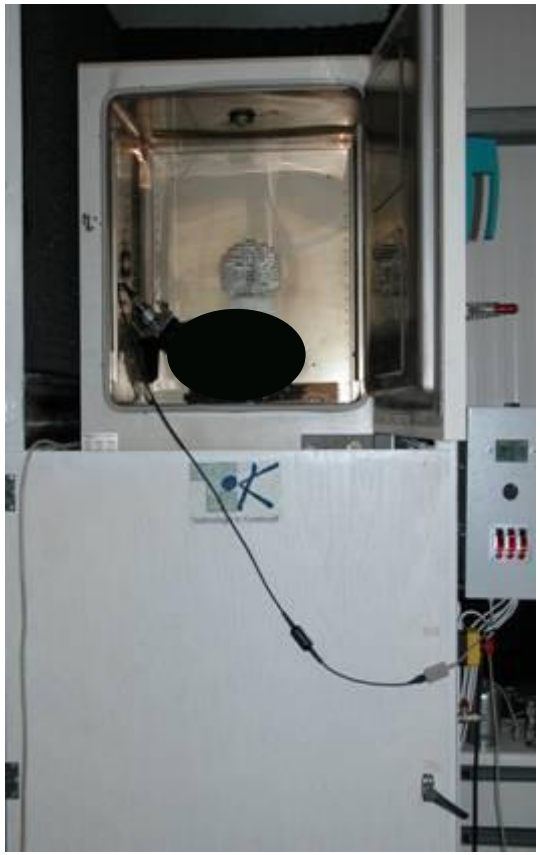

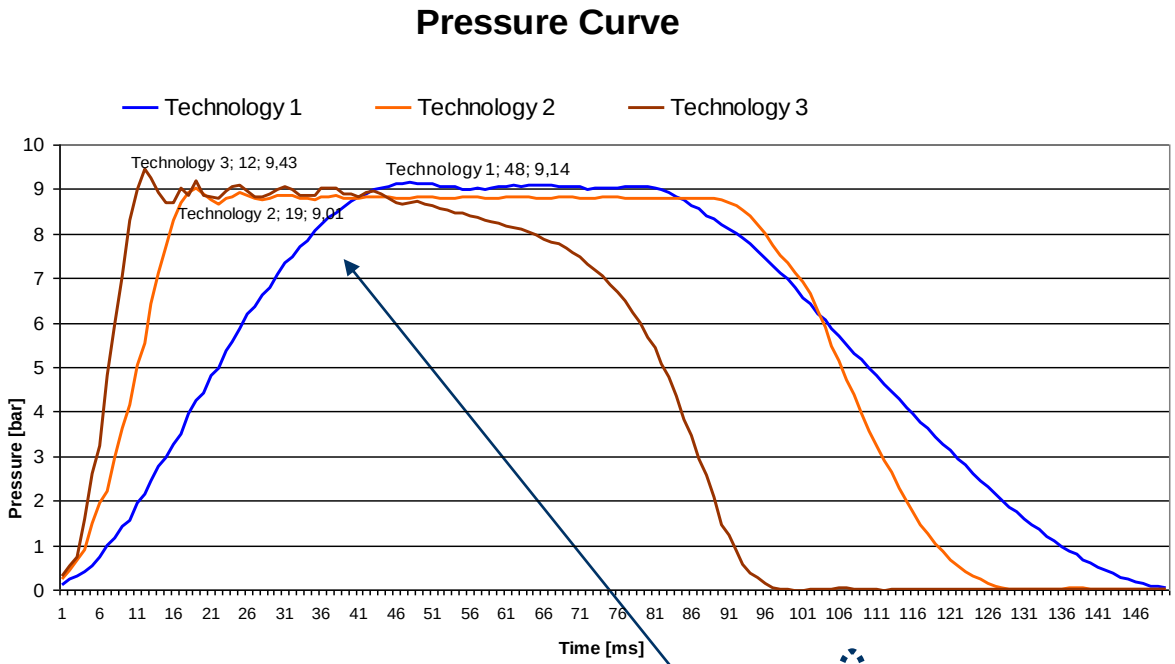

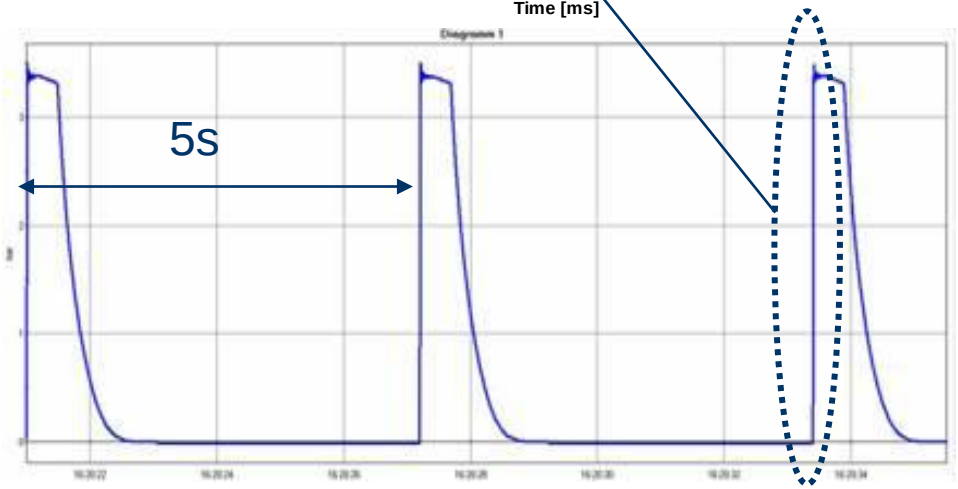

Acoustic Measurements

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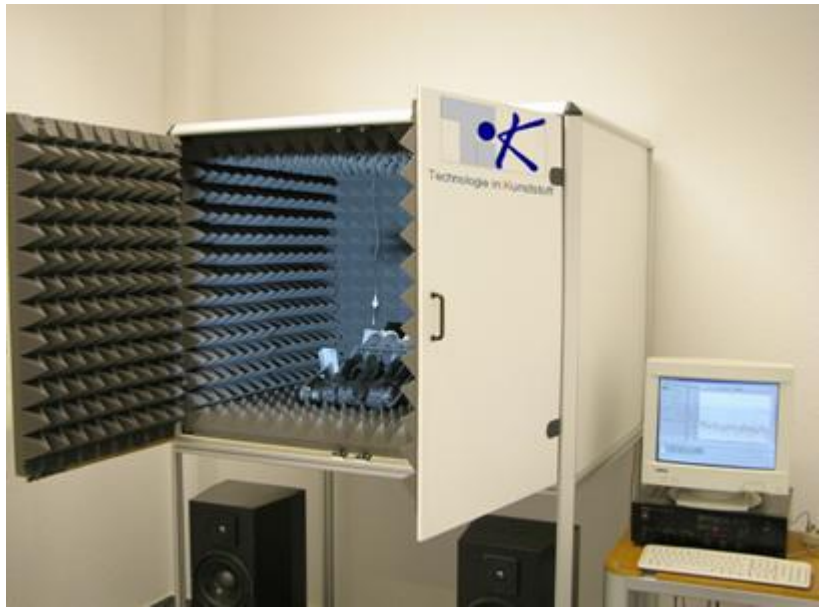
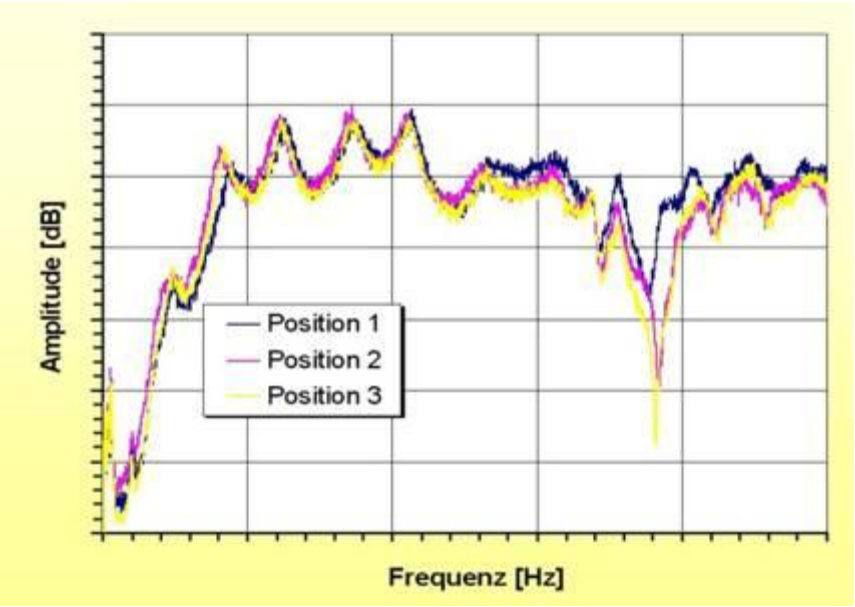




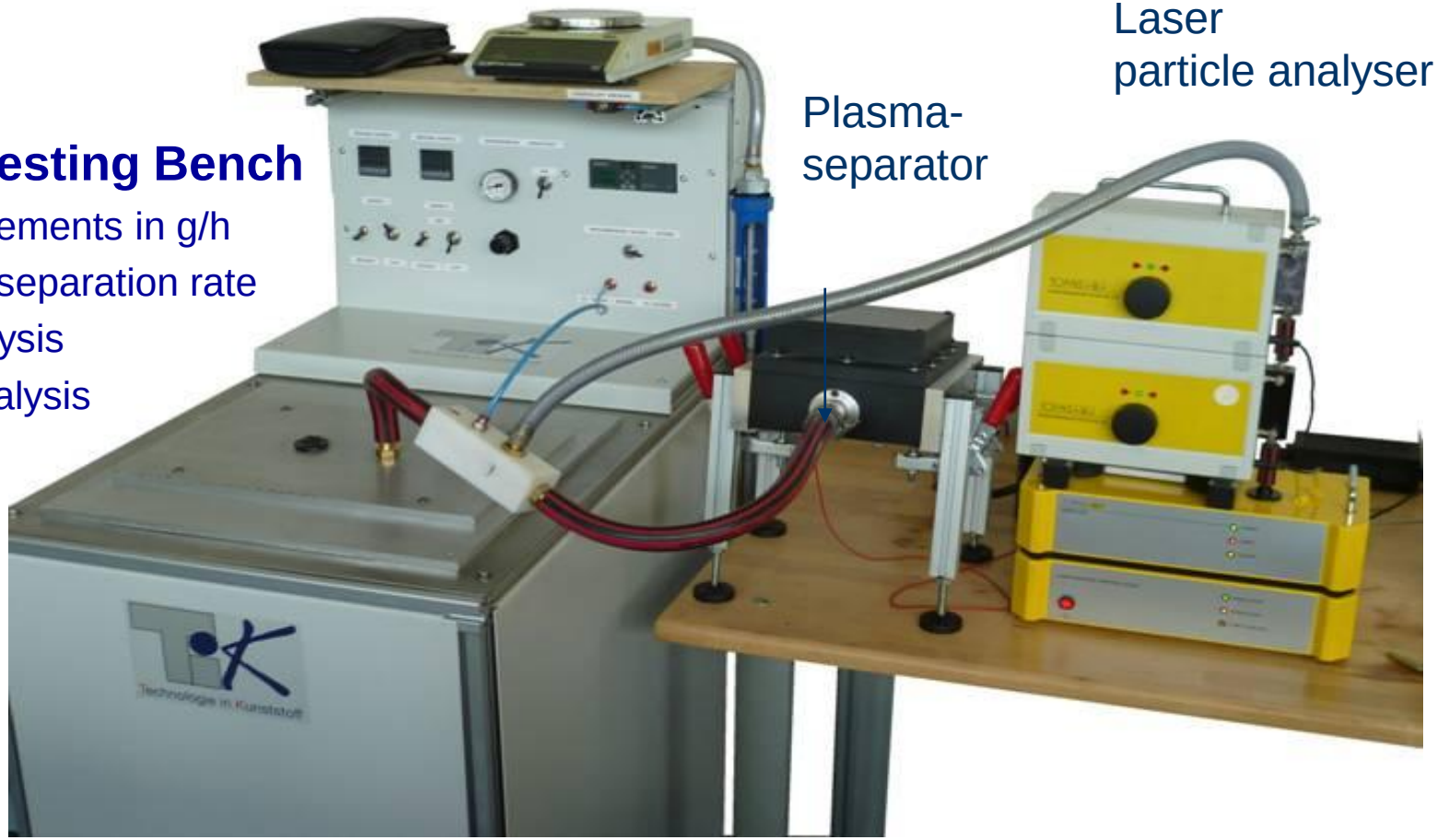
Acoustic Measurement Device

- Measurment of Acoustic Behavior
  - Structure Borne Noise
  - Air noise
- FFT Analyze
- 1/3- und 1/10-Oktavanalysen
- Comparison of different geometries / materials

Oil Separation Measurement
(Blow by Gas Analysis)

Technologie in Kunststoff

- **Oil Separation Testing Bench**
  - Absolute measurements in g/h
  - Measurement of separation rate
  - Particle size analysis
  - Pressure loss analysis



Oil Separation Testing Bench

2 Vibration test benches (Shaker)

Technologie in Kunststoff

Vibration Testing Bench (Shaker) 26KN

- Vibration Tests
  - Resonance search
  - Resonance dwell
  - Sinus sweep
- Temperature chamber (-40°C to 180°C)

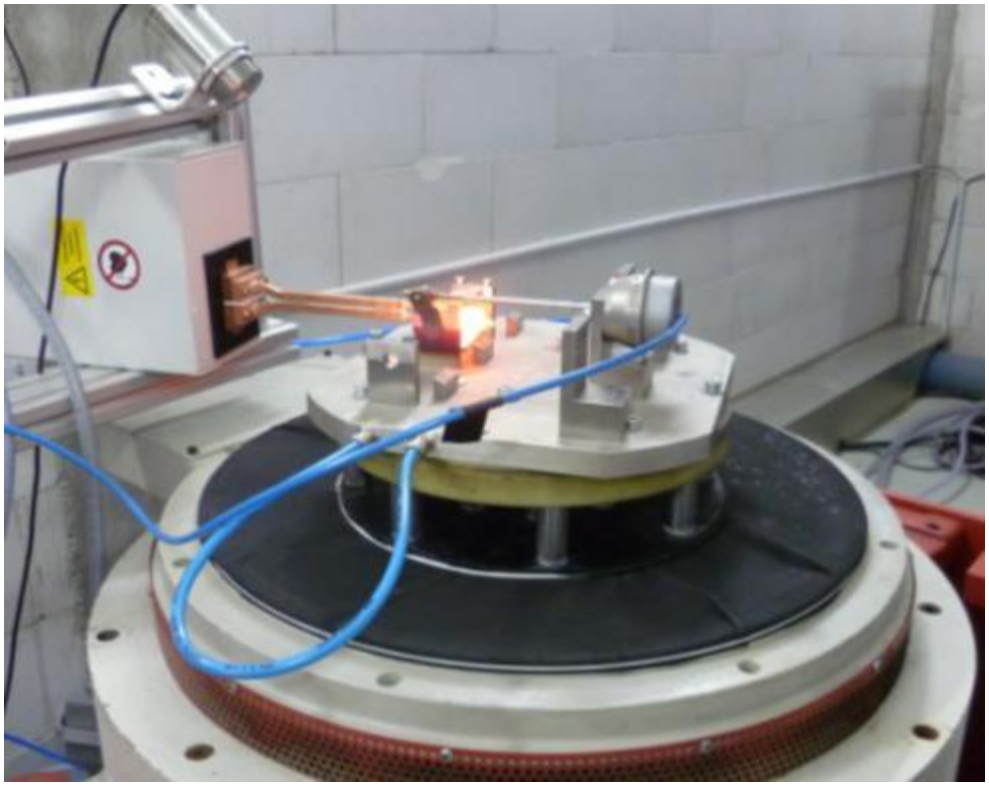
2 Vibration test benches (Shaker)

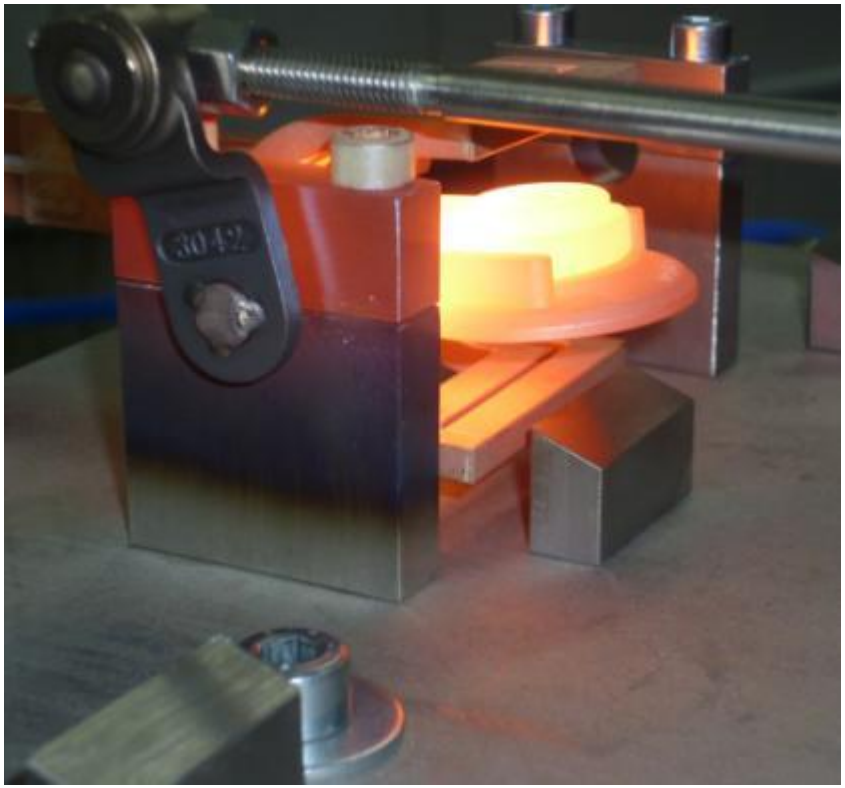
Technologie in Kunststoff

- Vibration test bench (Shaker) ETS
  - With temperature chamber (-40°C bis 180°C)
  - Sine force vector: 70 KN Frequency: 5 Hz – 2,5 KHz

Inductive heating
up to 1000 °C (on Shaker)

Technologie in Kunststoff





Test bench for ater pumps (built on demand for an OEM)

Technologie in Kunststoff

• No. of tested parts:	2 parallel
• Temperature in chamber:	120 °C
• Temperature of media:	120 °C
• Rotational speed:	3700 rpm
• Pressure at inlet:	0,9 bar rel.
• Resulting pressure at outlet:	1,6 bar rel.
• Media:	G48 / Water (50/50)
• PulleyForce:	281 N
• Test duration:	496 h

Ti*K* - Accreditation

Technologie in Kunststoff

- Accreditation No.PL-18828-01.

  Dipl.-Ing. Nico Tiersch

  Deutsche Akkreditierungsstelle GmbH (DAkkS)

ilac-MRA

DAkkS Deutsche Akkreditierungsstelle D-PL-18828-01-00

flexible accreditation according to Cat I.