

Powertrain

2. Measurement Systems



Measurement and Analysis Systems

Stationary Exhaust Measurement Device (AVL) SESAM i60 FT

Multi component exhaust gas measurement system for detailed determination of every single exhaust gas component.

Specification:

- Principle: Infrared spectroscopy
After treatment over Fourier Analysis
- Sampling rate: 1Hz
- Reactional speed: 1Sek (t_{10} to t_{90})
- Measurable gases:
nitric oxide, alcohols, aldehyde,
ammoniac, CO, CO₂, CH₄, SO₂,
formaldehyde, aromatic hydrocarbon,
pentane, octane



High-dynamic DC-Voltage source VES2 (Vehicle Energy System, Kratzer Automation)

DC Source for static and dynamic loading of electric engines and DC Drain for investigating battery like component behaving.

Specification:

- Power: $P = 250 \text{ kW (340PS)}$
- Voltage Output: $U = 40 - 800 \text{ V}$
- Current Output: $I = +/- 0 - 700 \text{ A}$
- Voltage reactional speed: $< 400\mu\text{s}$
- Current reaction speed: $< 400\mu\text{s}$



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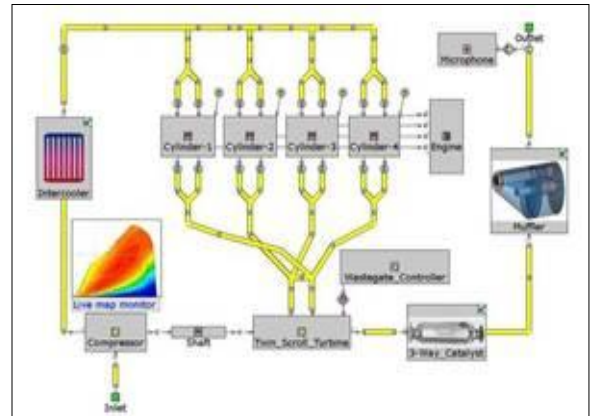
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Numerical Simulation

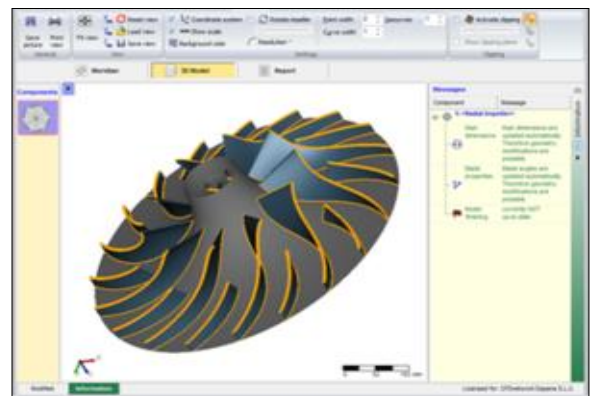
Engine Simulation

Over an 1-D engine simulation tool (GT Power) for science and teaching.



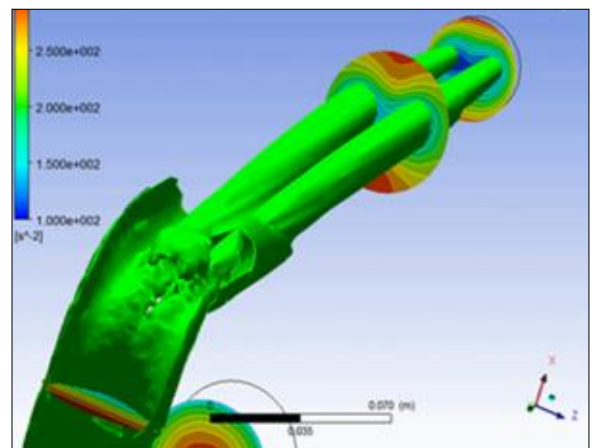
Turbocharger Dimensioning

CFTurbo is used to construct and shape turbochargers as needed for scientific investigations and also for teaching students.



Computational Fluid Dynamics

With ANSYS CFX and FLUENT, our staff has the possibilities to investigate fluid streams in three dimensions.



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Variable gas composition unit

- engine test bench supply with gaseous fuels
- gas mixtures generation with any composition

Specifications:

- gas components & maximum mass flow rate
 - methane (60 kg/h)
 - carbon dioxide (15 kg/h)
 - nitrogen (11 kg/h)
 - hydrogen (7 kg/h)
 - compressed natural gas (80 kg/h)
- gas pressure variable up to 16 bar
- 500 litres buffer tank for dynamic engine operation

