

## Test Rigs for Exhaust Gas Catalysts

PROREC engineers possess extensive experience in the design of customised test units for exhaust gas aftertreatment catalysts. Together with our partner JA-Gastechnology GmbH (JAG) our highly integrated test units offer complete solutions for our customers' requirements:

- generation and dosing of synthetic exhaust gas streams for evaluation of catalyst performance and ageing behaviour
- investigation of steady state and transient behaviour with dynamic flow, temperature and composition gradients for diverse exhaust gas applications, including selective catalytic reduction (SCR/deNO<sub>x</sub>), NO<sub>x</sub> storage catalysts (LNT), ammonia slip catalysts (ASC), diesel oxidation catalysts (DOC), 3-way catalysts (TWC), diesel and gasoline particle filters (cDPF, cGPF)
- generation of high quality reaction kinetics data for the development of advanced mathematical models
- realization of standard test procedures like static and dynamic catalyst light-off, lambda scan, oxygen storage capacity (OSC) test, etc.
- use of monolith core samples with diameters up to 1" and lengths up to 12"
- sample temperature range up to 900 °C
- volumetric flow rate 15-200 nl/min

Together with our partner JA-Gastechnology we have combined our expertise in process engineering, gas supply systems and test unit manufacturing to deliver solutions to meet challenging applications in exhaust gas aftertreatment. Our innovative test unit concept is a flexible approach which is specified to fully meet customer requirements:

- custom designed and developed furnace and reactor module for extremely rapid heating and cooling rates simulating dynamics close to actual engine conditions
- inert quartz reactor avoids blank conversion of the process stream at high temperatures
- innovative modular container system for installation of equipment, control room and gas supplies outside existing buildings (where no existing lab space is available)
- integration of the complete gas supply system and storage, gas management also if requested
- seamless integration of online analytical equipment & software with the test unit and process control system
- optimised process control system for high speed data acquisition up to 10 Hz
- powerful recipe control software for achieving complex, extensive and reproducible automated sequences

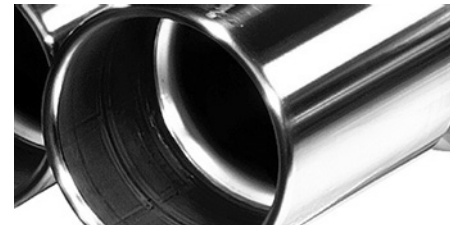
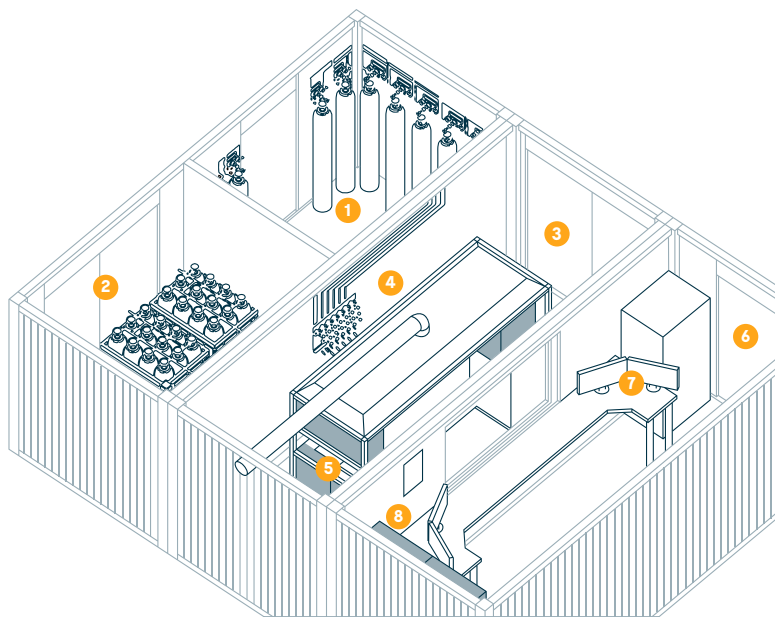
Our combined approach offers our customers a wide range of benefits when comparing to suppliers of standalone test units:

— all components (gas supply system, test unit, analytical equipment) supplied from a single contractor (JAG GmbH), reducing complexity in purchasing and project management thus freeing internal resources

— laboratory space saving & improved ergonomics with installation in modular external containers – no other laboratory space may be required

— inherently safer approach by installing system in external, unoccupied modular containers with separate control rooms

— minimal interfaces to existing infrastructure, reducing time required for installation and commissioning



Additional customer requirements can be implemented with the following options:

— nitrogen and compressed air generation

— laboratory module for sample preparation

— aftertreatment system for process exhaust gas

— closed circuit cooling water system

#### Example of an Integrated Exhaust Gas Aftertreatment Test Unit

- ① Gas Supply Module
- ② Gas Storage Module
- ③ Test Unit Module
- ④ Synthetic Gas Test Unit (incl. enclosure and ventilation)
- ⑤ Online Analytical Devices (e.g. FTIR, MS)
- ⑥ Control Room Module
- ⑦ Control System Interface
- ⑧ Control Cabinets (Process Control System)

Contact us  
for additional  
information

**PROREC**

**JAG**  
competence in  
gastechnology

PROREC GmbH  
Rungestr. 9 10179 Berlin  
www.prorec-berlin.com info@prorec-berlin.com  
Tel.: +49 (0) 30 220549782

JA-Gastechnology GmbH  
Albrecht-Thaer-Ring 9 30938 Burgwedel  
www.jag.de info@jag.de  
Tel.: +49 (0) 5139 98550