SIEMENS
Ingenuity for life

Safe chemical Processes...

... by experimental data

The safe operation of a chemical reactor requires knowledge of temperature and pressure development. This applies to both the target conditions as well as possible operational malfunctions. In many cases, the experimental determination of critical characteristic data is safer, faster, and more economical than theoretical considerations and unnecessary conservative operating parameters. By using different reactor systems, we are able to determine the safety-relevant characteristic data for your processes and operating scenarios:

Reactor system / Test principle	Key-performance indicators / Result
RC1™ / Isothermal tests under ideal conditions	• ΔH_R • $\Delta T_{adiabatic}$ • MTSR • Heat flow • Accumulation of substances and thermal potential • Gas release rate and amount
RC1™ / Process typical testing, for example, • according to operating specification • to measure effects of reduced dosing times • to measure effects of varying reaction temperatures	
Adapted VSP2™ / Adiabatic testing to clarify worst-case scenarios, e.g. • Dosage errors, • Cooling failures	• $\Delta T_{adiabatic}$ • Rate of pressure increase and p_{max} • Thermal output and maximum heat production rate
Micro-reactor system / continuous testing using modular micro-reaction technology	Continuous reactions can be studied safely in the micro-reactor system

We provide advise ranging from the identification of the necessary characteristic data to assistance in the operational implementation of our recommendations. Upon request, we offer process-typical experiments with sampling and analysis in the same laboratory (HPLC, GC) and in presence of your experts.

Interested? Contact us!
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Your benefit

- Specific recommendations for safe operation
- Experimental testing clarifies uncertainties quickly and inexpensively
- Robust characteristic data for design and operation
- Worst-case scenarios are experimentally investigated

Our service offer

- Comprehensive safety concepts and testing of individual process steps
- Standardized reactor systems for batch, semi-batch and continuous operation (RC1™, adapted VSP2™ and micro-reaction technology)
- Process safety evaluation of operating parameters and characteristic data