University of Applied Sciences and Arts Northwestern Switzerland
School of Life Sciences

# Process Technology Center (PTC)

Chemical process development
and process reliability

www.fhnw.ch/lifesciences

# Chemical process development and process reliability

Over three floors in the PTC, the chemical pilot plant offers firms a test environment for everything from metering to state-of-the-art separation processes.

Depending on the issue, dedicated reactors are available: a scale-down reactor is used for precise reaction modelling in the stirred tank; the thermal process safety of explosive reactions can be tested in the explosion reactor; and heterogeneous catalysis takes place on 3D-printed supports in the loop reactor.

Commonly used industrial filtration, drying and distillation processes can be integrated into the pilot plant. These separation processes can be run continuously and are equipped with their own solvent regeneration and wastewater treatment. The most important modern thermal separation simulation techniques are available.

In each area, an inline analytics system monitors process parameters and enables energy balancing, environmental impact studies and optimization simulations.

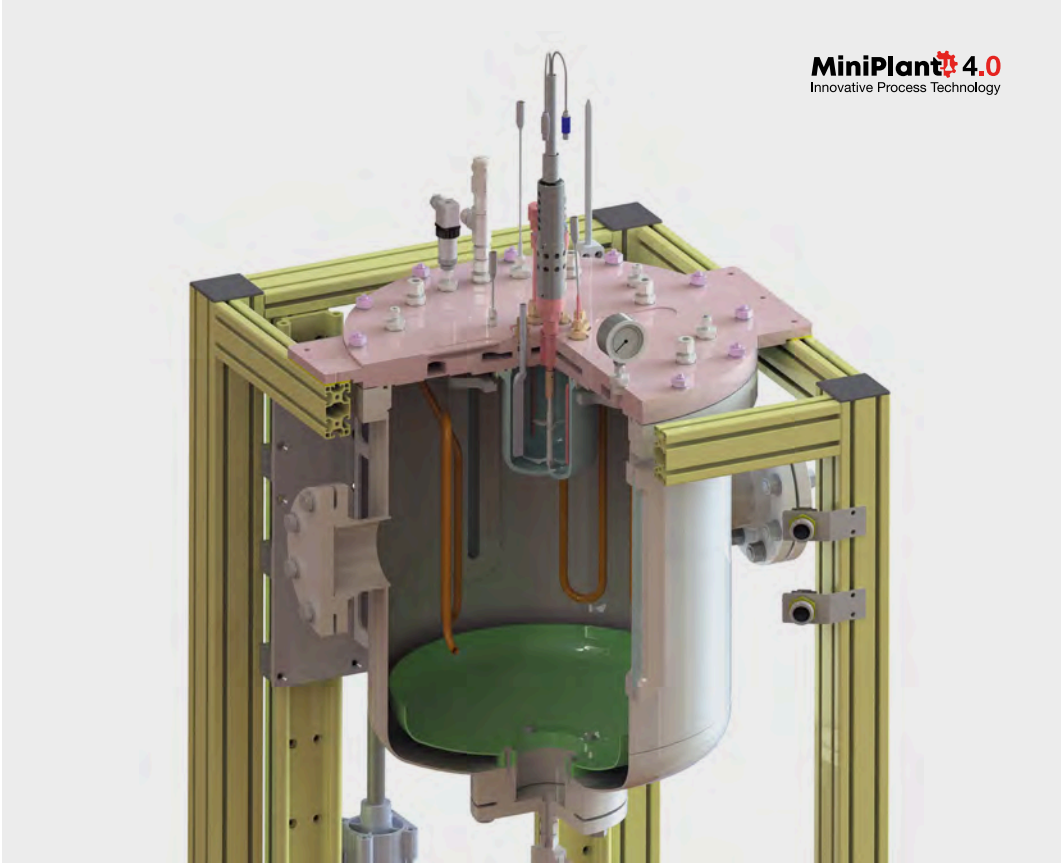
FHNW students are trained for Industry 4.0 with the latest process technologies. They are shown critical elements of process safety as part of process development: reaction calorimetry, thermal decomposition, explosion pressure measurement, pressure relief and the associated process modelling.

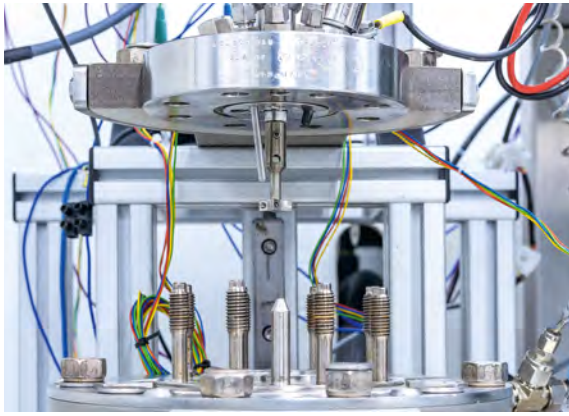
The Miniplant 4.0 association transfers novel reactors or processes developed at the HLS into practice in collaboration with local companies, thus strengthening the role of the FHNW in the field of translational research.

**Infrastructure:**

- Scale-down Reactor (reaction calorimeter) 1 ... 5 l, -1 ... 10 bar, 0 ... 150 °C (Glass / Hastelloy C22)
- Loop Reactor 1 l, 20 ... 120 °C (316 l)
- Explosion Reactor 10 ... 150 ml, -1 ... 300 bar, -20 ... 200 °C (Hastelloy C22)
- Differential Scanning Calorimeter (DSC) - 80 ... 600 °C
- Hydro Autoclave 2 l, -1 ... 40 bar, -20 ... 200 °C (Hastelloy C22)
- Glove box (can be made inert with nitrogen, integrated safety scrubber, oxygen and LEL measurement) e.g. for testing continuous reactor systems.
- Glass reaction calorimeter 250 ml, 20-150°C

MiniPlant 4.0
Innovative Process Technology





Prof. Dr. Andreas Zogg
FHNW School of Life Sciences
Institute for Chemistry and Bioanalytics
Hofackerstrasse 30, 4132 Muttenz
T +41 61 228 58 25 (Direct)
andreas.zogg@fhnw.ch

The FHNW incorporates nine faculties:

- FHNW School of Applied Psychology
- FHNW School of Architecture, Civil Engineering and Geomatics
- FHNW Academy of Art and Design
- **FHNW School of Life Sciences**
- FHNW Academy of Music
- FHNW School of Education
- FHNW School of Social Work
- FHNW School of Engineering
- FHNW School of Business

FHNW Northwestern Switzerland
School of Life Sciences
Hofackerstrasse 30
CH - 4132 Muttenz

T +41 61 228 55 77
info.lifesciences@fhnw.ch
www.fhnw.ch/lifesciences

**www.fhnw.ch/lifesciences**

Rendering: Thierry Furrer
Photography: Sabine Goldhahn