

Principles of Refrigeration (bilingual:
English/German)

Refrigeration for Industrial, Food,
and Bioprocess Engineers

Refrigeration Plants

Cryogenic Engineering

European Course of Cryogenics (TU Dresden,
Wrocław UT, NTNU Trondheim)

Principles of Piston Machines

Volumetric Pumps and Expanders

Hydrogen Low Temperature
and Storage Technologies

Refrigeration for Regenerative Energy
Systems

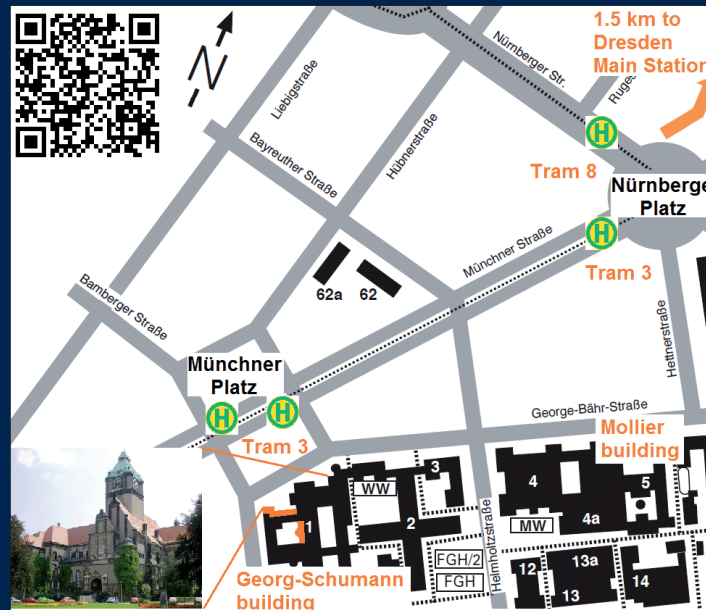
Mobile Refrigeration and Air Conditioning

Georg-Schumann building

Offices
student workplaces
seminar room

Mollier building

Central helium liquefier
Hydrogen lab
Refrigeration system performance test rigs
Compressor and expander lab
Temperature chambers
Acoustic test site
Household refrigerators test field
Lubricant-refrigerant fluid property lab



Visitor address:

Münchner Platz 3, Dresden
Georg-Schumann-Bau, Wing A, room A 204

Bitzer Chair of Refrigeration, Cryogenics and Compressor Technology

HOLDER OF THE
PROFESSIONAL CHAIR
Prof. Dr.-Ing. Ullrich Hesse

Contact

Tel.: +49 351 463 32548
Fax: +49 351 463 37247
sekretariat.kkt@mailbox.tu-dresden.de

Mail

TU Dresden
Bitzer-Stiftungsprofessur für
Kälte-, Kryo- und Kompressorentchnik
01062 Dresden, Germany



www.tu-dresden.de/mw/iet/kkt

REFRIGERATION

Natural refrigerants

- CO₂ as refrigerant with expander-compressor-unit
- CO₂ as evaporating secondary refrigerant
- NH₃ small scale hermetic compressor
- Air cycle cooling

Waste heat recovery

- Resorption refrigeration machines
- Cogeneration of cold, heat, and power
- Expansion machine cycles

Mixed refrigerants

- Characterization of fluid properties and interactions with lubricants
- Design of mixed refrigerant plants

Mobile refrigeration

- Automotive A/C incl. e-mobility
- Transport and container cooling
- Aircraft applications
- Solar-driven vaccine chillers

NVH / Acoustics

- Optimization of refrigerators
- Vibration of components

Specific test equipment

- Performance test benches, acoustic test site, NVH, temperature chambers
- Laser Doppler anemometer for flow characterization



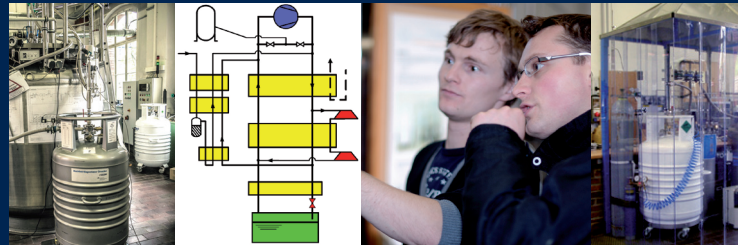
CRYOGENICS

Helium

- TU Dresden's central helium liquefier
- Design and optimization of large helium plants

Liquid hydrogen (LH₂)

- Test rig for LH₂
- Operation of a small scale H₂ liquefier
- LH₂ level probe
- Ortho-para-H₂ conversion
- Test bench for ortho-para-H₂ catalysts



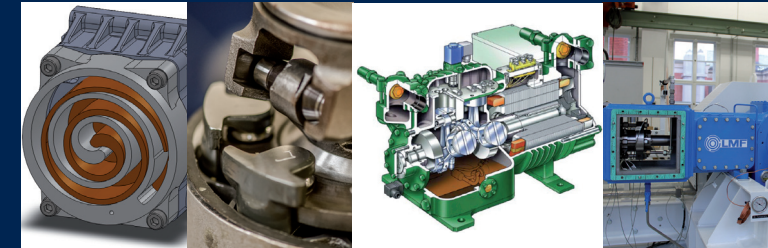
Special applications

- LNG systems and components
- Neon liquefier
- Taconis oscillation in LH₂ und LHe systems
- Optimization of LH₂ and LHe storage tanks
- Calorimeter cryostat for MLI characterization

Simulation

- Fluid dynamics and thermal analysis in ANSYS
- Transient and static loop simulations in Modelica besides others

COMPRESSORS AND EXPANDERS



New and advanced developments

- Compressors and expanders for natural refrigerants
- Efficient multistage compressors for compressed air systems in commercial vehicles
- Enhanced process gas compressors
- Scroll compressors and expanders

Fundamental research

- Valve dynamics
- Thermal management (piston rods, intercoolers, valve plates)
- Oil management

Performance test rigs

- Hermetic and semihermetic refrigerant compressors
- Automotive A/C
- Secondary refrigerant pumps
- Novel CO₂ compression strategies

Expander

- CO₂-expander-compressor-unit
- Expanders for waste heat recovery