



SAVONIA



ENERGY TECHNOLOGY

RESEARCH, DEVELOPMENT AND
INNOVATION ENVIRONMENT
AND SERVICES OF ENERGY
TECHNOLOGY



We prepare the research plan in close cooperation with the customer and if needed we can carry out measurements and tests in the company's facilities.

The energy technology laboratory is a research, development and innovation environment serving both education and companies. The laboratory offers expertise in measurement and testing services for corporate use. The strengths of the unit serving the research, development and innovation activities of technology companies lie especially in energy, manufacturing and material technology sectors.

The goal of education at Varkaus campus is to produce innovative employees with basic engineering skills for companies, with knowledge of how to plan metal structures, a strong technical knowledge of energy technology and material and manufacturing technology.

The professional and skillful staff in the energy laboratory offers measurement and consulting services to technology companies in the areas of product operation, manufacturing and energy efficiency. The laboratory uses comprehensive measurement and analysis devices for laboratory and field testing defining activity and energy efficiency of devices or processes. In addition the laboratory uses testing environments enabling the testing, measurements and simulations of energy production, energy transfer, energy storage and energy consumption under controlled conditions.

To support the measuring, testing or RDI-projects a computational fluid dynamics –software (CFD) is utilized when heat transfer and fluid flow phenomenon are needed for modelling or simulating. In addition, especially for educational purposes a power plant simulator and process simulator software are in use to improve knowledge about process automation and process behavior in different operating situations.

Services also include project management and training. Implementation of research projects in collaboration with universities further diversifies the range of services available for companies.



Savonia University of Applied Sciences has strongly invested in the laboratory and testing environments at Varkaus Campus.

Measurement and analysis services

Fuel analysis

The analysis includes the following quantitative determinations

- Lower calorific value, gross calorific value
- Ash content / ash percentage
- Moisture ratio / percentage of moisture
- Particle size analysis

Flue gas analysis

The analysis includes the following quantitative determinations:

- Percentages of flue gas components
- Flue gas temperature
- Flue gas volume flow rate

Testing of heat exchanger and heat accumulator

The experimental testing environment contains a heat supply system (an electric boiler at this moment), a heat accumulator, and heat sink units with which the uses of the hot-water supply and heating system can be modeled. The test environment can be used when product development projects of a new liquid heat exchanger or heat accumulator are under consideration. Among other things, the testing environment is suitable for testing and measuring different kind of hybrid heating systems.

Testing of Li-Ion batteries

Basic preconditions to test batteries and product development.

Distributed temperature measurement (DTS)

Based on fiber optics, it is possible to measure distributed temperature. The device measures the temperature from 1 meter up to 3 km per one cable. The optical cable works as measurement sensor.

High temperature corrosion testing

Corrosion test environment consists of a horizontal tube furnace (up to 1200 °C) and a corrosion sonde for field tests. The test environment is especially suitable for researching different materials which are used when manufacturing super heaters of a power plant or other products for challenging applications. The corrosion sonde is made especially for the corrosion testing between different materials, temperatures and ashes of super heaters at power plants.

Modeling and simulation services

Computational fluid dynamics software

By using the computational fluid dynamics software (CFD) it is possible to model and simulate the interactions of different constructions, and operating conditions on heat transfer and fluid flow. The goal of CFD-modeling is to improve the functionality and energy efficiency of the product without numerous and costly pilot projects.

Power plant simulator

With this software it is possible to study the different processes of power plant boilers utilizing CFB-technology and simulate the functionality of the power plants. It is also possible to analyze the effects of fuel properties, change of load or change of control on the power plant's function. Simulation environment is for educational and research purposes.

Project management services

Project control tools

Process development and modeling

Training services

Training for companies

Specialization studies

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