

*bayerl-consult*

**Your Partner for Physical  
Simulation**

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# Physical Simulation and Modelling

- Physical simulation and modelling are effective instruments for all questions of technical physics.
- Physical simulation is used for design and proof, prognoses, worst cases and research work.
- Physical simulation with *bayerl-consult* is always based upon real and not idealized data in order to gain results close to reality. Thus, starting and marginal conditions have to be carefully chosen and defined for each singular question.

# Physical Simulation

Effective instrument for

- Prognoses for conception and design
- Dimensioning of plants
- Optimisation of processes
- Proof of worst cases
- Risk analysis
- Investigation after incidents and catastrophes

# Conception and Design

- Physical simulation offers a wide range of varieties for design work.
- Changes in the simulation runs bring optimisation to processes.
- Input parameters for prognoses are based on design data and assumptions, also on micrometeorological data.

# Forecast Simulations

Forecast simulations for

- Ventilation and emergency ventilation systems → prediction of air flow at normal and higher thermodynamic conditions in complex systems
- Automated safety systems → definition and optimisation of criteria for control and automisation

# Prognoses

Prognoses based upon simulation are used for

- Noise abatement measures → prognoses of efficiency of measures for certain immission points
- Measures against air pollution → dimensioning of plants and processes, prognoses of direction and dimension of propagation
- And many other questions of technical physics.

# Worst Cases

Any plant, safety system or ventilation system must be tested before operation.

- This could either be achieved by large scale experiments – in case of fire protection systems this might be the burning of a truck in a tunnel or garage → nobody will be happy about such a large scale experiment.

# Worst Cases

- The other possibility – to investigate the system at normal temperatures and to forecast conditions at higher temperature by using thermodynamic simulation → thus the proof of the efficiency of the system can be given without large scale experiments



# Risk Analysis

Risk analysis is a typical topic for physical simulation.

- Simulation can offer a variety of different starting and marginal conditions in order to optimise any process.
- Risk analyses on basis of physical simulation leads to definition of worst cases and requirements for safety systems.

# Investigation after Incidents and Catastrophes

- The knowledge of the causes that lead to a catastrophe is always necessary to prevent such a catastrophe to happen again or to be able to better fight such an event in the future.
- Physical simulation from the end to the beginning of a process is based upon the situation that is at the end of a dynamic process, f.i. a flood or an avalanche.
- Preventive measures can be dimensioned with the knowledge of the forces that were in action at the previous event.

# Many Possibilities – One Instrument

Difficult topics are a challenge for *bayerl-consult*.

Our projects are special designs harmonized with the requirements of the client, the topic and the situation.

*bayerl-consult* uses the unlimited possibilities of theoretical physics to solve practical problems with adequate measures – no problem, no situation is ever the same as another – thus the same measures will never lead to the same results.

