# FLOW OPTIMIZATION IN A MUFFLE FURNACE

Problem Description

- For hardening steel is heated under a gas atmosphere in a muffle furnace. To ensure a high a quality hardening result, the samples should be exposed to a time constant gas concentration and temperature.

- To guarantee over time a homogeneous temperature and velocity field and the optimal species concentration the muffle shall be simulated.
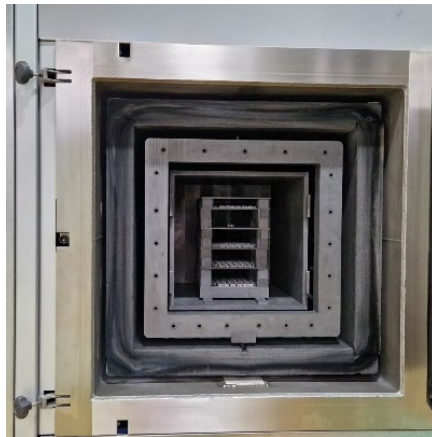
Muffle furnace with samples in shelf

Objectives & Tasks

- The simulations shall be done with Ansys Fluent. This includes
    - the preparation and meshing of the geometry,
    - the setup for the conjugate heat transfer in the solid,
    - the flow setup with species transport and
    - the Joule heating of the furnace.

- The aim is to find the process paramters for the gas flow through the furnace to optimize the carburization of the samples.

- The applicant should have a strong interest for fluid dynamics and heat transfer problems.