



HEAT TRANSFER IN POROUS MEDIA

Problem Description

- In the Hilti fire stop portfolio are foamy materials and materials that convert to ash under fire. These materials may exhibit open or closed pores.
- For porous materials not only heat conduction through the structure is of importance but as well radiation and convection in the pores. The properties of the pores, i.e. size, form, open or closed, have an significant influence on radiation and convection .



Hilti fire stop block



Sample of porous ash

Objectives & Tasks

- In literature there are analytical models describing these phenomena.
- The task is to build up a simulational setup for heat transfer in a porous material with open and closed pores, respectively.
- In a sensitivity study the size and the form of the pores and the surrounding structure should be varied to find out which property set leads to the highest / lowest overall heat transfer.
- For the simulations the software COMSOL will be used; previous knowledge of the software is not needed.
- The applicant should have a strong interest for the physical effects in heat transfer problems.