



# FIRE RESISTANCE EVALUATION OF GYPSUM PLASTERBOARD WALLS USING COUPLING METHODS

## Problem Description

- gypsum plasterboard walls are commonly used in constructions, providing passive fire protection as separating elements
- the fire resistance of the wall is assessed by performing expensive fire tests or conservative empirical calculations

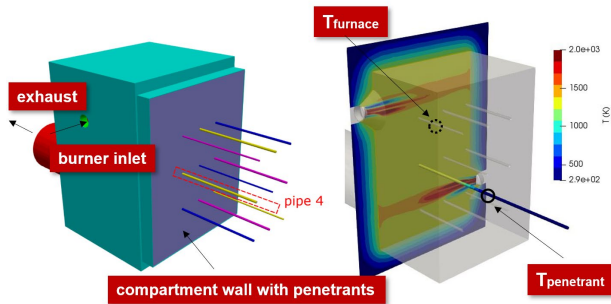


Fig. reactive fluid flow simulation using Fluent.

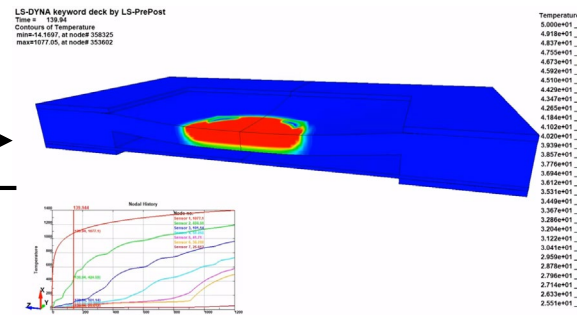


Fig. Transient thermo-mechanical simulation plasterboard response in LS-Dyna.

## Objectives & Tasks

- this work aims to evaluate the fire resistance of gypsum plasterboard lined walls by means of fluid-structure-interaction based simulations
- using coupling methods between reduced combustible gas flow and structural mechanics validation of the physical models and reduction of fluid flow simulation
- preferred software packages for fluid flow: *ANSYS Fluent* or *LS-Dyna* as well as structural mechanics: *ANSYS Mechanical* or *LS-Dyna*
- strong skills in understanding and interfacing complex physical effects as well as model reduction
- experience in programming (*Python*, *FORTRAN*) is a plus