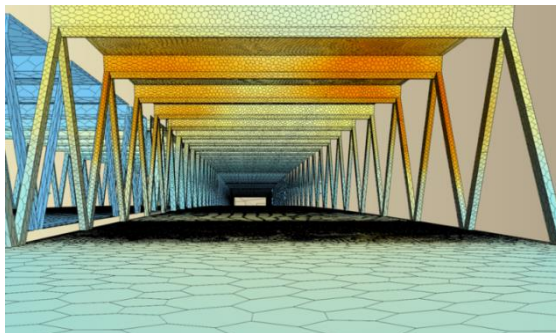
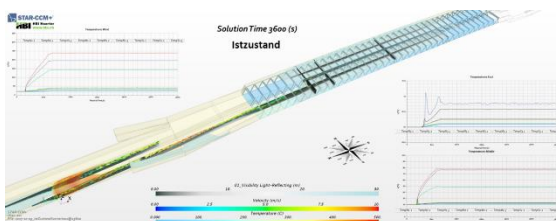




Bearing structure of the Dreirosenbrücke



Surface temperatures on the structure



Summary of the results per scenario

Description

The Dreirosenbrücke leads both the A2 (2 x 2 lanes) and the urban traffic (motorised individual traffic, bicycle, public transport, pedestrians) over the Rhine. The bridge was opened to traffic in two stages in 1999 and 2004. The upper deck is supported by a steel structure from the lower deck. The lower deck is partially glassed to protect against noise

In order to assess the structural fire protection, calculations specific to the structure were made. The temperature load of the steel structure in the event of fire (30 MW vehicle fire) was defined using 3D-CFD simulations in the adjoining tunnel tubes. For this purpose, the temperature of the air layer close to the structure was calculated. On the basis of this data both, the heat transfer into the structure and the resulting temperature distribution, were calculated using an FEM program (not included in the HBI services). The vehicle fire was modelled as three-dimensional, volumetric heat source. The temporal progression of thermal release was specified via a corresponding fire curve.

Services

The order comprised the following services:

- 3D-CAD modelling of the Dreirosenbrücke and spatial discretization of the airspace
- Time-dependent modelling of the event of fire by means of a volumetric heat source
- Calculation of the temperature in the air layer close to the structure and data export for further processing in an FEM program