

Project DigitalModelling Overview

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Funded by the BMFT as part of the MaterialDigital2 program:



Project partners:



Objective

DigitalModelling creates a digital foundation for material modelling that accelerates the integration of new models and data, improves decision-making, and supports AI-driven service life assessment.

Benefit

The digital platform enables the user to,

- make better decisions when selecting constitutive material models,
- integrate new material models more quickly,
- find, exchange, and integrate material data for model calibration,
- ensure the traceability of model parameters back to individual material data and material state information, and
- enable AI-supported service life assessment.

Application examples

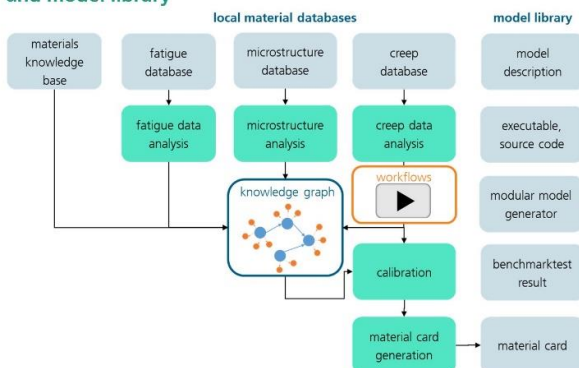
High temperature materials IN718 (turbine discs) and P91/P92 (power plant components)



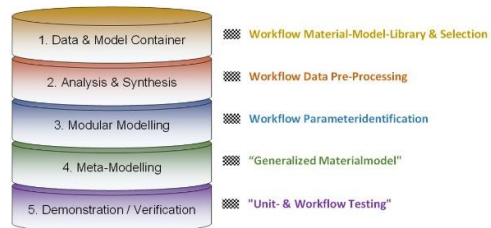
Our digital products

- Chatbot for querying domain knowledge from the material model library (CKAN)
- GraphDesigner app for generating graph templates
- Knowledge graph to ensure traceability from the material card to the individual data point
- Digital product passport for material cards
- Pylon-based workflow for calibrating constitutive material models
- Linux-based tool for parameter optimization
- AI-based prediction of batch specific creep properties
- Interfaces to commercial finite element software

Connection between knowledge graph, workflows and model library

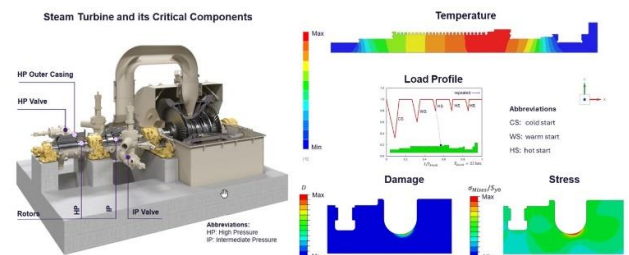


Work packages



Benchmarks and demonstrators

Benchmark tests for material models provided by industry partners



Challenges & outlook

- Confidential industry data may not leave the companies, i.e. model calibration workflows need to run within the company
- How can the infrastructure be operated sustainably beyond the end of the project?

Contact (industry)

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