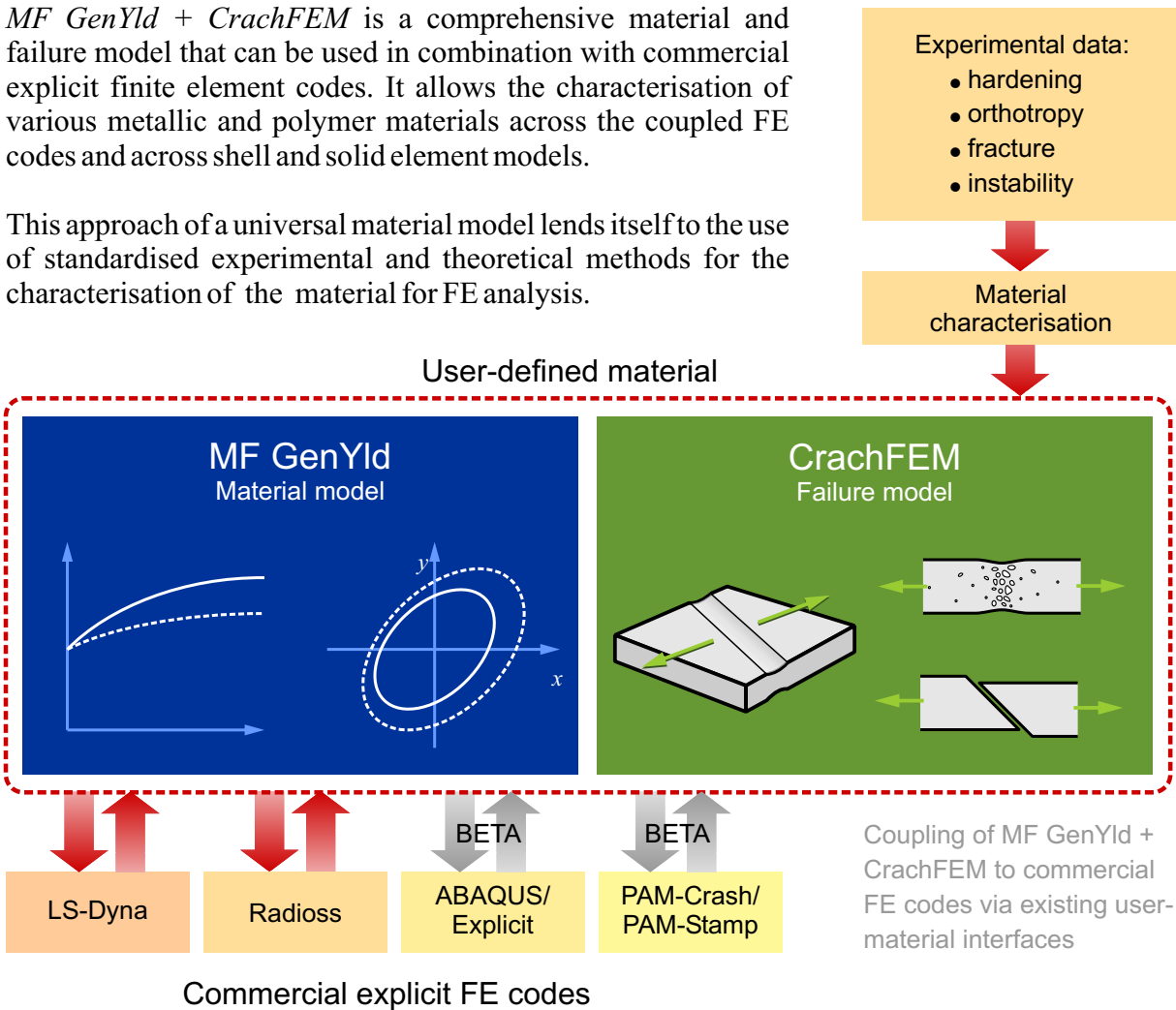


MF GenYld + CrachFEM

Version 3.8

MF GenYld + CrachFEM is a comprehensive material and failure model that can be used in combination with commercial explicit finite element codes. It allows the characterisation of various metallic and polymer materials across the coupled FE codes and across shell and solid element models.

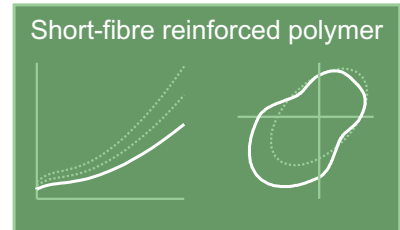
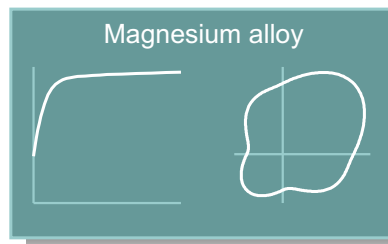
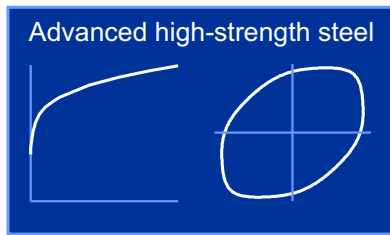
This approach of a universal material model lends itself to the use of standardised experimental and theoretical methods for the characterisation of the material for FE analysis.



LS-Dyna, Radioss, ABAQUS/Explicit, PAM-Crash and PAM-Stamp are registered trademarks and are property of their respective owners.

Plasticity model

The module *MF GenYld* (*generalised yield locus*) describes the plastic behaviour of the material. It includes a variety of yield criteria and hardening models as well as advanced models for isotropic-kinematic and anisotropic hardening. This allows the user to model various structural materials, such as steels, light metal alloys and plain and short-fibre reinforced polymers.

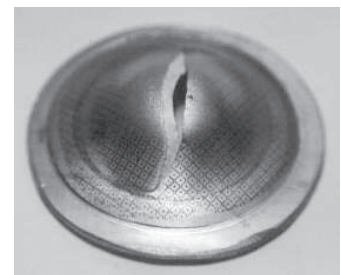
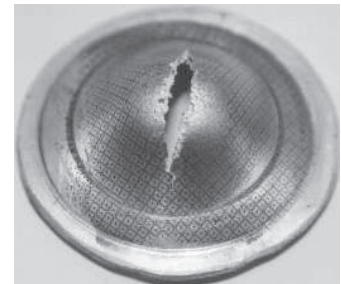
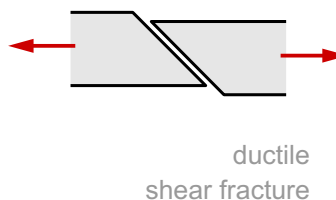
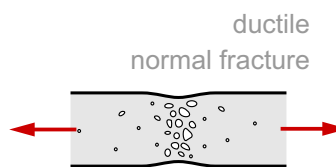
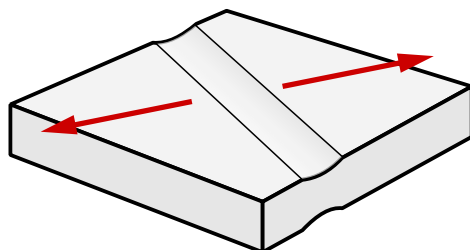


MF GenYld can model many physical effects of plasticity and allows to model a wide range of materials

Comprehensive failure model

The module *CrachFEM* describes material failure. Ductile normal fracture and shear fracture may be described for two- and three-dimensional elements. In addition, local tensile instability may be described for shell elements. This failure mechanism represents the local necking of sheets which cannot be represented with the regular shell discretisation.

CrachFEM's instability model resolves tensile instabilities in sheets that the shell discretisation cannot represent.

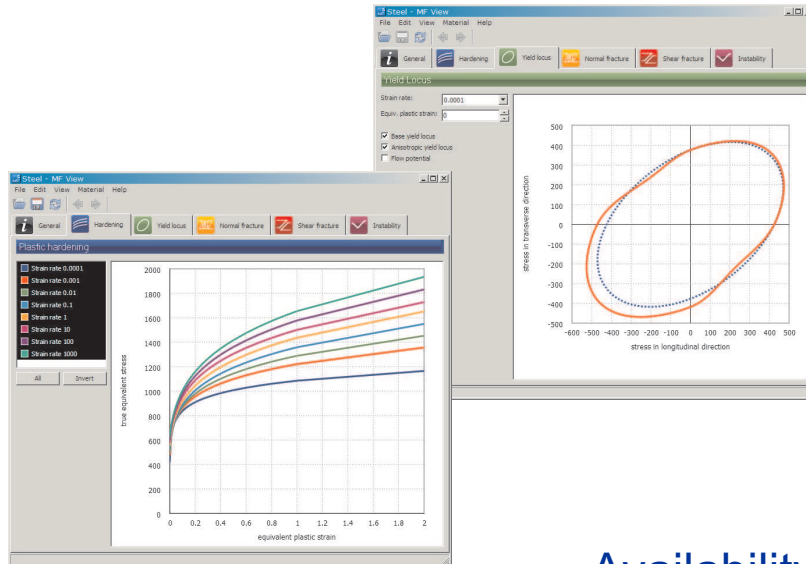


Failure may be used in post-processing; the failure risk can be shown in a fringe plot, e.g. to indicate problematic zones during forming. It is also possible to represent failure transiently by eliminating elements according to their failure risk. This may be used to account for the different distribution of forces in a vehicle crash after a part has ruptured.

CrachFEM can account for two modes of ductile fracture: normal fracture and shear fracture

Visualise the model

Together with *MF GenYld* + *CrachFEM*, the material browser *MF View* is distributed. It allows you to quickly scan the input data, find formatting errors and change numbering, unit system or solver format.



Visualisation of strain-rate dependent hardening and yield locus with MF View

All material properties defined on a MF GenYld material card can be displayed in MF View for easy reference

Availability

The material and failure model *MF GenYld* + *CrachFEM* may be coupled to the explicit FEM codes LS-Dyna, Radioss*, PAM-Crash* and ABAQUS/Explicit* via the user material interface. Massively parallel versions (MPP) are supported.

The coupling to solvers marked with * is currently in beta stage, but is actively developed.

Benefits

MF GenYld + *CrachFEM* offers comprehensive modelling of plasticity and failure for various material classes (metals, polymers, fibre-reinforced materials)

The material and failure models are under steady development; new features are being integrated according to our experience with industry and research projects.

Calibrate your material data only once for all solvers: *MF GenYld* + *CrachFEM* is available for various FE codes. *MF View* facilitates the handling of input for different solvers.

Use the same set of material data for shell and solid elements.

Use the same material data throughout the life-cycle chain of forming and crash.

MATFEM are consultant engineers in the fields of materials science and finite element simulation. We are specialised in providing an interface between testing and simulation.

Contact us:

Web: www.matfem.com

Phone: +49 89 15 98 97 95

Fax: +49 89 15 98 97 99