FEMCardPro : Material Data Sets for highest Requirements

The material cards presented in the following are being identified by means of our professional testing and evaluation method. They are representing the most common combinations of experimental design and material model for different kinds of materials. All material models are available in common FEA-Solvers like **ABAQUS, ANSYS, LSDyna, PAMCrash, Radioss, Nastran, Marc Mentat** etc.

Hyperelasticity (rubber like materials, gaskets, bearings etc.)

- 3 tensile tests on perforated rectangular specimens
- Material Model: **Neo Hooke, Mooney-Rivlin, Ogden, Yeoh, Polynomial**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Viscoelasticity (rubber like materials, gaskets, bearings etc.)

- 3 Loading and discharge Tests on perforated rectangular specimens
- Material Model: **Neo Hooke or Mooney-Rivlin, Ogden, Yeoh + relaxation moduli**
- Preconditioning of Specimens to minimize the mullins-effect
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Mullins Effect (rubber like materials, gaskets, bearings etc.)

- 3 Loading and discharge Tests on perforated rectangular specimens
- Material Model: **All (Visco)-Hyperelastic + Mullins Effect**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Von Mises Elastoplasticity with kinematic hardening where appropriate (steel, metals, cast materials)

- 3 Loading and discharge Tests on perforated rectangular specimens
- Material Model: **Von Mises Plasticity, nonlinear isotropic (and kinematic) hardening**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Drucker-Prager Elastoplasticity (Plastics, soil)

- 3 Loading and discharge tensile Tests on perforated rectangular specimens
- 3 Compression Tests on (perforated) cylindrical specimens, where required
- Material Model: **Drucker-Prager Plasticity with nonlinear hardening**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Damage (Cast material, Polymers where indicated, Fibre reinforced plastics)

- 3 Loading and discharge Tests on perforated rectangular specimens
- Material Model: **e.g. Gurson Damage Model**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Crash (Metals, plastics, elastomers, cast materials, fibre reinforced plastics)

- 6-9 tensile tests on perforated rectangular specimens at three different strain rates (e.g. 0.001 m/s, 0,3 m/s, 5,0 m/s)
- Material Model: **As requested (e.g. Johnson-Cook, Drucker-Prager elasto-viscoplasticity, Ogden-viscohyperelasticity)**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

Anisotropy (Metal forming, metal sheets, fibre reinforced plastics)

- 3 Loading and discharge Tests on perforated rectangular specimens
- Material Model: **e.g. orthotropic (visco)-elastoplasticity**
- Optical measurement of displacement fields
- Interpolation of displacement fields on corresponding FEM mesh
- Identification of Material data sets

It can easily be taken into account **individual customer requirements** (e.g. different specimen geometries and experimental design). For all identified material parameters **verifications** are performed, which are clearly integrated into the final reports. Feel free to contact us. We can advise you and find the right offer for you:

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