

# NEiNastran *for Windows*

## NEiFatigue (Fatigue Life Analysis)

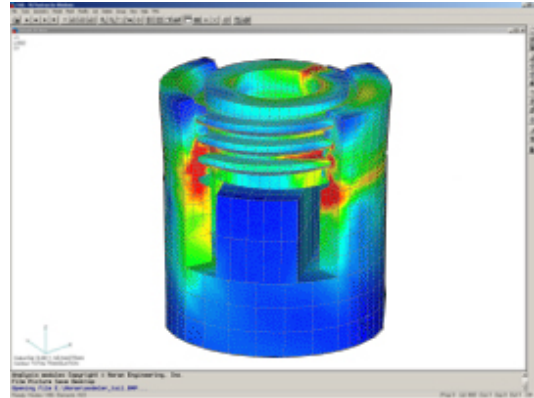
### Overview

NEiFatigue (WinLife) by Steinbeis TZ enables engineers to calculate the fatigue life of parts and components under dynamic loading. The product has two modules: a basic module and a multiaxial module. In the basic module, the fatigue life can be calculated based on nominal stress (without using finite elements) and/or based on the local strain approach (using notch factors in the usual manner). The multiaxial module is used to calculate the fatigue life of parts where a dynamic load results in considerable changes in the principal stress direction. NEiFatigue interfaces well with the NEiNastran Modeler.

### Capabilities:

#### Fatigue Calculation without FEM:

- Classical methods: nominal stress concept and local concept
- Stress S-N curves and mean stress sensitivity are required for the nominal stress concept
- Cyclic stress-strain curves, strain e-N curves and damage parameter curves according to Smith, Watson and Tooper are required for the local concept
- Component loading is provided for both methods
- Loading history (stress, moment, force) obtained from a measurement can also be used
- Rainflow method used for counting of stress histories
- Easy to use Load Spectrum generator
- S-N curve generator for steel, aluminum alloys and cast iron
- Fatigue life database calculated (can be extended by the user); contains S-N curves and data describing the damage for materials commonly used
- Rainflow matrix plots
- Load spectrum plots
- Load hysteresis plots
- Damage XY and Contour plots



#### Fatigue Calculation Combined with FEM:

- Static FE calculation is used to ascertain the stress within the component
- The direction of the standard load must correspond to the actual force
- Critical nodes can be selected for the fatigue life calculation thus reducing the calculation time
- S-N curves for failure probabilities between 0 and 100% can be created

#### Multiaxial Calculation:

- Method used when several loadings have an effect on a structure and are not in sync, and not proportional
- Up to 100 loadings working independently can be taken into account
- Should be used if the principal stress directions vary considerably in the component as the calculation is very time consuming
- Applications: bodywork structures, axle components, crankshafts, rotary blades for wind power stations
- Strain measurements data can be used

#### Unparalleled Support:

- Leader in outstanding customer support
- Onsite and offsite training courses taught by experienced professional engineers
- Phone and email support staffed by a team of FEA specialists

**Noran Engineering, Inc** is aggressively focused on commitment to the customer. Detailed documentation, customized on-site training, and comprehensive technical support ensures that you will see immediate return on your investment.

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