



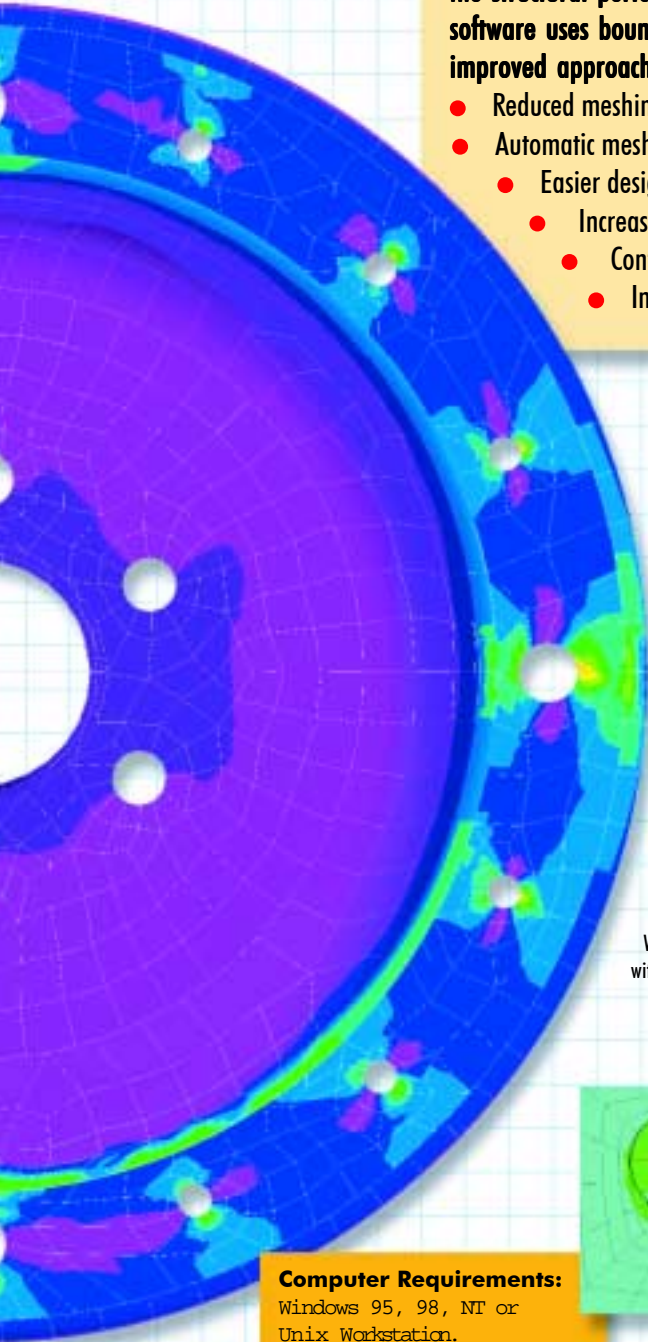
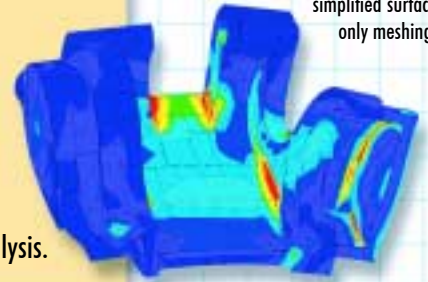
Mechanical Design Software

A robust computer modelling tool used to help design and predict the structural performance of mechanical components. The BEASY software uses boundary element technology to provide a radically improved approach to predictive computational analysis.

- Reduced meshing times;
- Automatic meshing without compromising accuracy;
 - Easier design changes;
 - Increase accuracy of results;
 - Contact simulation;
 - Integration with BEASY's crack growth analysis.

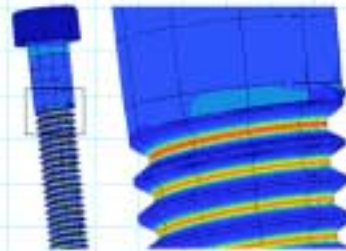
Reduced Meshing Times

BEASY improves the design process and reduces prototype costs using simplified surface only meshing.



Automatic Meshing Without Compromising Accuracy

Automatic meshing without the need for lower accuracy Tet elements.



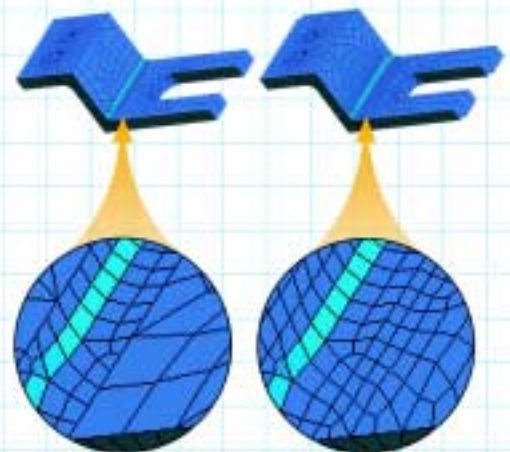
Contact Simulation

BEASY's contact analysis takes advantage of the reduced meshing times and increased accuracy to simplify contact analysis. Both node to node and node to surface contact are supported.

Easier Design Changes

How many times have you reviewed solution results and found the mesh wasn't refined enough to give you the critical information you needed? BEASY offers a better solution to this problem.

With BEASY the mesh can be locally modified without remeshing the entire model.

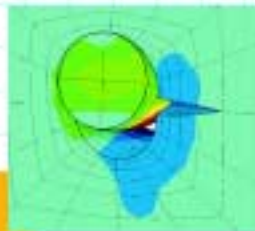


Discontinuous Mesh

Continuous Mesh

Integration with BEASY's Crack Growth Analysis

For life and durability predictions Cracks can be automatically added and grown using Beasy's Fatigue and Crack Growth software.



Increased Accuracy of Results

BEASY has no match in detailed analysis. Fillet holes and other small features can be effectively modelled since only the surfaces need to be defined. This means the real geometry can be analysed without simplification giving more accurate results and improved fatigue prediction.

Discontinuous elements allow you to accurately capture the behaviour in areas where results are changing quickly.

Computer Requirements:

Windows 95, 98, NT or Unix Workstation.

BEASY is compatible with existing modelling tools such as PATRAN and IDEAS.

Windows users can also use BEASY's own modelling tools.



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The BEASY Mechanical Design module is being used in the automotive, aerospace, pipeline and pressure vessel, biomedical, consumer product, manufacturing, and electronic industries to reduce design time and improve product quality.

- Stress analysis
- Contact analysis (single and multiple contact surface capability)
- Thermal stress analysis
- Heat transfer analysis

Modelling Features

- Error and convergence reports provide simple and clear interpretation of results
- Powerful use of problem symmetry to reduce computer time and improve accuracy
- Simple zoning of problems to improve accuracy, reduce computer time and define regions of varying properties
- Definition of boundary conditions in global and local co-ordinate systems
- Combine use of discontinuous and continuous elements makes mesh refinement and grading in areas of interest very simple, keeping model size to a minimum
- Body loads including point, line sources and forces, volume sources, rotational and acceleration loads

Element Library

- Complete range of elements including both discontinuous and continuous elements
- Hierarchical element types allow model refinement without change of mesh
- For three dimensional problems, quadrilaterals and triangles
- For two dimensional and axisymmetric problems isoparametric lines
- Tube elements for modelling cylindrical voids in 3D thermal problems
- All elements have high order shape functions for accurate model representation

Full User Control

- Free format input data
- Stop and restart

Contact Simulation

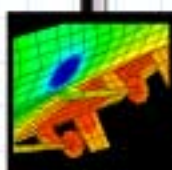
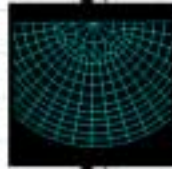
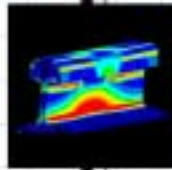
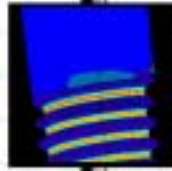
- Accurate analysis of surface gap/contact problems
- Analysis of single and multiple contact surfaces
- General 2D axisymmetric and 3D geometries
- Coupled stress and thermal analysis
- Contact with external rigid surfaces
- Interference fit

Comprehensive loading features are available and the user can simply specify initial gaps or overlaps (interference fit) of the contact surfaces. The automatic contact algorithm takes care of the rest.

Contact models can also be coupled with thermal models to include both stress and thermal effects.

Analysis Features

- Comprehensive checking of data and of computer resources required ensures that no analysis runs are wasted
- Local error guides to give clear indication of solution accuracy
- Evaluation of total force and thermal balance
- Comprehensive facilities for modelling 2D and 3D cracks and fracture
- Combination of thermal and stress analysis to undertake a thermal stress analysis
- Efficient and economical solution as at many user-specified "internal points" as required
- Step-by-step analysis option allows re-analysis to be carried out after minor changes without re-calculation of matrices



Zoning or Substructuring

A model can be split into any number of zones or substructures to represent different components or materials or to simplify the model.

Interface conditions between zones include:-

- Sliding
- Interface stiffness coefficients
- Prescribed added traction
- Contact or gap (requires BEASY Contact)
- Press fit
- Contact thermal resistance (membrane)
- Potential jump
- Prescribed added heat flux
- Heat transfer to external source or sink

Boundary Conditions and Loading

- Point and line loads
- Traction
- Displacement
- Support Stiffness
- Thermal Loading
- Centrifugal loading
- Acceleration (including gravity) in any direction
- Temperature
- Heat flux
- Heat transfer coefficient
- External (ambient temperature)
- Point, line and volume sources of heat flux

Geometry Features

- Implicit symmetry about any axis
- General zoning and substructuring

Material Properties & Stress Properties

- Isotropic for axisymmetric
- Isotropic, orthotropic and anisotropic
- Linear materials properties

Thermal Properties

- Anisotropic, orthotropic and isotropic
- Isotropic for axisymmetric
- Linear material properties
- Cartesian or user defined material co-ordinate system