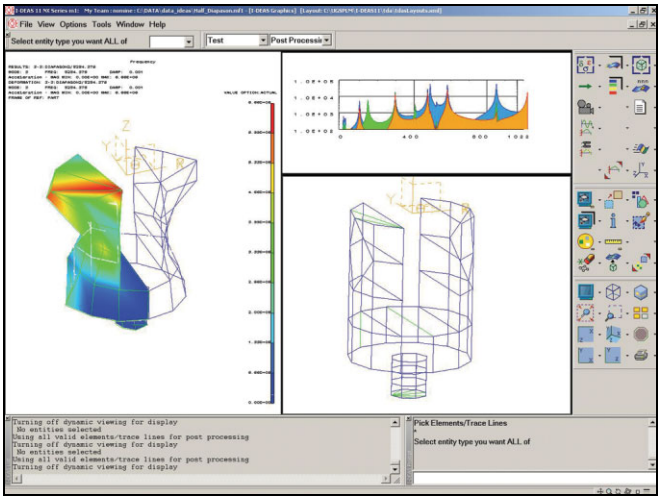
PRODUCT DATA

Test for I-deas Structural Modification — BZ-6019

Test for I-deas Structural Modification software helps you estimate the effects of basic structural changes of a tested structure.

USES

- Estimating the effects of structural changes
- Applications where the modal model is derived from experimentally measured frequency response functions or finite element analysis



Predicting the Effects of Basic Structural Changes

To determine the physical locations on a structure that are most sensitive to basic types of structural change, it is necessary to carry out a sensitivity calculation. Test for I-deas Structural Modification software uses a mathematical model representing the dynamic characteristics of the structure by its modes of vibration. These modes of vibration are expressed as sets of resonant frequencies, damping, modal stiffnesses, and mode shapes. They are usually used in applications where the modal model representing the structure is derived from experimentally measured frequency response functions. However, this modal model could also be developed from finite element analysis.

Structural Changes Evaluated

Appropriate applications involve evaluating basic changes to the structure which can be expressed in terms of simple mass, stiffness, and damping elements. This enables you to quickly gain insight into how to improve the vibrational performance of the structure. Since only the above basic modifications are investigated, more complicated types of physical modifications should be investigated using the more robust modeling capabilities in Test for I-deas Finite Element Modeling and Test for I-deas Model Solution.

Sensitivity Checking

Sensitivity checking guides you to the best physical locations on the structure to be modified, as well as the best type of modification. The sensitivity of the structure to the evaluated changes is expressed in terms of the percent change of modal frequencies and damping. The influence of a connection can also be predicted. The sensitivity of the structure to the following types of basic modifications can be evaluated:

- Grounded rigid: Estimates the sensitivity of connecting any degrees-of-freedom rigidly to ground
- Grounded flexible: Estimates the sensitivity of connecting any degrees-of-freedom to ground through a flexible connector containing mass, stiffness, and/or damping properties
- Lumped mass: Estimates the sensitivity of placing a lumped mass at any of the degrees-of-freedom on the structure

- Tuned absorber: Estimates the sensitivity of placing a tuned absorber represented by a spring, mass, and damper system at one or more degrees-of-freedom on the structure
- Rigid connection: Estimates the sensitivity of rigidly connecting one or more pairs of degrees-of-freedom on the structure together
- Flexible connection: Estimates the sensitivity of connecting one or more pairs of degrees-of-freedom on the structure through a spring, mass, and damper system

Model Prediction

After the best location is determined, the actual effects of the selected type of change can be determined in terms of new resonant frequencies, modal parameters, and mode shape deformation patterns. Animated mode shapes are displayed and compared with the original structure in the graphics task. Comparisons can also be made on the basis of synthesized frequency response functions.

Specifications – Test for I-deas Structural Modification BZ-6019

PREREQUISITES
Test for I-deas Core Test BZ-6000 and a Test for I-deas Modal Analysis software module, such as Comprehensive Modal BZ-6015, Basic Modal BZ-6016 or Advanced Modal BZ-6017

SENSITIVITY CHECKING
The sensitivity of the structure to the following types of basic modifications can be evaluated:
- Grounded rigid
- Grounded flexible
- Lumped mass
- Tuned absorber
- Rigid connection
- Flexible connection

COMPARISON TOOL
Frequency response synthesis

DISPLAYS
Geometry-based data displays with single or multiple viewports

Creation of Measurement Points (Nodes): Keyboard entry, copy/paste, reflect, interpolate, or cursor-picking measurement points from a detailed finite element model
- Data at nodes can be displayed on geometry using either line or colour contours (up to 78 contour levels and intervals)
- Groups of measurement points on different regions of the geometry can be defined to automate data processing/display

Animation Features: Wireframe, hidden line removed, and shaded image deformation displays are available as static plots on all supported graphics hardware devices. Wireframe and hidden line removed animation are available on most supported devices, and shaded image animation is available on certain advanced graphics devices
- Tracelines supported for wireframe displays
- Elements may be defined for advanced hidden line removed and shaded image displays and animation

Global and Local Coordinate Systems: Cartesian, cylindrical, or spherical systems
Data Types: Results from modal analysis, order track tests, operating tests, or any other type of vector data at measurement points can be displayed
- Displays of transient events defined from time histories can be animated on deformed geometry, providing a clear understanding of the response measurement as a function of time
- Responses at a specified order and RPM, or the total response of order track data from rotating machinery tests can be animated on geometry
- Vector arrow plots of data at nodes and criteria plots showing data above, below, within, or outside of a defined range are available

Ordering Information

BZ-6019-F	Test for I-deas Structural Modification

SERVICES

M1-6019-F	Annual Software Maintenance and Support Agreement
M2-6019-F	Annual Software Maintenance and Upgrade Agreement

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