

ANSYS Structural

ANSYS simulation technology enables you to predict with confidence that your products will thrive in the real world. Customers trust our software to help ensure the integrity of their products and drive business success through innovation.

Simulate All Structural Aspects of Your Product

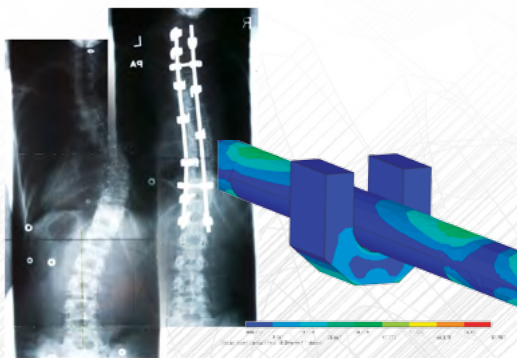
Conduct linear static analyses that reveal stresses or deformations, modal analyses that determine vibration characteristics, and advanced transient nonlinear studies that focus on dynamic effects and complex behaviors.

Combine High Speed with High Accuracy

Two reduction techniques — submodeling and substructuring — enable you to condense models for rapid computation, without significantly affecting the accuracy of results.

Comprehensive Element Library

Represent complex real-world geometries from our library of beams, shells or solid-shells for thin structures, as well as solids that are used in a wide variety of applications.



Biomedical researchers at the University of Alberta have relied on ANSYS to manage risk, improve insight and accelerate product development in biomedicine.

“Our customers want to buy state-of-the-art turbines that have proven technology and are able to run 20 years without any major problems. To achieve such strong structural components, ANSYS is very important for us.”

**Michael Schuld, Team Leader,
Structural Engineering, PowerWind**

Wimbledon’s Centre Court retractable roof and the Bregenz Festival’s operatic floating stage met operational design and completion targets as a result of ANSYS structural mechanics analysis.



Courtesy ACA Engineering Consultants.

Strength Analysis

Static; Buckling – Linear; Buckling – Nonlinear; Substructuring

Geometric Nonlinearity

Large Strain; Large Deflection

Material Models

Linear Material Models; Rate

Dependent Plasticity; Rate

Independent

Plasticity; Hyperelasticity; Visco-

elasticity; Creep; Reactive

Materials

Contact Modeling

Bonded / No Separation Sliding;

Pretension (bolts, etc.); Joints;

Spot Welds

Nonlinear Contact Modeling

Rough; Frictionless; Friction

Advanced Modeling

Gaskets; Cyclic Symmetry

Analysis; Rezoning; Adaptive

Remeshing; Submodeling;

Element Birth and Death;

Fracture Mechanics

Vibrations

Modal; Spectrum; Harmonic; Random Vibration; Rotordynamics; Super Elements & Component Mode Synthesis; Mistuning

Motion

Rigid/flexible Transient

Composite Materials

Material definitions; Layers definitions; Solid Extrusion; First-ply Failure; Last-Ply failure; Delamination; Draping

Preprocessing

Modeling capabilities

Bidirectional Geometry Interface

for major CAD Systems; Geo-

metry Reader for Neutral Files

such as PARASOLID, STEP or

IGES; Beam modeling

Meshing capabilities

Defeaturing; Surface Meshing;

Tetrahedral Meshing; Prism

Inflation Layers; Swept Hex-

Meshing; Thin-Sweep Hex

Meshing; Multizone Hex Mesh-

ing; Automatic Hexa-Dominant

Meshing; Adaptive mesh

refinement

Boundary conditions

Solid Model Loads and

Boundary Conditions; Tabular

Loads and Boundary Conditions;

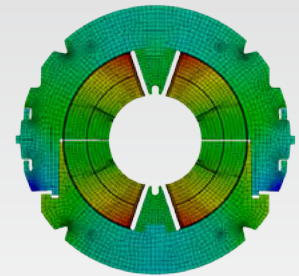
Function Loads and Boundary

Conditions; Apply Temperature

Loads

ANSYS Multiphysics solutions

help cross-functional engineering organizations predict system-level performance of complex designs involving multiple physics, then improve individual components and their interactions with one another.



CERN researchers used ANSYS multiphysics solutions to produce smaller magnets with a higher magnetic field for the Large Hadron Collider, which is investigating the fundamental nature of sub-atomic matter.

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