



**TOSCA**

**ANSA environment**

**A complete interface  
for effective optimizations**

## Set up your optimization analyses with Tosca, in a complete interface

Tosca-ANSA Environment (TAE) provides a complete interface for Tosca. Its interface facilitates the definition of Topology, Shape, Bead and Sizing optimization problems, providing feature-based entries for all Tosca Structure keywords. TAE provides monitoring of the optimization steps within the same interface, through the VTF Visualization module of Tosca. TAE is available as a stand-alone product or as an integral part of ANSA. SIMULIA Tosca is a product of Dassault Systèmes.

### Model validation

This tool, automatically defines a ready-to-run FE model, with validated integrity and accuracy of the optimum solution. The model validation process consists of:

- Re-meshing of the surface model that produced from the Tosca Smooth module in order to improve the elements quality.
- Automatic volume meshing of the surface model.
- Redistribution of the boundary condition entities like SPC, MPC, loads and pressure from the initial to the optimized model.
- Run the validation model to a predefined solver.

### Topology optimization

TAE offers solutions for optimization during the concept phase of the product and provide lighter and stiffer structures while it respects the manufacturing constraints. It's ideal for prototype builds.

The process consists of:

- Removing elements from the initial design space.
- Creation of a smooth surface around the remaining elements using Tosca Smooth.
- Definition of the validation model that is a solid structure ready-to-run in the solver.

### Shape optimization

Shape optimization is used to improve existing designs and provide more reliable and durable components by minimizing stress, strain, and damage. The optimizer applies smooth modifications on the surface to improve model behavior.

### Bead optimization

Bead optimization is used to improve the static and dynamic behavior of shell structures by generating optimal bead layouts. The bead generation respects manufacturing constraints and can be addressed in complex geometries and realistic loads.

### Sizing optimization

Sizing optimization modifies the sheet thicknesses of the model and finds the optimum combination between weight, stiffness, and dynamic behavior. It works efficiently for large scale models with up to millions of design variables.

