

## WHAT'S NEW IN EXTREME LOADING® FOR STRUCTURES 8.0?

This new version of Extreme Loading® for Structures (ELS) reinforces the fact that ELS is a practical easy-to-use structural analysis software program created for practicing engineers who have complex projects with non-traditional load cases. The majority of the new features provided in ELS Version 8 are advanced modeling and postprocessing features proposed by software users who wanted additional tools to help them create and solve more complex models. Additional features have been added to provide ease-of-use and versatility for everyday projects.

ELS's team has always been keen on the software nourishing achieved by the continuous updating of its existing features along with creating a wide variety of new features whose end target is enhancing the overall user's modelling and results viewing experience. The modeler now offers enhanced load definitions. It's now possible to use scripts to enter the desired loads which make complex problems (especially fluid mechanics problems) more achievable. The new load definition options include **Static OpenFOAM** loads and **Synchronous Dynamic OpenFOAM** loads.

ELS gives due care to deconstruction using multiple techniques including material weakening, demolishing scenarios and blast. An enhancement to the blast loads, "**Start the Analysis from the Blast Arrival Time**" option was added to eliminate the delay resulting from starting the loading stage before the blast wave reaches the target objects.

Since ELS focuses on allowing the user to easily create the most detailed and accurate model, now masonry walls can be modelled as a system of bricks. **Bricks systems** can now be defined by customizing the brick/block dimensions and material along with each brick's orientation inside the system as repetitive unit on each course and correspondingly of the whole wall.

In addition to that, ELS now offers new output options including **Contact Forces** and **Spring Temperature**. Contact Forces (forces created when an object touches another in dynamic stages) can now be displayed in the ELS results viewer and can be animated too. Shedding light on the fact that ELS's team is fully aware of the mass projects modelled via ELS by multiple engineers that might be in different countries, ELS channels communication between all parties. To achieve this gap bridging, ELS now enhances the option of **saving scenes** and exporting them to store the desired views without the hassle of taking screenshots and making detailed description of specific locations in the model.

Customizing materials has had its share of enhancements, now nonlinear materials with special **thermal expansion coefficients** can be modelled and the **reinforcement bending ratio** can be specified to reach the best possible accurate results aided by ELS's outstanding solver.

As for the results viewer, it is now possible to add actions to be performed by the solver (Conditional Solver Controller Actions) while running the analysis when a certain time/condition is met and can be instantly viewed in the results viewer and highlighted by the newly added "**Animate Log**" option. These new actions include:

1. **End Stage:** forces the solver to stop the stage analysis and jump to the next stage
2. **Stop Output:** forces the solver to stop producing certain specified output(s)
3. **Remove Loads From Elements:** forces the solver to stop taking into account the loads assigned to specific elements
4. **Change Time Step:** forces the solver to change the time step
5. **Change Output Time Step:** forces the solver to change the output time step
6. **No Action:** Displays in the solver analysis page a note showing that a certain condition is met.

The charts partition wasn't forgotten and had its share of enhancements including the **Current Frame Indicator** option (in the chart series option) and the Section Rotation graphical representation along with **importing/exporting the charts' scripts** to be as if pre-defined charts templates ready for any future use.

Knowing that ELS depends on the idea of interconnecting springs, it is now possible to clearly display **springs states** at any time frame with customizable colors indicators that get updated with each passing time frame.

