STRESSCHECK 10.3 RELEASE NOTES

MARCH 2017 (BUILD 40322)

Changes incorporated in the 64-bit StressCheck 10.3 Professional Edition - Build 40322. All work files (SCW) and project files (SCP) created in StressCheck 10.2 are compatible with StressCheck 10.3. However, any file created in StressCheck 10.3 cannot be opened in previous versions due to the file format changes incorporated into this release to support additional features and future enhancements.

RESOLVED ISSUES

- Several bug fixes including resolving issues with:
  - Automeshing
  - Boolean operations
  - BRS and SRS load application
  - COM API functions
  - Display and UI
  - Error and Warning message handling
  - Extraction methods and capabilities
  - H-discretization and autolamination

A more detailed list is provided at the end of the document.

UPDATES

In this release we have incorporated several updates to StressCheck Professional and to the Master Guide documentation. They include new behavior for the Display options; Cutting Plane functionality; Contact Error Labeling; Parameter Importation; Editing Load/Constraint records; Automesher improvements; COM version updates; improvements on Surface Residual Stress (SRS) functionalities and performance; improvements on the Project Log; and several GUI improvements and added functionality as described in the following.

CUTTING PLANE FUNCTIONALITY

Several enhancements have been implemented for increasing the functionality and efficiency of the cutting plane function. This includes a new interface which allows the user to control the cutting planes by mouse click or by explicit coordinate input using either a global or local system. The Cutting Planes window can be opened by clicking the Cutting Plane button within the Display Options toolbar as shown below.

Figure 1: Cutting Plane button to open new dialog window

The user has now two options, either Screen or Input (see Figure 2). The Screen option (default) provides controls that allow the user to display and manipulate cutting planes in the display window using the mouse. This is the same functionality provided in previous StressCheck versions. The main difference is that now the Contour Plot on a cutting plane will update automatically when changing the Plot resolution (up and down arrows) only if the auto-update toggle is selected, otherwise the Update Plot button needs to be clicked after selecting the desired Plot Resolution (default).

The new Input option allows the user to specify up to 4 systems to place cutting planes. For a given system selection the plane is placed using the selected normal axis. Additionally, custom offsets and rotations with respect to the selected reference system can be defined for each cutting plane. The preview button is used for previewing the cutting plane configuration in the model display window (at least one plane needs to be selected). The Update Plot is used (as in the Screen option) for setting or updating a Contour Plot along the intersection of the Cutting Planes and the model on the model display window. Pressing Plot in the Results Window will also update the Contour Plot along the Cutting Planes. To remove the cutting planes while using Screen option simply uncheck the selected planes or close the Cutting Planes window. To remove the cutting planes while using Input option, uncheck the cutting planes and press Update Plot or switch to the Screen option.

Cutting Planes and Cutting Sections option: Normal cutting planes result in the union of the "cut away" parts, which can be viewed as the intersection of the "kept" parts by each plane. The planes within a Cutting Section behave in the opposite manner with respect to each other, so that 2 intersecting planes in a section remove a wedge instead of leaving a wedge.
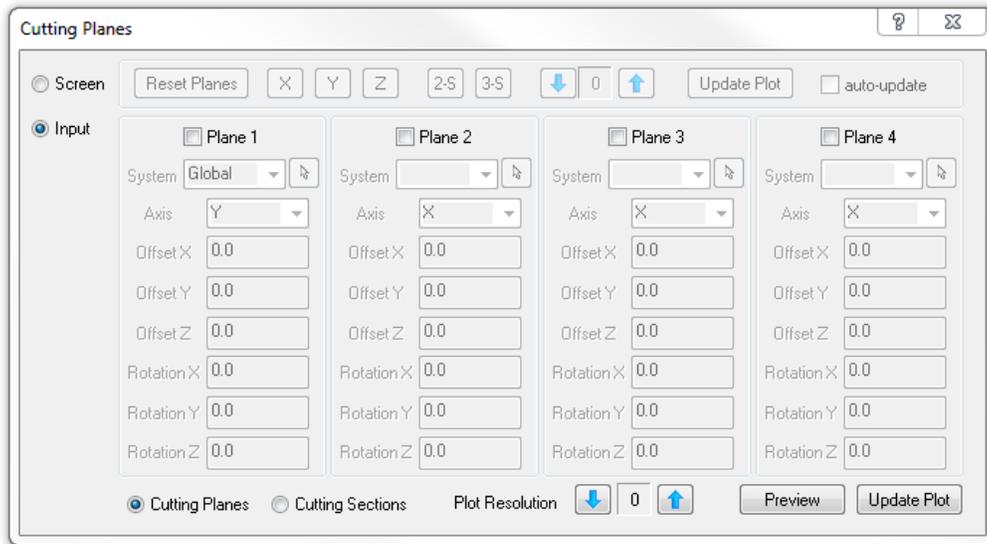
Figure 2: Cutting Planes input window

A help button is also available at the top of the new dialog window that opens a pdf file for additional information regarding the use of the Cutting Planes functionality.

The update to 10.3 also includes several bug fixes and implementations to improve the performance of cutting planes in StressCheck, specifically with regard to post-processing and fringe plotting.

See PDF page 58 of the Master Guide for details.

NEW CURVED MESHER

A new version of the automatic mesh generator has been implemented. In general, meshes with better aspect ratios, element distribution and geometric conformity are generated when compared with the previous automesher version. This new version is now the default mesher. However, a Legacy automesh option is still provided for reference purposes (see Figure 3 below). For files generated before version 10.3, automesh records will appear as "Legacy" when existing mesh records are retrieved.
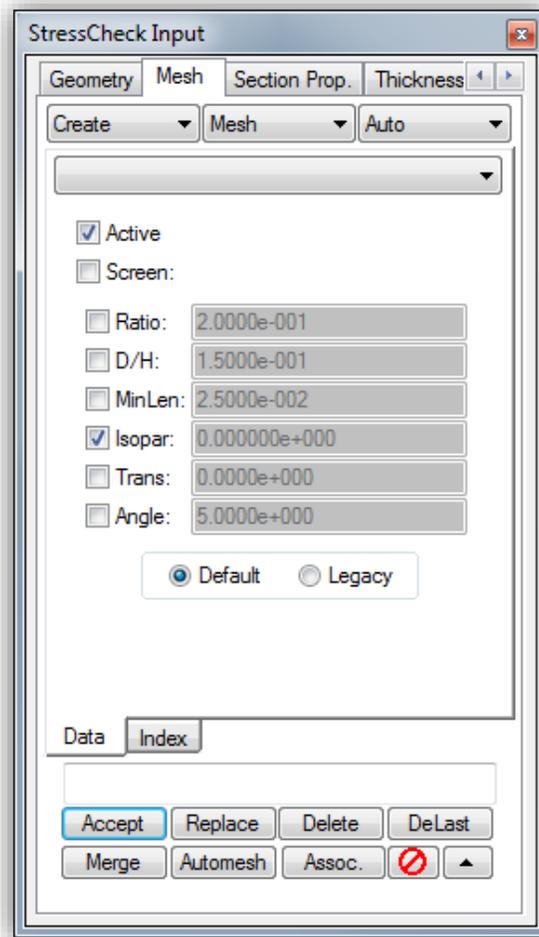
Figure 3: Automatic meshing controls.

When creating a new global mesh record (Create->Mesh->Auto) or Extrude mesh (Create->Mesh->Extrude) the option is given to choose from the new curved mesh function (Default) or the previous one (Legacy). Default/Legacy selections are not needed for local mesh refinements such as boundary layers or curved surfaces.

See PDF page 396 of the Master Guide for details.

LOAD AND CONSTRAINT EDITING

A new Edit option has been added to the Load and Constraint tabs of the Model Input interface. By clicking the Edit button of either the Load or Constraint tab a window is displayed to provide the user the ability to delete single or multiple load/constraint records (Delete button), entire load/constraint IDs (Purge ID button), or the full load/constraint records list (Purge List). The Edit Load/Constraint Cases window allows the user to display all records (Show All) or sort loads/constraints by ID. Individual records shown in the list can be selected by clicking the corresponding row. Multiple records can be selected by holding Ctrl and picking each row desired for selection. A continuous series of records can be chosen by clicking on the first row, and then dragging the mouse to the last row, or hold down Shift while pressing the up or down arrow keys to extend the selection or directly click on the last row to complete the selection. The Previous and Next buttons can be used for cycling through individual records on the list. Once a record(s) has been selected, the Delete button can be used to remove it from the list. To remove an entire load/constraint ID, simply select the correct Load/Constraint ID from the dropdown and click Purge ID. Purge All can be used at any time to remove all of the records from the list.
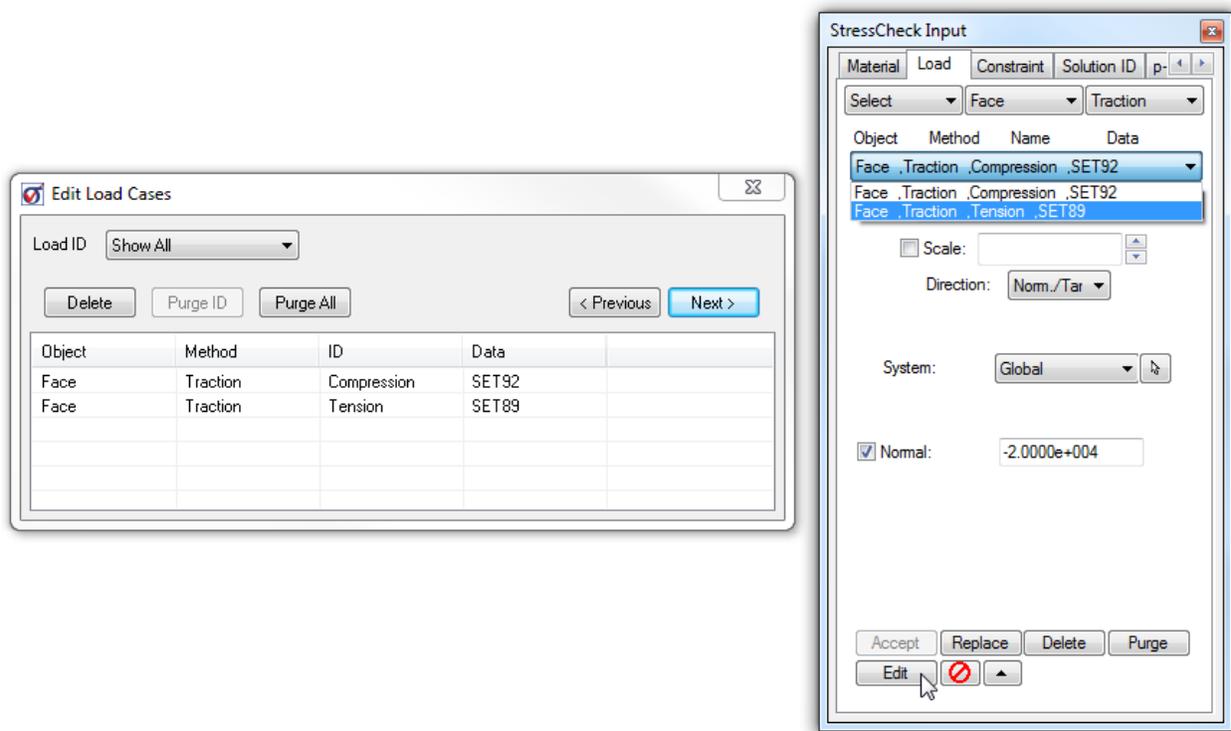

Figure 4: Edit Load Cases window after choosing Edit from the Load Tab.

See PDF page 113 of the Master Guide for details.

MIN/MAX TAGS ARE NOW AVAILABLE FOR FRINGE PLOTS

The possibility to include Min and Max extraction markers has been added to the Fringe Plot function. A marker and label will be created at the location of the minimum and/or maximum value of the selected function by turning on the Min and/or Max button next to the Fringe button. The label will identify if it is a minimum or maximum, include the extraction function name and value (if a formula is selected, the formula name will be used), the solution name and the selected run number.

To include the minimum and/or maximum markers and labels on a Contour Plot, simply select the "Min" and/or "Max" buttons enabled after clicking on the "Fringe" button. If the "Deform" shape is selected the markers and label will be placed in the deformed configuration with the location for the max and min being updated with the Deform Scale.
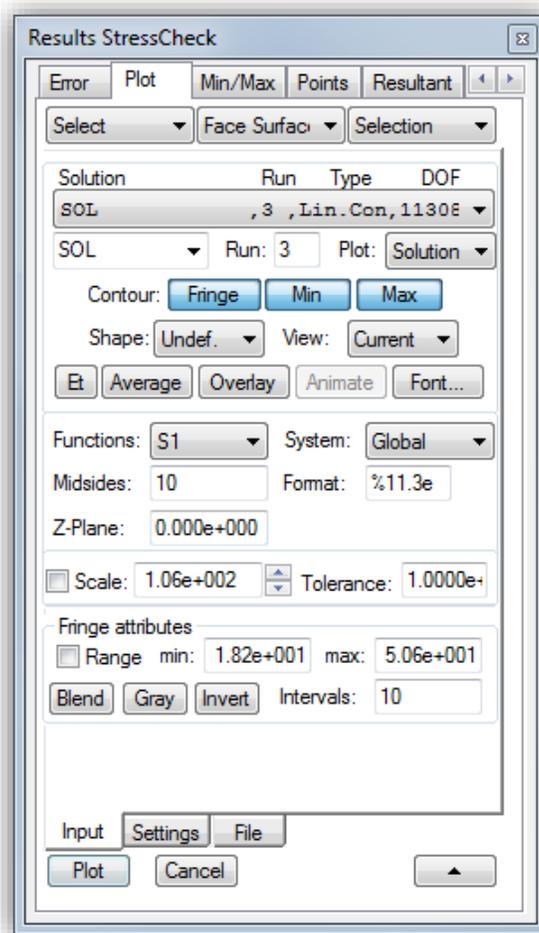

Figure 5: Results interface for plotting.

See PDF page 181 of the Master Guide for details.

IMPORT AND EXPORT PARAMETERS

The import and export process for parameters has been simplified. Users now have the ability to import and export parameters using the Import and Export options provided in the File Menu and readily accessible in the Main Toolbar buttons. The file type *.par has been added for importing and exporting parameters.

Figure 6: Import/Export buttons

See PDF page 36 of the Master Guide for details.

CONTACT ERROR LABEL

When solving a contact analysis problem, the associated live error update in the solver window is now more appropriately labelled as the "Max Contact Pressure Error." Additionally, the element number associated with the reported error value is also displayed in the solver window. This allows the user to quickly pinpoint which region has the highest contact pressure error. This information is also recorded in the project log for future reference. It is important to note that the error being reported in v10.3 is the same error as reported in previous versions of StressCheck, only the label has been updated for clarity.
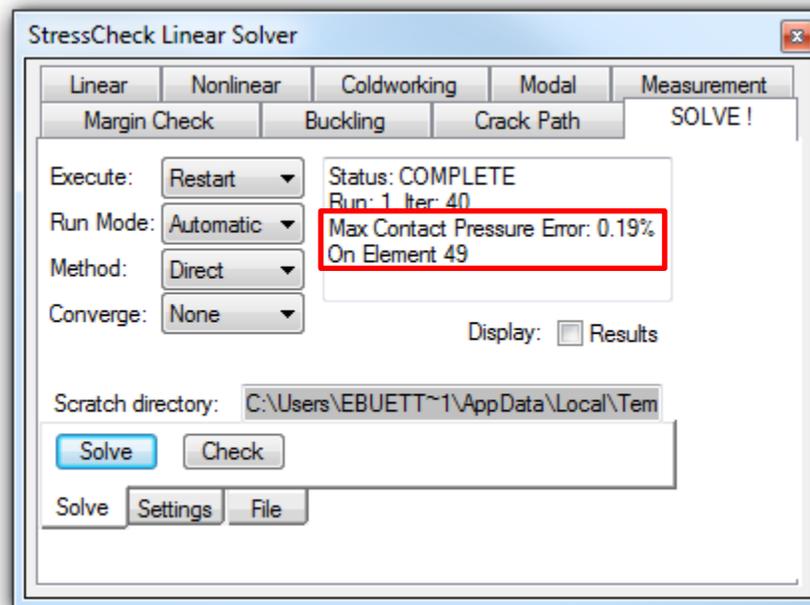

Figure 7: New contact error label

See PDF page 942 of the Master Guide for details.

CENTER VISIBLE ELEMENTS ONLY

A Center Visible Elements button is now available, which allows the user to center the view with a single click based only on the visible elements in the display window. That is, any other object being displayed (nodes, curves, surfaces, bodies, etc.) are ignored when centering the view.
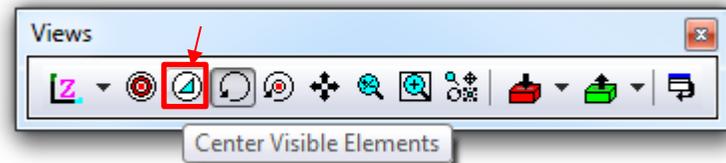

Figure 8: Center Visible Elements button as part of the Views Toolbar

See PDF page 53 of the Master Guide for details.

STRESSCHECK SERVER INSTALLATION

As in previous versions, StressCheck 10.3 can be deployed to run registration free. This allows users to run a 'server version' of StressCheck without any administrative privileges or registry modifications. StressCheck 10.3 can be deployed on a remote computer so that an engineer can mount the drive where the software is installed and run the application. The same installation file can be used to install StressCheck Professional 10.3 to a network drive or to a user's local machine.

See *StressCheck 10-3 Professional Server Installation Instructions.pdf* for additional details.

LIST OF RESOLVED ISSUES AND MINOR IMPROVEMENTS

Topic	Description
COM	*TLAP Traction* and *TLAP Bearing* loads are now available through COM.
	Fixed issue with *Point Extraction* for a *Face Set*.
	Object Sets can now be used for SRS load assignments.
	Improved *Loads.Remove* behavior to allow removing single records.
	Fixed issue with *Sets.Clear()* where it could not delete sets.
	*Local System*s can now be used in *Region Sets*.
Contact	Checking *Region Sets* in *Contact* problems is much faster now.
Contour Plot	Fixed issue when selecting *Surfaces* for *Contour Plot*.
Cutting Plane	Fixed display issues (shagged and discontinuous Contour Plots) with the *Contour Plane*.
	Fixed an issue where a *Contour Plot* would be removed from the *Cutting Plane* if a *Saved View* was recalled.
Fracture	Fixed *Edge Curve* selection that led to duplicate point extractions.
	Resolved issue with *SIF preview circle* not being correctly located (2D)
	SIF extraction can now be performed using *Point* to select the *Crack tip*, for a Point is not associated but shares the same coordinates than the *Node* at the crack tip (2D).
	Fixed error on *J-integral* extraction where wrong coordinates and plot were displayed (2D).
GUI	Added tooltips for all icons on the *Views Toolbar*.
	Fixed an issue with bad *Graph* numbering.
	Improved the behavior of the *Options* dialog to make it more consistent with standard Windows behavior.
H-Discretization	Now nodes are automatically merged after *h-discretization* of an auto laminated model.
ITP	Fixed issue with *Incremental Theory of Plasticity* that caused divergence of the solution when springs and tractions were applied to the same element.
Parameters	Fixed issue were a *Load* defined by a *Formula* was not being updated after parameter change when performing a *Load Check*.
Saving	Fixed issue with *Parts* not being visible after reopening a saved file.
Shell Resultants	Fixed bug computing *Shell resultants*
Solver	Fixed issue that prevented the *Esc* key to cancel an ongoing solution.
SRS/BRS	Fixed bug with *SRS* load assignment on elements not close to the loaded surfaces.
	Fixed *SRS* label swap for stress and strain.
	Fixed issue with Undo not working for *BRS* loads.
TLAP	Fixed Log entry when deleting multiple records in the *TLAP Case Definitions* window.
	A *Warning* is now issued when a *TLAP* assignment is performed on an internal surface.
	For a *TLAP Copy* operation, if the total number of points or the point numbers are not the same for the original (copy from) and the target (copy to) Case ID, the copy operation will fail and a warning will be issued.