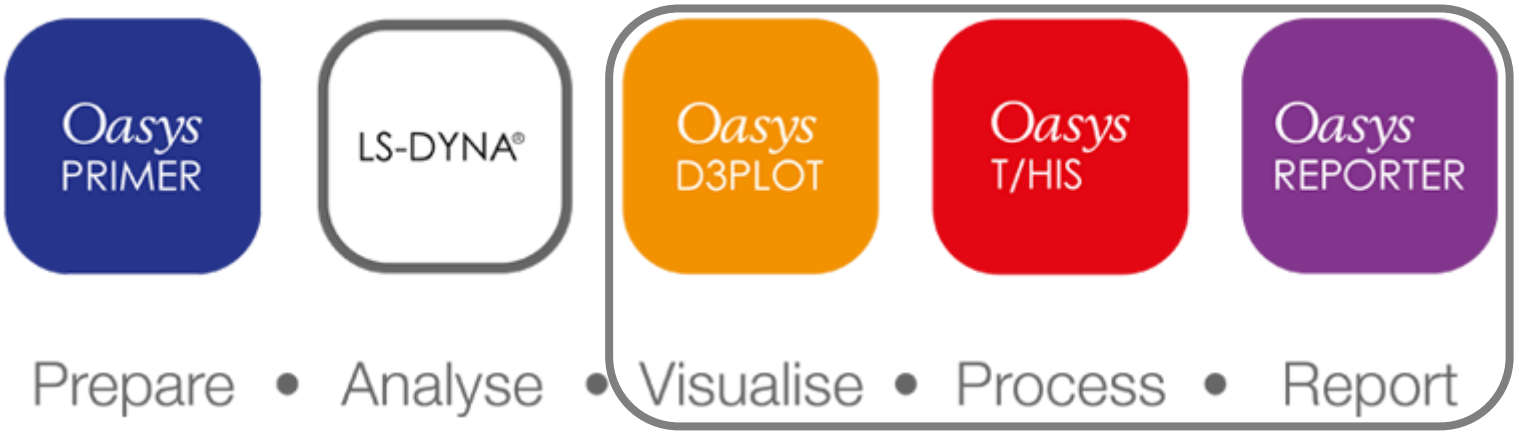
Oasys Post Processing

New Features in Version 16.0



www.arup.com/dyna

Oasys D3PLOT

- Model Visualisation
- Plot Tension and Compression
- Display Loads
- Transparent Cut-Sections
- Save and Retrieve Sessions

Oasys T/HIS

- Curve Table
- Regression Curves
- Anti-aliased Curves
- Save and Retrieve Sessions
- FAST-TCF Scripting
- JavaScript

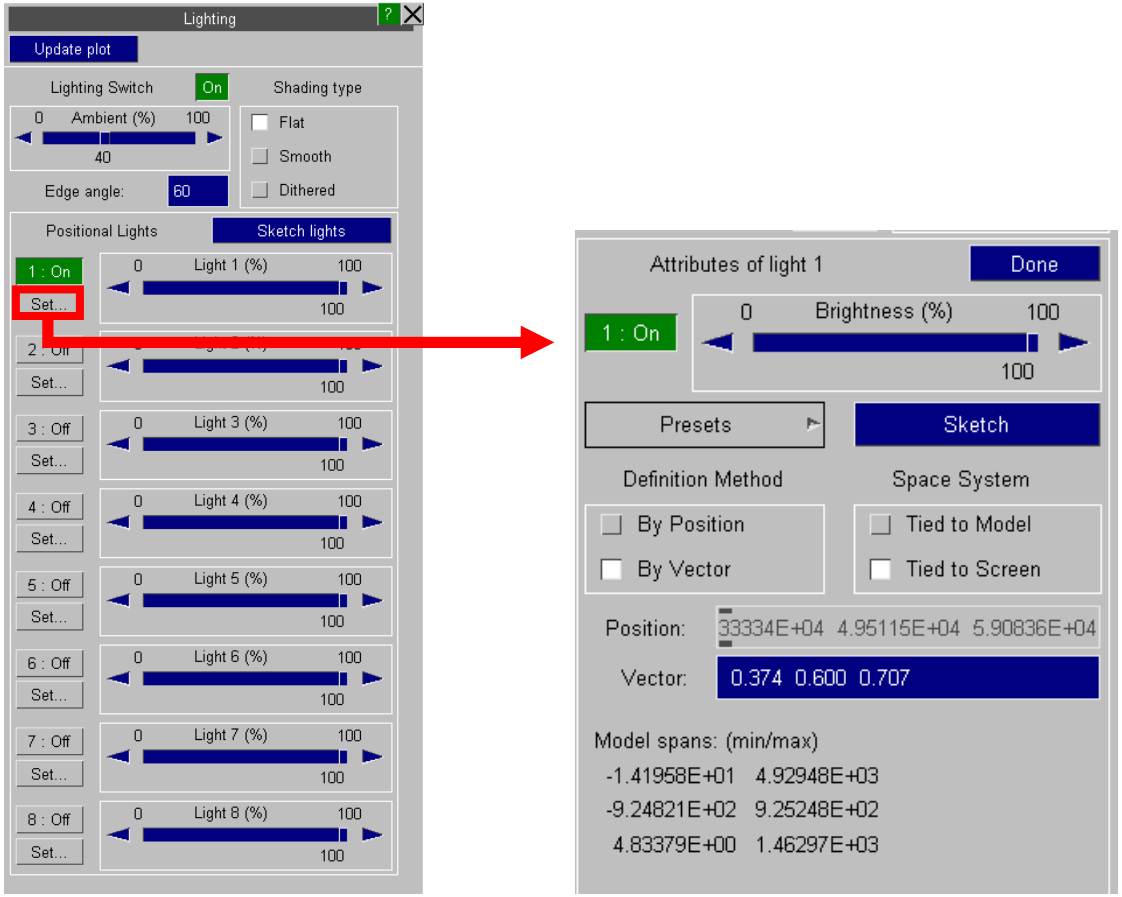
Oasys REPORTER

- Standard Templates to Summarise Model Output
- New Fonts
- Table Enhancements

D3PLOT 16.0

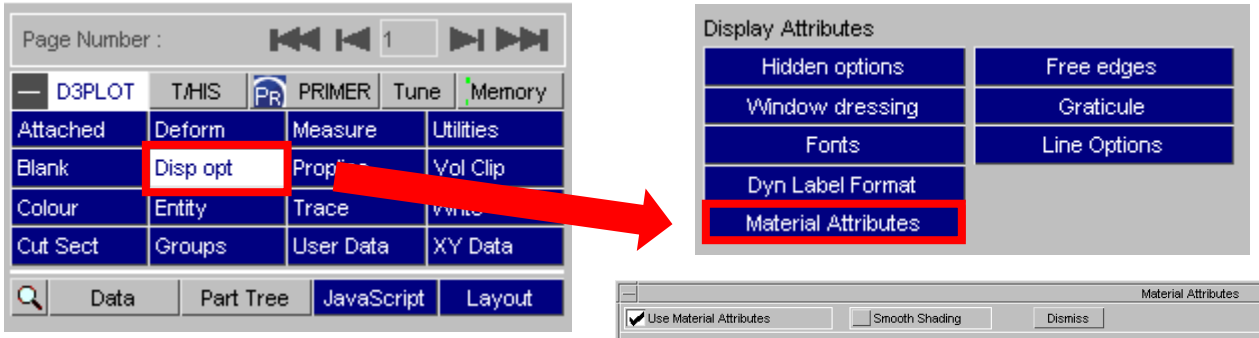
Model Visualisation

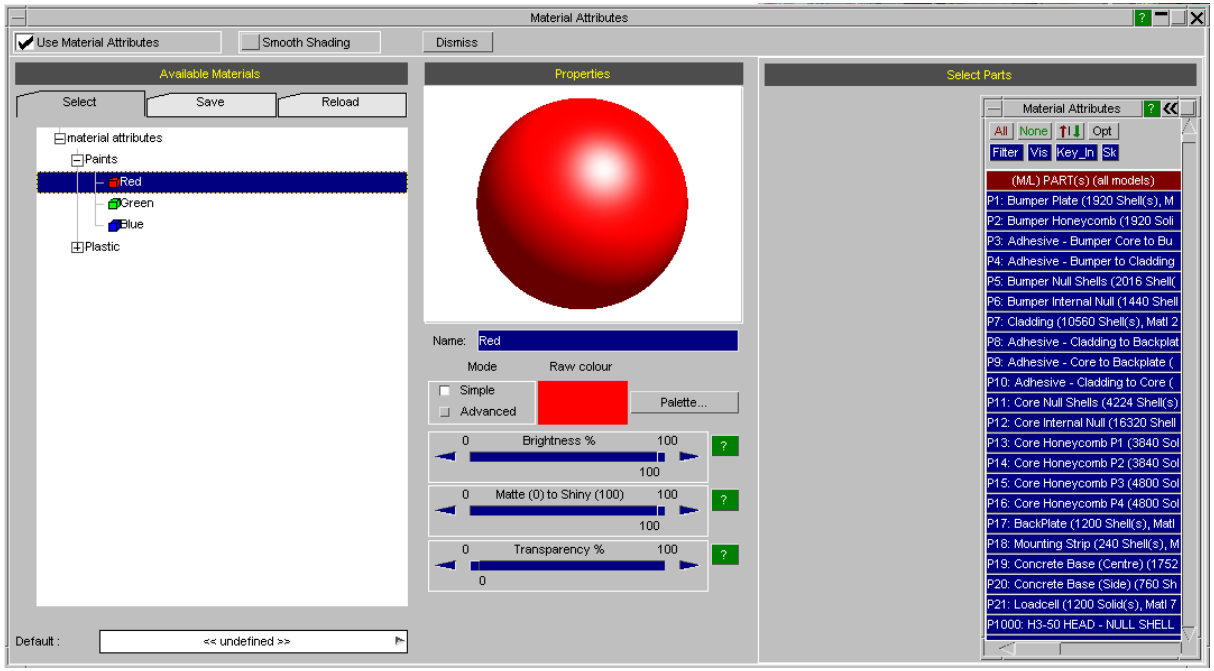
Lighting Panel



Material Attributes

New in D3PLOT 16, the Material Attributes panel allows for a greater range of part-specific colour and lighting control.

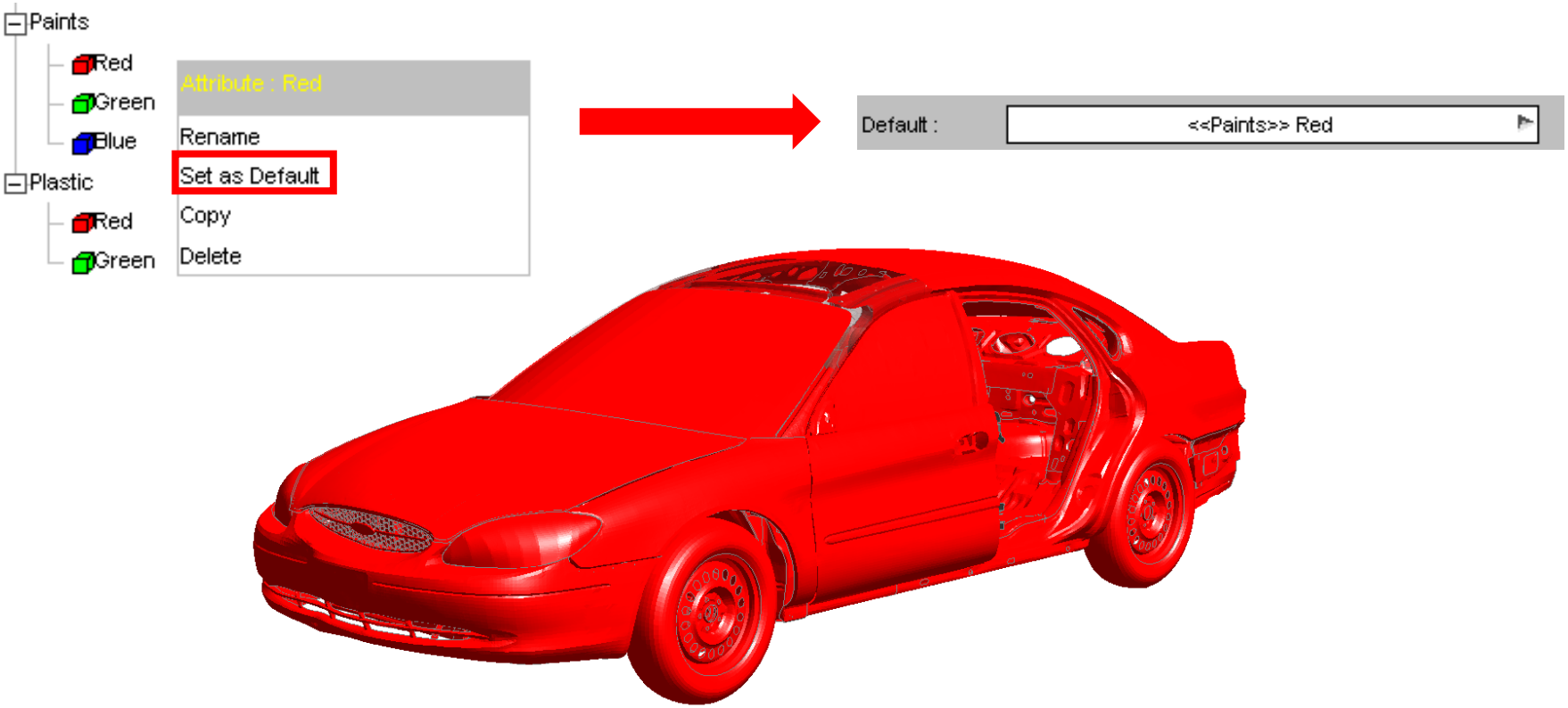




DEMO

An Attribute can be set as the “Default” attribute to apply by right clicking the attribute.

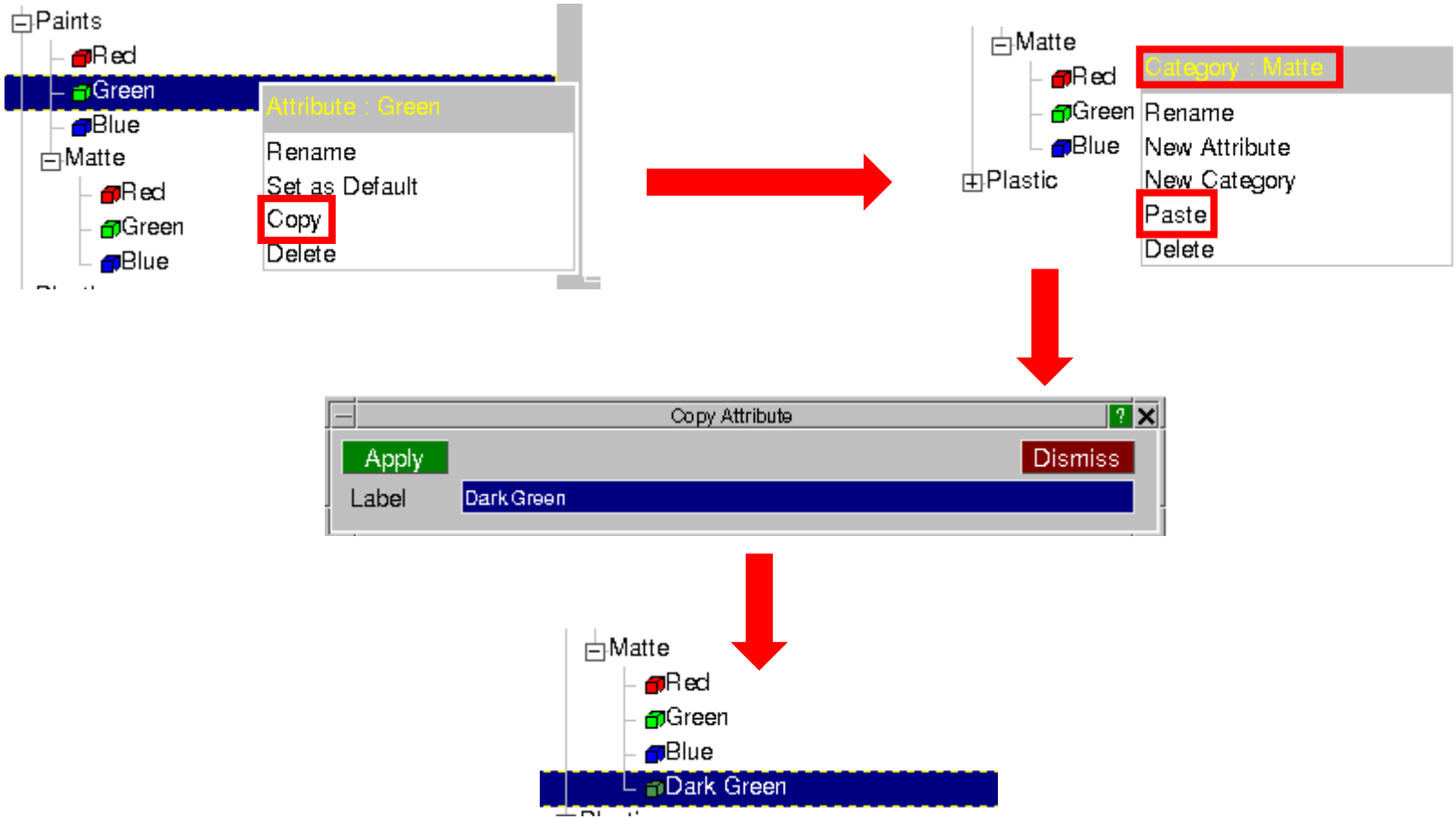
Setting this will apply the selected attribute to all parts within the model that do not currently have an attribute applied to them.



Material Attributes

DEMO

Attributes can be copied and pasted into other categories so that variants can be quickly created without having to re-adjust all of the material properties.



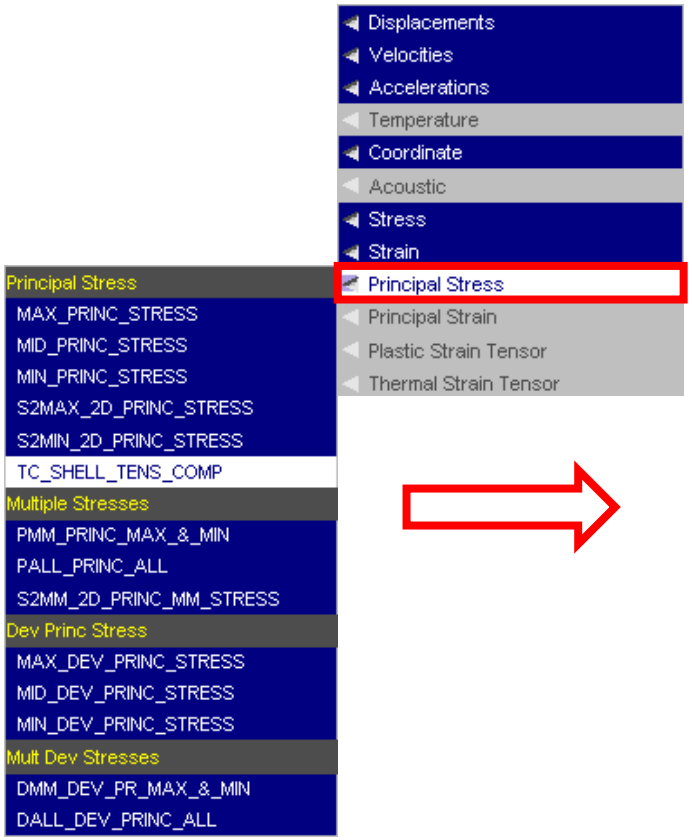
Material Attributes

Material Attributes

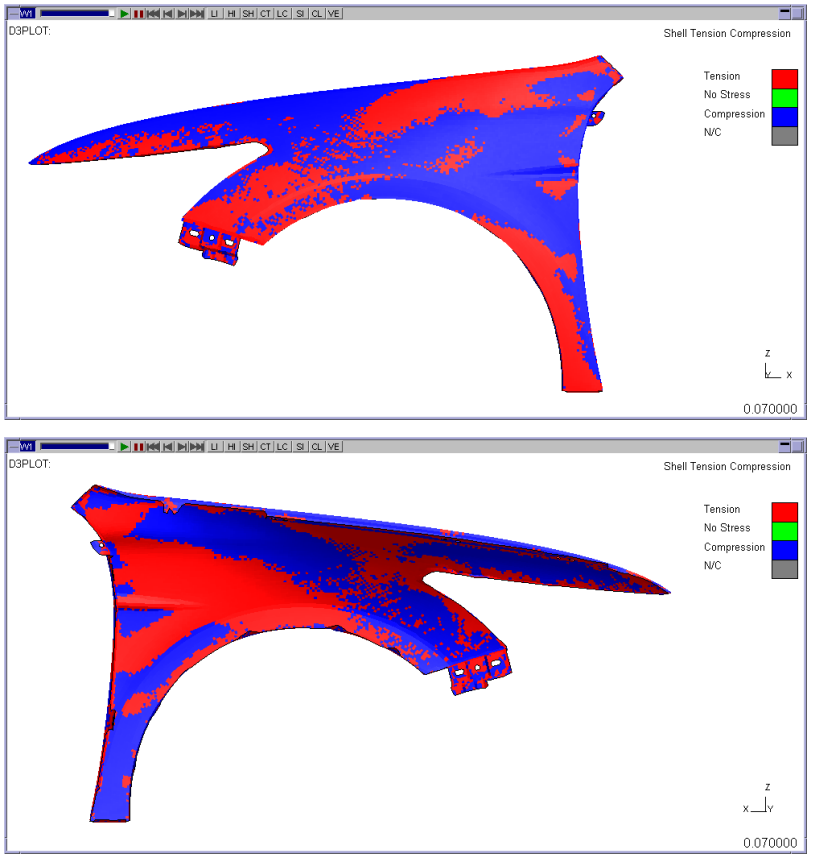
Shell Tension/Compression Data Component

Shell Tension/Compression

D3PLOT 16 can display a component that shows whether the surface of a shell that the user can see is in tension or compression. The contour colours on the top and bottom surface of the shell can be different colours, e.g. if the shell is in bending.



Front and back views of the same part, showing some areas of shells in bending



Shell Tension/Compression

The surface of the shell is considered to be in tension if the maximum principal stress is greater in magnitude than the minimum principal stress and vice versa for compression.

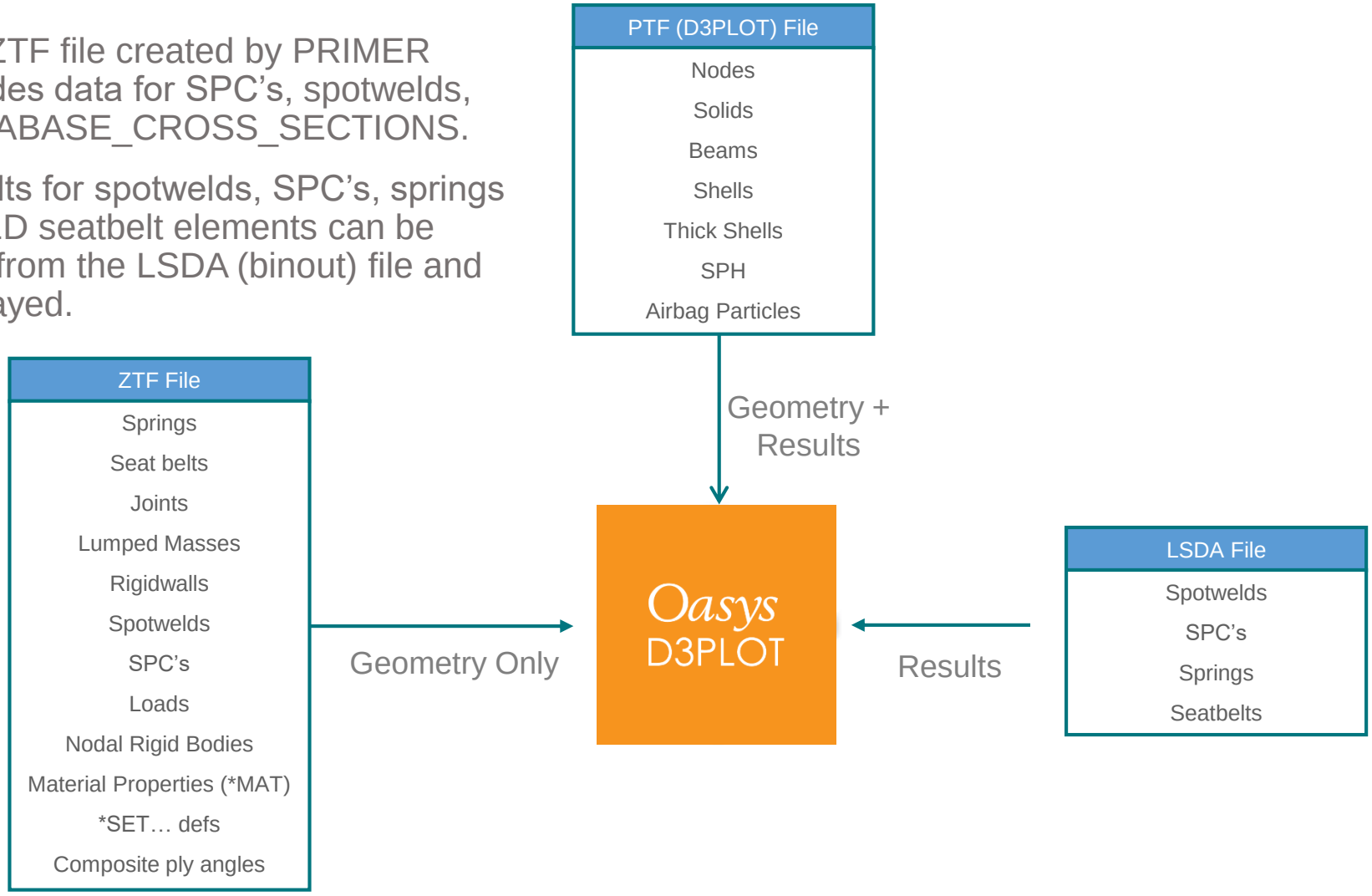
If the principal stress values on the shell surface are zero then the shell surface is contoured in green, e.g. at the beginning of an analysis.

If the shell surface cannot be computed then the shell surface is contoured in grey, for example if the number of through thickness integration points output does not include the top surface of the shell.

Displaying Loads

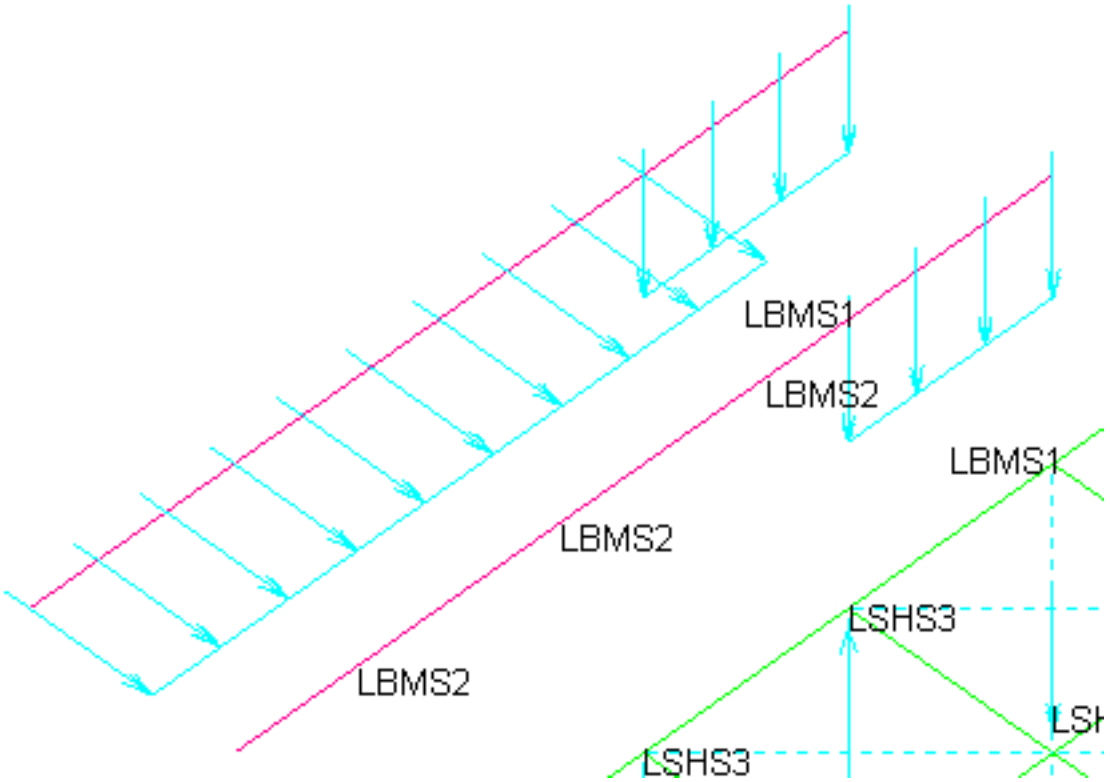
Data Read into D3PLOT

- The ZTF file created by PRIMER includes data for SPC's, spotwelds, *DATABASE_CROSS_SECTIONS.
- Results for spotwelds, SPC's, springs and 1D seatbelt elements can be read from the LSDA (binout) file and displayed.



Displaying Loads

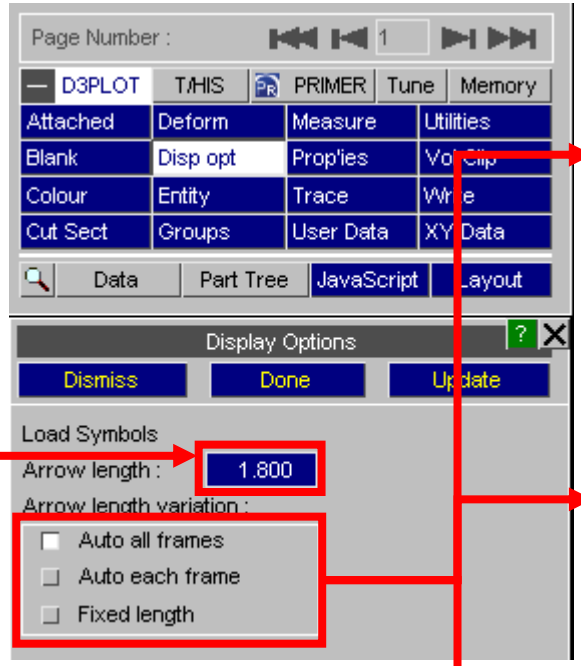
D3PLOT v16 introduces the ability to display loads on the model. Load information is transferred to D3PLOT via the ZTF file, so it is necessary to generate a ZTF file with PRIMER v16 for load plotting to be available.

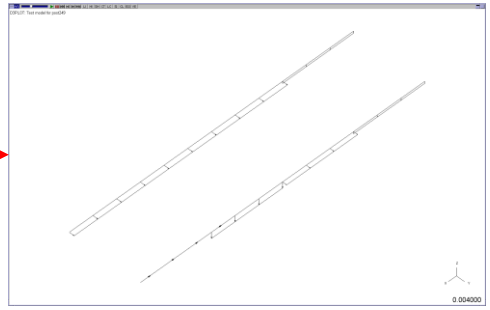


Displaying Loads

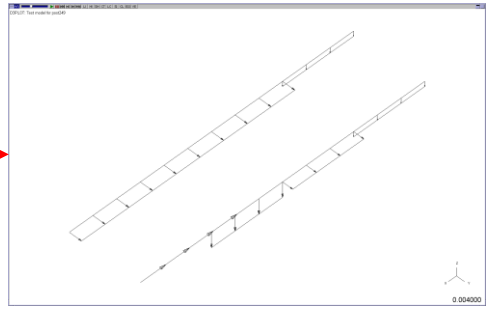
The display of loads can be controlled in Disp opt >> Loads

The size of load symbols can be adjusted.

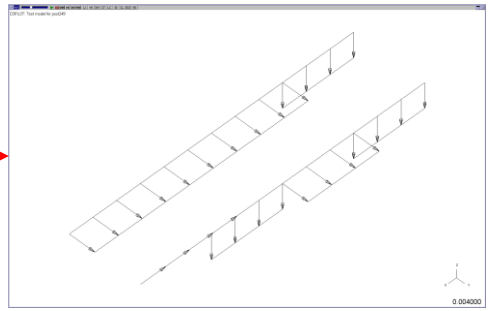




Auto all frames – load symbols normalised to maximum value across all states – as you step through states loads will 'grow'.

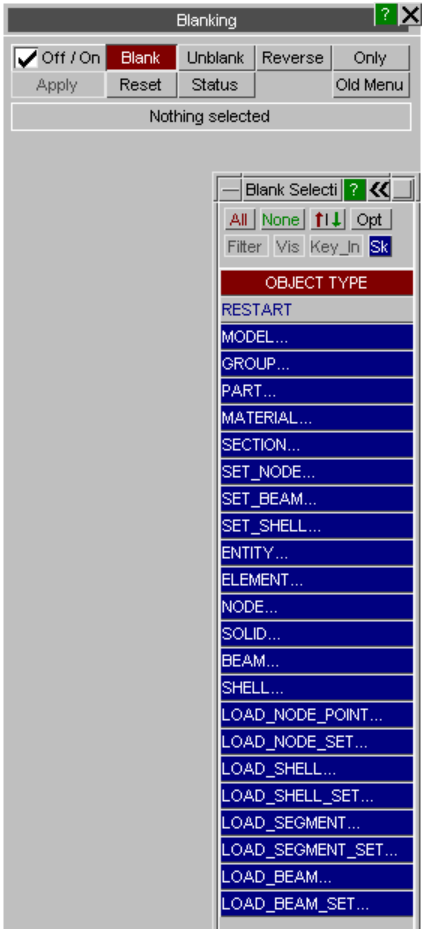


Auto each frame – load symbols normalised to maximum value in current state – shows distribution but not time variation.

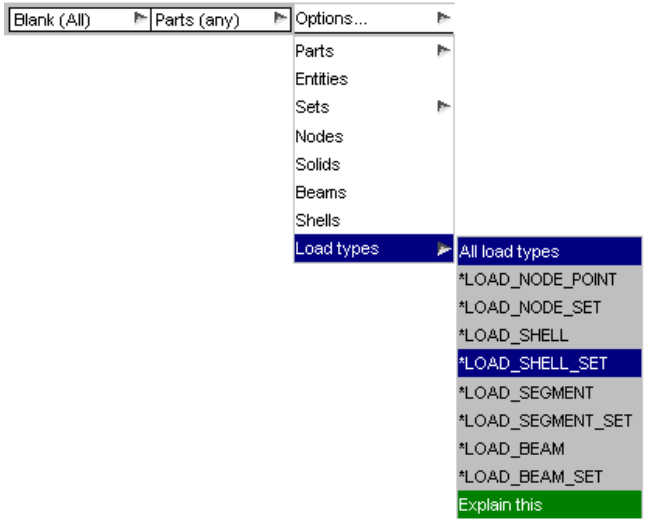


Fixed length – load symbols all shown with fixed length.

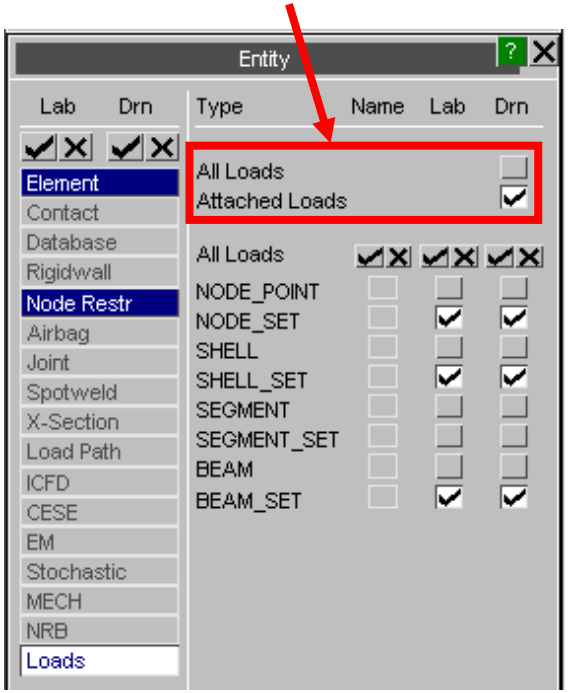
Displaying Loads



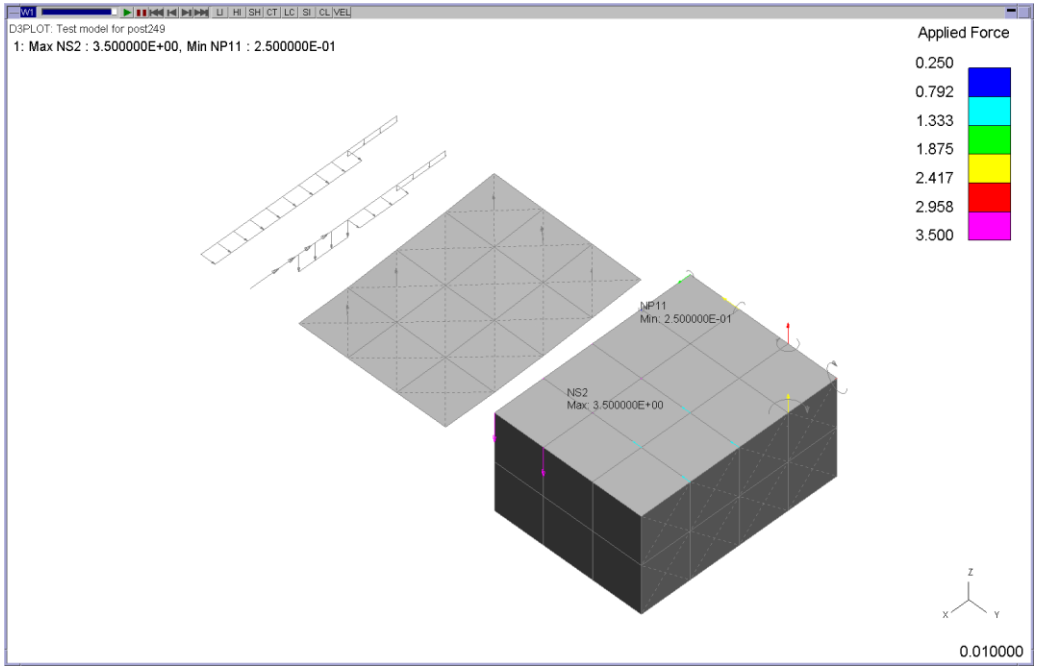
Loads can be blanked via the Blanking menu or using Quick Pick



Loads can be set to be shown only when the node or element they are applied to is visible, or to always be shown.



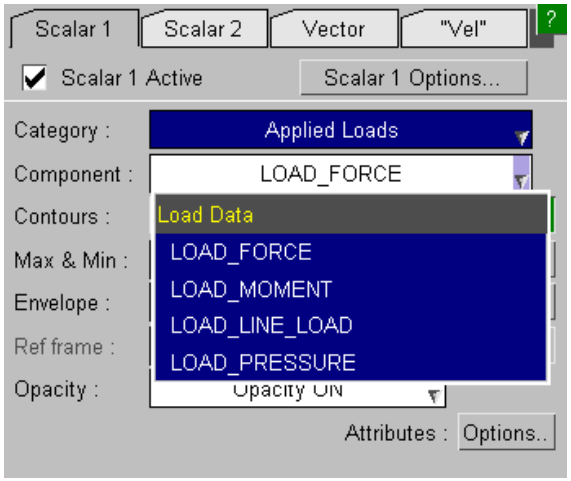
Displaying Loads



Loads can be contoured in CT and SI plot modes

A new component category “Applied Loads” has been added. This contains four components:

- LOAD_FORCE (node loads DOF 1-4)
- LOAD_MOMENT (node loads DOF 5-8)
- LOAD_LINE_LOAD (beam loads)
- LOAD_PRESSURE (shell & segment loads)



Displaying Loads

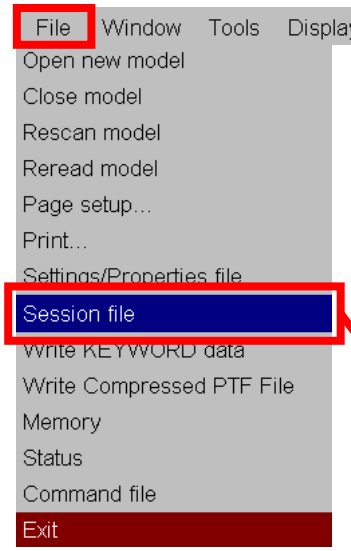
Load display has the following limitations:

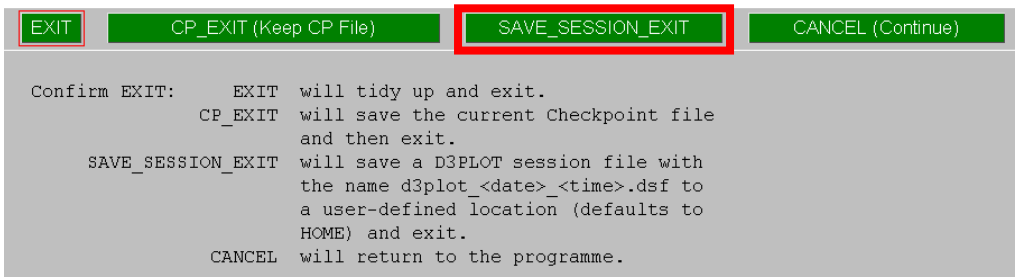
- Only the following load types can be plotted:
  - LOAD_NODE_POINT / SET,
  - LOAD_BEAM(_SET),
  - LOAD_SHELL(_SET),
  - LOAD_SEGMENT(_SET).
- Loads defined with functions are not supported and will not be displayed.
- The information to display loads is new to the v16.0 ZTF file, so the ZTF file must be generated with v16.0 PRIMER.

Save and Retrieve Sessions

Session Files

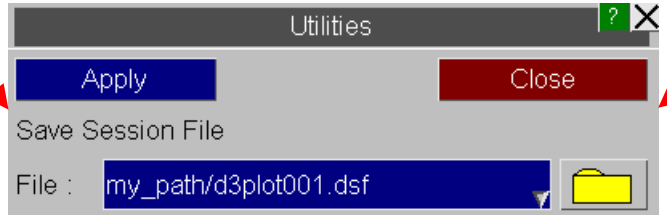
D3PLOT 16.0 introduces the ability to save and restore ‘sessions’, permitting the user to quickly revert to the state they were at when they last exited D3PLOT. Sessions may be saved via either the File popup menu, the Utilities panel or the EXIT window.

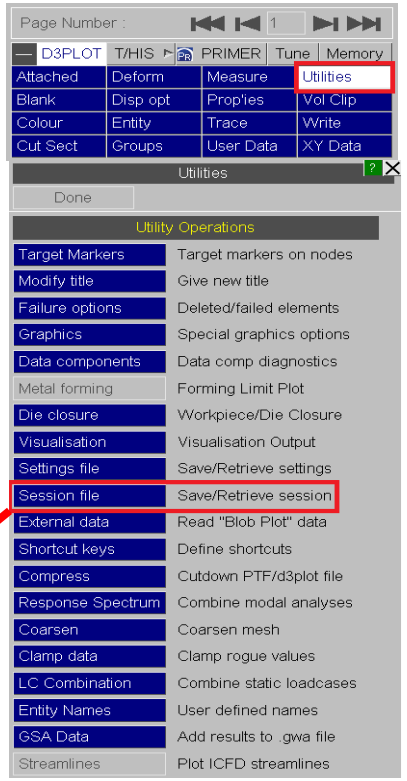




Auto-save

Explicit session path and name

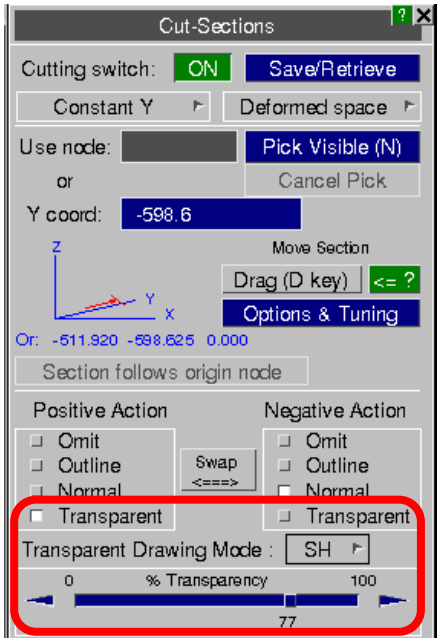


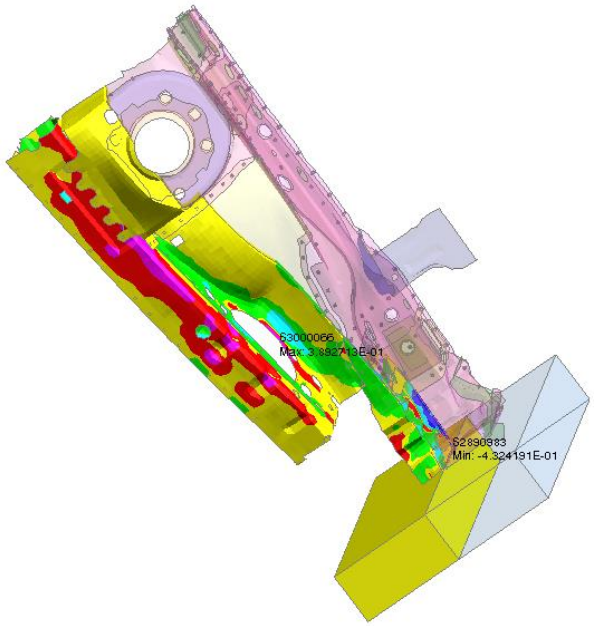


General – Cut Section Transparency

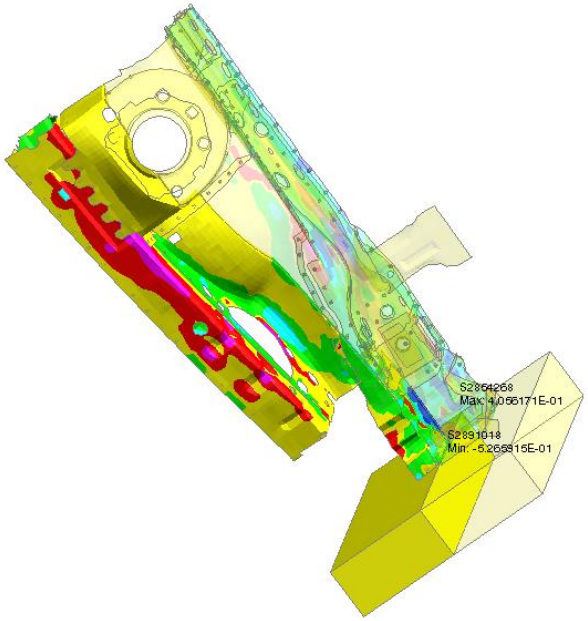
DEMO

Cut Sections now have a new ‘Transparent’ option for drawing either side of a Cut Section. Within this option, there are two drawing modes for colouring the transparent region, namely ‘Shaded’, which takes the colours from the original colours of the elements in the model, and ‘Current’, which takes the current colours of the model, such as contours with respect to a data component. The percentage transparency can be adjusted using the slider.





Shaded mode



Current mode

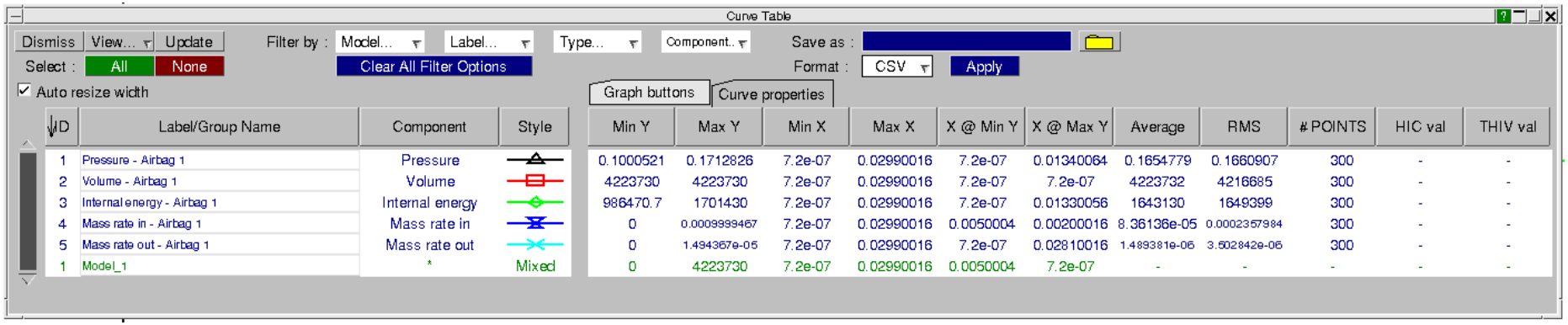
T/HIS 16.0

Oasys
T/HIS

- Curve Table
- Regression Curves
- Anti-aliased Curves
- Save and Retrieve Sessions
- FAST-TCF Scripting
- JavaScript

Curve Table

Curve Table



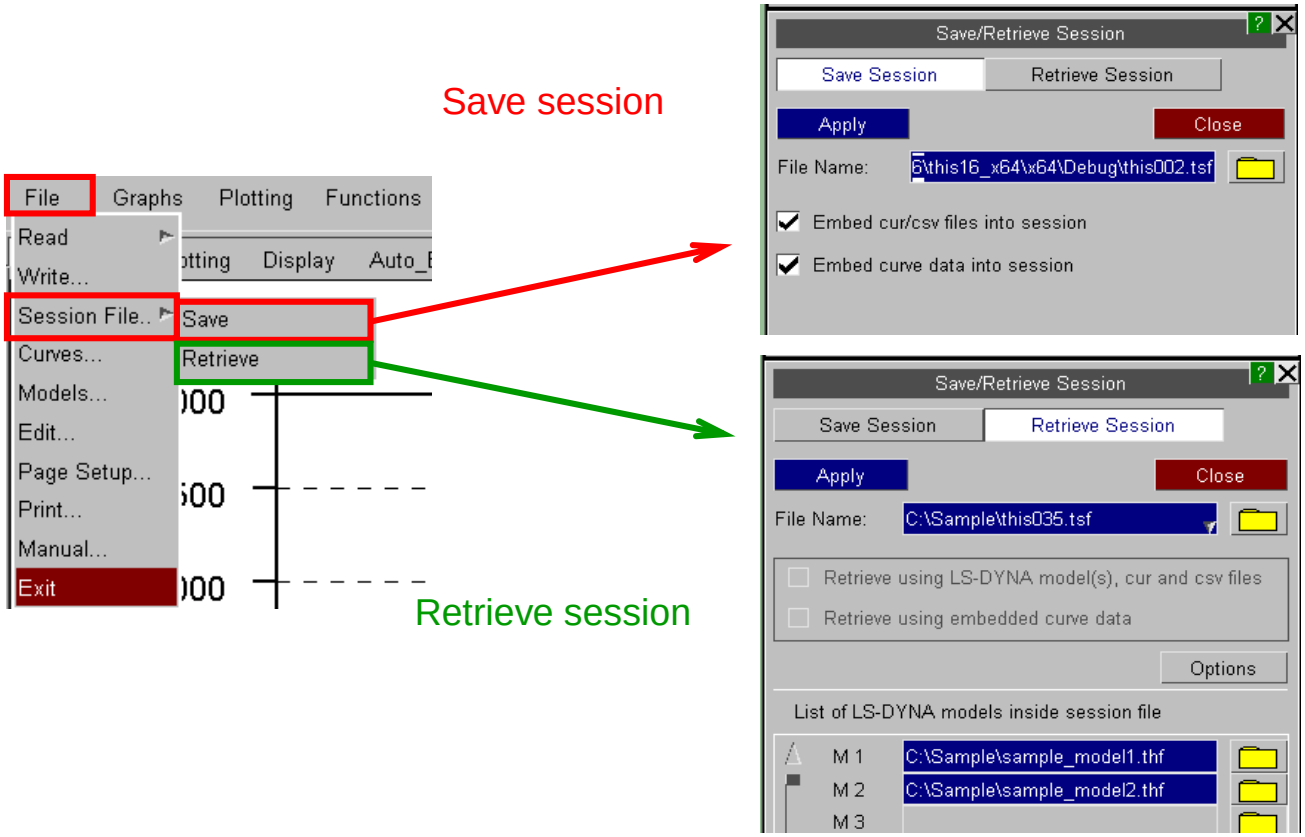
Multiple new features have been added to the curve table:

- Curve properties and injury values
- Write to CSV and XLSX files
- Operating on curves
- Annotating curves with property values

Session Files

T/HIS Session – Save and Retrieve

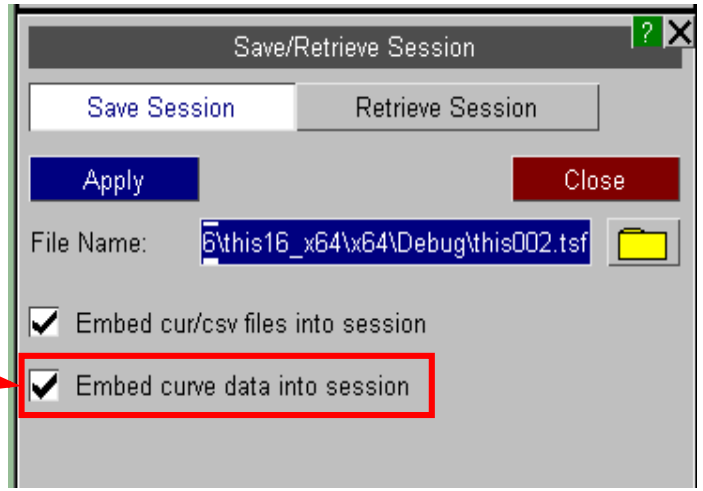
A T/HIS session can now be saved as a session file (.tsf), which can be read back in to restore the saved session.



T/HIS Session - Save

DEMO

The XY coordinate data for each curve in a session can be embedded into the session file. A session file with embedded curve data can be retrieved even if the model files are missing. Sessions retrieved using embedded curve data lose information such as curve IDs and graph properties. This option can be turned-on always, by using the new preference.

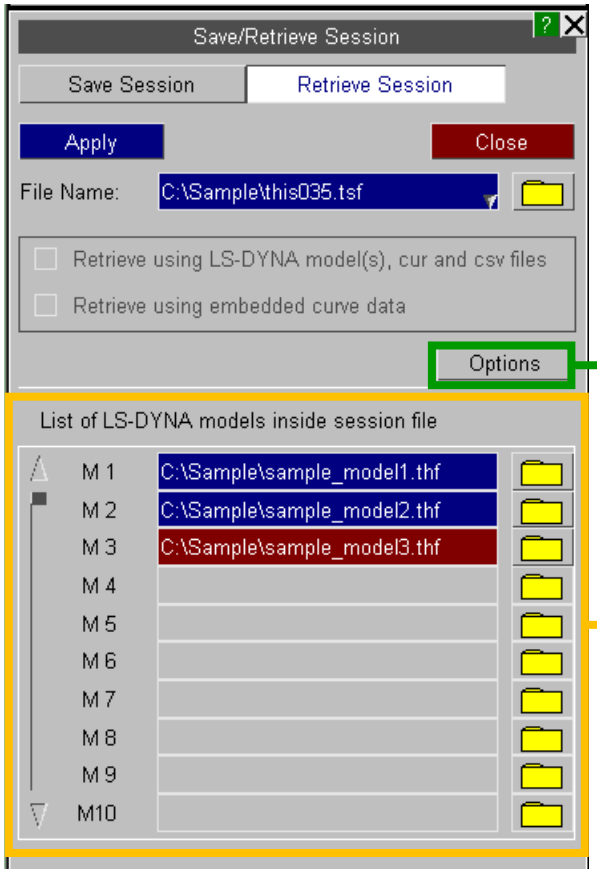


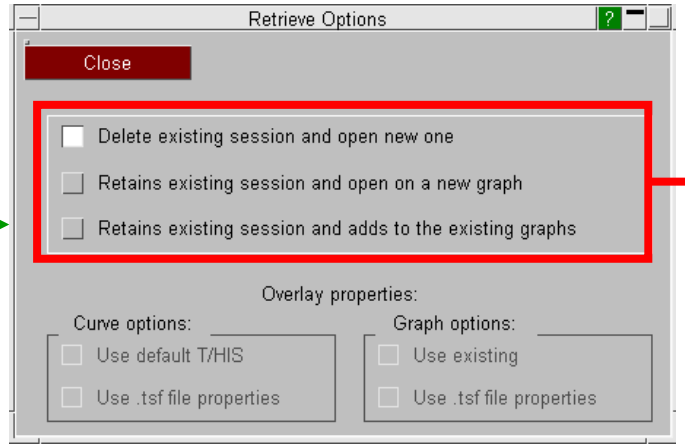
T/HIS Session - Retrieve

DEMO

Retrieving a session file which does not contain embedded curve data

The ‘Options’ button will be available if the current T/HIS session already contains curve(s) or model(s).





These options can be used to control how the new session is going to be opened when T/HIS already contains curve(s) or model(s).

List of all the LS-DYNA models that have been used by the session. Blue/red background colors indicate if T/HIS can/can’t find the LS-DYNA models used by the session. Path of the LS-DYNA models can be changed/updated manually or by using file selection browser.

Session File Preferences

The following preferences have been added to T/HIS and D3PLOT:

- **session_auto_save** Saves a session unconditionally on exit. By default T/HIS does not save session on exit.
  ON/OFF
- **session_save_option** Sets the location for auto saving of session on exit. By default will be saved to OA_HOME.
  HOME/USER_DEFINED/DESKTOP
- **session_save_dir** Defines the user-defined location for auto save on exit.
  string “pathname”

Session File Preferences

The following preferences have been added to T/HIS:

- **session_embed_cur/csv_files** Embed the cur and csv files used into the session file. By default cur/csv files are not embedded into session file.
  ON/OFF
- **session_embed_curve_data** Embed the curve data into the session file. This can help in retrieving a session even when LS-DYNA results are missing. By default curve data is not embedded into session files.
  ON/OFF
- **show_session_retrieve_on_start** A pop-up panel to retrieve T/HIS session file pops-up every time T/HIS is started. This panel does not appear by default.
  ON/OFF

New Preferences

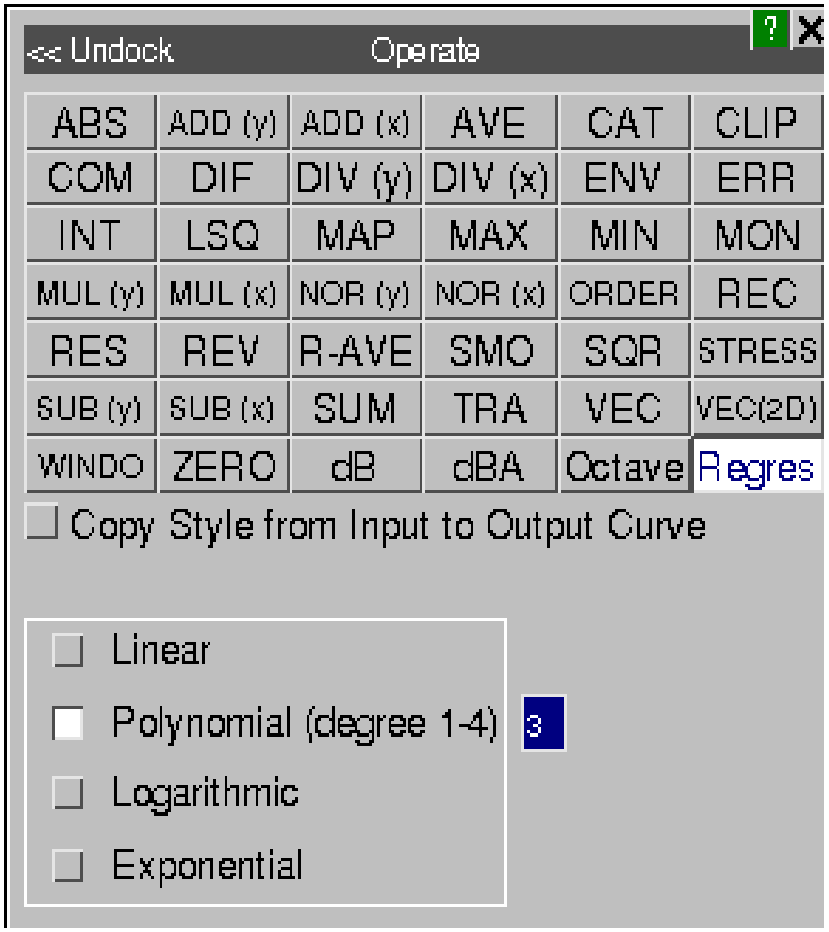
New Preferences

- **hic_time_window** Set default time window for HIC automotive function.
  float value
- **hic_scale_factor** Set default scale factor for HIC automotive function.
  float value
- **auto_hide** Auto-hides the graph toolbar. By default it is FALSE.
  TRUE/FALSE
- **drive_n** Mapping from Windows drive “n” to a unix path, where n is any drive from [a-z] i.e. drive_a, drive_q etc..
  This can be used with the “oasys*” prefix as the preference is now common between PRIMER, D3PLOT and T/HIS.
  string “pathname”

Curve Operations

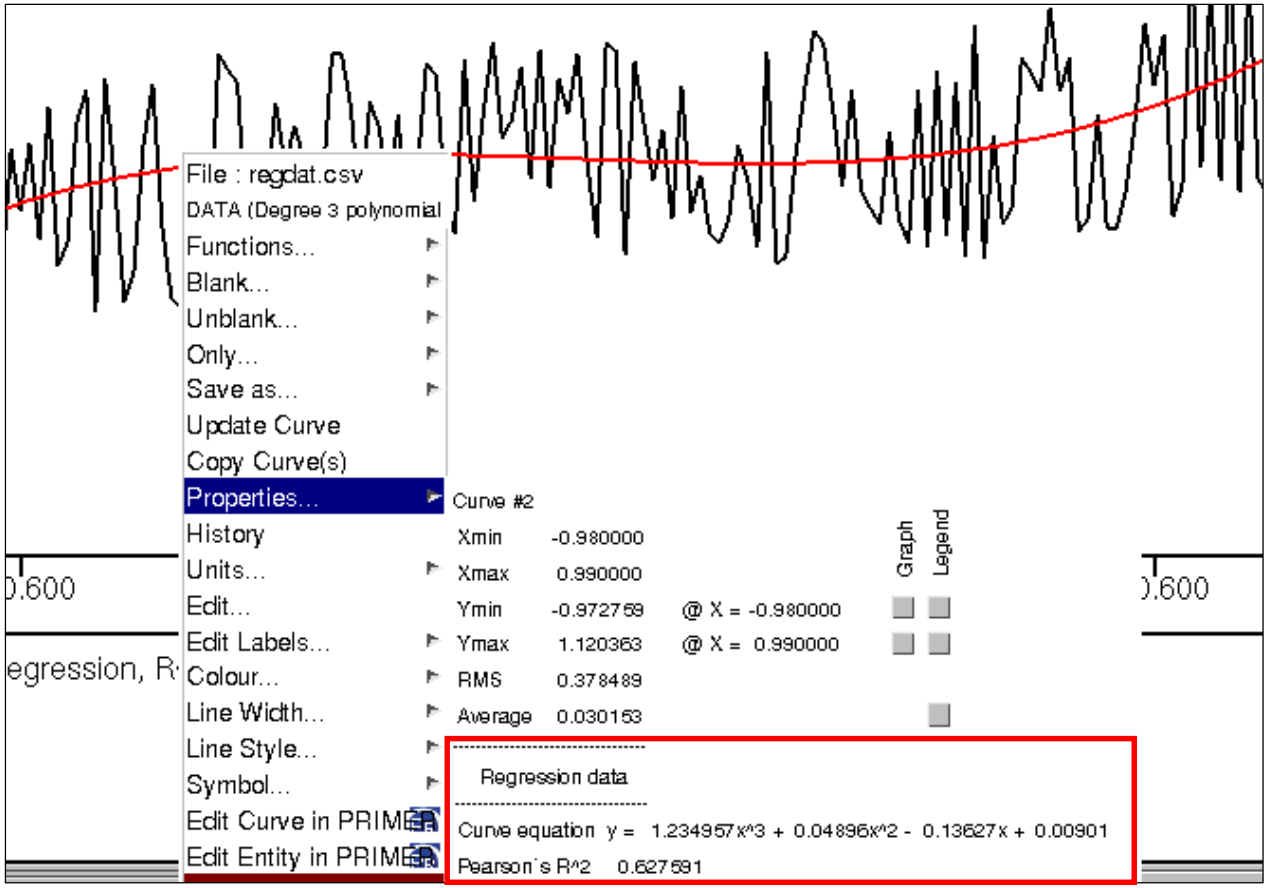
Curve Operations - Regression

The Regres operation applies least squares regression to fit data with either a linear, polynomial (degree 1-4), logarithmic or exponential curve.



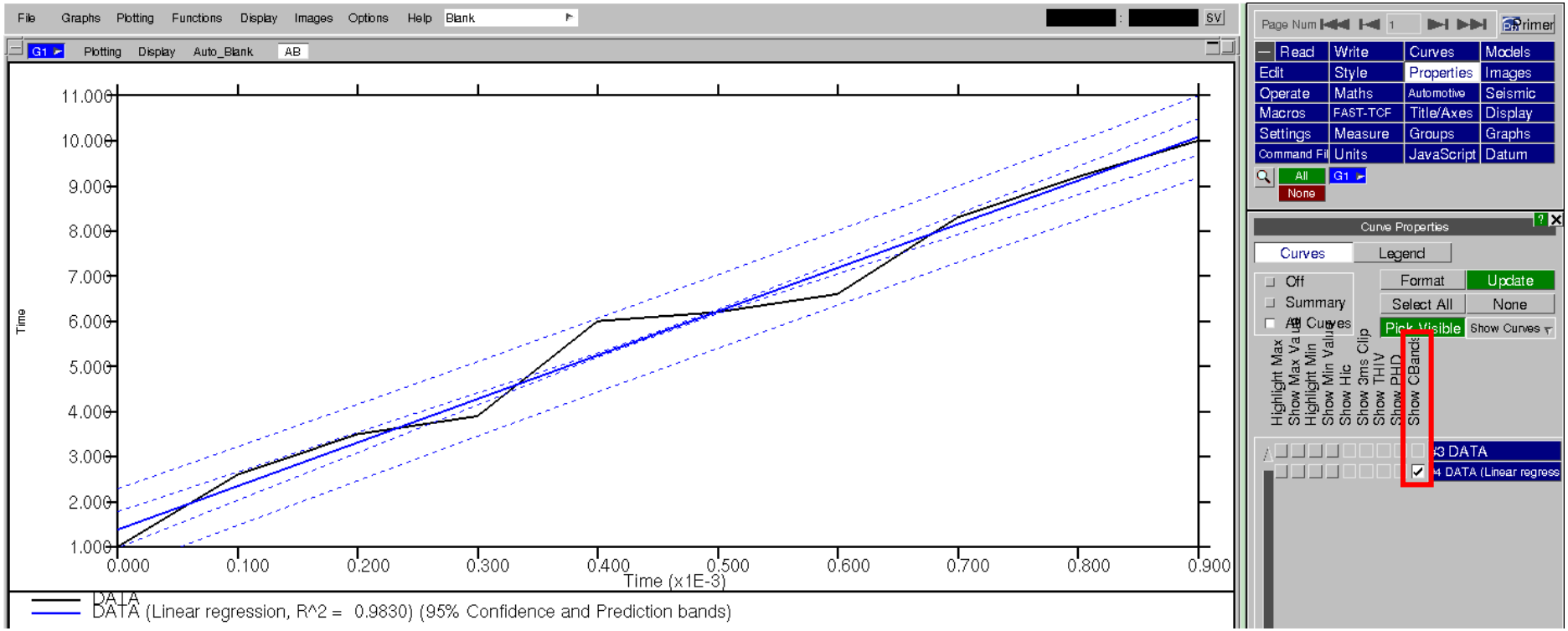
Curve Operations - Regression

The equation of the output curve and Pearson's R^2 coefficient can be viewed by right-clicking on the curve and selecting Properties.



Curve Operations - Regression

In the case of linear regression, additional statistics are given in the properties pop-up. Additionally, for linear regression it is possible to display 95% confidence and prediction bands around the output curve. These are displayed by selecting the Properties menu in the top-right panel and then ticking Show CBands.



Antialiasing Curves

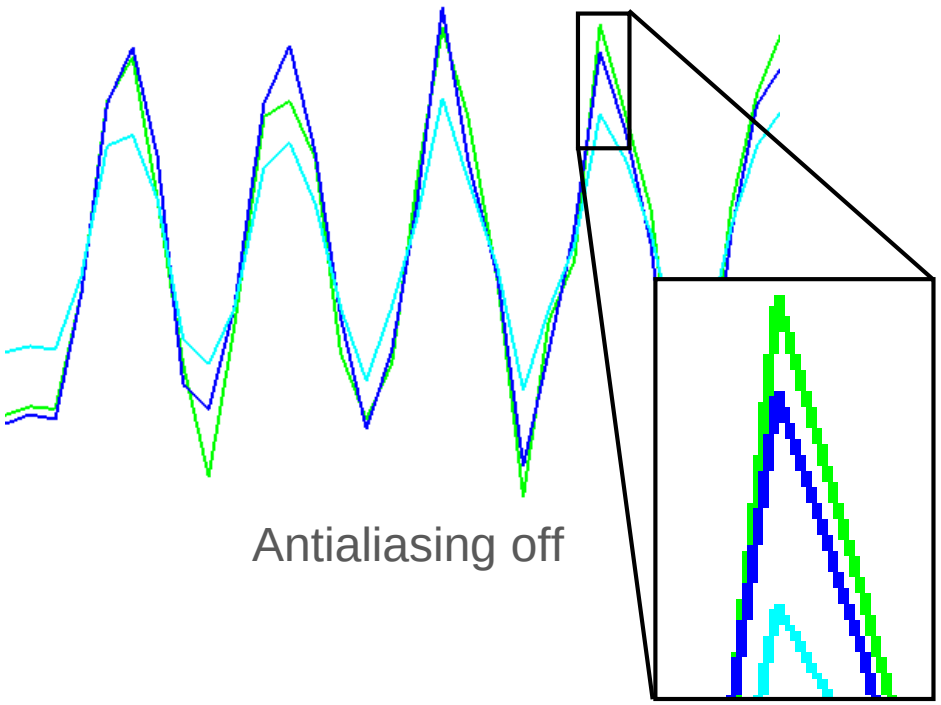
Antialiasing Curves

Curves are now antialiased by default in T/HIS, which gives them a smoother look. This can be turned on and off via:

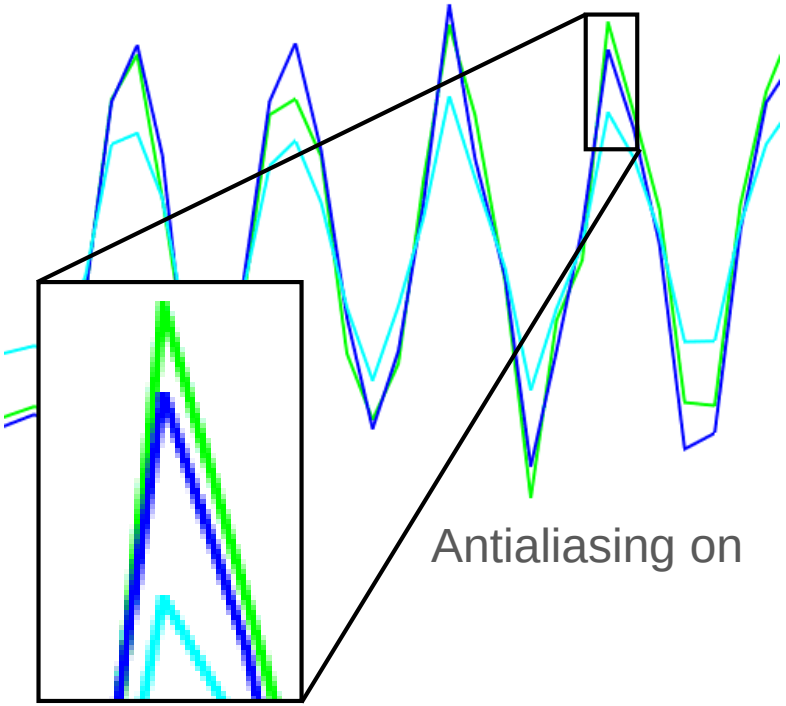
Display -> Use Antialised Lines

There is also a preference that can be used to turn this on or off by default:

this*line_antialias: ON/OFF



Antialiasing off



Antialiasing on

JavaScript

New JavaScript Functions – Page Class

Function	Description
Page.RemoveGraph(*page, graph, graph_start, graph_end*)	Removes graph *graph* from page *page.* If *graph* = 0, remove graphs with graph numbers between *graph_start* and *graph_end,* or just remove the highest ID graph if these are not specified.
Page.Layout(*page, layout, n_x, n_y*)	Sets the layout of page *page* to the layout given by the specifier *layout*, which can be any of “wide”, ”tall”, ”cascade”, ”1x1”, ”2x2”, ”3x3”, “xy”. If *layout* = “xy”, then *n_x* and *n_y* give the number of graphs in the x- and y-directions respectively. If *page* = 0, the layout is set on all graphs individually. If *page* = -1, the layout is set globally, as in the ‘Graphs’ panel.

New JavaScript Functions – Group Class

Function	Description
Group.xmin/xmax	Minimum/maximum X value over all curves in the group.
Group.ymin/ymax	Minimum/maximum Y value over all curves in the group.
Group.x_at_ymin/ymax	X value at minimum/maximum Y value over all curves in the group.
Group.crv_at_ymin/ymax	Curve number of the curve with the minimum/maximum Y value in the group.
Group.xminpos/yminpos	Minimum positive X value/Y value over all curves in the group.
Group.x_at_yminpos	X value at minimum positive Y value over all curves in the group.

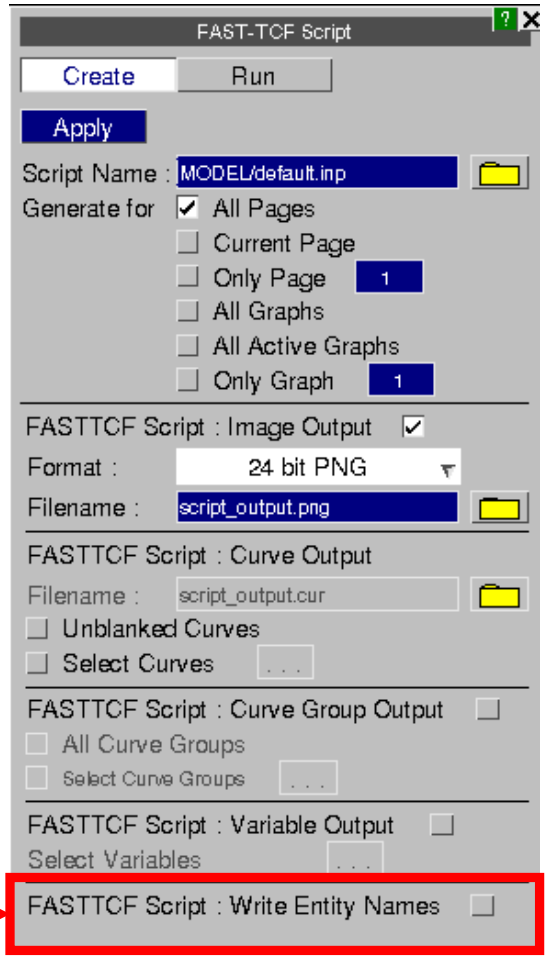
New JavaScript Functions – Read Class

Function	Description
Read.CSV(*filename*, *file_type,* *sep_opt,* *curve_label_row,* *axis_label_row,* *x_vals_col,* *x_start,* *x_int)*	Reads a CSV file named *filename* into T/HIS. The filetype can be specified, either 1 for XYXY or 2 for XYYY. The separator used in the file can be specified, either 0 for comma, 1 for space or 2 for tab. The rows containing the curve labels and axis labels can also be specified. Respectively, these are 1 and 2 by default. Either the column containing the x-values or a user defined start value and interval between points can be defined for the x-axis.
Read.Cur(*filename*)	Reads a .cur file named *filename* into T/HIS.

FAST-TCF

FAST-TCF

An option has been added to the FAST-TCF create panel, so that one can choose to write entity names (when they exist), in place of IDs, into any generated FAST-TCF script. These names will then be used to identify the entities when running the script.



FAST-TCF

The following commands have been added to FAST-TCF:

Command	Arguments	Description
colour	n RRGGBB	Set the n-th user-defined colour (up to 6) using a 6-digit hexadecimal to specify the RGB values.
colour_rgb	n R G B	Set the n-th user-defined colour (up to 6) using three integers in the range 0-255 to specify the RGB values.
y_min, ymax, y2_min, y2_max	auto_vis	Set the minimum/maximum value on the y/y2-axis to the automatic value based on the currently visible section of the x-axis. Similar to 'Y' shortcut key.

Command	Arguments	Description
y_ranges	auto auto_vis y_auto y_auto_vis y2_auto y2_auto_vis	Set the minimum and maximum values simultaneously on either the y-axis, the y2-axis or both together. These can be set either to the automatic values based on the whole x-axis or just on the visible portion.
varr vara varf tab taba tabc tabcr — VAR_NAME all	all_minx all_maxx all_miny all_maxy all_xatmin all_xatmax all_catmin all_catmax	New variables for properties relating to all curves. These give the min/max x, min/max y, x value at min/max y and curve number at min/max y respectively, each of which is calculated over all curves.

REPORTER 16.0

Oasys REPORTER

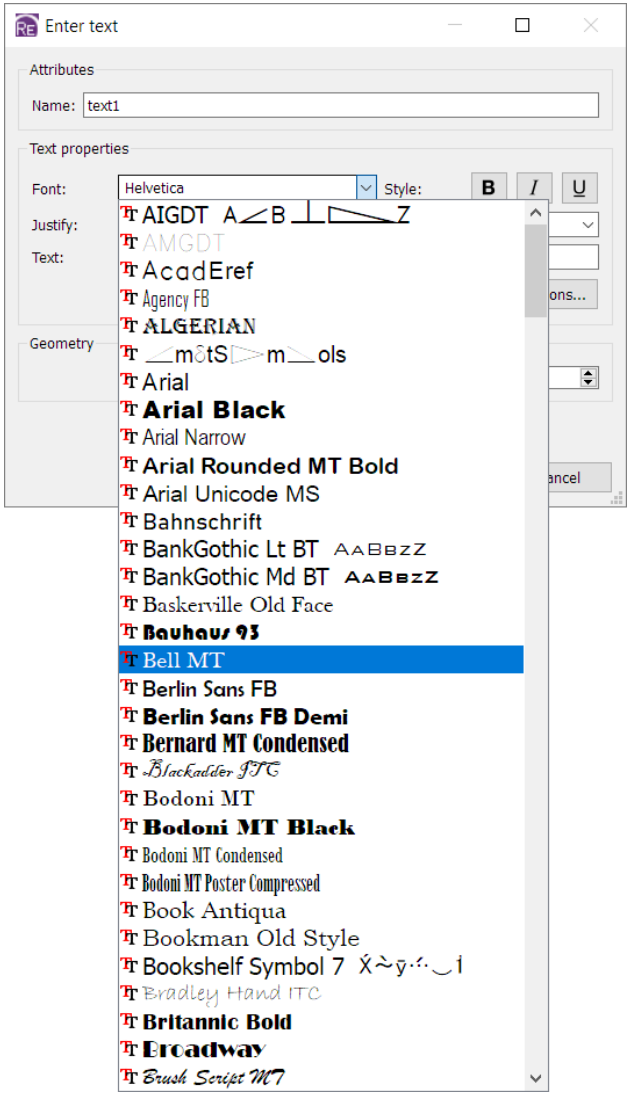
- Standard Templates to Summarise Model Output
- New Fonts
- Table Enhancements

Fonts

Until now, REPORTER has only supported four fonts (with very basic add-on support for Chinese, Japanese and Korean fonts):

Courier Helvetica Times Σψμβολ (Symbol)

Version 16.0 offers support for many more fonts, giving you greater control over the look of your reports, and allowing you to create templates that match your organisation's branding.



Fonts (continued)

Technical Details

Support for the four legacy fonts (Courier, Helvetica, Symbol, Times) is unchanged, so your existing REPORTER templates should be unaffected.

Now, REPORTER supports the following font types:

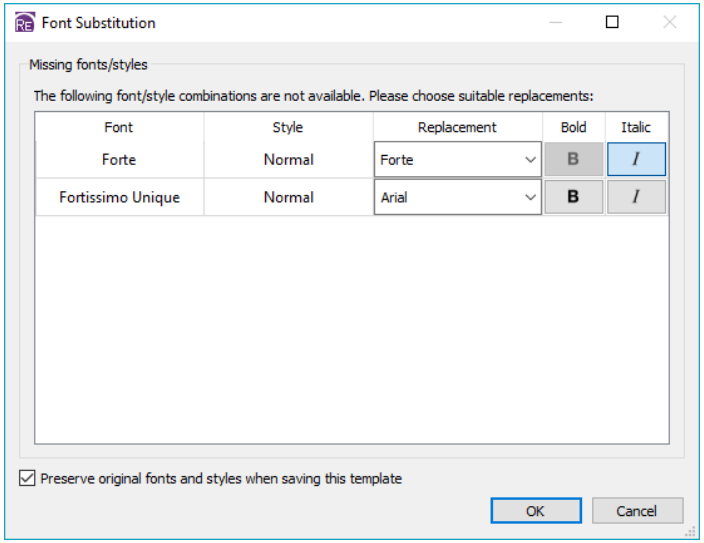
- TrueType fonts and collections (*.ttf* and *.ttc* files)
- OpenType fonts and collections (*.otf* and *.otc* files)
- Certain Type1 fonts (Printer Font Binary *.pfb* files and their *.pfm* metrics files)

Font Mapping

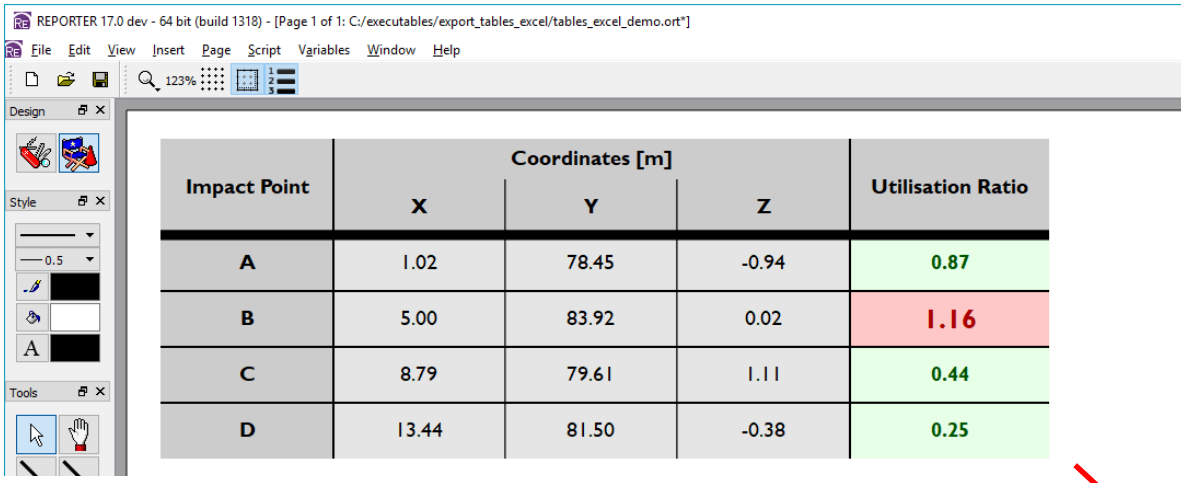
Customisable font mapping is provided to improve compatibility between users and operating systems. If another user shares a template with you that uses a font that is not installed on your system, suitable alternatives will be suggested in the Font Substitution dialog that appears when you open the template.

If you create templates on Windows but then run them in batch on a Linux server, font mapping will help preserve the look and style of your output.

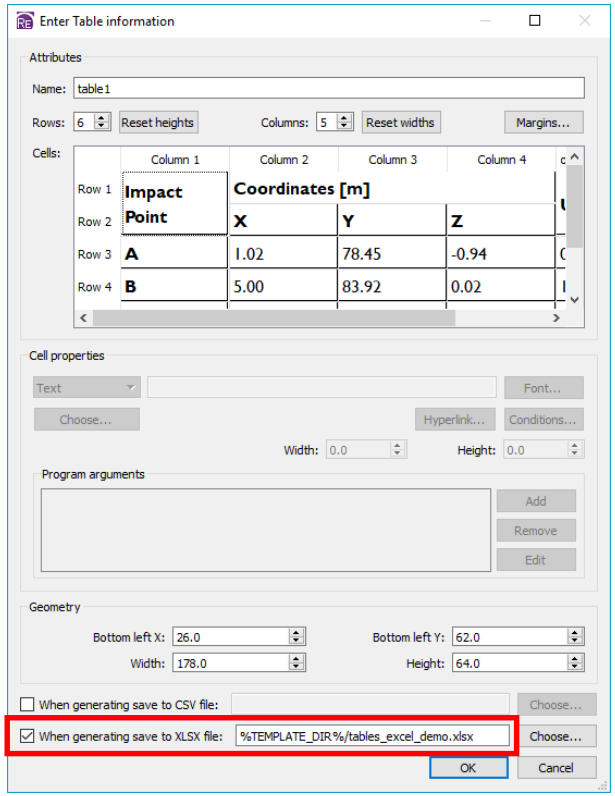
For more details, see chapter 11 of the REPORTER 16.0 manual.

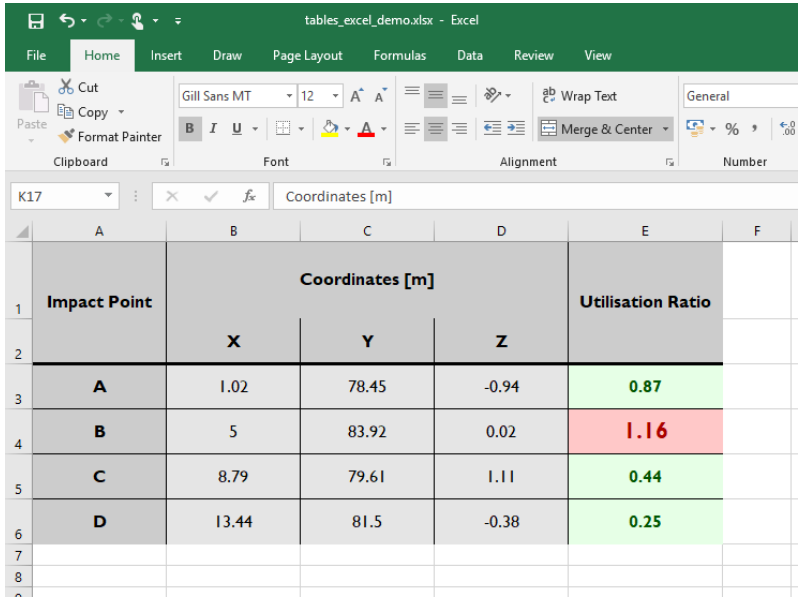


Exporting Tables to Excel



Impact Point	Coordinates [m]			Utilisation Ratio
	X	Y	Z	
A	1.02	78.45	-0.94	0.87
B	5.00	83.92	0.02	1.16
C	8.79	79.61	1.11	0.44
D	13.44	81.50	-0.38	0.25





Impact Point	Coordinates [m]			Utilisation Ratio
	X	Y	Z	
A	1.02	78.45	-0.94	0.87
B	5	83.92	0.02	1.16
C	8.79	79.61	1.11	0.44
D	13.44	81.5	-0.38	0.25

Table and Autotable items can now be exported in Microsoft Excel format, complete with formatting (cell size, text alignment, font style, borders, colours, merged cells).

In the Table or Autotable dialog, check ‘When generating save to XLSX file’ and choose a filename.

Tables in the JavaScript API

Various new functions have been added to the Item class of the JavaScript API to enable full control over Table and Autotable items. For example, it is now possible to:

- Insert/delete/resize rows/columns
- Merge/unmerge cells
- Get/set cell properties (e.g. text, alignment, font, colour, border width)
- Get/set cell conditions

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