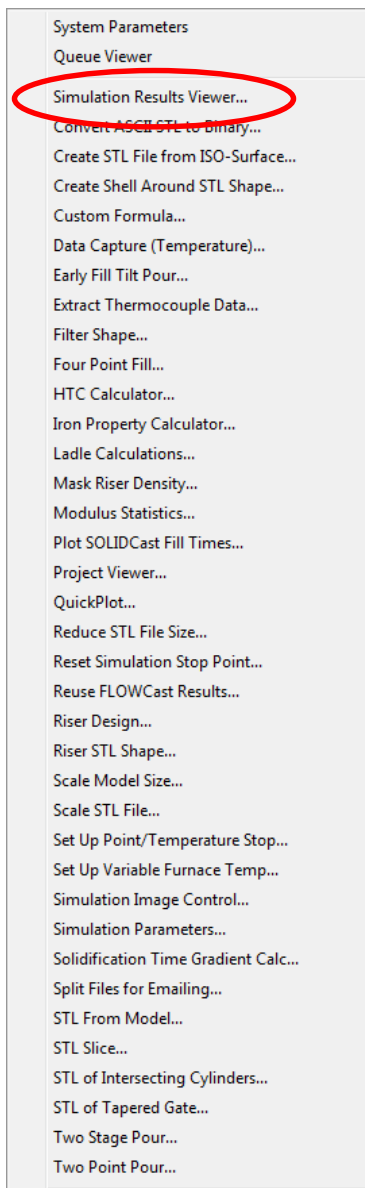


UNIT 52: Simulation Results Viewer

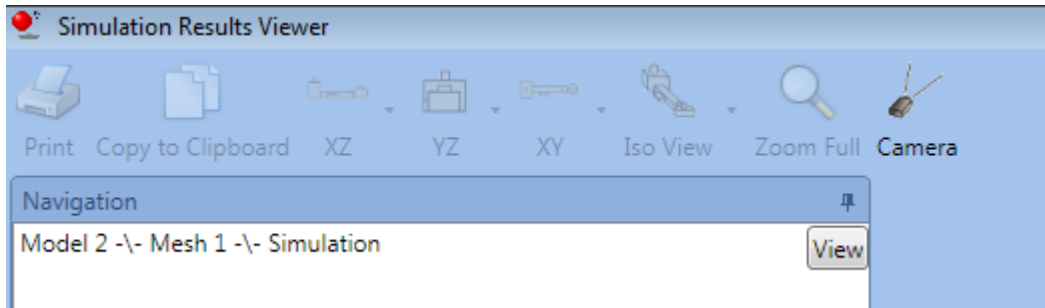
The Simulation Results Viewer in version 8.3 combines the functionality of four of SOLIDCast's existing plot types into a single application, using a modern user interface better suited to today's operating systems and users. Compared to the SOLIDCast model builder, the way you interact with the Results Viewer is different. This unit includes the presentation of the plots as well as the mouse and keyboard controls needed to set them up.

To use the viewer, you must first have a project that has a finished simulation. You will also need to load a model. Once you have done this, click on Tools from the top menu:

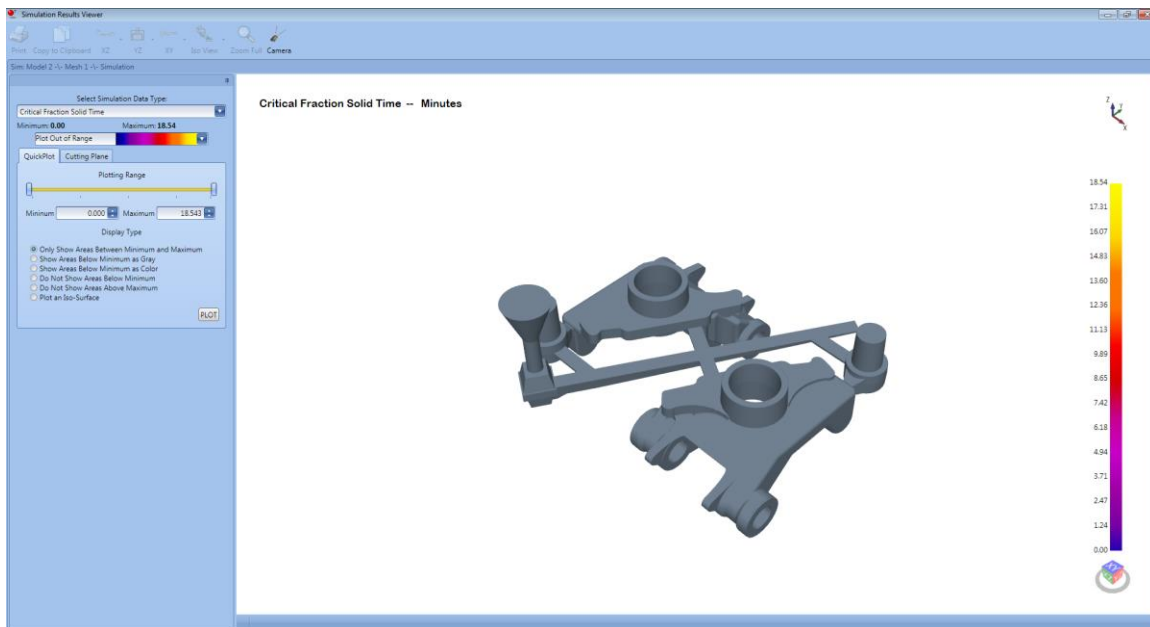


Select the Simulation Results Viewer from the list of available utilities.

Once you start the viewer, the system will display the main menu, along with a listing of all available simulations from your project.



Highlight the simulation results you want to examine, then click the View button. The viewer will load up the simulation data, and will produce an initial display similar to the following:

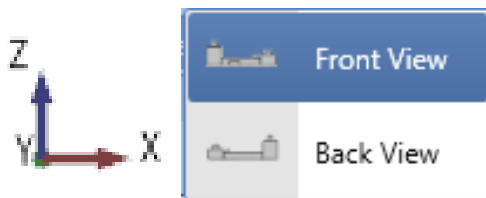


First let's look at the various keyboard commands and mouse functions for controlling the display. Then we will examine the plotting functions themselves.

Keyboard Commands in the SOLIDCast Simulation Results Viewer

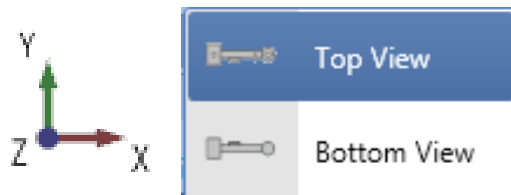


The list below details the behavior of the Simulation Results Viewer when given keyboard commands (i.e. CTRL + 1, CTRL + U, etc.).

Orthogonal Views

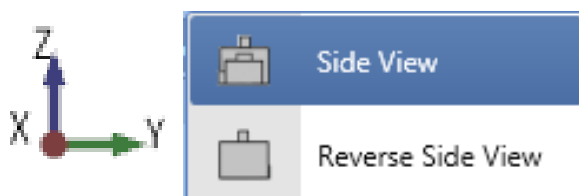
Front (XZ) View – CTRL + F

Back (-XZ) View – CTRL + B



Top (XY) View – CTRL + U (as in “up”)

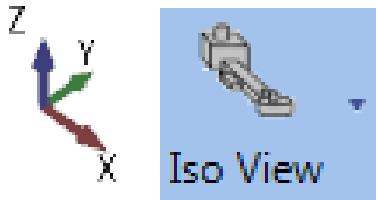
Bottom (-XY) View – CTRL + D (as in “down”)











Left Side (YZ) View – CTRL + L

Right Side (-YZ) View – CTRL + R

Isometric Views



CTRL + 0 sets the default Isometric View, which is the same action as clicking the Iso View button.

	View 1	Ctrl+1
	View 2	Ctrl+2
	View 3	Ctrl+3
	View 4	Ctrl+4
	View 5	Ctrl+5
	View 6	Ctrl+6
	View 7	Ctrl+7
	View 8	Ctrl+8

CTRL + a number sets alternate Isometric Views useful for examining alternate angles on the model. Each increase in number rotates the model by 45 degrees.

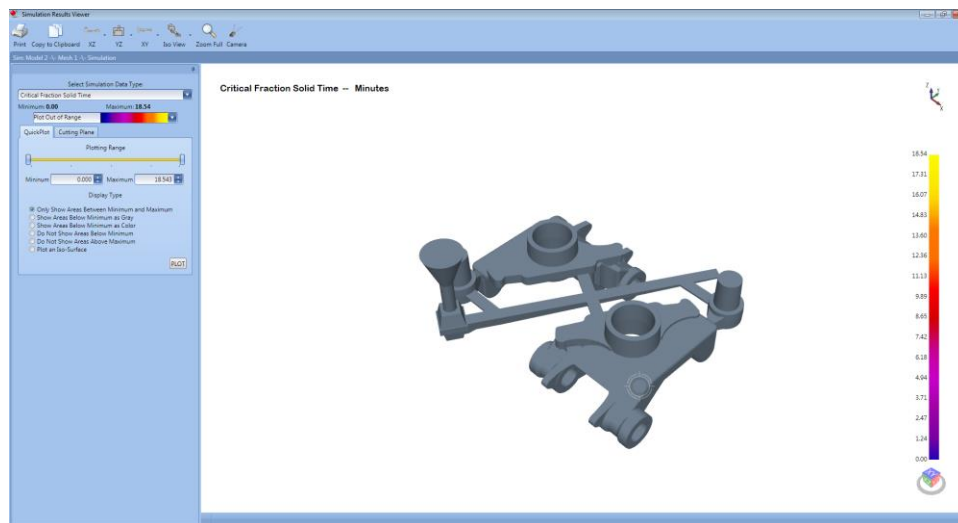
Mouse Input in the SOLIDCast Simulation Results Viewer

The list below details the behavior of the Simulation Results Viewer when given mouse gesture input (i.e. clicking, dragging).

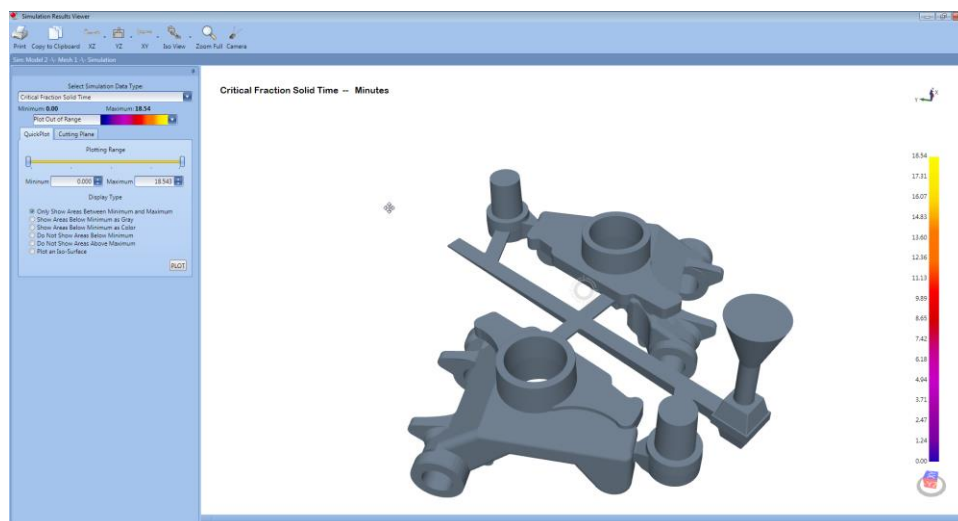
Right Mouse Button

Click and Drag: Rotate.

If the right-mouse button is clicked with the cursor over a portion of the model, the rotation will be around that point.



If the right-mouse button is clicked with the cursor over the white background, the rotation will be around the center of the model in the screen.



- **SHIFT + Click and Drag:** Pan
- **CTRL + Click and Drag:** Zoom
- **CTRL + SHIFT + Click and Drag:** Rubber-Band Zoom
- **Double-Click:** Change the center of rotation

Center Mouse Button

- **Click and Drag:** Pan

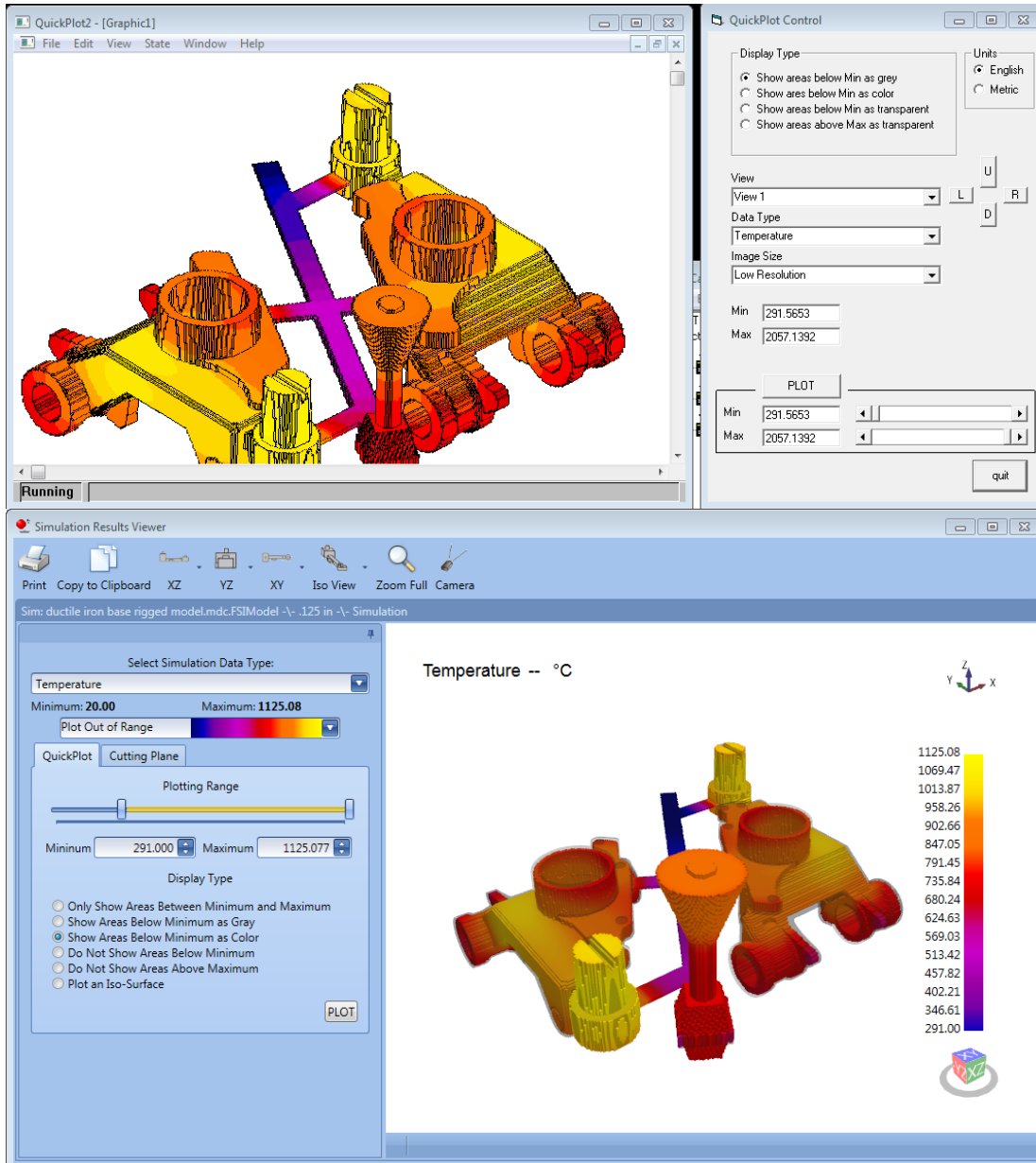
Left Mouse Button

- **Click:** If a Cut-Plane or CastPic plot has been run, the left mouse button will display all the simulation result data for the point clicked.

All of the plotting features in version 8.2 (Iso-Surface, Cut-Plane and Cast-Pic) are still in version 8.3 in their usual places. The next section describes the Simulation Results Viewer features in terms of SOLIDCast 8.2.

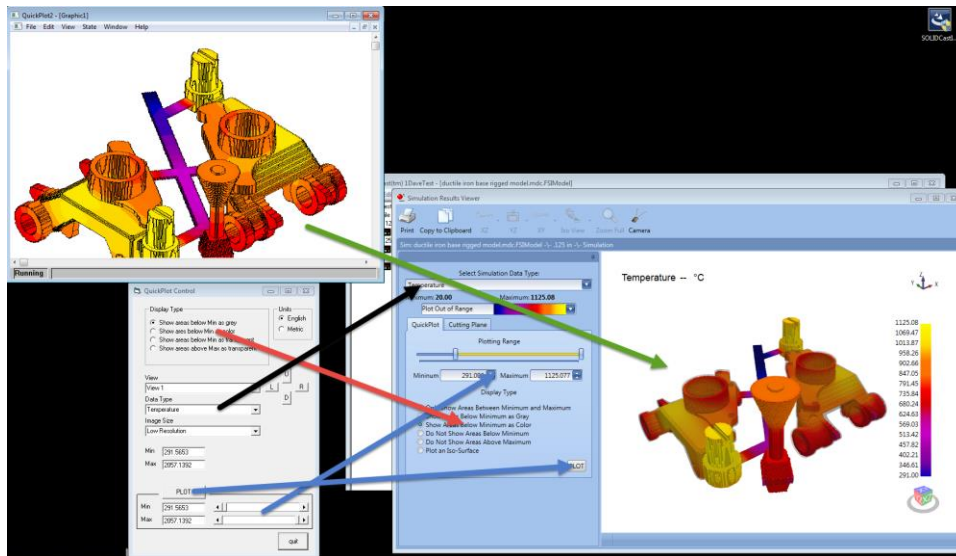
QuickPlot

The QuickPlot utility in version 8.2, accessed through the “Tools” menu, permits very rapid plots of the simulation results using the finite difference mesh nodes, plotted over an outline projection of the model.



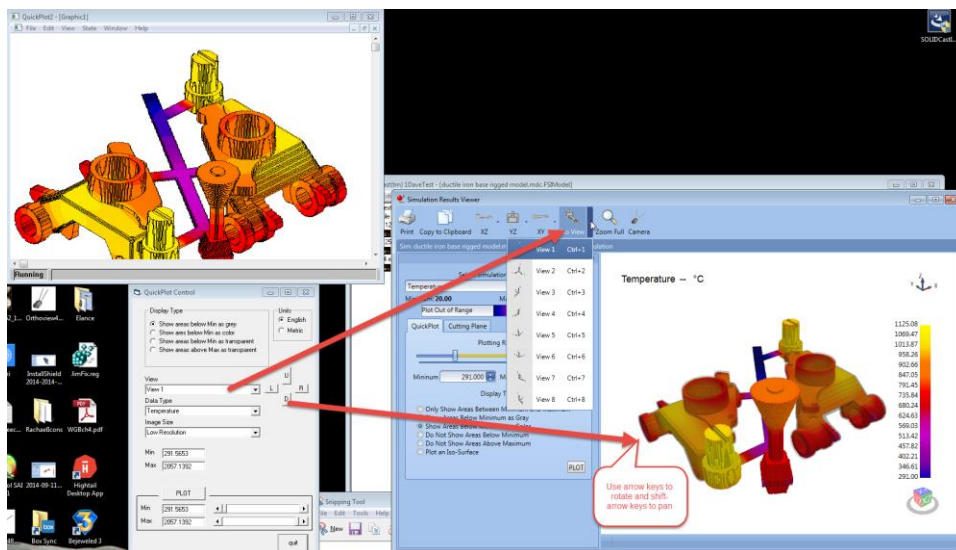
Quick Plot and Simulation Results Viewer in Version 8.3

In the Simulation Results Viewer, QuickPlot is the first report type visible after the simulation results are loaded. Controls for configuring the plot are essentially the same. There are drag bars and numeric entry fields to set the plotting range. The second through fourth selections under “Display Type” correspond between both versions of the tool. In the Simulation Results Viewer, a fifth plot type, at the top of the list, will permit you to plot only areas of interest.



QuickPlot and Simulation Results Viewer Corresponding Elements

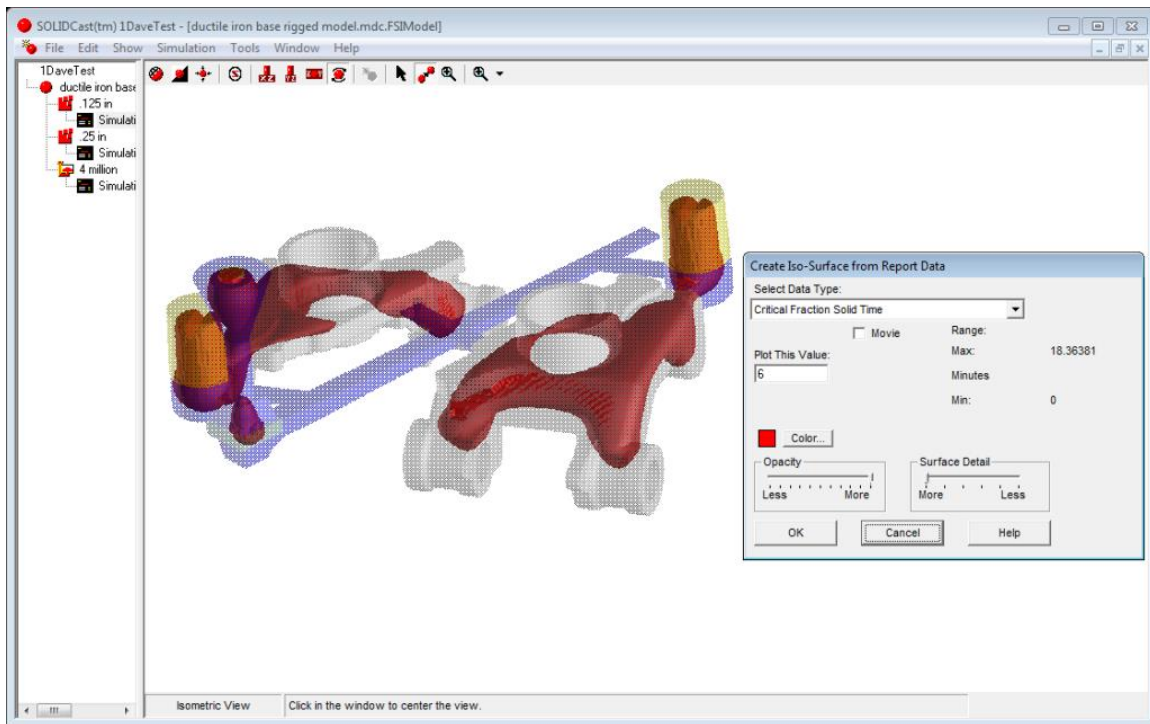
View controls (L, R, D, and U, along with the View combo box) are found in the top menu and can be fine-tuned with mouse and keyboard controls. See the instruction pages for those controls for more details.



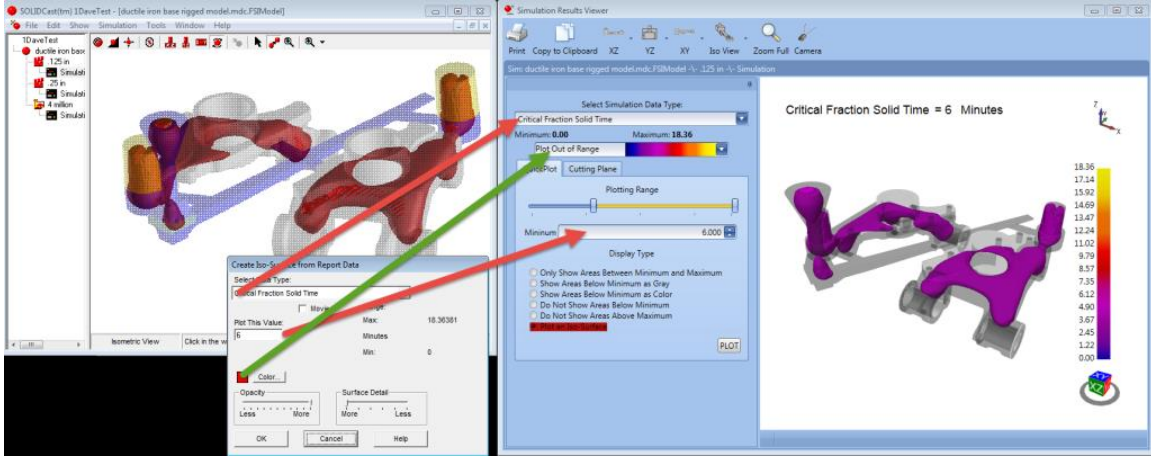
View Controls in QuickPlot and Simulation Results Viewer

Iso-Surface

The Iso-Surface plot permits you to examine contoured regions of interest in your casting results. In SOLIDCast 8.2.5, the Iso-Surface plot appears within a translucent rendering of your casting in the main model builder window. It is a reported problem with Iso-Surface plotting that the system will crash after repeated Iso-Surface plots due to a memory leak in Microsoft Windows.

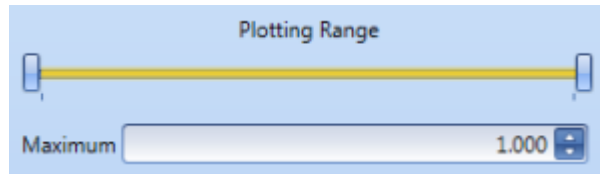


The Simulation Results Viewer provides Iso-Surface Plotting from the QuickPlot tab. Plot an Iso-Surface by selecting "Plot an Iso-Surface" from the list of options under "Display Type".

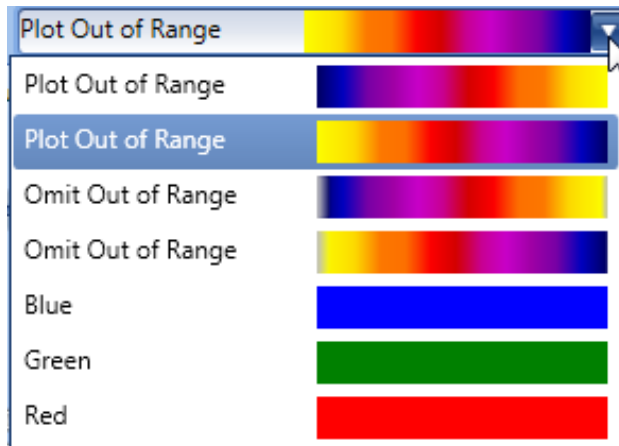


Use the Plotting Range section to set the plot value. Iso-Surface plots construct a contour around regions of interest depending on the selected data type. Some data types, such as Solidification Time or Critical Fraction Solid Time, have regions where the plot of interest surrounds values greater than the selection. Others, such as Material Density, plot regions less than the selected value.

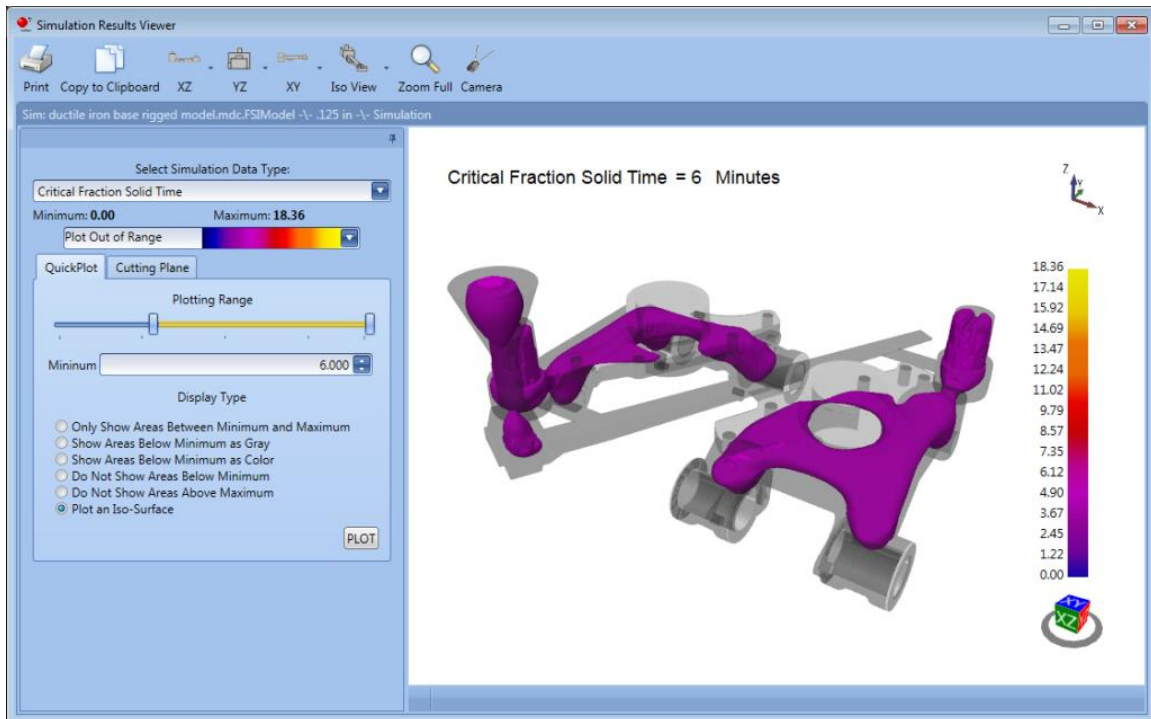
If the numeric field has “Minimum” in its caption, drag the left drag bar to adjust the plot value. If it has “Maximum”, drag the right drag bar. Or, enter a value directly into the field.



The plot color will correspond to the position of the value on the full value range, depending on the plot spectrum selected in its drop-down box. If the plotting palette is set to a solid color, then the plot will always be that color.

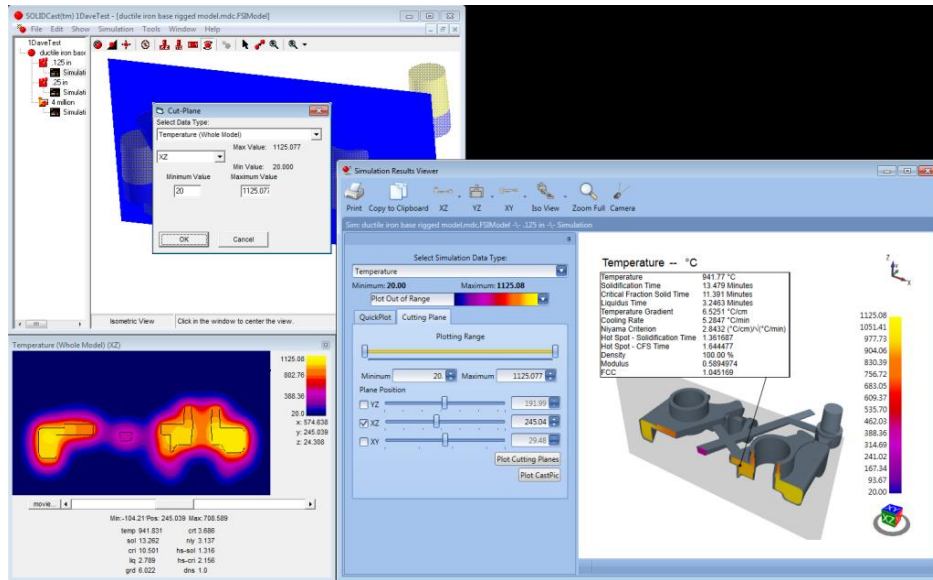


Adjusting the Plotting Range drag bars should trigger a re-plot. If anything doesn't look right, simply press the PLOT button to force the system to compute the plot according to your settings.

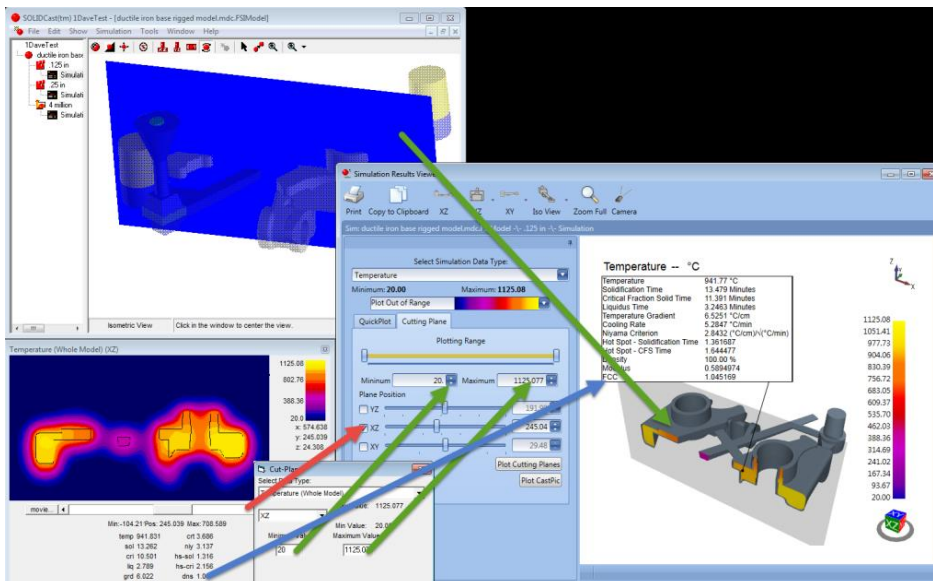


Cut Plane

The Cut-Plane plot permits you to examine the interior of your simulation results along an orthogonal plane. In SOLIDCast 8.2.5 the plot range and selected cutting plane are chosen in advance, upon which the cut position appears in the model builder, with a plot of that position appearing in a neighboring window, where there are controls to adjust the plane position or interrogate a specific point in the model.



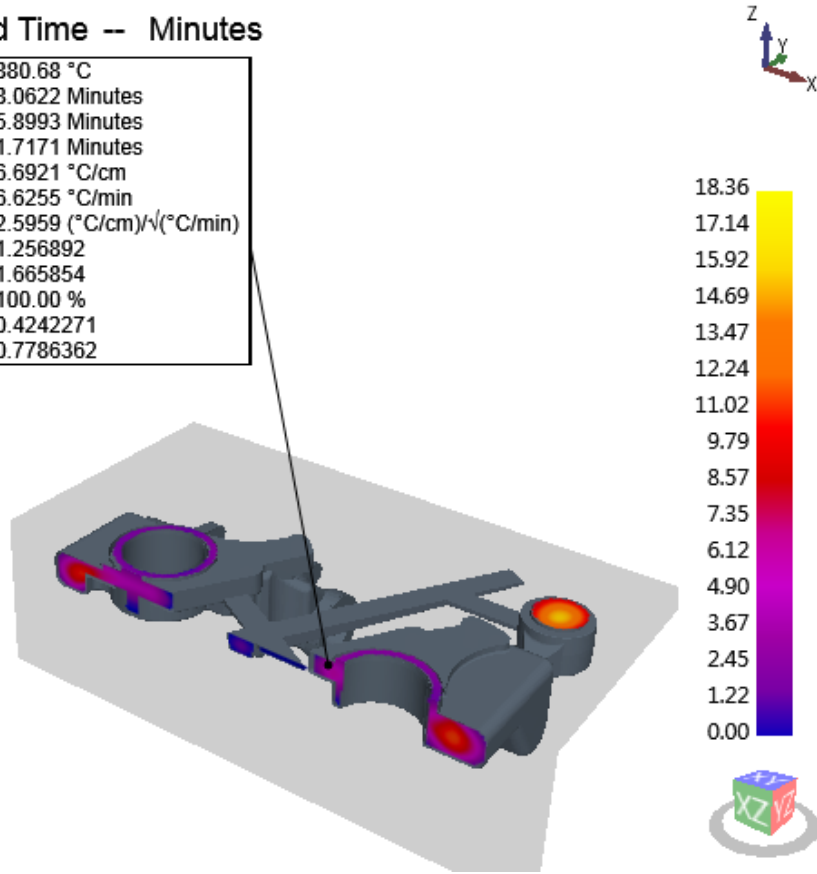
In the Simulation Results Viewer, these functions are combined under the “Cutting Plane” tab. Select the desired data type, plotting color palette, and plotting range. Then, select one (or more) cutting planes and adjust their positions. Click “Plot Cutting Planes” to compute the plot.



Clicking the surface of the cutting planes will bring up a box containing data for the clicked point, along with a pointer to the location which was interrogated.

Critical Fraction Solid Time -- Minutes

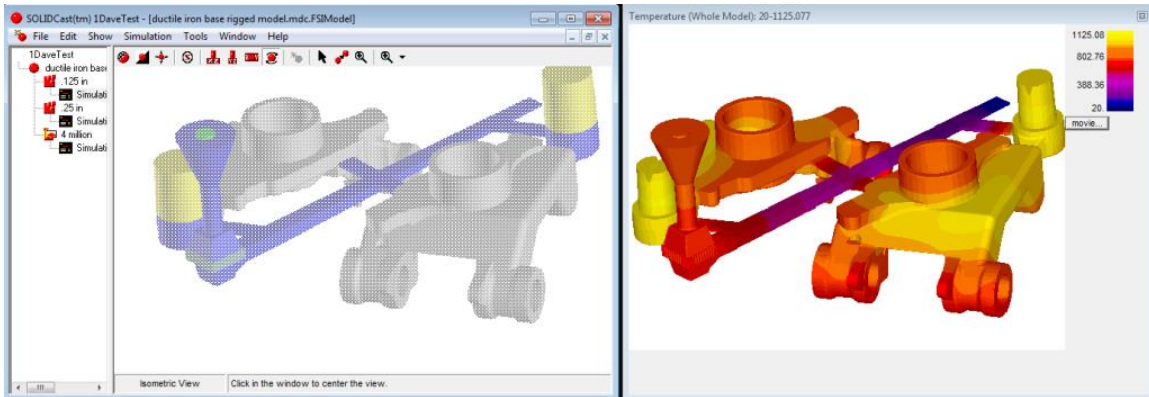
Temperature	880.68 °C
Solidification Time	8.0622 Minutes
Critical Fraction Solid Time	5.8993 Minutes
Liquidus Time	1.7171 Minutes
Temperature Gradient	6.6921 °C/cm
Cooling Rate	6.6255 °C/min
Niyama Criterion	2.5959 (°C/cm) ² /(°C/min)
Hot Spot - Solidification Time	1.256892
Hot Spot - CFS Time	1.665854
Density	100.00 %
Modulus	0.4242271
FCC	0.7786362



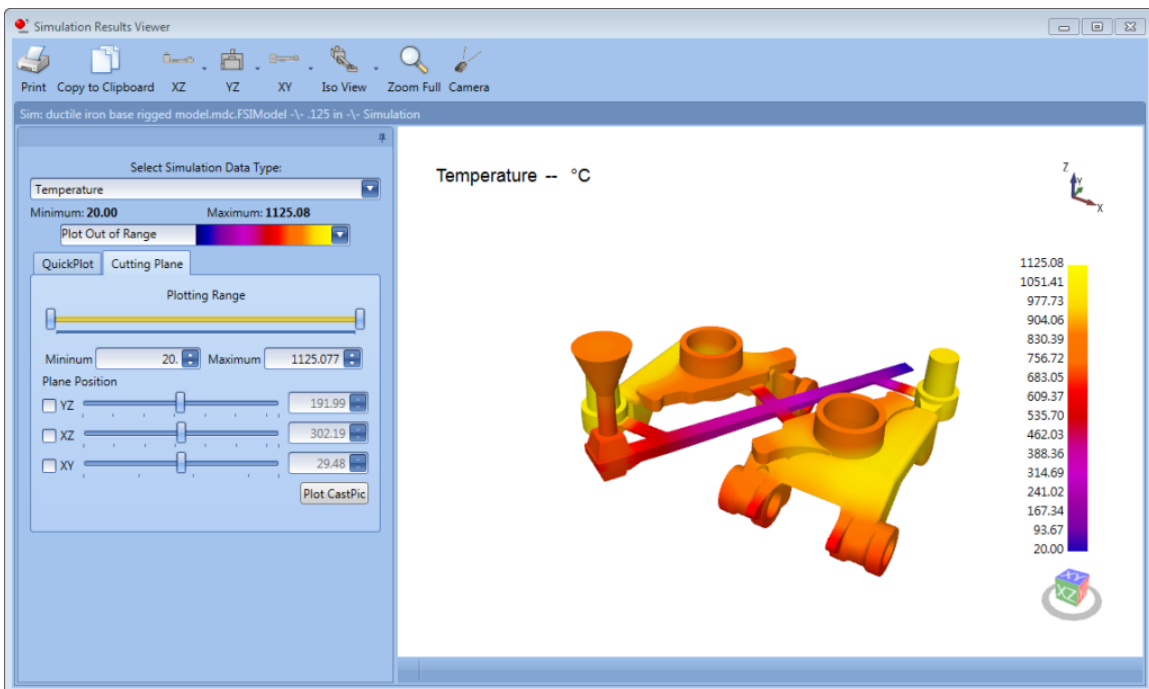
CastPic

The CastPic plot type permits you to view the same data as the Cutting Plane plot, with additional plot data along the surface contours of the casting.

In version 8.2.5, CastPics are a separate plot type which appear in a side window.

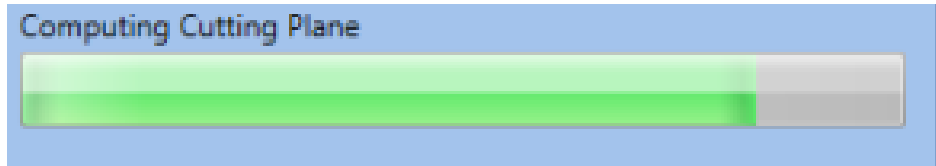


In the version 8.3 Simulation Results Viewer, the CastPic plot is associated with the Cutting Plane tab, because the inputs to CastPic and Cutting Plane are the same. To obtain a CastPic plot of your uncut model, click on the Cutting Plane tab, set the plot range you want, and click "Plot CastPic". You will see a result similar to this:

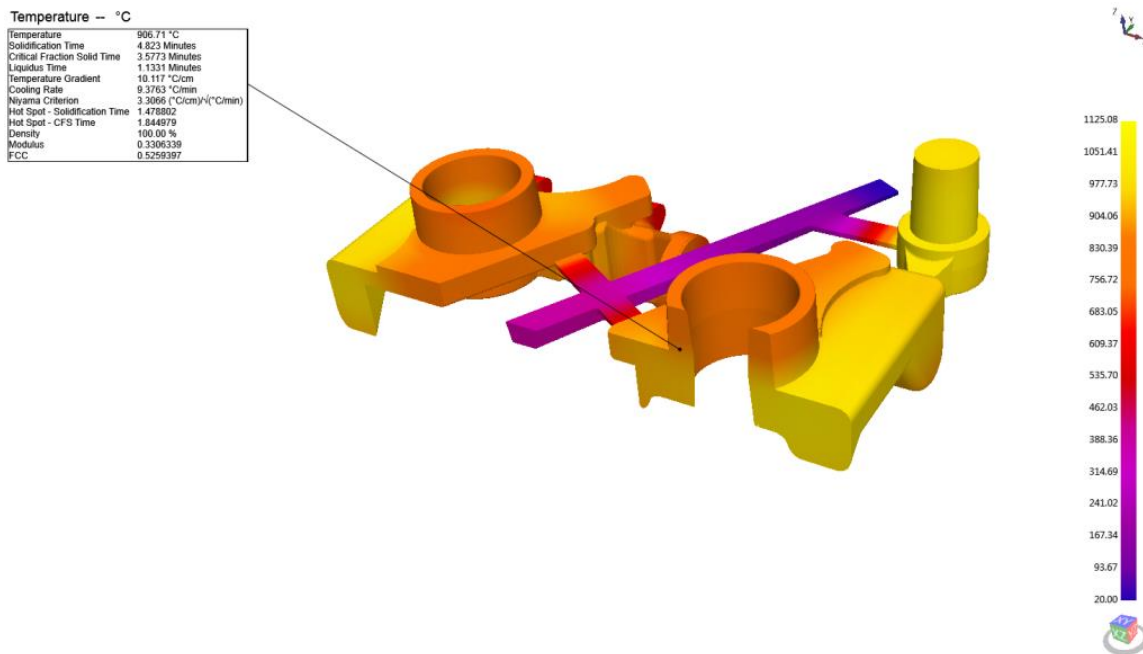


Then, select the cutting planes you want to plot through the casting, and click “Plot Cutting Plane”. This will trigger the Viewer to begin computing the surfaces of the cut planes and will present you with the cutting plane plot.

You will see a status bar appear:



When the status bar reaches full green, it will disappear and the “Plot CastPic” button will reappear. It may take several seconds for the system to compute the Cutting Plane surfaces for CastPic. The amount of time depends on the complexity of the cut surfaces and the number of cutting planes chosen.



For best results, ensure that your model files contain very well-formed STL data, if you use STL files to import geometries into the model builder. The best STL files describe only the surface contours of the casting and risers, with no internal triangle facets included. This is particularly important if you’re modifying a mold pattern by combining cope and drag shapes from a larger CAD assembly. STL files for SOLIDCast must not contain facets inside the cavity.

CastScan

The CastScan plot is not available in the Simulation Results Viewer.

Movies

Movie plotting is not available in the Simulation Results Viewer. It is targeted for version 8.4.