Autodesk® Moldflow® Insight 2012

AMI Molding Window Analysis Results

Autodesk®

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Molding Window analysis results

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This topic lists the results generated for a Molding Window analysis on a thermoplastic material.

Text based results

The following table lists the text results generated for a Molding Window analysis.

Results
Molding Window analysis log on page 3
Results Summary
Analysis Check

Graphical results

The following table lists the graphical results that are created by a Molding Window analysis and indicates whether each result is supported for the following analysis technologies:

- Midplane
- Dual Domain

For more information about a result, including how to interpret the display, click the result name.

Result	Available for analysis technology
Quality result on page 8	
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Result	Available for analysis technology
Cooling time, maximum (molding window) on page 6	

Molding Window analysis log 2

The Molding window analysis log is a text report that lists the input you used for the Molding Window analysis, followed by the process settings calculated by the Molding Window analysis.

This log is generated by the Molding Window analysis. Look for these lines of text at the end of the analysis log:

- Recommended Mold Temperature.
- Recommended Melt Temperature.
- Recommended Injection Time.

Using the Analysis Log

Type the Molding Window's recommended mold temperature, melt temperature, and injection time into the Process Settings Wizard, in order to use these values as input for a Fill+Pack analysis.

Molding window result 3

The Molding Window result shows the optimum mold and melt temperatures and the injection time required to produce an acceptable part for a specific material within the constraints of the mold design.

This result is generated by the Molding Window analysis and shows the following three colored zones:

- Green represents the preferred molding window
- Yellow represents a feasible molding window
- Red indicates there is no feasible molding window.

Using this result

Green–the preferred molding window

If you use the process settings represented by a green area, there is a higher chance the part will mold well.

If the molding window includes a green area but it is very narrow, try to improve it. A narrow green area indicates that if the processing conditions vary, even by a small amount, the part may be unsatisfactory. When parts are being made, it is likely that some variation in conditions will occur so try to ensure that the molding window is robust, that is, it has a fairly wide green area.

Yellow–a feasible molding window

If you use the process settings represented by a yellow area, you will probably be able to mold the part, but its quality may not be high.

An all-yellow molding window indicates that there is no particularly good combination of process settings for this part with this injection location and material. Depending on how strict the quality requirement for the part is, you may need to move or add another injection location, change the material, or change the part geometry.

NOTE: If the Molding window result indicates that a preferred molding window does not exist, a feasible molding window may still be possible.

Red–no feasible molding window

An all-red molding window indicates that there is no good combination of process settings for this part, with this injection location and material. You must move or add another injection location, change the material or change the part geometry.

Things to look for

Review other analysis results and look for defects that will help you choose new or different injection locations.

NOTE: The predicted process settings might result in molding or quality problems even after a Molding Window analysis has been performed. This is because the Molding Window analysis provides only a quick, preparatory suggestion, which is not intended to replace a full analysis.

Molding Window results

Modify the parameters of the Molding Window display.

Explore Solution Space dialog—XY Plot

This dialog allows you to explore the solution space of the displayed molding window XY plot result by varying one or more of the input factors scanned in the analysis.

To access this dialog, ensure that you have molding window analysis results, then right-click on a result in the molding window **Optimization** folder that is of type XY Plot and select **Properties**.

TIP: To use this dialog, specify which input variable you want to display on the X axis by selecting the check box, move the slider bar below the name of the input variable you want to change, and then watch the result plot change as you move the dialog slider bar.

Cooling time, maximum (molding window)

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The Cooling time, maximum result shows how the maximum cooling time varies with variations in the mold temperature, melt temperature, and injection time.

This result is generated by the Molding Window analysis.

This result, along with several others, are components of the Molding Window quality result.

Using this result

The default plot shows the predicted maximum cooling time (based on the recommended ejection temperature of the selected material) as a function of mold temperature.

To explore the effect of melt temperature and/or injection time on maximum cooling time, right-click on **Cooling time, maximum (molding window)** in the **Study Tasks** pane and select **Properties**.

Using the **Explore Solution Space—XY Plot** dialog, select a check box to display that variable, and then drag the sliders of the other two to vary the displayed variable with maximum cooling time.

Pressure drop, maximum (molding window) 5

The Pressure drop, maximum (molding window) result shows how the injection pressure varies with variations in the mold temperature, melt temperature, and injection time.

This result is generated by the Molding Window analysis.

This result, along with several others, are components of the Molding Window quality result.

Using this result

The default plot shows the predicted change in injection pressure, or pressure drop, as a function of mold temperature.

To explore the effect of melt temperature and/or injection time on injection pressure, right-click on **Pressure drop, maximum (molding window)** in the **Study Tasks** pane and select **Properties**.

Using the **Explore Solution Space—XY Plot** dialog, select a check box to display that variable, and then drag the sliders of the other two to vary the displayed variable with injection pressure.

Quality result

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The Quality result provides an indication of how the overall quality of your part will vary as the input variables mold temperature, melt temperature, and injection time vary.

This quality measure is derived from the results obtained for minimum flow front temperature, injection pressure, maximum cooling time, maximum shear rate, and maximum shear stress under a given set of molding conditions.

Better values for these individual quality criteria produce an overall better quality measure result. The quality measure will increase with reductions in injection pressure, maximum cooling time, maximum shear rate, and maximum shear stress and will increase within an increase in minimum flow front temperature.

The Quality result is generated by the Molding Window analysis.

Using this result

The default plot shows the predicted part quality as a function of mold temperature. To explore the effect of melt temperature and/or injection time on the overall quality measure, right-click on **Quality (molding window)** in the **Study Tasks** pane and select **Properties**.

These controls are similar to those used in the post-processing of a number of Design of Experiments results and are designed to allow you to explore the effect of multiple input variables on a given target function, in this case the effect of mold temperature, melt temperature and injection time on a quality measure.

The variable that is checked is the variable displayed on the X axis and the slider for this variable is inactive. The other two sliders will be active and can be dragged to vary that variable. The value is always shown on the right.

Display one variable, and then drag the sliders of the other two to vary the displayed variable.

Shear rate, maximum (molding window) 7

The Shear rate, maximum result shows how the shear rate varies with variations in the mold temperature, melt temperature, and injection time.

This result is generated by the Molding Window analysis.

This result, along with several others, are components of the Molding Window quality result.

Using this result

The default plot shows the predicted maximum shear rate as a function of mold temperature.

To explore the effect of melt temperature and/or injection time on maximum shear rate, right-click on **Shear rate, maximum (molding window)** in the **Study Tasks** pane and select **Properties**.

Using the **Explore Solution Space—XY Plot** dialog, select a check box to display that variable, and then drag the sliders of the other two to vary the displayed variable with maximum shear rate.

Shear stress, maximum (molding window)

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The Shear stress, maximum result shows how the shear stress varies with variations in the mold temperature, melt temperature, and injection time.

This result is generated by the Molding Window analysis.

This result, along with several others, are components of the Molding Window quality result.

Using this result

The default plot shows the predicted maximum shear stress as a function of mold temperature.

To explore the effect of melt temperature and/or injection time on maximum shear stress, right-click on **Shear stress, maximum (molding window)** in the **Study Tasks** pane and select **Properties**.

Using the **Explore Solution Space—XY Plot** dialog, select a check box to display that variable, and then drag the sliders of the other two to vary the displayed variable with maximum shear stress.

Temperature at flow front, minimum (molding window) 9

The Temperature at flow front, minimum result shows how the flow front temperature varies with variations in the mold temperature, melt temperature, and injection time.

This result is generated by the Molding Window analysis.

This result, along with several others, are components of the Molding Window quality result.

Using this result

The default plot shows the predicted minimum flow front temperature as a function of mold temperature.

To explore the effect of melt temperature and/or injection time on the predicted minimum flow front temperature, right-click on **Temperature at flow front, minimum (molding window)** in the **Study Tasks** pane and select **Properties**.

Using the **Explore Solution Space—XY Plot** dialog, select a check box to display that variable, and then drag the sliders of the other two to vary the displayed variable with minimum flow front temperature.