Autodesk® Moldflow® Insight 2012

AMI Microcellular Injection Analysis Results

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Contents

Microcellular Injection Molding analysis results

1

This help topic specifies the results generated for a Microcellular Injection Molding analysis on a thermoplastic material.

Text based results

The following table lists the text results that are created for each Microcellular Injection Molding analysis.

Results
Microcellular molding analysis log on page 2
Results Summary
Analysis Check

Graphical results

The following table lists the graphical results that are created for a Microcellular Injection Molding 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 on the result name.

Result	Available for analysis technology
Bubble pressure result on page 3	
Bubble radius result on page 5	
Bubble pressure, final result on page 4	
Bubble radius, final result on page 6	

Microcellular molding analysis log

2

The Analysis Log is a text report that lists the inputs that you used for the analysis, including solver parameters, material data, process settings and model details, followed by the analysis progress tables.

There is a separate section for the injection phase, and for the curing phase of the analysis. It is generated by the Microcellular Fill+Pack analysis.

NOTE: The Microcellular molding analysis is not supported for 3D analysis technology.

Using the analysis log

The Analysis Log for a Microcellular Fill+Pack analysis can be used to determine whether the part filled completely during injection before the curing phase began.

Look at the analysis progress table for the injection phase and check whether 100% of the cavity volume filled. If this did not occur, then you may see a solver message warning that a short shot has occured due to insufficient injection pressure.

Things to look for

- If a short shot occurs, try changing the following process settings (in the order presented) and re-run the analysis:
  - Melt and mold temperatures.
  - Fill time.
  - Pressure.

Bubble pressure result 3

The Bubble pressure result shows the pressure of the gas inside the bubble distributed across the part.

It is generated from a Microcellular analysis using Midplane or Dual Domain analysis technology.

Using this result

The Bubble pressure result is very useful for checking whether there are any pressure spikes. This is normally a sign of imbalance. Normally this can be fixed by changing gate location(s) or the amount of gas injected into the polymer. Sometimes only a subtle change is necessary.

Creating a Bubble pressure XY Plot result allows you to compare the bubble pressure against the normalized thickness.

NOTE: The Bubble pressure results is only available if the Number of profiled results specified in the solver parameters is greater than zero.

To specify the numbers of profiled results to output, click  **Home tab > Molding Process Setup panel > Process Settings** , if necessary click **Next** to access the **Fill+Pack Settings** page, click **Advanced options**, click **Edit** in the Solver parameters group, and select the **Intermediate Output** tab.

Things to look for

- If the bubble pressure is too high, warpage may occur. It is recommended that the bubble pressure be kept as low as possible.

Bubble pressure, final result 4

The Bubble pressure, final result shows the pressure of the gas inside the bubble at the end of the cooling phase.

It is generated from a Microcellular analysis using Midplane or Dual Domain analysis technology.

Using this result

The Bubble pressure, final result is very useful for checking whether there are any pressure spikes. This is normally a sign of imbalance. Normally this can be fixed by changing gate location(s) or the amount of gas injected into the polymer. Sometimes only a subtle change is necessary.

Creating an XY Plot allows you to compare the final bubble pressure against the normalized thickness

Things to look for

- If the final bubble pressure is too high, warpage may occur. It is recommended that the bubble pressure be kept as low as possible.

Bubble radius result 5

The Bubble radius result shows the size of bubble radius distribution across the part.

It is generated from a Microcellular analysis using Midplane or Dual Domain analysis technology.

Using this result

Ideally, the part should consist of uniformly distributed bubbles, and the radius of each bubble is consistent in size. Naturally, the radius of the bubble will be smaller around the gate area where the pressure is highest.

Through the control of the gas concentration injected into the polymer, the size of the bubbles either increases or decreases. Typically the recommended concentration of gas is about 0-1% of the part.

Creating a Bubble radius XY Plot result allows you to compare the bubble radius thickness against time.

NOTE: The Bubble radius results is only available if the Number of profiled results specified in the solver parameters is greater than zero.

To specify the numbers of profiled results to output, click  **Home tab > Molding Process Setup panel > Process Settings** , if necessary click **Next** to access the **Fill+Pack Settings** page, click **Advanced options**, click **Edit** in the Solver parameters group, and select the **Intermediate Output** tab.

Things to look for

- The amount of bubble growth and the radius for each bubble depends on the amount of plastic injected versus the amount of gas concentration. If not enough gas is injected, the part will short shot. If too much gas is injected, it may cause a deterioration of the finished surface.

Bubble radius, final result

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The Bubble radius, final result shows the final radial size of the bubble at the end of cooling (the bubble is assumed to be spherical).

It is generated from a Microcellular analysis using Midplane or Dual Domain analysis technology.

Using this result

While using the Bubble radius, final result, it is better to have a small bubble uniformly distributed throughout the part. However, in reality it is more common to have the bubble size smaller at the surface, and larger at the core.

Creating a final bubble radius XY Plot result allows you to compare the bubble radius thickness against the normalized thickness

Things to look for

- The amount of bubble growth and the radius for each bubble depends on the amount of plastic injected versus the amount of gas concentration. If not enough gas is injected, the part will short shot. If too much gas is injected, it may cause a deterioration of the finished surface.
- It is better to have a small bubble uniformly distributed throughout the part.