

Autodesk® Moldflow® Insight 2012

# AMI Co-injection Analysis Results

Autodesk®

Revision 1, 23 March 2012.

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# Co-injection analysis results

# 1

This help topic specifies the results for a Co-injection analysis on a thermoplastic material.

## Text based results

The following table lists the text results generated for a Co-injection analysis.






Results
<a href="#">Analysis Log</a>
<a href="#">Results Summary</a>
<a href="#">Analysis Check</a>

## Graphical results

The following table lists the graphical results that are generated for a Co-injection analysis, and indicates whether each result is supported for the following analysis technologies:

-  Midplane

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

Result	Analysis technology
<a href="#">%Volume of polymer {A,B}:XY Plot result</a> on page 2 	
<a href="#">Distribution of polymer A and B result</a> on page 3 	
<a href="#">Distribution of polymer A and B, laminated result</a> on page 4 	
<a href="#">Thickness fraction, polymer B result</a> on page 5 	
<a href="#">Weight of polymer {A,B}:XY Plot result</a> on page 6 	

**NOTE:** Fill and Pack results will always be generated during the analysis process, however, Cool, Warp, Stress and Fiber results will be generated depending on the analysis sequence set and material selected.

# **%Volume of polymer {A,B}:XY Plot result**

# **2**

The %Volume of polymer A:XY Plot and %Volume of polymer B:XY Plot results are generated from a Co-injection analysis and show the volume of polymer A or volume of polymer B displayed on an XY plot of volume versus process time.

Typically, the end result is most important.

## **Using this result**

The plots show the percentage of the part volume filled by polymer A (or B), at each point in time from the beginning of the process to the end.

A project may have a specified goal, for example: for a part that weighs 600 grams, 150 grams must consist of polymer B. In this example, each part would consist of 25% polymer B, by volume.

## **Things to look for**

- Check the %Volume of polymer A:XY Plot and %Volume of polymer B:XY Plot results to determine whether the volumes obtained during the analysis meet the design requirements.

# Distribution of polymer A and B result

# 3

The Distribution of polymer A and B result is generated from a Co-injection analysis, and shows the penetration and distribution of polymer A (skin, in red color) and polymer B (core, in blue color), calculated layer by layer, as a fraction of total part thickness.

## Using this result

- Penetration goal 1** To use the specified amount of core material, for example, to produce a part consisting of 30% core material.
- Penetration goal 2** To enable core material to reach almost to the ends of the part, farthest from the gate(s), but not all the way. Reaching almost to the ends ensures uniform distribution, but reaching all the way indicates the core material is breaking through the surface.
- Distribution goal** To use the core material equally throughout the part, so as not to introduce structural or warpage problems.

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**NOTE:** Move the animation slider bar to view the presence of polymer B at each thickness layer, ranging from 0 (the inside wall of the part) to 1 (the outside wall of the part). At each thickness layer, you will see a plot that uses one color to show where polymer A is located and the other color to show polymer B.

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## Things to look for

- Good penetration of core material.
- Uniform distribution of core material.
- Only skin material on the surface (at normalized thickness = 1).

# Distribution of polymer A and B, laminated result

# 4

The Distribution of polymer A and B, laminated result is generated from a Co-injection analysis, and shows the distribution of polymer A (skin, in red color) and polymer B (core, in blue color) at laminates in the model.

## Using this result

For interior laminates (grid points other than 0 and 1), the blue color (core) should be bounded by red color (skin). Otherwise it indicates that a blow-through occurred. For laminates 0 and 1, only red color (skin) should be seen. Otherwise it indicates a blow-through.

Blow-through occurs when the core material, which has less desirable properties, passes the skin material in the cavity and coats the surface of the part.

## Things to look for

- This result can be used to maximize the injection of core material without a blow-through occurring.

# Thickness fraction, polymer B result

# 5


The Thickness fraction, polymer B result is generated from a Co-injection analysis, and shows the penetration and distribution of polymer B (core material) averaged through the thickness, as a fraction of total part thickness.

This fraction varies during the molding cycle and ranges from zero (pure Material A) to one (pure Material B).

## Using this result

- Penetration goal 1** To use the specified amount of core material, for example, to produce a part consisting of 30% core material.
- Penetration goal 2** To enable core material to reach almost to the ends of the part, farthest from the gate(s), but not all the way. Reaching almost to the ends ensures uniform distribution, but reaching all the way indicates the core material is breaking through the surface.
- Distribution goal** To use the core material equally throughout the part, so as not to introduce structural or warpage problems.

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**NOTE:** Select  **Results tab > Plots panel > Examine** and click on the model. The value displayed is the polymer B thickness, as a % of total thickness, found at the queried location. For example, .32 indicates the material at the queried location, through the thickness, consists of 32% polymer B (core material) and 68% polymer A (skin material).

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## Things to look for

- Animate the plot to show if and where geometry affects penetration and distribution. For some geometries, certain areas fill early with skin material, leaving no space for core material. To correct such problems, you may need to change the gate location and/or thickness.

# Weight of polymer {A,B}:XY Plot result

# 6

The Weight of polymer A and Weight of polymer B results are generated from a Co-injection analysis, and show the weight of polymer A or weight of polymer B displayed on an XY plot of weight versus process time.

Typically, the end result is most important.

## Using this result

A project may have a specified goal, for example: for a part that weighs 600 grams in total, 150 grams must consist of polymer B. In this example, the part would consist of 25% polymer B, by weight.

## Things to look for

- Check the Weight of polymer A and Weight of polymer B results to determine whether the design requirements have been met.