Autodesk® Moldflow® Insight 2012

AMI Process Settings

Autodesk®

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Process settings 1

Process settings are all of the instructions needed beyond modeling, including the machine set-up and material properties, such as melt temperature.

After modeling the part and designing the mold, including the feed and cooling system, you must define the machine parameters. The available process settings will change according to the analysis sequence that you have selected.

Regardless of the analysis sequence, you can set the mold and melt temperatures, and define the velocity/pressure switchover, injection time, and the machine clamp open time.

Process settings

An analysis can be modified to simulate the actual process settings.

Editing process settings

The Process Settings Wizard is used to enter process settings for the selected molding process and analysis sequence, therefore, it is configured differently depending on the selected analysis sequence.

NOTE: The Process Settings Wizard updates with default settings after you select a material.

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1. Ensure that you have already set the molding process and the analysis sequence, and have selected a material. You do not have to have set an injection location at this stage.
2. Click  (**Analysis > Process Settings Wizard**), or double-click the Process Settings icon in the **Study Tasks** pane.
3. Edit all of the conditions that are relevant to your simulation.
4. Click **Finish**.

Specifying process settings for a Gate Location analysis

Specifying process settings allow you to customize the Gate Location analysis.

When you run a Gate Location analysis, you are not required to specify process settings other than the defaults. You may change the default settings if there

are particular characteristics of your study that you want the Gate Location analysis to consider, or when you want to choose a different Gate Locator algorithm.

1 Ensure that your model is meshed
2 Make sure you have selected the Gate Location analysis, and a material.
3 Click **Home tab > Molding Process Setup panel > Process Settings**, or double-click the Process Settings icon in the **Study Tasks** pane.
   The **Gate Location Settings** dialog appears.
4 Change any of the settings as required.

NOTE: The Advanced Gate Locator algorithm can only be used on a model that does not contain existing gates.

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5 Click **OK**.

Editing imported process settings

You can edit or verify process settings that have been imported into the current study from MPX.

NOTE: Importing processing conditions is only available for the Thermoplastic Injection Molding process.

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1 Click **Home tab > Molding Process Setup panel > Process Settings**.
2 Click **Advanced options...**
   The **Fill + Pack Analysis Advanced Options** dialog appears.
3 Click **Edit...** in the **Process controller** pane.
   The **Process controller** dialog appears.
4 Click the **MPX Profile Data** tab and click **Edit profile...**.
   The **Measured/Fitted Profile Data from** MPX dialog appears.
5 Select and edit the required data.

NOTE: The stroke must be entered in ascending order.

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6 Click **OK** to accept the data, and then close all other dialogs.

Editing solver parameters

During an analysis, solvers calculate simultaneous equations based upon the solver settings. Within the Process Settings Wizard, you can alter the numerical parameter defaults and solver tolerances for the selected molding process.

Common solver parameters and process settings can be changed with the Process settings wizard. For other parameters you need to access the advanced options page.

NOTE: Typically, the solver parameters should remain at their default values.

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1 Open the Process Settings Wizard.

2 Using the **Next** button if necessary, locate the page of the Process Settings Wizard with a button called **Advanced options...**.

TIP: If the process sequence contains Fill+Pack, it is on that page. Otherwise it is on the first page of the Process Settings Wizard.

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3 Click **Advanced options...**

4 Click **Edit** next to the **Solver parameters** drop-down list.

NOTE: You can also edit the material, process conditions and machine parameters for the current study.

Process controller 2

The **Process controller** is used to enter the control aspects of the processing conditions into the simulation, including the profile/switch-over, temperature, and time controls, and other controls depending on the selected molding process and analysis sequence.

The **Process controller** is part of the **Process Settings Wizard Advanced options** and is where all control aspects of the processing conditions are specified. When the part has been modeled and meshed, the feed system and cooling system have been added to the model, the material has been selected, and the molding process and analysis sequence have been chosen, the final steps in the simulation setup are defining the processing conditions.

Process controller

The **Process controller** is part of the **Process Settings Wizard Advanced options** and is where all control aspects of the processing conditions are specified.

Accessing the process controller

Access to the process controller is dependent on the molding process you have chosen. However, you can access all process controller dialogs via **Tools tab > Databases panel > New**. Select **Process Conditions** from the **Category** drop-down menu, and select the **Process controller** dialog that you would like to edit.

1. Double-click **Process Settings** in the **Study Tasks** pane to open the **Process Settings Wizard**.

   Alternatively, click **Home tab > Molding Process Setup panel > Process Settings**
2. Click **Advanced options**, to open the **Advanced options** dialog. You may need to navigate to the next page to find this button.
3. Click the **Edit** button associated with **Process controller** to open the **Process controller** dialog

   The **Process controller** is not available for all molding processes.
4. Select the different tabs and edit as appropriate.

Process controller

The **Process controller** dialog is where all control aspects of the processing conditions are specified. Different tabs on this dialog will be visible depending on the molding process and analysis sequence that have been chosen.

To access this dialog, double-click  **Process Settings** on the **Study Tasks** pane, navigate to the page with the **Advanced options** button, click it, then click the **Edit** button associated with **Process controller**.

Process controller dialog—Profile/Switch-Over Control tab

The **Profile/Switch-Over Control** tab of the **Process controller** dialog is used to specify default values for injection unit related inputs of a thermoplastics analysis.

Filling control	Specifies the method by which the filling phase of the analysis is controlled.
Velocity/pressure switch-over	Specifies the criteria by which the molding machine will switch from velocity control to pressure control.
Pack/holding control	Specifies the method by which the pressure phase of the molding process is controlled.

Process controller dialog—Temperature Control tab

The **Temperature Control** tab of the **Process controller** dialog is used to specify default values for temperature control related inputs of a thermoplastics analysis.

Mold temperature control	Specifies the mold temperature for the two halves of the mold.
Mold surface temperature	Specifies the temperature of the mold at the plastic-metal interface, where the plastic touches the mold.
Melt temperature	Specifies the temperature of the molten plastic, or melt, as it starts to flow into the cavity.
Ambient temperature	Normally, the ambient temperature should be set to the average ambient temperature at the site where the injection molding occurs.

Process controller dialog—MPX Profile Data tab

The **MPX Profile Data** tab of the **Process controller** dialog is used to view and/or edit ram speed profile data from Moldflow Plastics Xpert (MPX) that has been imported using **Import Process Settings from MPX** in the **Analysis** menu.

Imported profile data	View and/or edit the following types of imported profile data.

Process controller dialog—Time Control (Fill) tab

The **Time Control (Fill)** tab of the **Process controller** dialog is used to specify default values for cycle time related inputs of a thermoplastics fill (filling phase only) analysis.

Mold-open time	Specifies the time taken from the completion of one molding cycle, to the beginning of the next.

Process controller dialog—Time Control (Fill + Pack) tab

The **Time Control (Fill + Pack)** tab of the **Process controller** dialog is used to specify default values for cycle time related inputs of a thermoplastics Flow (filling and packing phase) analysis.

Cooling time	During a Fill+Pack analysis, cooling time can either be specified or calculated automatically.
Mold-open time	Specifies the time taken from the completion of one molding cycle, to the beginning of the next.

Process controller dialog—Time Control (Cool) tab

The **Time Control (Cool)** tab of the **Process controller** dialog is used to specify default values for cycle time related inputs of a thermoplastics Cool analysis.

Injection + packing + cooling time	Injection + packing + cooling time is equivalent to the total cycle time minus the mold-open time.
Mold-open time	Specifies the time taken from the completion of one molding cycle, to the beginning of the next.

Process controller dialog—Co-injection Control tab

The **Co-injection Control** tab of the **Process controller** dialog is used to specify default values for Co-injection control related inputs of a thermoplastics analysis.

Switch to the other controller by	For the co-injection molding process, this specifies when to switch from Controller A to Controller B, or from Controller B back to Controller A.

Process controller dialog—Microcellular Control tab

The **Microcellular Control** tab of the **Process controller** dialog is used to specify default values for the inputs of a Microcellular injection molding analysis.

Volume filled at start of foaming	Specifies the percentage volume of the cavity to be filled with polymer.
Initial bubble radius	Specifies the bubble radius before growth. The default value can be used in most cases.
Number of cells per volume	Specifies a nucleation density value.
Initial gas concentration	Specifies the percentage concentration of gas in the melt at the beginning of the process.

Process controller for Reactive Injection-compression molding dialog—Measured Profiles tab

The **Measured Profiles** tab of the **Process controller for Reactive Injection-compression molding** dialog is used to view and/or edit ram speed profile data from Moldflow Plastics Xpert (MPX) that has been imported using **Import Process Settings from MPX** in the **Analysis** menu.

Imported profile data	View and/or edit the different types of imported profile data.

Process controller for Reactive Injection-compression molding dialog—Time Control (Flow) tab

The **Time Control (Flow)** tab of the **Process controller for Reactive Injection-compression molding** dialog is used to specify default values for cycle time related inputs of a Reactive Injection-compression flow (filling and packing phase) analysis.

Mold-open time	Specifies the time taken from the completion of one molding cycle, to the beginning of the next.

Process controller for Reactive Injection-compression molding dialog—Transfer Pot tab

The **Transfer Pot** tab of the **Process controller for Reactive Injection-compression molding** dialog is used to specify default values for the transfer pot-related inputs of a Reactive Injection-compression molding analysis.

Pellet diameter	Enter the diameter of the encapsulation molding compound pellet.
Pellet length	Enter the length of the encapsulation molding compound pellet.
Transfer pot temperature	Specifies the transfer pot temperature.
Delay time in the pot	Specifies the amount of time the molding compound is kept in the pot before it is injected into the cavity.

Process controller for Reactive Injection-compression molding dialog—Curing Phase tab

The **Curing Phase** tab of the **Process controller for Reactive Injection-compression molding** dialog is used to specify default values for the curing phase-related inputs of a Reactive Injection-compression molding analysis.

Melt initial conversion	Specifies the initial conversion (curing) level at the injection location.
Curing time	The time taken for a thermoset material to become sufficiently cross-linked from heating to form a solid and freeze.
%Air Mass	The percentage air mass value is used to simulate the effect of air in the molding compound on the polymer flow.

Process controller for overmolding second component dialog—Profile/Switch-Over Control tab

The **Profile/Switch-Over Control** tab of the **Process controller for overmolding second component** dialog is used to specify default values for injection unit related inputs of the second component stage of an overmolding analysis.

Filling control	Specifies the method by which the filling phase of the analysis is controlled.
Velocity/pressure switch-over	The criteria by which the molding machine will switch from velocity control to pressure control.
Pack/holding control	Specifies the method by which the pressure phase of the molding process is controlled.

Process controller for overmolding second component dialog—Temperature Control tab

The **Temperature Control** tab of the **Process controller for overmolding second component** dialog is used to specify default values for temperature control related inputs of the second component stage of an overmolding analysis.

Melt temperature	The temperature of the molten plastic, or melt, as it starts to flow into the cavity.
Ambient temperature	The ambient temperature should be set to the average ambient temperature at the site where the injection molding occurs.

Process controller for overmolding second component dialog—Time Control (Cool) tab

The **Time Control (Cool)** tab of the **Process controller for overmolding second component** dialog is used to specify default values for cycle time related inputs of the second component stage of an overmolding analysis.

Injection + packing + cooling time	Injection + packing + cooling time is equivalent to the total cycle time minus the mold-open time. You can either specify this time directly, or calculate this time automatically during the analysis.
Mold-open time	Specify the time taken from the completion of one molding cycle, to the beginning of the next.

Process controller for overmolding second component dialog—Time Control (Fill) tab

The **Time Control (Fill)** tab of the **Process controller for overmolding second component** dialog is used to specify default values for cycle time related inputs of the second component stage of a filling only overmolding analysis.

Mold-open time	Specify the time taken from the completion of one molding cycle, to the beginning of the next.

Process controller for overmolding second component dialog—Time Control (Fill + Pack) tab

The **Time Control (Fill + Pack)** tab of the **Process controller for overmolding second component** dialog is used to specify default values for cycle time related inputs of the second component stage of a filling and packing overmolding analysis.

Cooling time	Specify a cooling time, or have it calculated automatically during the Fill+Pack analysis.
Mold-open time	Specify the time taken from the completion of one molding cycle, to the beginning of the next.