Autodesk® Moldflow® Insight 2012

AMI Venting Analysis

Autodesk®

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Venting analysis is used to predict the effects of air pressure on the flow of polymer to aid in selecting suitable locations where vents may be placed in the mold to allow trapped air to escape the cavity.

The option to perform a venting analysis is available for 3D Thermoplastics Injection Molding, Thermoplastics Overmolding, Reactive Molding and Microchip Encapsulation molding processes when an analysis sequence that includes Fill or Fill+Pack (using the Coupled 3D Flow solver) is selected.

The venting analysis calculates the pressure drop through specified venting analysis locations (air vents), based on analytical equations that account for compressible polymer flow behavior.

The venting analysis also calculates the pressure within air traps remaining in the part, using ideal gas law equations.

These calculated air trap pressures are then applied as boundary conditions defining the pressure at the melt front when solving the flow equations. These calculations show the effect of air pressure within the cavity on the flow of polymer.

You must specify at least one venting analysis location (node on the 3D model) before starting the analysis. You can accept the default values for vent properties, or you can specify values for these properties, including vent size, vent exit pressure, minimum void volume, and venting analysis locations grouping.

Results specific to venting analysis include the Air traps, including air vents result and the Vent region pressure result.

NOTE: The option to **Perform venting analysis** is off by default. To perform a venting analysis, ensure that you have set at least one venting analysis location on the model, and select the **Perform venting analysis** option on the **Venting Analysis** tab of the solver parameters dialog.

Venting analysis

Venting analysis is used to predict the effects of air pressure on the flow of polymer to aid in selecting suitable locations where vents may be placed in the mold to allow trapped air to escape the cavity.

Setting venting analysis locations

The option to perform venting analysis is off by default. Select this option and view or change values for vent properties, including vent size, vent exit pressure, minimum void volume, and venting analysis locations grouping before you begin setting venting analysis locations. Access the venting analysis parameters on the **Venting Analysis** tab of the solver parameters dialog.

Venting analysis locations indicate where vents may be placed in the mold to allow air to escape the cavity during a 3D Thermoplastics Injection Molding, Thermoplastics Overmolding, Reactive Molding or Microchip Encapsulation Fill or Fill+Pack analysis sequence using the Coupled 3D Flow solver.

NOTE: You must set at least one venting analysis location (node on the 3D model) before starting the analysis.

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1 Click  **Boundary Conditions tab > Venting panel > Venting Locations**.

Cross-hairs appear, allowing you to specify the venting analysis location. The **Set Venting analysis location** dialog appears, allowing you to select an existing or create a new set of properties (property ID) for the new venting analysis location.

NOTE: Set default values for venting analysis properties on the **Venting Analysis** tab of the solver parameters dialog.

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2 Click the cross-hairs on the node where you want to set the venting analysis location and select its property ID.

TIP: The Air traps result of a previous analysis may indicate suitable locations to set initial venting analysis locations.

Repeat this step to set additional venting analysis locations.

3 Right-click and select **Finish Set Venting Analysis Locations**.

4 Click in the Quick Access toolbar, or click  then click **Save > Save Study**.

NOTE: You can update the vent size and vent exit pressure properties of a venting analysis location later by right-clicking on a venting analysis location icon and selecting **Properties**.

Venting analysis

Use this dialog to specify settings for a venting analysis.

Venting analysis location dialog—Edit properties

The **Venting analysis location** dialog allows you to view or edit vent properties associated with a selected venting analysis location.

Access this dialog in one of three ways:

- Select **Boundary Conditions tab > Venting panel > Venting Locations**, then select **New** or **Edit**.
- Select an existing venting analysis location on the model, then select **Geometry tab > Properties panel > Edit**.
- Select an existing venting analysis location on the model, then right-click and select **Properties**.

The default **Vent properties** setting is **Use global setting in advanced options**. This sets the values for vent size and vent exit pressure to the values specified on the **Venting Analysis** tab of the solver parameters dialog.

You can change the **Vent properties** setting to **Specified** and click **Edit venting analysis parameters** if you want to set vent properties to other than the default values.

In the **Name** text box, enter a name for the set of properties. This saves the properties so they can be assigned to another venting analysis location.

Value dialog—Edit venting analysis parameters

The **Value** dialog is used to specify values for vent size and exit pressure parameters when you choose to use **Specified** vent properties instead of the global settings.

Vent size	Specify the Thickness, Length and Width of the vent associated with a venting analysis location.
Vent exit pressure (Gauge)	Specify the exit pressure of the vent associated with a venting analysis location.