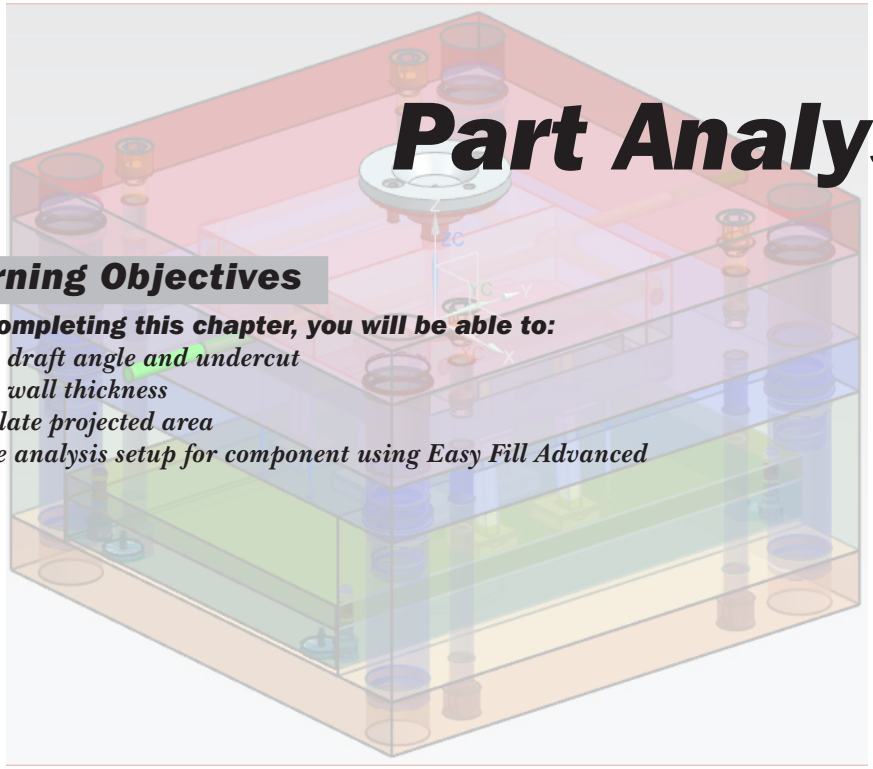
Chapter 2

Part Analysis



Learning Objectives

After completing this chapter, you will be able to:

- *Check draft angle and undercut*
- *Check wall thickness*
- *Calculate projected area*
- *Create analysis setup for component using Easy Fill Advanced*

INTRODUCTION

In this chapter, you will learn part analysis which is the first step in mold designing. You will also install the Easy Fill Advanced plugin to analyze any given part.

PART ANALYSIS

Part analysis is the first step of a mold designing process. By analyzing a part, you can better understand the moldability of that part. To analyze a part, you need to install the **Easy Fill Advanced** plugin. As you install the plugin; the **Easy Fill Advanced** tab becomes available in NX interface, refer to Figure 2-1. Now, you can use the tools available in the **Easy Fill Advanced** tab to analyze the part.

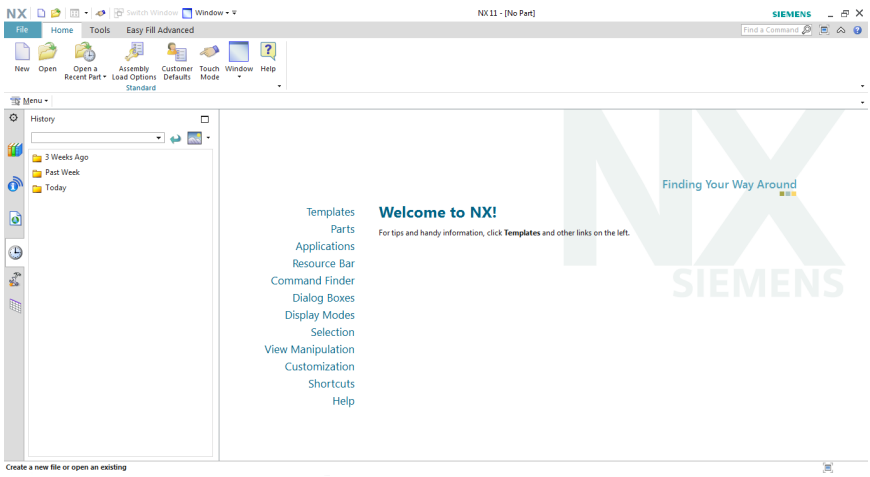


Figure 2-1 *The* ***Easy Fill Advanced*** *tab*

Before analyzing the part, you should know about the tools that are available in the NX mold wizard environment. You can use the tools according to the type of analysis that you need to perform. The types of analysis which you will learn are draft analysis, undercut analysis, thickness analysis, projected area, melt front time, air trap, weld line, volumetric shrinkage, shear stress, and cooling time.

Mold Design Validation

Ribbon: Mold Wizard > Part Validation gallery > Mold Design Validation

This tool helps to check the quality of the molded part. To check the quality of undercut, draft angle, and mold part, invoke the **Mold Design Validation** tool from the **Part Validation** gallery of the **Mold Wizard** tab; the **Mold Design Validation** dialog box will be displayed, as shown in Figure 2-2. The options in this dialog box are discussed next.

Component Validation

The check boxes available in this area help you to find out interference between the electrodes and the overlapping of core and cavity sheets.

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Product Quality

The check boxes available in this area help you to find out the undercut and the draft angle of the molded part.

Parting Validation

The check boxes available in this area help you to find out the faces to be split and also the overlapping patch surfaces.

As you choose the **Execute Check-Mate** button from the **Parameters** rollout of the dialog box, the **HD3D Tools** window is displayed, as shown in Figure 2-3. Depending upon the check boxes selected in the **Mold Design Validation** dialog box, the parameters will be displayed in the **HD3D Tools** window. In this window, the status of the results is shown in symbols. Following are the symbols with their meanings:

Passed with information.

Passed with warning.

Passed.

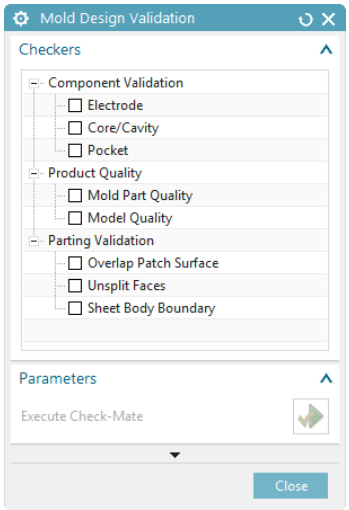

*Figure 2-2 The **Mold Design Validation** dialog box*

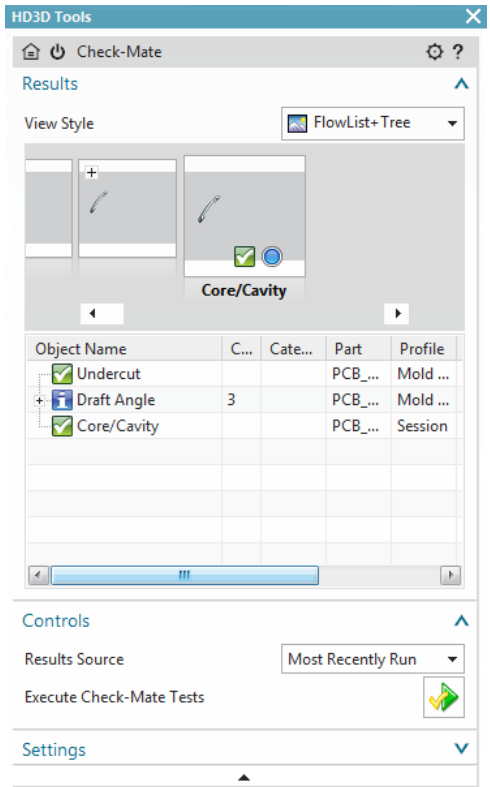

*Figure 2-3 The **HD3D Tools** window*

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Check Wall Thickness

Ribbon: Mold Wizard > Part Validation gallery > Check Wall Thickness

A part with uniform thickness allows the mold cavity to fill more easily as here the molten plastic does not have to be forced through varying restrictions while filling. If the walls of the part are not uniform then the material on thin section cools first than on the thick section which leaves warpage or sink marks in the part. So, the part thickness should ideally be uniform.

You can analyze the thickness using the **Check Wall Thickness** tool. To analyze thickness of the part, invoke the **Check Wall Thickness** tool from the **Part Validation** gallery of the **Mold Wizard** tab; the **Check Wall Thickness** dialog box will be displayed, refer to Figure 2-4, and you will be prompted to select solid body to analyze. Select the solid body and then select the **Ray** or **Rolling Ball** radio button from the **Method** rollout to calculate the thickness of the part. Now, choose the **Calculate Thickness** button from the **Process Results** rollout; the result will be displayed. Choose the **OK** button to close the dialog box.

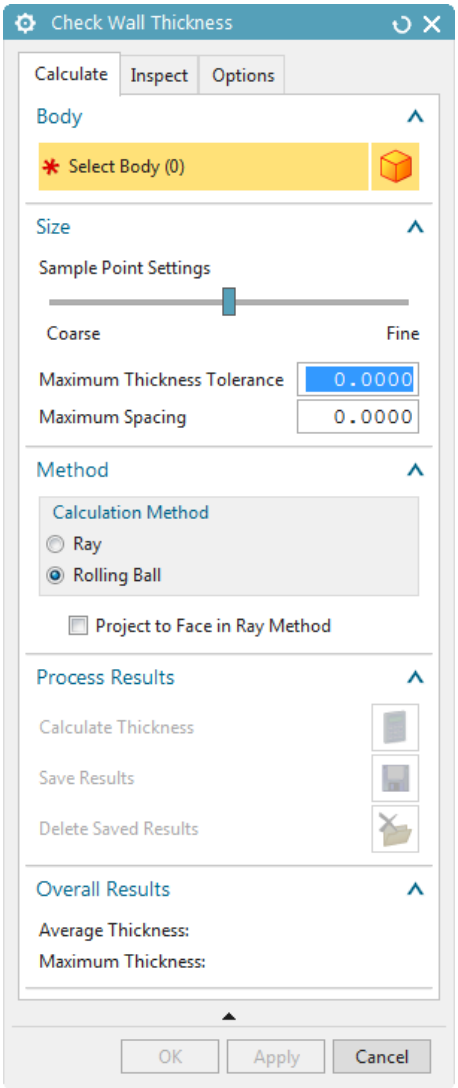

Figure 2-4 *The* ***Check Wall Thickness*** *dialog box*

Projected Area

Ribbon: Mold Wizard > Mold Tools gallery > Calculate Area

This tool helps to calculate the projected area of the part. When you design any mold, it is necessary to calculate the optimum required mold clamping force that the injection molding machine should have for the mold to be installed on the machine. For example, if a mold to be installed requires a clamping force of 100 ton and the mold is installed in 75 ton molding machine then the molded product thus created will be full of flash. Similarly, if you install it in 300 ton molding machine, the molding operation would still be possible but the cost of operation will become high.

Clamping Force = Projected Area x Injection Pressure

Now, to calculate the projected area of the part, invoke the **Calculate Area** tool from the **Mold Tools** gallery of the **Mold Wizard** tab; the **Calculate Area** dialog box will be displayed, as shown in Figure 2-5, and you will be prompted to select sheet or solid bodies to calculate area. Select

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the body and then select the **Specify Plane** area; you will be prompted to select objects to define the plane. Select the object face and specify the distance of the plane in the **Distance** edit box. Choose the **OK** button to close the dialog box; the **Information** window will be displayed where projected area calculations are shown, refer to Figure 2-6. Choose the **X** button in the **Information** window to close the window.

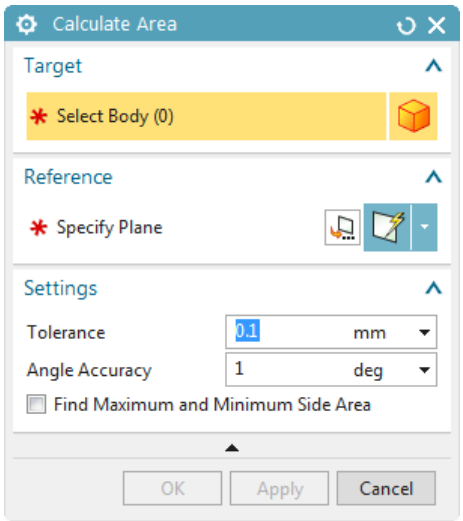

Figure 2-5 *The* ***Calculate Area*** *dialog box*

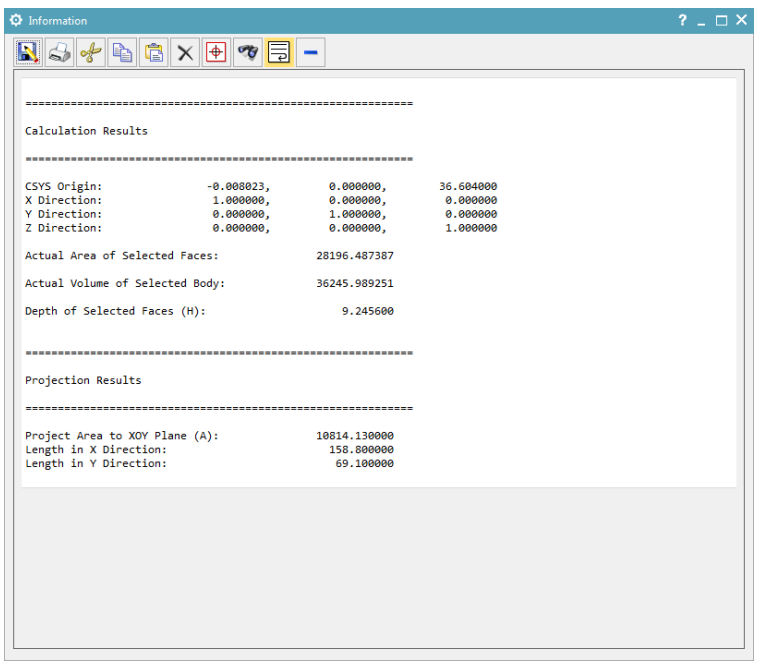

Figure 2-6 *The* ***Information*** *window*

For EDM machining, you can use the projected area to estimate the required ram force and the height to calculate the travel distance of ram.

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Easy Fill Advanced

NX provides various tools to simulate the flow of material into the mold. To simulate the flow of material, you need to add plugins. Various plugins that are available for simulation are Moldex3D, Easy Fill, and Easy Fill Advanced. In this chapter, you will use Easy Fill Advanced plugin because this provides more advanced options to analyze the part for mold designing. In the tutorial of this chapter, you will use tools available in the Easy Fill Advanced plugin. As you add this plugin; the **Easy Fill Advanced** tab gets displayed in the NX Welcome window, refer to Figure 2-7.

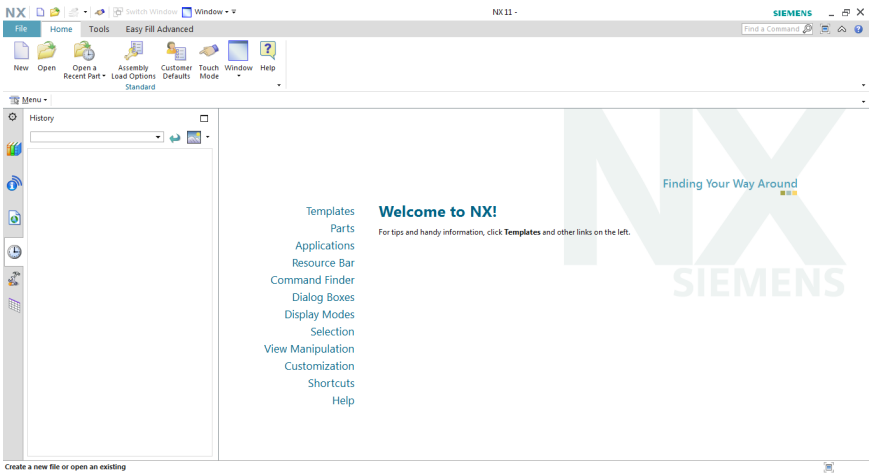

Figure 2-7 *The NX Welcome window with the* ***Easy Fill Advanced*** *tab*

TUTORIALS

To perform the tutorials, you need to download the zipped file named as *c02_NX_Mold_input* from the **Input Files** section of the CADCIM website. The complete path for downloading the file is:

Textbooks > CAD/CAM > NX_Mold > Mold Design Using NX 11.0: A Tutorial Approach > Input Files

After the file is downloaded, extract the folder and rename it as *c02*.

Tutorial 1

In this tutorial, you will analyze the PCB_COVER model which you have downloaded and is shown in Figure 2-8. You will also apply gate, runner, and sprue to analyze the flow of material into the model. Next, you will display and analyze the results.

After analysis, save the file with the name *c02tut1.prt* at the location given below:

\c02 **(Expected time: 3 hr)**

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The following steps are required to complete this tutorial:

a. Start NX and open the model.
b. Create the gate, runner, and sprue.
c. Start analysis and show results.
d. Save the file.

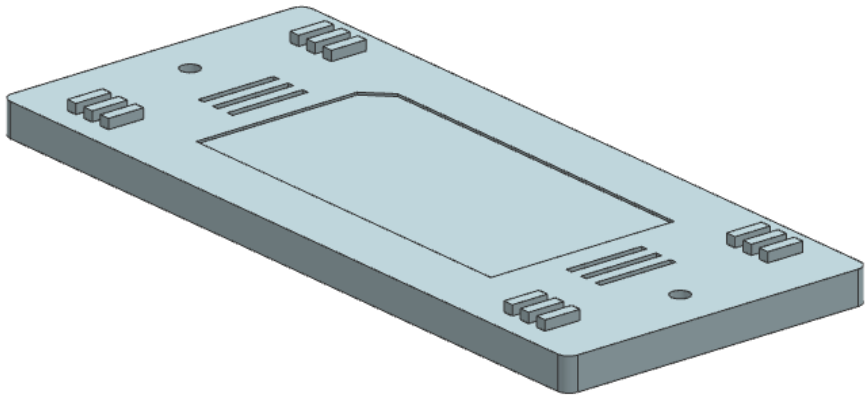

Figure 2-8 *The PCB_COVER model for Tutorial 1*

Starting NX and Opening the Model

First, you need to start NX and open a new file.

1. Double-click on the NX shortcut icon on the desktop of your computer to start NX.

2. Choose the **Open** button from the **Standard** group of the **Home** tab or choose **Menu > File > Open** from the **Top Border Bar**; the **Open** dialog box is displayed.

3. Select the **PCB_COVER** from the **Name** list; the **PCB_COVER** is displayed in the **File name** drop-down list. Next, choose the **OK** button; the model is displayed, refer to Figure 2-9.

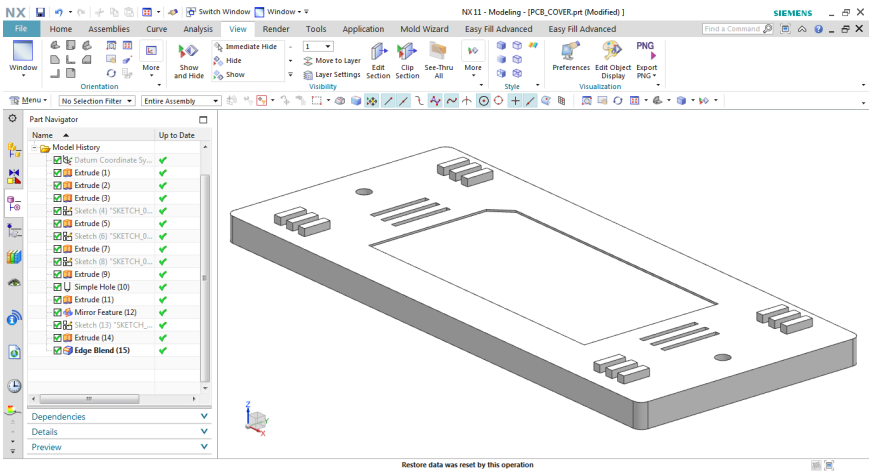

Figure 2-9 *PCB_COVER model displayed in modeling environment*

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Set the Working Folder

In this section, you will analyze the model by using the tools in the **Easy Fill Advanced** tab. Sometimes, the material is not filled properly in the model. In such a case, you need to perform iterations by changing the gate, runner, coolant size, shape, or orientation.

1. Choose the **Easy Fill Advanced** tab. Next, choose the **Set Working Folder** tool from the **Setting** group of the tab; the **Working Folder** dialog box is displayed.

2. In this dialog box, choose the **Browse** button; the **Open** dialog box is displayed, refer to Figure 2-10.

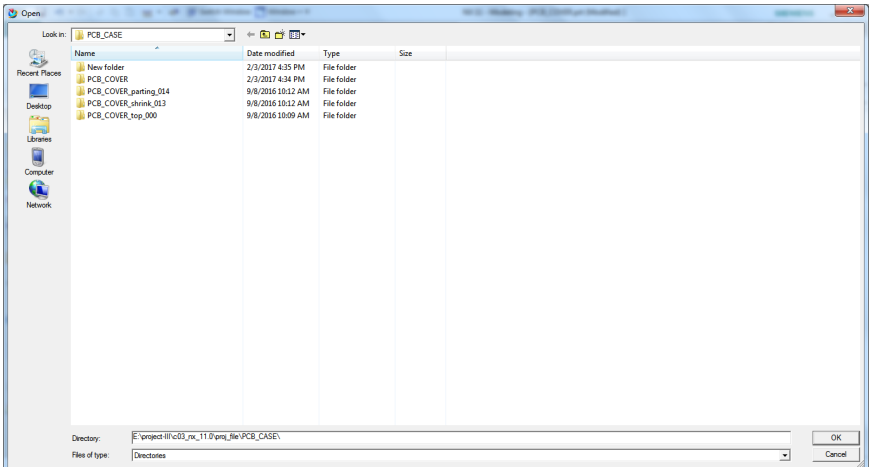

Figure 2-10 *The* ***Open*** *dialog box*

3. In this dialog box, set the working folder and choose the **OK** button from the **Open** dialog box and then from the **Working Folder** dialog box.

Creating the Gate

In this section, you will create the gate.

1. Choose the **Set Cavity** tool from the **Setting** group of the **Easy Fill Advanced** tab in the **Ribbon**; the **Select Cavity** dialog box is displayed, refer to Figure 2-11.

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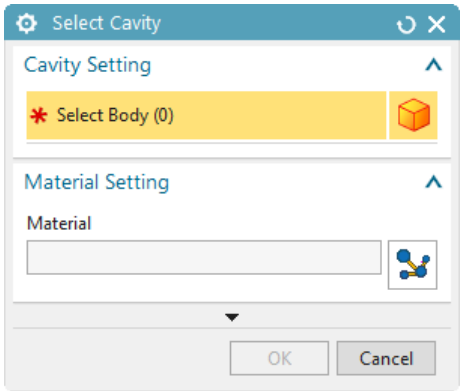

Figure 2-11 *The* ***Select Cavity*** *dialog box*

2. Select the solid body from the **Select Body** area of the **Cavity Setting** rollout to specify the solid body as cavity.

3. Choose the **Push button to select material** button in the **Material Setting** rollout; the **Moldex3D Material Wizard** dialog box is displayed, refer to Figure 2-12.

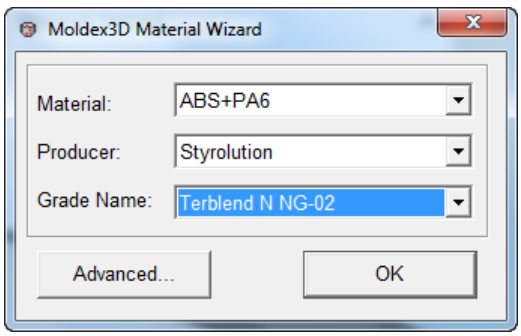

Figure 2-12 *The* ***Moldex3D Material Wizard*** *dialog box*

4. Select **ABS+PA6** from the **Material** drop-down list if not selected.

5. Select **Styrolution** from the **Producer** drop-down list if not selected.

6. Select **Terblend N NG-06** from the **Grade Name** drop-down list if not selected.

7. Choose the **OK** button from the **Moldex3D Material Wizard** and then choose the **OK** button from the **Select Cavity** dialog box.

8. Choose the **Gate Wizard** tool from the **Wizard** group; the **Create Gate** dialog box is displayed, refer to Figure 2-13.

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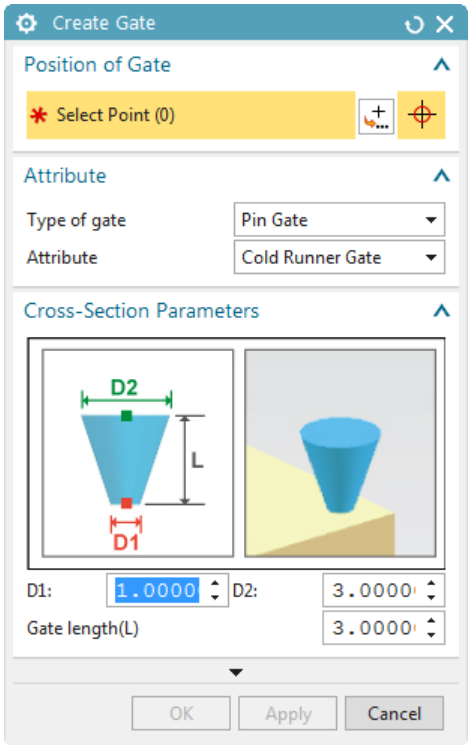

Figure 2-13 *The* ***Create Gate*** *dialog box*

9. Select the **Fan Gate** from the **Type of gate** drop-down list. Enter **3**, **3**, **8**, **4**, **180**, and **7** in **a1**, **a2**, **b1**, **b2**, **Angle**, and **L** edit boxes respectively in the **Cross-Section Parameters** rollout of the dialog box.

10. Select the **Cold Runner Gate** option from the **Attribute** drop-down list if it is not selected by default.

11. Choose the **Point Dialog** button from the **Position of Gate** rollout; the **Point** dialog box is displayed, refer to Figure 2-14.

12. Select the **Point on Face** option from the **Type** drop-down list; you are prompted to specify the point location on the desired face. The rotated view of the model indicating point location for gate placement is shown in Figure 2-15.

13. Enter **1** and **0.5** in the **U Parameter** and **V Parameter** edit boxes, respectively and choose the **OK** button to close the **Point** dialog box.

    If you need to change the dimensions of the gate then change the values in a1, a2, b1, b2, angle and gate length(L) edit boxes from the **Cross-Section Parameters** rollout, refer to Figure 2-16.

14. Choose the **OK** button to close the **Create Gate** dialog box.

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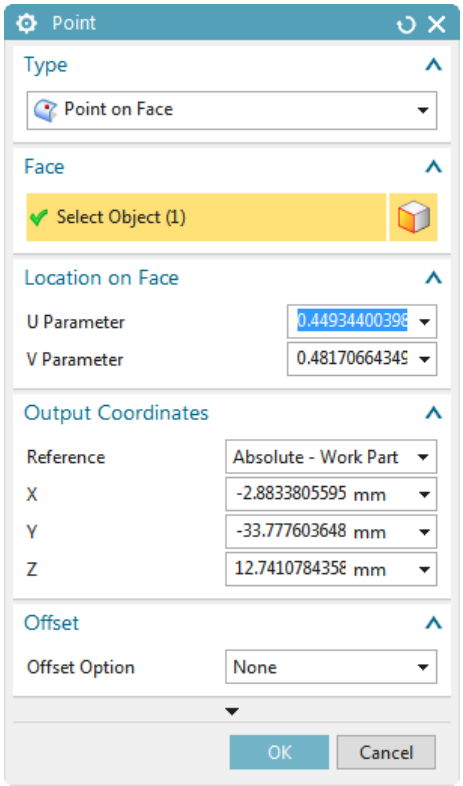

Figure 2-14 *The* ***Point*** *dialog box*

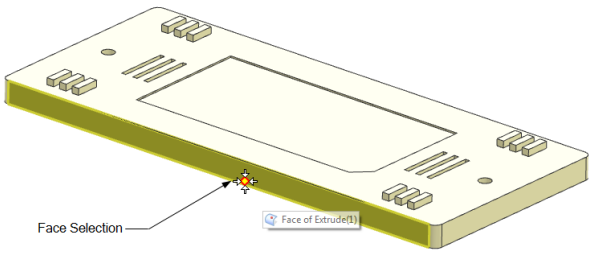

Figure 2-15 *The rotated view of the model for gate placement*

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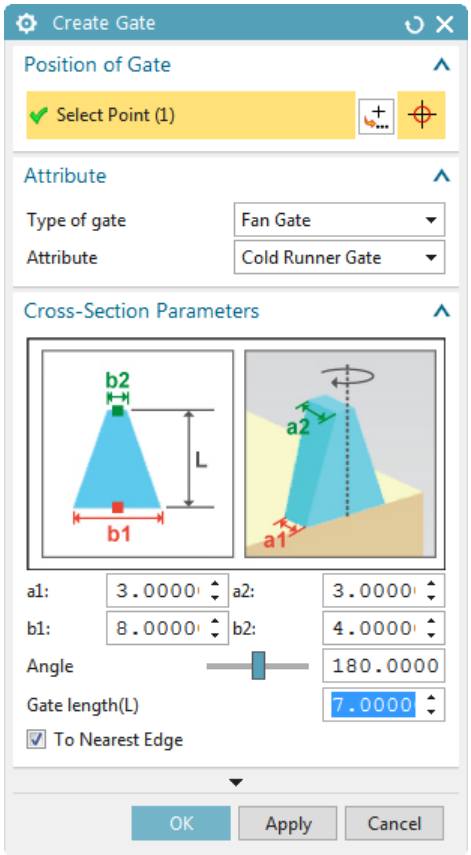

*Figure 2-16 The **Create Gate** dialog box*

Creating the Runner and Sprue

In this section, you will create the runner and sprue.

1. Choose the **Runner Wizard** tool from the **Wizard** group; the **Runner Wizard** dialog box is displayed, refer to Figure 2-17.

2. If the **Mold Setting** tab is not chosen by default then choose the **Reset** button.

3. Select **Z-Axis/+Z**, **2-Plate mold**, and **Cold Runner** from the **Parting Direction**, **Mold Plate Type**, and **Runner Attribute** drop-down lists, respectively if they are not selected by default.

4. Choose the **Sprue Setting** tab and then enter **10**, **6**, and **55** in the **D1**, **D2**, and **SH** edit boxes, respectively.

5. Choose the **Runner Setting** tab and select the **Circular** type of cross section for runner from the **Type** drop-down list. Enter **10** in the **D** edit box.

6. Choose the **OK** button to close this dialog box; the gate, runner, and sprue are now attached to the model, refer to Figure 2-18.

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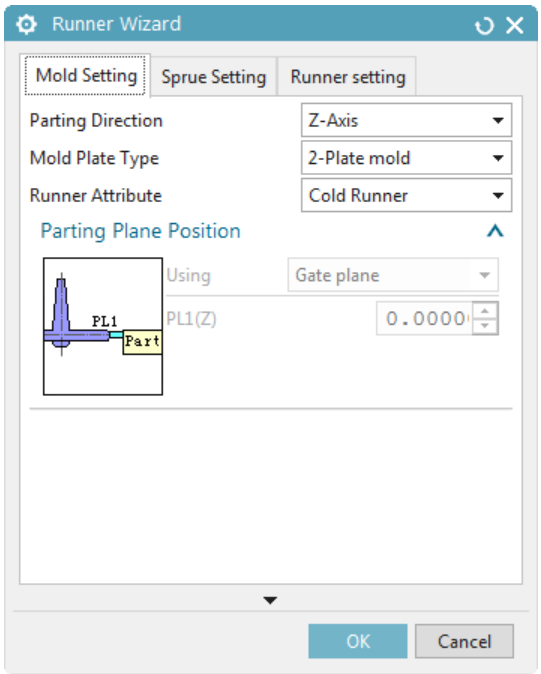

Figure 2-17 *The* ***Runner Wizard*** *dialog box*

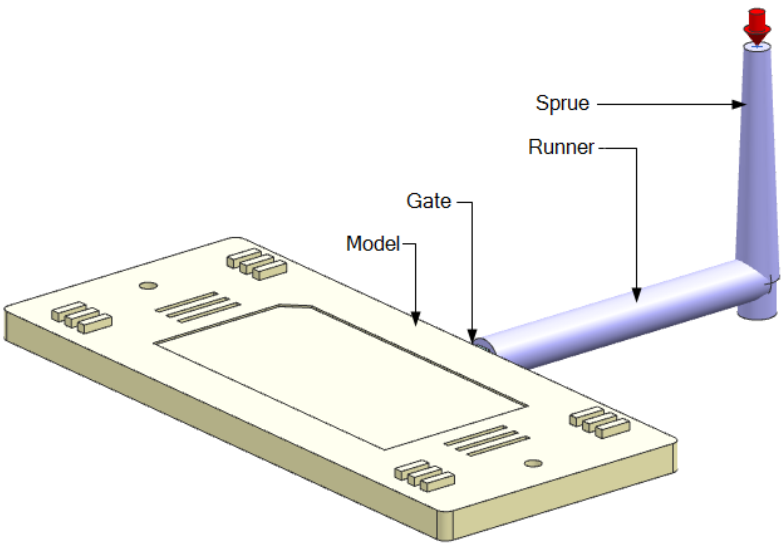

Figure 2-18 *The gate, runner, and sprue attached to the model*

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Setting the Parting Direction

In this section, you will set the direction of ejection.

1. Choose the **Set Parting Direction** tool from the **Settings** group to set the parting direction of the model; the **Vector** dialog box is displayed, as shown in Figure 2-19.

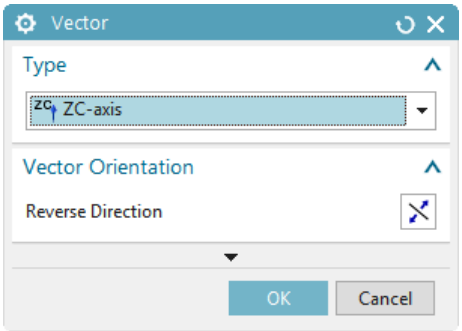

Figure 2-19 *The **Vector** dialog box*

2. Select the **ZC-axis** option from the **Type** rollout and choose the **OK** button to close the dialog box.

Starting Analysis and Analyzing Results

In this section, you will start the analysis and show results.

1. Choose the **Start Analysis** tool from the **Setting** group to start analysis of the model; the **Start Analysis** dialog box is displayed, as shown in Figure 2-20.

2. Select the **Filling & Packing - F P** option from the **Analysis** drop-down list in the **Analysis Sequence Setting** rollout.

3. Enter **220**, **0.65**, **4.5**, **260**, and **60** in the **Maximum injection pressure(MPa)**, **Filling time(Sec.)**, **Packing time(Sec.)**, **Melt Temperature(°C)**, and **Mold Temperature(°C)** edit boxes, respectively, in the **Process Condition** rollout.

4. Choose the **OK** button; the dialog box gets closed and the **Moldex3D** window showing the progress of solid mesh generation is displayed, refer to Figure 2-21.

   Note that after the solid mesh is created; the **Easy Fill Advanced Project Monitor** window showing the progress of filling and packing is displayed, refer to Figure 2-22. After completion of analysis, the **Moldex3D eDesignSYNC** window gets displayed. Choose the **OK** button.

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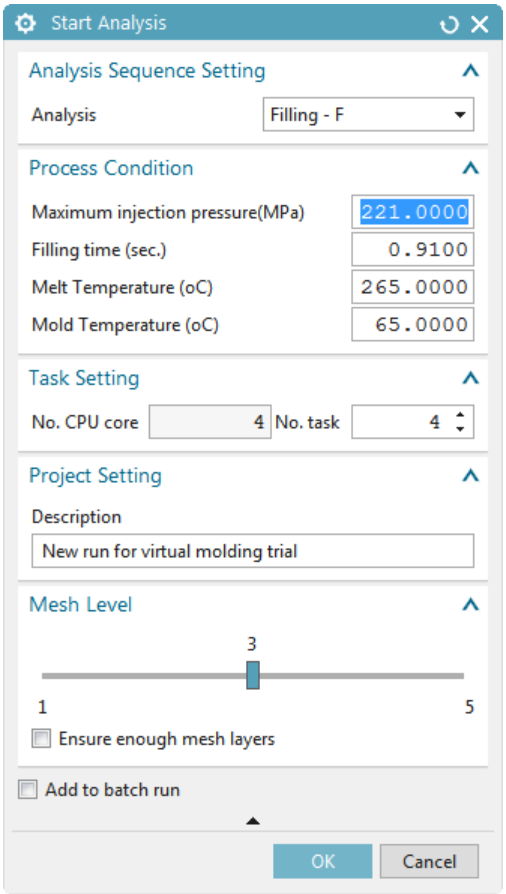

Figure 2-20 *The* ***Start Analysis*** *dialog box*

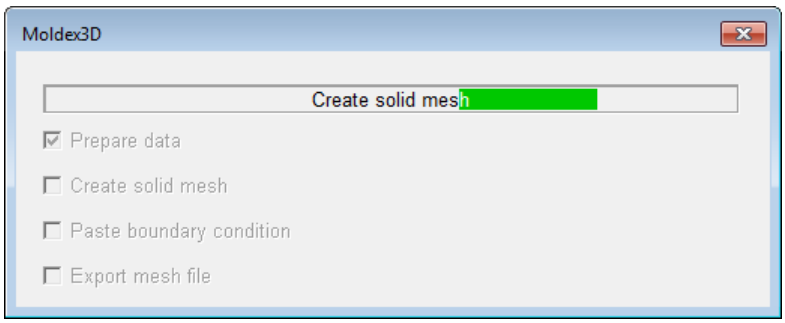

Figure 2-21 *The* ***Moldex3D*** *window*

5. Choose the **Close** button from the **Easy Fill Advanced Project Monitor** window.

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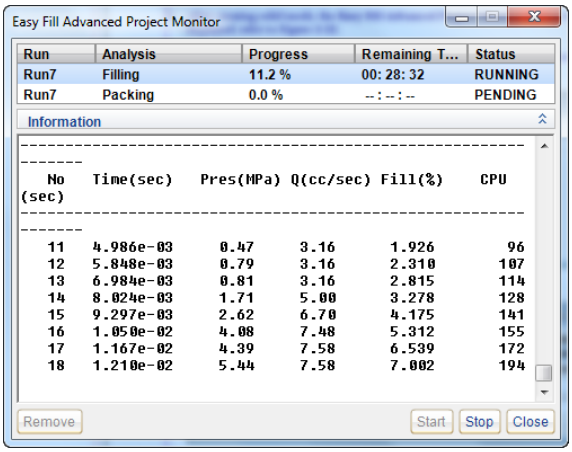

Figure 2-22 *The* ***Easy Fill Advanced Project Monitor*** *window*

6. Choose the **Show Result** tool from the **Setting** group; the **Show Result** dialog box is displayed, refer to Figure 2-23.

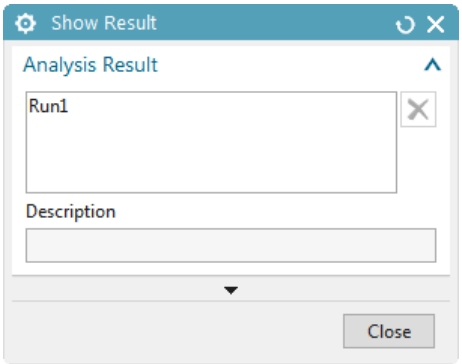

Figure 2-23 *The* ***Show Result*** *dialog box*

7. In this dialog box, select the result from the **Analysis Result** rollout. As you select the result from this rollout; the dialog box gets modified, refer to Figure 2-24.

8. From the **Display Result** rollout, you can select the **Filling and Packing** option. By default, the **Filling** option is selected.

   You can also visualize the results by selecting an appropriate option from the **Result Type** drop-down list.

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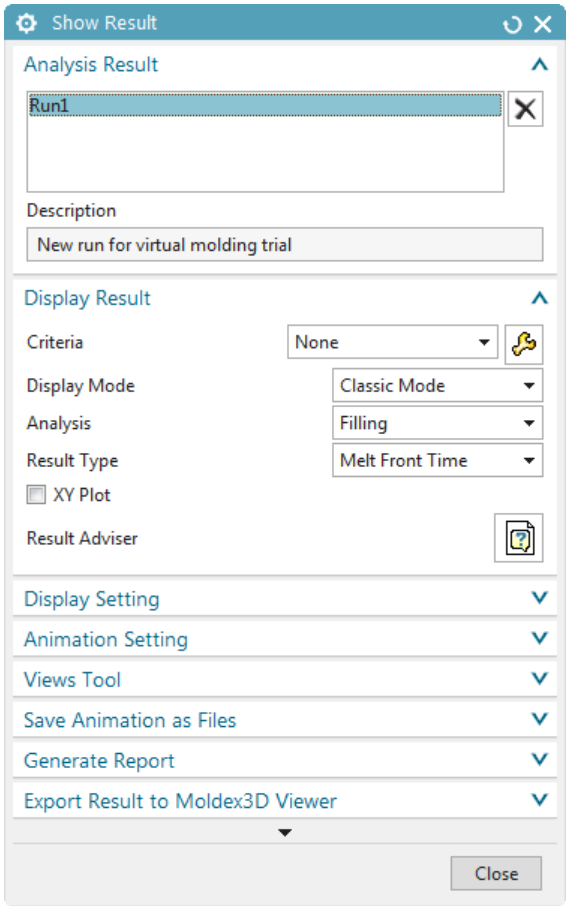

Figure 2-24 *The modified* ***Show Result*** *dialog box*

The options to visualize the results are **Melt Front Time**, **Air Trap**, **Weld Line**, **Volumetric Shrinkage**, **Maximum Shear Stress**, and **Sink Marks Indicator**.

9. Select the **XY Plot** check box to activate the **XY Curve Type** drop-down list. In this drop-down list, select the **Clamping Force** option; the resultant graphs are shown in Figures 2-25 through 2-30.

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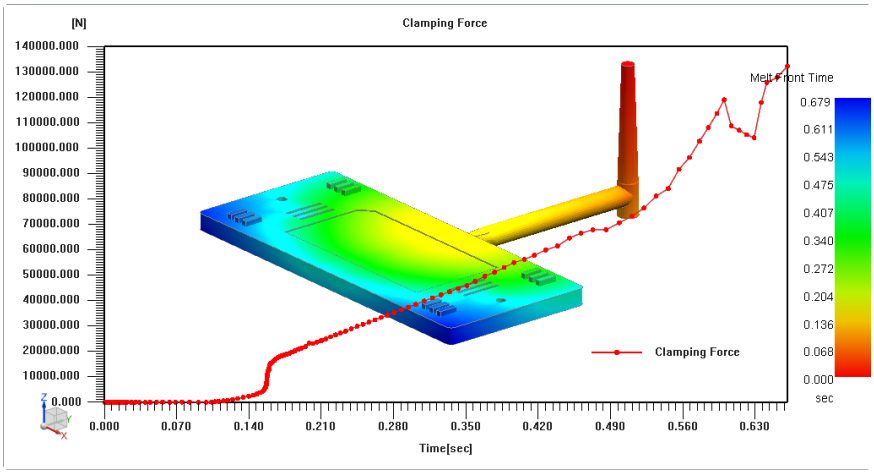

Figure 2-25 *The Clamping Force vs Melt Front Time graph*

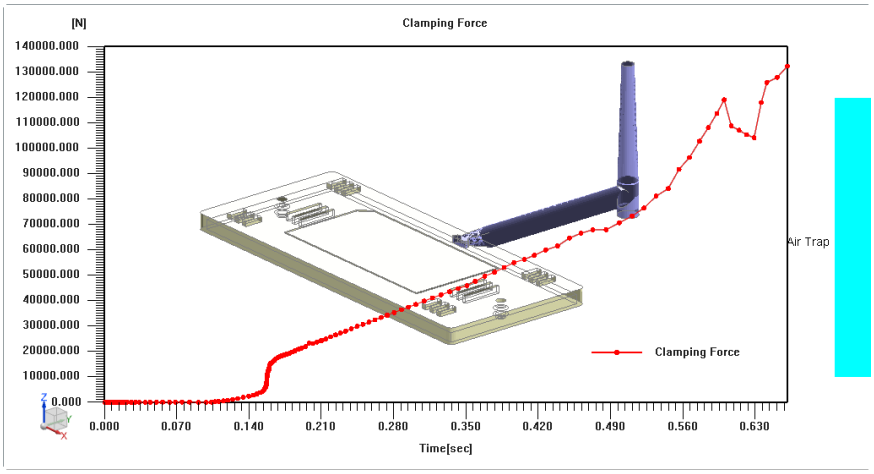

Figure 2-26 *The Clamping Force vs Air Trap graph*

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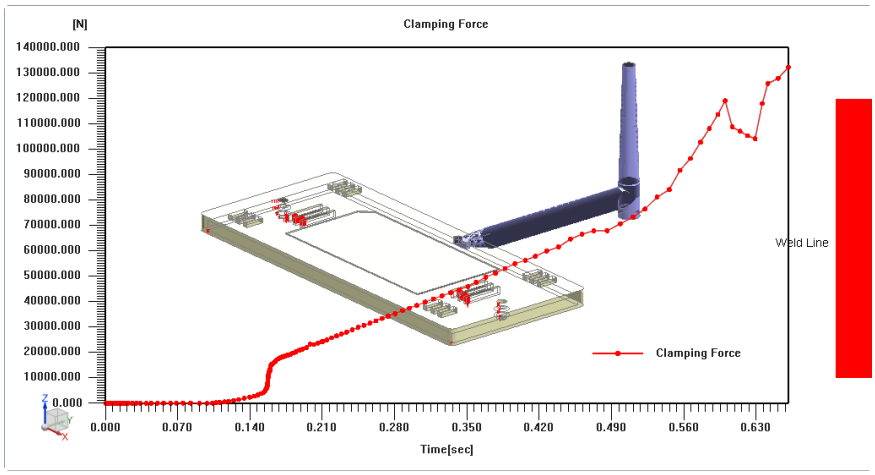

Figure 2-27 *The Clamping Force vs Weld Line graph*

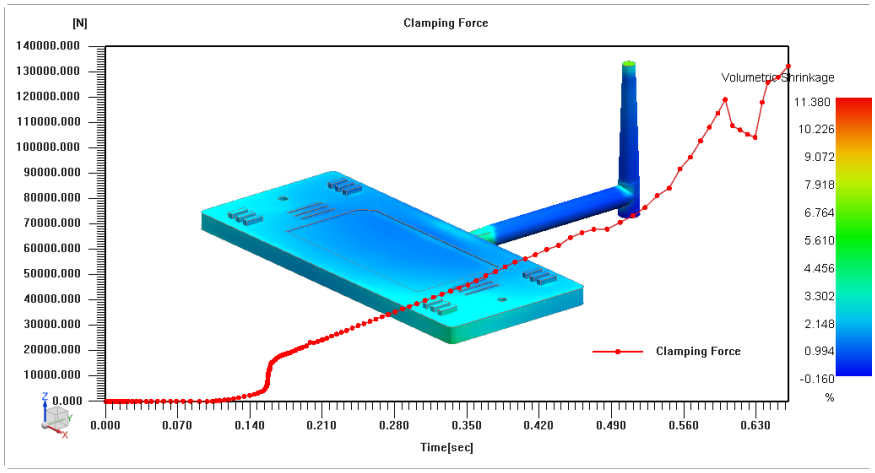

Figure 2-28 *The Clamping Force vs Volumetric Shrinkage graph*

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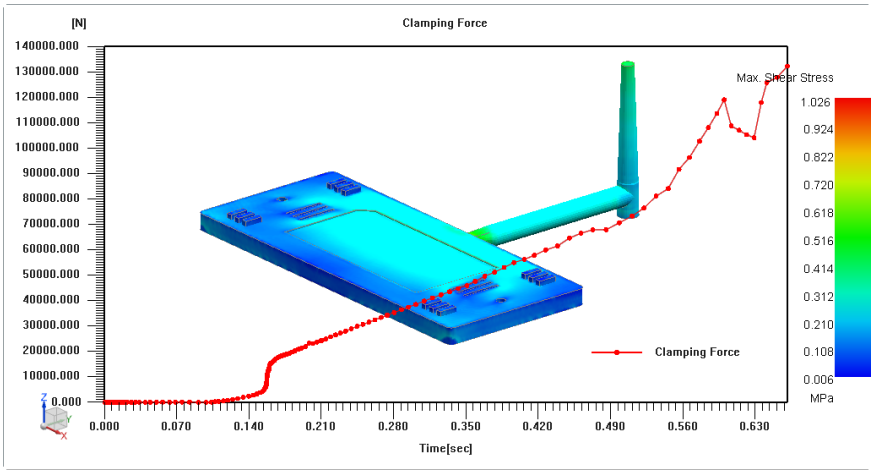

Figure 2-29 *The Clamping Force vs Max. Shear Stress graph*

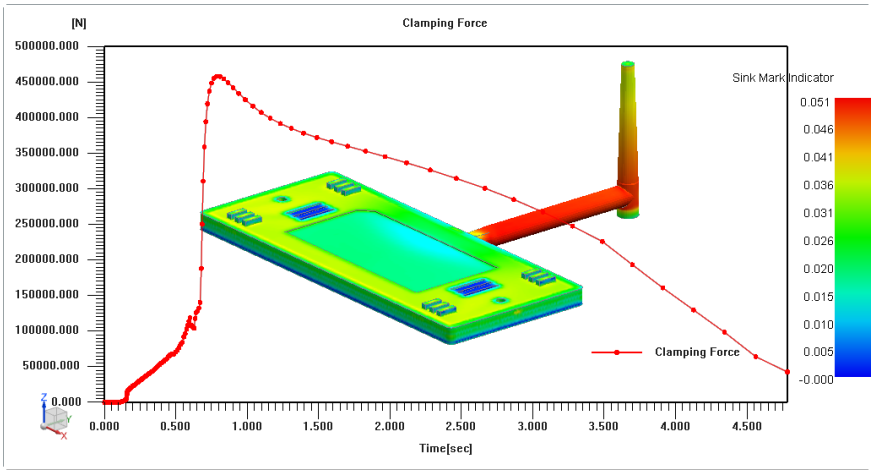

Figure 2-30 *The Clamping Force vs Sink Mark Indicator graph*

10. Choose the **Play** button from the **Animation Setting** rollout to see the flow of material. Next, choose the **Close** button to close the dialog box.

Saving and Closing the File

1. Choose **Menu > File > Close > Save and Close** from the **Top border Bar** to save and close the file.

Tutorial 2

In this tutorial, you will analyze the PCB_UPPER_CASE model which is shown in Figure 2-31. You will apply gate, runner, and sprue to analyze the flow of material into the model. You will also display and analyze the results.

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After analysis, save the file with the name *c02tut2.prt* at the location given below:

\c02 **(Expected time: 3 hr)**

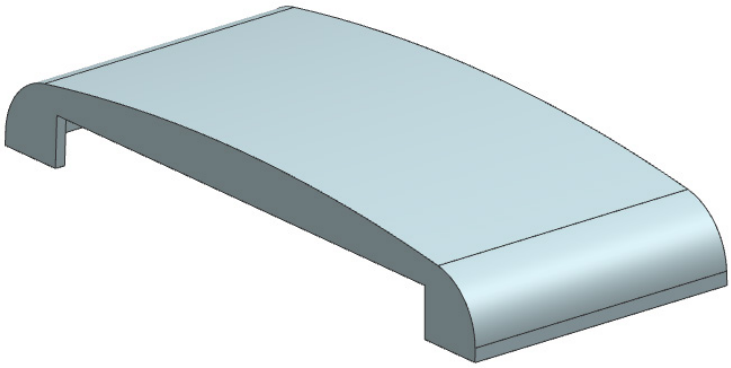

Figure 2-31 *The PCB_UPPER_CASE model for Tutorial 2*

The following steps are required to complete this tutorial:

a. Start NX and open the model.
b. Set a working folder.
c. Create the gate, runner, and sprue.
d. Start a Analysis and show results.
e. Save the file.

Starting NX and Opening the Model

First, you need to start NX and open the file.

1. Double-click on the shortcut icon of NX on the desktop of your computer to start NX.

2. Choose the **Open** button from the **Standard** group of the **Home** tab or choose **Menu > File > Open** from the **Top Border Bar**; the **Open** dialog box is displayed.

3. Select the **PCB_UPPER_CASE** from the **Name** list; the **PCB_UPPER_CASE** is displayed in **File name** drop-down list. Next, choose the **OK** button; the model is displayed, refer to Figure 2-32.

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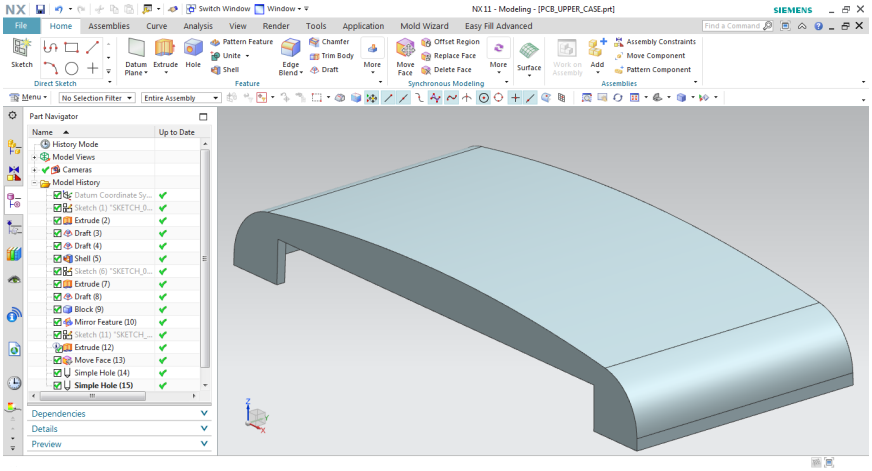

Figure 2-32 The PCB_UPPER_CASE model in Modeling environment

Setting the Working Folder

In this section, you will analyze the model by using the tools in the **Easy Fill Advanced** tab. Sometimes, the material is not filled properly in the model. In this case, you need to perform iterations by changing the gate, runner, coolant size, shape, or orientation.

1. Choose the **Easy Fill Advanced** tab. Next, choose the **Set Working Folder** tool from the **Setting** group of the tab; the **Working Folder** dialog box is displayed.

2. In this dialog box, choose the **Browse** button; the **Open** dialog box is displayed, refer to Figure 2-33.

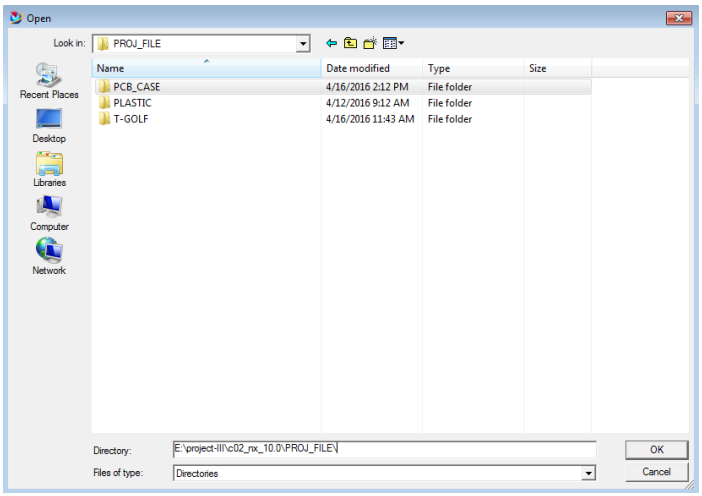

*Figure 2-33 The **Open** dialog box*

3. Set the working folder and choose the **OK** button from the **Open** and **Working Folder** dialog boxes to close the dialog boxes.

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Creating the Gate

In this section, you will create a gate.

1. Choose the **Set Cavity** tool from the **Setting** group of the **Easy Fill Advanced** tab in the **Ribbon**; the **Select Cavity** dialog box is displayed, refer to Figure 2-34.

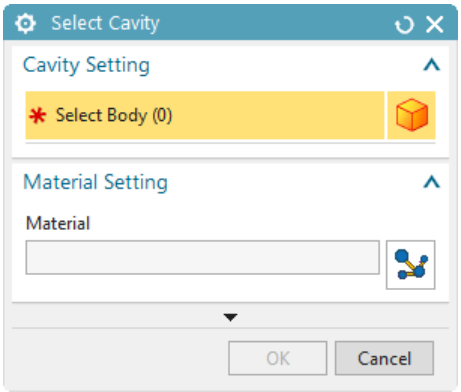

*Figure 2-34 The **Select Cavity** dialog box*

2. Select the solid body from the **Select Body** area of the **Cavity Setting** rollout to specify the solid body as cavity.

3. Choose the **Push button to select material** button in the **Material Setting** rollout; the **Moldex3D Material Wizard** dialog box is displayed, refer to Figure 2-35.

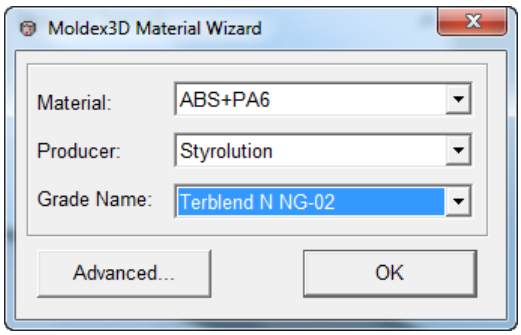

*Figure 2-35 The **Moldex3D Material Wizard** dialog box*

4. Select **ABS+PA6** from the **Material** drop-down list if it is not selected.

5. Select **Styrolution** from the **Producer** drop-down list if it is not selected.

6. Select **Terblend N NG-06** from the **Grade Name** drop-down list if it is not selected.

7. Choose the **OK** button from the **Moldex3D Material Wizard** dialog box and choose the **OK** button from the **Select Cavity** dialog box.

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8. Choose the **Gate Wizard** tool from the **Wizard** group; the **Create Gate** dialog box is displayed, refer to Figure 2-36.

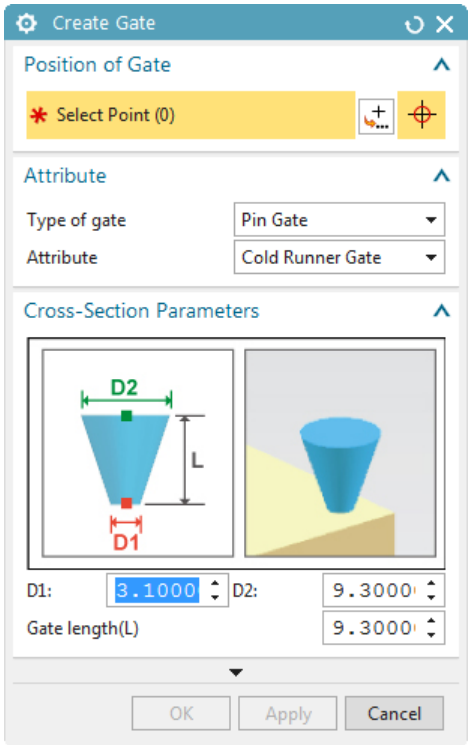

Figure 2-36 *The* ***Create Gate*** *dialog box*

9. Select the **Edge Gate** from the **Type of gate** drop-down list. Enter **3**, **3**, **5, 180** and **6** in **a1**, **a2**, **b, Angle**, and **L** edit boxes in the **Cross-Section Parameters** rollout of the dialog box.

10. Select **Cold Runner Gate** from the **Attribute** drop-down list if it is not selected by default.

11. Choose the **Point Dialog** button; the **Point** dialog box is displayed, refer to Figure 2-37.

12. Select the **Point on Face** option from the **Type** drop-down list; you are prompted to specify the point location on the desired face, refer to Figure 2-38.

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

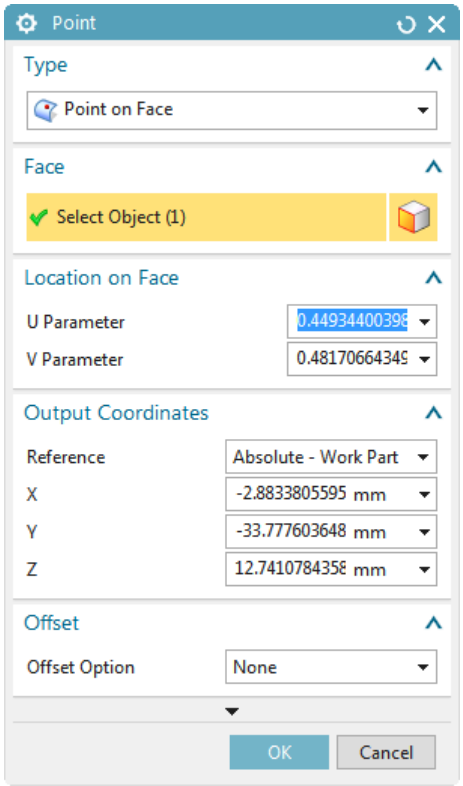

Figure 2-37 *The* ***Point*** *dialog box*

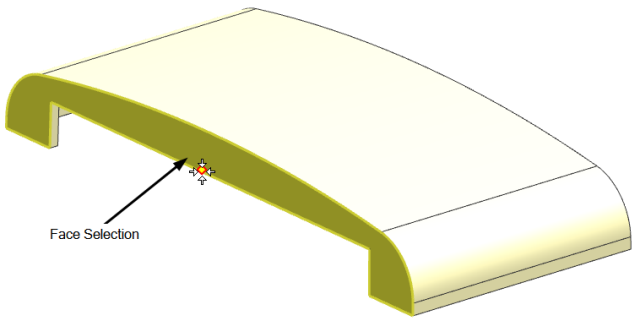

Figure 2-38 *The face selected for gate placement*

13. Enter **0.481** and **0.5** in the **U Parameter** and **V Parameter** edit boxes, respectively, and choose the **OK** button to close the **Point** dialog box.

    If you need to change the dimensions of the gate then select **a1**, **a2**, **b1**, **b2**, **angle** and **gate length**(L) edit box from the **Cross-Section Parameters** rollout.

14. Choose the **OK** button to close the **Create Gate** dialog box.

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Creating Runner and Sprue for Analyzing the Model

In this section, you will create the runner and sprue.

1. Choose the **Runner Wizard** tool from the **Wizard** group; the **Runner Wizard** dialog box is displayed, refer to Figure 2-39.

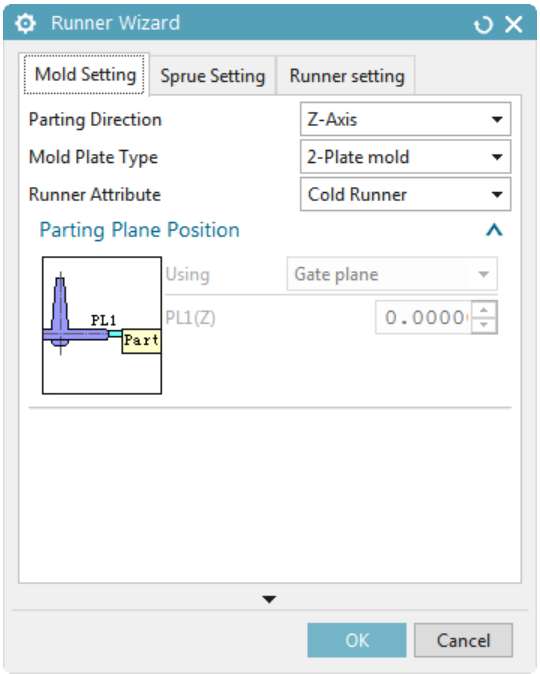

*Figure 2-39 The **Runner Wizard** dialog box*

2. By default, the **Mold Setting** tab is chosen. If it is not chosen by default then the use **Reset** button in dialog box.

3. Select **Z-Axis/+Z**, **2-Plate mold**, and **Cold Runner** from the **Parting Direction**, **Mold Plate Type**, and **Runner Attribute** drop-down lists, respectively if not selected by default.

4. Choose the **Sprue Setting** tab and then enter **10**, **6**, and **55** in the **D1**, **D2**, and **SH** edit boxes, respectively.

5. Choose the **Runner Setting** tab and select the **Circular** type of cross section for runner from the **Type** drop-down list. Enter **10** in the **D** edit box.

6. Choose the **OK** button to close this dialog box; the gate, runner and sprue are now attached to the model, refer to Figure 2-40.

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

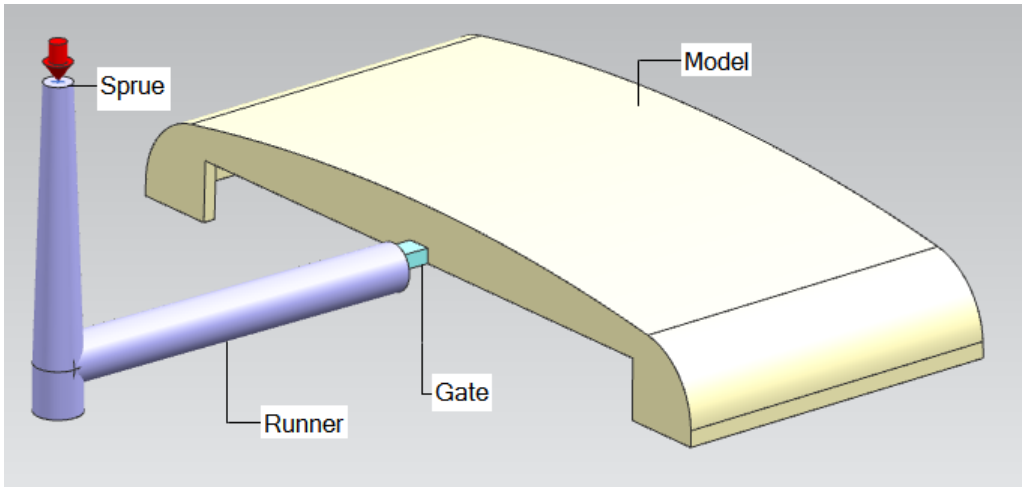

Figure 2-40 The gate, runner, and sprue attached to the model

Setting the Parting Direction

To analyze the model, you need to set up the parting direction.

1. Choose the **Set Parting Direction** tool from the **Settings** group to set the parting direction of the model; the **Vector** dialog box is displayed, refer to Figure 2-41.

2. Select the **ZC-axis** option from the **Type** rollout and choose the **OK** button to close the dialog box.

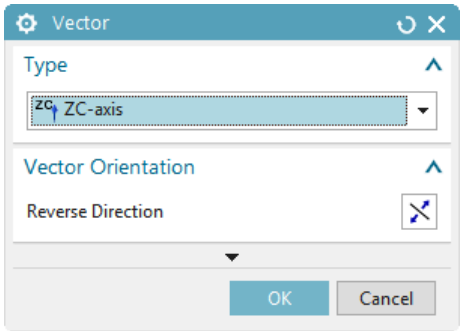

*Figure 2-41 The **Vector** dialog box*

Starting Analysis and Analyzing Results

In this section, you will start the analysis and show results.

1. Choose the **Start Analysis** tool from the **Setting** group to start the analysis of the model; the **Start Analysis** dialog box is displayed, as shown in Figure 2-42.

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

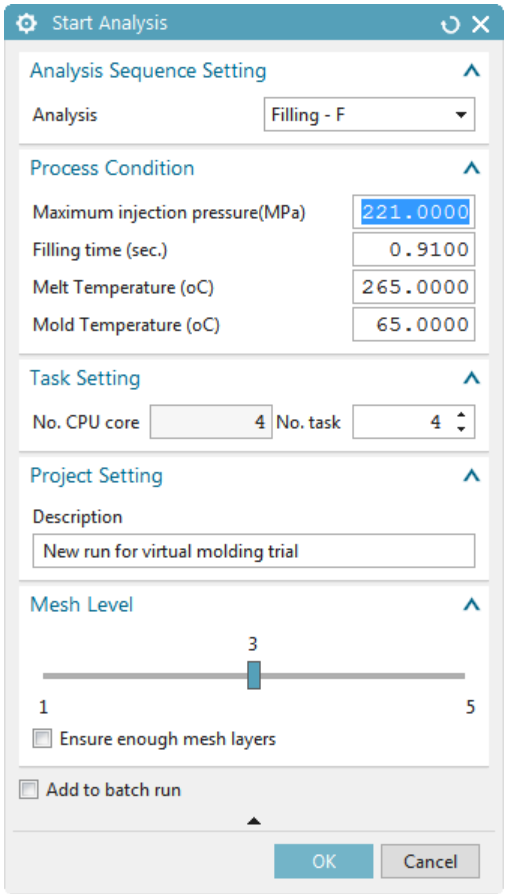

Figure 2-42 *The* ***Start Analysis*** *dialog box*

2. Select the **Filling & Packing - F P** option from the **Analysis** drop-down list of the **Analysis Sequence Setting** rollout.

3. Enter **165**, **0.58**, **6.5**, **270**, and **70** in the **Maximum injection pressure(MPa)**, **Filling time(Sec.)**, **Packing time(Sec.)**, **Melt Temperature(°C)**, and **Mold Temperature (°C)** edit boxes respectively in the **Process Condition** rollout.

4. Choose the **OK** button; the dialog box gets closed and the **Moldex3D** window showing the progress of solid mesh generation is displayed, refer to Figure 2-43.

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

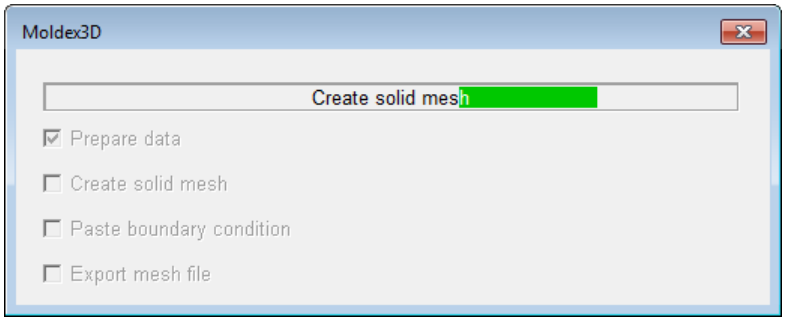

*Figure 2-43 The **Moldex3D** window*

Note that after the solid mesh is created; the **Easy Fill Advanced Project Monitor** window showing the progress of filling and packing is displayed, refer to Figure 2-44. After completion of analysis, the **Moldex3D eDesignSYNC** window gets displayed. Choose the **OK** button.

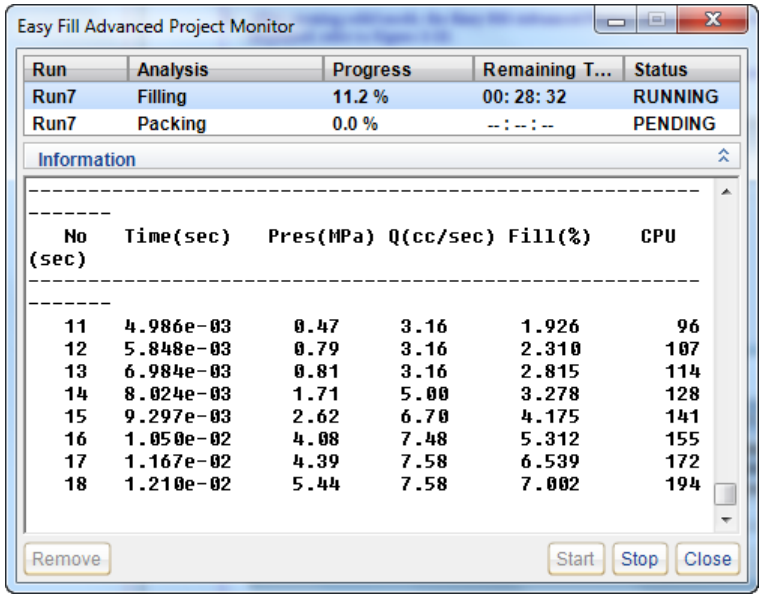

*Figure 2-44 The **Easy Fill Advanced Project Monitor** window*

5. Choose the **Close** button from the **Easy Fill Advanced Project Monitor** window.

6. Choose the **Show Result** tool from the **Settings** group; the **Show Result** dialog box is displayed, refer to Figure 2-45.

7. Select result from the **Analysis Result** rollout; the dialog box gets modified, refer to Figure 2-46.

   From the **Display Result** rollout, you can select the **Filling and Packing** option. By default, the **Filling** option is selected.

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You can select the **Filling** or **Packing** option from the **Analysis** drop-down list in the **Display Result** rollout. By default, the **Filling** option is selected.

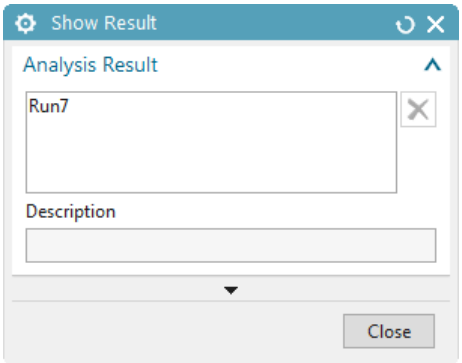

Figure 2-45 *The* ***Show Result*** *dialog box*

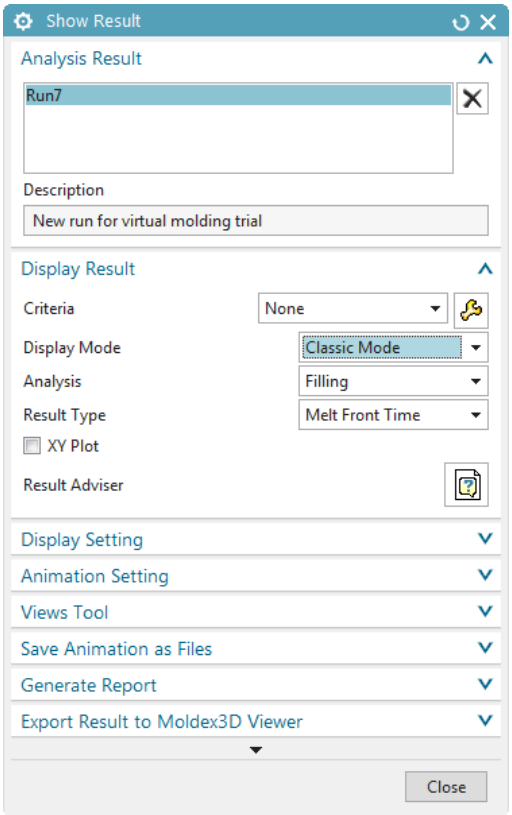

Figure 2-46 *The modified* ***Show Result*** *dialog box*

In this tutorial, you can visualize the results by selecting appropriate option from the **Result Type** drop-down list.

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The options which can be selected for results are **Melt Front Time**, **Air Trap**, **Weld Line**, **Volumetric Shrinkage**, **Maximum Shear Stress**, and **Sink Marks Indicator**.

8. Select the **XY Plot** check box to activate the **XY Curve Type** drop-down list. Next, select the **Clamping Force** option from this drop-down list; the resultant graphs are shown, refer to Figure 2-47 through Figure 2-52.

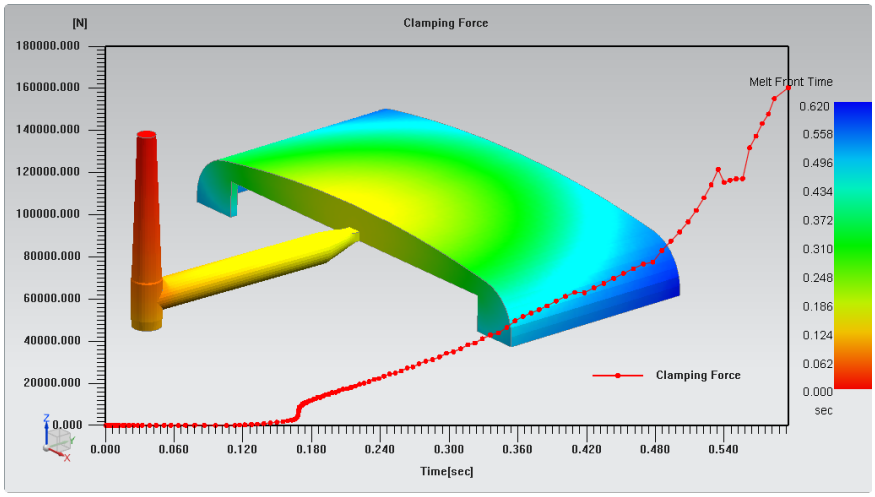

Figure 2-47 *The Clamping Force vs Melt Front Time graph*

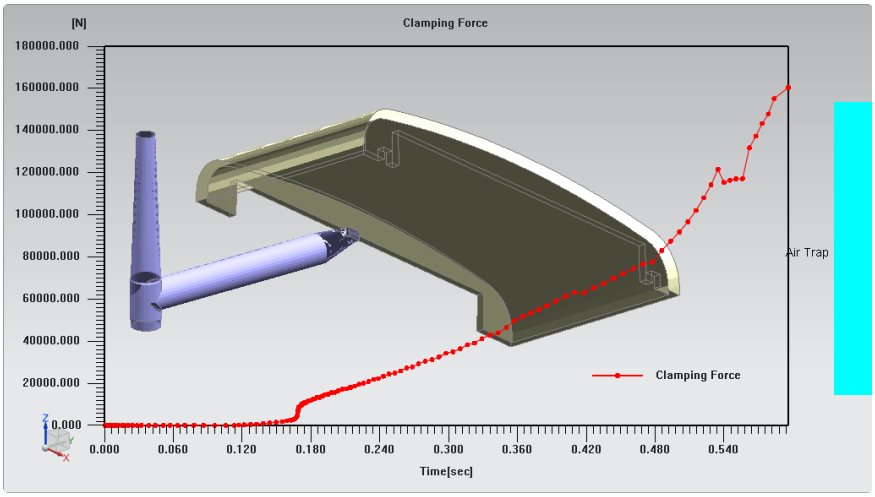

Figure 2-48 *The Clamping Force vs Air Trap graph*

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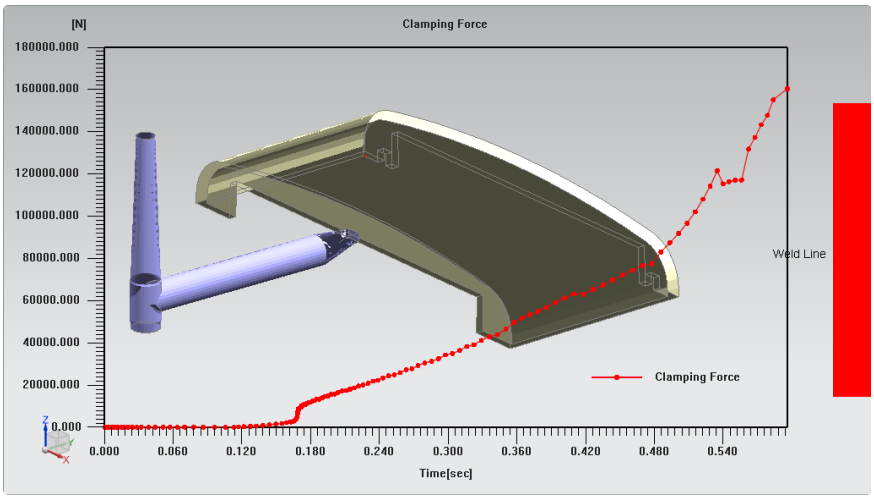

Figure 2-49 *The Clamping Force vs Weld Line graph*

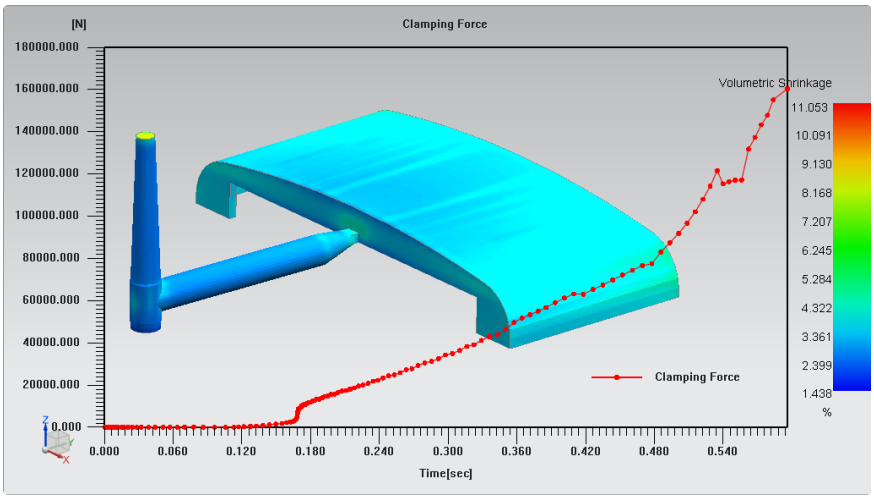

Figure 2-50 *The Clamping Force vs Volumetric Shrinkage graph*

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

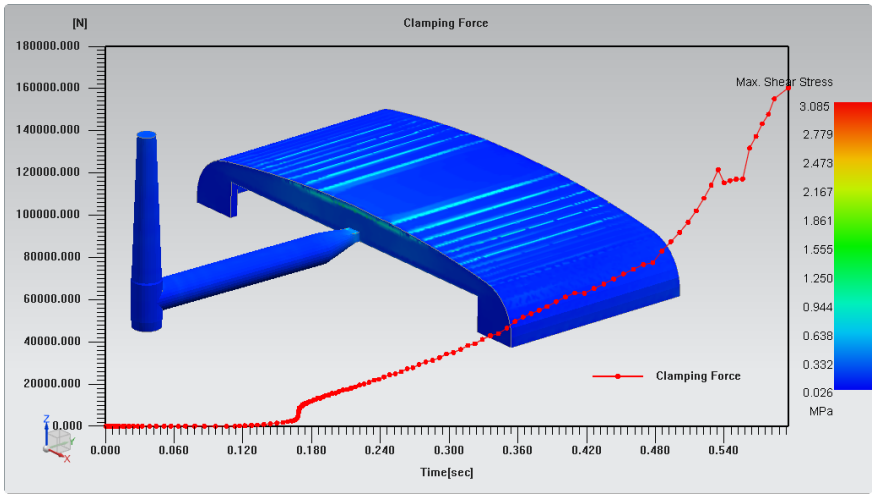

Figure 2-51 *The Clamping Force vs Max. Shear Stress graph*

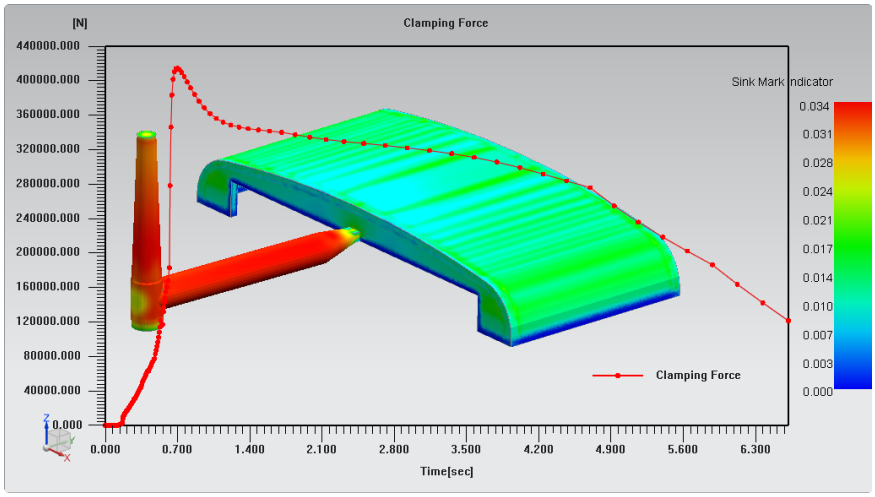

Figure 2-52 *The Clamping Force vs Sink Mark Indicator graph*

Evaluation Copy. Do not reproduce. For information visit www.cadcim.com

9. Choose the **Play** button from the **Animation Setting** rollout. Next, choose the **Close** button to close the dialog box.

Saving and Closing the File

1. Choose **Menu > File > Close > Save and Close** from the **Top border Bar** to save and close the file.

Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

1. The _____ tool is used to analyze the wall thickness of the part.

2. The _____ tool is used to calculate the projected area of a part.

3. Clamping Force is calculated by multiplying injection pressure and _____.

4. The _____ window is used to show the projected area value.

5. You can use the _____ or _____ option to calculate the wall thickness in the **Check Wall Thickness** dialog box.

6. The _____ dialog box is used to check the product quality.

7. You can select the material from the **Select Cavity** dialog box. (T/F)

8. There are two types of attributes in the **Create Gate** dialog box. (T/F)

Review Questions

Answer the following questions:

1. Which of the following dialog boxes is displayed when you choose the **Set Cavity** button from the **Easy Fill Advanced** tab to specify the cavity of the component?

   (a) **Set Cavity** (b) **Select Cavity**
   (c) **Cavity** (d) **Set**

2. Which of the following tools in NX Mold Wizard is used to start analysis in the **Easy Fill Advanced** tab?

   (a) **Analysis** (b) **Start**
   (c) **Start Analysis** (d) None of these

3. You can select the _____ and _____ option of analysis, from the Display Result rollout of the Show Result dialog box.

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4. You can use the _____ area to estimate the required ram force for EDM machining.

5. You need not to specify the plane while calculating the projected area using the **Calculate Area** tool. (T/F)

EXERCISE

To perform the exercise, you need to download the zipped file named as *c02_NX_Mold_input* from the **Input Files** section of the CADCIM website. The complete path for downloading the file is:

Textbooks > CAD/CAM > NX_Mold > Mold Design using NX 11.0: A Tutorial Approach > Input Files

After the file is downloaded, extract the folder.

Exercise 1

In this exercise, you need to open the model that you have downloaded and then create and position gate, runner, and sprue and analyze the following results. Figure 2-53 shows the model for this exercise.

(a) Clamping Force vs Melt Front Time graph
(b) Clamping Force vs Air Trap graph
(c) Clamping Force vs Weld Line graph
(d) Clamping Force vs Volumetric Shrinkage graph
(e) Clamping Force vs Max. Shear Stress graph
(f) Clamping Force vs Sink Mark Indicator graph

(Expected time: 70 min)

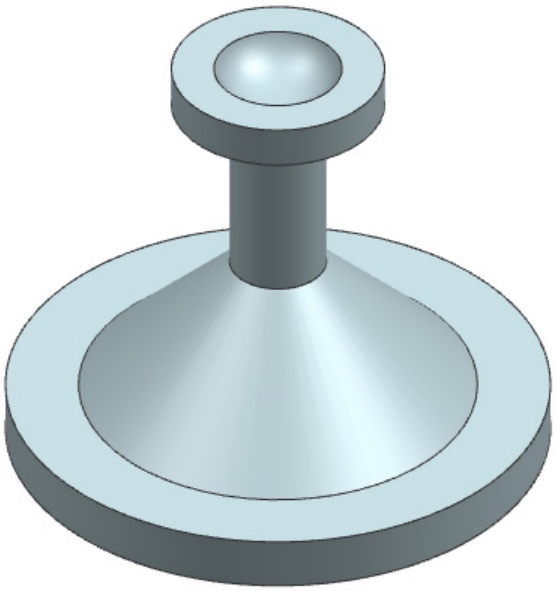

Figure 2-53 *Model for Exercise 1*

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Answers to Self-Evaluation Test

1. Check Wall Thickness, **2. Calculate Area**, **3.** projected area, **4. Information**, **5. Ray**, **Rolling ball**, **6. Mold Design Validation**, **7.** T, **8.** T

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