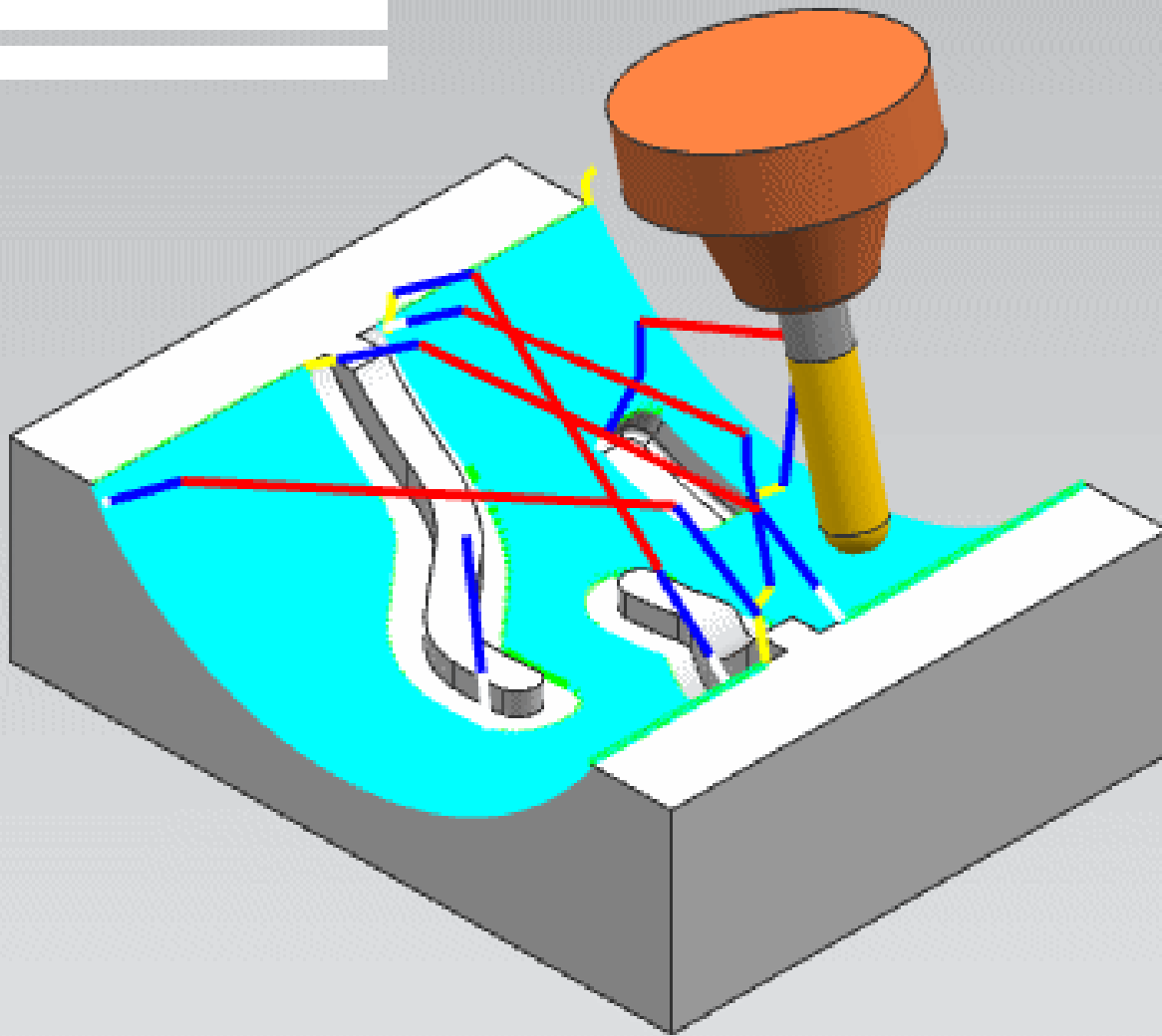


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Easily finish cylindrical faces

NX CAM 9: How to use the new 4-axis rotary milling operation

Answers for industry.

About NX CAM

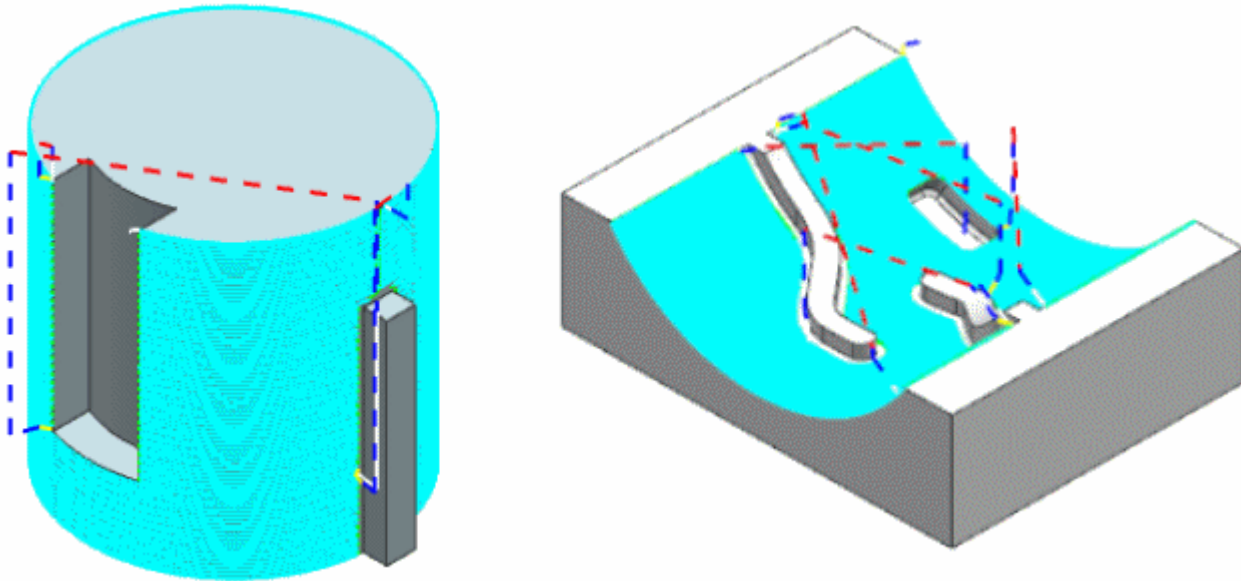
NX™ CAM software has helped many of the world's learning manufacturers and job shops produce better parts faster. You can also achieve similar benefits by making use of the unique advantages NX CAM offers.

This is one of many hands-on demonstrations designed to introduce you to the powerful capabilities in NX CAM 9. In order to run this demonstration, you will need access to NX CAM 9.

Visit the [NX Manufacturing Forum](#) to learn more, ask questions, and share comments about NX CAM.

Hands-on Demonstration: Easily finish cylindrical faces

This enhancement allows you to easily finish cylindrical faces. It introduces a new operation type (mill_rotary), a new operation subtype (Rotary Floor), a new drive method (Rotary Floor Finish), and a new geometry object (ROTARY_GEOM). This new operation type is based on the current Variable Contour operation with Surface Area Drive Method.



Do you have a question?

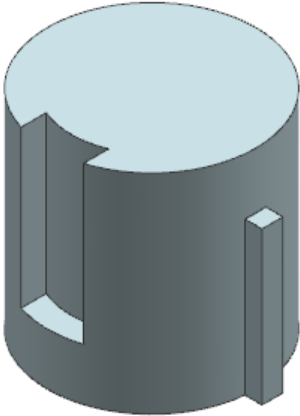
Post your questions or comments at the bottom of [this Tech Tip article in the NX Manufacturing Forum](#).

Prerequisites:

1. You will need access to **NX CAM 9** in order to run this demonstration.
2. If you haven't done so already, download and unzip **Floor Finishing for Cylindrical Parts.7z**. You will find the .7z file attached directly to [this Tech Tip article in the NX Manufacturing Forum](#).

Demo:

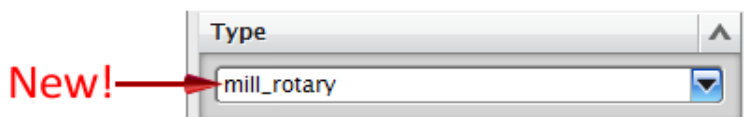
1. Open **Cylindrical Parts Finishing 1.prt** in NX.



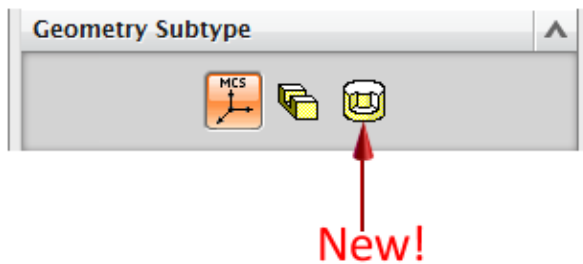
Create the ROTARY_GEOM geometry object

You will create a ROTARY_GEOM geometry object containing part geometry that will be used by the operations.

2. Click **Create Geometry**.
3. Select **mill_rotary** in the **Type** list. This option is new.

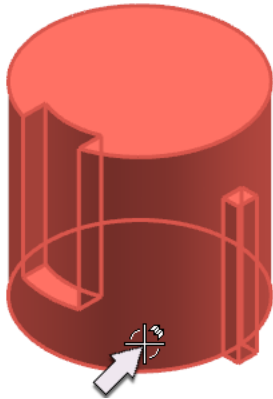


4. Click **ROTARY_GEOM**. This option is new.



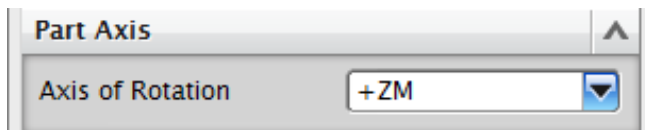
5. Select **MCS_MILL** from the **Geometry** list.
6. Click **OK**.
7. Click **Specify Part**.

8. Select the part geometry.



9. Click **OK**.

10. Be sure **+ZM** is specified as the **Axis of Rotation**.

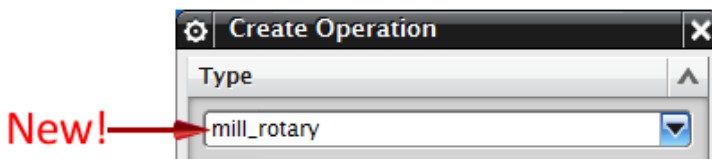


11. Click **OK** to complete the **ROTARY_GEOM** object.

Finish the Outside of the Part Using Rotary Floor

12. Click **Create Operation**.

13. Select **mill_rotary** in the **Type** list. This option is new.



14. Select **Rotary Floor** as the **Operation Subtype**. This option is new.



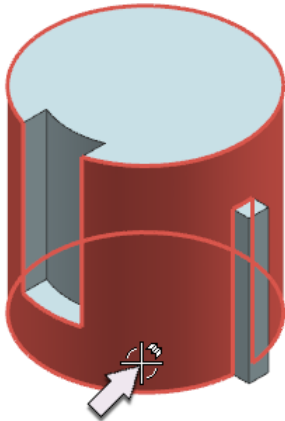
15. Specify the following:

Program: NC_PROGRAM
Tool: NONE
Geometry: ROTARY_GEOM
Method: MILL_FINISH

16. Click **OK**.

17. Click **Specify Floor** .

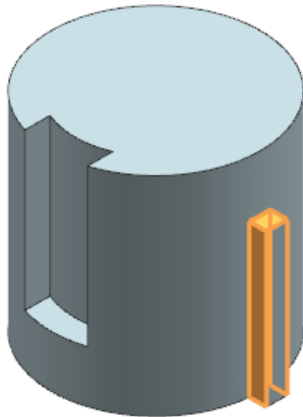
18. Select the cylindrical face.



19. Click **OK** in the Floor Geometry dialog box.

20. Click **Specify Walls** .

21. Click **Preselect** .



22. Click **OK** in the Wall Geometry dialog box.

23. In the **Tool** section of the dialog box, click **Create New**.

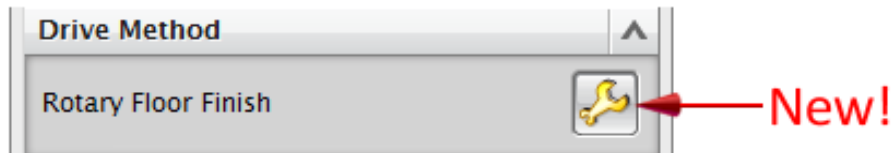
Notice that this type of operation is restricted to using only ball and spherical mill tools.



24. Click **Cancel**.

25. Select **UGT0203_059 (Ball End 4 mm)** from the **Tool** list.

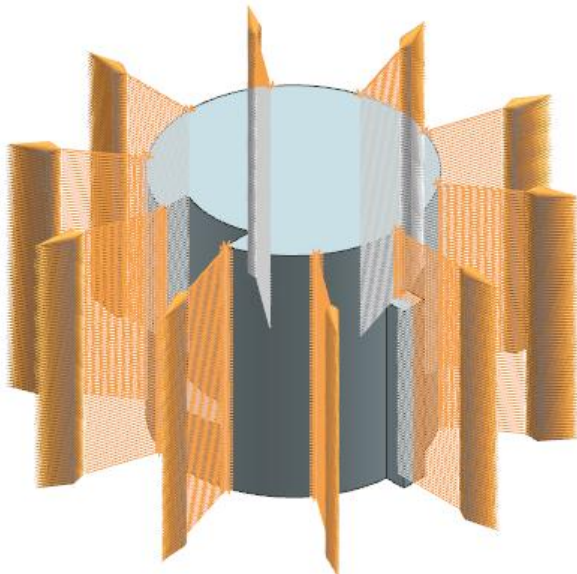
26. In the **Drive Method** section of the dialog box, click **Rotary Floor Finish**. This option is new.



27. Type **0.1000** in the **Maximum Scallop Height** box.

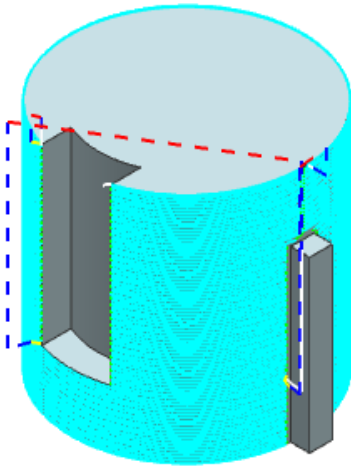
This step is done only to reduce tool path processing time.

28. Click **Display Contact Points**.



29. Click **OK**.

30. Click **Generate**.



31. Click **Verify** and **Play**.

32. Click **OK** to complete the tool path visualization.

33. Click **OK** to complete the operation.

Finish the Pocket Floor

34. Click **Create Operation**.

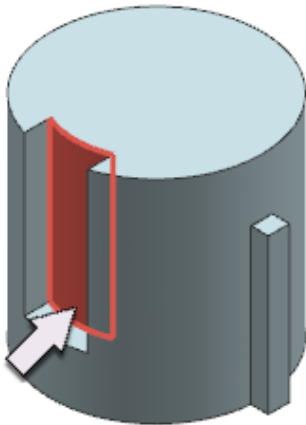
35. Specify the following:

Program:	NC_PROGRAM
Tool:	UGT0203_059
Geometry:	ROTARY_GEOM
Method:	MILL_FINISH

36. Click **OK**.

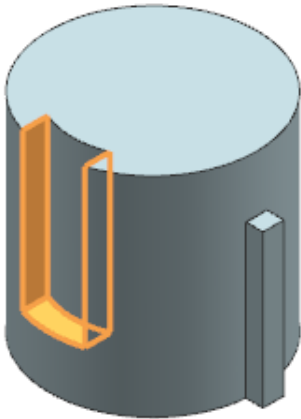
37. Click **Specify Floor**.

38. Select the cylindrical face at the bottom of the pocket.

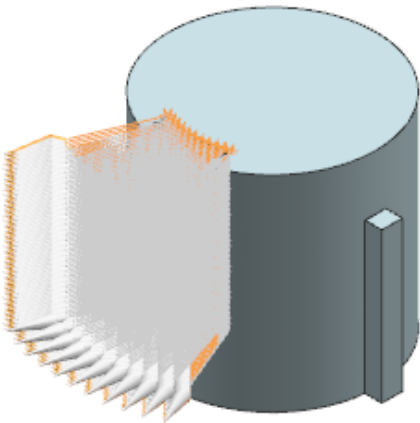


39. Click **OK** in the Cut Area dialog box.

40. Click **Specify Walls**.
41. Click **Preselect**.



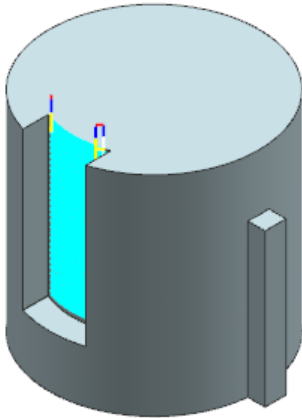
42. Click **OK** in the Wall Geometry dialog box.
43. In the **Drive Method** section of the dialog box, click **Rotary Floor Finish**.
44. Type **0.1000** in the **Maximum Scallop Height** box.
45. Click **Display Contact Points**.



46. Click **OK**.

In the Tool Axis section of the Rotary Floor dialog box, the Fan Distance smooth's the tilting as the tool approaches the wall.

47. Click **Generate**.



48. Click **Verify** and **Play**.

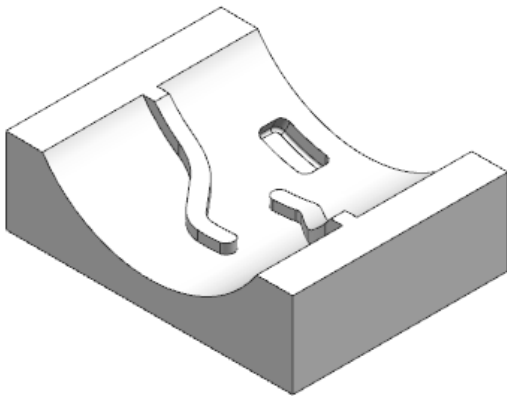
49. Click **OK** to complete the tool path visualization.

50. Click **OK** to complete the operation.

51. Close the part without saving and continue to the second half of this demo.

Machine a Concave Cylindrical Surface

1. Open **Cylindrical Parts Finishing 2.prt** in NX.



Create the ROTARY_GEOM geometry object

You will create a ROTARY_GEOM geometry object containing part, floor, and wall geometry that will be used by the operation.

2. Click **Create Geometry**.

3. Select **mill_rotary** in the **Type** list.

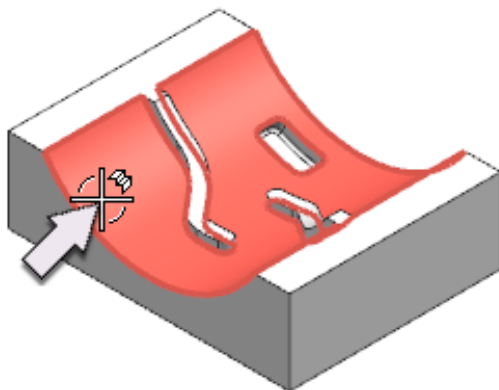
4. Click **ROTARY_GEOM**.

5. Select **WORKPIECE** from the **Geometry** list.

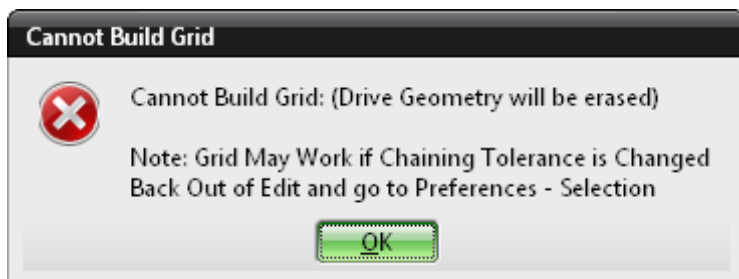
6. Click **OK**.

The part and blank geometry have been defined in the WORKPIECE object.

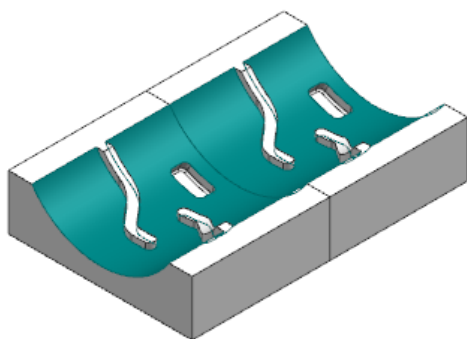
7. Click **Specify Cut Area**.
8. Select the cylindrical face.



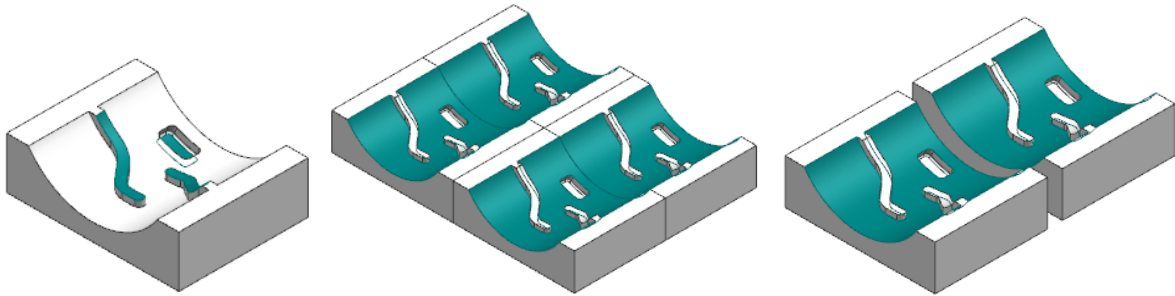
You may select more than one face for the cut area, but they must form a rectangular grid. If not, you get this error message when you attempt to generate the tool path or when you select Rotary Floor Finish as the Drive Method.



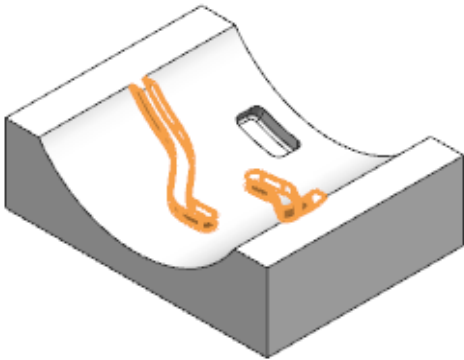
This is allowed:



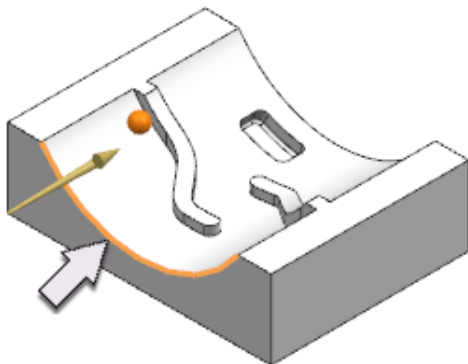
This is not allowed:



9. Click **OK** in the Cut Area dialog box.
10. Click **Specify Walls**.
11. Click **Preselect**.



12. Click **OK** in the Wall Geometry dialog box.
13. Select **Specify** from the **Axis of Rotation** list.
14. Select **YC** from the **Specify Vector** list.
15. Select **Arc/Ellipse/Sphere Center** from the **Specify Point** list.
16. Select the edge of the cylindrical surface.



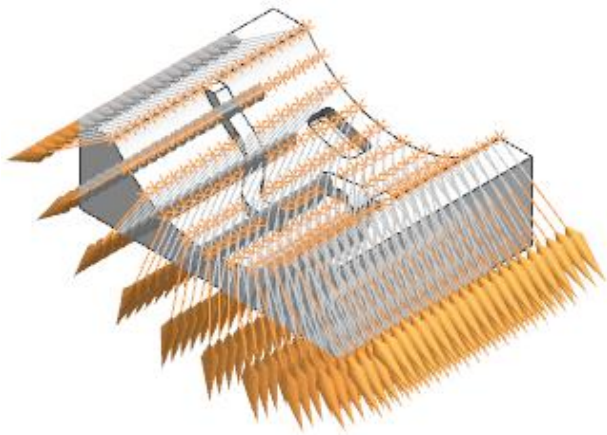
17. Click **OK** to complete the **ROTARY_GEOM** object.

Create the Rotary Floor operation

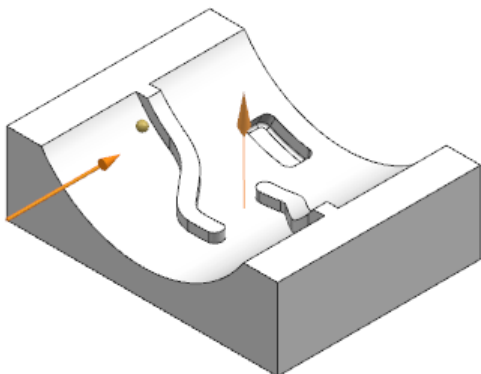
18. Click **Create Operation**.
19. Select **mill_rotary** in the **Type** list.
20. Select **Rotary Floor** as the **Operation Subtype**.
21. Specify the following:

Program:	NC_PROGRAM
Tool:	BALL_MILL_08
Geometry:	ROTARY_GEOM
Method:	MILL_FINISH

22. Click **OK**.
23. In the **Drive Method** section of the dialog box, click **Rotary Floor Finish**.
24. Click **Display Contact Points**.
25. The normal vectors of the floor point away from the tool and must be flipped.

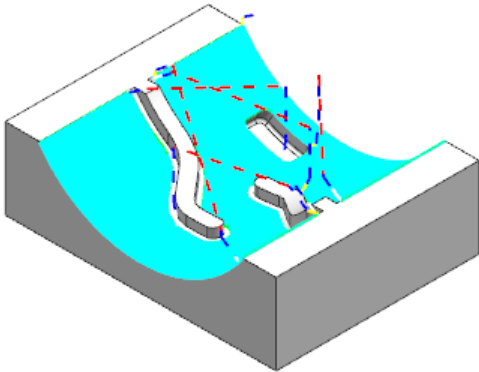


26. In the **Drive Geometry** section of the dialog box, click **Flip Material**.



27. Click **OK**.

28. Click **Generate**.



29. Click **Verify** and **Play**.

30. Click **OK** to complete the tool path visualization.

31. Click **OK** to complete the operation.

32. Close the part without saving.

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