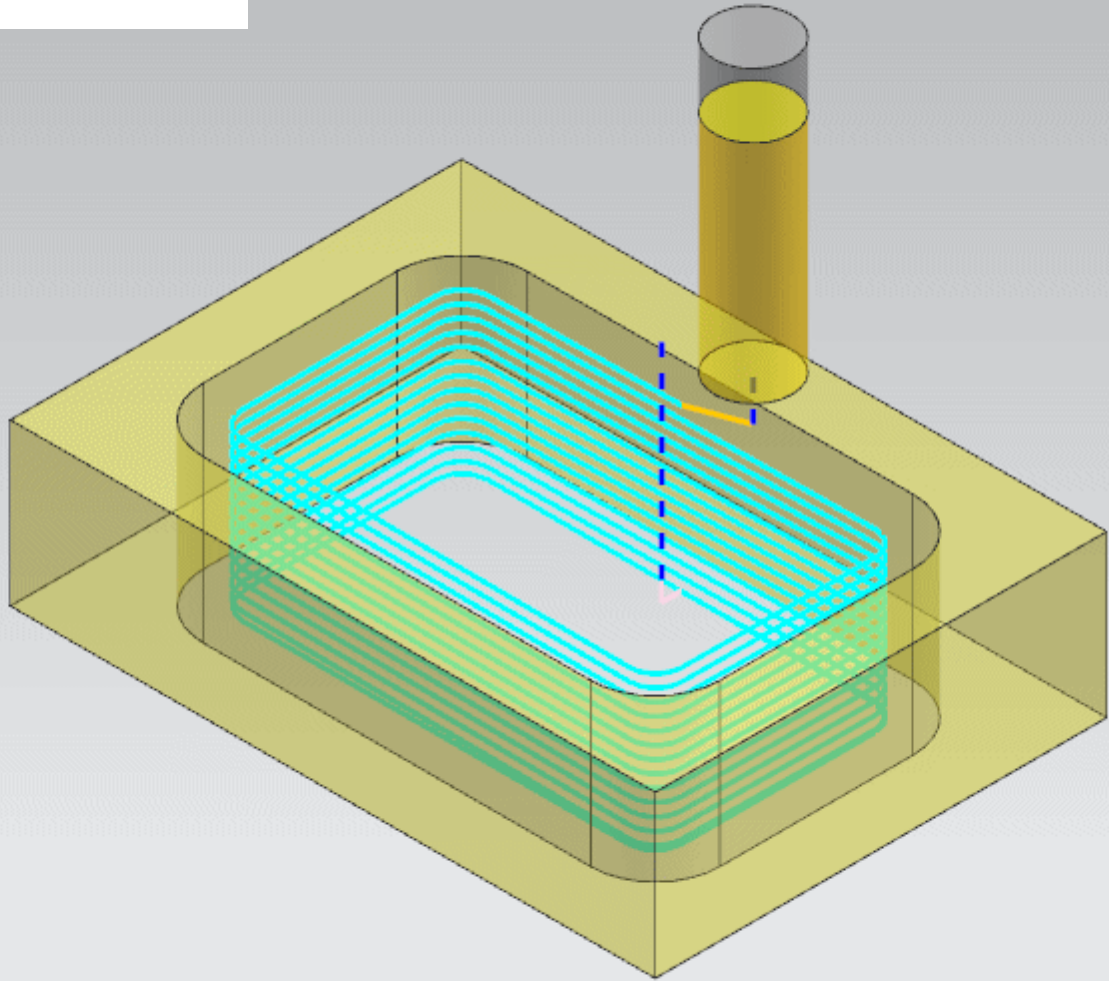


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Siemens PLM Software

# NX CAM 11: Profile Ramping in Floor Wall Milling

Ramping while profiling in a Floor Wall Milling operation.

**Answers for industry.**

## **About NX CAM**

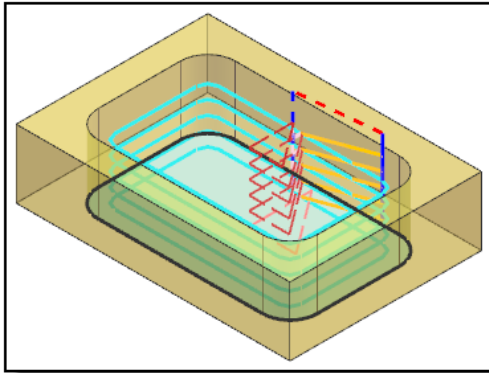
NX™ CAM software has helped many of the world's leading manufacturers and job shops produce better parts faster. You can also achieve similar benefits by making use of the unique advantages NX CAM offers.

This is one of many hands-on demonstrations designed to introduce you to the powerful capabilities in NX CAM 11. In order to run this demonstration, you will need access to NX CAM 11.

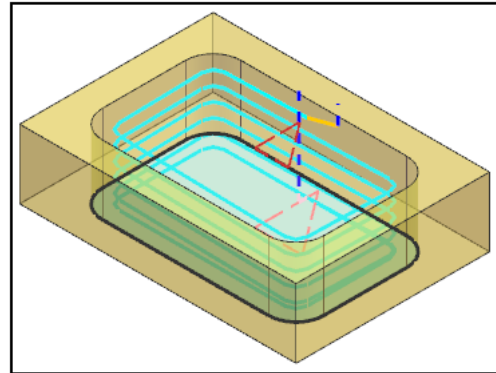
Visit the [NX Manufacturing Forum](#) to learn more, ask questions, and share comments about NX CAM.

## Hands-on Demonstration: Profile Ramping in Floor Wall Milling

You can now create a Profile cut pattern for Floor and Wall Milling operations that cuts continuously by ramping in a helical manner to a specified depth. Ramping produces fewer engages and retracts than cutting by levels.

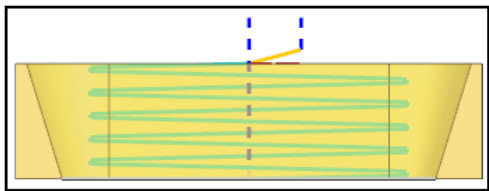
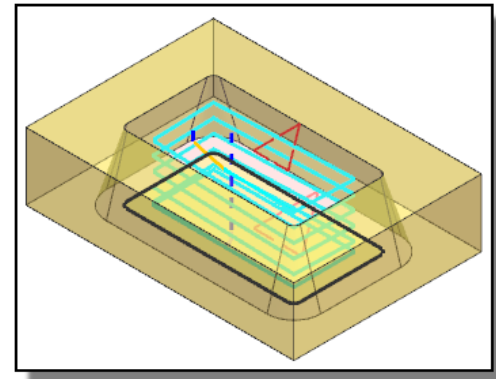
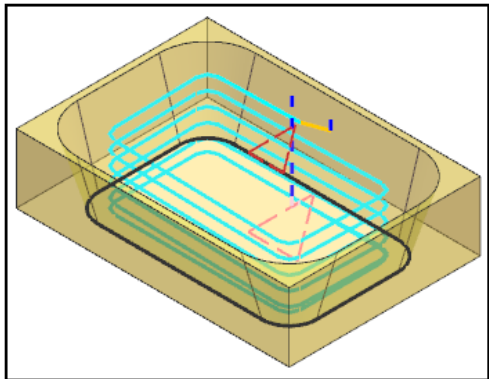


Cutting Depths = **Levels**

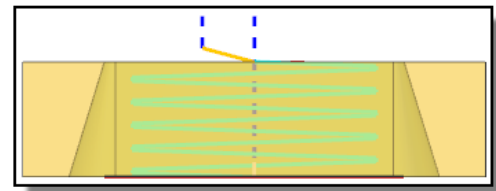


Cutting Depths = **Ramp by Depth**

Walls may be vertical or tapered. If the walls are tapered, the smallest opening determines the size of the helix.



Positive Draft Angle



Negative Draft Angle

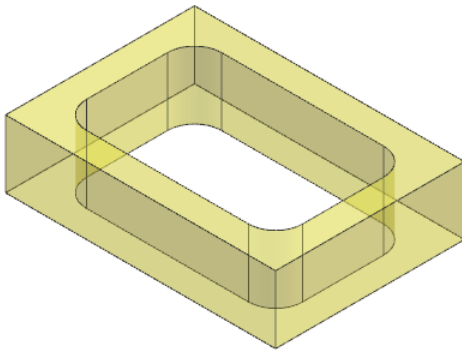
## Prerequisites:



1. You will need access to **NX CAM 11** in order to run this demonstration.
2. If you haven't done so already, download and unzip **profile\_ramping.7z**.


## Demo:

1. Open **profile\_ramping.prt** in NX.

**Note:** If the part is not translucent as shown below, choose **Menu→Preferences→Visualization**, click the **Visual** tab, and select the **Translucency** check box.

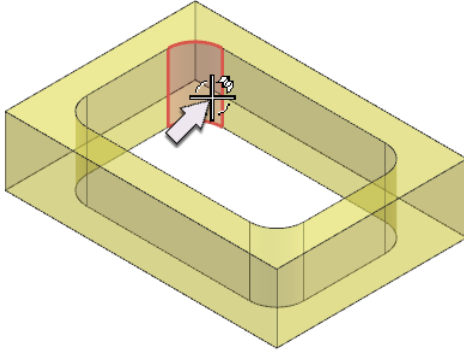


2. Click **Create Operation** .
3. Select **mill\_planar** from the **Type** list.
4. Select **Floor and Wall with IPW** .
5. Specify the following:  

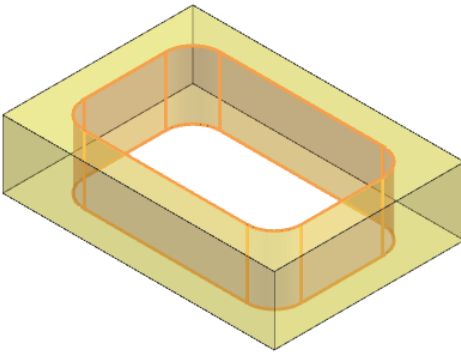
Program:	PROGRAM
Tool:	MILL_12
Geometry:	WORKPIECE
Method:	MILL_FINISH
6. Click **OK**.
7. Clear the **Automatic Walls** check box .
8. Click **Specify Wall Geometry** .
9. Select **Tangent Faces** from the **Face Rule** list.



10. Select one of the wall faces.



The Number of Items in the Geometry list should indicate 8.

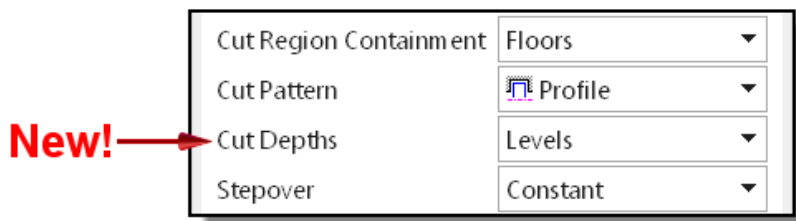


11. Click **OK**.

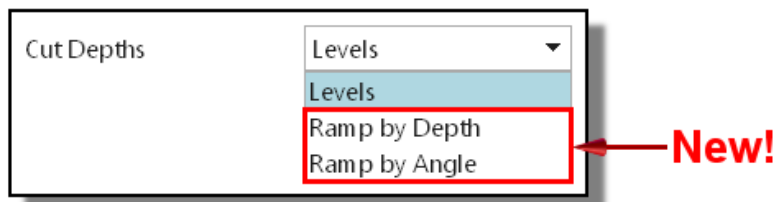
12. In the **Tool Axis** section of the dialog box, select **+ZM Axis** from the **Axis** list.

13. Select **Profile** from the **Cut Pattern** list.

The Cut Depths option is new. This option is available only when Profile has been selected as the Cut Pattern.



Prior to this enhancement, cut depths were defined only by Levels. Two additional options are now available.



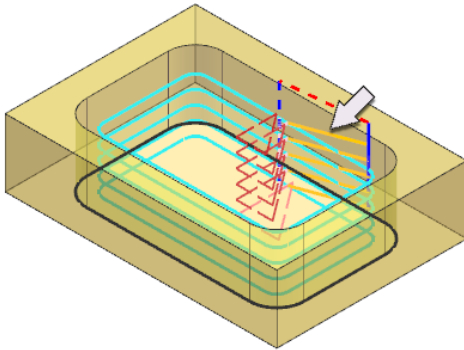
First, you will define the cut depths by level. Then you will see how you can improve the tool path by ramping.

14. Select **Levels** from the **Cut Depths** list.

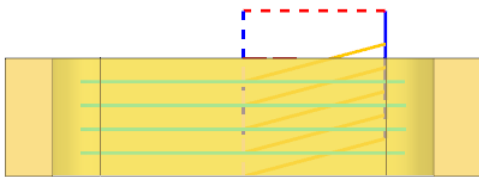
15. Type **5.0000** in the **Depth Per Cut** box.

16. Click **Generate** .

Notice how many engages and retracts are required when cut depths are defined by levels.



17. Change the view orientation to **Front**.



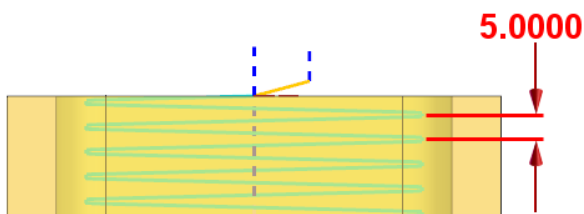
Now you will see how you can improve the tool path by ramping to each cut depth.

18. Select **Ramp by Depth** from the **Cut Depths** list.

19. Leave **5.0000** typed in the **Depth Per Cut** box.

This value specifies the cut depth measured along the tool axis for each completed helical profile pass.

20. Click **Generate** .



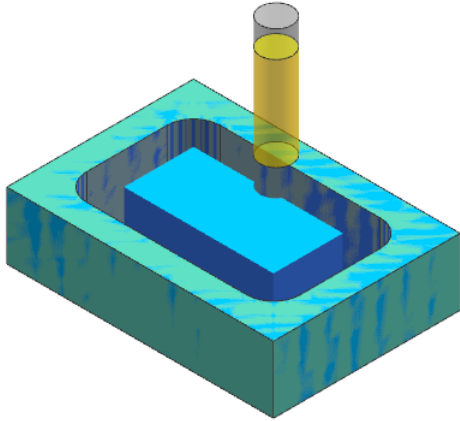
21. Change the view orientation to **Isometric**.

22. Click **Verify** .

23. Select the **3D Dynamic** tab.

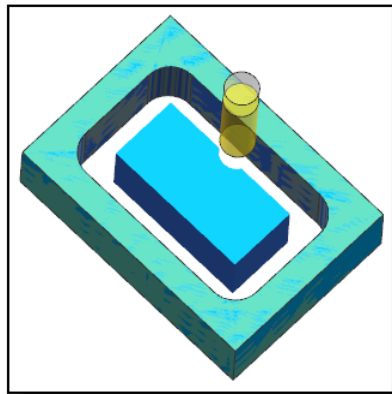
24. Set the **Animation Speed** to **7** and click **Play** .

Notice that walls are profiled in one continuous helical cutting motion, leaving a core in the middle.

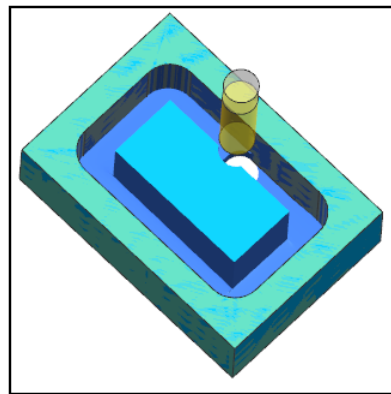


25. Click **OK** to complete the tool path visualization.

If **Add Cleanup Pass** is checked, the floor material is removed completely. If it is unchecked, floor material is left behind where the maximum thickness is the specified **Depth per Cut**.



Add Cleanup Pass

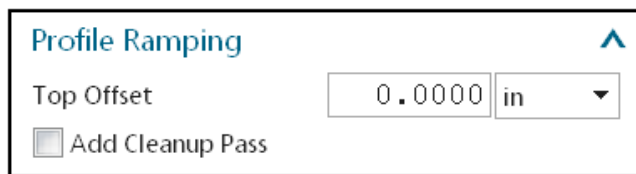


Add Cleanup Pass

26. Click **Cutting Parameters** .

27. Select the **Strategy** tab.

The **Profile Ramping** section of the dialog box is new.



**New!**

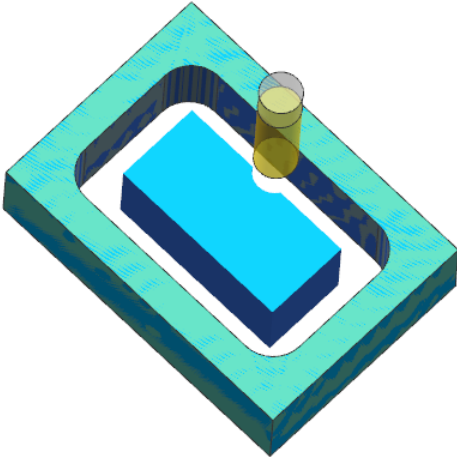
28. Select the **Add Cleanup Pass** check box  if it is not already checked.

29. Click **OK**.

30. Click **Generate** .

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

All material at the floor level has been removed.



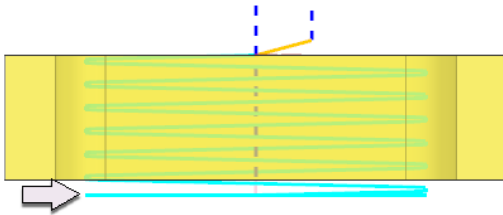
32. Click **OK** to complete the tool path visualization.

33. Change the view orientation to **Front**.

Offsetting will allow you to see the cleanup pass clearly.

34. Type **3.0000** in the **Z-Depth Offset** box.

35. Click **Generate** .



Floor material is left behind when Add Cleanup Pass is unchecked and no Z-Depth Offset is defined. This is sometimes desirable if you wish to tap out the core.

36. Click **Cutting Parameters** .

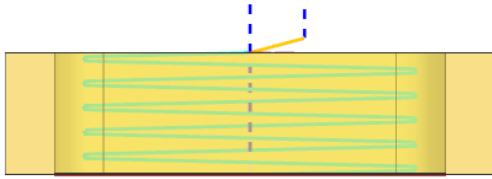
37. Clear the **Add Cleanup Pass** check box .

38. Click **OK**.

39. Type **0.0000** in the **Z-Depth Offset** box.



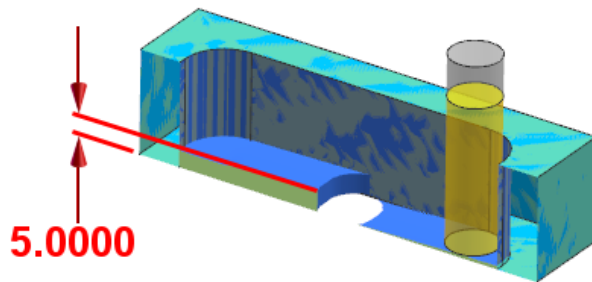
40. Click **Generate** .



41. Click **Verify** and **Play**.



The remaining floor material has a maximum thickness of the specified Depth per Cut (5.0000 mm).



In cases where the remaining material is too thick to tap out the core, you can reduce the thickness by specifying a Z-Depth Offset. This option offsets a planar cut level from the thickest part of the remaining material (in this case, from the top of the 5.0000 thick remaining floor material).

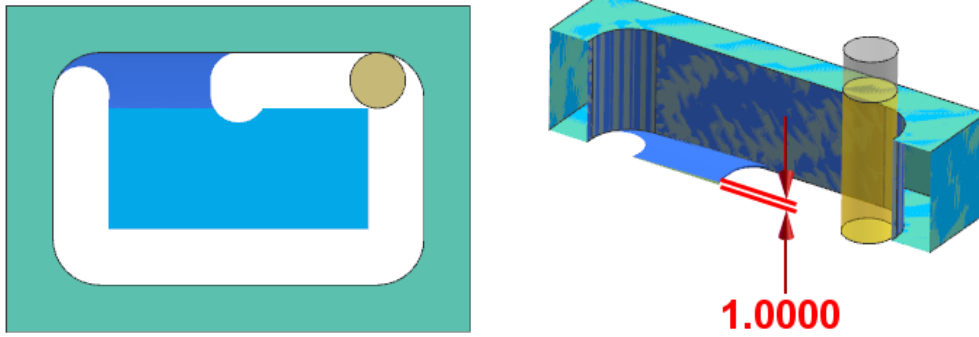
42. Click **OK** to complete the tool path visualization.

43. Type **4.0000** in the **Z-Depth Offset** box.

This will leave a floor material thickness of 1.0000 mm to support the core.

44. Click **Generate** .

45. Click **Verify** and **Play**.



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

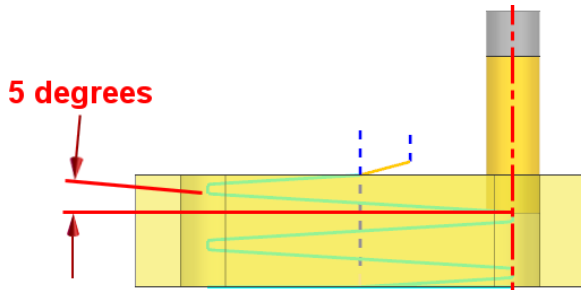
You can also ramp to each cut depth by specifying an angle.

47. Change the view orientation to **Front**.

48. Select **Ramp by Angle** from the **Cut Depths** list.

49. Type **5.0000** in the **Ramp Angle** box.

This value specifies the angle between a line normal to the tool axis and the profile pass.



50. Type **0.0000** in the **Z-Depth Offset** box.

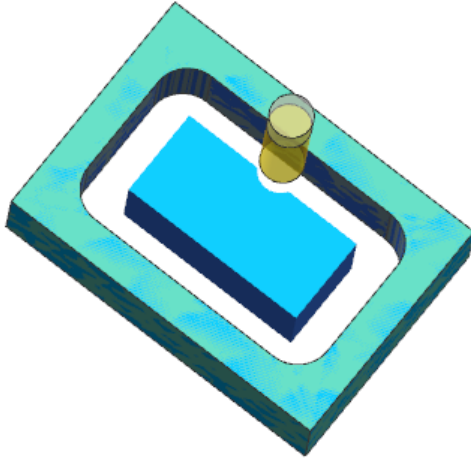
51. Click **Cutting Parameters** .

52. Select the **Add Cleanup Pass** check box .

53. Click **OK**.

54. Click **Generate** .

55. Click **Verify** and **Play**.



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

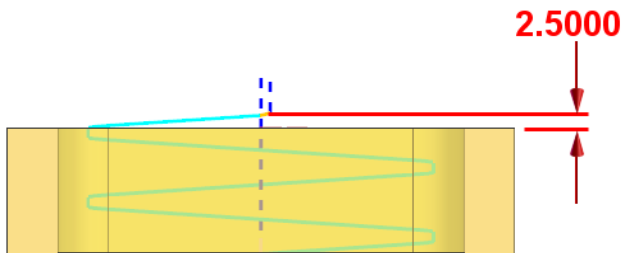
You may specify a top offset to extend the cutting move above the blank geometry.

57. Click **Cutting Parameters** .

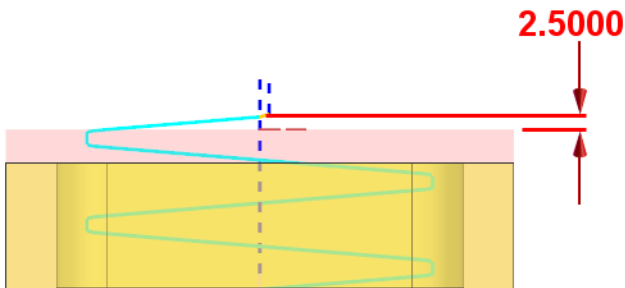
58. Type **2.5000** in the **Top Offset** box. This option is new.

59. Click **OK**.

60. Click **Generate** .



In this case, the blank geometry is the same height as the part. If you extend the blank geometry above the part, you can see how the Top Offset is measured from the blank.



Lastly, you will see how you can machine away the core using Additional Passes and Stepper.

61. Change the view orientation to **Isometric**.

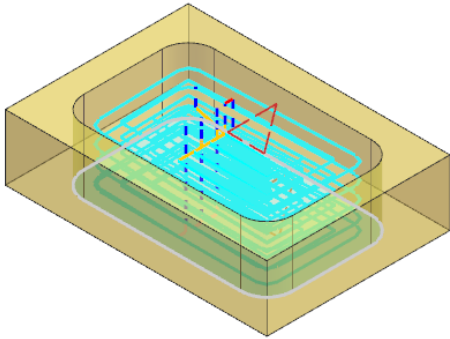
62. Click **Cutting Parameters** .

63. Type **0.0000** in the **Top Offset** box.
64. Click **OK**.
65. Type **2.0000** in the **Ramp Angle** box.

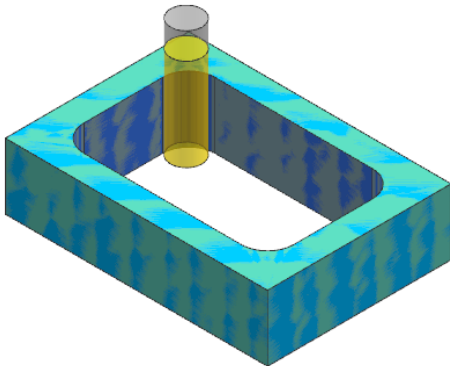
Notice that the Stepover is set to Constant and the Maximum Distance is set to 50% of the tool diameter.

66. Type **3** in the Additional Passes box.

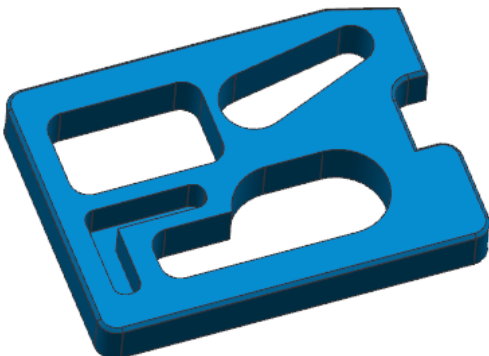
67. Click **Generate** .



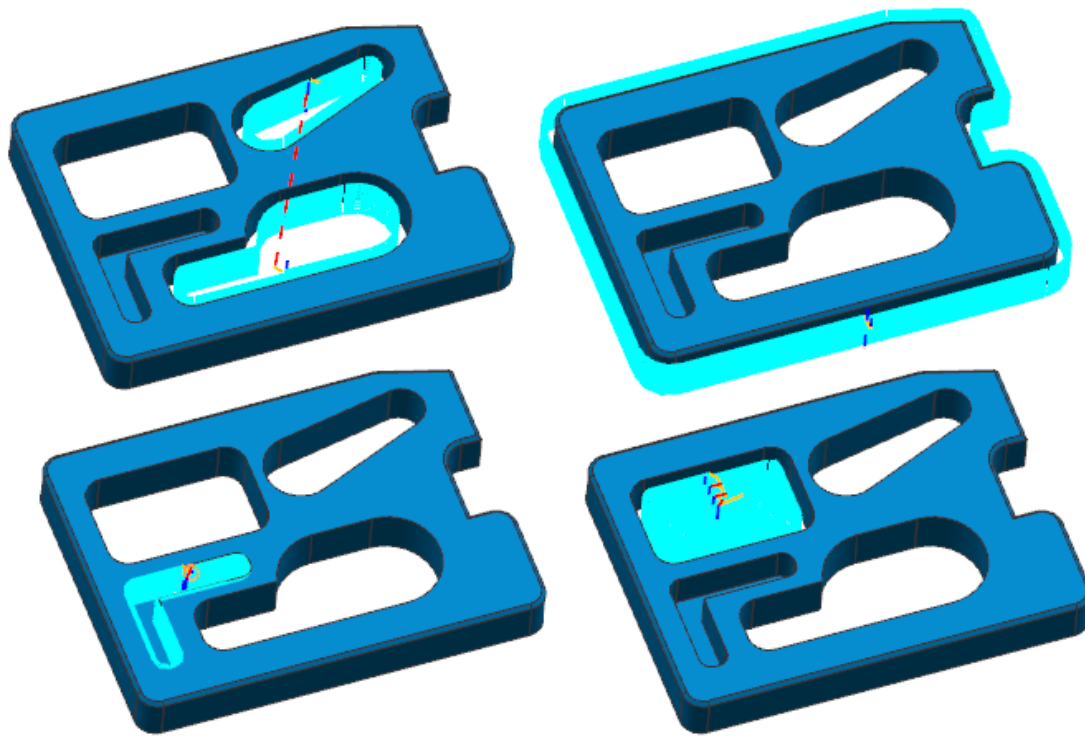
68. Click **Verify** and **Play**.



69. Click **OK** to complete the tool path visualization.
70. Click **OK** in the operation dialog box.
71. Close the part without saving.
72. Open **profile\_ramping\_practice.prt** in NX.



This part contains operations that use ramping to profile inside and outside walls, cut areas with and without floors, and additional passes to machine away the core.



73. Observe how ramping is used in these operations and use this part for additional practice.
74. When you have finished, close the part without saving.

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