

PCET's & NMVPM's

Nutan College of Engineering & Research (NCER)

(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere)

CAD/CAM Assignment No: 06 on

Milling Operation

By

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Guided By

Prof. P.V Mohite



Department of Mechanical Engineering

NCER, Talegaon Dabhade

(2021-2022)

Assignment No: 6

Milling operation

2 Jobs on CNC Milling Operation with Programs.

Problem Definition:

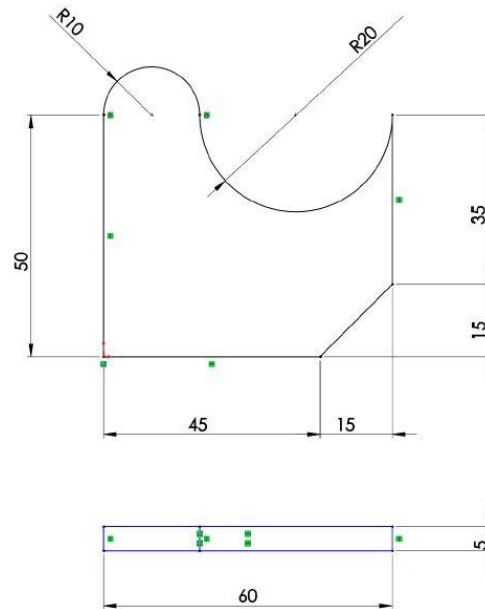


Fig. 1: Component Geometry

Procedure

1. Sketching and Machine Setup
 - Press F9 to activate the axes.
 - Sketch the geometry with the given dimensions.
 - Use rotation>Copy to complete the sketch.
 - From the Main Menu, select Machine type > Milling > Default.
 - In Operation Manager, select Properties > Stock Setup.
 - Under the section 'Stock', select Rectangular
 - Rectangular >Bounding box > Expand
 - Put values X- 2.0 Y- 2.0
 - Box Thickness- 10
 - Click on 'OK'.

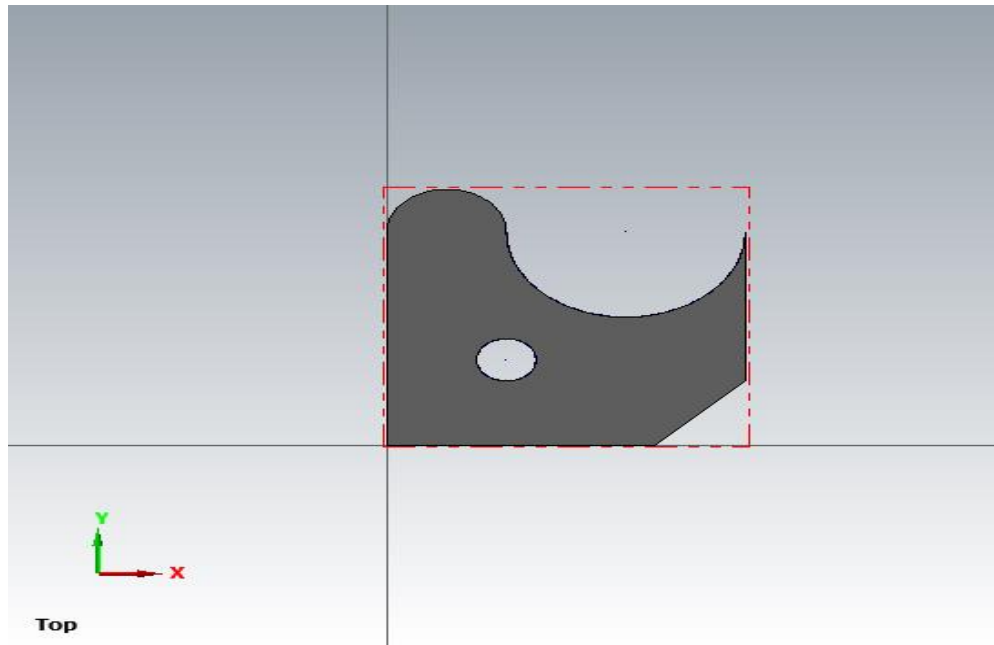


Fig. No. 2 Definition Of Stock and Blank

2. End milling Operation (Contour)

- From the Main Menu, select Toolpaths > Contour
- In the chaining window, click on 'Chain'.
- Select the entry point and exit point of the tool from the sketch.
- Click on 'OK'.
- Click Tool > Library > Any tool(Put tool diameter as 15) > ½ Flat End mill
- Click on 'OK'.
- Click Cut parameters > Click right > Depth Cut
Max Rough Step-2 Finish Cut-1 Finish Step-0.05
- Click Multipasses
Rough : Number-4 : Spacing -14 Finish : Number-1: Spacing -0.05
- Click Linking Parameters
- Everything to be made Absolute
- Linking Parameters > Depth -10
- Click on 'OK'.

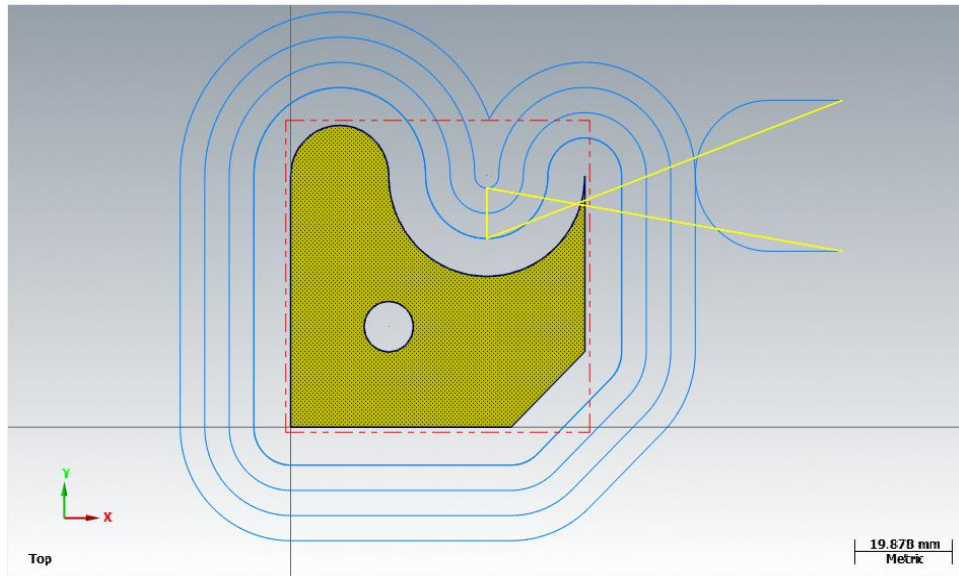


Fig. No.3 Contour Operation

3. Drill Milling Operation

- From the Main Menu, select Toolpaths > Pocket.
- In the chaining window, click on 'Chain'.
- Select the same chain as in the milling operation.
- Click on 'OK'.
- Click on Tool properties
- In Tool > Diameter 15
- Tool properties, Flute dimension- 4
- Click Roughing > Zigzag > Depth cut
- Under Depth of cut put,
 - Max Rough Step-2
 - Finish Cut-1
 - Finish Step - 0.05
- Click Linking Parameters
- Under linking Parameters everything is to be made "Absolute"
- Linking Parameters > Depth -10
- Click on 'OK'.

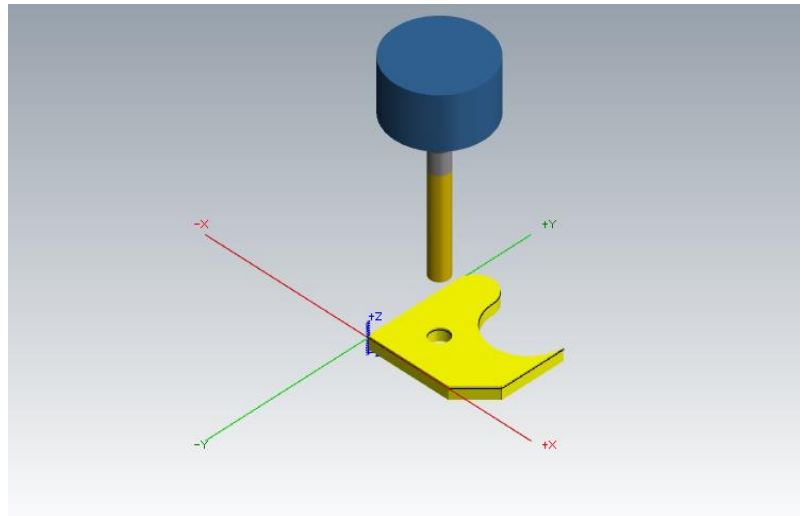


Fig. No. 4 Drilling Operation

4. Facing Operation

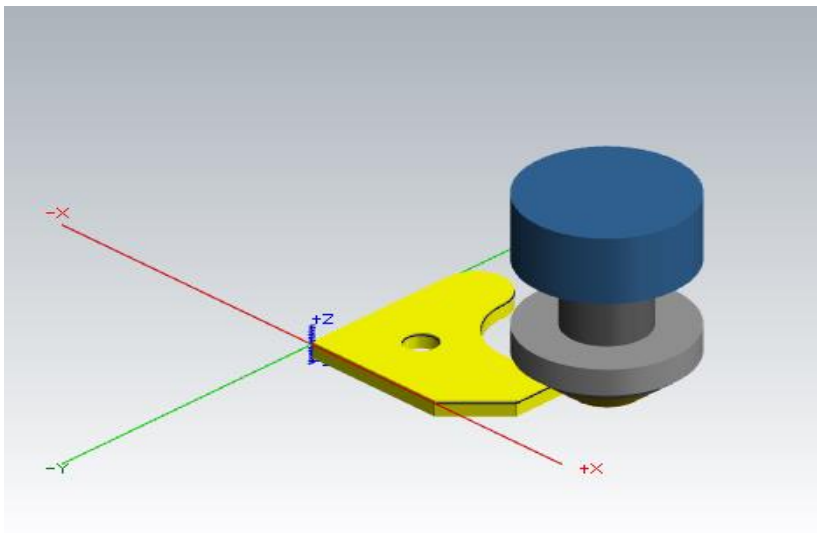


Fig. No. 5 Facing Operation

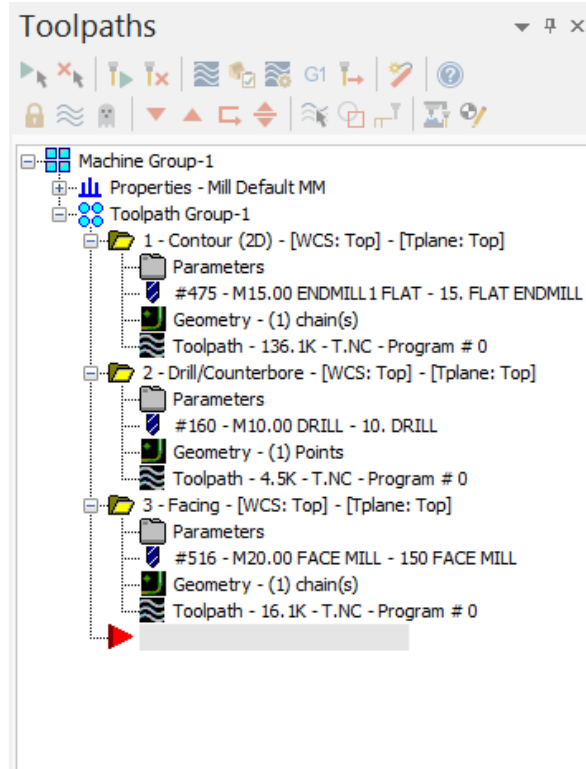


Fig. No 6 Toolpath of operations

NC Part Program

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%
O0000(T)
  (MCX FILE - T)
  (NC FILE -
  C:\USERS\RUSHIKESH.BHOKARE\DO
  CUMENTS\MY
  MCAMX9\MILL\NC\T.NC)
  (MATERIAL - ALUMINUM MM -
  2024)
  ( T516 | 150 FACE MILL | H516 | XY
  STOCK TO LEAVE - 0. | Z STOCK TO
  LEAVE - 1. )
  ( T475 | 15. FLAT ENDMILL | H475 )
  ( T160 | 10. DRILL | H160 )
N710 G2 X75.945 Y-.945 I-22.55 J0.
N720 G1 X60.945 Y-15.945
N730 G2 X45. Y-22.55 I-15.945 J15.945
N100 G21
N110 G0 G17 G40 G49 G80 G90
N120 T516 M6
N130 G0 G90 G54 X-19.597 Y59.998
A0. S254 M3
N140 G43 H516 Z25.
N150 Z10.
N420 X-22.
N430 G0 Z25.
N440 X-19.597 Y59.998
N450 Z10.
N460 G1 Z1. F50.8
N470 X66.636 F101.6
N480 X72. Y47.999

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N740 G1 X0.
N750 G2 X-22.55 Y0. I0. J22.55
N760 G1 Y50.
N930 G2 X45. Y-17.55 I-12.41 J12.41
N940 G1 X0.
N950 G2 X-17.55 Y0. I0. J17.55
N960 G1 Y50.
N970 G2 X10. Y77.55 I27.55 J0.
N980 X37.55 Y50. I0. J-27.55
N990 G3 X40. Y47.55 I2.45 J0.
N1000 G0 Z25.

2 Job or Workpiece

Problem Definition:

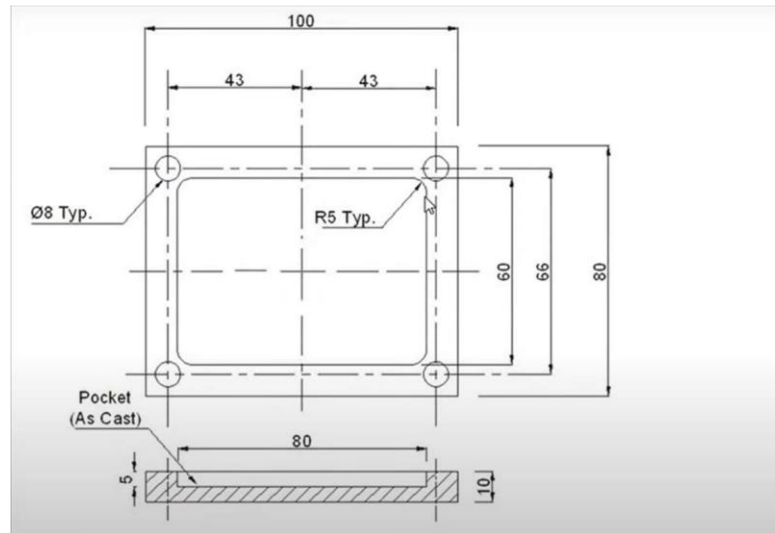


Fig. 1: Component Geometry

Procedure

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- Under the section 'Stock', select Rectangular
- Rectangular >Bounding box > Expand
- Put values X- 2.0 Y- 2.0
- Box Thickness- 10
- Click on 'OK'.

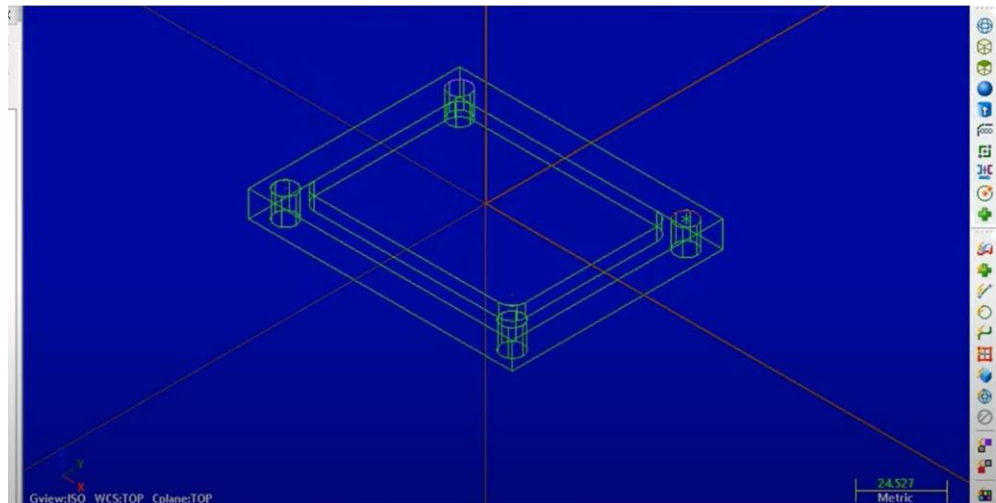


Fig. No. 2 Definition Of Stock and Blank

3. End milling Operation (Contour)

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- Click on 'OK'.
- Click Tool > Library > Any tool(Put tool diameter as 15) > ½ Flat End mill
- Click on 'OK'.
- Click Cut parameters > Click right > Depth Cut
Max Rough Step-2 Finish Cut-1 Finish Step-0.05
- Click Multipasses
Rough : Number-4 : Spacing -14 Finish : Number-1: Spacing -0.05
- Click Linking Parameters
- Everything to be made Absolute
- Linking Parameters > Depth -10
- Click on 'OK'.

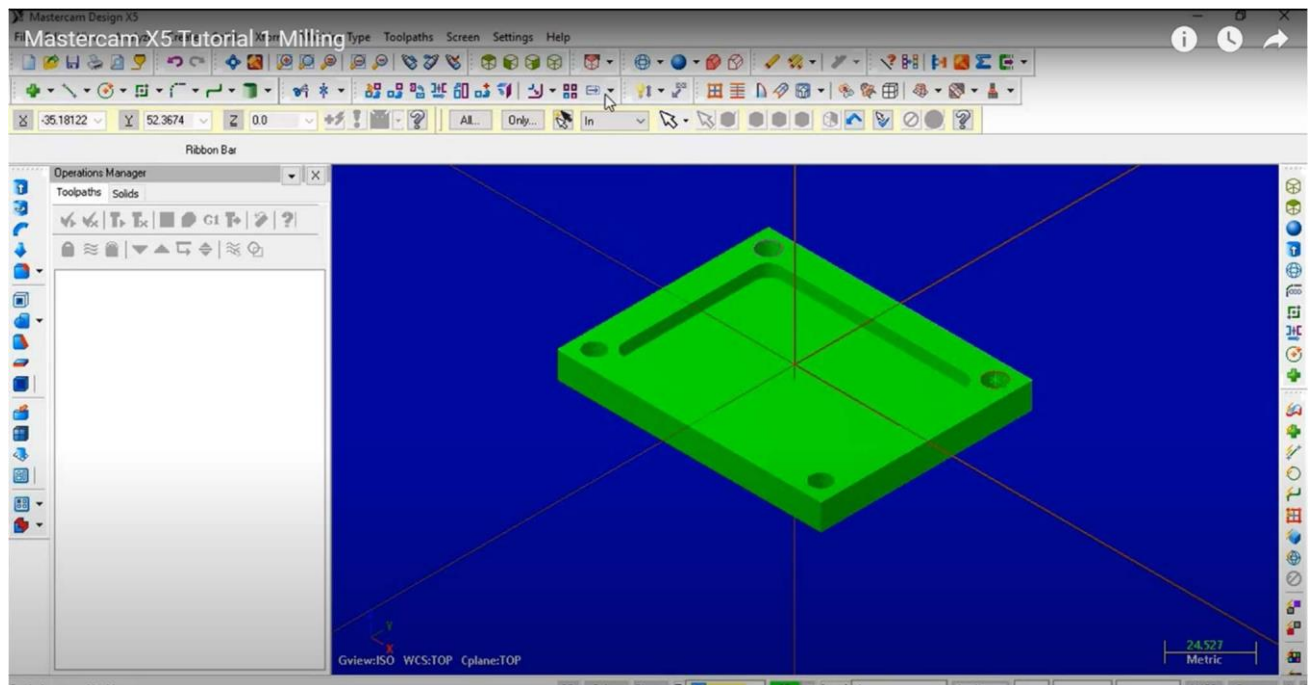


Fig. No.3 Contour Operation

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- In the chaining window, click on 'Chain'.
- Select the same chain as in the milling operation.
- Click on 'OK'.
- Click on Tool properties
- In Tool > Diameter 15
- Tool properties, Flute dimension- 4
- Click Roughing > Zigzag > Depth cut
- Under Depth of cut
 - put, Max Rough
 - Step-2 Finish Cut-1
 - Finish Step - 0.05
- Click Linking Parameters
- Under linking Parameters everything is to be made "Absolute"
- Linking Parameters > Depth -10
- Click on 'OK'.

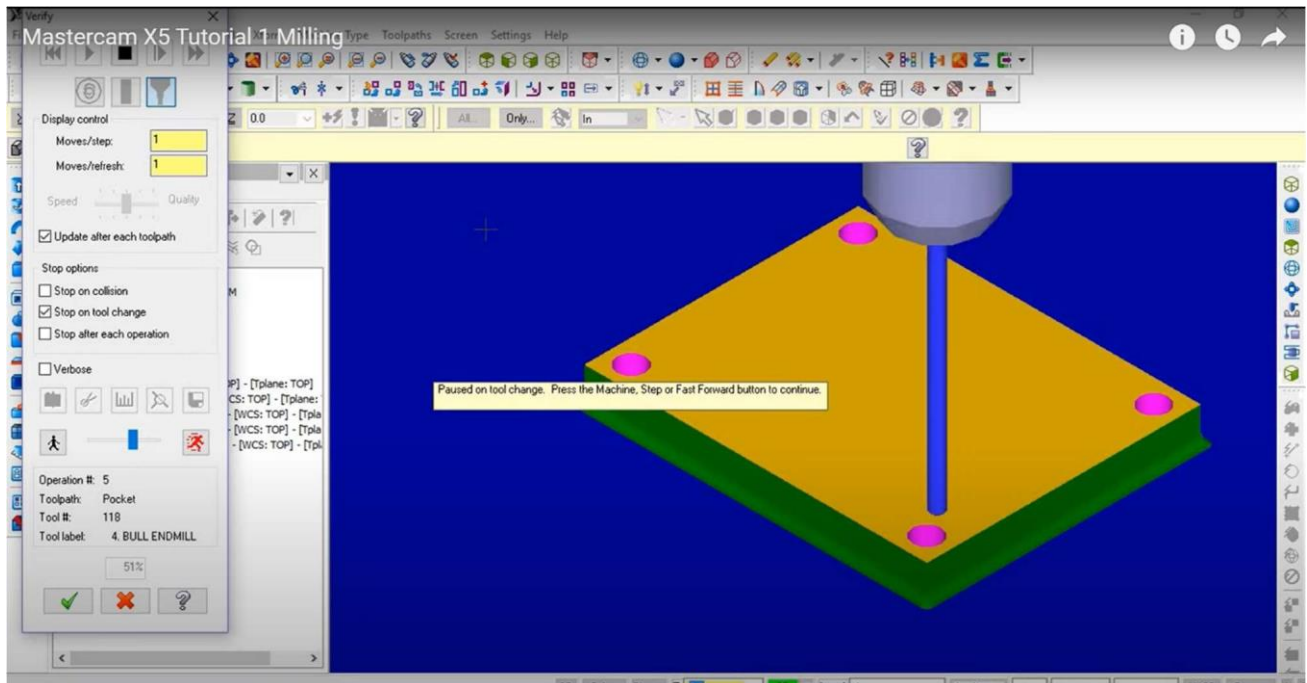
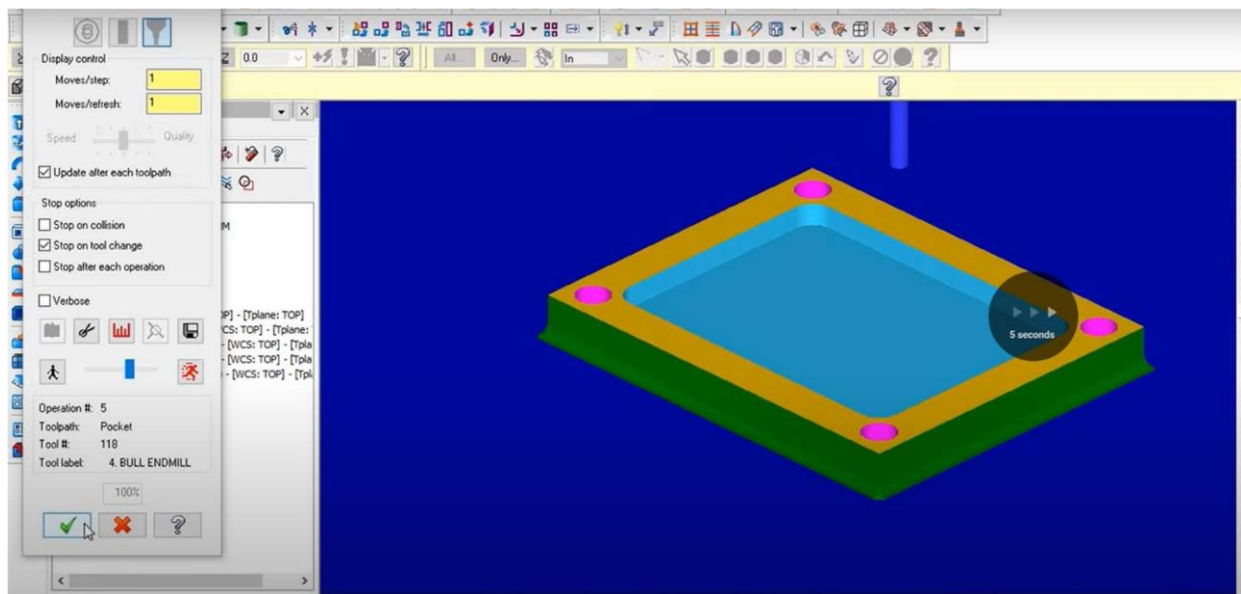


Fig. No. 4 Drilling Operation

Finish part



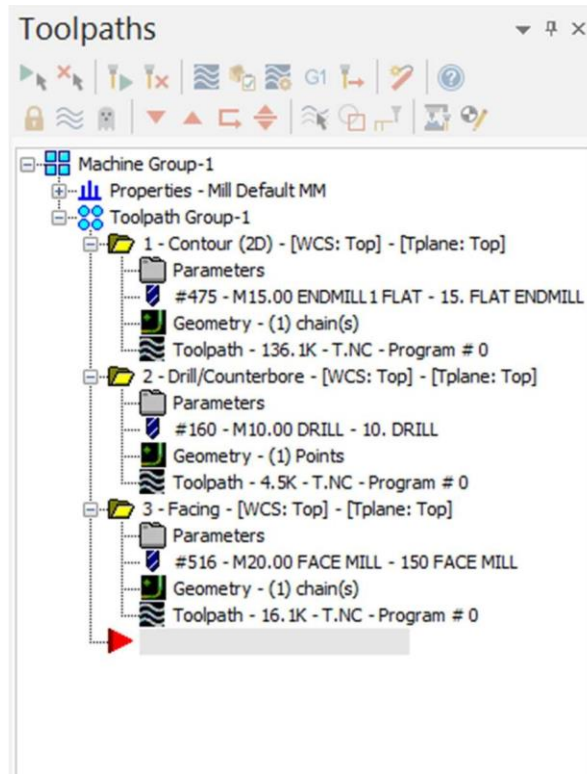


Fig. No 6 Toolpath of operations

NC Part Program

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( NC FILE - C:\USERS\HP_PC\DOCUMENTS\MY NCAM\5MILL\T.NC)
( MATERIALS - ALUMINIUM 6061 )
( T170 | 80 FACE MILL | R270 )
( T140 | 15.000 ENDMILL 1 FLAT | H140 )
( T1 | 8.000 CENTER DRILL | H1 )
( T10 | 8.000 DRILL | H10 )
( T118 | 4.000 ENDMILL 0.2 RAD | H118 )
M100 G01
M102 G0 G17 G40 G54 G80 G90
M104 T270 M6
M106 G0 G90 G54 X-105. Y39.998 A0. B763 M3
M108 G43 H270 Z25.
M110 Z11.
M112 G1 Z-5 F152.6
M114 X80. F100.2
M116 Y13.333
M118 X-80.
M120 Y-13.333
M122 X80.
M124 Y-39.998
M126 X-105.
M128 G0 Z25.5
M130 Y39.998
M132 Z10.5
M134 G1 Z0. F152.6
M136 X80. F100.2
M138 Y13.333

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M120 Y-13.333
M122 X80.
M124 Y-39.998
M126 X-105.
M128 G0 Z25.5
M130 Y39.998
M132 Z10.5
M134 G1 Z0. F152.6
M136 X80. F100.2
M138 Y13.333
M140 X-80.
M142 Y-13.333
M144 X80.
M146 Y-39.998
M148 X-105.
M150 G0 Z25.5
M152 M5
M154 G91 Z28 Z0.
M156 A0.
M158 M01
M160 T140 M6
M162 G0 G90 G54 X-77.5 Y11. A0. B1736 M3
M164 G43 H140 Z26.
M166 Z11.
M168 G1 Z-.833 F173.6
M170 X-66.5 F347.2
M172 G0 X-55.5 Y0. Z0. Q-11.
M174 G1 Y-40.
M176 G3 X-50. Y-45.5 Z5.5 J0.
M178 G1 X0.
M180 G3 X55.5 Y-40. Z0. J5.5

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