

HEIDENHAIN

Webinar



Optimized Contour Milling

TNC 640

Option #167

WEBINAR





INHALT

1. Anwendungsmöglichkeiten im Überblick
2. Optimized Contour Milling
3. Programmierung
4. Anwendungsbeispiele

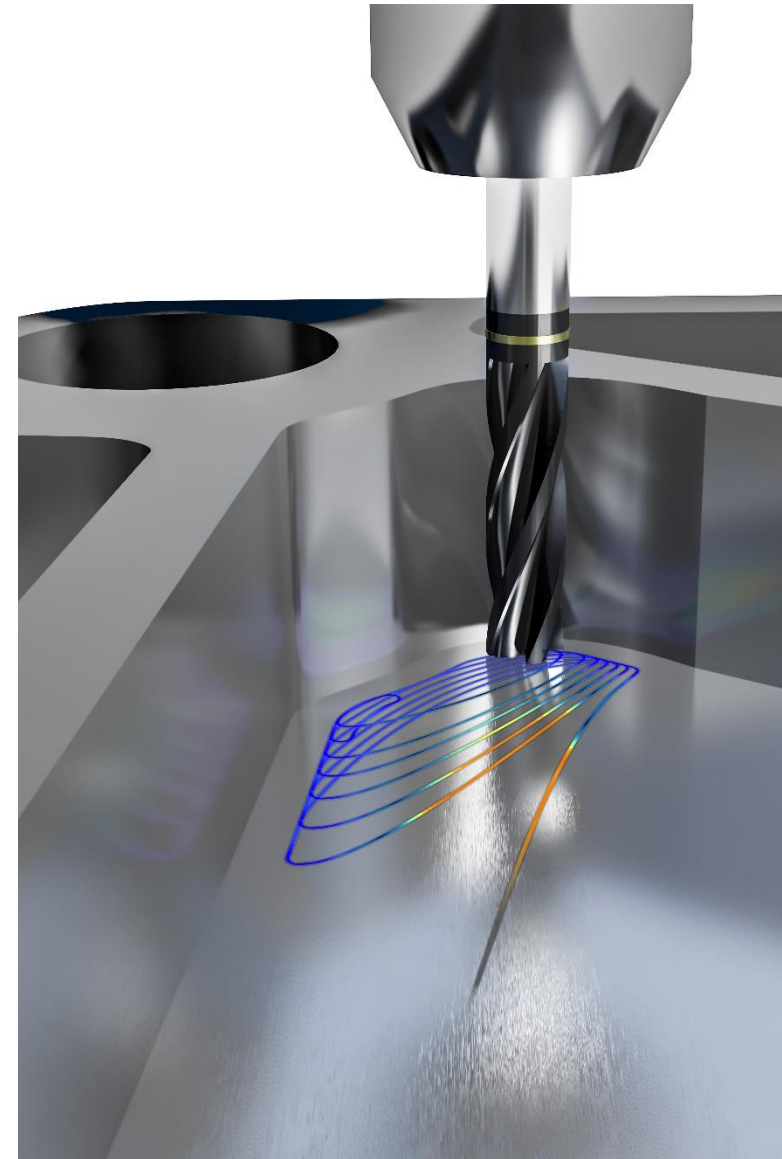


1 Anwendungsmöglichkeiten im Überblick



Anwendungsmöglichkeiten im Überblick

- Beliebige Taschen und Inseln
werkstatorientiert programmieren
- Gleichmäßige Eingriffsbedingungen
ermöglichen deutlich gesteigerte
Schnittparameter
- Besonders präzise Einhaltung der
Bahnüberlappung – auch an Innenecken





2 **Optimized Contour Milling** Option #167



Optimized Contour Milling Option #167

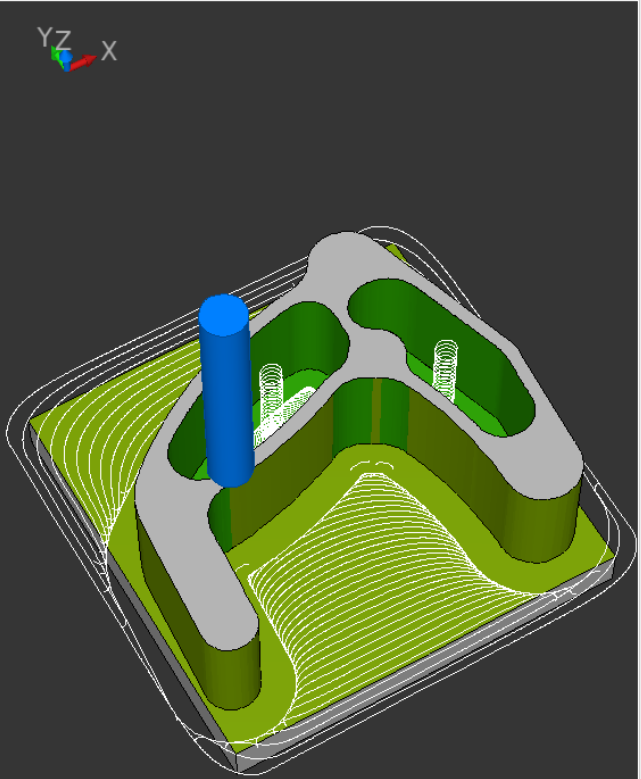
- Einfache Programmierung
- Offener, geschlossener oder teilgeöffneter Außenrahmen
- Konstanter Eingriffswinkel
- Restmaterial-Erkennung

Manual operation ➔ Test Run

Test Run
⚠ Plunging not possible at position (-4.331994, 15.270749)

TNC: \Webinar_OCM\Part1_1297910.H

```
Q351=+1 ;CLIMB OR UP-CUT
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 CYCL DEF 273 OCM FINISHING FLOOR
    Q370=+1 ;TOOL PATH OVERLAP
    Q385=+2000 ;FINISHING FEED RATE
    Q568=+0.3 ;PLUNGING FACTOR
    Q253= MAX ;F PRE-POSITIONING
    Q200=+2 ;SET-UP CLEARANCE
    Q438=-1 ;ROUGH-OUT TOOL
15 L X+0 Y+0 Z+50 R0 FMAX M3 M99
16 ;
17 CYCL DEF 274 OCM FINISHING SIDE
    Q338=+0 ;INFEEED FOR FINISHING
    Q385=+1800 ;FINISHING FEED RATE
    Q253= MAX ;F PRE-POSITIONING
    Q200=+2 ;SET-UP CLEARANCE
    Q14=+0 ;ALLOWANCE FOR SIDE
    Q438=-1 ;ROUGH-OUT TOOL
    Q351=+1 ;CLIMB OR UP-CUT
18 L X+0 Y+0 Z+50 R0 FMAX M3 M99
19 ;
20 M30
21 END PGM PART1_1297910 MM
```



00:03:45 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START



3 Programmierung



Programmierung

- Konturen festlegen, z. B.
 - Geschlossener Rahmen
 - Insel

Manual operation Test Run

TNC: \Webinar_OCM\FRAMES\PART1.h

```
0 BEGIN PGM PART1 MM
1 BLK FORM 0.1 Z X+0 Y+0 Z-30
2 BLK FORM 0.2 X+100 Y+100 Z+0
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S8000 F3000
5 CONTOUR DEF
  P1 = LBL "FRAME" I2 = LBL 2
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-20 ;DEPTH
  Q368=+0 ;ALLOWANCE FOR SIDE
  Q369=+0 ;ALLOWANCE FOR FLOOR
  Q260=+100 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+0 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+20 ;PLUNGING DEPTH
  Q370=+0.4 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 M30
11 LBL "FRAME"
12 L X+10 Y+50
13 L Y+90
14 RND R10
15 L X+90
16 RND R10
```

00:01:42 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START



Programmierung

- Konturen festlegen, z. B.
 - Teilweise geöffneter Rahmen
 - Insel

Manual operation Test Run

TNC: \Webinar_OCM\FRAMES\PART2.h

```
0 BEGIN PGM PART2 MM
1 BLK FORM 0.1 Z X+0 Y+0 Z-30
2 BLK FORM 0.2 X+100 Y+100 Z+0
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S8000 F3000
5 CONTOUR DEF
  P1 = LBL "FRAME" I2 = LBL 2 I3 = LBL 3
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-20 ;DEPTH
  Q368=+0 ;ALLOWANCE FOR SIDE
  Q369=+0 ;ALLOWANCE FOR FLOOR
  Q260=+100 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+1 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+20 ;PLUNGING DEPTH
  Q370=+0.4 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 M30
11 LBL "FRAME"
12 L X+0 Y+0
13 L X+100
14 L Y+100
15 L X+0
16 L Y+0
```

YZ X

TNC 640 HEIDENHAIN

00:01:56 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START



Programmierung

- Konturen festlegen, z. B.
 - Offener Rahmen
 - Insel

Manual operation Test Run

TNC: \Webinar_OCM\FRAMES\PART3.h

```
0 BEGIN PGM PART3 MM
1 BLK FORM 0.1 Z X+0 Y+0 Z-30
2 BLK FORM 0.2 X+100 Y+100 Z+0
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S8000 F3000
5 CONTOUR DEF
  P1 = LBL "FRAME" I2 = LBL 2
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-20 ;DEPTH
  Q368=+0 ;ALLOWANCE FOR SIDE
  Q369=+0 ;ALLOWANCE FOR FLOOR
  Q260=+100 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+1 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+20 ;PLUNGING DEPTH
  Q370=+0.4 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 M30
11 LBL "FRAME"
12 L X+0 Y+0
13 L X+100
14 L Y+100
15 L X+0
16 L Y+0
```

00:01:05 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START



Programmierung

- Schruppen
 - Bahn-Überlappung (konstanter Eingriffswinkel am Werkzeug)

Manual operation Programming

TNC: \Webinar_OCM\FRAMES\PART1.h

→ Path overlap factor?

```
4 TOOL CALL "MILL_D16_ROUGH" Z S8000 F3000
5 CONTOUR DEF
  P1 = LBL "FRAME" I2 = LBL 2
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-20 ;DEPTH
  Q368=+0 ;ALLOWANCE FOR SIDE
  Q369=+0 ;ALLOWANCE FOR FLOOR
  Q260=+100 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+0 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+20 ;PLUNGING DEPTH
  Q370=0.4 TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 M30
11 LBL "FRAME"
12 L X+10 Y+50
13 L Y+90
14 RND R10
15 L X+90
16 RND R10
17 L Y+10
18 RND R10
19 L X+10
```

$k = r_T \times Q370$

SET STANDARD VALUES



Programmierung

- Schruppen (Restmaterial)
 - Q438=-1 Werkzeug-Radius aus dem Zyklus 272 wird übernommen

Manual operation Programming

TNC: \Webinar_OCM\RESUDAL_MATERIAL\PART1.h

→ Number/name of rough-out tool?

```

4 TOOL CALL "MILL_D16_ROUGH" Z S8000 F3000
5 CONTOUR DEF
  P1 = LBL "POCKET"
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-20 ;DEPTH
  Q368=+0 ;ALLOWANCE FOR SIDE
  Q369=+0 ;ALLOWANCE FOR FLOOR
  Q260=+100 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+0 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+20 ;PLUNGING DEPTH
  Q370=+0.4 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 ;STEP2
11 TOOL CALL "MILL_D10_ROUGH" Z S10000 F2000
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 ;STEP3
15 TOOL CALL "MILL_D4_ROUGH" Z S10000 F2000
16 L X+0 Y+0 Z+50 R0 FMAX M3 M99
17 ;
18 M30
19 LBL "POCKET"
  
```

Q438 ≥ 0

Q438 = -1

| T | NAME | R |
|----|--------|----|
| xx | MILL_R | xx |

$I_T =$

BEGIN PGM
 :
 :
 $I_T =$ CYCL DEF 272
 :
 :
 CYCL DEF 272

The diagram shows a 2D coordinate system with X and Y axes. A rectangular pocket is defined. A tool is shown at the top center of the pocket, with a blue arrow indicating its radius I_T extending to the side walls of the pocket.

| TOOL NUMBER | TOOL NAME | QS |
|-------------|-----------|----|
| | | |

SELECT



Programmierung

- Schruppen (Restmaterial)
 - Q438=-1 Werkzeug-Radius aus dem Zyklus 272 wird übernommen
- Werkzeug Schafffräser D16

The screenshot displays the Heidenhain TNC 640 control interface. The top bar shows "Manual operation" and "Test Run" modes. The main window is divided into a code editor on the left and a 3D visualization on the right. The code editor shows the following program:

```
TNC:\Webinar_OCM\RESUDAL_MATERIAL\PART1.h
Q578=+0.2 ;INSIDE CORNER FACTOR
Q569=+0 ;OPEN_BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
Q202=+20 ;PLUNGING DEPTH
Q370=+0.4 ;TOOL_PATH OVERLAP
Q207= AUTO ;FEED RATE MILLING
Q568=+0.6 ;PLUNGING FACTOR
Q253= AUTO ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
Q577=+0.2 ;APPROACH RADIUS FACTOR
Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 ;STEP2
11 TOOL CALL "MILL_D10_ROUGH" Z S10000 F2000
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 ;STEP3
15 TOOL CALL "MILL_D4_ROUGH" Z S10000 F2000
16 L X+0 Y+0 Z+50 R0 FMAX M3 M99
17 ;
18 M30
19 LBL "POCKET"
20 L X+50 Y+10
21 L X+90
22 RND R2
23 L X+50 Y+90
24 RND R2
25 L X+10 Y+10
26 RND R2
27 L X+50
28 LBL 0
29 END PGM PART1 MM
```

The 3D visualization shows a blue cylindrical tool bit positioned above a grey rectangular block. A green, rounded triangular pocket is being milled into the block. The coordinate system (X, Y, Z) is visible in the top left of the 3D view. The bottom status bar shows the time "00:00:48" and the feed rate "F MAX". The bottom control panel includes buttons for "VIEW OPTIONS", "OFF/ON" (with a printer icon), a stop button, "START", "START SINGLE", and "RESET + START".



Programmierung

- Schruppen (Restmaterial)
 - Q438=-1 Werkzeug-Radius aus dem Zyklus 272 wird übernommen
- Werkzeug Schafffräser D10
Restmaterial vom D16 wird entfernt

The screenshot displays the Heidenhain TNC 640 control interface. The top bar shows "Manual operation" and "Test Run" modes. The main window is divided into a code editor on the left and a 3D visualization on the right. The code editor shows the following program:

```
TNC:\Webinar_OCM\RESUDAL_MATERIAL\PART1.h
Q370=+0.4 ;TOOL PATH OVERLAP
Q207= AUTO ;FEED RATE MILLING
Q568=+0.6 ;PLUNGING FACTOR
Q253= AUTO ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
Q577=+0.2 ;APPROACH RADIUS FACTOR
Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 ;STEP2
11 TOOL CALL "MILL_D10_ROUGH" Z S10000 F2000
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 ;STEP3
15 TOOL CALL "MILL_D4_ROUGH" Z S10000 F2000
16 L X+0 Y+0 Z+50 R0 FMAX M3 M99
17 ;
18 M30
19 LBL "POCKET"
20 L X+50 Y+10
21 L X+90
22 RND R2
23 L X+50 Y+90
24 RND R2
25 L X+10 Y+10
26 RND R2
27 L X+50
28 LBL 0
29 END PGM PART1 MM
```

The 3D visualization shows a grey rectangular block with a green triangular pocket being milled. A blue tool is positioned above the pocket. The interface includes a status bar at the bottom with a timer showing "00:01:04" and "F MAX", and a control panel with buttons for "VIEW OPTIONS", "OFF", "ON", "STOP AT", "START", "START SINGLE", and "RESET + START".



Programmierung

- Schruppen (Restmaterial)
 - Q438=-1 Werkzeug-Radius aus dem Zyklus 272 wird übernommen
- Werkzeug Schafffräser D4
Restmaterial vom D10 wird entfernt

The screenshot displays the Heidenhain TNC 640 control interface. The top bar shows "Manual operation" and "Test Run" buttons. The main window is divided into a code editor on the left and a 3D model on the right. The code editor shows the following program:

```
TNC:\Webinar_OCM\RESUDAL_MATERIAL\PART1.h
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
Q577=+0.2 ;APPROACH RADIUS FACTOR
Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 ;STEP2
11 TOOL CALL "MILL_D10_ROUGH" Z S10000 F2000
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 ;STEP3
15 TOOL CALL "MILL_D4_ROUGH" Z S10000 F2000
16 L X+0 Y+0 Z+50 R0 FMAX M3 M99
17 ;
18 M30
19 LBL "POCKET"
20 L X+50 Y+10
21 L X+90
22 RND R2
23 L X+50 Y+90
24 RND R2
25 L X+10 Y+10
26 RND R2
27 L X+50
28 LBL 0
29 END PGM PART1 MM
```

The 3D model on the right shows a rectangular block with a triangular pocket. The pocket is highlighted in green, and the tool path is shown in blue. The interface also includes a status bar at the bottom with "00:01:20" and "F MAX", and a control panel with buttons for "VIEW OPTIONS", "STOP AT", "START", "START SINGLE", and "RESET + START".



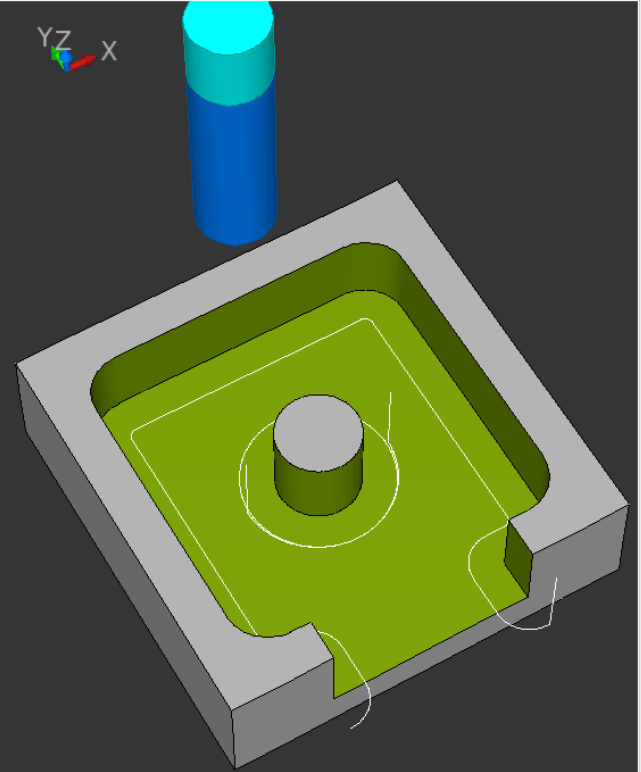
Programmierung

- Schichten
 - Optimale An- und Abfahrbewegungen

Manual operation Test Run

TNC: \Webinar_OCM\FINISHING\PART1.h

```
0 BEGIN PGM PART1 MM
1 BLK FORM 0.1 Z X+0 Y+0 Z-30
2 BLK FORM 0.2 X+100 Y+100 Z+0
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S8000 F3000
5 CONTOUR DEF
  P1 = LBL "FRAME" I2 = LBL 2 I3 = LBL 3
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-20 ;DEPTH
  Q368=+0.5 ;ALLOWANCE FOR SIDE
  Q369=+0 ;ALLOWANCE FOR FLOOR
  Q260=+100 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+1 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+20 ;PLUNGING DEPTH
  Q370=+0.4 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 STOP
11 CYCL DEF 274 OCM FINISHING SIDE
  Q338=+0 ;INFEEED FOR FINISHING
  Q385= AUTO ;FINISHING FEED RATE
  Q253= AUTO ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q14=+0 ;ALLOWANCE FOR SIDE
```



00:02:09 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START

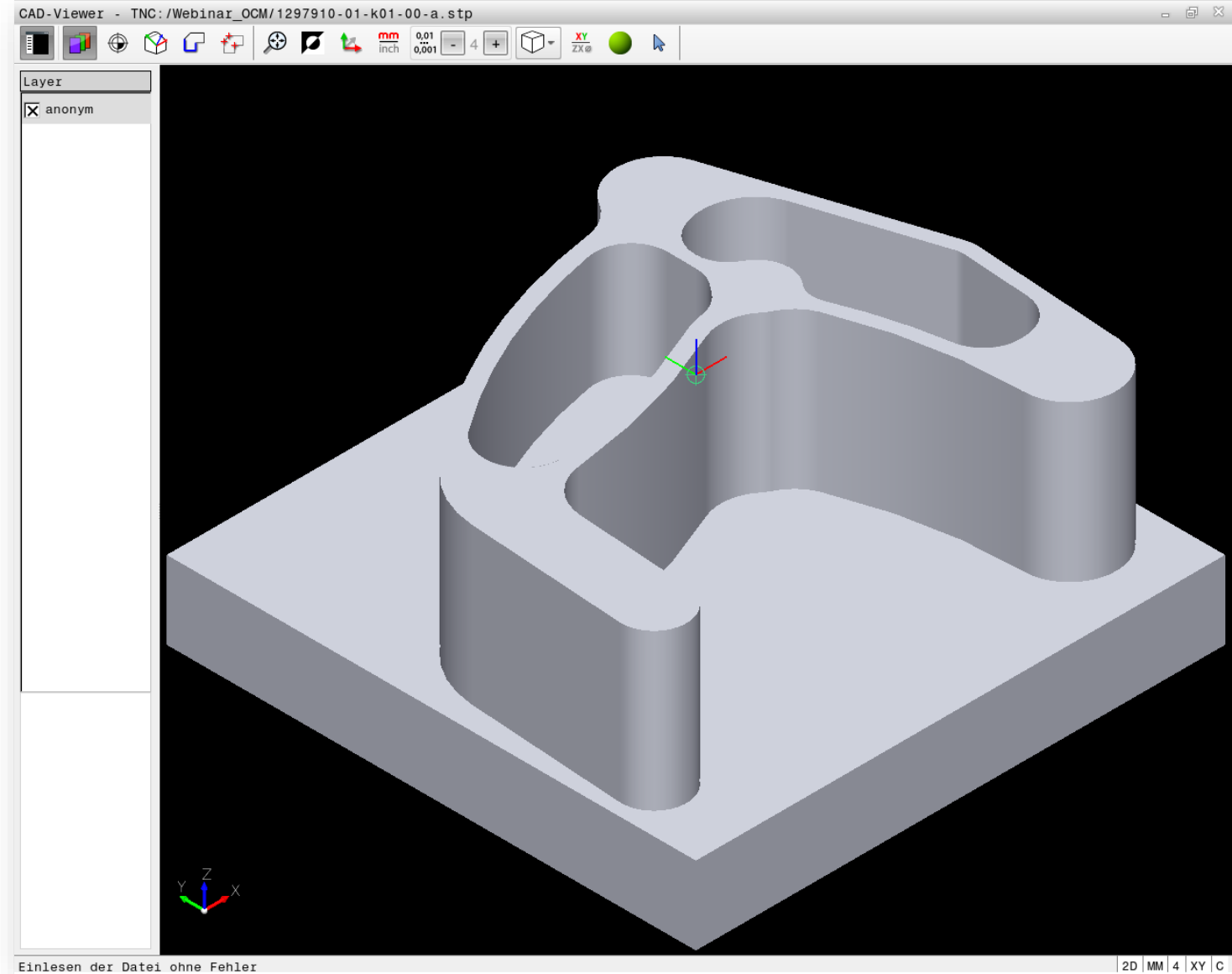


4 Anwendungsbeispiel



Anwendungsbeispiel

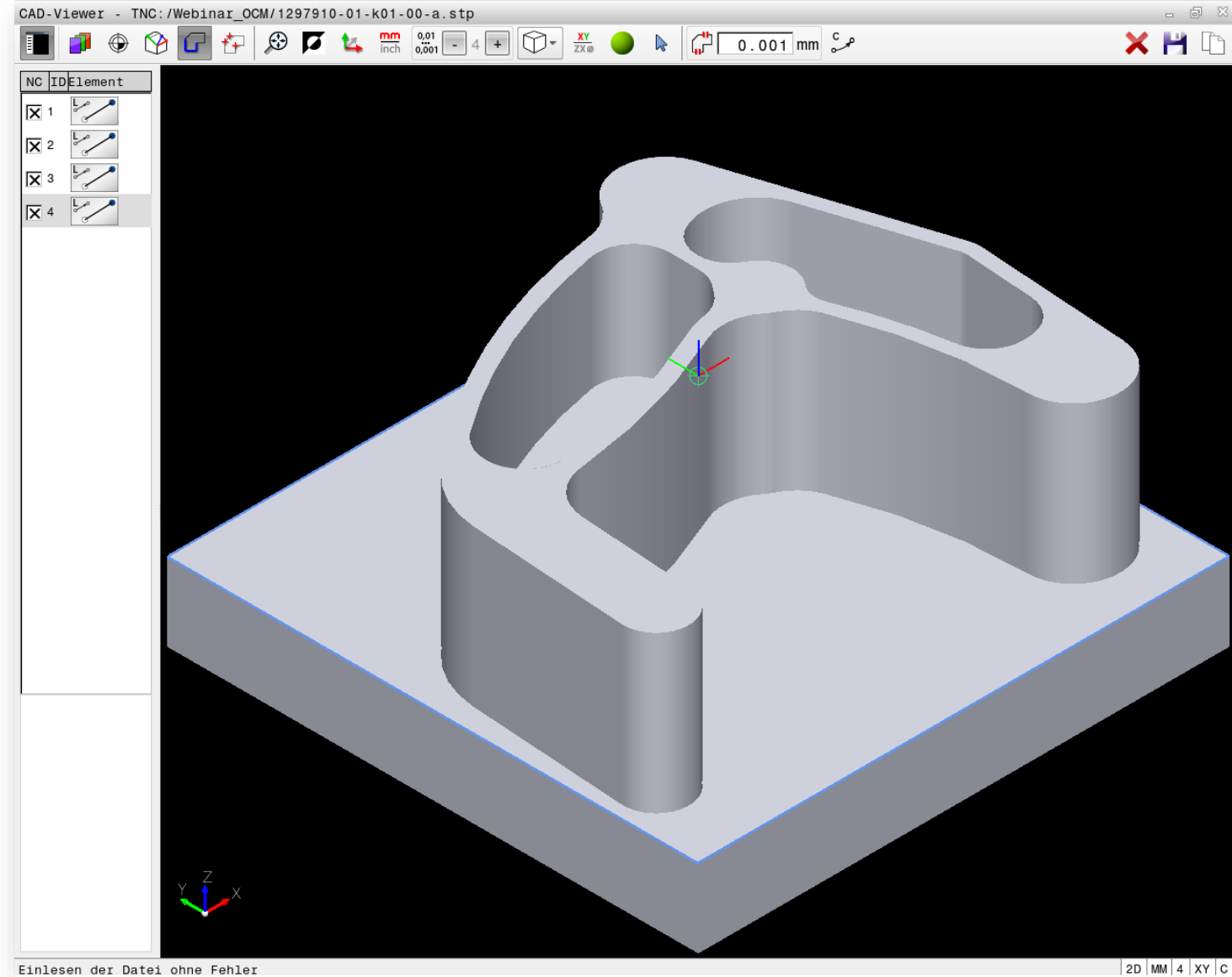
- Konturen auswählen
- Schruppen T D16
- Restmaterial T D10
- Schichten





Anwendungsbeispiel

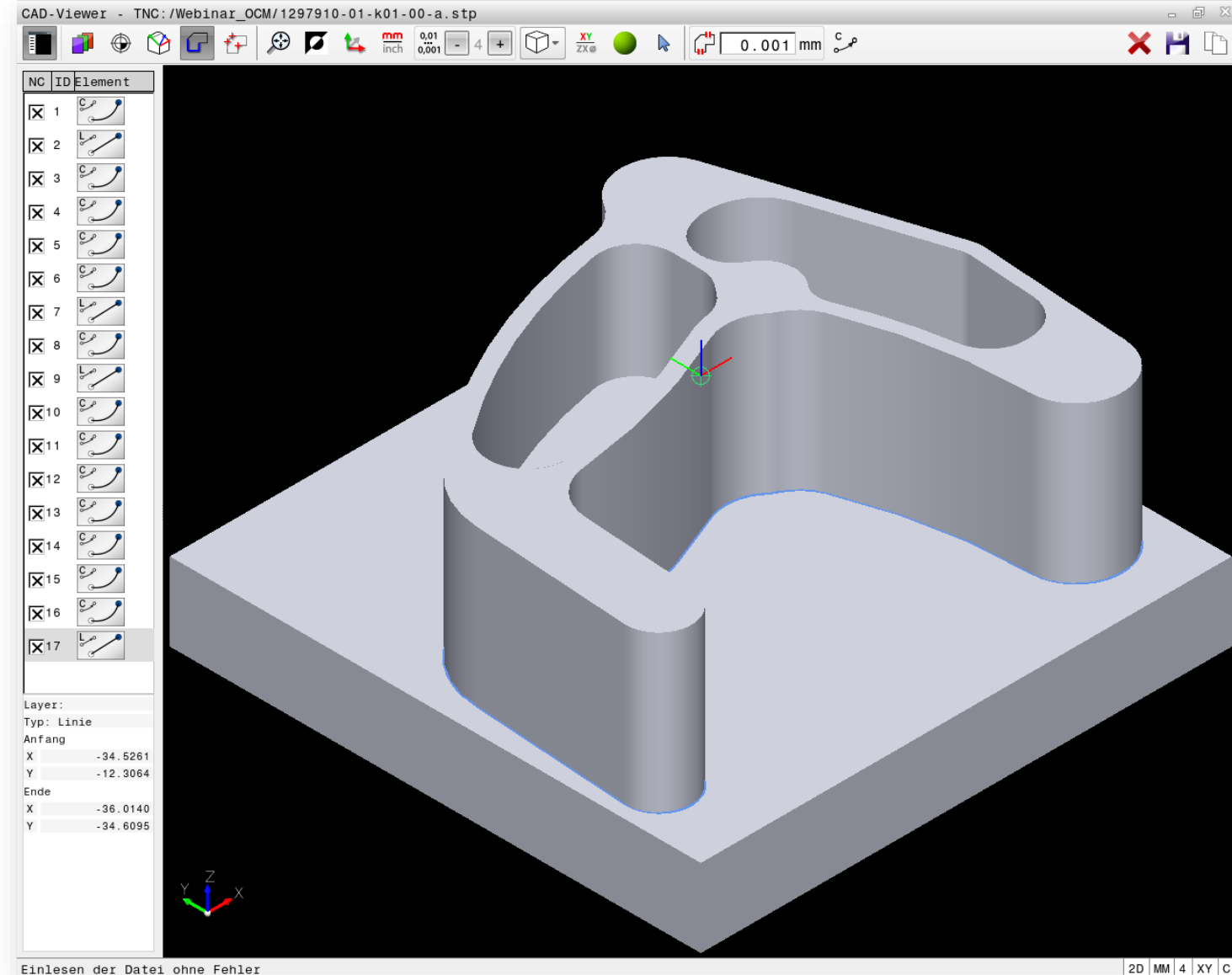
- Konturen auswählen
→ Außenkontur FRAME
- Schruppen T D16
- Restmaterial T D10
- Schichten





Anwendungsbeispiel

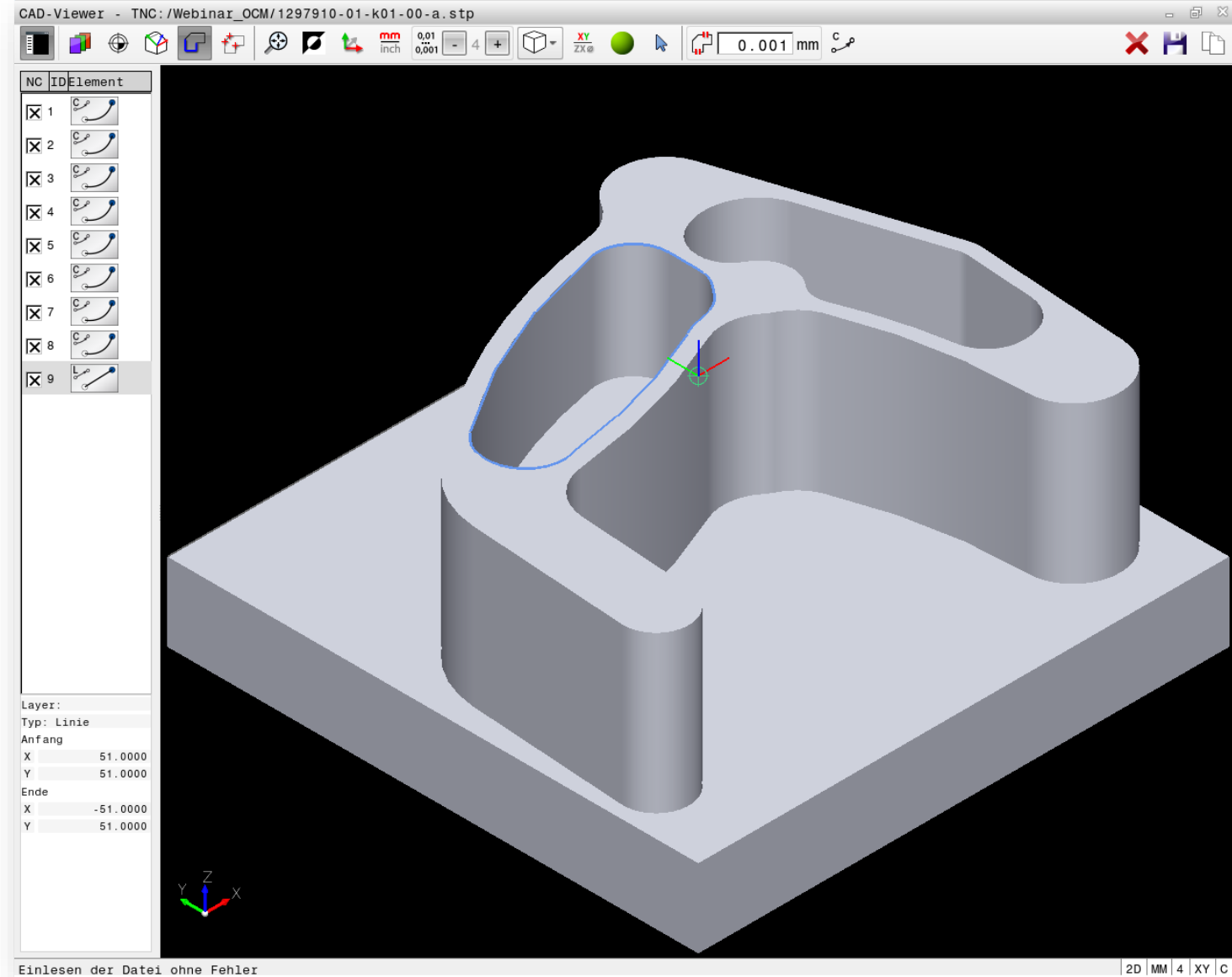
- Konturen auswählen
→ Inselkontur ISLAND
- Schruppen T D16
- Restmaterial T D10
- Schichten





Anwendungsbeispiel

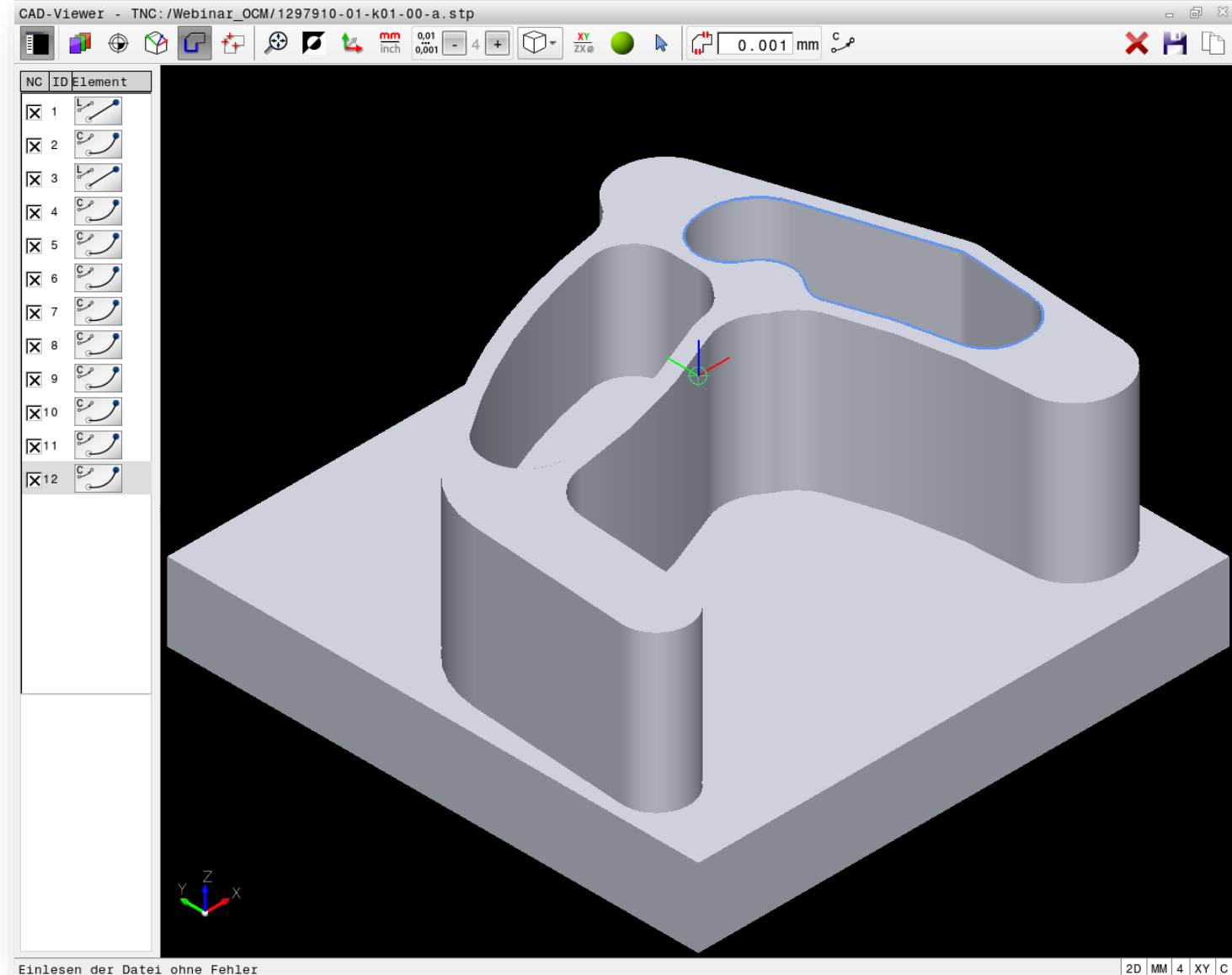
- Konturen auswählen
→ Tasche 1
- Schruppen T D16
- Restmaterial T D10
- Schichten





Anwendungsbeispiel

- Konturen auswählen
→ Tasche 2
- Schruppen T D16
- Restmaterial T D10
- Schichten





Anwendungsbeispiel

- Konturen auswählen
 - Contour Def
 - Vier Konturen kombinieren
- Schruppen T D16
- Restmaterial T D10
- Schlichten

Manual operation Programming

TNC: \Webinar_OCM\PART_1297910.H
→ PART_1297910.H

```
0 BEGIN PGM PART_1297910 MM
1 BLK FORM 0.1 Z X-50 Y-50 Z-40
2 BLK FORM 0.2 X+50 Y+50 Z+0
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S10000 F6000
5 CONTOUR DEF
  P1 = "TNC:\Webinar_OCM\FRAME.H" I2 =
  "TNC:\Webinar_OCM\ISLAND.H" P3 =
  "TNC:\Webinar_OCM\POCKET1.H" P4 =
  "TNC:\Webinar_OCM\POCKET2.H"
6 END PGM PART_1297910 MM
```

Y
X

DECLARE CONTOUR DEF CONTOUR DEF SEL CONTOUR CONTOUR FORMULA PATTERN DEF SEL PATTERN



Anwendungsbeispiel

- Konturen auswählen
- **Schruppen T D16**
- Restmaterial T D10
- Schichten

Manual operation Programming

TNC: \Webinar_OCM\PART_1297910.H
→ PART_1297910.H

```
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S10000 F6000
5 CONTOUR DEF
  P1 = "TNC:\Webinar_OCM\FRAME.H" I2 =
  "TNC:\Webinar_OCM\ISLAND.H" P3 =
  "TNC:\Webinar_OCM\POCKET1.H" P4 =
  "TNC:\Webinar_OCM\POCKET2.H"
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-30 ;DEPTH
  Q368=+0.5 ;ALLOWANCE FOR SIDE
  Q369=+0.5 ;ALLOWANCE FOR FLOOR
  Q260=+25 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+1 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+30 ;PLUNGING DEPTH
  Q370=+0.25 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= MAX ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 END PGM PART_1297910 MM
```

TNC 640 HEIDENHAIN

Y
X

6
4
2
0
-2
-4

4
2
0
-2
-4

FIND START START SINGLE RESET + START



Anwendungsbeispiel

- Konturen auswählen
- Schruppen T D16
- Restmaterial T D10
- Schlichten

Manual operation Programming

TNC: \Webinar_OCM\PART_1297910.H
→ PART_1297910.H

```
Q253= MAX ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
Q577=+0.2 ;APPROACH RADIUS FACTOR
Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 TOOL CALL "MILL D10 ROUGH" Z S12000 F4000
11 CYCL DEF 272 OCM ROUGHING
Q202=+15 ;PLUNGING DEPTH
Q370=+0.25 ;TOOL PATH OVERLAP
Q207= AUTO ;FEED RATE MILLING
Q568=+0.6 ;PLUNGING FACTOR
Q253= MAX ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
Q577=+0.2 ;APPROACH RADIUS FACTOR
Q351=+1 ;CLIMB OR UP-CUT
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 END PGM PART_1297910 MM
```

TNC 640 HEIDENHAIN

SELECT BLOCK CUT OUT BLOCK INSERT BLOCK COPY BLOCK FIND INSERT REMOVE INSERT REMOVE INSERT LAST NC BLOCK



Anwendungsbeispiel

- Konturen auswählen
- Schruppen T D16
- Restmaterial T D10
- Schlichten

Manual operation Programming

TNC: \Webinar_OCM\PART_1297910.H
→ PART_1297910.H

```
Q253= MAX ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
Q577=+0.2 ;APPROACH RADIUS FACTOR
Q351=+1 ;CLIMB OR UP-CUT
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 CYCL DEF 273 OCM FINISHING FLOOR
Q370=+1 ;TOOL PATH OVERLAP
Q385=+3000 ;FINISHING FEED RATE
Q568=+0.3 ;PLUNGING FACTOR
Q253= MAX ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q438=-1 ;ROUGH-OUT TOOL
15 L X+0 Y+0 Z+50 R0 FMAX M3 M99
16 ;
17 CYCL DEF 274 OCM FINISHING SIDE
Q338=+15 ;INFEED FOR FINISHING
Q385=+300 ;FINISHING FEED RATE
Q253= MAX ;F PRE-POSITIONING
Q200=+2 ;SET-UP CLEARANCE
Q14=+0 ;ALLOWANCE FOR SIDE
Q438=-1 ;ROUGH-OUT TOOL
Q351=+1 ;CLIMB OR UP-CUT
18 L X+0 Y+0 Z+50 R0 FMAX M3 M99
19 ;
20 M30
21 END PGM PART_1297910 MM
```

TNC 640 HEIDENHAIN

SELECT BLOCK CUT OUT BLOCK INSERT BLOCK COPY BLOCK FIND INSERT REMOVE INSERT REMOVE INSERT LAST NC BLOCK



Anwendungsbeispiel

- Konturen auswählen
- Schruppen T D16
- Restmaterial T D10
- Schlichten

Manual operation **Test Run**

Test Run
⚠ Plunging not possible at position (-4.331994, 15.270749)

TNC: \Webinar_OCM\Part1_1297910.H

```
Q351=+1 ;CLIMB OR UP-CUT
12 L X+0 Y+0 Z+50 R0 FMAX M3 M99
13 ;
14 CYCL DEF 273 OCM FINISHING FLOOR
    Q370=+1 ;TOOL PATH OVERLAP
    Q385=+2000 ;FINISHING FEED RATE
    Q568=+0.3 ;PLUNGING FACTOR
    Q253= MAX ;F PRE-POSITIONING
    Q200=+2 ;SET-UP CLEARANCE
    Q438=-1 ;ROUGH-OUT TOOL
15 L X+0 Y+0 Z+50 R0 FMAX M3 M99
16 ;
17 CYCL DEF 274 OCM FINISHING SIDE
    Q338=+0 ;INFEEED FOR FINISHING
    Q385=+1800 ;FINISHING FEED RATE
    Q253= MAX ;F PRE-POSITIONING
    Q200=+2 ;SET-UP CLEARANCE
    Q14=+0 ;ALLOWANCE FOR SIDE
    Q438=-1 ;ROUGH-OUT TOOL
    Q351=+1 ;CLIMB OR UP-CUT
18 L X+0 Y+0 Z+50 R0 FMAX M3 M99
19 ;
20 M30
21 END PGM PART1_1297910 MM
```

00:03:45 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START



Anwendungsbeispiel

- Konturen auswählen
- Schruppen T D16
- Restmaterial T D10
- Schlichten

Manual operation Test Run

TNC: \Webinar_OCM\Part1_1297910.H

```
0 BEGIN PGM PART1_1297910 MM
1 BLK FORM 0.1 Z X-50 Y-50 Z-40
2 BLK FORM 0.2 X+50 Y+50 Z+0
3 ;
4 TOOL CALL "MILL_D16_ROUGH" Z S10000 F5000
5 CONTOUR DEF
  P1 = "TNC:\Webinar_OCM\FRAME.H" I2 =
  "TNC:\Webinar_OCM\ISLAND.H" P3 =
  "TNC:\Webinar_OCM\POCKET1.H" P4 =
  "TNC:\Webinar_OCM\POCKET2.H"
6 CYCL DEF 271 OCM CONTOUR DATA
  Q203=+0 ;SURFACE COORDINATE
  Q201=-30 ;DEPTH
  Q368=+0.3 ;ALLOWANCE FOR SIDE
  Q369=+0.5 ;ALLOWANCE FOR FLOOR
  Q260=+25 ;CLEARANCE HEIGHT
  Q578=+0.2 ;INSIDE CORNER FACTOR
  Q569=+1 ;OPEN BOUNDARY
7 CYCL DEF 272 OCM ROUGHING
  Q202=+30 ;PLUNGING DEPTH
  Q370=+0.25 ;TOOL PATH OVERLAP
  Q207= AUTO ;FEED RATE MILLING
  Q568=+0.6 ;PLUNGING FACTOR
  Q253= MAX ;F PRE-POSITIONING
  Q200=+2 ;SET-UP CLEARANCE
  Q438=-1 ;ROUGH-OUT TOOL
  Q577=+0.2 ;APPROACH RADIUS FACTOR
  Q351=+1 ;CLIMB OR UP-CUT
8 L X+0 Y+0 Z+50 R0 FMAX M3 M99
9 ;
10 TOOL CALL "MILL_D10_ROUGH" Z S12000 F2000
11 CYCL DEF 272 OCM ROUGHING
  Q202=+30 ;PLUNGING DEPTH
  Q370=+0.2 ;TOOL PATH OVERLAP
```

00:05:08 F MAX

VIEW OPTIONS OFF ON STOP AT START START SINGLE RESET + START

HEIDENHAIN

Webinar



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WEBINAR

