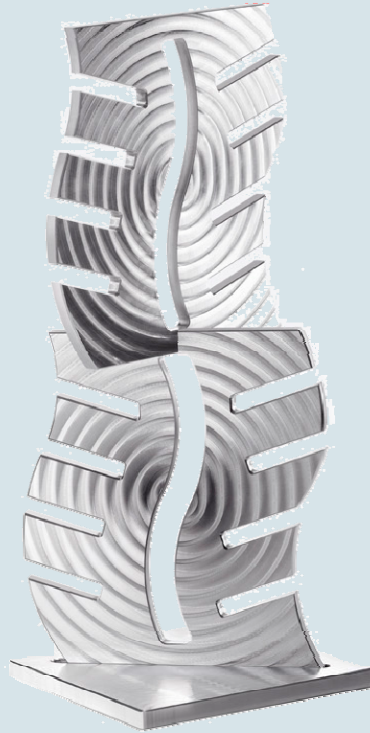


Production of a modular CD stand



CD stand in modular construction

The modular CD stand is the esthetic answer to the question how you can store your CDs while showing your good design sense. Proudly show your CDs and say a conscious No to small trendy music storage systems. The CD stand can be freely expanded and is the eye-catcher next to every exclusive music system. The parts are milled using ShopMill.

All information, drawings, tool data and ShopMill machining plans required for the reproduction are summarized in the following sections.

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Table of Contents

1. Safety note	2
2. Preliminary remark	2
3. Drawing list	3
4. Blank workpiece	3
5. Milling machine and milling program	3
6. Used tools	4
7. Production steps	5
8. Information in the Internet	9
9. Simulation pictures of the programs	10
10. Workpiece figures	15
11. Clamping and machining situations	17

1. Safety note

The handling of machines brings many dangers. Consequently, the legal and general company safety regulations must always be observed for the production of the CD stand.

2. Preliminary remark

The following description is oriented to technicians familiar with a CNC milling machine who have experience or knowledge of the SINUMERIK CNC with ShopMill. All technology data listed here is appropriate for the machines, tools, materials, machining plans and drawings used to produce the Siemens Corp. sample piece. Although the wide range of conditions prevailing in other workshops mean they are only exemplary for a reproduction, in most cases they should allow a problem-free reproduction.

The CD stand consists of a base and the expandable modules for holding the CDs. The plates for the modules are first clamped in the vise. The zero point is the plate center. The 1SEITE.MPF machining plan is used for milling the groove and the contour. This machining plan contains three work steps controlled using R-parameters.

The plates are first face-milled using the cycle for a circular pocket to create the interesting surface structure. The wave-shaped longitudinal groove must then be milled in the middle. After milling this groove, the workpiece is then clamped on the plate using a clamp so that the external contour can be freely milled in a single work step. The rear side of the contour is then chamfered using the 2SEITE.MPF machining plan. To allow the zero point to be determined easier for reclamping, the end faces are milled for the two upper grooves of the external contour parallel to the center line. A probe at these edges is easy. You can use the GRAVUR.MPF machining plan to individually form the modules. The NUT.MPF machining plan permits the



milling of the transverse groove for the assembly. The machining plan to produce the base from a plate is contained in FUSS.MPF.

To guarantee success, we recommend simulating the machining plans prior to the start. This detects and avoids any program errors.

You can download without charge all CAD drawings and production descriptions for the workpieces in the registered "My SINUMERIK" Internet area at www.siemens.com/cnc4you. We make the following files and formats available here:

PDF file of the model with dimensions / drawing file / Jobshop files

3. Drawing list

- CD stand milled part drawing.

4. Blank workpiece

- Four 10 mm aluminum plates, AlMg 4.5 Mn material, material no. 3.3547; cut size approx. 200 x 210 mm.

5. Milling machine and milling program

- SAEILO CONTUR MMV-660 milling machine equipped with SINUMERIK 810D and ShopMill.
- ShopMill version 6.4 milling program (minimum equipment).
- 1SEITE.MPF machining plan for face-milling the upper side, milling the groove and contour.
- 2SEITE.MPF machining plan for chamfering the groove and contour on the rear side.
- NUT.MPF machining plan for milling the transverse groove on the face side.
- FUSS.MPF machining plan as milling example for a base.
- GRAVUR.MPF machining plan for milling an individual engraving.



6. Used tools

Tools for milling and engraving

Designation	Tool name in the machining plan	Order number of the Hoffmann Group tools
14 mm diameter end mill, two-sided cutter	FRAESER_14	201200 14
10 mm diameter end mill, two-sided cutter	FRAESER_10	201200 10
8 mm diameter end mill, two-sided cutter	FRAESER_8	201200 8
Chamfer milling cutter	ENTGRATER	208111 8
Engraving milling cutter	KUGEL	2071175 2

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7. Production steps

Face milling of the plate

1SEITE.MPF is used to face-mill the plate in the first step.

Note:

The 1SEITE.MPF program is used for three work steps. The R-parameter controls which program section is to be processed. Consequently, ensure that the R-parameter is correctly selected for work steps A-C.

Work steps on the milling machine

1. Approach the reference point of the machine.
2. Import the 1SEITE.MPF machining plan.
3. Enter measured tools in the tool list.
4. Place tools in the magazine.
5. Clamp the plate raw stock in the vise.
6. Set workpiece zero point by scratching.
7. In the program, check R=1 is specified in line N10.
8. Perform simulation.
9. Start the manufacturing; process the machining plan.



Milling the wave-shaped groove

1SEITE.MPF is used to mill the wave-shaped groove in the second step.

Work steps on the milling machine

1. In the program, check R=2 is specified in line N10.
2. Perform simulation.
3. Start the manufacturing; process the machining plan.

Milling and chamfering the contour

To mill the contour, the workpiece must be clamped to a plate; the clamping bracket can be clamped using the elongated hole (see also clamping situation).

Work steps on the milling machine

1. Import the 1SEITE.MPF machining plan.
2. Enter measured tools in the tool list.
3. Place tools in the magazine.
4. Clamp the plate using the bracket and determine the zero point.
5. In the program, check R=3 is specified in line N10.
6. Perform simulation.
7. Start the manufacturing; process the machining plan.

Add the engraving

After milling the front side, the GRAVUR.MPF program can be used to add an optional engraving.

Work steps on the milling machine

1. Import the 1SEITE.MPF machining plan.
2. Change appropriately the engraving text in lines N10 and N15.
3. Perform simulation.
4. Start the manufacturing; process the machining plan.



Chamfering the contour on the rear side

To chamfer the rear side, the workpiece must be reclamped and the new zero point determined. To simplify determining the zero point, the face sides of the upper two grooves are created parallel to the center line.

Work steps on the milling machine

1. Import the 2SEITE.MPF machining plan.
2. Enter measured tools in the tool list.
3. Place tools in the magazine.
4. Clamp the plate using the bracket and determine the zero point.
5. Perform simulation.
6. Start the manufacturing; process the machining plan.

Milling the transverse groove for the connection

To mill the transverse groove, the plate must be clamped vertically. The zero point then lies in the center of the face side. The transverse groove is cut in only on one side for the first and last plate. The transverse groove is milled on both face sides for the inner parts.

Work steps on the milling machine

1. Import the NUT.MPF machining plan.
2. Enter measured tools in the tool list.
3. Place tools in the magazine.
4. Clamp the plate vertically in the vise and determine the zero point.
5. Perform simulation.
6. Start the manufacturing; process the machining plan.



Milling the base

You can individually design the CD stand base. It can be produced either as turned part or as milled part. The FUSS.MPF machining plan can be used for a simple plate with longitudinal groove. Ensure that the lowermost module fits tightly in the longitudinal groove.

Work steps on the milling machine

1. Import the FUSS.MPF machining plan.
2. Enter measured tools in the tool list.
3. Place tools in the magazine.
4. Clamp the plate in the vise and determine the zero point.
5. Perform simulation.
6. Start the manufacturing; process the machining plan.



8. Information in the Internet

Design of the parts, creation of the drawings, development of the machining plans for the machining

Siemens AG, SINUMERIK TAC Application Center
Frauenauracher Strasse 80
91056 Erlangen / Germany
in the Internet: <http://www.siemens.de/cnc4you>

Dimensions and performance data for the tools to be used

Hoffmann Group
Werkzeughersteller Hoffmann GmbH Qualitätswerkzeuge
Haberlandstrasse 55
81241 Munich / Germany
in the Internet: www.hoffmann-group.com

Details of the tool machine to be used

SAEILO Deutschland GmbH
Hauptstrasse 68
35585 Wetzlar-Blasbach / Germany
In the Internet: www.saeilo.de

Siemens AG manuals and information

Manuals and detailed information about our products are available at www.siemens.de/sinumerik -> index or search: DOConWEB -> SINUMERIK

- "Simple milling with ShopMill" training document
-> Info/Training -> "Simple milling with ShopMill" training document
- ShopMill product brief
-> 840D/840Di/810D users -> ShopMill 840D/810D product brief
- ShopMill operating/programming
-> 840D/840Di/810D users -> ShopMill operating and programming

Searching tips at DOConWEB

DOConWEB permits the fast access to individual pages from documents without loading the complete file.

- You have the possibility to restrict the selection by clicking "A-Z"
(-> a search is now only made within this item in the index),
- Or click the magnifying glass
(-> the search is now made for complete text within this item).

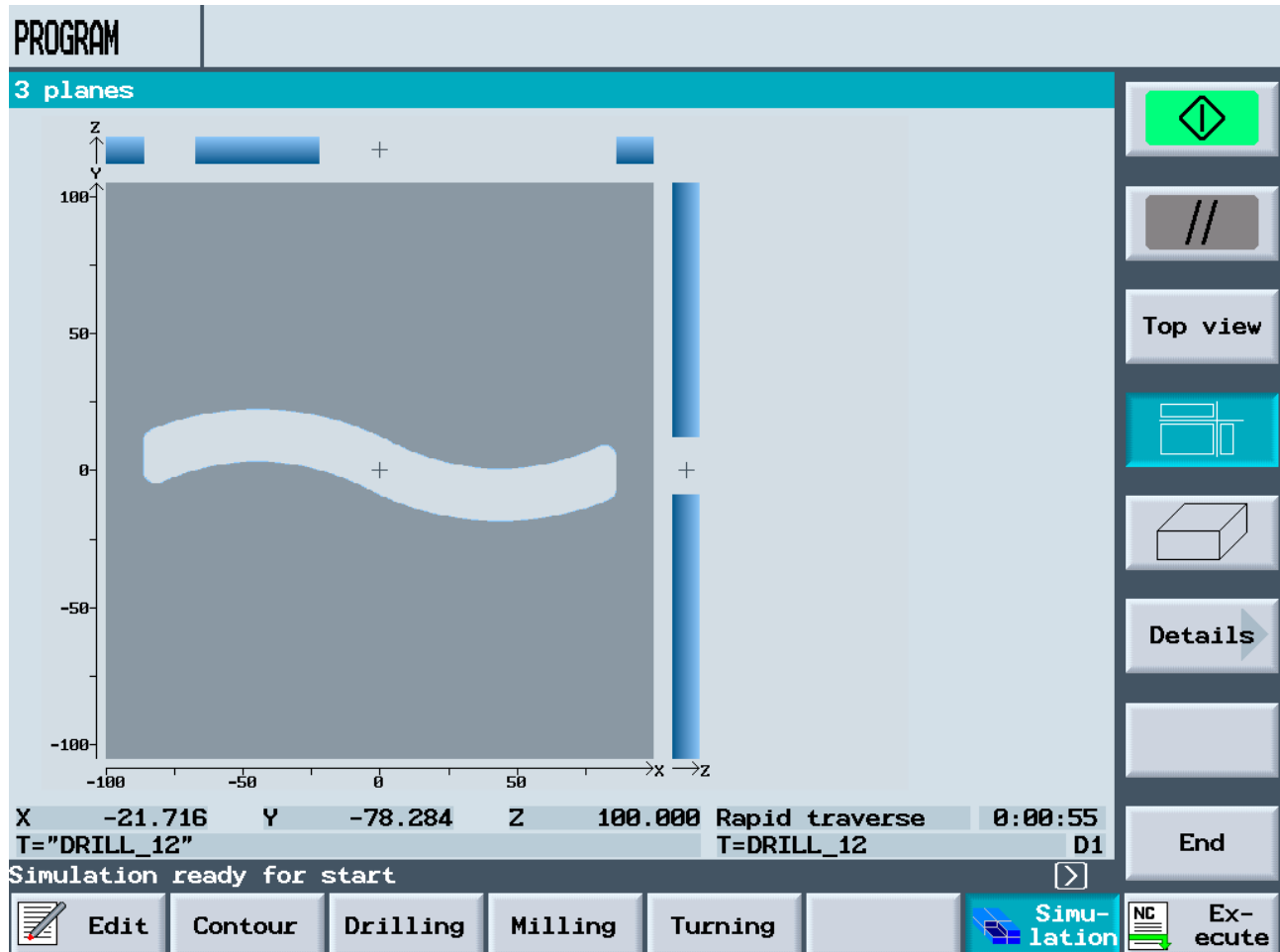
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9. Simulation pictures of the programs

Simulation of the wave-shaped 1SEITE.MPF longitudinal groove

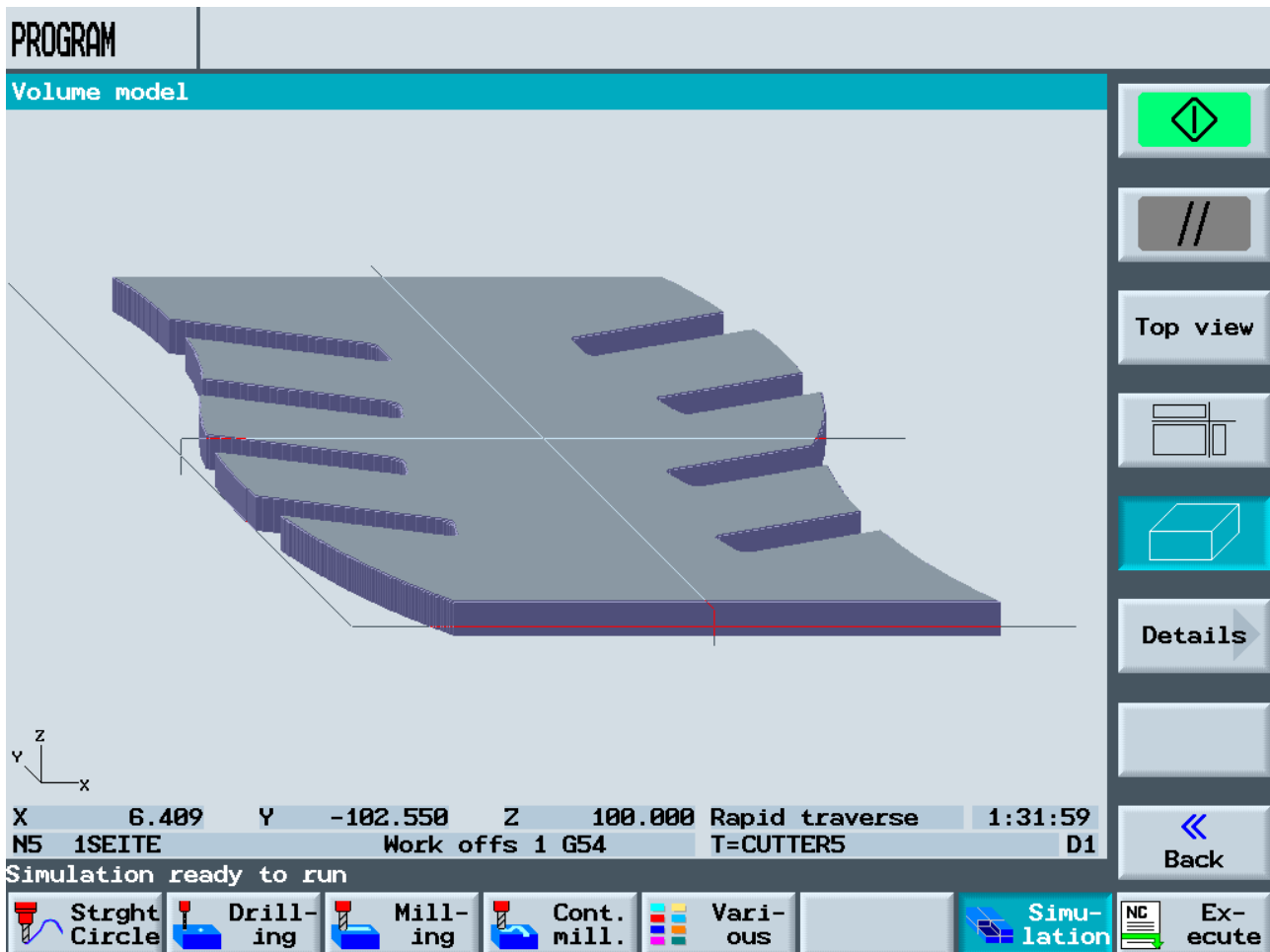


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Simulation of the external contour

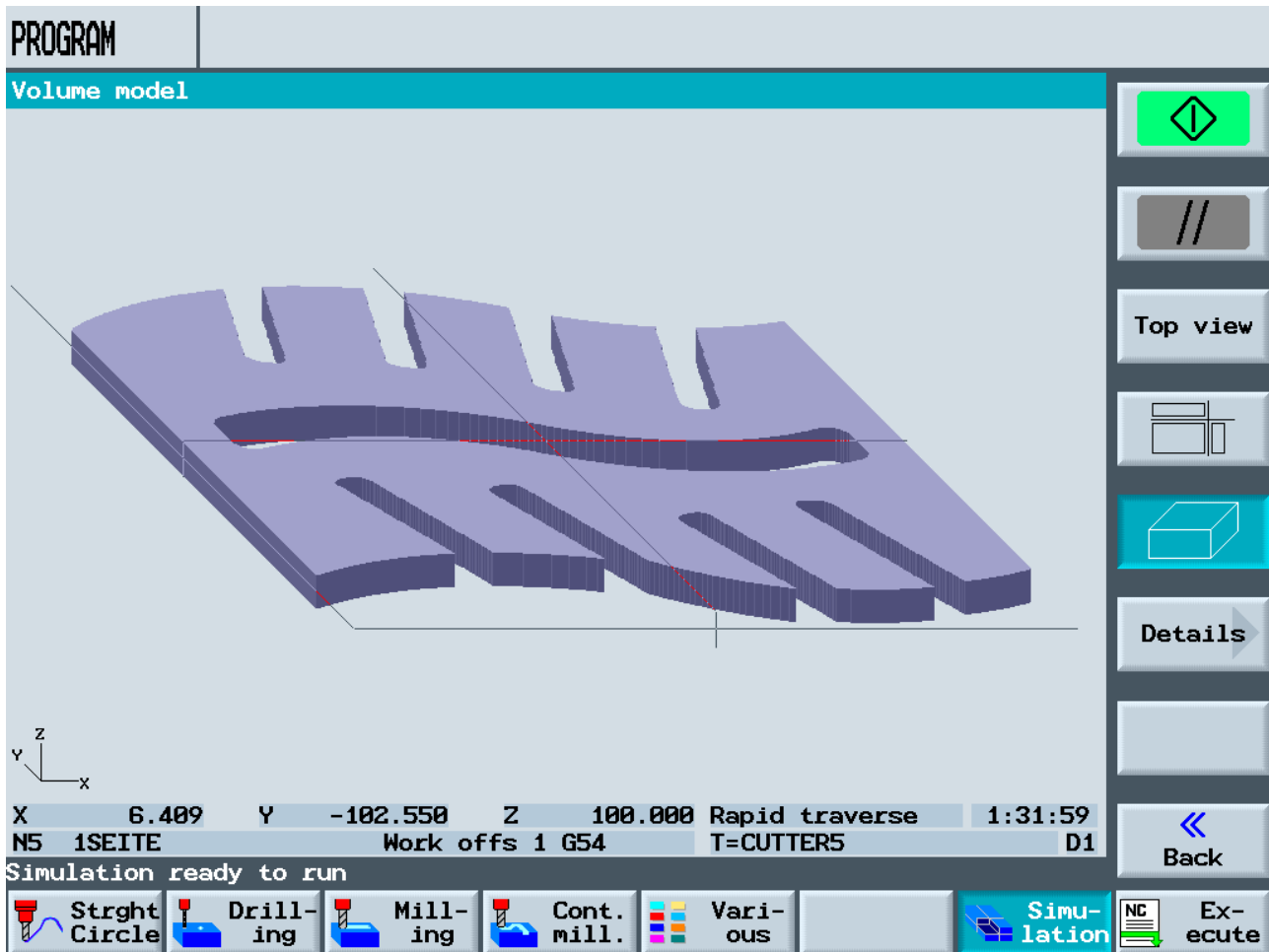


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Volume model of the 1SEITE.MPF complete machining



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1SEITE.MPF machining plan with marked line of the R-parameters

PROGRAM	
1SEITE	
P	N5 1SEITE Nullpktv. 1 G54
G	N10 R1=1
G	N15 IF R1==1 GOTOF _ANF1
G	N20 IF R1==2 GOTO _ANF2
G	N25 IF R1==3 GOTOF _ANF3
G	N30 _ANF1:
	N35 Kreistasche ▽ T=FRAESER14 F2000/min S6000U X0=0 Y0=0
G	N40 M30
G	N45 _ANF2:
	N50 Drehung add Z-90
	N55 KONTUR_INNEN
	N60 Tasche Fräsen ▽ T=FRAESER8 F700/min S8000U Z0=0
	N65 Bahnfräsen ▽ T=FRAESER8 F700/min V8000m Z0=0
	N70 Bahnfräsen ▽ T=ENTGRATER_1 F700/min V8000m FS0.5
	N75 Drehung add X0 Y0 Z0
G	N80 M30

Strai. Circle

Drill- ing

Mill- ing

Cont. mill.

Vari- ous

Simu- lation

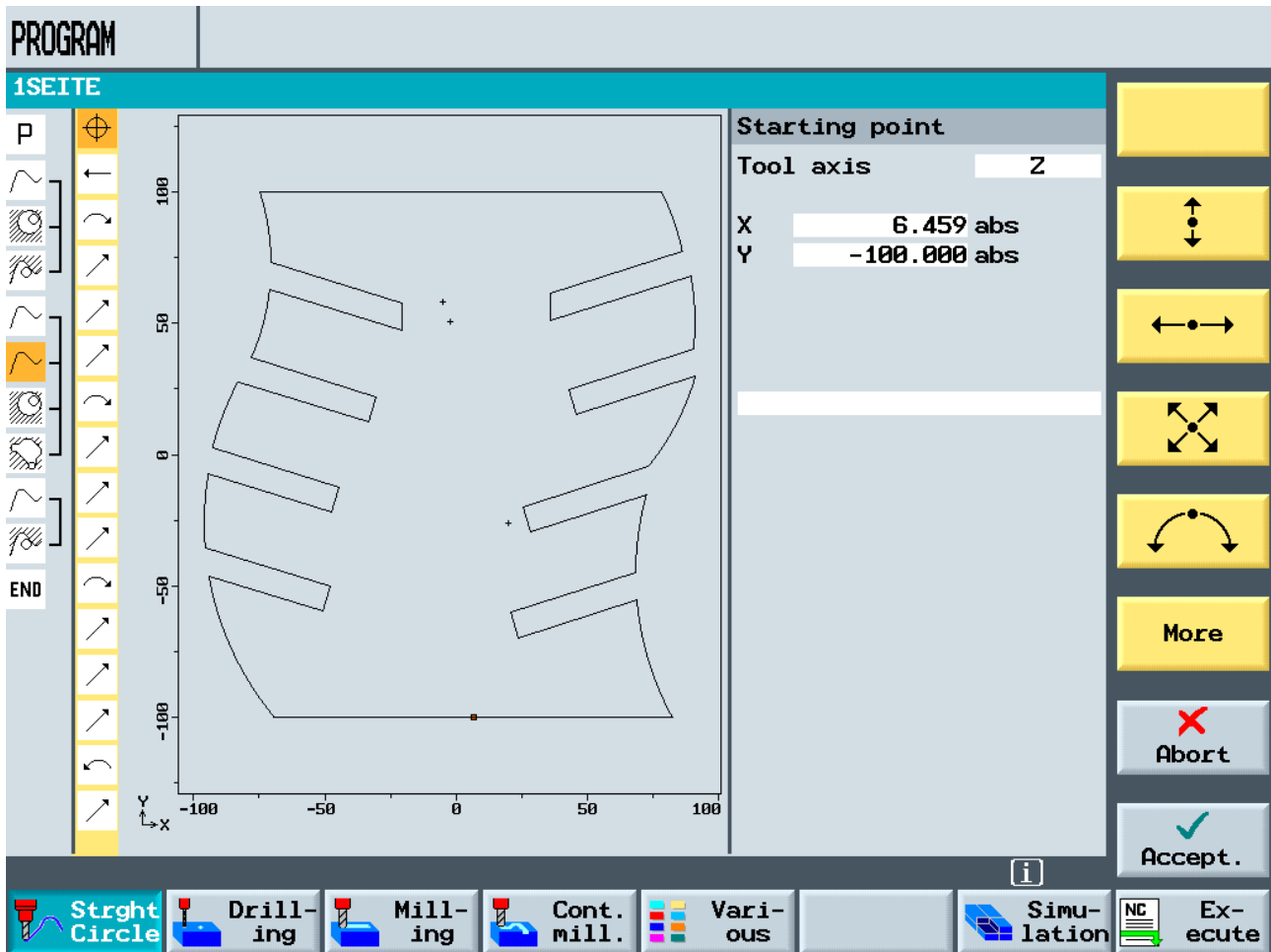
Ex- ecute

Machine funct.

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Contour drawn and displayed in the contour editor



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10. Workpiece figures

CD stand with two modules and CDs (full)



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CD stand with two modules and CDs



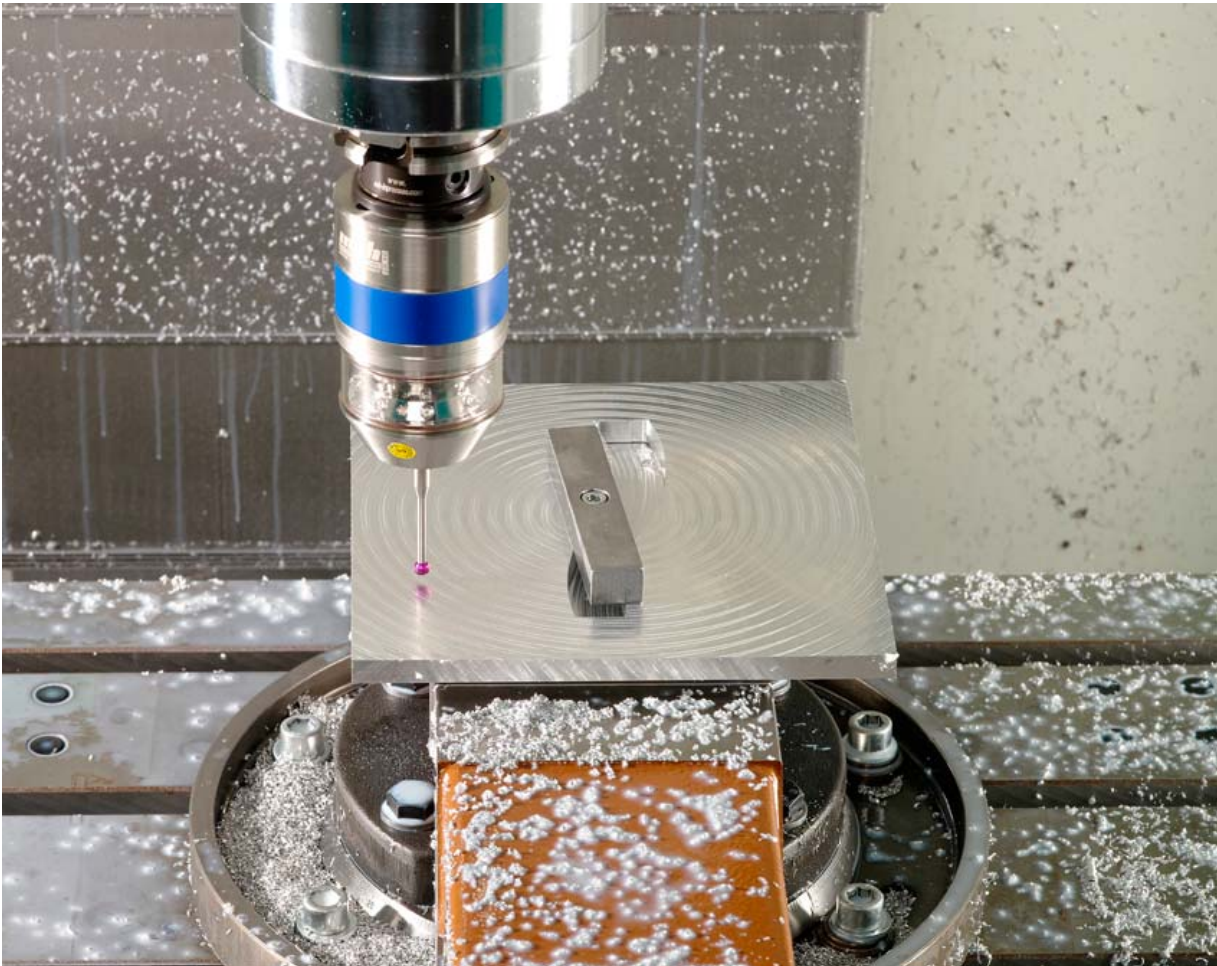
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11. Clamping and machining situations

Clamping situation with bracket for the front side machining



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Contour machining



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Milling the circular pocket for face milling



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