Production of a beer mug lid

Beer mug lid

Don't give insects a chance and protect your beer! With this unique beer mug lid, your mug content remains protected from any insect attack and it will certainly be the hit at every garden party.

The contour was converted from the DXF file with the help of the CAD reader into ShopTurn programs. These programs are processed by the contour milling cycle.

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

www.siemens.com/cnc4you

Table of Contents

1. Safety note 2

2. Preliminary remark 2

3. Workpiece blank 4

4. Turning machine and machining plans 4

5. Tools used for turning and milling of the beer mug lid 4

6. Turning the lower side 5

7. Turning the upper side 5

8. Information in the Internet 6

9. Figures 8

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 beer mug lid.

2. Preliminary remark

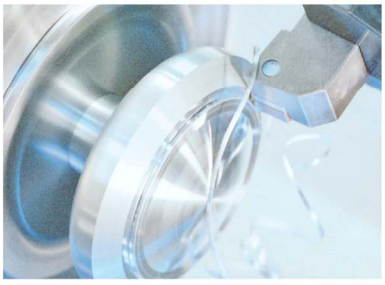
The following description is oriented to technicians familiar with a CNC turning machine who have experience or knowledge of the SINUMERIK CNC with ShopTurn. All technology data listed here is appropriate for the machines, tools, materials, machining plans and drawings used to produce the sample. Although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

ShopTurn permits the turning of the beer mug lid using just two clampings. The rear side of the beer mug lid is produced in the first clamping. The concave inner side is bored and a shoulder machined.

In the second clamping, a convex surface is turned and the fly contour milled. The wide range of possibilities of the turning program are by no means exhausted in this step. For example, it would be possible without additional clamping to use the program's engraving function to engrave an arbitrary text.

A cut round stock with a diameter of approximately 100 mm and a thickness of approximately 30 mm is used as raw material.

To guarantee success, we recommend simulating the machining plans prior to the start. This detects and avoids any program errors. The "perform simulation" work step before starting the production is not essential.



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:
DXF file / Jobshop file

3. Workpiece blank

- One piece of round stock, AlCuMgPb material, material no. 3.1645;
  cut diameter 100 mm, thickness approximately 30 mm

4. Turning machine and machining plans

- SPINNER TC-600 turning machine equipped with SINUMERIK 840D sl and ShopTurn
- ShopTurn version 6.4 turning program (minimum equipment)
- 1SEITE.MPF machining plan for turning the lower side
- 2SEITE.MPF machining plan for turning the upper side
- Machining plans for milling the contour of the upper side
  AUGE_L.MPF
  AUGE_R.MPF
  FLUGEL.MPF
  NASE.MPF
  OBEN_KOUNTUR.MPF
  OBEN_WITH_S.MPF
  OBEN_WITHOUT_S.MPF
  UNTEN.MPF
  UNTEN_KONTUR.MPF
  ZUNGE.MPF

5. Tools used for turning and milling of the beer mug lid

Designation	Tool name in the machining plan
3 mm diameter VHM groove cutter	GRAV
Outside turning holder tool with tool insert	CNMG120408_UNI_HS
Outside turning holder tool with tool insert	VCMT160404_SM_HS
Cut-off tool	GARANT_SCHWERT3.1

6. Turning the lower side

The cut blank is clamped securely.

Work steps on the turning machine

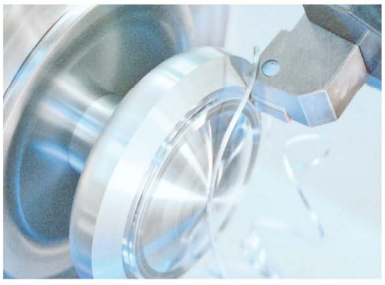
1. Approach the reference point of the machine.
2. Import the 1SEITE.MPF machining plan.
3. Enter measured tools in the tool list.
4. Place tools in the magazine.
5. Set workpiece zero point by scratching.
6. Perform simulation.
7. Start the manufacturing; process the machining plan.

7. Turning the upper side

The cut blank with the lower side to be machined is clamped securely.

Work steps on the turning machine

1. Approach the reference point of the machine.
2. Import the 2SEITE.MPF machining plan.
   The contour programs must be located in the same directory.
3. Enter measured tools in the tool list.
4. Place tools in the magazine.
5. Set workpiece zero point by scratching.
6. Perform simulation.
7. 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

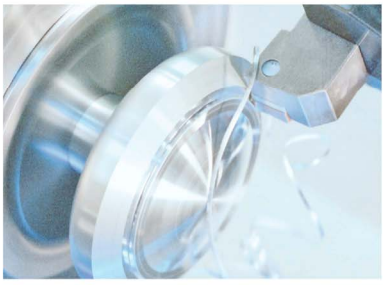
Siemens AG, SINUMERIK TAC Application Center
Frauenauracher Strasse 80
91056 Erlangen
Germany
in the Internet: http://www.siemens.com/cnc4you

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

SPINNER Werkzeugmaschinenfabrik
Rudolf-Diesel-Ring 24
82054 Sauerlach
Germany
In the Internet: www.spinner-wzm.de



Siemens AG manuals and information

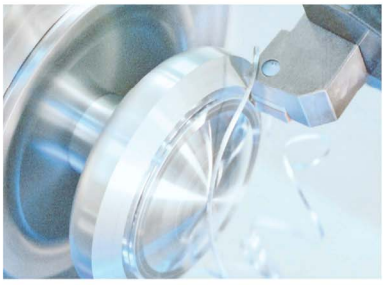
Manuals and detailed information about our products are available at www.siemens.de/sinumerik -> index or search: DOConWEB -> SINUMERIK

- "Simple turning with ShopTurn" training document
  -> Info/training -> "Simple turning with ShopTurn" training document
- ShopTurn product brief
  -> 840D/840Di/810D users -> ShopTurn 840D/810D product brief
- ShopTurn operating/programming
  -> 840D/840Di/810D users -> ShopTurn operating and programming

Searching tips at DOConWEB

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

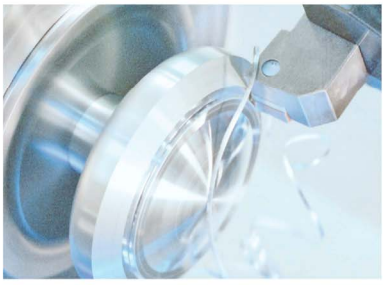
- You have the possibility to restrict the selection by clicking "A-Z"
  (-> a search is now only made within this item in the index),
- Or click the magnifying glass
  (-> the search is now made for complete text within this item).



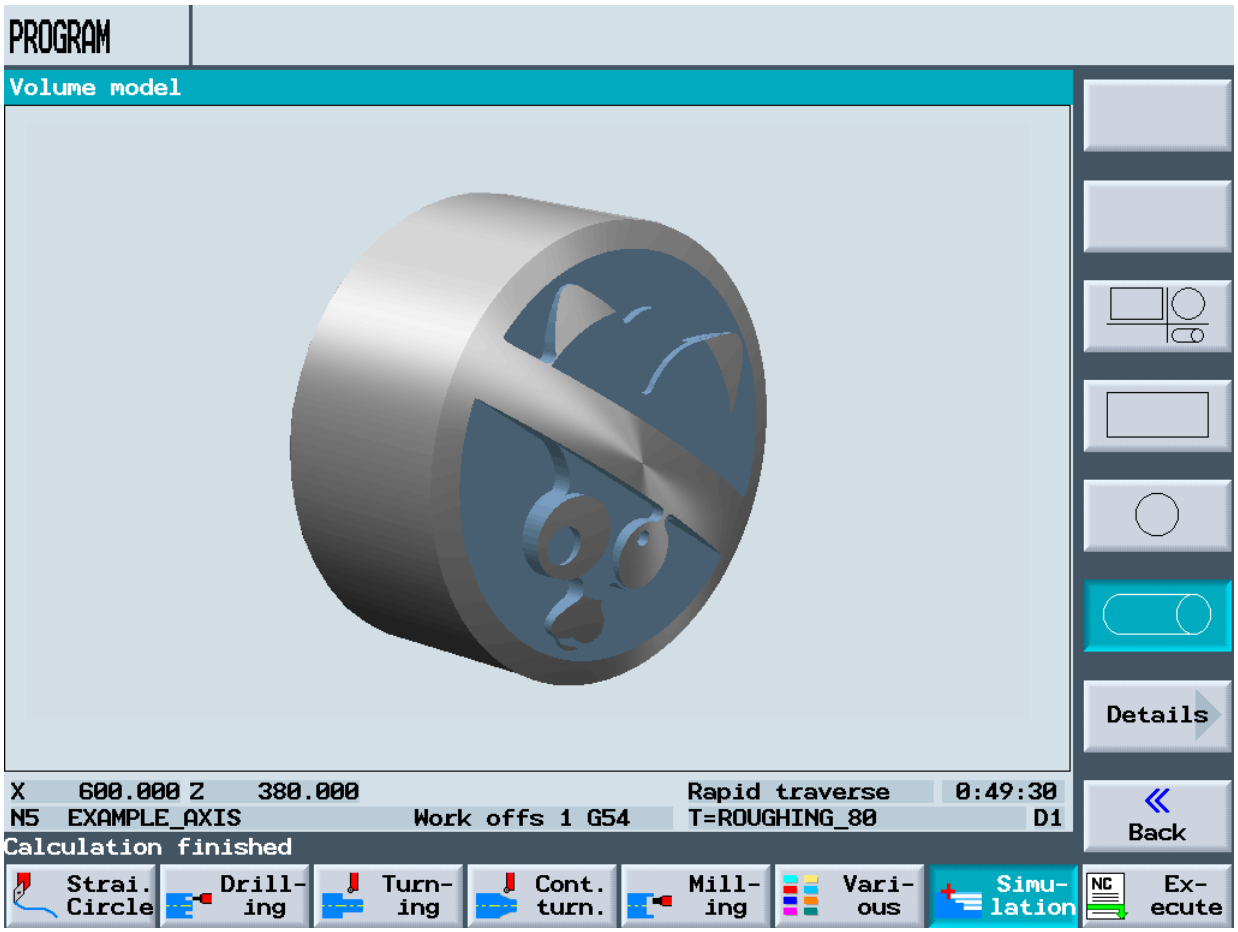
9. Figures

Beer mug lid with mug

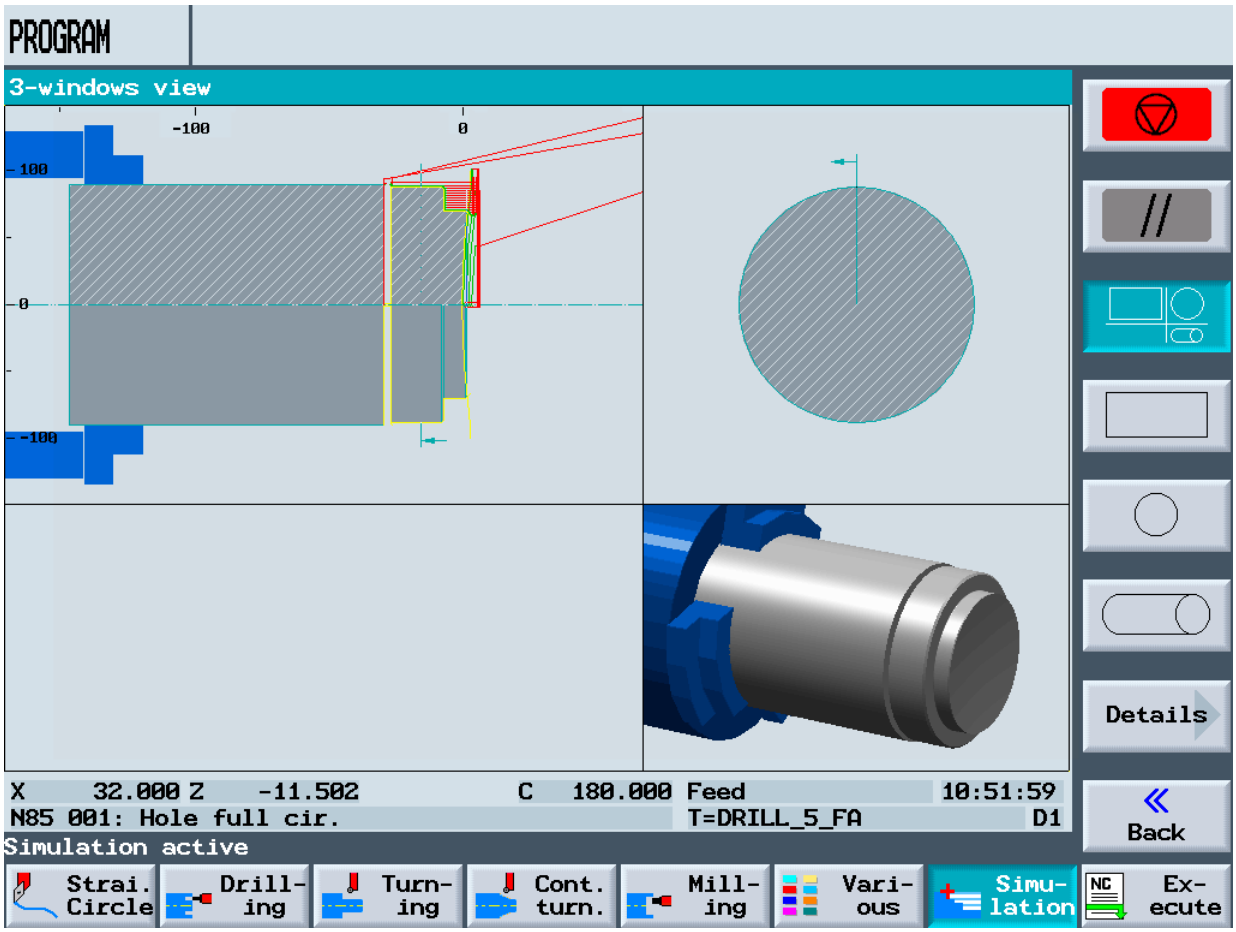
Fly DXF file



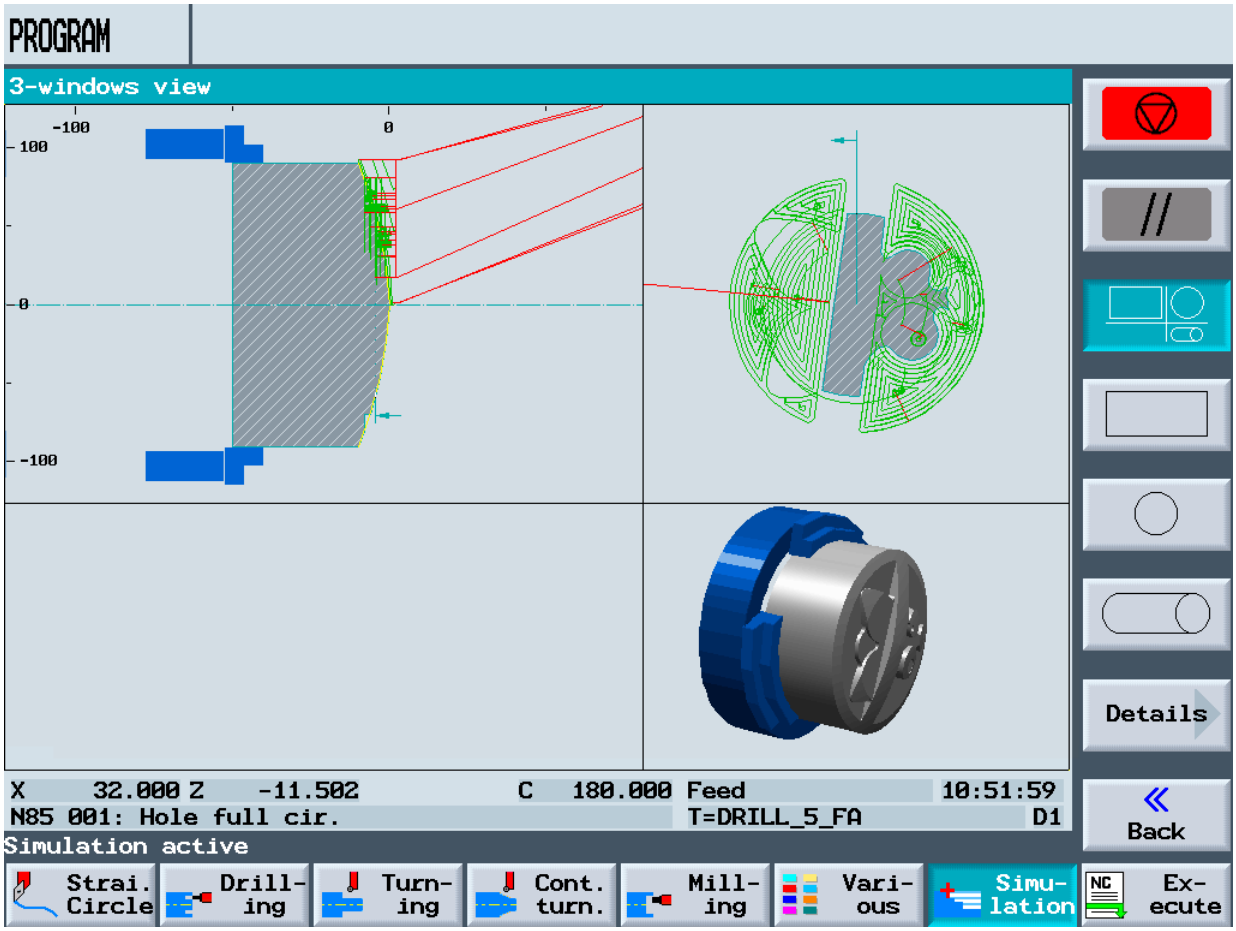
3D simulation upper side



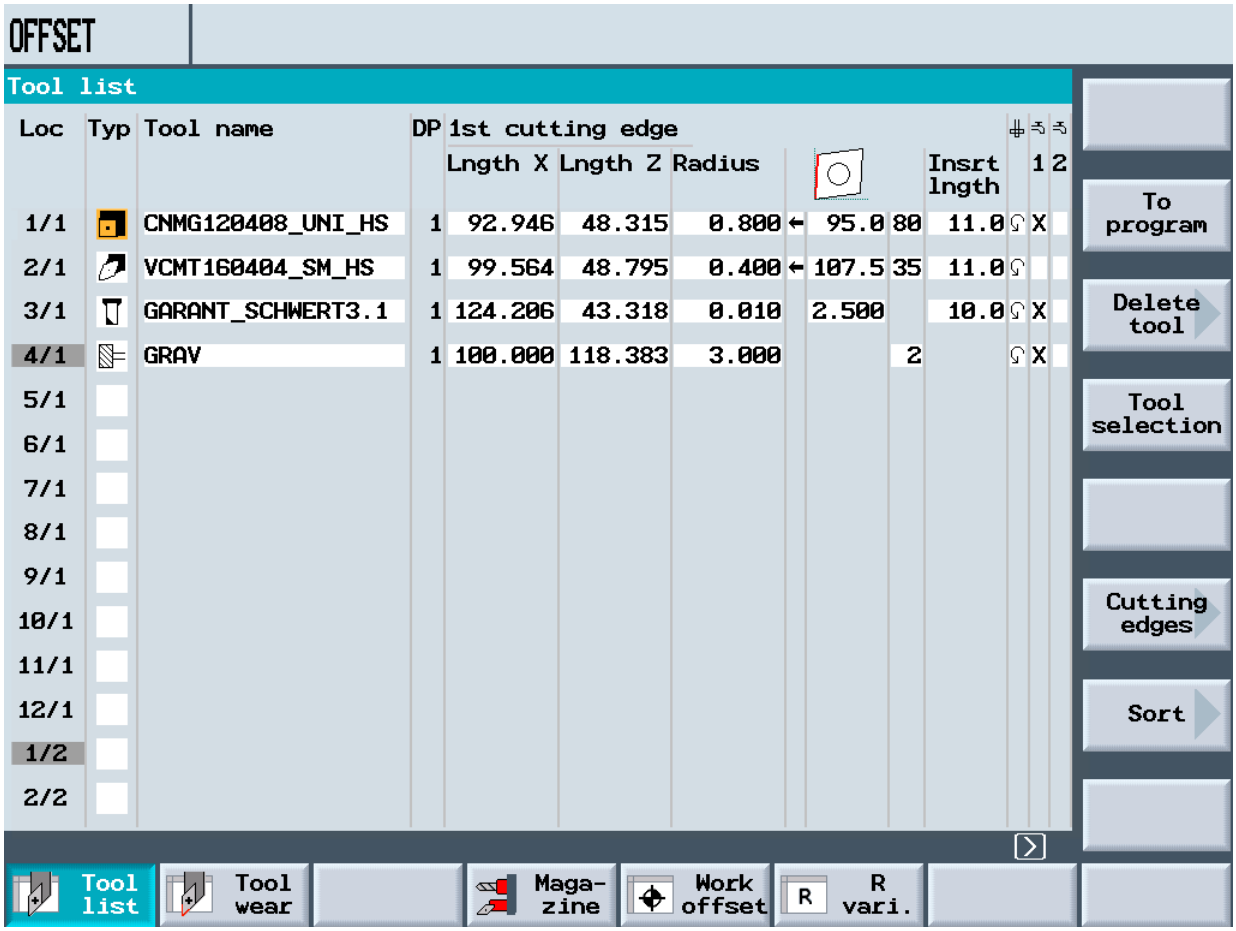
3-windows view simulation lower side



3-windows view simulation upper side



Tool list


OFFSET
Tool list
Loc
Typ
Tool name
DP
1st cutting edge
Lngth X
Lngth Z
Radius
Insrt lngth
1
2
1/1 CNMG120408_UNI_HS 1 92.946 48.315 0.800 95.0 80 11.0 X
2/1 VCMT160404_SM_HS 1 99.564 48.795 0.400 107.5 35 11.0
3/1 GARANT_SCHWERT3.1 1 124.206 43.318 0.010 2.500 10.0 X
4/1 GRAV 1 100.000 118.383 3.000 2 X
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
1/2
2/2
To program
Delete tool
Tool selection
Cutting edges
Sort
Tool list
Tool wear
Maga-zine
Work offset
R vari.