

# Production of a Bottle Opener



*Bottle opener and stopper*

The ideal companion when visiting a beer garden or also for the balcony, the bottle opener and stopper, which can be used to open standard bottles with crown caps and then close them again.

The contour is created in the contour editor of ShopTurn and machined with the stock removal cycle. A tailstock has been used because of the unclamped length.

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

[www.siemens.com/cnc4you](http://www.siemens.com/cnc4you)

## Table of contents

<b>1. Safety note</b>	<b>2</b>
<b>2. Preliminary remark</b>	<b>2</b>
<b>3. Workpiece blank</b>	<b>3</b>
<b>4. Lathe and machining plans</b>	<b>3</b>
<b>5. Tools used to turn the bottle opener</b>	<b>3</b>
<b>6. Turning of the bottle opener</b>	<b>4</b>
<b>7. Information on the Internet</b>	<b>5</b>
<b>8. Figures</b>	<b>7</b>

### 1. Safety note

Working with machines is always associated with numerous hazards. It is therefore imperative that the legal and company safety regulations are also observed during the production of the bottle opener.

### 2. Preliminary remark

The following description is intended for persons acquainted with CNC lathes and who have experience with or knowledge of SINUMERIK CNCs with ShopTurn. All the technical data listed here corresponds to the machines, tools, materials, machining plans and drawings used to produce the prototype. Because of the very varying conditions in other workshops, this data is only of exemplary character for a reproduction. Nevertheless, a problem-free reproduction should be possible in most cases.

ShopTurn enables the bottle opener to be turned in two clamping operations. The ball on the front part of the bottle opener is machined in the first clamping. The shorter unclamped length must be taken into account. The workpiece is unclamped over a longer length to turn the rear part and held with a tailstock.

The contour is turned in the second clamping. This also includes relief cuts and grooves. The bottle opener is cut off in the last machining step. This by no means exhausts the numerous options of the turning program. For example, it would be possible to use the program's engraving function to engrave an arbitrary text on the peripheral surface, without an additional clamping operation.

Round material with a diameter of approximately 30 mm sawn to a length of approximately 150 mm is used for the blank.

For greater safety, we recommend that the machining plans be simulated before starting the actual machining. In this way, any program errors can be detect and avoided. The "Perform simulation" machining step is not mandatory before starting the production.

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You can download all the CAD drawings and machining descriptions for the workpieces free of charge in the registered Internet area "My SINUMERIK" at [www.siemens.com/cnc4you](http://www.siemens.com/cnc4you). The following files and formats are available there:

**DXF file / Jobshop file / Drawing as PDF**

### 3. Workpiece blank

- 1 piece of V2A round material, material no.: 1.4301; diameter 30 mm, length approx. 150 mm
- O-ring; RG-O-DIN3771-PERBUNAN70-12.37x2.62

### 4. Lathe and machining plans

- SPINNER TC-600 lathe equipped with SINUMERIK 840D sl and ShopTurn
- ShopTurn Version 6.4 turning program (minimum requirement)
- VERSCHLUSS.MPF machining plan to turn the bottle opener

### 5. Tools used to turn the bottle opener

Designation	Tool name in the machining plan	Order number for SECO
Tool tip holder with turnplate	SCHRUPPER_SECO	DCLNR2020K12 CNMG120408-MF4, TM400
Tool tip holder with turnplate	SCHLICHTER_SECO	PDHNR2020K11 DNMG110408-MF1, TM2000
DIN center drill	ZENTRUM	
Parting tool with tool tip	STECHEER_3_SECO_SR	CFIR2020K03 LCMF160302-0300-MC, CP600
Parting tool with tool tip	STECHEER_3_SECO_SL	CFIR2020K03 LCMF160302-0300-MC, CP600
Holder and turnplate for grooving	BS_SPEZIAL_SECO	A12G-SGXN08-20 LCEX080402-0250R-R30, CP500
Engraving cutter	GRAVUR_SECO	29060

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## 6. Turning of the bottle opener

The sawn blank or the bar material is securely clamped.

### Machining steps on the lathe

1. Home the machine
2. Load the VERSCHLUSS.MPF machining plan
3. Enter the measured tools in the tool list
4. Insert the tools in the magazine
5. Set tool zero by scratching
6. Perform simulation
7. Start production, execute machining plan up to first tailstock command
8. Unclamp workpiece further and counter with the tailstock. This operation can be programmed with a counterspindle or bar loader. If unclamped manually, the tools must be measured again.
9. Continue with the machining plan

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## 7. Information on the Internet

### **Construction of the parts, creation of the drawings, development of the plans for the machining**

Siemens AG, SINUMERIK TAC  
Frauenauracher Strasse 80  
D-91056 Erlangen, Germany  
On the Internet: <http://www.siemens.com/cnc4you>

### **Dimensions and performance data of the tools used**

Seco Tools GmbH,  
Freiheitstrasse 7  
D-40699 Erkrath, Germany  
On the Internet: <http://www.secotools.com>

### **Specifications of the machine tool used**

SPINNER Werkzeugmaschinenfabrik  
Rudolf-Diesel-Ring 24  
D-82054 Sauerlach, Germany  
On the Internet: <http://www.spinner-wzm.de>

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## Manuals and information from the Siemens AG

Manuals and detailed information about our products can be found at [www.siemens.de/sinumerik](http://www.siemens.de/sinumerik) -> Index or search: DOConWEB -> SINUMERIK

- "Simple Turning with ShopTurn" Training Documents  
-> Info/Training -> "Simple Turning with ShopTurn" Training Documents
- ShopTurn Product Brief  
-> 840D/840Di/810D Users -> ShopTurn Product Brief 840D/810D
- ShopTurn Operation/Programming  
840D/840Di/810D Users -> ShopTurn Operation and Programming

## Tips when searching in DOConWEB

DOConWEB enables individual pages to be called up quickly from documents without having to load the entire file.

- You can restrict the search by clicking "A-Z"  
(-> a search is now only performed below this point in the index)
- Or click the zoom  
(-> a full text search is now performed below this point)

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## 8. Figures

### Bottle opener/stopper



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## Bottle opener in use



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## 2D simulation

**PROGRAM**

Side view

-100 -100 0 0

X 282.332 Z 333.814 Rapid traverse 0:06:51  
N5 VERSCHLUSS Work offs 1 T=STECHER\_3\_SECO\_SL D1

Simulation ready to run

Strght Circle Drilling Turning Cont. turn. Mill-ing Vari-ous Simu-lation Ex-ecute

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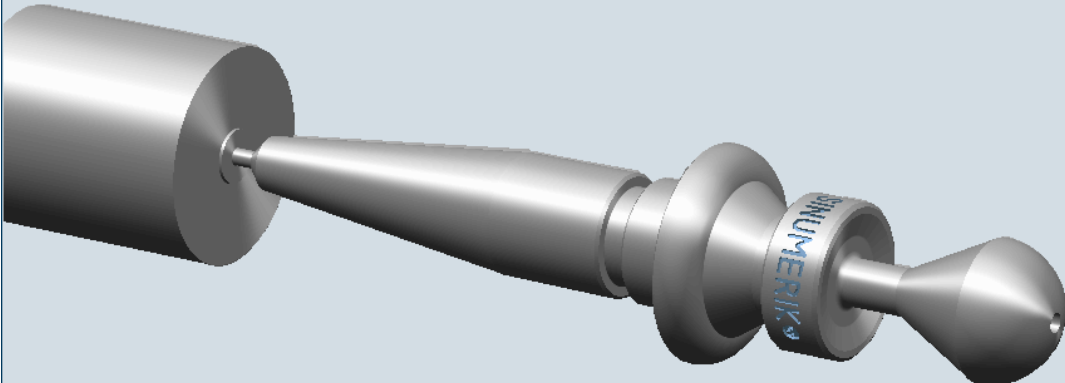
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## 3D simulation

PROGRAM

Volume model



To origin

Zoom +

Zoom -

View →

View ←

View ↻

Cut

⏪ Back

X	282.332	Z	333.814	Rapid traverse	0:06:51
N5	VERSCHLUSS	Work offs	1	T=STECHER_3_SECO_SL	D1

Calculation finished

Strght Circle
Drill- ing
Turn- ing
Cont. turn.
Mill- ing
Vari- ous
Simu- lation
NC Ex- ecute

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## 3-windows view of simulation

The screenshot displays the Siemens SINUMERIK 3-windows simulation interface. The main window is divided into three panes: a top-left 2D cross-section view of the workpiece and tool, a top-right 2D top view, and a bottom-right 3D perspective view of the workpiece. The status bar at the bottom shows the current program line (N5 VERSCHLUSS), coordinates (X 282.332 Z 333.814), and operation details (Rapid traverse, T=STECHER\_3\_SECO\_SL, D1). A toolbar on the right contains various simulation controls, and a bottom toolbar offers different simulation modes like Straight Circle, Drilling, Turning, Cont. turn., Milling, and Various.

**PROGRAM**

**3-windows view**

X 282.332 Z 333.814 Rapid traverse 0:06:51  
N5 VERSCHLUSS Work offs 1 T=STECHER\_3\_SECO\_SL D1

Simulation ready to run

Strght Circle Drilling Turning Cont. turn. Milling Various Simulation Execute

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## Tool list

OFFSET

Tool list

Loc	Typ	Tool name	DP	1st cutting edge			Insrt Lngh	1 2
				Lngh X	Lngh Z	Radius		
1		SCHRUPPER_SECO	1	110.947	48.103	0.800 ←	95.0 80	11.0 2 X
2		SCHLICHTER_SECO	1	106.997	48.069	0.800 ←	107.5 55	11.0 2 X
3		ZENTRUM	1	100.000	117.078	2.500	118.0	2 X
4		STECHER_3_SECO_SR	1	109.388	44.176	0.100	3.000	10.0 2 X
5		STECHER_3_SECO_SL	1	108.634	41.958	0.100	3.000	10.0 2 X
6		BS_SPEZIAL_SECO	1	95.249	4.225	0.100 ↑	93.0 55	2.0 2 X
7		GRAVUR_SECO	1	114.520	0.000	0.500	1	2 X
8								
9								
10								
11								
12								

Buttons: To program, Delete tool, Tool selection, Cutting edges, Sort

Bottom bar: Tool list, Tool wear, Magazine, Work offset, R vari.

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