

Corkscrew/Bottle Stopper



Corkscrew

Opening and closing bottles – these functions are united in one compact tool with the elegant, modular corkscrew. The corkscrew consists of two elements – the head and the sleeve – which are produced on a CNC turning machine. Together with the corkscrew spiral, it can be used as both a bottle opener and a stopper for open bottles.

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

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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 corkscrew.

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 and machining plans used to produce the corkscrew. 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 programs were created and tested using a CNC turning machine (with counter spindle) equipped with SINUMERIK Operate V4.7 SP1 HF2. It should be possible to easily adapt the program to other SINUMERIK versions (e.g. different SINUMERIK Operate SW versions). A simulation and necessary changes (e.g. zero points) should always be carried out.

You can download all the CAD drawings, programs and machining descriptions for the workpieces free of charge at www.siemens.com/cnc4you.

The following files and formats are available there:
NC programs ShopTurn, drawings PDF, 3d data



3. Workpiece blanks/parts list

- Brass CuZn3Pb3, round stock Ø 30 mm, length approximately. 250 mm
- O-Ring

Corkscrew spiral (www.korkenzieherspirale.de, article no. S0150)

Corkscrew round thread

Material: stainless steel

Length: ca. 70 mm

Shaft diameter: 6 mm with 7 mm M6

Pitch thread: 10 mm 45 mm long Ø approx. 9.7 mm

Surface: high gloss

Note

You can, for example, buy the corkscrew spiral on Ebay, or obtain it directly from manufacturers, for example www.korkenzieherspirale.de, article no. S0150.

4. Turning machine and machining plans

- CNC turning machine DOOSAN PUMA 2600SY
SINUMERIK 828D with SINUMERIK Operate V4.7 SP1
- ShopTurn machining plan: CORKSCREW_KORKENZIEHER.MPF

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5. Tools used

Turning, drilling and milling tools for machining both sides of the parts.

Tools for turning machine

Tool name in the machining plan	Designation
SCHRUPP	Turning chisel for outside with one roughing disk, Roughing 80° SCLCL, CCGT120404
SCHL35	Turning chisel for outside with one finishing disk, Finishing 35° SVJCR, VBGT160404
ABSTECHE-3	Cutoff tool HM, plate width 3 mm, 273697-3
GRAVUR	Engraving tool without drive ø3 mm WriteStar Radial
GEW_P1	Thread turning tool pitch 1 Thread P1, 16ER1.0
NC-ANBOHRER-10	NC drills D10 Radial
BOHRER-16	Twist Drill D16 Radial
BOHRER-5	Twist Drill D5 Axial
BOHRER-6.1	Twist Drill D6,1 Axial
GEWINDE-M6	Tap M6 Axial
BOHRER-11	Twist Drill D11 Axial
GEWINDE-M12X1	Tap M12x1 Axial

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6. Turning the parts

The corkscrew consists of two turned parts, the sleeve and the head. Programming is done in ShopTurn.

The work plan consists of four work sections. After each section is a programmed stop (M0). The work plan is processed again by NC-START. For the sections, the new zero point must be observed.



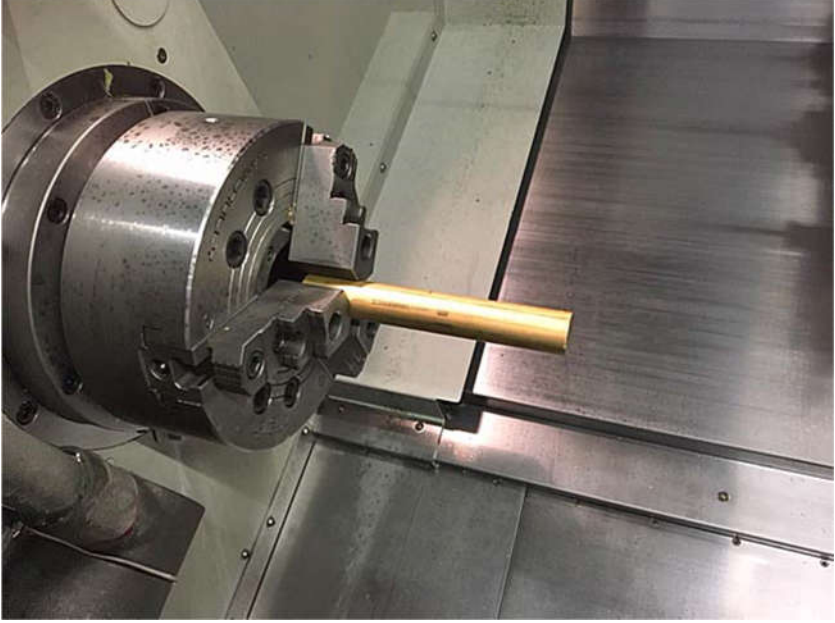

Work steps at the turning machine

1. Approach the reference point of the machine.
2. Read-in the workplan: CORKSCREW_KORKENZIEHER.MPF.
3. Read-in the tool list or zero offsets CORKSCREW_TMZ.INI.
4. Measure tools and enter them in the tool list.
5. Insert tools in magazine.
6. Clamp the workpiece (clamping length 160 mm).
7. Set tool zero point, by scraping.
8. Program zero offsets.
9. Start production, process workplan.
10. Turning first side of the head. Programmed stop (Wait M0). Note new zero point and clamping length and continue with NC START.
11. Turning fist side sleeve. After the stop, screw the head into the sleeve. Note new zero point and clamping length and continue with NC START.
12. Second side of the head is turned and workpiece will be cut off. After holding, clamp the sleeve with a clamping sleeve in the jaw chuck. Note new zero point and clamping length and continue with NC START.
13. Second side of the sleeve is turned and workpiece will be cut off.



Sections work plan

The ShopTurn work plan consists of several sections.

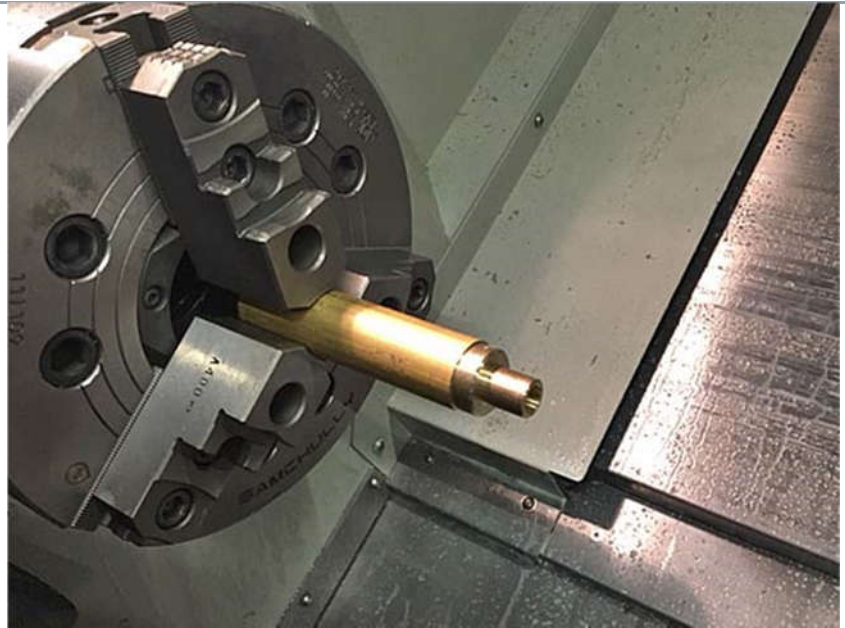
Work plan	Picture
<p>Clamp the blank, clamping length approx. 160 mm.</p>	
<p>Turning first side corkscrew head and cut off.</p>	

Corkscrew

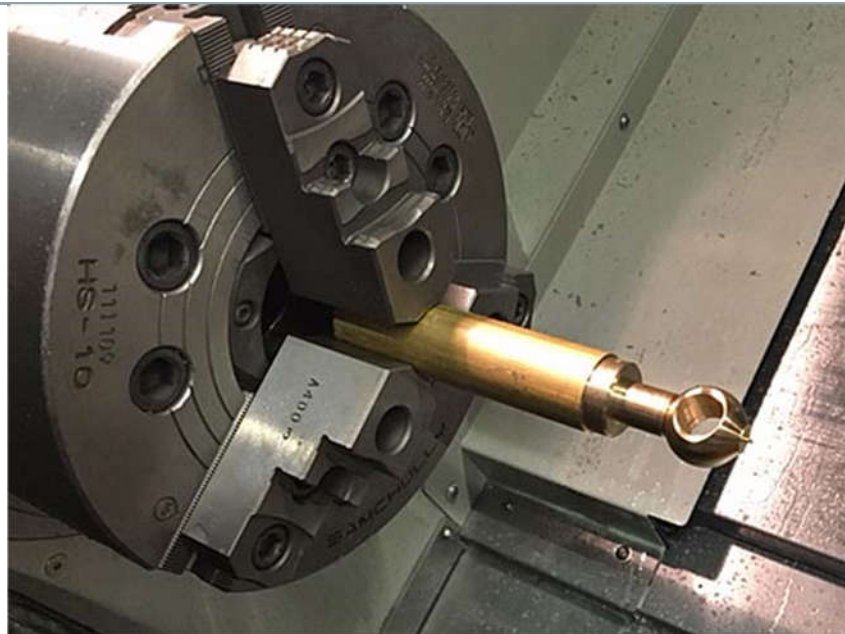
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Turning first side of the sleeve.



Screw corkscrew head into the machined side of the corkscrew sleeve.



Corkscrew

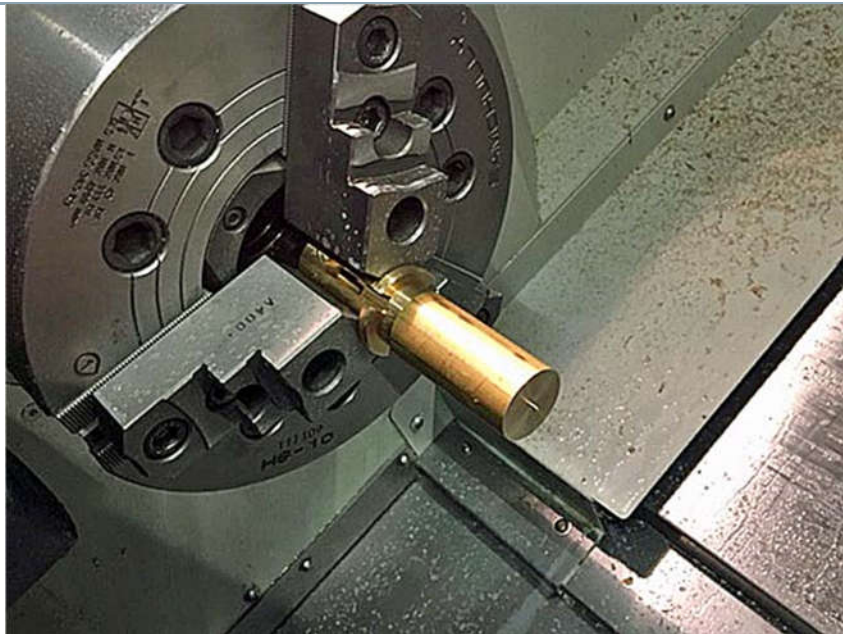
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Finish the second side of the corkscrew head and then cut it off.



Unscrew the corkscrew sleeve and head and clamp the corkscrew sleeve using a chuck or clamping sleeve.



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Turning the second side of the corkscrew sleeve.



Assembly

The corkscrew spiral need only be screwed into the head and the O-ring placed over the sleeve into the cut-in. To open bottles, the sleeve is inserted into the radial bore hole of the head with the conical part first.



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Storing the corkscrew is easy – the head and the spiral are simply screwed into the sleeve.



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7. Information on the Internet

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

TAC Technology and Application Center
Frauenauracher Str. 80
91056 Erlangen

Details of the tool machine and tools to be used

DOOSAN turing center
Internet: <http://www.doosan.com/>

Manuals and information from the Siemens AG

Manuals and detailed information about our products, please visit the following websites:

- Documentation (<https://support.industry.siemens.com/cs/ww/en/view/109476679>)
- Service&Support Portal (www.support.industry.siemens.com)
- SINUMERIK Website (www.siemens.com/sinumerik)



8. Pictures

Simulation first section of the work plan, corkscrew head

SIEMENS SINUMERIK OPERATE 11/19/17 3:58 PM

NC/LKS/KORKENZIEHER/CORKSCREW_KORKENZIEHER

Xø 169.552 Z 143.709 Y S1 T ABSTECHEN-3 D1

G M0 Rapid trav 80% 00:03:39

Edit Drilling Turning Cont. turn. Milling Various Simulation Execute

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Simulation second section, turning the sleeve

X \emptyset	250.022 Z	57.629 Y	S1	<input checked="" type="checkbox"/>	T GEWINDE-M12X1	D1
G	M0				Rapid trav	80% 00:05:41

Edit Drilling Turning Cont. turn. Milling NC Various Simulation NC Execute

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Simulation third section, ball turning

Xø	169.552 Z	132.009 Y	S1	T ABSTECHEN-3	D1
G	M0			Rapid trav	80% 00:06:32

[Edit](#)
[Drilling](#)
[Turn- ing](#)
[Cont. turn.](#)
[Milling](#)
[NC Vari- ous](#)
[Simu- lation](#)
[Ex- ecute](#)

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Simulation fourth section, finishing the sleeve

Xø	185.570	Z	173.085	Y		S1	<input checked="" type="checkbox"/>	T SCHL35	D1
END	End of program							Rapid trav	80% 00:08:32

Edit Drilling Turning Cont. turn. Milling NC Vari-ous Simulation NC Ex-ecute

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