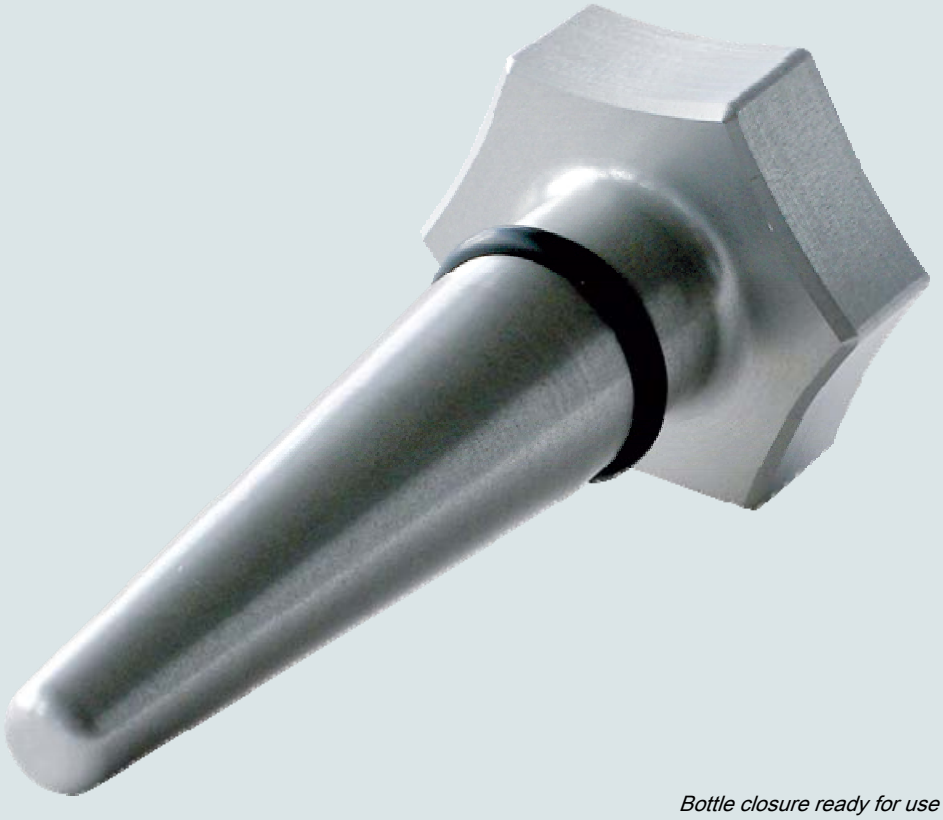
Manufacturing of a bottle closure



Bottle closure ready for use

The bottle closure finds plenty of everyday uses in the workshop. It is turned in two operations using ShopTurn.

All the necessary post-manufacturing information, drawings, tool data and ShopTurn work plans are summarized below.

Contents

1. Safety Instructions

Use of machines can be dangerous. Mandatory and general company safety regulations must be adhered to when manufacturing the bottle closure.

2. Preliminary Note

The following description is intended for CNC lathe professionals who have experience with and understand how to use the SINUMERIK CNC control with ShopTurn. All the technical data listed below relates to the machines, tool, materials, work plans and drawings used by the company W. Andreas Pfeiffer of Zirndorf in manufacturing the prototype. For post-manufacturing applications, the diverse range of circumstances in other workshops means that these data should only be used as a guide. However, troublefree post-manufacturing should be possible in most cases.

ShopTurn enables bottle closures to be turned in just two operations. The first operation involves producing the contour of the closure from the tip to the handle. In the second operation, the handle is face turned and then milled to its final shape using the ShopTurn path milling function. This process barely scratches the surface of the many possibilities available with the turning program. For example, the owner's name could be engraved onto the bottle closure without any additional clamping using the program's engraving function.

To ensure the bottle closure also creates a seal, a standard O-ring is fitted after turning and milling.

To be on the safe side, we recommend simulating the work plans before starting. This will allow any possible program errors to be recognized and avoided.

All CAD drawings and manufacturing descriptions of the workpieces can be downloaded free of charge from the "My SINUMERIK" registered internet zone at **www.siemens.de/cnc4you**. This zone contains the following files and formats:
PDF file of the model with dimensions / IGS file / ISO file / Jobshop file

3. List of Drawings

- Drawing of turned part **Bottle top, List of drawings, Sheet 1**


4. Workpiece Blank

- Bar material, diameter 40mm, length approx. 300mm, material ALcuMg1, material no.: 3.1325
- 1 O-ring NBR70 12.1x2.7

5. Lathe and Turning Program

- Gildemeister CTX 410 lathe with Sinumerik 840D
- Milling program ShopTurn V6.4 (minimum requirement)
- Work plan SIE_BOTTLE_001.MPF for turning the outer contour
- Work plan SIE_BOTTLE_002.MPF for face turning the handle and milling its contour

6. Tools Used

A Tools for turning the outside contour

Name	Tool name in work plan
NC spot drill	CENTER_R
Turning tool	ROUGHING_EX-CC
Turning tool	FINISHING_EX-VC
Parting tool	PLUNGE_PART 3.0
Cutoff tool	PLUNGE_CUT 3

B Tools for face turning and milling of the handle

Name	Tool name in work plan
NC spot drill	CENTER_R R
Turning tool	ROUGHING_EX-CC
Turning tool	FINISHING_EX-VC
Milling tool 10	MILLING_10
Chamfering bit	MILL_CH_10x90

7. Manufacturing Operations

A Turning the outside contour

Lathe operations:

- A.1 Move to the machine's reference position
- A.2 Read in the SIE_BOTTLE_001.MPF work plan
- A.3 Enter gaged tools into tool list
- A.4 Put tools into tool magazine
- A.5 Clamp round stock, unclamped length 105 mm
- A.6 Scratch on workpiece zero point
- A.7 Carry out simulation run
- A.8 Start manufacturing, work through work plan

B Face turning and milling of the handle

The outside contour of the closure has been finished and the workpiece cut off.

Lathe operations:

- B.1 Move to the machine's reference position
- B.2 Read in the SIE_BOTTLE_002.MPF work plan
- B.3 Enter gaged tools into tool list
- B.4 Put tools into tool magazine
- B.5 Clamp workpiece at tip, unclamped length 19.3 mm
- B.6 Scratch on workpiece zero point
- B.7 Carry out simulation run
- B.8 Start manufacturing, work through work plan


8. Online Information

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

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Measurements and performance data for tools used

Hoffmann – Gruppe,
Werkzeughersteller Hoffmann GmbH Qualitätswerkzeuge,
Haberlandstraße 55, D-81241 Munich,
Internet: www.hoffmann-group.com

Details of the machine tools used

Gildemeister Aktiengesellschaft,
Gildemeisterstraße 60,
D-33689 Bielefeld,
Internet: www.gildemeister.com

Handbooks and information from Siemens AG

Handbooks and detailed information about our products can be found by visiting www.siemens.de/sinumerik > Index or search for DOConWEB > SINUMERIK

- Training document "Easy turning with ShopTurn"
  -> Info/Training -> Training document "Easy milling with ShopTurn"
- ShopTurn Quick Reference
  -> 840D/840Di/810D Users -> ShopTurn Quick Reference 840D/810D
- Operating and programming ShopTurn
  840D/840Di/810D Users -> Operating and programming ShopTurn

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- You can restrict your search by clicking on "A-Z"
  (-> only index items starting with the relevant letter will be returned),
- or by clicking on the magnifier
  (-> a full text search is then performed).


9. Illustrations