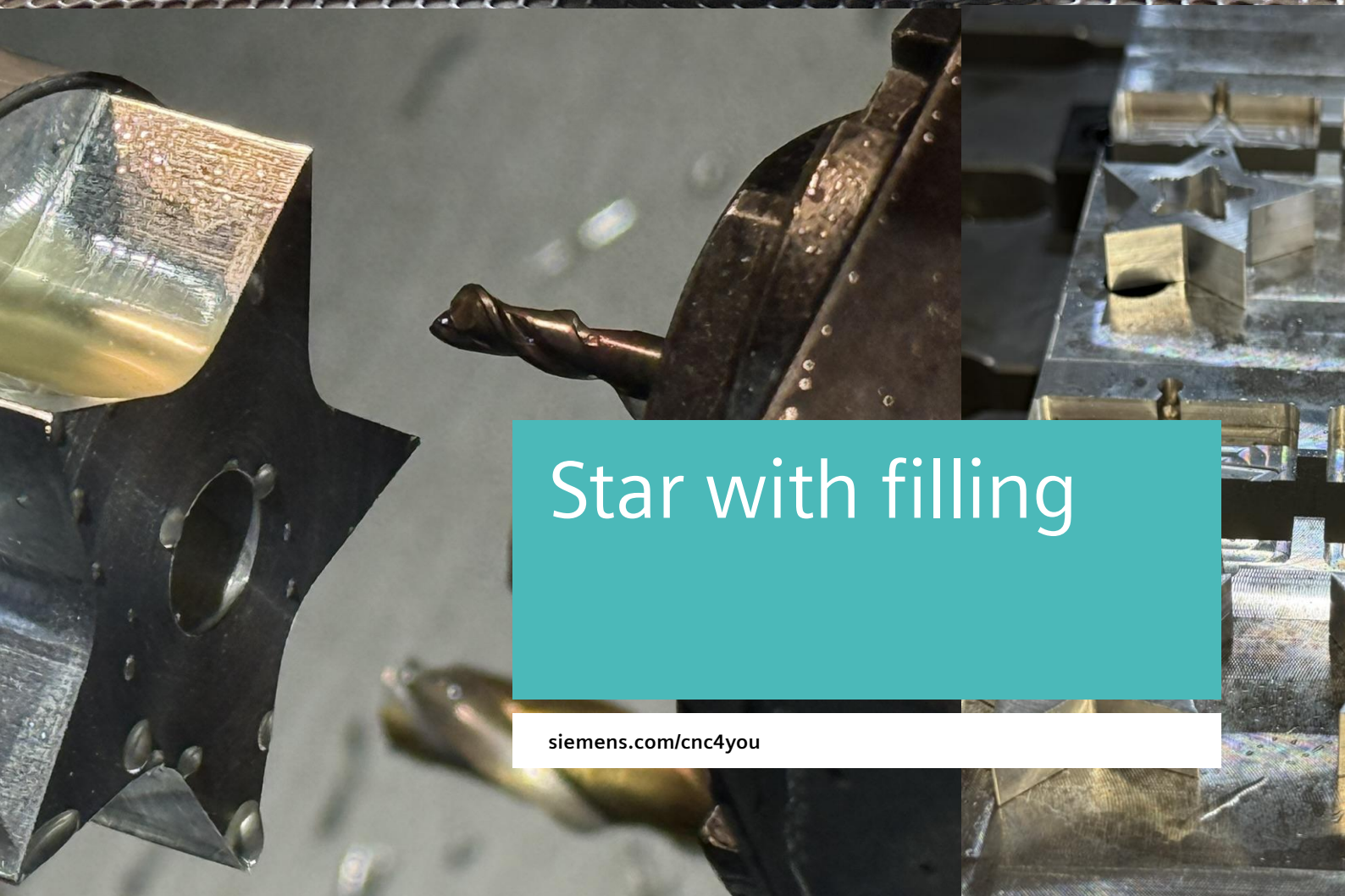
SIEMENS



Star with filling

siemens.com/cnc4you

Workpiece „Star with filling“ (CNC4you Christmas workpiece 2025)

The CNC4you workpiece "Star with filling" is a turned 5-pointed star. It forms a solid outer contour into which inserts can be wedged, and a stop edge in the inner contour helps with this.

The inserts can be 3D printed, but they can also be natural materials (e.g. a matching small nut). The design and production of the "inner life" of the star is up to your creativity, so they are not the subject of this manufacturing description. Nevertheless, you can find the CAD data for a 3D print of our design variant in the download data for the workpiece.

Turning and milling machine required (?)

The contour edges on the back of the star are reworked (chamfered) on a milling machine. If no milling machine is available, chamfering can also be done on a lathe with a counter-spindle with suitable soft clamping jaws. To do this, the parts programs must then be changed if necessary. be adapted on their own responsibility.

License-free simulation on the PC

With the license-free demo machines of Run MyVirtual Machine, the processing of the NC programs for the workpiece can be simulated on the PC.

All the information required for production, such as tool data, work plans and NC programs, is compiled below.

www.siemens.com/cnc4you

Table of Contents

1	Safety Notice	3
2	Preliminary remark	4
3	Workpiece blanks/parts list	**Fehler! Textmarke nicht definiert.**
4	Machines and NC programs	5
5	Tools used	6
6	Manufacturing of the workpiece "Star with filling"	7
6.1	Contour and front	7
6.2	Back side processing (chamfering the contour)	9
6.3	Milling the clamping aid	10
6.4	Decoration of the star with 3D printing	11
7	Information on the Internet	**Fehler! Textmarke nicht definiert.**

1 Safety Notice

Handling machines involves dealing with a wide range of risks – making it crucial that the legal and usual operational safety regulations are carefully complied with when fabricating CNC4you workpieces like this.

2 Preliminary comment

The following description addresses technicians that are familiar with CNC machines, and who have experience or know-how about SINUMERIK CNC controls. All the technology data listed here correspond to the machines, tools, materials, machining plans and drawings used to craft this workpiece. When it comes to replicating the workpiece however, this only serves as an example because of the wide diversity of resources available in other workshops. Having said that, in most cases it should be possible to simply replicate this CNC4you workpiece.

The programs for the workpiece were created and tested on CNC turning and milling machines. The machines were equipped with SINUMERIK 828D controllers, on which the ShopTurn or ShopMill user interface was also installed as standard. The system software for the machines was SINUMERIK Operate version V4.95.

The workpiece is manufactured in two clamping operations: one on the turning machine for contour and front side machining, one clamping on the milling machine for reverse side machining (chamfering of the contour edges).

Generally, the program can be simply adapted to other SINUMERIK versions, for example, to other SINUMERIK Operate software releases. A simulation run and any modifications required, for example adjusting the zero offsets, should always be carried out.

All CAD drawings, programs and machining descriptions for the workpieces can be downloaded at no charge from **www.siemens.com/cnc4you**. You can find the following files and formats for this tree here:

- NC programs for the workpiece and the clamping aid
- This manufacturing description in German and English
- Model data for 3D printers on the filling of the star

3 Workpiece, blanks/bill of materials

- For the workpiece you will need:

  Aluminium rod with a diameter of 50 mm and a length of at least 145 mm, of which approx. 125 mm clamping length. Approx. 20 mm raw material required for the workpiece itself.

- For clamping on the milling machine:

  2 pieces of aluminium or hard plastic cuboids measuring 24 mm x 48 mm x 13 mm

4 Maschinen und Arbeitspläne

CNC turning maschine:

- Type: Doosan
- CNC: SINUMERIK 828D with ShopTurn V 4.95

CNC milling maschine:

- Type: Mazak (3 axis)
- CNC: SINUMERIK 828D with ShopMill V 4.95

ShopTurn work plans:

- 2025_CHRISTM_PART_NO_CS.MPF

ShopMill work plans:

- 2025_CHRISTMAS_PART_MILL.MPF (Backside machining of the star)
- 2025_CHRISTMP_CHICK_CLAM.MPF (Clamping aid)

For CNC training on the PC, you can download the **Run MyVirtual Machine software** from the CNC4you online portal, which also includes a license-free demo turning machine with the option of processing residual material.

5 Tools used

Turning machine:

INI file: 2025_CHRISTM_PART_TMZ.INI

Werkzeuge/Kurzname	Beschreibung
ROUGHING_TOOL	Roughing Chisel
ENDMILL_D12_MS	Endmill, Ø 12 mm
ENDMILL_D3_L8_MS	Endmill, Ø 3 mm
ENDMILL_D3_L14_MS	Endmill, Ø 3 mm, länger
ENDMILL_D4_ MS	Endmill, Ø 4 mm
CHAMPHER_D6_90GR	Chamfer, Ø 6 mm, 90 Degree
PLUNGE_3MM_MS	Plunge, 3 mm
DRILL_D4_MS	Drill, Ø 4 mm
DRILL_D10_MS	Drill, Ø 10 mm
CENTERDRILL_D12_MS	Drill, Ø 12 mm

Millig machine:

INI file: 2025_CHRISTM_MILL_TMZ.INI

Werkzeuge/Kurzname	Beschreibung
SCHAFT_ALU_D6	Endmill, Ø 6 mm
ALU_D16	Facemill, Ø 16 mm
STICHEL_D4	Drill, Ø 4 mm
NC_AMB_D16_HSS	Drill, Ø 16 mm

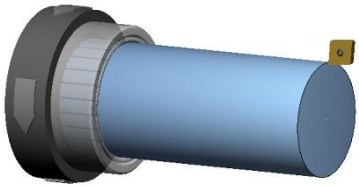
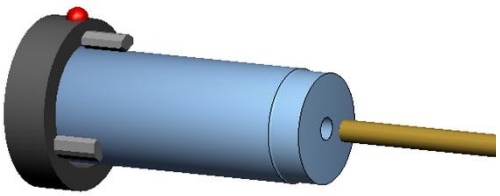
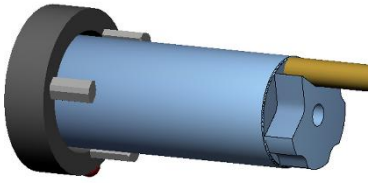
6 Manufacturing of the workpiece "star with filling"

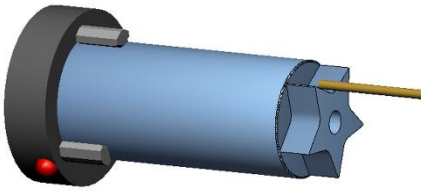
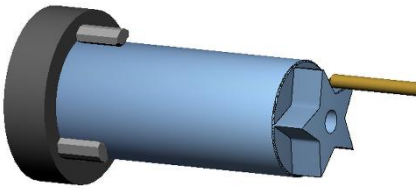
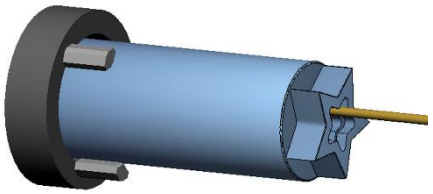
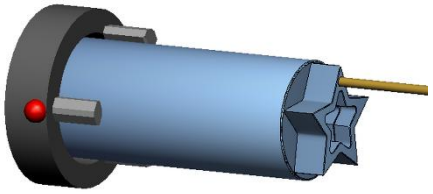
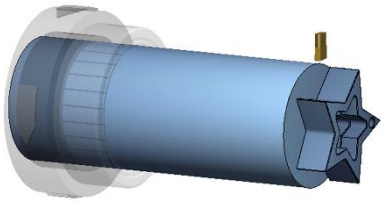
6.1 Contour and front

6.1.1 Work steps on the turning machine

1. Approach the machine reference point.
2. Read-in the machining plan: 2025_CHRISTM_PART_NO_CS.MPF
3. Read-in the tool list: 2025_CHRISTM_PART_TMZ.INI
4. Measure the tools, enter in the tool list.
5. Insert the tools in the magazine.
6. Clamp the workpiece (unclamped length, 120 mm)
7. Set the workpiece zero using a measuring probe or by probing using an appropriate device
8. Check the work offsets programmed in the part program and if required, the specific machine configuration.
9. Perform the simulation run: Check whether there is a risk of collision!
10. Start machining, execute the machining plan.
11. Remove the workpiece.

6.1.2 Executing the ShopTurn machining plan 2025_CHRISTM_PART_NO_CS.MPF

Arbeitsschritt	Bild
Face Turning of the End Face	
Central hole for later milling	
Milling the outer contour, coarse	

Milling outer contours, smaller radii	
Chamfering of the outer contour	
Inner contour milling and chamfering in 3 steps: A) Coarse milling B) Milling small radii/stop edge C) Chamfering of the inner contour	
Drilling and chamfering the hanger hole	
Parting off	

6.2 Backside processing (contour chamfers)

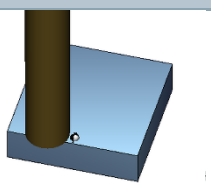
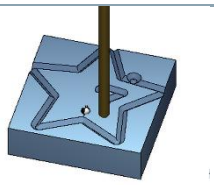
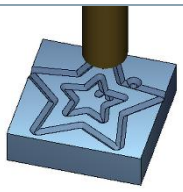
6.2.1 Work steps on the milling machine

1. Approach the reference point of the machine.
2. Read-in the machining plan: 2025_CHRISTMAS_PART_MILL.MPF

If you haven't already done so:

3. Reading the tool list: 2025_CHRISTM_MILL_TMZ.INI
4. Measure tools, enter in the tool list.
5. Insert the tools into the magazine.
6. Insert previously milled contour-supporting clamping jaws into the clamping device, clamp the workpiece
7. Set the workpiece zero using a measuring probe or by probing using an appropriate device
8. Check the zero offsets programmed in the parts program. If necessary adapt to the specific machine situation.
9. Perform the simulation run: Check whether there is a risk of collision!
10. Start machining, execute the machining plan.
11. Remove workpiece.

6.2.2 Executing the ShopMill machining plan 2025_CHRISTMAS_PART_MILL.MPF

Arbeitsschritt	Bild
Face milling / finishing the back of the star Note: In the simulation, a cuboid of the corresponding size is shown instead of the star.	
Chamfering of the outer and inner contours of the star	
Chamfering of the hanger hole	

6.3 Milling the clamping aid

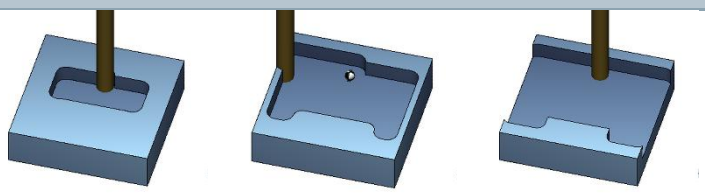
6.3.1 Work steps on the milling machine

1. Approach the reference point of the machine.
2. Read-in the machining plan: 2025_CHRISTMP_CHICK_CLAM.MPF

If you haven't already done so:

3. Reading the tool list: 2025_CHRISTM_MILL_TMZ.INI
4. Measure tools, enter in the tool list.
5. Insert the tools into the magazine.
6. Clamp the blanks for the two halves of the clamping aid together in the clamping device so that a square cuboid measuring 48 x 48 x 13 mm is formed.
7. Set the workpiece zero using a measuring probe or by probing using an appropriate device
8. Check the zero offsets programmed in the parts program. If necessary adapt to the specific machine situation.
9. Perform the simulation run: Check whether there is a risk of collision!
10. Start machining, execute the machining plan.
11. Remove workpiece.

6.3.2 Executing the ShopMill machining plan 2025_CHRISTMP_CHICK_CLAM.MPF

Arbeitsschritt	Bild
The pocket for the contour-correct clamping of the star is milled into the clamping aid.	

6.4 Decoration of the star with 3D printing

The star has a stop edge on the inner contour that can be used to position a decorative element. A set of CAD files for 3D printing is included in the downloads for this workpiece.

Alternatively, the star can also be used to place a rolled voucher, a small handicraft, a nut or candy of the right size - or even without any "filling".

7 Information in the Internet

Published by

The Impact, Experience Center for Digital Transformation
Frauenauracher Str. 80
91056 Erlangen

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

The Impact, Experience Center for Digital Transformation
Frauenauracher Str. 80
91056 Erlangen

Manuals and information of Siemens AG

Manuals and detailed information about our products are provided at the following websites:

- Siemens Industry Online Support: (https://support.industry.siemens.com/cs/document/108464614)
- Service & Support Portal (https://support.industry.siemens.com)
- SINUMERIK website (www.siemens.com/sinumerik)