Manufacturing of the "Big Boss" clasp

Big Boss clasp with clamping jaws

Big Boss is an original decorative plate for belts. This attractive "eyecatcher" is manufactured in a single operation from a preformed blank using ShopMill. Specially manufactured clamping jaws hold the workpiece in place while it is being milled. Two holes are provided for attaching the buckle to the belt.

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

Contents

Safety Instructions

Use of machines can be dangerous. Mandatory and general company safety regulations must be adhered to when manufacturing the Big Boss clasp.

1. Preliminary Note

The following description is intended for CNC milling professionals who have experience with or understand how to use the SINUMERIK CNC control with ShopMill/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, 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.

ShopMill enables the complete clasp to be milled in a single clamping and machining operation. Despite this, the flexibility in terms of design and shape is impressive. The detail drawings illustrate which elements are used in the manufacture of the clasp. This process barely scratches the surface of the many possibilities available with the milling program. For example, the engraving cycle included in the program is not used. This feature would enable a name to be etched into the edge of the plate in the same operation.

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


2. List of Drawings

- Clamping jaws raw part drawing CLAMPING JAWS RAW PART, Sheet 1
- Clamoing jaws finished part drawing CLAMPING JAWS FOR DASP, Sheet 1
- Clasp raw part drawing CLASP RAW PART, Sheet 1
- Clasp finished part drawing CLASP FINISHED PART, Sheet 1
- Clasp detail drawings CLASP DETAIL, Sheets 1-7

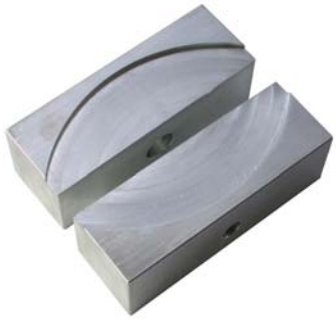
3. Workpiece Blanks

- 2 blanks for clamping jaws, material AlMg4.5Mn, material no.: 3.3547,
  according to drawing CLAMPING JAWS RAW, Sheet 1
- 1 blank for clasp, material AlMg4.5Mn, material no.: 3.3547,
  according to drawing CLASP RAW PART, Sheet 1

4. Milling machine and milling programs

- Deckel-Maho DMC 64V linear milling machine with Sinumerik 810 D
- Milling program ShopMill V6.4
- Work plan S SIE_BELTBUCKLE_CLAMP:MPF for milling the clamping jaws, developed by Pfeiffer
- Work plan SIE_BELTBUCKLE.MPF for milling the clasp, developed by Pfeiffer

5.Tools used to mill the clamping jaws



Name	Tool name in work plan	Figure
Milling tool 16	MILLING_16	


6. Tools used to mill the clasp

Name	Tool name in work plan	Figure
Milling tool 4	MILLING_4	
Milling tool 2.5	MILLING_2.5	
Tapered cutter 90	MILLING_TAPER_90	
Drill 2.7	DRILL_2.7	


NC - spot drill 4	CENTER_R	
3D caliper	3D_PROBE	

7. Manufacturing the clambing jaws

Two clamping jaws are required. The vise used to clamp the clasp blank has jaws that are 130 mm long, 45 mm wide and 45 mm high. The clamping jaws shown in the CLAMPING JAWS FOR CLASP drawing are this size. If the jaws on the vise have differing dimensions, the size of the jaws must be adapted accordingly. The manufacture of blanks for clamping jaws is a commonplace activity in the workshop and will not be described here.

Milling machine operations:

- 7.1. Move to the machine's reference position
- 7.2. Read in the SIE_BELTBUCKLE_CLAMP.MPF work plan
- 7.3. Add gaged tools to tool list
- 7.4. Put tools into tool magazine
- 7.5. Clamp clamping jaw blanks in milling machine
- 7.6. Set and center the workpiece zero point
- 7.7. Carry out simulation run
- 7.8. Start manufacturing, work through work plan

8. Milling the clasp

The clamping jaws have been machined, the clasp blank is available.


Milling machine operations

- 8.1. Move to the machine's reference position
- 8.2. Read in the SIE_BELTBUCKLE.MPF work plan
- 8.3. Add gaged tools to tool list
- 8.4. Put tools into tool magazine
- 8.5. Place clamping jaws and blank in the milling machine
- 8.6. Set and center the workpiece zero point
- 8.7. Carry out simulation run
- 8.8. Start manufacturing, work through work plan

9. Online Information

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

W. Andreas Pfeiffer Maschinen- und Apparatebau,
Buchackerstraße 4 in D-90513 Zirndorf,
Internet: www.wapfeiffer.de

Measurements and performance data for tools used

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

Tips for searching using DOConWEB

DOConWEB allows quick access to individual pages of documents without having to load the entire file.

- 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).

10. Additional information

If you want to wear the "Big Boss" clasp as a belt, you'll need:

- 1 belt buckle 829008 for c. €2.90
- 1 belt, available in various lengths:
  -> size 95 cm 8240295 c. €4.40
  -> size 100 cm 8240200 c. €4.40
  -> size 115 cm 8240215 c. €4.40


Ordering data

Both items can be ordered from e.g. Engelbert Strauss GmbH & Co.

Engelbert Strauss GmbH &Co
Frankfurter Straße 98-102
D-63599 Biebergemünd
Tel.: +49 6050 971012
Fax: +49 6050 971090
Internet: www.engelbert-strauss.de
E-mail: info@engelbert-strauss.de

The following parts will also be required to fit the clasp:

- 2 VA countersunk screws, M2.5 x 14
- 2 VA hexagon nuts
- 2 brass shims, ext. diameter 5.5 mm, int. diameter 3.0 mm, length 2 to 5 mm


11. Illustrations