

Threading with driven tools

6

Principle and application with SINUMERIK Operate

0

siemens.com/cnc4you

Unrestricted © Siemens 2019

Threading with driven tools



1	Threading with driven tools	
	1.1	Thread milling
	1.2	Tapping
	1.3	Drill thread milling

- 2 Threading with SINUMERIK Operate
- 3 Practice: Threading on the milling machine

Threading options



- Thread turning
- Thread whirling
- Thread milling
- Tapping
- Drill thread milling
- Thread forming
- Punch tapping

Both the cutting and non-cutting method can be used for threading.



1 Threading options

Threading with driven tool – thread milling



Thread milling

Process features

- Chipping, economical method
- Suitable for interior and exterior machining
- High degree of flexibility in regard to thread dimensions, large thread diameters can be implemented

Advantages

- High quality as a point load is applied on the tool
- Flexible tool usage, also for right-hand or left-hand threads
- Threads down to the base of the drill hole

Disadvantages

- Uninterrupted cut puts strain on machine
- Longer processing times
- 3-axis CNC necessary



Source: Spur et al., Metal Cutting Manual, 2014

1 Threading options Threading with driven tool - tapping

Tapping

Process features

- Standard cutting method for cutting interior threads
- Continuous cut
- Notice: Different tools are needed for through-holes or blind holes, chip removal!
- Cut parameters largely specified by tool

Advantages

• Can be used on all machines with driven tool, also on multispindle machines or manually

Disadvantages

- Predrilling of core hole diameters necessary
- Profile tools with radially increasing teeth





Source: Spur et al., Metal Cutting Manual, 2014

SIEMENS Ingenuity for life

1 Threading options

Threading with driven tool - drill thread milling



Drill thread milling

Process features

- Cutting method for cutting female threads
- 3:1 processing possible → Core drilling, threading, adding a chamfer
- Suitable for short-chipping cast materials, aluminum, aluminum alloys, and some types of plastic

Advantages

- No thread core drilling necessary
- Quick (tool change)

Disadvantages

Increased costs due to tool wear and interior supply of coolant at the tool





Source: Spur et al., Metal Cutting Manual, 2014

2 Threading with SINUMERIK Operate Male and female thread milling

SIEMENS Ingenuity for life



² Threading with SINUMERIK Operate

Tapping, selection of cycle





Unrestricted © Siemens 2019

Page 8

² Threading with SINUMERIK Operate

Drill thread milling, selection of cycle



SIEMENS	SINUMERIK OPERATE	09/12/19 10:43 AM
NC/WKS/TEMP/TEMP	Drill thrd mill.	Select
	Drill thrd mill.TF50.000 mm/minS2000 rpmDrilling21Z125.000 incD5.000 incDF90.000 %V11.200Spot drillNoThread millingRemove chipsNoRH threadF21000.000 mm/minTableNone	n Select tool Graphic view Tapping
	P 2.000 mm/rev Z2 1.000 inc ∅ 1.000 Down-cut	Cancel
	un Vari- Simu- un	Ех-

Unrestricted © Siemens 2019

³ #Placeholder: Practical part Thread milling, drilling and drill thread milling



4 Summary

Introduction to thread types and threading



- Fast and reliable threading with SINUMERIK Operate!
- **User-friendly** cycle screen for producing a wide variety of thread types with driven tools.
- Realistic production-relevant simulation of threading.
- Thread milling/drilling/forming and drill thread milling



With SINUMERIK, both cutting and non-cutting threading is possible on turning and milling machines!

Produced by





Digital Experience and Application Center Erlangen

Frauenauracher Strasse 80 91056 Erlangen, Germany

siemens.com/cnc4you

Unrestricted © Siemens 2019