

www.weiler.de



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WEILER SL2 Control

Complex Tasks – Solved Simply



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Anyone who knows how to turn can master the WEILER SL2 Control

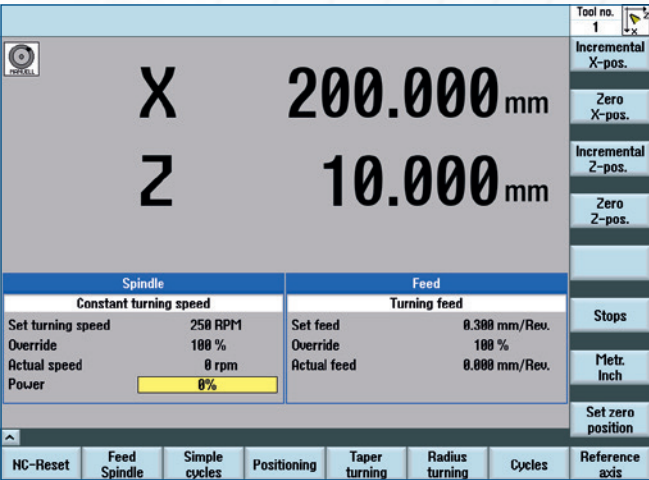
Any qualified lathe operator will immediately feel at home with the WEILER software, even if they don't have any programming experience.

The automated cycles allow each lathe to be operated like a "manually operated" machine. And the geometry processor enables complete programming of the workpiece contours – up to and including automatic calculation of points of intersection.

Three basic principles apply when working with the WEILER SL2 control:

- 1 Simple workpieces are processed in the same way as with a conventional machine, only smarter.
- 2 Elaborate parts are processed in the same way as with a conventional machine, only faster.
- 3 Complex parts are processed in the same way as with a CNC machine, only easier.

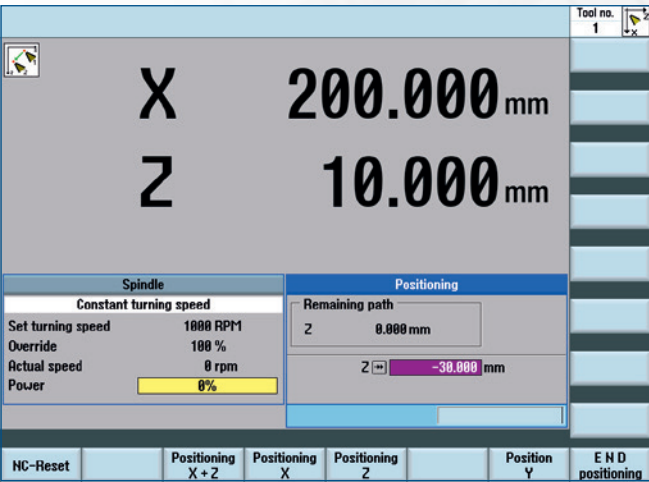
The WEILER SL2 control guides its user just as needed and step-by-step from the most straightforward to the most complex options. It is an exclusive and and proprietary WEILER development that is only available in conjunction with WEILER E-Series machines.



Main screen

Speed and Feed Values

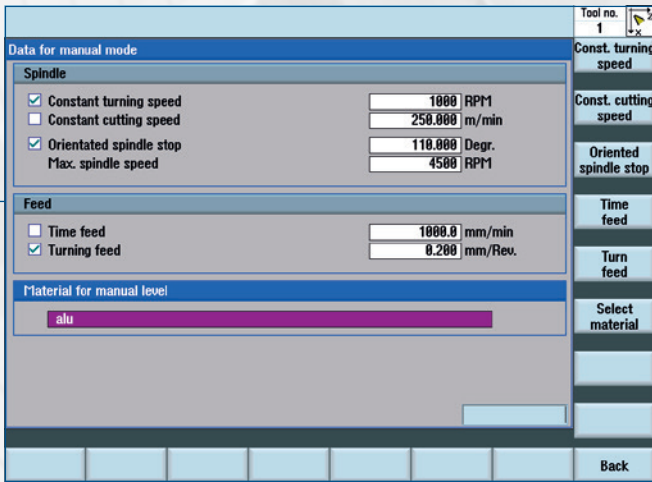
- ▶ Simple entry of speed and feed values
- ▶ Technology processing from the tool database
- ▶ Oriented spindle stop (teach-in)
- ▶ Speed limitation



Positioning

Main screen

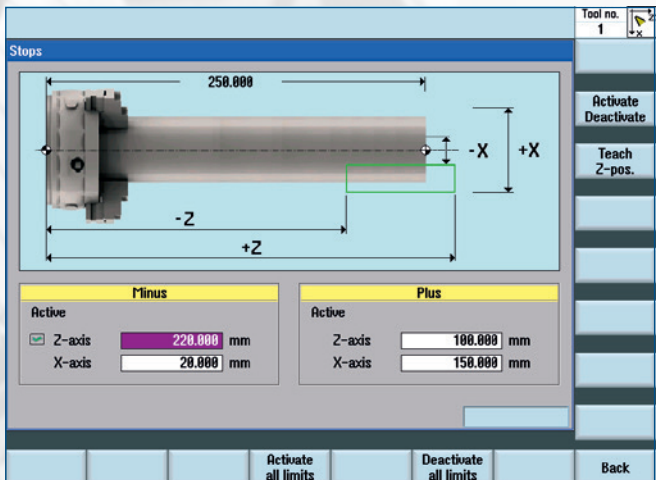
- ▶ All necessary information is clearly displayed



Feed / spindle data

Positioning

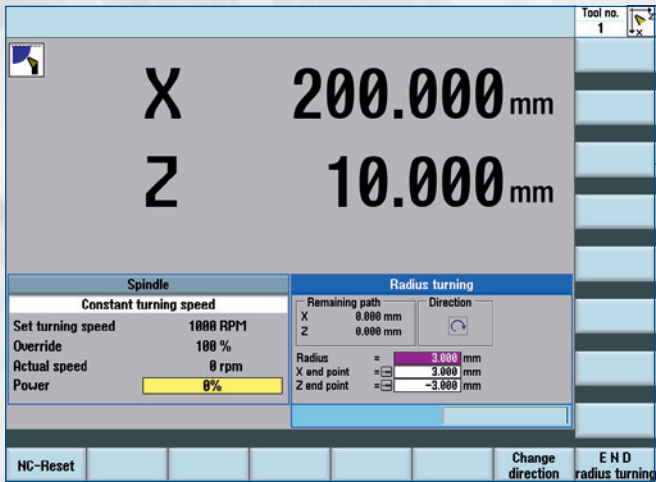
- ▶ Automatic positioning of the tool within the working area



Setting stops

Taper turning

- ▶ No need for set-up or programming
- ▶ Any taper can be turned throughout the working area
- ▶ Also with limitation (turning against a shoulder)



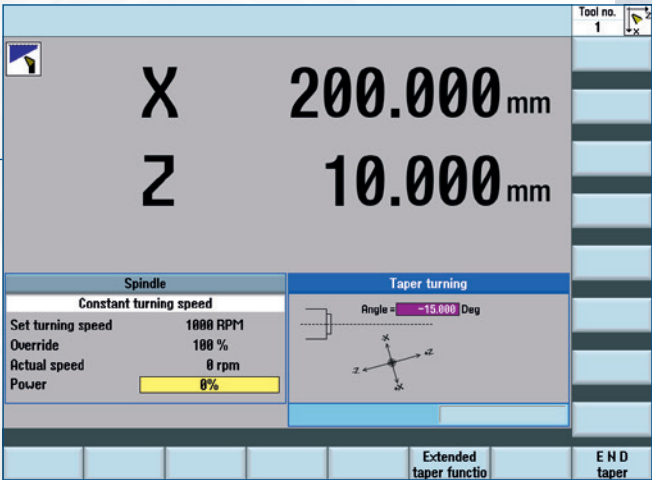
Radius turning

Simple cycles

- ▶ Cutting longitudinal/transverse
- ▶ Internal and external machining
- ▶ Thread cutting (metric and inch)
- ▶ Calculation of the thread depth according to the indicated pitch
- ▶ Fast execution through minimal data input
- ▶ Access to the programming level not necessary

Turning against the stop

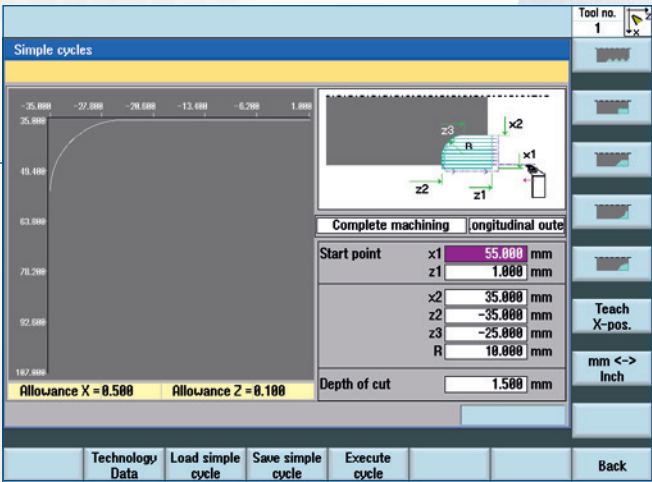
- ▶ Set stops longitudinally and transversely
- ▶ Stops in the directions (+) and (-)
- ▶ Active with automatic feed and when working with the handwheels



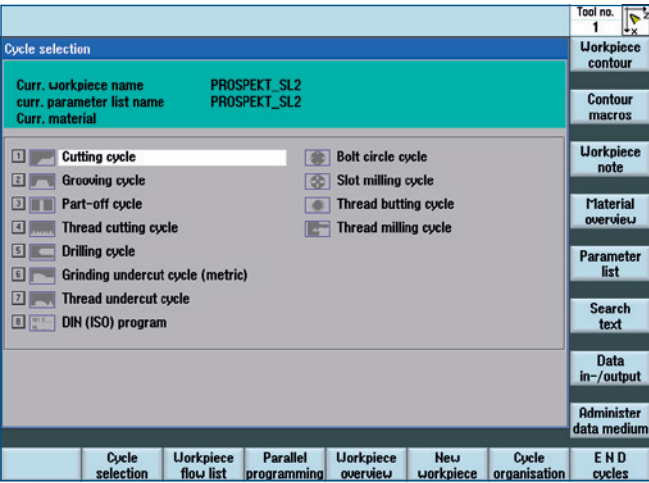
Simple taper turning

Radius turning

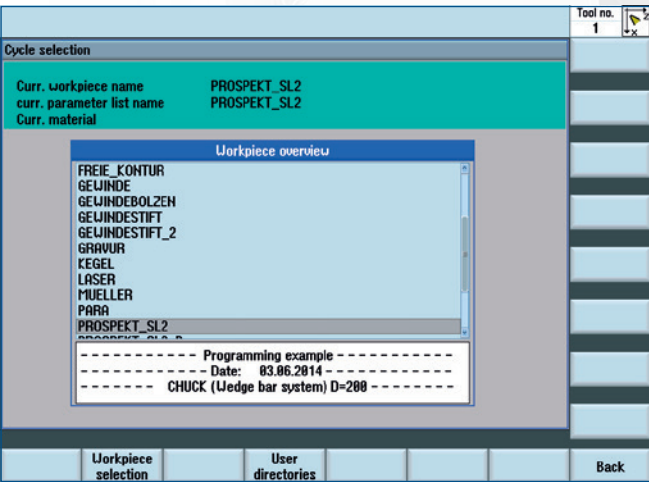
- ▶ Convex and concave arcs
- ▶ Any radius and end point coordinates can be entered
- ▶ No forming tools necessary



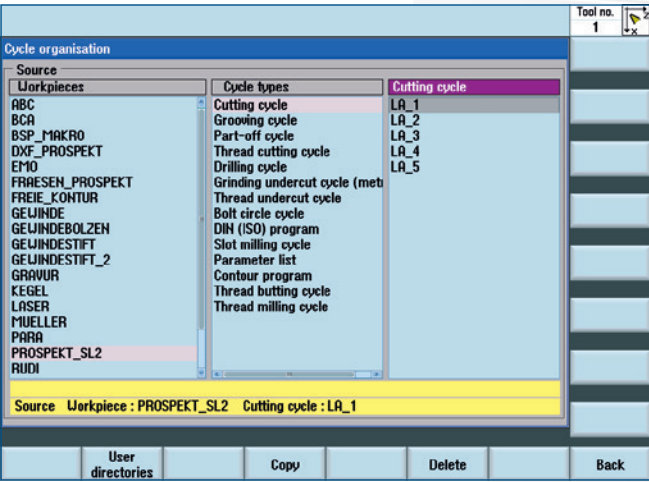
Simple cycle



Cycle overview



Workpiece selection with comment text



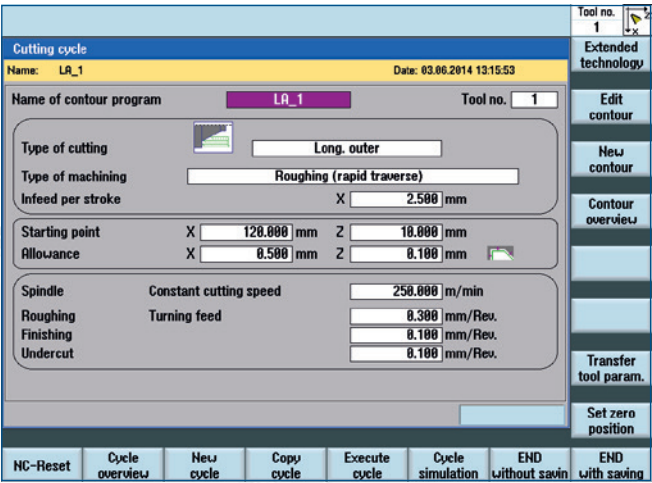
Cycle management

General cycle information

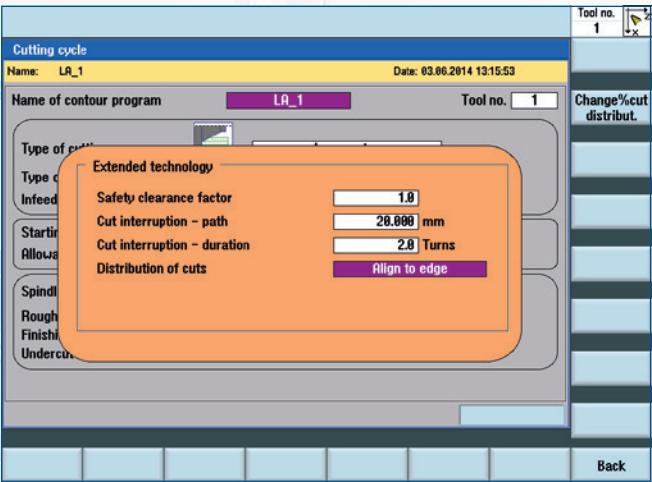
- ▶ Workpiece-related management of cycles and DIN (ISO) programs
- ▶ Straightforward programming through technology and geometry data screens
- ▶ Graphically assisted data entry
- ▶ Safety clearances can be individually programmed
- ▶ Parameter lists for part families
- ▶ Programming parallel to machining operations
- ▶ Simulation
- ▶ Search function for already existing jobs (text search)
- ▶ Raw part definition

Data management

- ▶ Copying and deletion of individual cycles or complete workpiece archives
- ▶ Creation and management of customer-specific directories
- ▶ Comment texts



Cutting cycle technology

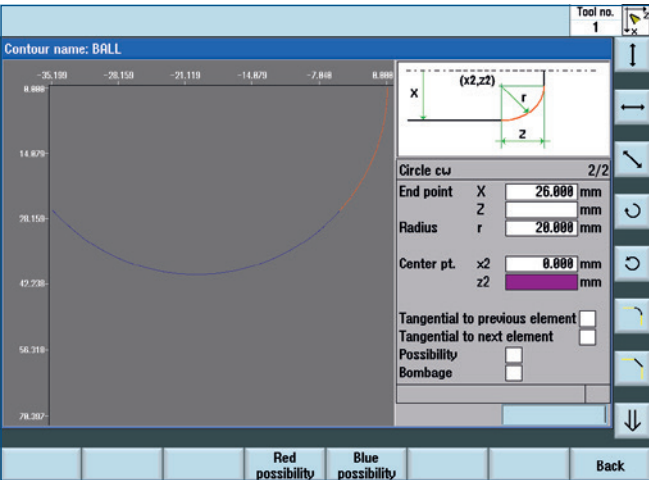


Cutting cycle – extended technology

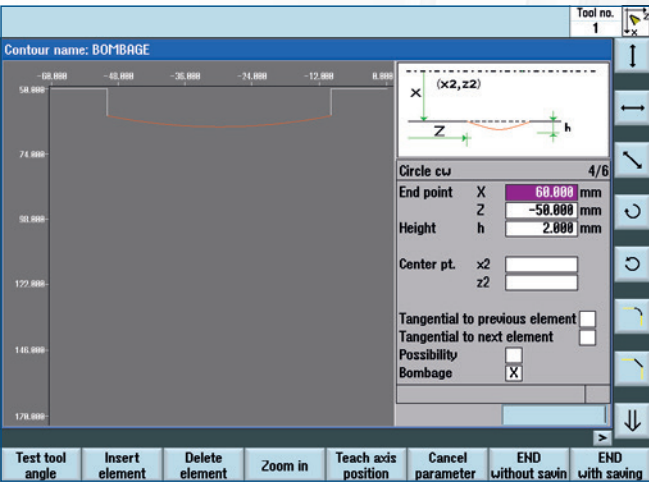
Cutting technology

- ▶ Longitudinal/transverse
- ▶ ID/OD
- ▶ “Diagonal” cutting (for increased stability and improved chip removal)
- ▶ True-to-form finishing allowance
- ▶ Technologically optimized undercut machining
- ▶ Chip breaking cycle for long-chipping materials
- ▶ Automatic tool angle monitoring, also in the feed direction
- ▶ Allowance for pre-formed blanks (forged parts, cast parts, pre-turned workpieces)
- ▶ Straightforward raw part contour input through teach-in function
- ▶ Optimized cut proportioning

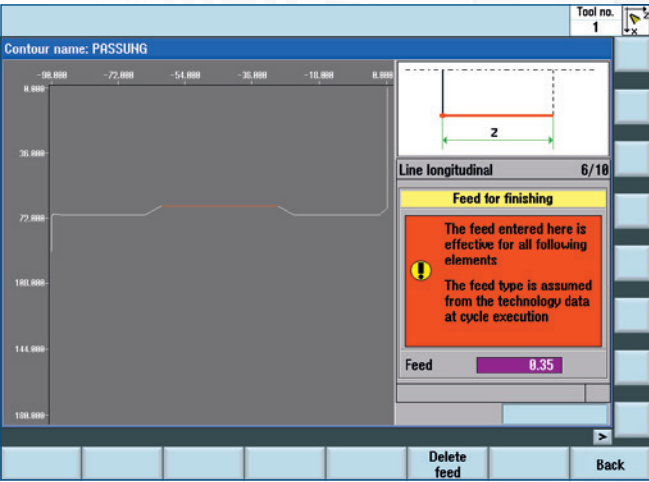
Operator directories



Calculation of points of intersection line/circle with the possibilities "red/blue"



Crowning



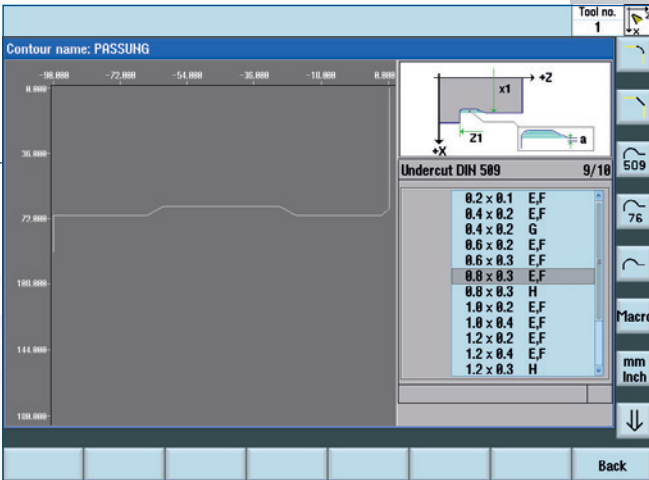
Feed input

Powerful geometry calculator

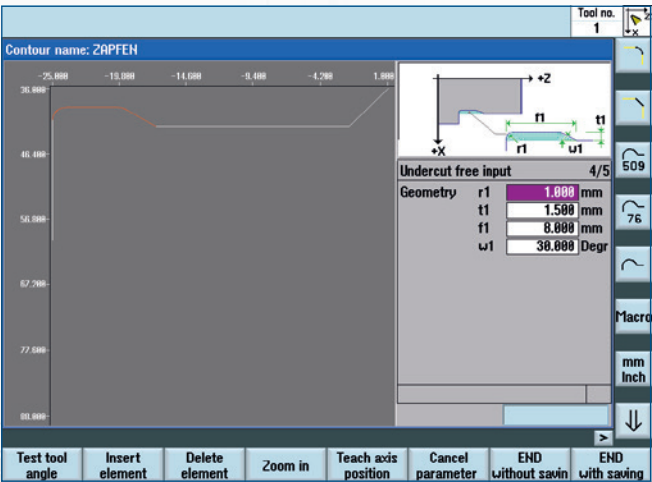
- ▶ Automatic calculation of points of intersection and tangential transitions
- ▶ Crowning, possible simply through the input of the height
- ▶ Straightforward selection of elements through symbols
- ▶ Zoom function for the enhanced display of details
- ▶ Assistance with data input through pictograms
- ▶ Element-specific feed input to optimize the finishing process
- ▶ Layout that allows easy correction (e.g. for prototype production)
- ▶ Use of parameter lists to define part families
- ▶ Predefined macros for DIN undercuts
- ▶ Freely definable contour macros for frequently repeated contour sections

Macros for undercuts

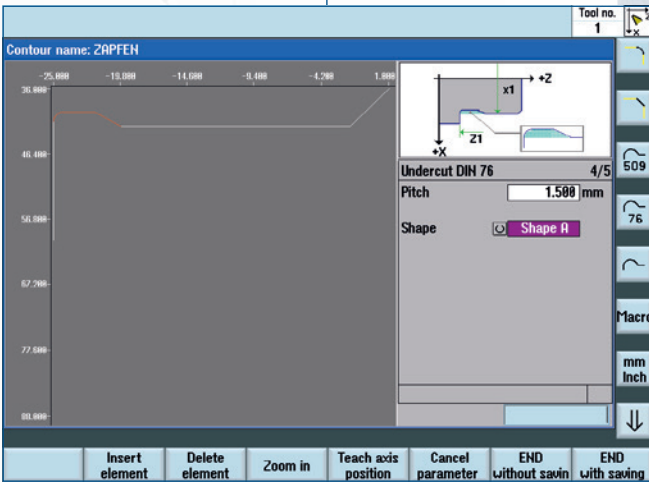
- ▶ DIN 509 shapes (E, F, G and H)
- ▶ DIN 76 shapes (A, B, C and D)
- ▶ Customized with freely selected input of radius, depth, length and angle



DIN 509 undercut selection

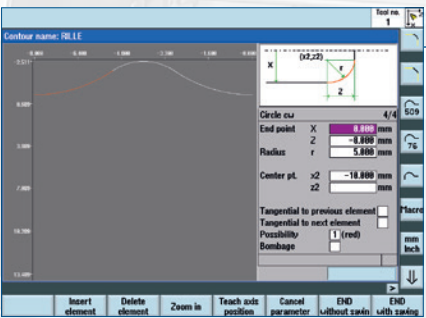


Customized undercut programming

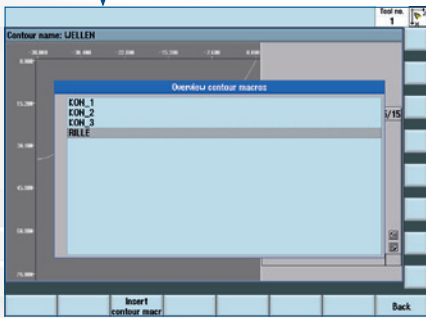


DIN 76 undercut programming

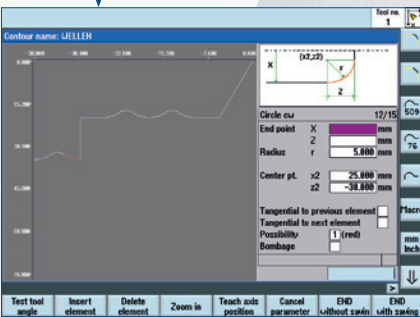
Freely definable contour macros



Macro creation



Macro selection



Geometry with inserted macros

Part-off cycle

Name: ABSTICH Date: 03.06.2014 13:32:52

Tool no. 31

Longitudinal machine Measurement right edge

Starting point X 50.000 mm Z 10.000 mm
Initial point X 40.000 mm Z -60.000 mm
End point X 2.000 mm
Infeed depth X 3.000 mm
Edge break Radius 0.000 mm Chamfer 0.500 mm

Number of part-offs 1
Offset of part-offs Z 0.000 mm

Spindle Constant turning speed 1000 RPM
Feed Turning feed 0.050 mm/Rev.

Edge break OFF

Transfer tool param.

Set zero position

NC-Reset Cycle overview New cycle Copy cycle Execute cycle Cycle simulation Cycle without saving END with saving

Part-off cycle

Grooving cycle

- Longitudinal and transverse
- ID/OD
- Standard / free contour

Part-off cycle

- Fast programming of simple grooves (longitudinal and transverse)
- Parting-off of workpieces
- With chamfer/radius

Contour name: KONTUR

Tool no. 1

Circle CW 4/8

End point X 60.000 mm Z 76.000 mm
Radius r 10.000 mm

Center pt. x2 z2

Tangential to previous element X
Tangential to next element
Possibility 1 (red)
Bombage

Insert element Delete element Zoom in Teach axis position Cancel parameter END without saving END with saving

Free grooving contour

Grooving cycle

Name: KONTUR Date: 03.06.2014 13:39:09

Tool no. 31

Type of geometry Groove long. outer
Type of machining Roughing + Finishing
Contour type Free groove contour

Starting point X 120.000 mm Z 10.000 mm
Infeed depth X 3.000 mm
Finish allowance base 0.200 mm
Finish allowance flanks 0.200 mm

Number of grooves 1
Offset of grooves Z 0.000 mm

Spindle Constant cutting speed 150.000 m/min
Feed Turning feed 0.050 mm/Rev.

NC-Reset Cycle overview New cycle Copy cycle Execute cycle Cycle simulation Cycle without saving END with saving

Grooving cycle technology

Extended technology: Grooving cycle

Name: EINSTICH Date: 03.06.2014 14:26:31

Machining
☒ Standard groove
☒ Step-grooving
☒ Turn-cutting

Machining direction
☒ From radius/chamfer 1 to 4
☒ Alternate from groove center
☒ From radius/chamfer 4 to 1

Retract finishing
☒ Center groove
☒ Radius/chamfer 3
☒ Radius/chamfer 2

Chip width in % of tool width 90 %
Depth of step-grooving 0.000 mm
Dwell time at groove base 1.5 Turns
Retracting feed 1.000 mm/Rev.
Safety clearance factor 1.0

Change machining
Change direction
Change %retr

Back

Expanded technology (standard)

Grooving cycle Geometry

Name: EINSTICH Date: 03.06.2014 14:26:31

Tool no. 1

Initial point transverse X 55.000 mm
Initial point longitudinal Z -50.500 mm
Groove width Base b 7.000 mm
Groove base t 36.000 mm
Contour angle wα 0.000 Deg.
Flank angle flank 1 w1 15.000 Deg.
Flank angle flank 2 w2 15.000 Deg.
Chamfer 1 r1 0.500 mm
Radius 2 r2 0.000 mm
Radius 3 r3 0.000 mm
Chamfer 4 r4 0.500 mm

Teach Z-pos.
Change datum
mm <-> Inch
Offset surface

Import contour Back

Standard geometry

Thread cutting cycle

- Easy creation of nearly all types of thread
- API mode for oil and gas-tight threads etc.
- Trapezoidal mode to machine large trapezoidal threads for the reduction of the cutting pressure
- Standard mode with various choices of infeed
- Longitudinal, transverse and tapered threads
- "Fast retraction" function for interruptions in the cut
- Metric, inch, module and diametral pitch threads
- Multiplex threads through starting angle offset
- Constant, progressive or degressive pitches
- Technologically effective machining of multiplex threads (processing plane by plane)
- Additional cuts to optimize the thread with handwheel infeed
- Speed change during the cut
- Threads can be processed in the same way as with a conventional machine through the manual recutting function
- Thread repair by determining the starting angle or through manual recutting
- Specific programming of a starting angle offset

Thread cutting cycle

Name: GEWINDE Date: 03.06.2014 13:47:53

Tool no. 21

Type of geometry External thread
Type of cutting Constant chip cross section
Type of machining Infeed with change of flanks

Starting point X 120.000 mm Z 10.000 mm
Finishing allowance 0.020 mm
Thread pitch 1.500 mm
Thread depth 0.920 mm

Amount of rough passes 8
Amount of empty passes 1
Number of starts (multiple thread) 1

Spindle Constant turning speed 1000 RPM

Find start angle
Transfer tool param.
Set zero position

NC-Reset Cycle overview New cycle Manual recutting Execute cycle Cycle simulation Cycle without saving END with saving

Cycle technology

Thread cutting cycle Geometry

Name: GEWINDE Date: 03.06.2014 13:47:53

Tool no. 1

Trans. initial point AP x1 16.000 mm
Long. initial point AP z1 0.000 mm
Trans. end point EP x2 16.000 mm
Long. end point EP z2 -14.500 mm
Taper angle w 0.000 Deg.
Run in path a 3.000 mm
Run out path b 0.000 mm
Infeed angle c 28.000 Deg.

Teach X-pos.
mm <-> Inch

Back

Thread geometry

Thread cutting cycle

Name: GEWINDE Date: 03.06.2014 13:47:53

Tool no. 21

Type of geometry External thread

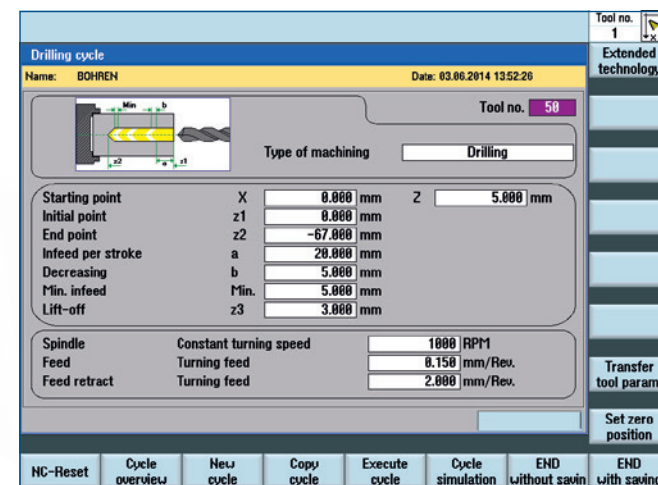
Start angle for thread recutting
Start angle in CW 223.536
Start angle in CCW 136.464

Amount of rough passes 8
Amount of empty passes 1
Number of starts (multiple thread) 1

Spindle Constant turning speed 1000 RPM

Delete start angle Teach start angle Back

Starting angle



Drilling cycle
Name: BOHREN Date: 03.06.2014 13:52:26

Tool no. 50

Type of machining: Drilling

Starting point X: 0.000 mm Z: 5.000 mm
Initial point z1: 0.000 mm
End point z2: -67.000 mm
Infeed per stroke a: 20.000 mm
Decreasing b: 5.000 mm
Min. infeed: 5.000 mm
Lift-off z3: 3.000 mm

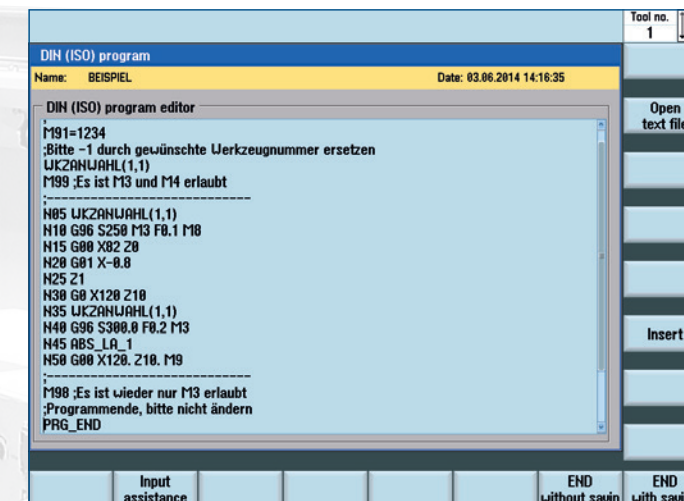
Spindle: Constant turning speed 1000 RPM
Feed: 0.150 mm/Rev.
Feed retract: 2.000 mm/Rev.

NC-Reset Cycle overview New cycle Copy Execute cycle Cycle simulation END without saving END with saving

Drilling Cycle

Drilling cycle

- For centric machining
- Centering, drilling, reaming, tapping
- Deep-hole drilling
 - Infeed linear/decreasing
 - Chip breaking/chip removal
- Tapping with automatic reversal of direction at the end of the thread
- Separate feed input for the machining and retracting movement



DIN (ISO) program
Name: BEISPIEL Date: 03.06.2014 14:16:35

DIN (ISO) program editor

```
M91=1234
;Bitte -1 durch gewünschte Werkzeugnummer ersetzen
WZANWAHL(1,1)
M99 ;Es ist M13 und M14 erlaubt

N05 WZANWAHL(1,1)
N10 G96 S250 M3 F0.1 M10
N15 G80 X0.2 Z0
N20 G01 X-0.8
N25 Z1
N30 G0 X120 Z10
N35 WZANWAHL(1,1)
N40 G96 S300.0 F0.2 M3
N45 ABS_LA_1
N50 G80 X120. Z10. M9

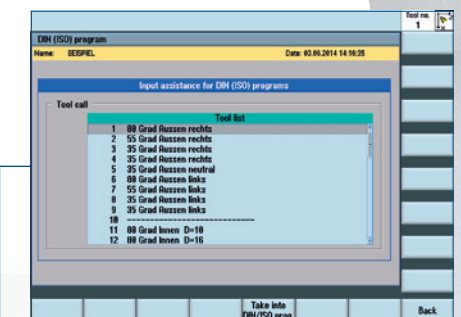
M98 ;Es ist wieder nur M13 erlaubt
;Programmende, bitte nicht ändern
PRG_END
```

Input assistance END without saving END with saving

DIN/ISO editor

DIN/ISO

- A DIN/ISO program can define individual processing steps as well as a complete sequence
- DIN/ISO programs and cycle programs can be combined as required
- Input assistance for
 - Tool selection
 - Technology
 - Path conditions
 - Cycles
 - Spindle functions
 - Functions for driven tools
- Insertion of text blocks (e.g. X/Z coordinates) from other text files



DIN (ISO) program
Name: BEISPIEL Date: 03.06.2014 14:16:35

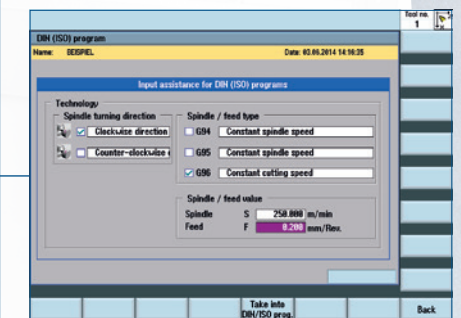
Input assistance for DIN (ISO) programs

Tool call

Tool	Tool list
1	90 Grad Reizen rechts
2	55 Grad Reizen rechts
3	35 Grad Reizen rechts
4	35 Grad Reizen rechts
5	35 Grad Reizen neutral
6	80 Grad Reizen links
7	55 Grad Reizen links
8	35 Grad Reizen links
9	35 Grad Reizen links
10	
11	80 Grad Reizen Di-10
12	80 Grad Reizen Di-10

Take info DIN/ISO prog Back

Tool selection



DIN (ISO) program
Name: BEISPIEL Date: 03.06.2014 14:16:35

Input assistance for DIN (ISO) programs

Technology

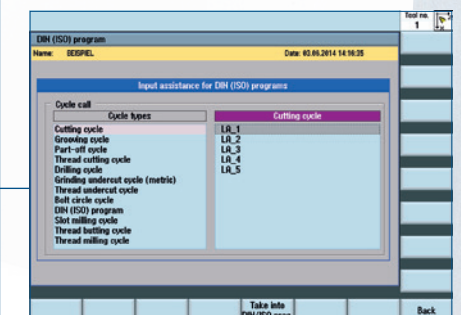
Spindle turning direction: Clockwise direction Counter-clockwise

Spindle / feed type: G04 Constant spindle speed G05 Constant spindle speed G06 Constant cutting speed

Spindle / feed value: S 250.000 rpm/min F 0.200 mm/Rev.

Take info DIN/ISO prog Back

Technology



DIN (ISO) program
Name: BEISPIEL Date: 03.06.2014 14:16:35

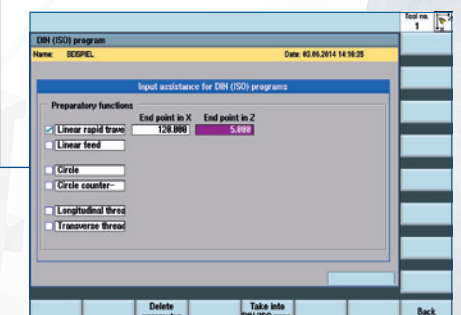
Input assistance for DIN (ISO) programs

Cycle call

Cycle types	Cutting cycle
Cutting cycle	LA_1
Grooving cycle	LA_2
Part-off cycle	LA_3
Thread cutting cycle	LA_4
Drilling cycle	LA_5
Grinding undercut cycle (metric)	
Thread undercut cycle	
Bolt circle cycle	
Slot milling cycle	
Thread milling cycle	
Thread milling cycle	

Take info DIN/ISO prog Back

Cycle selection



DIN (ISO) program
Name: BEISPIEL Date: 03.06.2014 14:16:35

Input assistance for DIN (ISO) programs

Preparatory functions

End point in X: 120.000 End point in Z: 5.000

Linear rapid traverse Linear feed

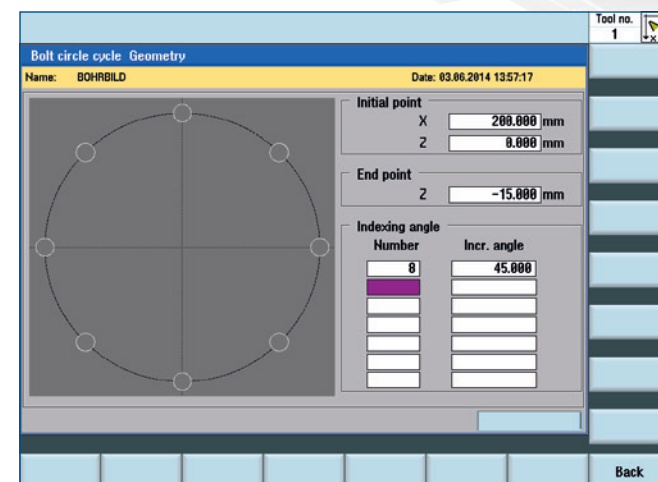
Circle Circle counter

Longitudinal thread Transverse thread

Delete parameter Take info DIN/ISO prog Back

Path conditions

CYCLES FOR DRIVEN TOOLS (OPTIONAL)



Bolt circle cycle Geometry
Name: BOHRBILD Date: 03.06.2014 13:57:17

Initial point X: 200.000 mm Z: 0.000 mm
End point Z: -15.000 mm

Indexing angle Number: 8 Incr. angle: 45.000

Back

Bolt hole circle geometry

Bolt hole circle

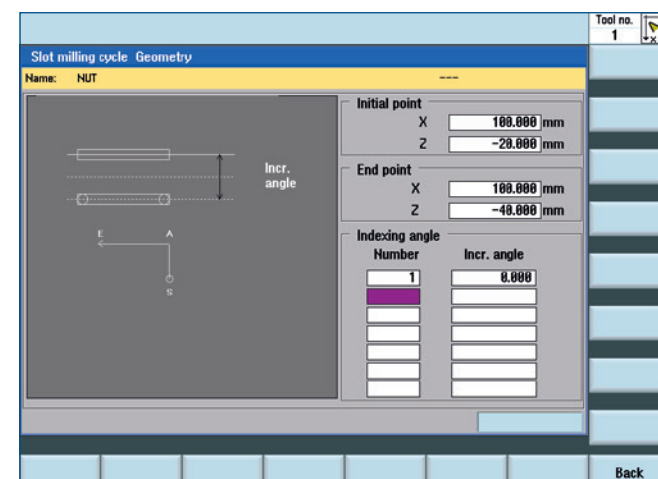
- Radial and axial machining
- Drilling and tapping
- Any graduation can be entered

Slot milling

- Machining of transverse and longitudinal grooves, also on tapered surfaces
- Any graduation can be entered

C-axis (option)

- Through main drive
- Retractable C-axis for spindle bores of 165 mm and above
- For extremely precise graduations



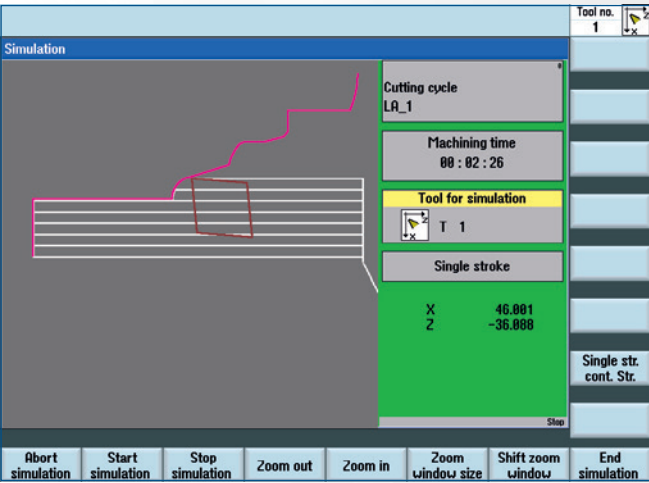
Slot milling cycle Geometry
Name: NUT

Initial point X: 100.000 mm Z: -20.000 mm
End point X: 100.000 mm Z: -40.000 mm

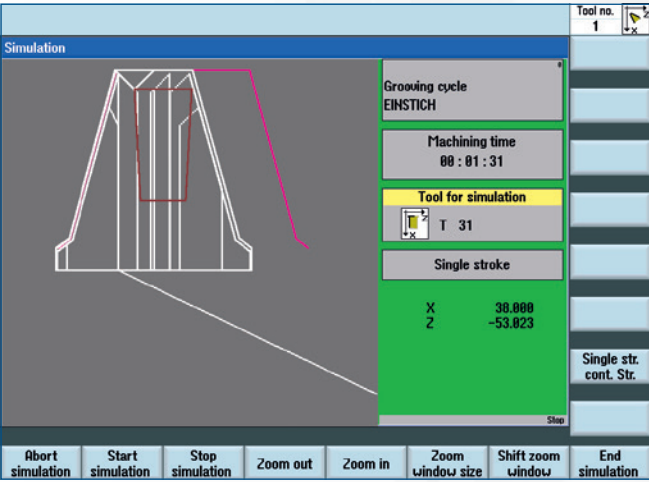
Indexing angle Number: 1 Incr. angle: 0.000

Back

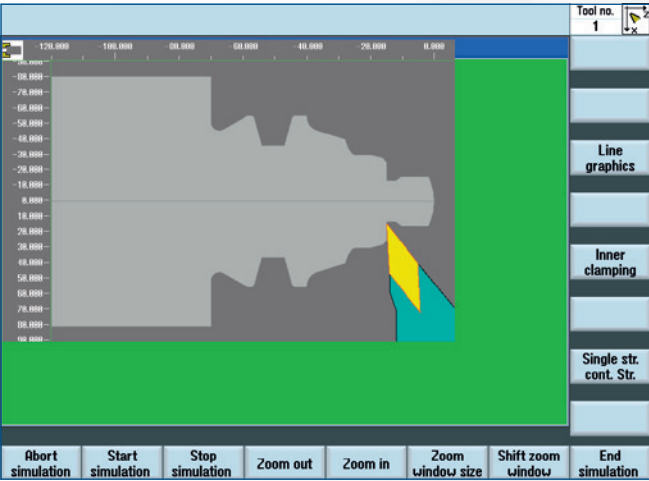
Slot milling geometry



Simulation cutting



Simulation grooving



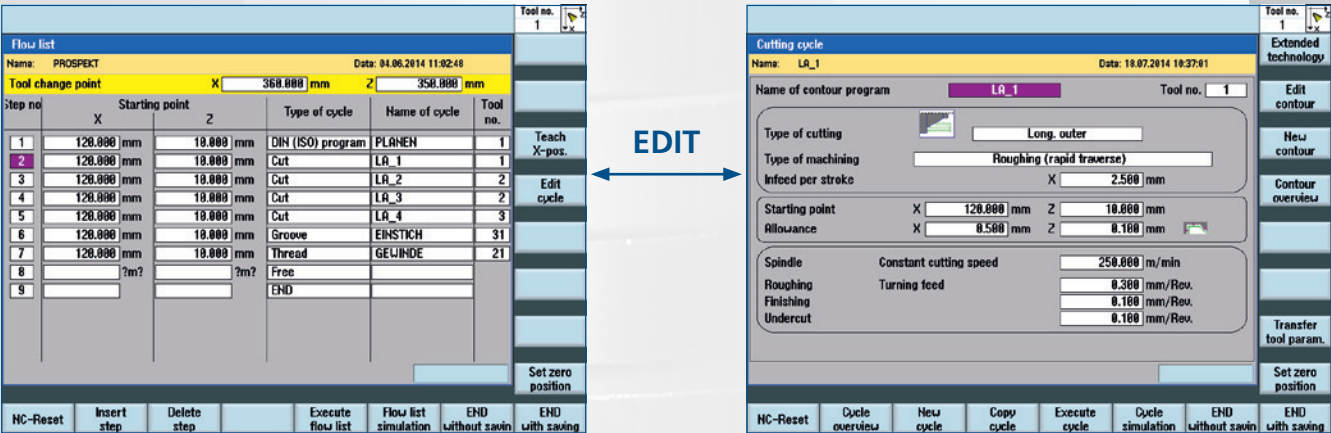
Solid graphics

Line graphics

- ▶ With workpiece and raw part display
- ▶ With depiction of the cutting tip
- ▶ Execution with single stroke or continuous stroke
- ▶ Output of the individual X/Z coordinates for improved monitoring
- ▶ Zoom function to show details
- ▶ Selection of different plains for turning, facing or OD machining

Erasing graphics

- ▶ With display of the raw part contour
- ▶ With complete illustration of the tool
- ▶ Zoom function
- ▶ Simulation of the removal of material



Flow list

Cutting technology

Flow List

- ▶ Link the individual steps (cycles/DIN-ISO) to a complete machining sequence
- ▶ Automatated program run with manual tool change or with a turret
- ▶ Simple definition of the tool change point, also possible in the teach-in mode
- ▶ Takes into account a number of different clamping positions and zero positions
- ▶ Positioning cycles for measuring procedures or individual tool changing points
- ▶ Display of the tools used
- ▶ Straight forward screens
- ▶ Capability of directly editing the individual machining steps

Tool overview				Tool no. 1
T-No.	Name	Type		
1 88 Grad Aussen rechts		Turning tool		
2 55 Grad Aussen rechts		Turning tool		
3 35 Grad Aussen rechts		Turning tool		
4 35 Grad Aussen rechts		Turning tool		
5 35 Grad Aussen neutral		Turning tool		
6 88 Grad Aussen links		Turning tool		
7 55 Grad Aussen links		Turning tool		
8 35 Grad Aussen links		Turning tool		
9 35 Grad Aussen links		Turning tool		
10		Turning tool		
11 88 Grad Innen D=18		Turning tool		
12 88 Grad Innen D=16		Turning tool		
13 88 Grad Innen D=25		Turning tool		
14 55 Grad Innen D=18		Turning tool		
15 55 Grad Innen D=16		Turning tool		
16 55 Grad Innen D=25		Turning tool		
17 35 Grad Innen D=16		Turning tool		

Tool chart

- ▶ 200 tools
- ▶ Copy and delete function
- ▶ Spindle orientation
- ▶ Coolant for automatic operations
- ▶ Tool station
- ▶ Easy selection through tool name, tool type and orientation of the cutting edge

		Tool data
		Tool number 1
		Tool name 88 Grad Aussen rechts
		Tool type Turning tool
		Tool coordinates X 200.000 mm Z 18.000 mm
		Tool radius R 0.400 mm
		Buttons: New tool, Tool graphic, Tool wear, Tool overview, Tool notes, Technology Data, Activate tool, Change cutter position, Back

Individual tool

X 200.000 mm	
Z 10.000 mm	
Set zero position	
Back	

Set zero position

Zero offset

- ▶ Coordination of different clamping postions and workpiece dimensions
- ▶ Clear graphic display for data input
- ▶ Can be called up in all relevant areas

DXF import	Tool no. 1
Layer list, DXF file selection, Export contour, DXF Import END	

Contour name: Finished part contour		Tool no. 1
Taper 5/21		
End point X	16.000 mm	
Z	-13.095 mm	
Angle a		Degr
Length l		mm
Buttons: Insert element, Delete element, Zoom in, Teach axis position, Cancel parameter, END without saving, END with saving		

CAD drawing

Imported contour

Import of DXF drawings

- ▶ Import of drawing data in the DXF format into the machine control
- ▶ Generation of a profile which needs to be cut
- ▶ Selection of various layers
- ▶ Different modes for the selection of the required contour elements
- ▶ Zoom function
- ▶ Provision for various drawing scales
- ▶ Conversion inch => metric or metric => inch
- ▶ Mirroring along the X/Z-axis
- ▶ Contour rotation
- ▶ Trimming of individual contour elements
- ▶ Subsequent processing possible in contour editor (delete element, insert element, change dimensions)

Tool no. 4714 3
Extended technology

End face machining
Name: NUT Date: 04.06.2014 14:41:07

Tool no. 900

Contour type: Groove
Type of machining: Roughing and finishing

Starting point X: 200.000 mm Z: 10.000 mm Y: 0.000 mm
Infeed per stroke: 5.000 mm
Infeed contour: 5.000 mm
Allowance infeed: 0.500 mm
Allowance contour: 0.500 mm

Spindle: Constant turning speed: 1500 RPM
Feed: 150 mm/min
Feed infeed: 100 mm/min

Transfer tool param.
Set zero position

NC-Reset Cycle overview New cycle Copy cycle Execute cycle Cycle simulation END without saving END with saving

Face milling technology screen with "slot" geometry

Tool no. 4714 3
Extended technology

Outer surface machining
Name: KEILE Date: 06.06.2014 12:20:00

Tool no. 800

Contour type: Splined shaft

Extended technology
Machining direction: Synchronous
Machining with real Y-axis: ON
Safety clearance factor: 1.0
Clamping: C+ indexing

Feed infeed: Time feed: 100 mm/min

Change%cla
Back

Expanded technology with Y-axis selection

Tool no. 4714 3

Face milling cycle polygon geometry
Name: VIERECK Date: 04.06.2014 14:41:32

Initial point Z: 0.000 mm
End point Z: -10.000 mm
C-position: 0.000 Deg

Center point
X: 0.000 mm
Y: 0.000 mm

Edges
Amount: 4
Turning angle: 0.000 Deg
Wrench size: 50.000 mm

Diameter of workpiece
d1: 80.000 mm

Teach Z-pos.
mm <-> Inch

Back

Geometry data screen with square

Tool no. 4714 3

Outer surface milling cycle groove geometry
Name: NUT Date: 06.06.2014 16:03:40

C-position: 0.000 Deg

Reference point
Center
Z: -50.000 mm

Geometry
Amount of gro: 4
Length: 60.000 mm
Width: 20.000 mm
Depth: 10.000 mm

Diameter of workpiece
d1: 100.000 mm

Teach C-pos.

Back

Geometry data screen "groove" (outer surface)

Tool no. 4714 3

Surface milling cycle splined shaft geometry
Name: KEILE Date: 06.06.2014 12:20:00

C-position: 0.000 Deg

Reference point
Center
Z: -50.000 mm

Geometry
Amount of spli: 4
Length: 60.000 mm
Width: 20.000 mm
Depth: 10.000 mm

Diameter of workpiece
d1: 100.000 mm

Teach C-pos.

Back

Spline geometry with 4 elements $l = 100$, $\varnothing = 60$, depth = 5, width = 10

Tool no. 4714 3
Extended technology

Hole pattern cycle
Name: BOHRBILD Date: 05.06.2014 16:30:11

Tool no. 900

Type of machining: Drilling
Drill axis: Z

Starting point X: 100.000 mm Z: 10.000 mm Y: 0.000 mm
Infeed per stroke: 20.000 mm
Retract: 3.000 mm
Decreasing: 0.000 mm
Minimum infeed: 0.000 mm

Spindle: Constant turning speed: 1500 RPM
Feed: 150 mm/min
Feed retract: 1000 mm/min

Transfer tool param.
Set zero position

NC-Reset Cycle overview New cycle Copy cycle Execute cycle Cycle simulation END without saving END with saving

Hole pattern cycle technology

Cycles for:

- ▶ Circular thread cutting
 - Centric
 - Bolt hole circle
- ▶ Thread milling
 - Start of the thread
 - End of the thread
- ▶ Polygon
 - Square
 - Hexagon
 - Triangle and other polygons
- ▶ Key areas

- ▶ Surfaces
- ▶ Feather keyway with slot wall correction
- ▶ Circular grooves of various widths
- ▶ Splined shaft profiles
- ▶ Lubricating grooves
- ▶ Hole pattern with cartesian coordinate programming
- ▶ Eccenters
- ▶ Engraving to mark your workpiece (certification)

COMPLEX TASKS – SOLVED SIMPLY

Convincing Arguments for the WEILER SL2 Control

1 Weiler proprietary GUI

- ▶ Drawing on the experience of over 5000 machines in operation
- ▶ Based on the needs of our customers

2 Siemens 840D sl basic control unit

- ▶ Large storage capacity
- ▶ Straight forward graphical user interface (GUI)
- ▶ Large 15" TFT color screen
- ▶ Touch-sensitive membrane keyboard with clearly structured key arrangement
- ▶ PC membrane keyboard
- ▶ Trackball (optional)

3 Tool management

- ▶ 200 tools
- ▶ Tool graphics
- ▶ User technology database
- ▶ Explanatory texts

4 Straightforward manual operation

- ▶ Turning against the stop
- ▶ Taper turning and radius turning
- ▶ Roughing and finishing cycles for simple machining operations
- ▶ Thread cutting without having to access the programming level

5 Clear and simple contour data input

- ▶ Powerful contour calculator for determining points that are not directly dimensioned. The results are displayed graphically and can be accepted at the touch of a button
- ▶ Pre-defined macros for grinding undercuts according to DIN 509 (shape E, F, G and H)
- ▶ Pre-defined macros for thread undercuts according to DIN 76 (shape A, B, C and D)
- ▶ Pre-defined macro for the input of customer-specific undercuts
- ▶ Contour macros for frequently repeated contour elements
- ▶ Programming of part families through integrated parameter lists

6 CAD/CAM

- ▶ CAD drawings in DXF format can be imported to create a workpiece contour (option)
- ▶ Import of externally created DIN/ISO programs

7 Efficient thread-cutting cycle

- ▶ For linear, degressive und progressive thread pitches
- ▶ For thread repair the same as on a conventional lathe
- ▶ For longitudinal and transverse threads, inside and outside as well as tapered threads (e.g. API)
- ▶ For trapezoidal threads with large pitches (thread depths)
- ▶ Fast retraction for interruptions in the cut

8 Clear data management

- ▶ Workpiece programs consist of individual, clear working steps. These can consist of cycles as well as DIN/ISO programs.
- ▶ All programs can be provided with information that is important for the operator
- ▶ Programs can be stored according to specific product groups, customer names or similar criteria
- ▶ A program can be created during the machining operation

9 "Smart" cutting cycles

- ▶ Every contour element can be allocated its own feed value
- ▶ Transverse/longitudinal machining on the inside as well as the outside
- ▶ Diagonal cutting for increased stability of the workpiece and tool as well as improved chip removal
- ▶ Pre-machined contours can be taken into consideration
- ▶ Chip breaking cycles for long-chipping materials
- ▶ Grooving with standard geometries as well as freely defined contours
- ▶ Cycles for machining with driven tools (optional)
 - Spindle positioning
 - C-axis machining
 - Y-axis machining

10 Informative graphics

- ▶ Line graphics with illustration of the workpiece and cutting tip
- ▶ Display of the current tool position
- ▶ Integral zoom function for the enhanced display of details
- ▶ "Erasing graphic simulation" showing the removal of material
- ▶ Calculation of the machining time
- ▶ Selection of different plains for the display of turning as well as milling operations

11 Communication

- ▶ USB interface
- ▶ Network interface
- ▶ RS232 (optional)
- ▶ Tele service (optional)