

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M2 x 0.4	Material	1.2379 - 60 HRC
Length	4.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	6821 U/min
Milling cutter diameter	d1 = 1.40 mm	Vf	136 mm/min	Vm	41 mm/min
Programming radius	0.67 mm	fz	0.005 mm/z	Total time	30 s
Order no.	WZG 171518/M2				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M2	; Tool = WZG 171518/M2
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.005 mm/z	; fz=0.005 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S6821 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S6821
N50 G91	4 L M14
N60 G42 G01 X0.000 Y0.700 F20 ;(F68)	5 L M51
N70 G02 X0.000 Y-1.700 I0.000 J-0.850 Z-0.060	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400 F41 ;(F136)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	9 L IY-0.700 RR F20 ;(F68)
N110 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	10 CC IX0 IY0.850
N120 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	11 CP IPA-180 IZ-0.060 DR-
N130 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	12 CC IX0 IY-1.000
N140 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	13 CP IPA-360 IZ-0.400 DR- F41 ;(F136)
N150 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	14 CP IPA-360 IZ-0.400 DR-
N160 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	15 CP IPA-360 IZ-0.400 DR-
N170 G02 X0.000 Y0.000 I0.000 J1.000 Z-0.400	16 CP IPA-360 IZ-0.400 DR-
N180 G02 X0.000 Y1.700 I0.000 J0.850 Z-0.060	17 CP IPA-360 IZ-0.400 DR-
N190 G40 G01 X0.000 Y-0.700	18 CP IPA-360 IZ-0.400 DR-
N200 G90	19 CP IPA-360 IZ-0.400 DR-
N210 G00 Z2.000 M9	20 CP IPA-360 IZ-0.400 DR-
N220 M30	21 CP IPA-360 IZ-0.400 DR-
	22 CP IPA-360 IZ-0.400 DR-
	23 CC IX0 IY-0.850
	24 CP IPA-180 IZ-0.060 DR-
	25 L IY0.700 R0
	26 L Z2.000 R0 F MAX
	27 L M9
	28 L M52
	29 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M3 x 0.5	Material	1.2379 - 60 HRC
Length	6.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	3979 U/min
Milling cutter diameter	d1 = 2.40 mm	Vf	127 mm/min	Vm	25 mm/min
Programming radius	1.17 mm	fz	0.008 mm/z	Total time	57 s
Order no.	WZG 171518/M3				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M3	; Tool = WZG 171518/M3
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.008 mm/z	; fz=0.008 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S3979 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S3979
N50 G91	4 L M14
N60 G42 G01 X0.000 Y1.200 F13 ;(F64)	5 L M51
N70 G02 X0.000 Y-2.700 I0.000 J-1.350 Z-0.075	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500 F25 ;(F127)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	9 L IY-1.200 RR F13 ;(F64)
N110 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	10 CC IX0 IY1.350
N120 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	11 CP IPA-180 IZ-0.075 DR-
N130 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	12 CC IX0 IY-1.500
N140 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	13 CP IPA-360 IZ-0.500 DR- F25 ;(F127)
N150 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	14 CP IPA-360 IZ-0.500 DR-
N160 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	15 CP IPA-360 IZ-0.500 DR-
N170 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	16 CP IPA-360 IZ-0.500 DR-
N180 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	17 CP IPA-360 IZ-0.500 DR-
N190 G02 X0.000 Y0.000 I0.000 J1.500 Z-0.500	18 CP IPA-360 IZ-0.500 DR-
N200 G02 X0.000 Y2.700 I0.000 J1.350 Z-0.075	19 CP IPA-360 IZ-0.500 DR-
N210 G40 G01 X0.000 Y-1.200	20 CP IPA-360 IZ-0.500 DR-
N220 G90	21 CP IPA-360 IZ-0.500 DR-
N230 G00 Z2.000 M9	22 CP IPA-360 IZ-0.500 DR-
N240 M30	23 CP IPA-360 IZ-0.500 DR-
	24 CP IPA-360 IZ-0.500 DR-
	25 CC IX0 IY-1.350
	26 CP IPA-180 IZ-0.075 DR-
	27 L IY1.200 R0
	28 L Z2.000 R0 F MAX
	29 L M9
	30 L M52
	31 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M4 x 0.7	Material	1.2379 - 60 HRC
Length	8.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	3080 U/min
Milling cutter diameter	d1 = 3.10 mm	Vf	123 mm/min	Vm	28 mm/min
Programming radius	1.52 mm	fz	0.01 mm/z	Total time	78 s
Order no.	WZG 171518/M4				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M4	; Tool = WZG 171518/M4
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.01 mm/z	; fz=0.01 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S3080 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S3080
N50 G91	4 L M14
N60 G42 G01 X0.000 Y1.550 F14 ;(F62)	5 L M51
N70 G02 X0.000 Y-3.550 I0.000 J-1.775 Z-0.105	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700 F28 ;(F123)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	9 L IY-1.550 RR F14 ;(F62)
N110 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	10 CC IX0 IY1.775
N120 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	11 CP IPA-180 IZ-0.105 DR-
N130 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	12 CC IX0 IY-2.000
N140 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	13 CP IPA-360 IZ-0.700 DR- F28 ;(F123)
N150 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	14 CP IPA-360 IZ-0.700 DR-
N160 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	15 CP IPA-360 IZ-0.700 DR-
N170 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	16 CP IPA-360 IZ-0.700 DR-
N180 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	17 CP IPA-360 IZ-0.700 DR-
N190 G02 X0.000 Y0.000 I0.000 J2.000 Z-0.700	18 CP IPA-360 IZ-0.700 DR-
N200 G02 X0.000 Y3.550 I0.000 J1.775 Z-0.105	19 CP IPA-360 IZ-0.700 DR-
N210 G40 G01 X0.000 Y-1.550	20 CP IPA-360 IZ-0.700 DR-
N220 G90	21 CP IPA-360 IZ-0.700 DR-
N230 G00 Z2.000 M9	22 CP IPA-360 IZ-0.700 DR-
N240 M30	23 CP IPA-360 IZ-0.700 DR-
	24 CP IPA-360 IZ-0.700 DR-
	25 CC IX0 IY-1.775
	26 CP IPA-180 IZ-0.105 DR-
	27 L IY1.550 R0
	28 L Z2.000 R0 F MAX
	29 L M9
	30 L M52
	31 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M5 x 0.8	Material	1.2379 - 60 HRC
Length	10.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	2513 U/min
Milling cutter diameter	d1 = 3.80 mm	Vf	141 mm/min	Vm	34 mm/min
Programming radius	1.87 mm	fz	0.014 mm/z	Total time	92 s
Order no.	WZG 171518/M5				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M5	; Tool = WZG 171518/M5
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.014 mm/z	; fz=0.014 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S2513 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S2513
N50 G91	4 L M14
N60 G42 G01 X0.000 Y1.900 F17 ;(F70)	5 L M51
N70 G02 X0.000 Y-4.400 I0.000 J-2.200 Z-0.120	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800 F34 ;(F141)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	9 L IY-1.900 RR F17 ;(F70)
N110 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	10 CC IX0 IY2.200
N120 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	11 CP IPA-180 IZ-0.120 DR-
N130 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	12 CC IX0 IY-2.500
N140 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	13 CP IPA-360 IZ-0.800 DR- F34 ;(F141)
N150 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	14 CP IPA-360 IZ-0.800 DR-
N160 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	15 CP IPA-360 IZ-0.800 DR-
N170 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	16 CP IPA-360 IZ-0.800 DR-
N180 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	17 CP IPA-360 IZ-0.800 DR-
N190 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	18 CP IPA-360 IZ-0.800 DR-
N200 G02 X0.000 Y0.000 I0.000 J2.500 Z-0.800	19 CP IPA-360 IZ-0.800 DR-
N210 G02 X0.000 Y4.400 I0.000 J2.200 Z-0.120	20 CP IPA-360 IZ-0.800 DR-
N220 G40 G01 X0.000 Y-1.900	21 CP IPA-360 IZ-0.800 DR-
N230 G90	22 CP IPA-360 IZ-0.800 DR-
N240 G00 Z2.000 M9	23 CP IPA-360 IZ-0.800 DR-
N250 M30	24 CP IPA-360 IZ-0.800 DR-
	25 CP IPA-360 IZ-0.800 DR-
	26 CC IX0 IY-2.200
	27 CP IPA-180 IZ-0.120 DR-
	28 L IY1.900 R0
	29 L Z2.000 R0 F MAX
	30 L M9
	31 L M52
	32 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M6 x 1	Material	1.2379 - 60 HRC
Length	12.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	2076 U/min
Milling cutter diameter	d1 = 4.60 mm	Vf	149 mm/min	Vm	35 mm/min
Programming radius	2.27 mm	fz	0.018 mm/z	Total time	96 s
Order no.	WZG 171518/M6				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M6	; Tool = WZG 171518/M6
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.018 mm/z	; fz=0.018 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S2076 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S2076
N50 G91	4 L M14
N60 G42 G01 X0.000 Y2.300 F17 ;(F75)	5 L M51
N70 G02 X0.000 Y-5.300 I0.000 J-2.650 Z-0.150	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000 F35 ;(F149)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	9 L IY-2.300 RR F17 ;(F75)
N110 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	10 CC IX0 IY2.650
N120 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	11 CP IPA-180 IZ-0.150 DR-
N130 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	12 CC IX0 IY-3.000
N140 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	13 CP IPA-360 IZ-1.000 DR- F35 ;(F149)
N150 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	14 CP IPA-360 IZ-1.000 DR-
N160 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	15 CP IPA-360 IZ-1.000 DR-
N170 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	16 CP IPA-360 IZ-1.000 DR-
N180 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	17 CP IPA-360 IZ-1.000 DR-
N190 G02 X0.000 Y0.000 I0.000 J3.000 Z-1.000	18 CP IPA-360 IZ-1.000 DR-
N200 G02 X0.000 Y5.300 I0.000 J2.650 Z-0.150	19 CP IPA-360 IZ-1.000 DR-
N210 G40 G01 X0.000 Y-2.300	20 CP IPA-360 IZ-1.000 DR-
N220 G90	21 CP IPA-360 IZ-1.000 DR-
N230 G00 Z2.000 M9	22 CP IPA-360 IZ-1.000 DR-
N240 M30	23 CP IPA-360 IZ-1.000 DR-
	24 CP IPA-360 IZ-1.000 DR-
	25 CC IX0 IY-2.650
	26 CP IPA-180 IZ-0.150 DR-
	27 L IY2.300 R0
	28 L Z2.000 R0 F MAX
	29 L M9
	30 L M52
	31 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M8 x 1.25	Material	1.2379 - 60 HRC
Length	15.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	1540 U/min
Milling cutter diameter	d1 = 6.20 mm	Vf	135 mm/min	Vm	30 mm/min
Programming radius	3.07 mm	fz	0.022 mm/z	Total time	142 s
Order no.	WZG 171518/M8				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M8	; Tool = WZG 171518/M8
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.022 mm/z	; fz=0.022 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S1540 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S1540
N50 G91	4 L M14
N60 G42 G01 X0.000 Y3.100 F15 ;(F68)	5 L M51
N70 G02 X0.000 Y-7.100 I0.000 J-3.550 Z-0.188	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250 F30 ;(F136)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	9 L IY-3.100 RR F15 ;(F68)
N110 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	10 CC IX0 IY3.550
N120 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	11 CP IPA-180 IZ-0.188 DR-
N130 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	12 CC IX0 IY-4.000
N140 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	13 CP IPA-360 IZ-1.250 DR- F30 ;(F136)
N150 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	14 CP IPA-360 IZ-1.250 DR-
N160 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	15 CP IPA-360 IZ-1.250 DR-
N170 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	16 CP IPA-360 IZ-1.250 DR-
N180 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	17 CP IPA-360 IZ-1.250 DR-
N190 G02 X0.000 Y0.000 I0.000 J4.000 Z-1.250	18 CP IPA-360 IZ-1.250 DR-
N200 G02 X0.000 Y7.100 I0.000 J3.550 Z-0.188	19 CP IPA-360 IZ-1.250 DR-
N210 G40 G01 X0.000 Y-3.100	20 CP IPA-360 IZ-1.250 DR-
N220 G90	21 CP IPA-360 IZ-1.250 DR-
N230 G00 Z2.000 M9	22 CP IPA-360 IZ-1.250 DR-
N240 M30	23 CP IPA-360 IZ-1.250 DR-
	24 CP IPA-360 IZ-1.250 DR-
	25 CC IX0 IY-3.550
	26 CP IPA-180 IZ-0.188 DR-
	27 L IY3.100 R0
	28 L Z2.000 R0 F MAX
	29 L M9
	30 L M52
	31 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M10 x 1.5	Material	1.2379 - 60 HRC
Length	18.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	1273 U/min
Milling cutter diameter	d1 = 7.50 mm	Vf	142 mm/min	Vm	36 mm/min
Programming radius	3.71 mm	fz	0.028 mm/z	Total time	169 s
Order no.	WZG 171518/M10				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M10	; Tool = WZG 171518/M10
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.028 mm/z	; fz=0.028 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S1273 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S1273
N50 G91	4 L M14
N60 G42 G01 X0.000 Y3.750 F18 ;(F71)	5 L M51
N70 G02 X0.000 Y-8.750 I0.000 J-4.375 Z-0.225	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500 F36 ;(F143)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	9 L IY-3.750 RR F18 ;(F71)
N110 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	10 CC IX0 IY4.375
N120 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	11 CP IPA-180 IZ-0.225 DR-
N130 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	12 CC IX0 IY-5.000
N140 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	13 CP IPA-360 IZ-1.500 DR- F36 ;(F143)
N150 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	14 CP IPA-360 IZ-1.500 DR-
N160 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	15 CP IPA-360 IZ-1.500 DR-
N170 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	16 CP IPA-360 IZ-1.500 DR-
N180 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	17 CP IPA-360 IZ-1.500 DR-
N190 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500	18 CP IPA-360 IZ-1.500 DR-
N200 G02 X0.000 Y8.750 I0.000 J4.375 Z-0.225	19 CP IPA-360 IZ-1.500 DR-
N210 G40 G01 X0.000 Y-3.750	20 CP IPA-360 IZ-1.500 DR-
N220 G90	21 CP IPA-360 IZ-1.500 DR-
N230 G00 Z2.000 M9	22 CP IPA-360 IZ-1.500 DR-
N240 M30	23 CP IPA-360 IZ-1.500 DR-
	24 CP IPA-360 IZ-1.500 DR-
	25 CC IX0 IY-4.375
	26 CP IPA-180 IZ-0.225 DR-
	27 L IY3.750 R0
	28 L Z2.000 R0 F MAX
	29 L M9
	30 L M52
	31 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M12 x 1.75	Material	1.2379 - 60 HRC
Length	20.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	1061 U/min
Milling cutter diameter	d1 = 9 mm	Vf	140 mm/min	Vm	35 mm/min
Programming radius	4.46 mm	fz	0.033 mm/z	Total time	206 s
Order no.	WZG 171518/M12				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M12	; Tool = WZG 171518/M12
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.033 mm/z	; fz=0.033 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S1061 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S1061
N50 G91	4 L M14
N60 G42 G01 X0.000 Y4.500 F18 ;(F70)	5 L M51
N70 G02 X0.000 Y-10.500 I0.000 J-5.250 Z-0.262	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750 F35 ;(F140)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	9 L IY-4.500 RR F18 ;(F70)
N110 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	10 CC IX0 IY5.250
N120 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	11 CP IPA-180 IZ-0.262 DR-
N130 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	12 CC IX0 IY-6.000
N140 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	13 CP IPA-360 IZ-1.750 DR- F35 ;(F140)
N150 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	14 CP IPA-360 IZ-1.750 DR-
N160 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	15 CP IPA-360 IZ-1.750 DR-
N170 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	16 CP IPA-360 IZ-1.750 DR-
N180 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	17 CP IPA-360 IZ-1.750 DR-
N190 G02 X0.000 Y0.000 I0.000 J6.000 Z-1.750	18 CP IPA-360 IZ-1.750 DR-
N200 G02 X0.000 Y10.500 I0.000 J5.250 Z-0.262	19 CP IPA-360 IZ-1.750 DR-
N210 G40 G01 X0.000 Y-4.500	20 CP IPA-360 IZ-1.750 DR-
N220 G90	21 CP IPA-360 IZ-1.750 DR-
N230 G00 Z2.000 M9	22 CP IPA-360 IZ-1.750 DR-
N240 M30	23 CP IPA-360 IZ-1.750 DR-
	24 CP IPA-360 IZ-1.750 DR-
	25 CC IX0 IY-5.250
	26 CP IPA-180 IZ-0.262 DR-
	27 L IY4.500 R0
	28 L Z2.000 R0 F MAX
	29 L M9
	30 L M52
	31 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!

CNC PROGRAMMING EXAMPLE



Machining			
Thread size	M16 x 2	Material	1.2379 - 60 HRC
Length	28.00 mm		

Tool		Cutting values			
Description	Carbide thread milling cutter for metric threads, hard machining	Vc	30 m/min	n	830 U/min
Milling cutter diameter	d1 = 11.5 mm	Vf	139 mm/min	Vm	39 mm/min
Programming radius	5.71 mm	fz	0.042 mm/z	Total time	319 s
Order no.	WZG 171518/M16				

NC - Options			
Machine control	Siemens / Heidenhain	Milling process	Climb milling [counterclockwise]
Milling path	Center point path, incremental	Direction of rotation	left (M4)

Note
CNC program serves as a programming example and should be tested by simulation before use.

CNC - Code Siemens	CNC - Code Heidenhain
; Tool = WZG 171518/M16	; Tool = WZG 171518/M16
; Material = 1.2379 - 60 HRC	; Material = 1.2379 - 60 HRC
; Vc=30 m/min	; Vc=30 m/min
; fz=0.042 mm/z	; fz=0.042 mm/z
; Climb milling [counterclockwise]	; Climb milling [counterclockwise]
; One cut	; One cut
; Thread type= internal right thread	; Thread type= internal right thread
N10 M6 T1	0 BEGIN PGM 1 MM
N20 G90 G54 G00 X0.000 Y0.000	1 BLK FORM 0.1 Z X-100 Y-100 Z-40
N30 Z2.000 S830 M4 M8	2 BLK FORM 0.2 Z X100 Y100 Z0
N40 G00 Z0.500	3 TOOL CALL 1 Z S830
N50 G91	4 L M14
N60 G42 G01 X0.000 Y5.750 F20 ;(F70)	5 L M51
N70 G02 X0.000 Y-13.750 I0.000 J-6.875 Z-0.300	6 L X0 Y0 R0 F MAX
N80 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000 F39 ;(F140)	7 L Z2.000 F MAX
N90 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	8 L Z0.500 F MAX
N100 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	9 L IY-5.750 RR F20 ;(F70)
N110 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	10 CC IX0 IY6.875
N120 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	11 CP IPA-180 IZ-0.300 DR-
N130 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	12 CC IX0 IY-8.000
N140 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	13 CP IPA-360 IZ-2.000 DR- F39 ;(F140)
N150 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	14 CP IPA-360 IZ-2.000 DR-
N160 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	15 CP IPA-360 IZ-2.000 DR-
N170 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	16 CP IPA-360 IZ-2.000 DR-
N180 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	17 CP IPA-360 IZ-2.000 DR-
N190 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	18 CP IPA-360 IZ-2.000 DR-
N200 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	19 CP IPA-360 IZ-2.000 DR-
N210 G02 X0.000 Y0.000 I0.000 J8.000 Z-2.000	20 CP IPA-360 IZ-2.000 DR-
N220 G02 X0.000 Y13.750 I0.000 J6.875 Z-0.300	21 CP IPA-360 IZ-2.000 DR-
N230 G40 G01 X0.000 Y-5.750	22 CP IPA-360 IZ-2.000 DR-
N240 G90	23 CP IPA-360 IZ-2.000 DR-
N250 G00 Z2.000 M9	24 CP IPA-360 IZ-2.000 DR-
N260 M30	25 CP IPA-360 IZ-2.000 DR-
	26 CP IPA-360 IZ-2.000 DR-
	27 CC IX0 IY-6.875
	28 CP IPA-180 IZ-0.300 DR-
	29 L IY5.750 R0
	30 L Z2.000 R0 F MAX
	31 L M9
	32 L M52
	33 END PGM 1 MM

Important! For controls that refer to the feed rate of the outer path, the value in brackets must be used!