

3.7 Milling rectangular pockets - POCKET1



Programming

POCKET1 (RTP, RFP, SDIS, DP, DPR, LENG, WID, CRAD, CPA, CPD, STA1, FFD, FFP1, MID, CDIR, FAL, VARI, MIDF, FFP2, SSF)



Parameters

RTP	real	Retraction plane (absolute)
RFP	real	Reference plane (absolute)
SDIS	real	Safety clearance (enter without sign)
DP	real	Pocket depth (absolute)
DPR	real	Pocket depth relative to the reference plane (enter without sign)
LENG	real	Pocket length (enter without sign)
WID	real	Pocket width (enter without sign)
CRAD	real	Corner radius (enter without sign)
CPA	real	Pocket center point, abscissa (absolute)
CPO	real	Pocket center point, ordinate (absolute)
STA1	real	Angle between longitudinal axis and abscissa Value range: $0 \leq \text{STA1} < 180$ degrees
FFD	real	Feedrate for depth infeed
FFP1	real	Feedrate for surface machining
MID	real	Maximum infeed depth for infeed (enter without sign)
CDIR	int	Milling direction for machining the pocket Value: 2 (for G2) 3 (for G3)
FAL	real	Final machining allowance on pocket edge (enter without sign)
VARI	int	Type of machining Value: 0=Complete machining 1=Roughing 2=Finishing
MIDF	real	Maximum infeed depth for finishing
FFP2	real	Feedrate for finishing
SSF	real	Speed for finishing



The cycle requires a milling cutter with an "end tooth cutting over center" (DIN 844).

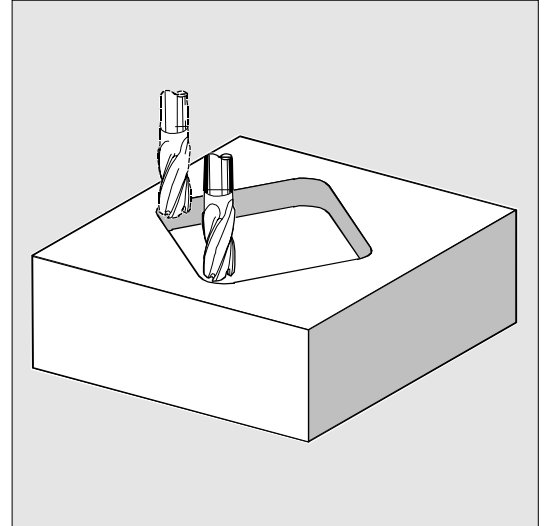


The pocket milling cycle POCKET3 can be performed with any tool.



Function

The cycle is a combined roughing-finishing cycle. With this cycle you can machine rectangular pockets in any position in the machining plane.



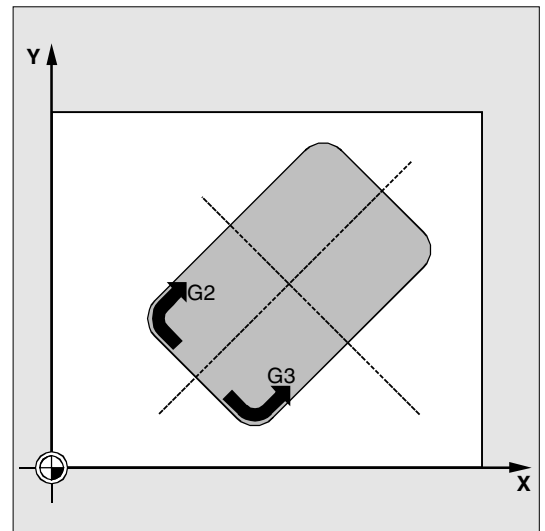
Sequence of operations

Position reached prior to cycle start:

This can be any position from which the starting position on the center point of the pocket at the retraction plane level can be approached without collision.

The cycle implements the following motion sequence:

- With G0, the pocket center point is approached at the retraction plane level and then, from this position, with G0 the reference plane brought forward by the safety clearance is approached. Complete machining of the pocket is performed in the following stages:
 - Infeed to the next machining depth with G1 and feedrate FFD.
 - Pocket milling up to the final machining allowance with feedrate FFP1 and the spindle speed that was active before the cycle was called.
- After roughing is completed:
 - Infeed to the machining depth defined by MIDF
 - Final machining allowance along the contour at feedrate FFP2 and speed SSF.
 - The machining direction is defined by CDIR.



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- When machining of the pocket is completed the tool is traversed to the pocket center point on the retraction plane and the cycle is terminated.



Description of parameters



See Section 2.1.2. (Drilling, Centering – CYCLE81) for a description of parameters RTP, RFP, SDIS.



See Section 3.5 (SLOT1) for a description of parameters FFD, FFP1, MID, CDIR, FAL, VARI, MIDF, FFP2, SSF.

See Section 3.2 for cycle setting data _ZSD[1].

DP and DPR (pocket depth)

The pocket depth can be defined as either absolute (DP) or relative (DPR) to the reference plane.

If it is entered as a relative value, the cycle automatically calculates the correct depth on the basis of the positions of the reference and retraction planes.

LENG, WID and CRAD (length, width and radius)

The shape of a pocket in the plane is determined with parameters LENG, WID and CRAD.

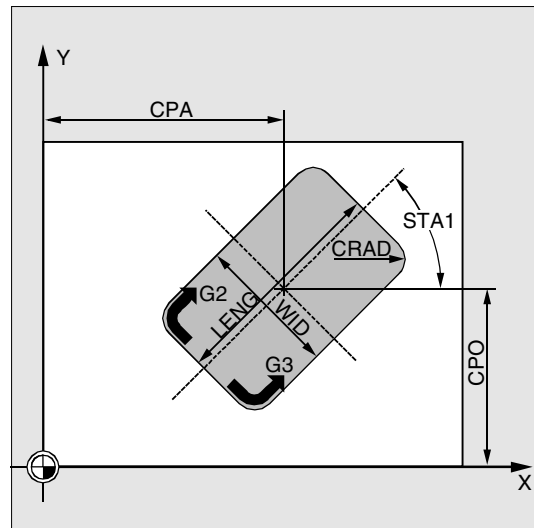
If it is not possible to traverse to the programmed corner radius with the active tool because its radius is larger, the corner radius of the completed pocket corresponds to the tool radius. If the milling cutter radius is greater than half the length or width of the pocket, the cycle is aborted and alarm 61105 "Cutter radius too large" is output.

CPA, CPO (center point)

With parameters CPA and CPO you define the center point of the pocket in the abscissa and ordinate.

STA1 (angle)

STA1 defines the angle between the positive abscissa and the longitudinal axis of the pocket.





Further notes

A tool offset must be activated before the cycle is called. Otherwise the cycle is aborted and alarm 61000 "No tool offset active" is output.

A new workpiece coordinate system that influences the actual value display is used in the cycle. The zero point of this coordinate system lies on the pocket center point.

The original coordinate system becomes active again after the end of the cycle.

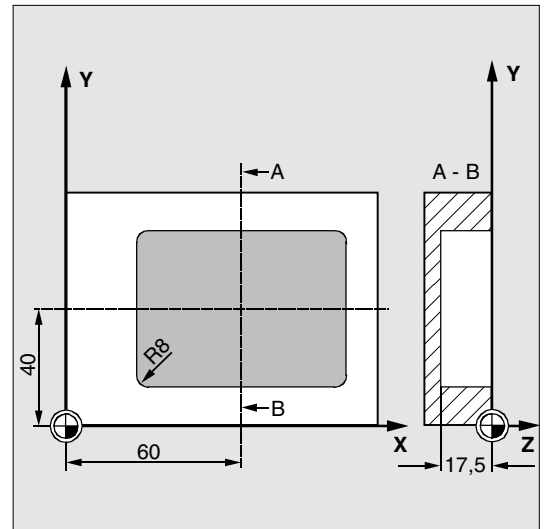


Programming example

Pocket

With this program you can machine a pocket that is 60 mm long, 40 mm wide, 17.5 mm deep (difference between the reference plane and the base of the pocket) and which has a corner radius of 8 mm in the XY plane. The angle to the X axis is 0 degrees. The final machining allowance of the pocket edges is 0.75 mm, the safety clearance in the Z axis, which is added to the reference plane, is 0.5 mm. The center point of the pocket lies at X60 and Y40, the maximum depth infeed is 4 mm.

Only roughing is to be performed.



```
DEF REAL LENG, WID, DPR, CRAD
```

Definition of variables

```
DEF INT VARI
```

```
N10 LENG=60 WID=40 DPR=17.5 CRAD=8
```

Value assignments

```
N20 VARI=1
```

```
N30 G90 T20 D2 S600 M4
```

Specification of technology values

```
N40 G17 G0 X60 Y40 Z5
```

Approach starting position

```
N50 POCKET1 (5, 0, 0.5, , DPR, ->
-> LENG, WID, CRAD, 60, 40, 0, ->
-> 120, 300, 4, 2, 0.75, VARI)
```

Cycle call

Parameters MIDF, FFP2 and SSF are omitted

```
N60 M30
```

End of program

-> Must be programmed in a single block