

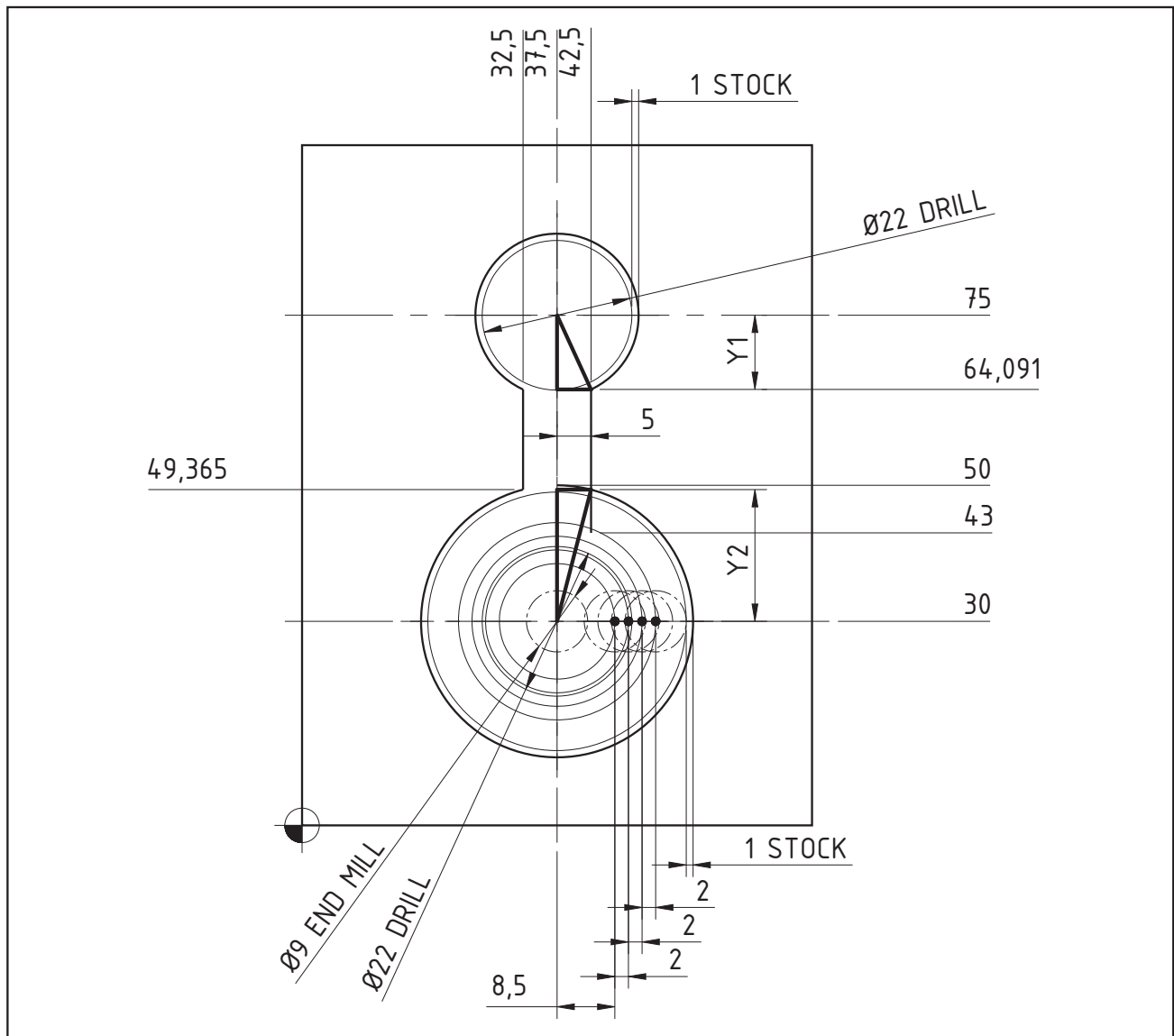
## Circular Pockets

The included solution uses three cutting tools - T01 = #5 standard center drill, T02 = Ø22 mm drill that opens each pocket at its center, and T03 = Ø9 mm center cutting carbide end mill. Only two calculations are necessary:

$$Y1 = \sqrt{12^2 - 5^2} = 10.909 \quad Y2 = \sqrt{20^2 - 5^2} = 19.365$$

For reference, speeds and feeds have been calculated for each tool using the following standard formulas:

$$\begin{aligned} T01 &= (25 \text{ m/min} \times 1000) / (3.14 \times 6.25) = 1274 \text{ r/min} & (\text{Ø6.25 mm is the effective diameter}) \\ T02 &= (60 \text{ m/min} \times 1000) / (3.14 \times 22) = 868 \text{ r/min} \\ T03 &= (50 \text{ m/min} \times 1000) / (3.14 \times 9) = 1769 \text{ r/min} \end{aligned}$$



Program listing matches the toolpaths in the illustration:

(33-04 - CIRCULAR POCKETS)

(X0Y0 = LL CORNER - Z0 = TOP OF PART)

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N1 G21
N2 G17 G40 G80 T01 (T01 - #5 CENTER DRILL)
N3 M06
N4 G90 G54 G00 X37.5 Y30.0 S1274 M03 T02
N5 G43 Z10.0 H01 M08
N6 G99 G82 R2.0 Z-7.0 P200 F100.0
N7 Y75.0
N8 G80 G00 Z10.0 M09
N9 G28 Z10.0 M05
N10 M01

N11 T02 (T02 - 22 MM DIA U-DRILL)
N12 M06
N13 G90 G54 G00 X37.5 Y75.0 S868 M03 T03
N14 G43 Z10.0 H02 M08
N15 G99 G81 R2.0 Z-13.0 F110.0
N16 Y30.0
N17 G80 G00 Z10.0 M09
N18 G28 Z10.0 M05
N19 M01

N20 T03 (T03 - 9MM DIA CARBIDE END MILL)
N21 M06
N22 G90 G54 G00 X37.5 Y30.0 S1769 M03 T01
N23 G43 Z10.0 H03 M08
N24 G01 Z-11.0 F500.0
N24 G91 X8.5 F200.0 (1 MM BELOW BOTTOM)
N25 G03 I-8.5 (2 MM WIDE CUT 1)
N26 G01 X2.0 (ROUGH CUT 1)
N27 G03 I-10.5 (2 MM WIDE CUT 2)
N28 G01 X2.0 (ROUGH CUT 2)
N29 G03 I-12.5 (2 MM WIDE CUT 3)
N30 G01 X2.0 (ROUGH CUT 3)
N31 G03 I-14.5 (2 MM WIDE CUT 4)
N32 G90 G00 X37.5 (ROUGH CUT 4)
N33 G41 G01 X42.5 Y43.0 D01 F300.0 (CENTER POSITION)
N34 Y64.091 F150.0 (START POINT FOR FINISH)
N35 G03 X32.5 I-5.0 J10.909 (RIGHT SIDE OF SLOT)
N36 G01 Y49.365 (RADIUS 12 CUTTING)
N37 G03 X37.5 Y50.0 I5.0 J-19.365 (LEFT SIDE OF SLOT)
N38 G40 G00 Y30.0 (RADIUS 20 CUTTING)
N39 Z10.0 M09 (CENTER POSITION)
N40 G28 X37.5 Y30.0 Z10.0 M05
N41 M30
%
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