

Thread Calculator Manual

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1 Main Window

Choose **External Thread Calculator** for external thread calculations, such as depth of cut, number of passes, and finishing allowance.

Choose **Internal Thread Calculator** for internal thread calculations related to center drilling, drilling, and tapping.

2 External Thread Calculator: CYCLE99

2.1 With Runout

2.1.1 Designation

Enter the standard ISO metric thread designation here. Accepted forms (examples):

- M12x1.75-6g
 - Both x and × may be used.
- M12x1.75
 - In this case, calculations use the default tolerance grade and class specified in ISO 965-1.
- M12-6g
 - In this case, calculations use the coarse thread values specified in ISO 261.
- M12
 - In this case, calculations use the default tolerance grade and class specified in ISO 965-1.
 - Coarse thread values specified in ISO 261 are also applied.
- 12
 - This is the simplified form of the previous designation; default values from the relevant standards are applied.

2.1.2 Thread Start Point and Length

Thread start point — the Z-coordinate of the thread start point on a lathe machine, in millimeters. This value may be any real number.

Length — the length of the thread as shown on the technical drawing, in millimeters. This value must be positive. For example, if the thread start point is 0 and the thread length is 10, the input should be: 0, 10.

Below is a sample workpiece featuring an external thread with runout:

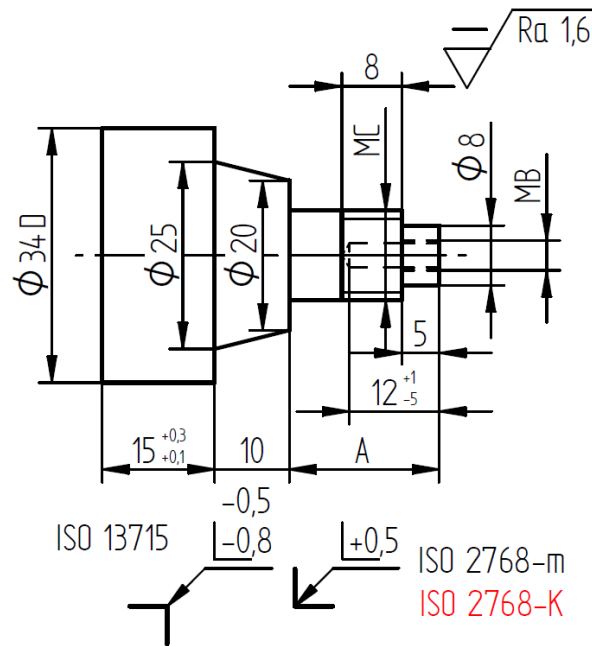


Figure 1: Sample workpiece with an external thread with runout.

Assume MC is given as M14. According to the technical drawing, the external thread start point is -5 and the thread length is 8 . Entering these values into the Thread Calculator yields the following results:

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With Runout

With Undercut

Input

Designation: 14

Thread start point and its length: -5, 8

Calculate

Clear Output

Output

SPL: -5.0
DM1: 14.0
FPL: -18.0
APP: 2.0
ROP: 5.0
TDEP: 1.2858
FAL: 0.08
IANG: 28
NRC: 7
PIT: 2.0
VARI: 300103 (constant area)

Figure 2: Program output.

The program output displays the calculated values for the corresponding fields in the Sinumerik threading cycle (CYCLE99).

2.2 With Undercut

The fields under this tab are filled in a similar manner to those for a thread with runout. However, this mode includes an additional field for the PDX value of the insert, as the thread end point depends on it.

Example

Below is a sample workpiece featuring an external thread with an undercut:

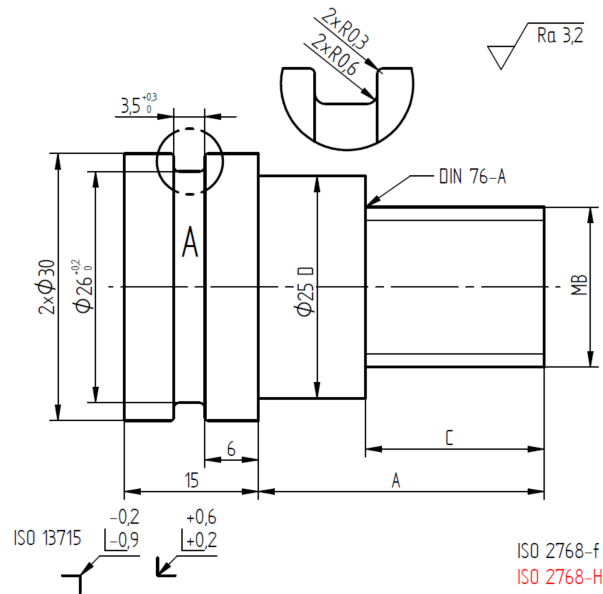


Figure 3: Sample workpiece with an external thread with undercut.

Assume MB is given as M20 and C as 22. According to the technical drawing, the external thread start point is 0 and the thread length is 22. Entering these values into the Thread Calculator yields the following results:

The screenshot shows the 'With Undercut' tab of the Thread Calculator. The input fields are filled with the following values:

- Designation: 20
- Thread start point and its length: 0, 22
- PDX-value of your insert: 1.5

The output section displays the following results:

- SPL: 0.0
- DM1: 20.0
- FPL: -20.0
- APP: 2.5
- ROP: g1-(2.0)
- TDEP: 1.5970
- FAL: 0.08
- IANG: 28
- NRC: 9
- PIT: 2.5
- VARI: 300103 (constant area!)

Figure 4: Program output.

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Center Drill Deep Hole Drill Tapping

Input

Designation: m3

Hole start point: 0

Center drill cone angle: 120

Calculate Clear Output

Output

RFP: 0.0
DP: -0.46910

Figure 6: Program output.

3.2 Deep Hole Drilling: CYCLE83

3.2.1 Tapping Tool Form

This is the letter corresponding to the chamfer size of the tapping tool. For example, the maximum chamfer size for a type C tool is $3p$.

3.2.2 Hole Start Point and Thread Length

This input specifies the Z-coordinate of the hole start point and the thread length, both in millimeters.

3.2.3 Deep Hole Drill Cone Angle

This is the cone angle of the tool used for deep hole drilling, measured in degrees.

Note: By clicking the **Get Data** button, the relevant hole data entered in the Center Drill input fields can be copied automatically into the corresponding fields on the Deep Hole Drill page.

Example

According to the technical drawing (Figure 5), the thread length is 5. Figure 7 shows the input field values when the tapping tool form is C and the drill cone angle is 118° .

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Center Drill Deep Hole Drill Tapping

Input

Designation: m3

Tapping tool form (e.g., C): c

Hole start point and thread length: 0, 5

Deep hole drill cone angle: 118

Get Data Calculate Clear Output

Output

RFP: 0.0
DP: -8.500
FDEP: -5.0

Figure 7: Program output.

Note: The final hole depth (DP) must lie within the tolerance range specified in the technical drawing, 12_{+1}^{-5} .

3.3 Tapping: CYCLE84

This section does not require any additional input data. All fields can be populated automatically by clicking the **Get Data** button.

The screenshot displays a software interface for the CYCLE84 Tapping program. At the top, there is a navigation bar with a '← Back' button and three tabs: 'Center Drill', 'Deep Hole Drill', and 'Tapping'. The 'Tapping' tab is currently selected. Below the tabs, the interface is divided into two main sections: 'Input' and 'Output'.

The 'Input' section contains three text input fields:

- 'Designation:' with the value 'm3'.
- 'Tapping tool form (e.g., C):' with the value 'c'.
- 'Hole start point and thread length:' with the value '0, 5'.

Below these fields are three buttons: 'Get Data', 'Calculate', and 'Clear Output'.

The 'Output' section on the right displays the following results:

- RFP: 0.0
- DP: -6.5
- SDAC: 5
- PIT: 0.5

Figure 8: Program output.