



# HEIDENHAIN



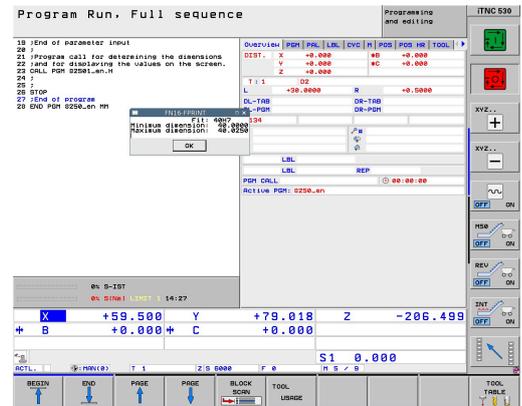
## NC Solutions

Description of NC Program 8250

English (en)  
6/2020

# 1 Description of NC program 8250\_en.h

NC program for displaying the dimensions of a tolerance in the uniform hole and uniform shaft systems on the screen.



### Requirement:

The dimensions of a fit that are dimensioned in the uniform hole and uniform shaft systems should be displayed on the screen.

### Solution:

The values of the tolerance tables for the uniform hole and uniform shaft systems were transferred into two freely defined tables. In the NC program, define the nominal dimension and the tolerance. Then the control determines the tolerance values from these and calculates the maximum dimension and the minimum dimension. The control then displays these calculated values on the screen.

 The NC program is operable with iTNC 530 NC software 34049x-07 and 60642x-02 or higher.

### NC program 8250\_en.h

In the NC program 8250\_en.h, define the basic size with a Q parameter and the tolerance in a string parameter. Then the control calls the NC program 82501\_en.h. If you do not save both NC programs in the same directory, you must adjust the file path in the program call. After the NC program 82501\_en.h has been executed, the control jumps back into the main program. In order to interrupt the run at this point, a stop is programmed in the example program. The control then ends the NC program.

Simply copy the content of this NC program to the point in your machining program where the dimensions should be displayed on the screen.

Parameter	Name	Meaning
Q1	BASIC SIZE	Nominal dimension of the hole or shaft
QS1	TOLERANCE	Tolerance specification in the uniform hole or uniform shaft systems

### NC program 82501\_en.h

In the NC program 82501\_en.h, the control determines the dimensions of the fit defined in the NC program 8250\_en.h. With these dimensions, the control calculates the maximum dimension and the minimum dimension. The control displays these dimensions on the screen.

First, the control defines the lower case letter a in parameter QS2. In the next step, the control checks whether the letter of the defined fit is alphabetically before or after the lower case letter a. The control saves the result in parameter Q2.

Depending on the fit defined by you, the control decides as follows:

- You defined a uniform hole with an upper case letter. This letter alphabetically comes before the lower case letter a. The control saves the value -1 in the parameter Q2
- You defined a uniform shaft with a lower case letter. This letter alphabetically comes after the lower case letter a or is at the same position. The control saves the value 0 or +1 in Q2

Then the control uses the **FN26 TABOPEN** function to open the table 82503\_hole.tab in which the dimensions for the uniform hole system are defined. Subsequently, the control checks by means of the value that is saved in Q2 whether the fit is defined in the uniform hole system.

- If the value saved in Q2 is -1, a fit was defined in the uniform hole system. The control then jumps to the **LBL 1** jump label
- If the value saved in Q2 is 0 or +1, a fit was defined in the uniform shaft system. In this case, the NC program continues to run without jump

Then the control uses the **FN26 TABOPEN** function to open the 82503\_shaft.tab table. In this table, the dimensions for tolerances are saved for the uniform shaft system. The **LBL 1** jump label is defined next.

Then the control saves the value 0 in parameter Q2. This parameter serves as counter for the table row from here on. With the **FN 28 TABREAD** function, the control reads the value from the **RANGE** column in row 0 of the table.

Subsequently, the **LBL 11** jump label is defined.

Then the control checks whether the defined basic size is larger than the value read out from the table:

- If the basic size is larger than the table value, the control jumps to the **LBL 12** jump label
- If the basic size is not larger the table value, the NC program continues without jump

Then the control reads from the tables with the **NF 28 TABREAD** function. It reads out the value from the column of the fit defined in QS1 and from the row defined in Q2. The control saves this read out value in parameter Q4.

Then the control increments the value in the row counter Q2.

Subsequently, it again reads out the value of the newly calculated row and the column with the name corresponding to QS1 from the table. The control saves this value in parameter Q5. In the next NC block, the control jumps to the **LBL 99** jump label.

In the NC program, the next defined jump label is **LBL 12**. Then the control increments the value in the row counter Q2 by two. Then it reads out the value in the **RANGE** column and in the row saved

in counter Q2 from the table. It saved this value in parameter Q3. Subsequently, the control jumps to the **LBL 11** jump label.

The next step in the NC program is the **LBL 99** jump label. Then the control calculates the maximum dimension of the fit. For this purpose, it adds one thousandth of the upper dimension in parameter Q4 to the basic size in parameter Q1. The control saves the result in parameter Q2. Then it calculates the minimum dimension. For this purpose, it adds one thousandth of the lower dimension in Q5 to the basic size in Q1. The control saves the minimum dimension in parameter Q3.

Subsequently, the control combines the basic size and the tolerance to a text variable. For this purpose, it converts the value of the basic size in Q1 into a text variable and appends the text variable for the tolerance in QS1. It saves the text resulting from this in QS2.

Then the control uses the FN 16 F-PRINT function to display the content of the mask file 82502\_en.a on the screen. Then the control ends the NC program and jumps back to the main program.

#### **Mask file 82502\_en.a**

In order to display texts and values on the screen, the output format must be defined with a mask file. The file 82502\_en.a specifies the texts and placeholders that are filled with the Q parameters QS2, Q2, and Q3 during output.

```
"Fit %S",QS2;
```

```
"Minimum dimension:%9.4LF",Q3;
```

```
"Maximum dimension:%9.4LF",Q4;
```

```
M_CLOSE;
```

**Table 82503\_hole.tab**

In the table 82503\_hole.tab, the dimensions for the general tolerances in compliance with ISO 286 are defined in the uniform hole system. The defined diameter ranges from 0 mm to 400 mm.

The following tolerances are defined:

- D10
- E9
- F7
- F8
- G7
- G9
- H6
- H7
- H8
- H9
- H11
- H12
- H13
- JS7
- JS9
- K6
- K7
- M6
- M7
- N7
- N9
- P7
- P9
- R7

**Table 82503\_shaft.tab**

In the table 82503\_shaft.tab, the dimensions for the general tolerances according to ISO 286 are defined in the uniform shaft system. The defined diameter ranges from 0 mm to 400 mm.

The following tolerances are defined:

- d9
- e8
- f7
- g6
- h5
- h6
- h7
- h8
- h9
- h11
- js5
- js6
- js13
- js14
- k5
- k6
- m5
- m6
- n6
- p6
- r6
- s6
- s7