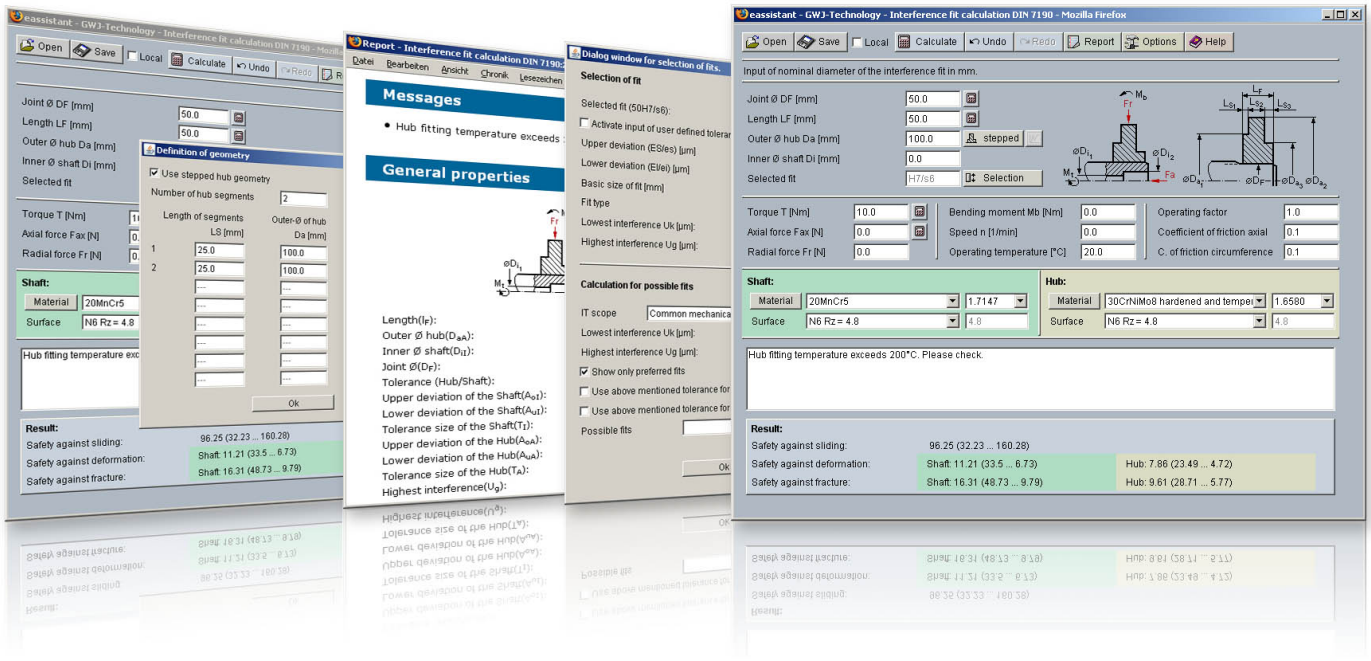
Calculation Example

Interference Fit According to DIN 7190



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0.1 Calculation Example: Interference Fit According to DIN 7190

0.1.1 Start the Calculation Module

Please login with your username and your password. To start the calculation module for interference fits, please click the menu item 'Connections' on the left side and then select 'Interference fit'.

0.1.2 Calculation Example

A cylindrical interference fit has to be dimensioned against sliding. Enter the following values:

Joint diameter = 50 mm
Length = 20 mm
Outer diameter hub = 95 mm
Inner diameter shaft = 30 mm
Torque = 80 Nm
Axial force = 125 N
Speed = 2,000 min^{-1}
Operating temperature = 25 °C
Operating factor = 1.2
Coefficient of friction axial = 0.15
Coefficient of friction circumference = 0.15
Material shaft = 20MnCr5
Surface shaft = N6
Material hub = C45 hardened and tempered
Surface hub = Rz = 6

0.1.3 Start the Calculation

Please start to enter the values into the input field. All important calculation results will be calculated during every input and will be displayed in the result panel. A recalculation occurs after every data input. During the input of the values it can happen that the results will be marked in red. Nevertheless, please continue to enter the data as usual.

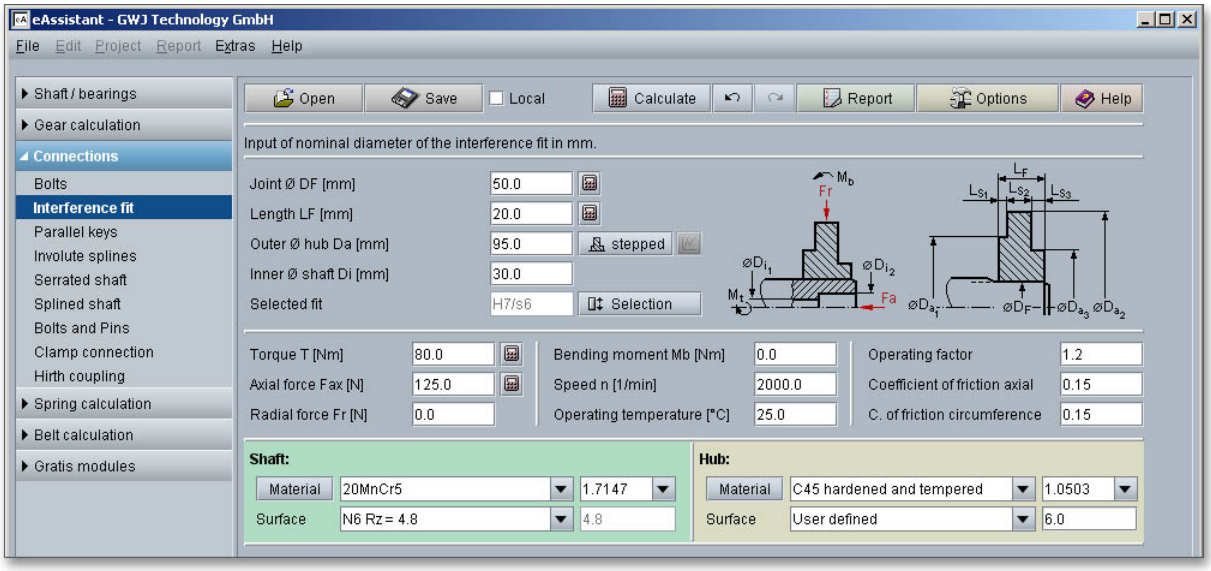

Figure 1: Input of the values

Hinweis: Please note the section 'Selection of fit' for the specification of the tolerances. With the definition of the surface quality of the hub, you have to notice that the given value (Rz = 6) has to be entered by the 'User-defined' input. Select 'User-defined' in the appropriate listbox and enter the desired value into the input field next to the listbox.

Selection of Fit/Calculation of Possible Fits

The button 'Selection' allows you to open the dialog window for selection of fits. Here you can choose the possible tolerances or the appropriate fits can be suggested.

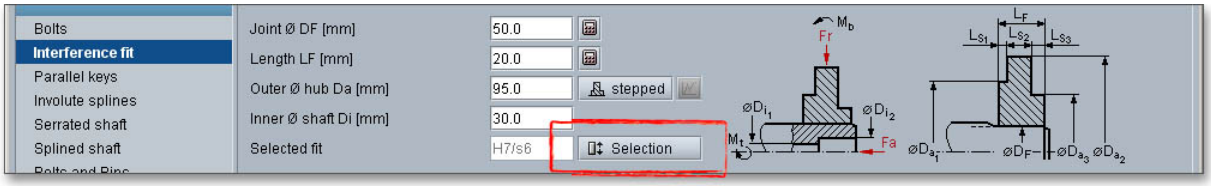

Figure 2: Button 'Selection'

Enable 'Show only preferred fits' and click the button 'Search fits'.

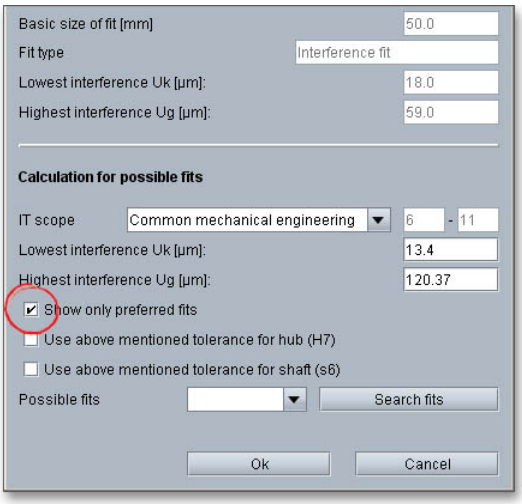

Figure 3: Activate preferred fits

Two fits will be recommended to you.

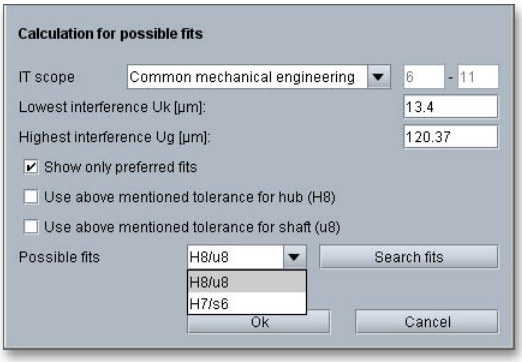

Figure 4: Recommended fits

Select the fit H7/s6 and click the button 'Ok'.

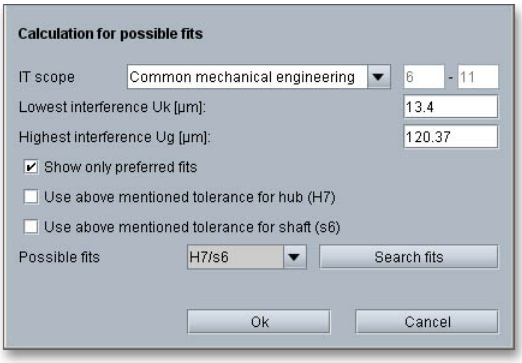

Figure 5: Select the fit H7/s6

Automatic Dimensioning of the Maximum Torque

Due to the fit calculation, a safety close to the given minimum safety has been determined. By the help of the comfortable dimensioning functions, other values can be checked and optimized regarding the use of the minimum safety. So the maximum torque can be defined by using the given minimum safety against sliding ($S_R = 1.2$). The button 'Options' allows you to specify the minimum safety. Click on the dimensioning button (calculator symbol) next to the input field for the torque.

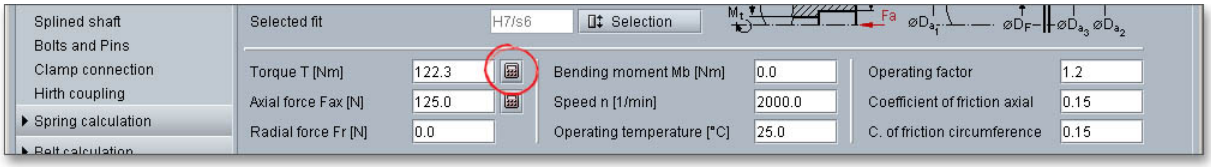

Figure 6: Automatical dimensioning function

The maximum torque is determined.

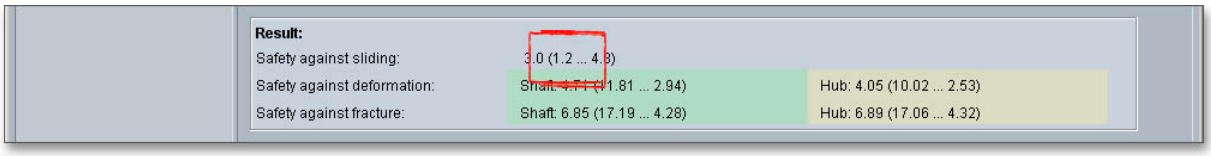

Figure 7: Minimum safety

Here the maximum torque is 83.60 Nm. If you enter now a higher value than '83.60 Nm', the safety against sliding is fallen below.

The calculation result is marked in red. You will get an appropriate information in the message window.

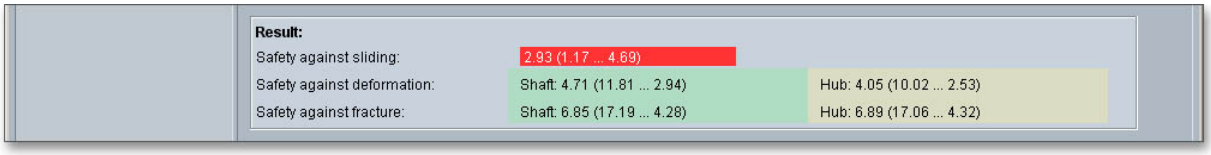

Figure 8: Result panel

Now click on the calculator symbol again, then the maximum torque is determined (83.50 Nm) and the minimum safety of 1.2 is fulfilled. The specifications of the results is given for the lowest, highest and mean

interference. If the minimum safety is not fulfilled, then the safety is marked in red.

0.1.4 Calculation Results

All important calculation results, such as the lowest, highest and mean interference, will be calculated during every input and will be displayed in the result panel. A recalculation occurs after every data input. Any changes that are made to the user interface take effect immediately. If the result exceeds certain values (e.g., the minimum safety), the result will be marked red.

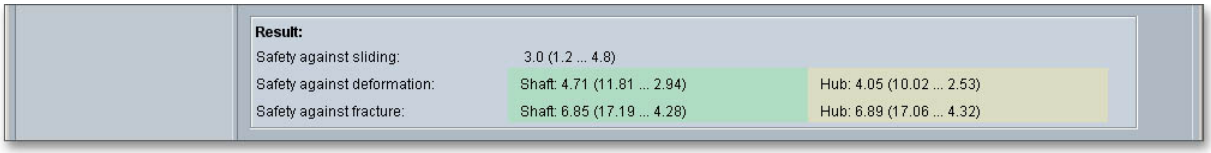

Figure 9: Calculation results

0.1.5 Documentation: Calculation report

In case you have finished your calculation, please click on the button 'Report'.

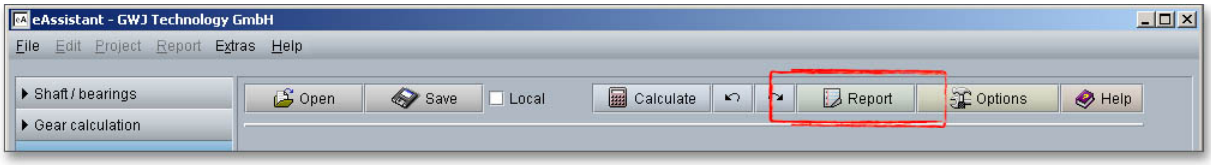

Figure 10: Button 'Report'

The calculation report contains a table of contents. You can navigate through the report via the table of contents that provides links to the input values, results and figures. The report is available in HTML and PDF format. Calculation reports, saved in HTML format, can be opened in a web browser or in Word for Windows.

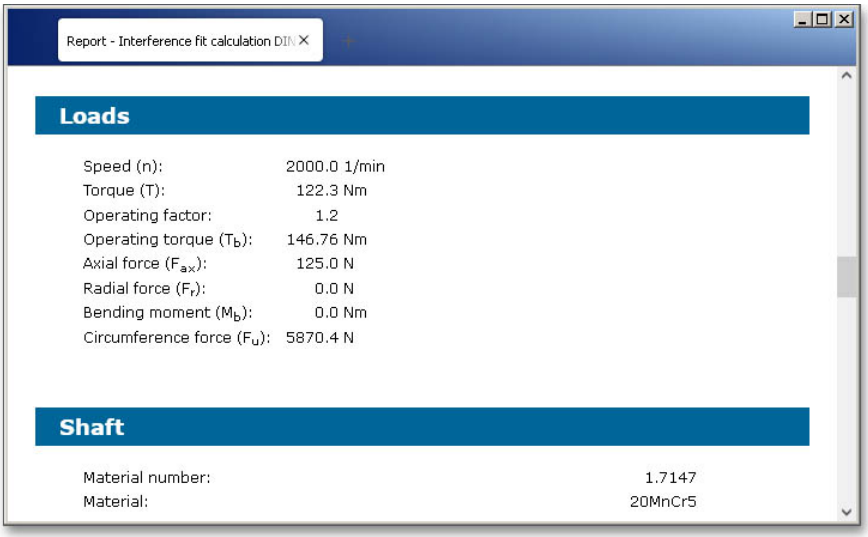

Figure 11: Calculation report

You may also print or save the calculation report:

- To save the report in the HTML format, please select 'File' ⇒ 'Save as' from your browser menu bar. Select the file type 'Webpage complete', then just click on the button 'Save'.

- If you click on the symbol 'Print', then you can print the report very easily.
- If you click on the symbol 'PDF', then the report appears in the PDF format. If you right-click on the PDF symbol, you should see the 'Save Target As' option. Click on that option and you will see the dialog box for saving the report.

0.1.6 How to Save the Calculation

When the calculation is finished, it is easy to save the calculation. You can save your calculation either to the eAssistant server or to your computer. Click on the button 'Save'.

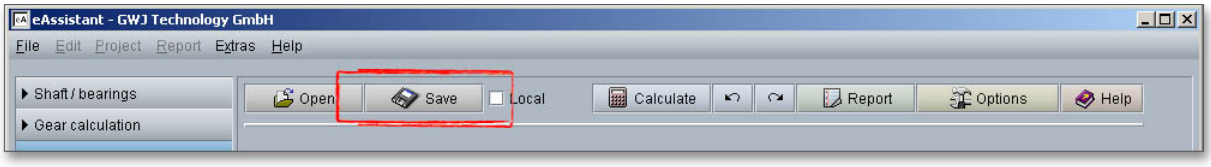

Figure 12: Button 'Save'

Before you can save the calculation to your computer, you need to activate the checkbox 'Local' in the calculation module. A standard Windows dialog for saving files will appear. Now you will be able to save the calculation to your computer.

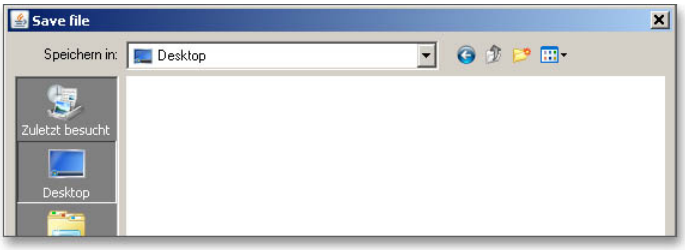

Figure 13: Windows dialog to save the file

In case you do not activate the option in order to save your files locally, then a new window is opened and you can save the calculation to the eAssistant server. Please enter a name into the input field 'Filename' and click on the button 'Save'.

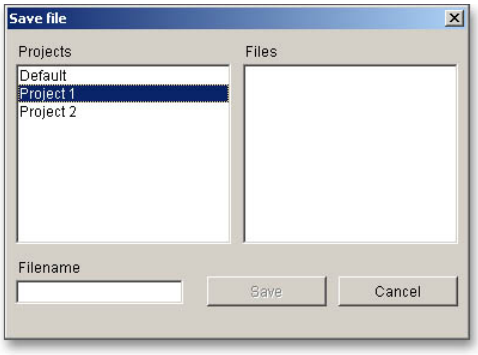

Figure 14: Save the calculation

Our manual is improved continually. Of course we are always interested in your opinion, so we would like to know what you think. We appreciate your feedback and we are looking for ideas, suggestions or criticism. If you have anything to say or if you have any questions, please let us know by phone *+49 (0) 531 129 399-0* or email *eAssistant@gwj.de*.