

# FED 14

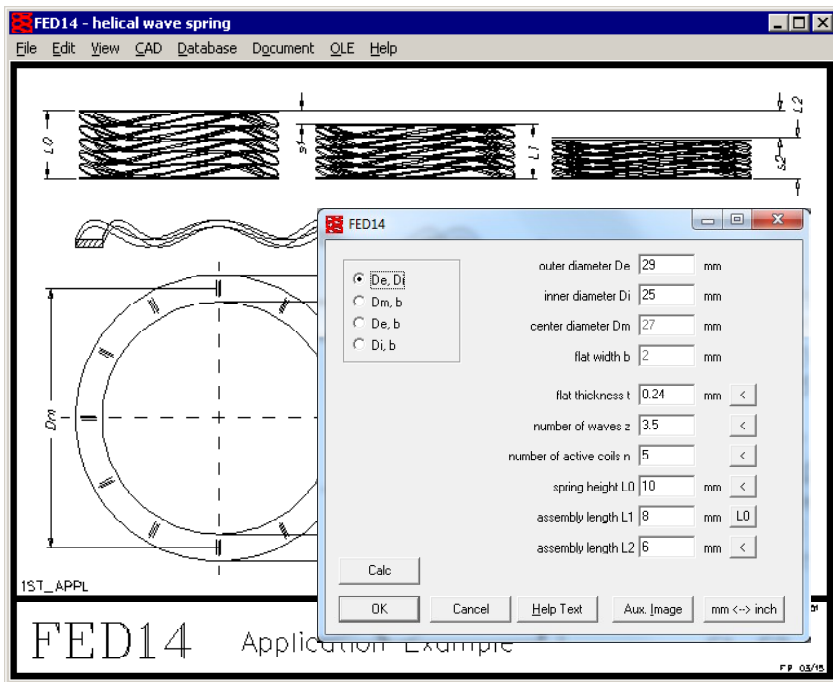


www.hexagon.de

## Software for Helical Wave Springs

for Windows

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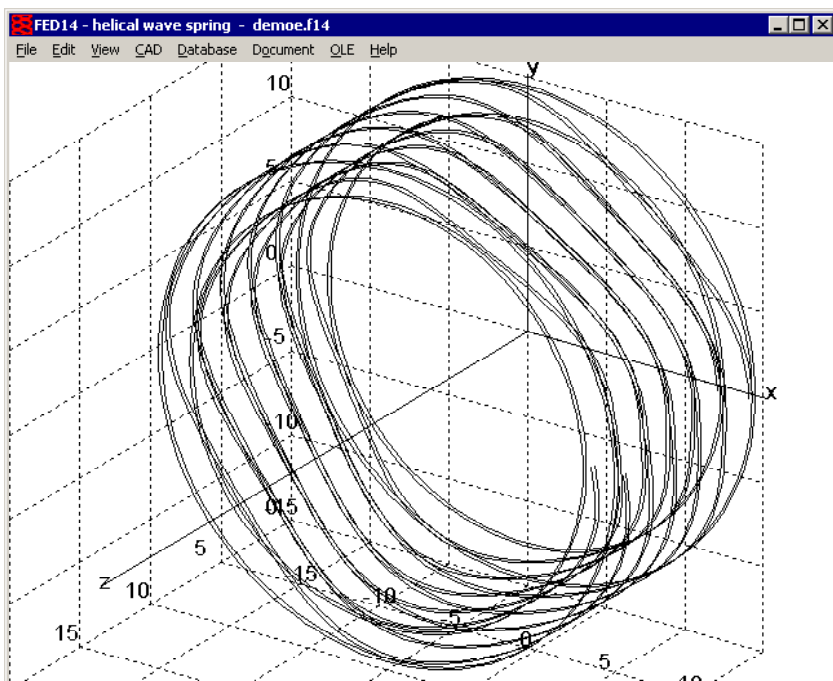


### Calculation of Helical Compression Springs

FED14 calculates helical coiled wave springs of flat spring material. Crests of the coiled waves must lay exactly on each other, therefore the number of waves per turn must always be x.5, preferred 2.5 or 3.5 or 4.5 waves. FED14 calculates spring rate, load-deflection diagram, and bending stress for axial load of the helical wave spring. Input data are inner and outer coil diameter, flat thickness, number of waves per turn, number of turns (coils), and spring length L0. FED14 calculates load and bending stress for operating length L1 and L2. Inactive end coils (unwaved) may also be considered.

### Pre-Dimensioning

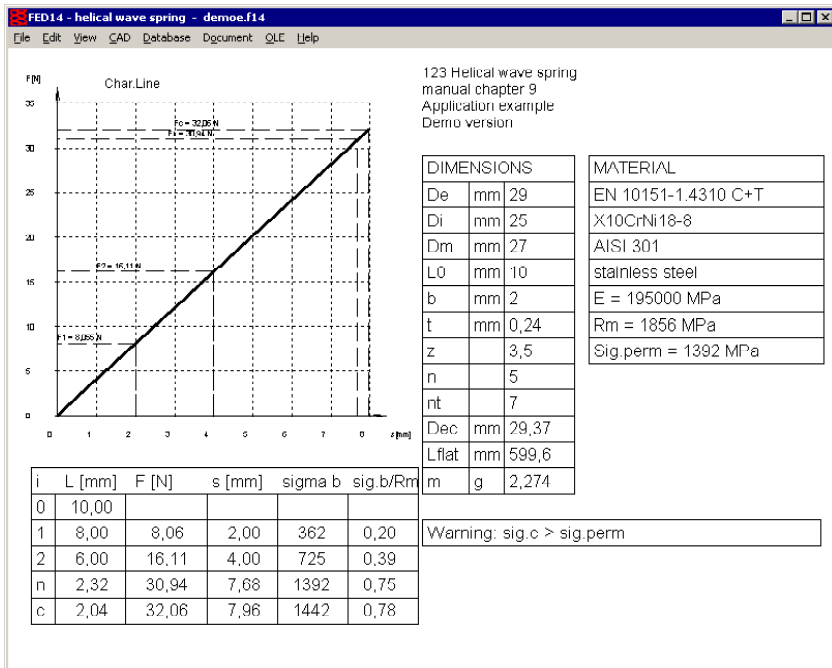
In Pre-Dimensioning, you can calculate dimensions of a helical wave spring by input of only one or two spring loads and spring deflection or stroke. By means of coil ratio, stress safety  $\sigma_{maz}/\sigma_{sigma2}$ , block safety  $s_c/s_2$  and number of waves you can modify the calculated dimensions.



### Material Database

Material properties of the most important flat spring materials (tensile strength, permissible shear stress and bending stress as function of material thickness, modulus of elasticity, density) are stored in the integrated material database. The dbf file may be extended and modified by the user.

NAME1	NAME2	NAME3	NAME4	E	DICHTE	RM0	DR0
EN 10089 S15C17	hot-rolled spring steel			206000	7.85	1700	
EN 10089 S15C17	hot-rolled spring steel	1.7109		206000	7.85	1650	
EN 10132-4 10S20-0T	cold-rolled steel strip	1.2087		206000	7.8	1720	
EN 10132-4 12S22-0T	cold-rolled steel strip	1.2042		206000	7.8	1720	
EN 10132-4 48S17-0T	cold-rolled steel strip	1.5021		206000	7.8	1500	
EN 10132-4 51C14-0T	cold-rolled steel strip	1.8159		206000	7.8	1630	
EN 10132-4 56S17-0T	cold-rolled steel strip	1.5025		206000	7.8	1500	
EN 10132-4 75S18-0T	cold-rolled steel strip	1.5694		206000	7.8	1630	
EN 10132-4 90LV2-0T	cold-rolled steel strip	1.2225		206000	7.8	1720	
EN 10132-4 C1005-0T	cold-rolled steel strip	1.1274		206000	7.8	1720	
EN 10132-4 C1255-0T	cold-rolled steel strip	1.1224		206000	7.8	1720	
EN 10132-4 C385-0T	cold-rolled steel strip	1.1204		206000	7.8	1600	
EN 10132-4 C395-0T	cold-rolled steel strip	1.1211		206000	7.8	1500	
EN 10132-4 L3/5-0T	cold-rolled steel strip	1.1221		206000	7.8	1500	
EN 10132-4 C755-0T	cold-rolled steel strip	1.1248		206000	7.8	1630	
EN 10132-4 C385-0T	cold-rolled steel strip	1.1269		206000	7.8	1630	
EN 10132-4 C395-0T	cold-rolled steel strip	1.1217		206000	7.8	1720	
EN 10151-1 4401 C-1	AISI 301	17-7 PH	stainless steel	190000	7.9	2000	
EN 10151-1 4401 C-1	AISI 316	17-7 PH	stainless steel	190000	7.95	1300	
EN 10151-1 4568 C-1	AISI 316	17-7 PH	stainless steel	200000	7.9	1650	



### Load-deflection diagram

FED14 calculates characteristic line of spring (load-deflection diagram) as function of spring travel and spring length.

### Goodman-Diagram

If dynamically loaded, Goodman diagram is useful to calculate fatigue strength safety and bearable load cycles of the spring.

### Quick View

In Quick View, spring data and calculation results, drawings and diagrams are printed altogether on one screen.

### Text Printout

Input data and calculation results with spring travel, spring length, spring load and stresses for different spring positions may be printed, saved as text or HTML file, or exported to Microsoft Excel.

### Production Drawing

FED14 generates a production drawing of the helical wave spring with all dimensions. Drawing header according to ISO 7200 contains description and modifications as entered in FED14.

### Spring Drawing 3D

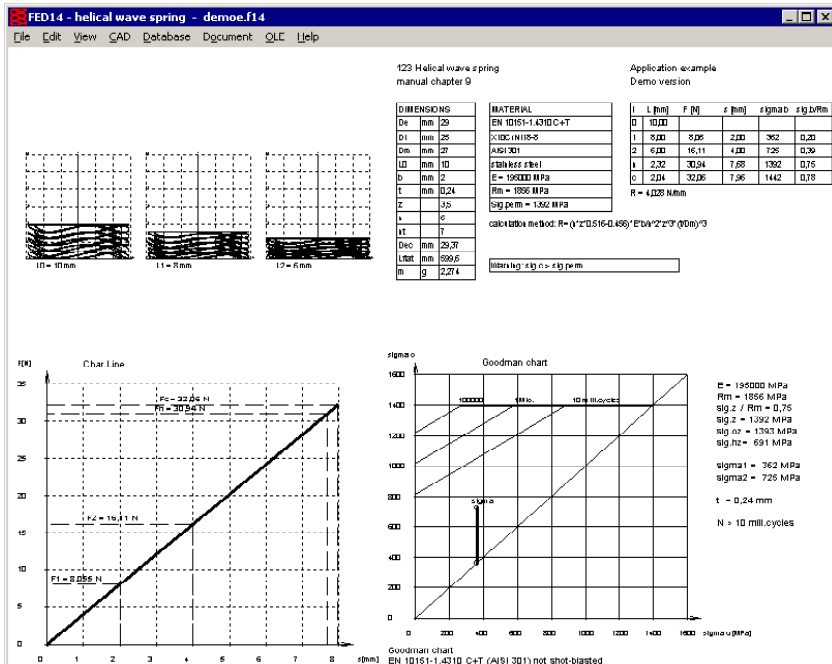
FED14 generates a true-scale drawing of the helical wave spring that can be exported to your CAD system as DXF or IGES file.

### HEXAGON-Help System

Auxiliary text and images are available for all dialogue windows. If error messages occur, you can get description and remedy suggestion.

### Interfaces

All drawings and diagrams can be saved as DXF or IGES file to be loaded with CAD programs. The OLE interface lets you import/export data from/to Excel.



### Export Formats

DXF, IGES, HTML, TXT, DBF, Excel, F14.

### System Requirements

FED14 is available as 32-bit app or as 64-bit app for Windows XP, Vista, Windows 7, 8, 10.

### Scope of Delivery

FED14 program with database files, example applications and help images, user manual (pdf), license contract for unlimited time use.

### Software Maintenance

FED14 is constantly being improved and updated. Registered users will be informed about news, and can get new versions at a reasonable update price.

### Guarantee

HEXAGON gives a 24 month guarantee on full functionality of the software. We provide help and support by email and hotline without extra charge.

