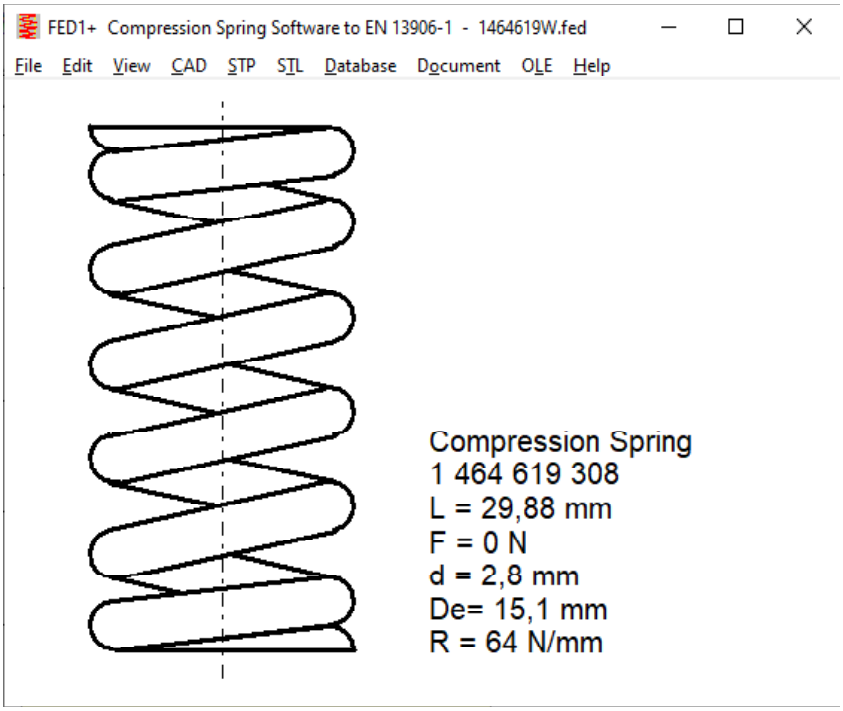
F E D 1 / F E D 1 +

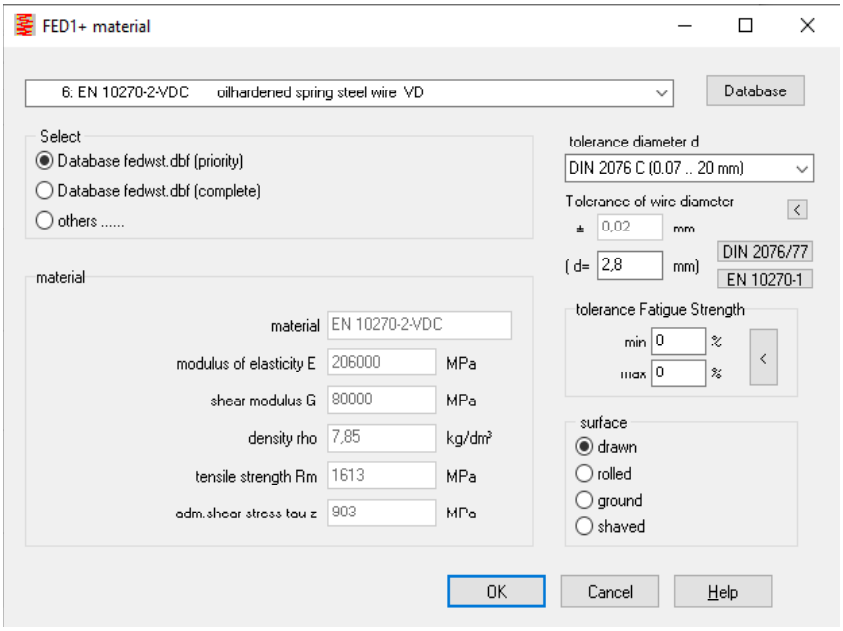
www.hexagon.de

Software for Calculation of
Helical Compression Springs
for Windows



Calculation

FED1+ calculates cylindrical helical compression springs according to EN 13906-1. Graphical presentation of the spring's characteristic curve, the Goodman diagram and the buckling field is possible. A scale drawing of the spring, as well as a production drawing in accordance with EN can be printed or exported to CAD. FED1+ also contains a spring database, 3D centerline drawing, cost calculation, animation on screen, calculation of relaxation, and springs made from rectangular, square and elliptic wire.
In dimensioning, compression spring dimensions are calculated from the spring loads, stroke, coil diameter and clamping length. In re-calculation, existing springs can be calculated by input of spring dimensions. Spring loads, deflections, spring rate, spring energy, stresses, wire length, buckling length, radial deflection, natural frequency and weight are calculated. The minimum and maximum forces, F1 and F2 can be iteratively calculated, as well as the minimum and maximum wire diameter.



Material Database

The software obtains the material properties from the integrated material database (tensile strength, admissable shearing stress in relation to wire diameter, shearing modulus, modulus of elasticity, density).

Tolerances

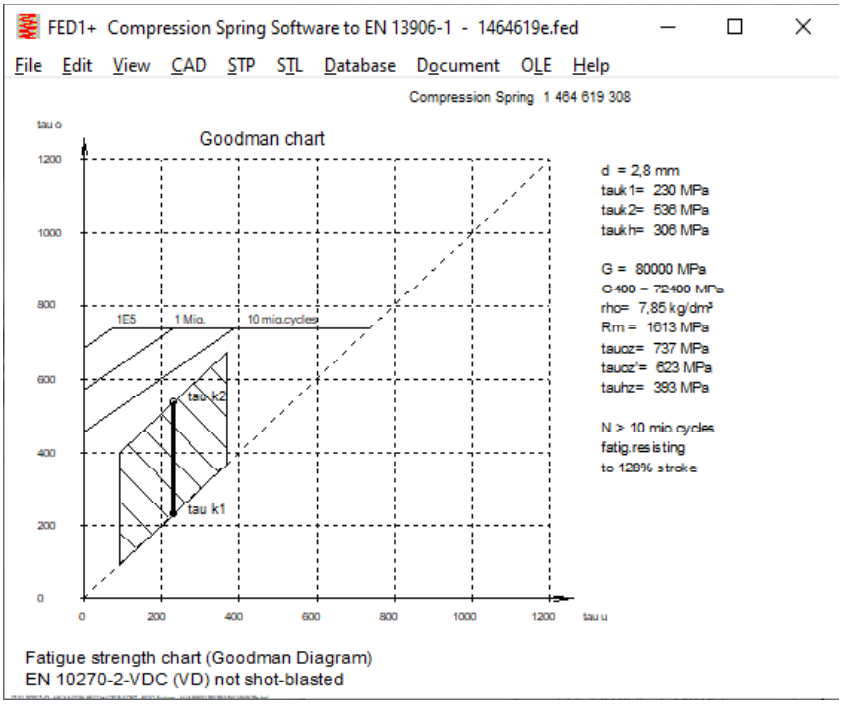
The program calculates the tolerances for the wire diameter d according to EN 10218, EN 10270, DIN 2077, and for Dm, L0, F1 and F2 according to EN 15800 or DIN 2096 (hot-coiled springs).

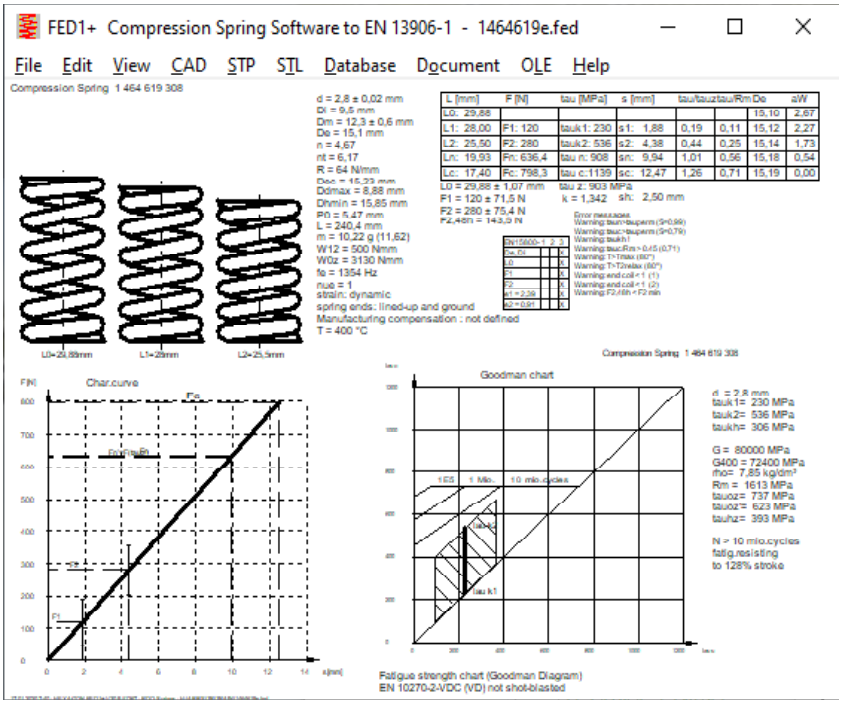
Spring Characteristic Curve

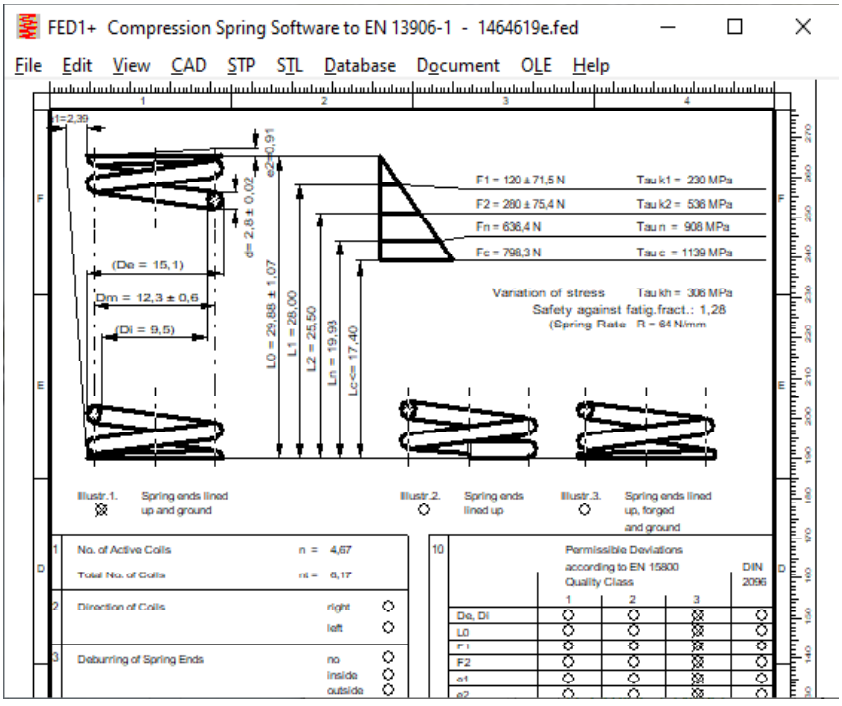
The load-deflection diagram for the compression spring can be displayed on screen, optional with tolerance zones calculated from quality grades.

Buckling Field

It becomes clear in the buckling field at which spring length the compression springs begins buckling.







Goodman Diagram
You can see in the fatigue strength diagram whether or not the permissable variation of stress has been adhered to for dynamically stressed springs. The curves for fatigue strength safety (>10 million) as well as for 1 million and 100,000 load cycles are shown.

Relaxation
FED1+ calculates relaxation of the spring depending on material, load, temperature and time.

Spring Drawing
You can display a true-scale spring drawing on screen in any clamping length between L0 and Lc. The spring drawing, as well as a 3D centerline drawing, can be exported to CAD via DXF/IGES file.

Production Drawing
FED1+ generates a complete production drawing according to EN 15800, which can be printed or exported to CAD.

Spoilage Calculation
FED1+ calculates the wastage quota for all quality grades and tolerances based on normal distribution according to the Gaussian curve when you provide manufacturing conditions (e.g. 1% spoilage with quality grade 1).

Animation
FED1+ animation simulates the motion of the spring between two specified points on screen.

Spring Database
FED1+ contains a database with spring manufacturer catalogues, which you can replace or extend with your own stock springs. After a spring calculation you can search the database for appropriate compression springs when inputting minimum and maximum values.

Cost Calculation
FED1+ calculates the price for the manufactured spring. Base data for calculation can be modified.

Quick View
Quick View shows drawings, diagrams and tables altogether on one screen.

Hard and Software Requirements
FED1+ is available as 32-bit app or 64-bit app for Windows 11, Windows 10, Windows 8, Windows 7.

Scope of Delivery
Program with user manual (pdf), database files, example applications and help images, non-expiring license for unlimited time use with update rights.

Software Maintenance
HEXAGON Software is continuously improved and updated. Registered users are regularly kept informed of updates and new editions.

Guarantee
HEXAGON gives a 24 month guarantee on full functionality of the software.