

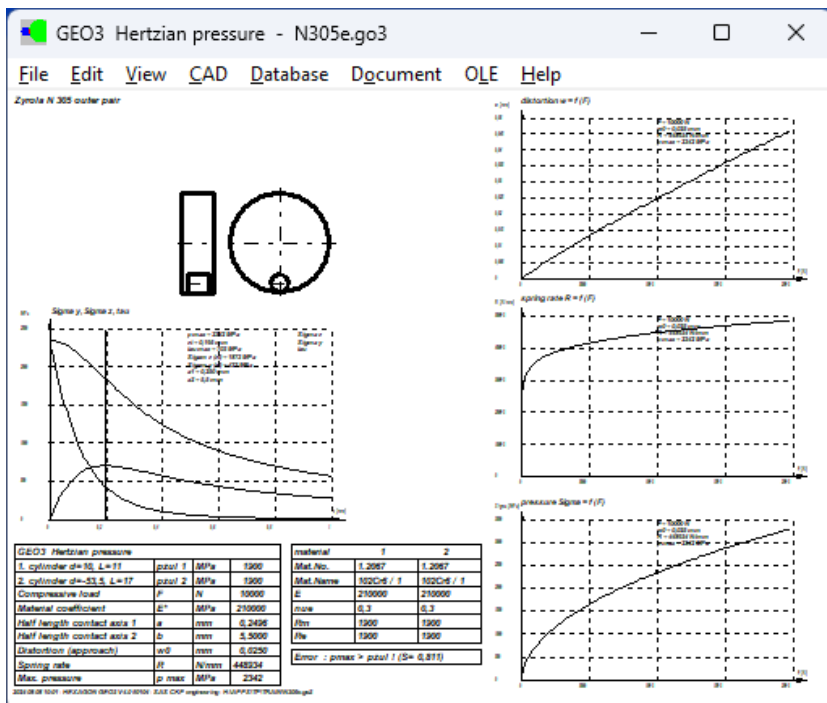
# GEO3



## Hertzian Pressure Calculation Software

for Windows

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### Hertzian Pressure

If two bodies touch with a point-shaped or line-shaped contact area, deformations and tensions appear according to Hertz's theory because of pressures. Hertz's solutions are based on Boussinesq's expressions. A homogenous, isotropic material and the validity of Hook's law is presumed as well as the results of axial forces on the touching area only. Moreover, the deformation  $w_0$  (panel raising cut) must be small compared to the dimensions of the body.

### Calculation

The GEO3 software calculates Hertzian pressure and deformation of two bodies whose common area is point-shaped or line-shaped. Pressure tensions, deformation, length and width of the pressure ellipse and the spring rate are calculated. For calculation of the deformation in case of contact pair cylinder-cylinder there is no Hertzian formula available. For this combination, you can configure different calculation methods in GEO3: calculation according to Arnell, Lundberg, Kunert, Palmgren, or Ina-Schaeffler.

### Body Shapes

GEO3 can calculate following body combinations: Ball-ball, ball-plane, cylinder-cylinder. The touching contour can be concave or convex. Bodies with a different radius (e. g. rolling bearing rings) are input as special bodies with radius  $R_x$  and  $R_y$ .

### Geometry Input

Balls are defined by their diameter  $d$ , cylinders by diameter  $d$  and length  $L$ . Cambered planes are fixed by their radii  $r_x$  and  $r_y$ .

### Input Material - Material Database

To calculate deformation and Hertzian pressing, elastic modulus and Poisson ratio are needed. The values can be directly input, or you can choose a material from the database.

body 1

ball

cylinder

special

d = 10 mm

L = 11 mm

rx = 5 mm ry = 0 mm

body 2

ball

cylinder

special

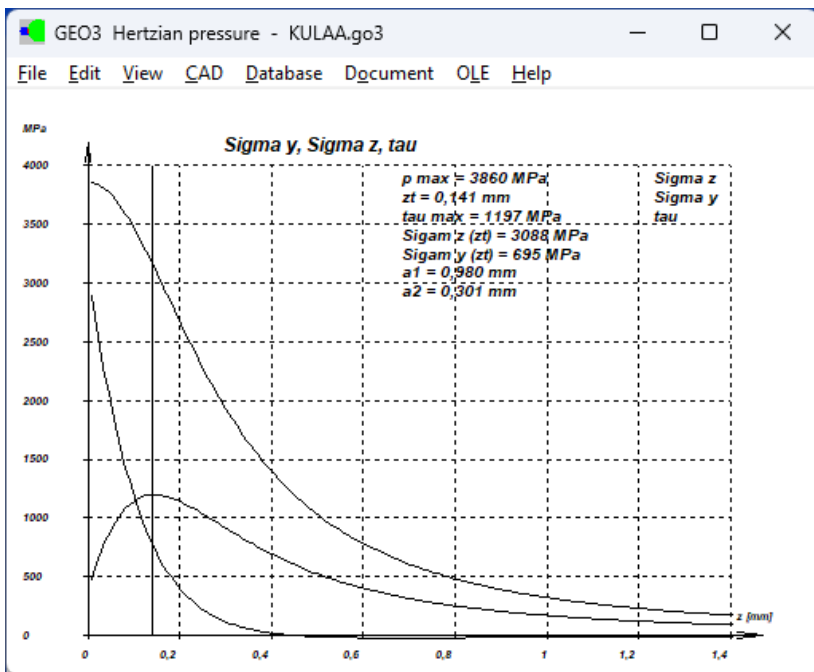
plane

d = 0 mm

d = -53,5 mm L = 17 mm

rx = -26,75 mm ry = 0 mm

OK Cancel ? ? mm <-> inch Calc



### Diagrams

The curves for deformation, tensile stress and spring rate as function of the pressure F, and also pressure stress and shear stress under the surface can be displayed as diagrams.

### Table Drawing

Drawing of the contact bodies and table with calculation results are provided as table drawing with ISO 7200 data field. Drawing data can be entered in GEO3. Table drawing can be printed on any Windows printer, or exported to CAD.

### Text Output

Input data and calculation results may be printed, saved as text or HTML file, or exported to MS Excel via OLE interface.

### HEXAGON Help System

For each input there is a help text and auxiliary picture of the utilized denominations available in the HEXAGON Help System. GEO3 displays warnings and error messages when exceeding a limit. For every error message you can have a description and remedy suggestion.

### Units

Units can be switched between metric (mm) and imperial (inches).

### Interfaces

All drawings and diagrams can be saved as DXF or IGES file to be loaded with CAD programs. To adapt to the utilized CAD system, text style and width factor can be configured in GEO3. Layers and colours can also be redefined. The OLE interface lets you import/export data from/ to Excel.

### Export Formats

DXF, IGES, HTML, TXT, DBF, Excel, GO3.

### Import Formats

TXT, DBF, Excel, GO3.

### System Requirements

GEO3 is available as 32-bit app or as 64-bit app for Windows 11, Windows 10, Windows 7.

### Scope of Delivery

Program with user manual (pdf), example applications and help images, non-expiring perpetual license.

### Guarantee

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

