G E O 1 +

Software for calculation of cross-sections and profiles

for Windows

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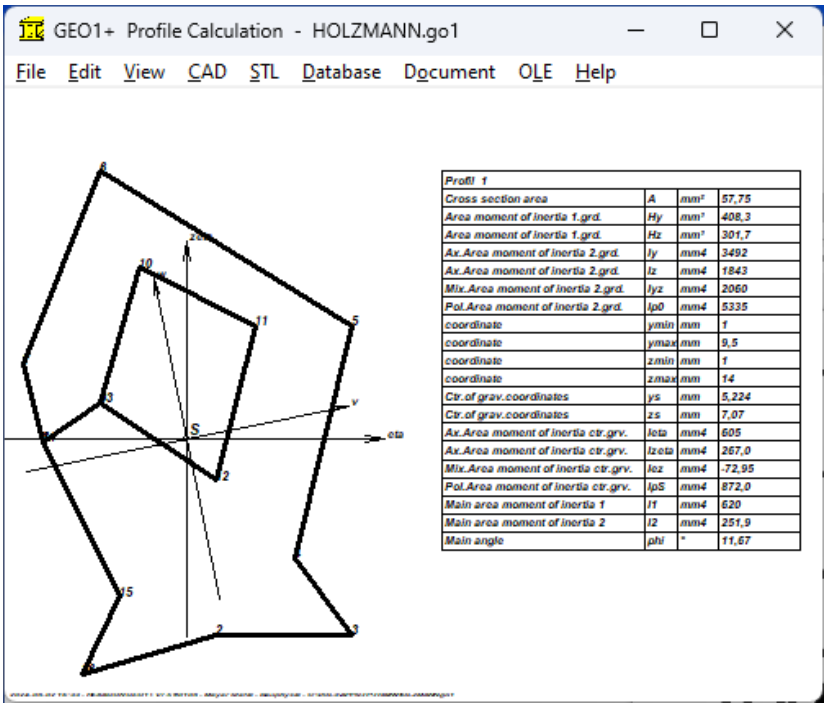
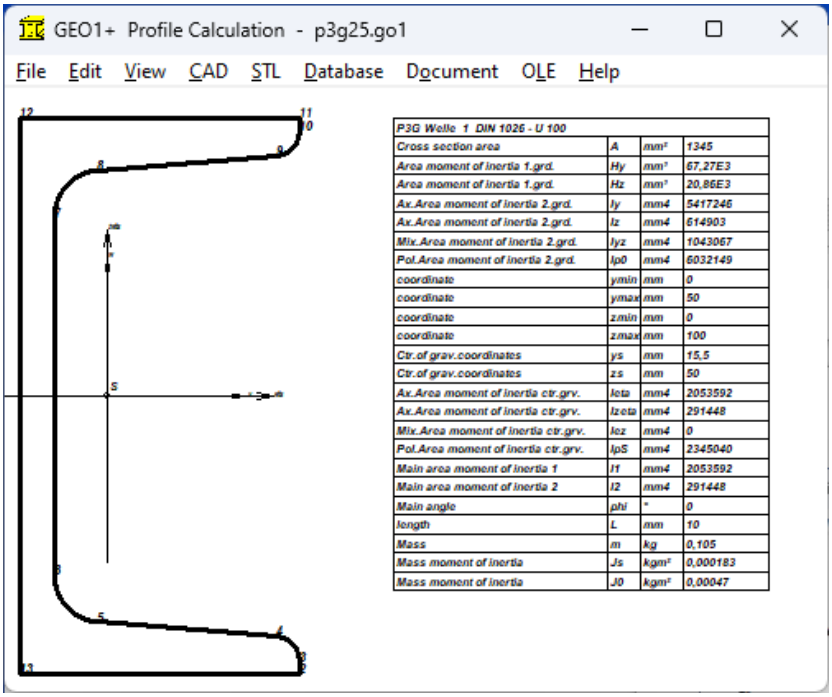


Profil 1			
Cross section area	A	mm²	57,75
Area moment of inertia 1.grd.	Hy	mm³	408,3
Area moment of inertia 1.grd.	Hz	mm³	301,7
Ax.Area moment of inertia 2.grd.	Iy	mm4	3492
Ax.Area moment of inertia 2.grd.	Iz	mm4	1843
Mix.Area moment of inertia 2.grd.	Iyz	mm4	2060
Pol.Area moment of inertia 2.grd.	Ip0	mm4	5335
coordinate	ymin	mm	1
coordinate	ymax	mm	9,5
coordinate	zmin	mm	1
coordinate	zmax	mm	14
Ctr.of grav.coordinates	ys	mm	5,224
Ctr.of grav.coordinates	zs	mm	7,07
Ax.Area moment of inertia ctr.grv.	Ieta	mm4	605
Ax.Area moment of inertia ctr.grv.	Izeta	mm4	267,0
Mix.Area moment of inertia ctr.grv.	Iez	mm4	-72,95
Pol.Area moment of inertia ctr.grv.	IpS	mm4	872,0
Main area moment of inertia 1	I1	mm4	620
Main area moment of inertia 2	I2	mm4	251,9
Main angle	phi	°	11,67



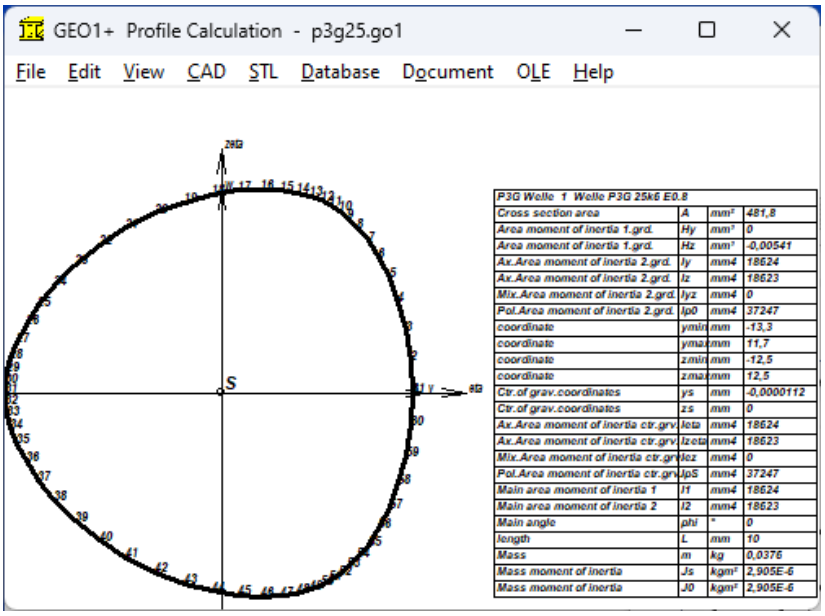
P3G Welle 1 DIN 1026 - U 100			
Cross section area	A	mm²	1345
Area moment of inertia 1.grd.	Hy	mm³	67,27E3
Area moment of inertia 1.grd.	Hz	mm³	20,86E3
Ax.Area moment of inertia 2.grd.	Iy	mm4	5417246
Ax.Area moment of inertia 2.grd.	Iz	mm4	614903
Mix.Area moment of inertia 2.grd.	Iyz	mm4	1043067
Pol.Area moment of inertia 2.grd.	Ip0	mm4	6032149
coordinate	ymin	mm	0
coordinate	ymax	mm	50
coordinate	zmin	mm	0
coordinate	zmax	mm	100
Ctr.of grav.coordinates	ys	mm	15,5
Ctr.of grav.coordinates	zs	mm	50
Ax.Area moment of inertia ctr.grv.	Ieta	mm4	2053592
Ax.Area moment of inertia ctr.grv.	Izeta	mm4	291448
Mix.Area moment of inertia ctr.grv.	Iez	mm4	0
Pol.Area moment of inertia ctr.grv.	IpS	mm4	2345040
Main area moment of inertia 1	I1	mm4	2053592
Main area moment of inertia 2	I2	mm4	291448
Main angle	phi	°	0
length	L	mm	10
Mass	m	kg	0,105
Mass moment of inertia	Js	kgm²	0,000183
Mass moment of inertia	J0	kgm²	0,00047

GEO1+
GEO1+ software calculates cross-section areas, surface moment of inertia, center of gravity and mass moment of inertia of any cross-section made up of up to 2000 lines and arcs. GEO1+ contains an additional database with the most common profile cross-sections acording to DIN, and also generates the coordinates of standard profiles like polygon, tube, sectors of circle.

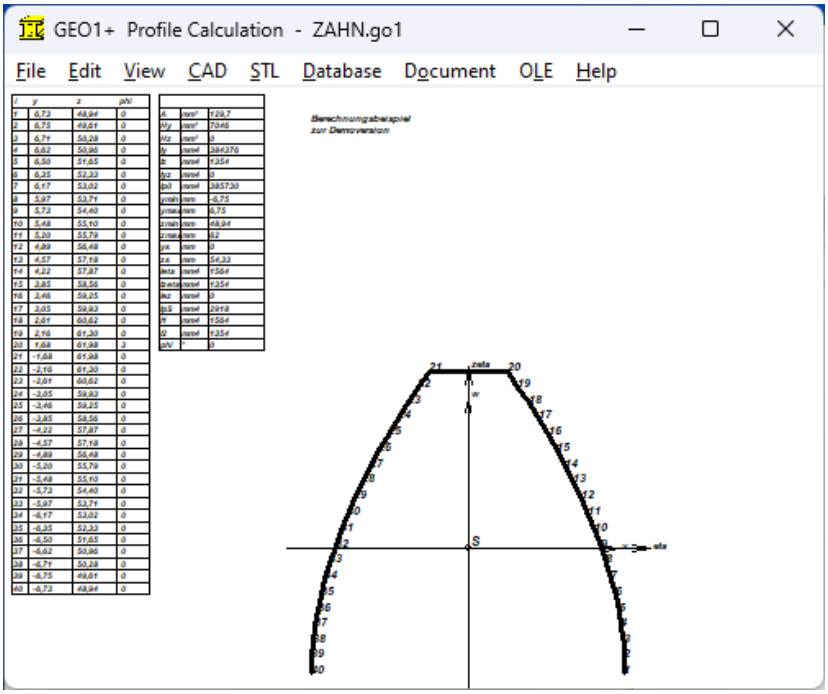
Geometry Input
The contour is defined by input of the y and z coordinates of the first and last point in the xyz coordinate system. For arcs the opening angle is also required. The outer contour is entered anti-clockwise, apertures and boreholes are entered clockwise. Coordinate positions are saved in a table, import via clipboard from Excel worksheet or other Windows programs is possible. The contour can also be imported as a polyline from a DXF file, or drawn directly in GEO1+.

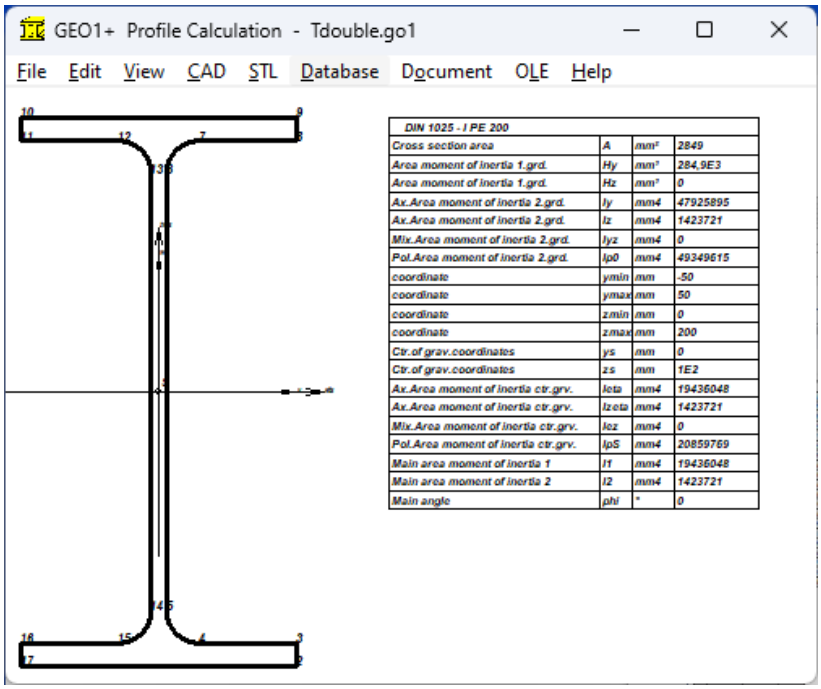
Calculation
GEO1 calculates the cross-section area, the area moment of inertia 1st and 2nd grade, mixed and polar area momentv of inertia in relation to coordinate origin and center of gravity. GEO1 also calculates the main area moments of inertia and the main gravity angle of the coordinate system. The flat surface becomes a body by entering a contour length Lx and the material density. In this case GEO1 also calculates volume, mass and mass moment of inertia relative to both, center of gravity and coordinate origin. For the calculation, arcs and circles are converted into polygons, the accuracy can be set.

Graphic Output
The defined contour is displayed on screen along with the coordinates, center of gravity and main axes. The most important result data is shown in a table. Drawings and tables can be printed on each Windows printer, or exported to CAD.



P3G Welle 1 Welle P3G 25k6 E0.8			
Cross section area	A	mm²	481,8
Area moment of inertia 1.grd.	Hy	mm³	0
Area moment of inertia 1.grd.	Hz	mm³	-0,00541
Ax.Area moment of inertia 2.grd.	Iy	mm4	18624
Ax.Area moment of inertia 2.grd.	Iz	mm4	18623
Mix.Area moment of inertia 2.grd.	Iyz	mm4	0
Pol.Area moment of inertia 2.grd.	Ip0	mm4	37247
coordinate	ymin	mm	-13,3
coordinate	ymax	mm	11,7
coordinate	zmin	mm	-12,5
coordinate	zmax	mm	12,5
Ctr.of grav.coordinates	ys	mm	-0,0000112
Ctr.of grav.coordinates	zs	mm	0
Ax.Area moment of inertia ctr.grv.	Ieta	mm4	18624
Ax.Area moment of inertia ctr.grv.	Izeta	mm4	18623
Mix.Area moment of inertia ctr.grv.	Iez	mm4	0
Pol.Area moment of inertia ctr.grv.	IpS	mm4	37247
Main area moment of inertia 1	I1	mm4	18624
Main area moment of inertia 2	I2	mm4	18623
Main angle	phi	°	0
length	L	mm	10
Mass	m	kg	0,0376
Mass moment of inertia	Js	kgm²	2,905E-6
Mass moment of inertia	J0	kgm²	2,905E-6





DIN 1025 - I PE 200			
Cross section area	A	mm²	2849
Area moment of inertia 1.grd.	Hy	mm³	284,9E3
Area moment of inertia 1.grd.	Hz	mm³	0
Ax.Area moment of inertia 2.grd.	Iy	mm4	47925895
Ax.Area moment of inertia 2.grd.	Iz	mm4	1423721
Mix.Area moment of inertia 2.grd.	Iyz	mm4	0
Pol.Area moment of inertia 2.grd.	Ip0	mm4	49349615
coordinate	ymin	mm	-50
coordinate	ymax	mm	50
coordinate	zmin	mm	0
coordinate	zmax	mm	200
Ctr.of grav.coordinates	ys	mm	0
Ctr.of grav.coordinates	zs	mm	1E2
Ax.Area moment of inertia ctr.grv.	Ieta	mm4	19436048
Ax.Area moment of inertia ctr.grv.	Izeta	mm4	1423721
Mix.Area moment of inertia ctr.grv.	Iez	mm4	0
Pol.Area moment of inertia ctr.grv.	IpS	mm4	20859769
Main area moment of inertia 1	I1	mm4	19436048
Main area moment of inertia 2	I2	mm4	1423721
Main angle	phi	°	0

GEO1+ Profile Database
GEO1+ contains databases with standard profiles according to DIN: T profiles to DIN 1024, double-T to DIN 1025, L-profile to DIN 1027, angular profile to DIN 1028, U profile to DIN 1026 and rectangular profile to DIN 1017 can be selected from GEO1+ database. GEO1+ generates coordinates from the database values and calculates cross-section.

Standard Profiles
For circular profile (shaft), tube, rectangular tube, polygon, polygon tube, sector of circle, sector of annulus, sector of annulus with bore, rectangle with bore, and circle with eccentric bore, just enter inner and outer width, diameters etc. and GEO1+ calculates coordinates and cross-section.

Coordinate transformation
When coordinates have been saved in a table, you have all possibilities to shift, enlarge or reduce, rotate or mirror the cross-section profile.

CAD Interface
Geometry and result tables are generated by GEO1+ as DXF or IGES files. This enables export to CAD systems or word-processing programs. On the other hand the contour need not be input in GEO1, but can be imported as a DXF file if the contour has been drawn as a polyline (POLYLINE command).

STL Interface for 3D Printing
Enter height of the profile and create an STL file to create a model on your 3D printer.

Export Formats
DXF, IGES, HTML, STL, TXT, DBF, Excel, GO1.

Import Formats
Excel, DXF, DBF, GO1.

System Requirements
GEO1+ 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.

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. We provide help and support by email without extra charge.