MESYS Hertzian Stress Calculation v1 - Demo version - for evaluation only

File name:

Project name: Examples

Description: Example for rolling bearing contact, inner race

Date: Di 19. Apr 13:33:59 2011

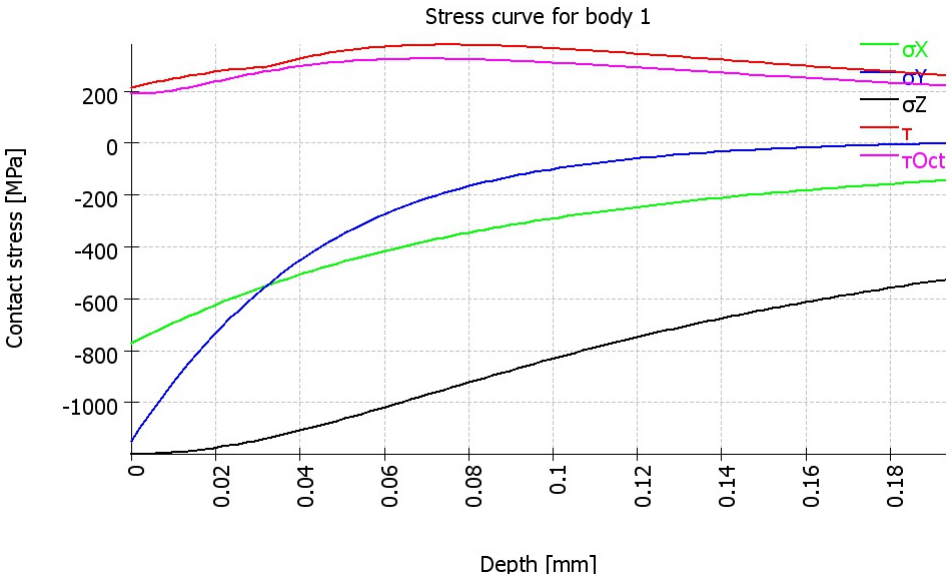
Contact Stress Calculation

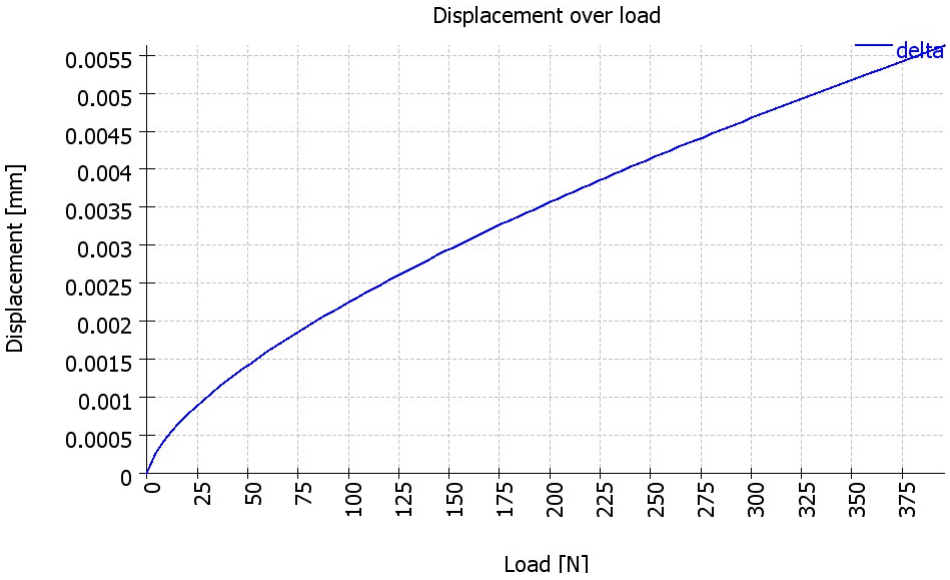
Input data

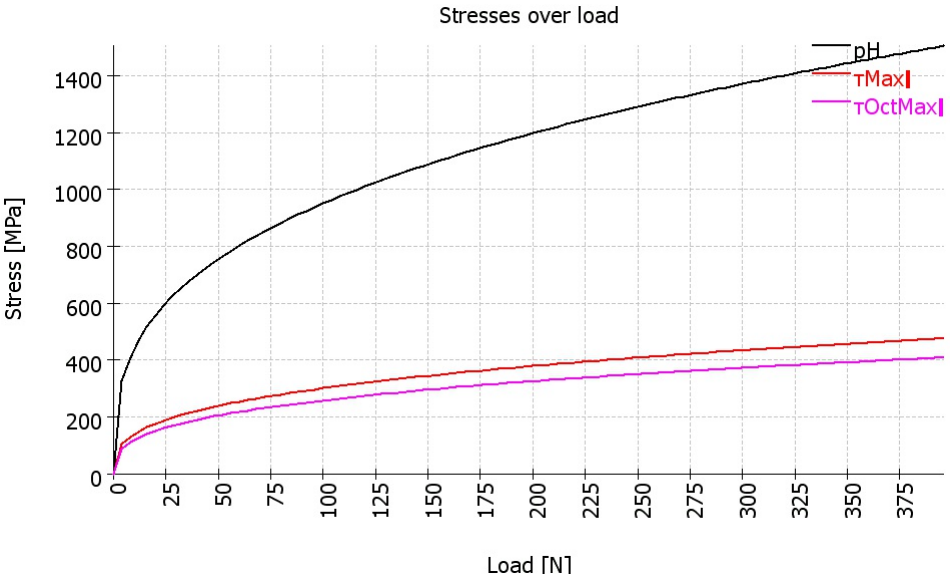
First radius body 1	r_{11}	5.000 mm
Second radius body 1	r_{12}	5.000 mm
First radius body 2	r_{21}	-5.2000 mm
Second radius body 2	r_{22}	100.00 mm
Effective length for cylinders	Leff	0.0000 mm
Normal force	Fn	200.00 N
Youngs modulus body 1	E_1	210000 MPa
Youngs modulus body 2	E_2	210000 MPa
Poisson number body 1	υ_1	0.3
Poisson number body 2	υ_2	0.3
Angle between planes for radii	α	0.0000 °

Results

Major half axis of contact ellipsis	a	0.8172 mm
Minor half axis of contact ellipsis	b	0.0975 mm
Approach of both bodies	δ	0.0036 mm
Contact stiffness	R	84259.6 N/mm
Hertzian stress	pH	1198.6 MPa
Maximal shear stress body 1	τMax_1	378.95 MPa
Maximal octahedral shear stress body 1	$\tau OctMax_1$	324.94 MPa
Depth for max. shear stress body 1	$z(\tau Max_1)$	0.0747 mm
Equivalent stress body 1 (Tresca)	$\sigma eTresca_1$	757.89 MPa
Equivalent stress body 1 (Mises)	$\sigma eMises_1$	689.30 MPa
Maximal shear stress body 2	τMax_2	378.95 MPa
Maximal octahedral shear stress body 2	$\tau OctMax_2$	324.94 MPa
Depth for max. shear stress body 2	$z(\tau Max_2)$	0.0747 mm
Equivalent stress body 2 (Tresca)	$\sigma eTresca_2$	757.89 MPa
Equivalent stress body 2 (Mises)	$\sigma eMises_2$	689.30 MPa




Displacement over load
delta
Displacement [mm]
0.0055
0.005
0.0045
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375
Load [N]


Stresses over load
pH
τMax
τOctMax
Stress [MPa]
1400
1200
1000
800
600
400
200
0
0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375
Load [N]