

NAFEMS		SOLID CYLINDER / TAPER / SPHERE - TEMPERATURE	Test No LE11	DATE / ISSUE 15-6-90/2
ORIGIN		NAFEMS report LSB2		
ANALYSIS TYPE		Linear elastic solid		
GEOMETRY		Units M, KN		
LOADING		Linear temperature gradient in the radial and axial direction $T\text{ }^{\circ}\text{C} = (x^2 + y^2)^{1/2} + z$		
BOUNDARY CONDITIONS		Symmetry on xz-plane i.e. zero y-displacement Symmetry on yz-plane i.e. zero x-displacement Face on xy-plane zero z-displacement Face HIH'I' zero z-displacement		
MATERIAL PROPERTIES		Isotropic, $E = 210 \times 10^3 \text{ MPa}$, $\nu = 0.3$ $\alpha = 2.3 \times 10^{-4} / ^{\circ}\text{C}$		
ELEMENT TYPES		Solid hexahedra, wedges and tetrahedra		
MESHES				
OUTPUT		Direct stress σ_{zz} at point A		
		TARGET -105 MPa (refined axisymmetric)		

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doc : vim — Konsole

PROBLEM mechanical
READ_MESH $0.msh

# linear temperature gradient in the radial and axial direction
T(x,y,z) = (x^2 + y^2)^(1/2) + z

# Boundary conditions
BC xz      symmetry
BC yz      symmetry
BC xy      w=0
BC HIH'I'  w=0

# material properties (isotropic & uniform so we can use scalar constants)
E = 210e3*1e6      # mesh is in meters, so E=210e3 MPa -> Pa
nu = 0.3           # dimensionless
alpha = 2.3e-4     # in 1/°C as in the problem

SOLVE_PROBLEM
WRITE_RESULTS FORMAT vtk
PRINT "sigma_z(A) =" sigmaz(0,1,0)/1e6 "MPa (target was -105 MPa)" SEP " "
~
"nafems-le11.fee" 20L, 561B                                     1,1      All

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doc : bash — Konsole

gtheler@tom:~/codigos/feenox/doc$ feenox nafems-le11.fee
sigma_z(A) = -105.041 MPa (target was -105 MPa)
gtheler@tom:~/codigos/feenox/doc$

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