

Practical assignment №4

3D PROBLEM OF CONTACT BETWEEN TWO DEFORMABLE SOLIDS

Individual assignments

Take the following values for material properties: for the first material – Young’s modulus $E_1 = 2 \cdot 10^{11}$ Pa, Poisson’s ratio $\nu_1 = 0.3$; for the second material – Young’s modulus $E_2 = 2.2 \cdot 10^{11}$ Pa, Poisson’s ratio $\nu_2 = 0.35$.

$$\eta = \frac{1 - \nu_1^2}{E_1} + \frac{1 - \nu_2^2}{E_2}$$

Solve the static contact problem for two 3D deformable bodies. Analyze convergence for various values of mesh density. Check results and prepare the report.

Requirements to the report.

The report should contain the name of the student, the full description of the problem and the results obtained in ANSYS. Text of input file should be also included in the report.

Provide the following computation results:

- Finite element mesh
- Boundary conditions shown on finite element or solid model
- Picture of the displacements distribution
- Picture of the stresses distribution
- Comparison of computational and theoretical results

Hint. In the problems with distributed load along the line you can use F command to set concentrated force in nodes. Using the command *GET,MY_NUM,NODE,,COUNT, first you have to determine the number of nodes along the line (the value of the nodes number will be assigned to the parameter MY_NUM). Then for every node you can set the force of the magnitude $q \cdot L / MY_NUM$, where q is the load value per unit length, L is the length of the line.

Table 1. Suggestions for individual assignments.

	Student’s name	Task no.
1.	Текучева Татьяна Дмитриевна	1
2.	Олейник Михаил Александрович	2