Subject: Solid Mechanics Simulation
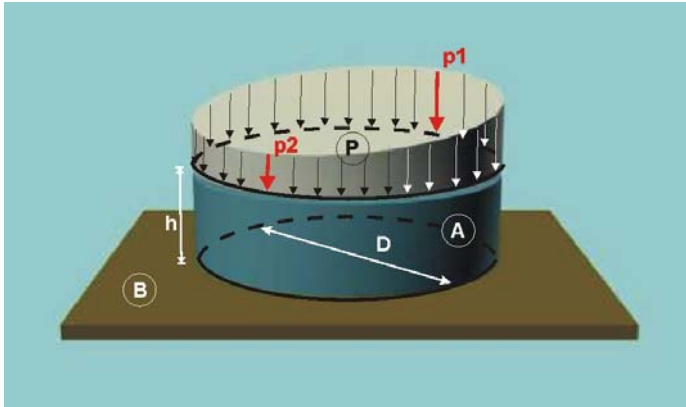

Fig. 1

Assignment: A solid rubber disk **A** in dimensions *D=4 cm* lie on the rigid plate **B** and is loaded by the variable pressure load as is shown in fig.1.

Determine the width *h* of the disk with difference between upper and lower values of the contact surface will be under 10%. The maximum value of the load is p_1= 8 *N/cm²*, the minimum value is p_2= 4 *N/cm²*.

The mechanical properties of the disk can be obtained from the tension and compression experimental points (table 1).

Table 1

Submit:
1. Geometrical model, including the mesh and the boundary conditions.
2. The stress (von Mises) field in the final state of strain.

i	1	2	3	4	5
σ [Pa]	-2.5e06	-0.9e06	0	2.1e06	12.8e06
ε	-0.49	-0.25	0	1	3

3. The strain field in the final state of strain.
4. Animate the process.
Answer the next questions:
1. What is the mechanical property peculiarity of the rubber and where it is treated in the solution?
2. What element type was used?
3. What element options were used?
4. What real constants were used?
5. How many nodes and elements were created?
6. What is the % error (SEPC) for your solution?