List 4

Task 1

Create a solid model of an IPE 80 beam with a length of L = 1000 mm, according to the dimensions shown in the drawing.



Prepare a computational model for a bending beam made of structural steel (Young's modulus E = 200 GPa; Poisson's ratio v = 0,3), with a continuous load of F = 10 kN acting on the upper flange. Perform the simulation for two different support methods, as shown in the drawings below:



Task 2

Determine how changing the material of the bending beam from task 1 to an aluminum alloy (E = 71 GPa; υ = 0,33; R_e = 280 MPa) and to a titanium alloy (E = 96 GPa; υ = 0,36; R_e = 930 MPa) will affect the values of displacements and stresses.