

Rubber is often used to reduce the vibration transmission between parts. A rectangular rubber vibration isolator fits into a slot that is the same width as the rubber block in the x-direction. It is bolted between two pieces of steel so that the steel uniformly applies a compressive stress of 1 MPa on the rubber block in the y-direction. There are no constraints in the z-direction. The Poisson's ratio of rubber is 0.5 and the Young's modulus is 12.5 MPa.

- What is the stress in the x-direction? (4 points)
- Before applying stress, the rubber has a thickness of 10 mm in the y direction. What is the thickness after applying the 1 MPa stress? (3 points)
- In the deformed state, the block has a length of 127.2 mm in the z-direction. What is the original length in the z-direction? (3 points)

You can assume that the deformation of the steel is negligible compared to the deformation of the rubber.

