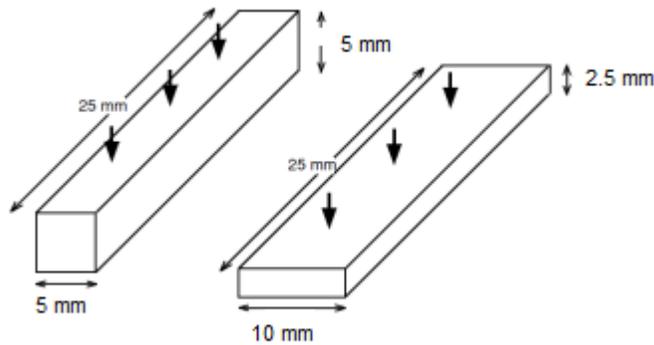


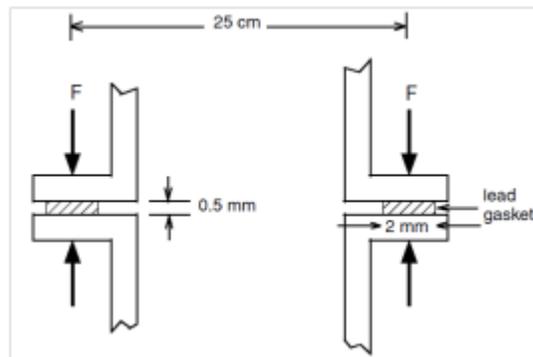
1- Estimate the force required to coin a 25-cents coin. Assume that the mean flow stress is 55,000 psi, the diameter is 0.56 in, and the thickness after forming is 0.043 in and the friction is sticking.

2- Figure shows a billet before and after hot forging from an initial size of 5 mm × 5 mm × 25 mm to 10 mm × 2.5 mm × 25 mm. This is accomplished by using a flat-face drop hammer. Sticking friction can be assumed. For the rate of deformation and the temperature, a flow stress of 106 MPa can be assumed.

- Find the force necessary.
- Find the work required. (Remember that work = $\int FdL$ and that F changes with L.)
- From what height would the hammer have to be dropped?
- Compute the efficiency, η .



3- Figure below shows a thin lead ring being used as a gasket. To insure an acceptable seal the gasket must be compressed to a thickness of 0.25 mm. Assume that the flow stress of lead is 15 MPa and strain hardening is negligible. Find the required force.



4- A block of lead 50mm x 40mm x 180mm is pressed between flat dies to a size 20mm x 100mm x 180mm. If the uniaxial flow stress is $Y=14$ MPa and $\mu=0.15$ determine the pressure distribution over the 100mm dimension and the total forging load.