

Problem M16

A cylindrical specimen of stainless steel having a diameter of 12.8 mm and a gauge length of 50.8 mm is pulled in tension. Use the load-elongation characteristics tabulated below to complete problems (a) through (f).

Load (N)	Length (mm)
0	50.800
12700	50.825
25400	50.851
38100	50.876
50800	50.902
76200	50.952
89100	51.003
92700	51.054
102500	51.181
107800	51.308
119400	51.562
128300	51.816
149700	52.832
159000	53.848
160400	54.356
159500	54.864
151500	55.880
124700	56.642
FRACTURE	

- Plot the data as engineering stress vs. engineering strain.
- Compute the Young's modulus
- Determine the yield strength at a strain offset of 0.002 (0.2%)
- Determine the tensile strength of this alloy
- What is the approximate ductility expressed as a percentage of elongation?
- Estimate the energy that must have been supplied to cause the specimen to reach failure.