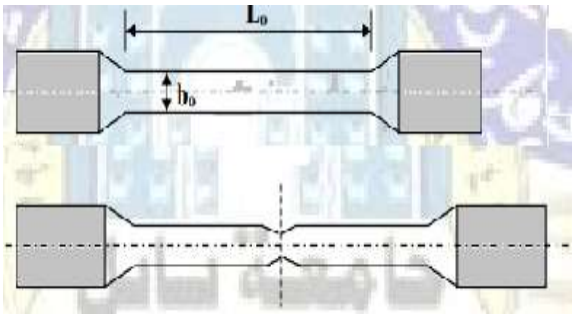
TP N^{0}1 tensile test

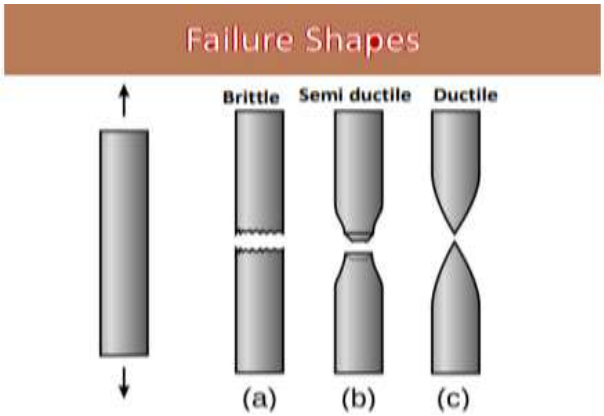
1- Objective of tensile test

- Calculating elasticity of Modulus.
- Determine the maximum stress value of the model material (σu, Stress Ultimate).
- Determine the value of the failure stress (Stress Fracture).
- Find the elongation percentage.
- Find the percentage of decrease in cross-sectional area (Area in Reduction %).
- Obtaining the relationship between stress and strain (Curve Strain-Stress)

2- Tensile sample description:

In Figure (1) below, the dimensions of the sample used, made of , with a rectangular cross-section, are noted before and after performing a tensile test on it.





Using the results we obtained from the experiment, the following calculations are performed:

- The strain and strain are calculated:

$$\sigma_n = \frac{F}{s_0} \qquad \varepsilon_n = \frac{L - L_0}{L_0}$$

-percentage elongation A%:

$$A\% = \frac{L_{final} - L_{original}}{L_{original}} * 100\%$$

-percentage reduction in Area Z % :

$$Z\% = \frac{A_{original} - A_{final}}{A_{original}} * 100\%$$

F(N)	ΔL (mm)	S_0(mm^2)	σ=F/ S_0 (MPa)	$\mathcal{E}$= ΔL/L	E= σ/ $\mathcal{E}$ (MPa)

Questions:

A standardized tension test is carried out on a beam of diameter d_0 = mm and of length L_0 ≈

Using the values from the table above, plot the curve Stress-strain (σ – ε) and calculate the following values:

* The module of Young Eth and Eexp E= (E1+….+En)/n

* The elastic limit stress: σe

* Maximum tension strength: σmax

* The fracture of stress: εr

* Percentage elongation A%.