**TENSILE TEST**

**1) OBJECTIVE**

To measure and observe the behaviour of a tensile specimen, while being tested to destruction, and determine:

* The yield stress of the material.
* The ultimate stress of the material.
* The percentage elongation.
* The percentage reduction in area.
* The value of modulus elasticity and poisons ratio of the material.

**2) APPARATUS**

1)Tensometer

2) callipers

**3) SPECİMEN TEST**

Tensile specimen steel

Diameter : 5 mm

Initial length : 3.8 cm

**4) PROCEDURE**

* Tensometer device is installed.
* Material length is measured with callipers.
* Material is setup on machine.
* Point load applied on the paper will be scored.
* Specimen was elongated to 4.095 cm 4.1 cm.

**Using the corrected graph to calculate the following:**

* Yield strength of the specimen material
* Yield strain of the specimen material
* Ultimate strength of the specimen material
* Modulus of elasticity
* Percent elongation

**6)CALCULATİON**

**Procedure for calculation**

* Prepare this table while performing the tensile test.

|  |  |  |
| --- | --- | --- |
| **READİNG** | **FORCE**  **F (KN)** | **ELONGATİON**  **Li-Lo=∆L** |
| **0** | **0** | **0** |
| **1** | **2** | **0.8** |
| **2** | **4** | **1.2** |
| **3** | **6** | **1.8** |
| **4** | **8** | **2.2** |
| **5** | **10** | **2.9** |
| **6** | **12** | **4.5** |

* Force versus Elongation
* From the equations find values

Lo= 38 , Ao= 19.63

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Reading** | **F (N)** | **Li (mm)** | **Ao**  **(mm2)** | **ΔL**  **(mm)** | **σnom**  **N/mm2** | **εnom** |
| 0 | 0 | 0 | 19.63 | 0 | 0 | 0 |
| 1 | 2000 | 0.8+3.8=4.6 | 19.63 | 0.8 | 101.88 | 0.21 |
| 2 | 4000 | 1.2+3.8=5 | 19.63 | 1.2 | 203.76 | 0.31 |
| 3 | 6000 | 1.8+3.8=5.6 | 19.63 | 1.8 | 305.65 | 0.47 |
| 4 | 8000 | 2.2+3.8=6 | 19.63 | 2.2 | 407.53 | 0.58 |
| 5 | 10000 | 2.9+3.8=6.7 | 19.63 | 2.9 | 509.42 | 0.76 |
| 6 | 12000 | 4.5+3.8=8.3 | 19.63 | 4.5 | 611.31 | 1.18 |

**Nominal stress versus nominal strain**

* Yield strength (σy),

σy= 101.88 MPa (Reading from the graph)

* Elasticity modulus (E),
* Ultimate stress (σu)

(Reading from the graph)

* Fracture strain.
* Percent elongation

% 8 reduction of elongation

**CONCLUSIONS**

Calculation of the value of the material learned can handle the load. How about the material to be tested also acquainted.