MAE 150L Part I: Strain Gage Data Acquisition with Arduino

Week 2 – Placing the Strain Gage

Prepared by Kivanc Azgin

Intro

A good quality strain test requires a good quality bond between the gage and the material. This week we will be preparing the Aluminum bars with the strain gages.

Procedure

Following the steps below are crucial for a high quality test part. Before you start, make sure you are working on a clean surface.

1- Determine the place and direction you need the strain gage and put two lines on that spot vertical to each other using a ballpoint pen. Make sure the lines intersect at the spot and one of the lines are along the direction you will measure the strain. We need the indentation that the ballpoint pen leaves on the surface, not the ink. So press on the pen to make the scratch deeper for a better visibility.

2- Put some Conditioner on a clean tissue paper and wipe the surface off (make sure all the ink from the ball point pen is removed)

3- Now put some Neutralizer on another clean tissue paper and wipe the surface off to remove the acidic residues from the conditioner.

4- Take the transparent film with the Strain Gage out of the bag and separate the films. Make sure that the shiny solder pads are facing up. Keep the gage on the film because film is the cleanest surface readily available that you can keep the gage.

5- Take a clean (freshly cut) tape and pick the gage with it. Again, make sure the shiny solder pad side is stuck to the tape. Put it back to the film and press on the gage. There should not be any gap, bubble or void between the tape and the gage.

6- Now separate the film and the tape, but keep the angle as low as possible to avoid any cracks on the gage.

7- Put some glue on the back of the gage and make sure the gage has glue everywhere on its back.

8- Now place the gage on the bar and align the three small triangles on the gage with the alignment mark on the part. After aligning, press on the gage to force all the excess glue out. This will guarantee a strong yet thin bond between the gage and the test specimen.

9- Let it dry at least 10 minutes. Then remove the tape slowly with a high angle.

10- Before soldering the wire to the pads, make sure you put some solder on the pads and on the wire tip beforehand. This will make the connection much stronger and easier.

11- After soldering the wire, fix the wire on the bar to make a sturdier connection.