Guidelines for using the M3 Lab Instron

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To be able to use the Instron you must fulfill the following requirements:

- Contact Ridhi Sahani to be approved to use the scheduling calendar
- Communicate if you need to be trained on Instron use and for what method (tension/compression test) and what load cell is required for your tests
- Sign-up for a time on the M3 lab Instron calendar- it is recommended that you sign up for at least 1.5 times your estimated test time to allow for troubleshooting
- Fill out the Instron log sheet each time you use the machine and note down the following
    - Name
    - Date/Time of use
    - Instron setup during testing (type of test, load cell used)
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Instron Tensile Testing Methods

1. open bluehill software
2. *with **only mounts** and no grips or sample, click **balance all***
3. move **mounts to touch**, watching for load to reach **~ -0.02N**
4. **balance all**
5. move mounts apart to ~50mm and **place grips with sample on mount pins**
6. **move mount/grip** to approximately **remove slack**
7. **start test**, select **'tenCreep'** method
8. **start test** (creep load to ~0.1N hold for 60s)
9. when test finishes (ie when 'start' button enabled), **note 'Extension' value**:
10. **Sample length = this extension value - 34mm** (34mm= length of mounts/grips)
11. click **finish**, then **'no'**
12. click **'balance all'**
13. on home screen, start a **new test** using **'tensionTest01'** method
14. browse to **save test data**, click 'next'
15. enter **specimen length** calculated above, click **'next'**
16. **start test** (grip will move at 0.5%/s until 50% strain)
17. ok (grips will move), finish, finish, no
18. *for subsequent samples start over from top*

Instron Compression Testing Methods

Prelim setup
1. Using Windows Explorer, created sample data folder.
2. Start BlueHill software. Do not load a method or test yet.
3. Install compression platen. Lightly grasp platen to confirm load cell reads >0 in tension and <0 in compression. Confirm knurled locknut is screwed tight against load cell socket.
4. Fill bath (sample dish) with fluid until level reaches ~5mm from top.

5. Jog platen until it is partially immersed in bath. Using spatula, push away any large bubbles from underneath platen.
6. Click "Balance load".
7. Carefully move platen to lightly contact bottom of dish as follows:

- While watching platen, use jog wheel to carefully lower platen to within ~1mm of dish bottom.
- While watching load reading, continue slowly moving jog wheel (~1 click per sec) until load reading abruptly becomes more negative, from zero to approximately -0.5 N.
- Raise platen by one click of load wheel.

8. Click "Reset gauge length." Beyond this point until the end of the creep test, never click "Return" or platen will suddenly move to contact the dish and crush any sample that may be in place.
9. Carefully raise platen away from dish to approximately the height of the fluid level.
10. Place sample in dish. Using spatula and viewing the sample from the front and side, position sample concentric with platen.
11. Using jog button/wheel, lower platen to within ~1mm of sample. Do not contact sample.

Creep Displacement test
1. On Bluehill home screen, click "Test" near bottom left.
2. Double click "m3creep.im_crelax" method. Note that "Extension [mm]" and "Load [N]" values change sign when a compression method or test is selected.
3. ?? Name sample and browse to target directory. Plots of the test in PDF format will be saved but not raw test data.
4. Click "Start" and wait for test to complete ("Finish" button will enable).
5. Write down the absolute value of "Extension [mm]". This will be the sample height for any subsequent stress relaxation tests.
6. Click "Finish" and "No" ("Start another 6. new sample?")
7. Return to home screen.
8. **IMPORTANT**: Click "Balance all".

Stress Relaxation test

1. Click "Test" and select m3srl.im_crelax.
2. Browse to sample folder and name sample uniquely for each SRL ramp, e.g. srl05, srl10, srl15, srl20.
3. Enter sample height recorded above. This should be a positive number.
4. Enter desired strain magnitude % as "Start of hold value". Click "Next".
5. Click "Start" and wait for test to finish.
6. Click "Ok" at prompt to return platen to start position. Start timer (using phone, etc.) to allow sample to recover for 2x SRL relaxation time.
7. Click "Next" and "Finish Sample" and "No" ("Start another new sample?").
8. For subsequent tests:
   1.