Title: Mechanical Testing System Coupled with an Environmental Chamber for Hydrogels

Names:
Team: Gabriel Martinez-Diaz, Darcee Nelson, Charlie Haggart, Mike Piche
Client: Prof. Weiyuan John Kao
Advisor: Paul Thompson

Date: 1/29/03 – 2/4/03

Problem Statement: To update an existing procedure to make dog-bone stencils, approved by the American Society for Testing Materials (ASTM), and to test an environmental chamber, built in BME 301, to be used with a mechanical testing system in order to test the mechanical properties of hydrogels including stress, strain and creep.

Restatement of Team Goals:

1. Make project schedule.
2. Obtain permits for ME shop.
4. Design system to hold the LVDT upright.
5. Continue working on construction of the creep prototype in the ME shop.

Summary of Accomplishments:

1. Made project schedule.
2. Summarized Instron 1000 sensitivity issues.
3. Met with Dr. Kao to discuss sensitivity issues, creep testing, and plan for the semester. Dr. Kao agreed with Instron 1000’s insensitivity to measure tensile properties of hydrogels, but wanted the chamber used to measure tensile properties for skin and muscle tissues of rats. Tensile tests with these tissues will be performed on mornings of 2/18, 2/27, and 3/3. Tests will be performed at room temperature and solution pH = 7.4 and temp = 37 ºC. After this data is taken, the entire group will work to finish the creep system.
4. Obtained locker for project in ECB.
5. Summarized future alterations/additions to creep testing system
   a. LVDT stabilized in vertical position with a block of acrylic.
   b. Pulley mount placed on a hinge or swivel so user’s hand can fit inside the chamber.
   c. Grip system needs to be modified so the top grip doesn’t rotate. In addition, the sample must be aligned outside of the chamber and then placed inside the chamber with the grips without damaging the sample.
   d. Weight tray placed perpendicular to the length of the LVDT.
   e. Weight placed on the top grip to balance the weight of the core.

Statement of Team Goals:

1. Discuss graduation requirements.
2. Assign dates for tensile tests of rat skin and muscle tissues.
3. Update schedule.
4. Brainstorm modifications of grip system.
5. Choose design of grip system and order parts on Friday.
6. Begin work in ME shop.

**Project Schedule:** See attached schedule.

**Difficulties:** N/A

**Activities:**

Team: Friday meeting with team and Paul, 2 hr (Darcee, 1 hr)
Monday team meeting to discuss schedule and meeting with Dr. Kao, 1 hr

Gabriel: Preparation for meeting with client, 1 hr
Proposal brainstorming, 1.5 hr
This week: 5.5 hr
Total: 10.5 hr

Darcee: Made tentative schedule, 1 hr
Meeting with Dr. Kao, 1 hr
Meeting Charlie and Mike to discuss changes to creep chamber, 1 hr
Progress Report, emails, etc. 1 hr
This week: 6 hr
Total: 10.5 hr

Charlie: Meeting with Dr. Kao, 1 hr
Meeting Darcee and Mike to discuss changes to creep chamber, 1 hr
EXPO information meeting, 1 hr
Preparation for meeting with Dr. Kao, 1 hr
This week: 7 hr
Total: 12 hr

Mike: Meeting Darcee and Charlie to discuss changes to creep chamber, 1 hr
Brainstormed grip system modifications, sketches, 2 hr
Obtaining ECB locker, 0.5 hr
This week: 6.5 hr
Total: 11.5 hr