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: 10/30/02 – 11/5/02

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:
Tensile Testing
1. Work more on the issues involving the PDMS stencils.
2. Incorporate pieces needed to attach and adjust the height of the PVC hose to the chamber, depending on when the machine shop is done with machining of the environmental chamber.
3. Start working on a draft of the final paper.

Creep Testing
1. Talk to Bill Hagquist in the ME shop about which pulleys would be adequate for our design.
2. Review materials sent by Hydrastar Company.
3. Final design sketch with dimensions, by Thursday.
4. Order parts.

Summary of Accomplishments:
Tensile Testing
1. Planned upcoming experiments while waiting for part from machine shop.
2. Worked on paper outline.

Creep Testing
1. Ordered LVDT from Sentech, Inc.
2. Started auto cad sketch of creep testing system.
3. Researched pulleys and weights to use for testing.

Statement of Team Goals:
Tensile Testing
1. IPN testing on Thursday.
2. Testing of the new piece when it comes in.
3. Work on paper

Creep Testing
1. Finish auto cad sketch/sketch with dimensions.
2. Order acrylic, pulleys, and other parts.
3. Request more specs from Sentech.
4. Work on paper.

Project Schedule:
<table>
<thead>
<tr>
<th>Date</th>
<th>Tasks</th>
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<tbody>
<tr>
<td>9/4 - 9/10</td>
<td>Define team roles and outline semester goals</td>
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<tr>
<td>9/11 - 9/17</td>
<td>Make a schedule for semester, update PDS, and set-up meeting with client</td>
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<tr>
<td>9/11 - 9/20</td>
<td>Testing of existing chamber (temp, seals, visibility, compatibility with Instron 1000)</td>
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<tr>
<td>9/17 - 9/24</td>
<td>Brainstorm designs for creep testing apparatus, and for modifications of chamber for Tensile testing</td>
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<tr>
<td>9/25 – 10/17</td>
<td>Make modifications to chamber for tensile testing, develop and finalize designs of creep testing apparatus</td>
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<tr>
<td>10/14-10/17</td>
<td>Work on mid-semester presentation</td>
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<td>10/18</td>
<td>Mid-semester presentation</td>
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<tr>
<td>10/19-11/25</td>
<td>Update PDMS stencil procedure, obtain more EPON masters, finish/test modifications of Chamber for tensile tests, build creep testing apparatus. Finish a draft of the paper.</td>
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<tr>
<td>11/26-12/5</td>
<td>Tensile testing and creep testing/data analysis</td>
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<tr>
<td>12/5 - 12/12</td>
<td>Preparation of final paper and poster presentation</td>
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<tr>
<td>12/13</td>
<td>Poster presentation</td>
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<tr>
<td>12/14 - 12/20</td>
<td>Final meeting with advisor</td>
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Last updated: 11/5/02

**Difficulties:** New piece for chamber from the machine shop is still not ready.

**Activities:**

Team: Friday class time, 2 hr

**Gabriel:** Work on Paper outline, 1 hr
E-mails, misc. 1.5 hr
Experiment planning, 0.5 hr

Total: 5 hr
Cumulative Time: 57.5 hr

**Darcee:** Talked to companies about LVDT, Internet searching, and ordering, 2.5 hr
Emails, progress report, etc. 0.5 hr.

Total: 5 hr
Cumulative Time: 60.25 hr

**Charlie:** Emails, etc, 1 hr
Notebook updates, 1 hr

Total: 4 hr
Cumulative Time: 53.0 hr

**Mike:** worked on auto cad drawing, 3 hr
Looked for info on weights and pulleys, 1 hr

Total: 4 hr
Cumulative Time: 54 hr