

Team Spirometer Progress Report **July 2, 2009 – July 8, 2009**

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Goals for the past week

- Complete and distribute newsletter
- Create detailed physical design specifications for a Fleisch spirometer
- Draft preliminary PCB layout
- Acquire new Honeywell sensor with same specs as PCB-capable model
- Start creating regulatory documentation as recommended by Naresh

Accomplishments

- Distributed second newsletter
 - Sent at 8:45 AM on July 8
 - As of right now, a 31% open rate
 - Includes links to blog to encourage posting of feedback
- Constructed new Fleisch-type spirometer
 - See newest post on openspirometry.org for pictures and a dimensions document
- Tested new spirometer with 3 different port configurations
 - Compared functionality of ports located on the edge vs. in the middle
 - Full testing report should be composed by 7/9
 - Summary: front port at edge and rear port in middle provided best sensitivity
- Developed new body/handle configurations
 - Ports located on the side to minimize buildup of “gunk”
 - Body and tubing can disconnect for cleaning, attached with a snap-in mechanism
- Ordered new PCB-compatible Honeywell sensor
 - Should arrive today (7/8), intending to test tomorrow
- Meeting with Tom Fleming tonight to discuss microcontroller selection
 - Will clearly define how data is passed through the system and what processing/manipulation occurs at each step
- Modeled 3 different port configurations in SolidWorks and performed flow analysis

Goals for the upcoming week

- Complete documentation for testing done on 7/8
- Test sensitivity of Honeywell 24PC01SMT sensor
- Determine if additional modifications need to be done with the spirometer design
 - If this design cannot generate laminar flow, the capillary layout will need to be redesigned
- Work with Amit to develop a usable PCB layout
 - Amit recently took a PCB layout course and has contacts familiar with the process
 - Pin connections on the main components are understood, but additional components (capacitors, resistors, diodes, etc.) that are needed to optimize functionality need to be determined
- Try to obtain pressure and flow meters from Prof. Chesler's contacts
 - A differential pressure meter would allow us to experimentally determine resistance much more efficiently, and a flow meter would allow us to expedite iLite calibration
- Work with interns to develop the proper coaching implementation in the software
 - Recently discovered that Java will not be able to handle the video playback capabilities we want for the interactive coaching
 - The interns are re-examining Adobe AIR for media

Difficulties

- David will be out of town until July 28th or so. We will communicate regularly via e-mail until his return. He will be able to participate in our weekly meetings via a cellphone or Skype.
- The new Fleisch model does not appear capable of creating a linear Flow-Pressure relationship. We will most likely need to decrease the capillary diameter even further to approximately 1 mm to correct the problem.

Areas we would like assistance/feedback

- Fluid mechanics – how does capillary length affect Reynolds number and laminar flow?