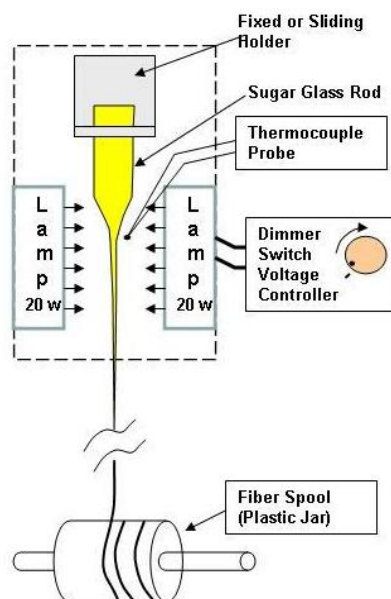


Optical Fiber Drawing Tower - An Interactive, Home-Built Demo with Sugar Glass

By Bill Heffner, wrh304@lehigh.edu

International Materials Institute for Glass at Lehigh University

<http://www.lehigh.edu/imi>



The International Materials Institute for Glass at Lehigh University has been developing a mini curriculum of hands-on experiences in glass science - all built around a glass the student can make at home, sugar glass, a.k.a. hard candy. See “**Exploring glass science through hard candy**” on our website at:

<http://www.lehigh.edu/imi/libraryglassedu.html>

We also emphasize “building your own” experiments and apparatus. This is my latest effort. Come check us out. Feedback on applicability in the high school classroom is highly welcome.

Use in conjunction with discussion of
Chemistry (matter, structure, physical properties, materials, and others)
Physics (refractive index, total internal reflection, flow and viscosity)
Engineering (fiber optics, communications, moldable materials, process control)

Background material on glass and candy glass (on website)

Sugar Glass Lecture and Demo (video)

http://rm1.cc.lehigh.edu:8080/ramgen/dept/IMI/rm_Ed/CandyGlassDemo2.rm

Sugar Glass Recipe and Cooking Procedure on website:

http://rm1.cc.lehigh.edu:8080/dept/IMI/pdf_ed/CandyGlassRecipe.pdf

Building the dimmer switch power supply (and simple hot stage):

http://www.lehigh.edu/imi/docs_edu/How2Build_SimpleHotStage.pdf

plus much more

Construction Details:

Designed with standard lumber sizes to minimize cutting.

Parts list:

Furnace:

1x4 pine cut into the following pieces:

2- 3.5" long 1x4 (sides of heater)

1- 5.5" long 1x4 (back of heater)

4 - 1 1/4" wood screws

2 - under cabinet halogen accent lamp (20 W, by Westek at Home Depot, \$10 ea)

Base

1- 9" long 2x8

1- 6" long 2x4

1- 7.5" long 1x4

1 - 8" long 1/2" wood dowel

1 - 2' long 1/2 aluminum rod from ring stand

1 - 6" long 1/2 wood or aluminum rod to hold furnace

1 - 90 degree ring stand connector

Meters and controllers:

1 - voltmeter (to monitor voltage)

1 - digital voltmeter with thermocouple probe

(Harbor Freight, ITEM 37772-2VGA, \$25.)

1 - dimmer switch voltage controller - see separate make file at

http://www.lehigh.edu/imi/docs_edu/How2Build_SimpleHotStage.pdf

