

HEAT

Introduction

The lecture demonstrations listed in this section also include a short description and outline of how the demonstration experiment works. This is for the benefit of the lecturer (who is going to use it in the classroom) and the student (who will see it demonstrated in class).

[To the lecturer:

All of the equipment used in these demonstrations is stored in Heldenfels Hall. Some of the equipment is rather delicate and not easily transported to other buildings (our only mode of transport is a cart pushed by hand).

When requesting a demonstration, be sure to mention the reference number and name listed in this section (example MEC-1 Friction). Requests for demonstrations to be set up in a different building from Heldenfels will require at least 3 class-days notice. The logistics of setting up demonstrations in different buildings gets difficult without advance notice.

Practice with the apparatus prior to use in the classroom is always encouraged.]

Contents

H-01 Ball, Ring, and Bimetallic Strip

H-02 Linear Expansion of a Rod

H-03 P-V-T Models

H-1 BALL, RING AND BIMETALLIC STRIP

Equipment: Bimetallic strip on holder
Brass ring on holder
Brass ball on holder
Bunsen burner and lighter
Gas source (or propane tank)

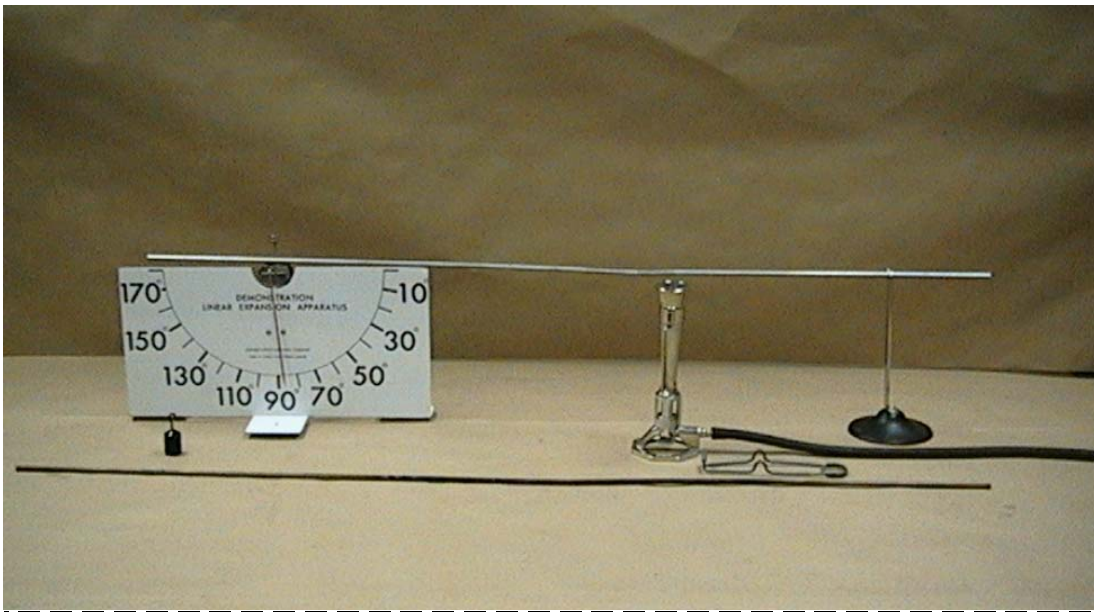
Comments: First, show that the ball will not pass through the ring. Heat the ring and the ball will pass in and out. **CAUTION—REMOVE THE RING FROM THE BALL BEFORE IT COOLS.** Carefully heat the bimetallic strip evenly with the burner. It is made of a strip of brass and a strip of invar brazed together.



H-2 LINEAR EXPANSION

Equipment: Tube support and scale w/needle
Aluminum tube (3ft long)
Brass tube (3ft long)
50g hooked mass
Bunsen burner and lighter
Gas source (or propane tank)

Comments: Place one of the tubes on the tube support and put the 50g mass on the tube near the scale (used to weigh down the tube). The tube should rest on top of the indicating needle. Heat the tube evenly along its entire length. This procedure can only show that the two metal tubes expand when heated but can not compare the coefficient of linear expansion since the tubes can not be heated at the exactly the same temperature.



H-3 PVT MODELS

Equipment: Ideal gas model
CO₂ model
H₂O model

Comments: Any or all of the above may be selected for use. The models represent the pressure, volume, and temperature relations. They are light weight and color-coded.

