

## VACUUM DEMONSTRATION TIPS

- **Falling feather** - see drawing for placement of feather and metal piece. Demonstrate outside of chamber first.
- **Expanding balloon** - Prestretch balloon by blowing in up a couple of times. Tie off balloon leaving a small amount of air inside.
- **Expanding marshmallows** - Use “fresh” large marshmallows. Best demonstrated as a stack. (see drawing)
- **Crushing a pop can** - Make sure can is clean and dry. Remove the tab from can and remove the knurled screw that holds the viton seal in place on the base plate. Place can over the opening on the base plate and while holding the can in place with the palm of your hand (put pressure on can so it makes good seal with viton) turn on pump. The can collapses immediately.
- **Vacuum plates** - Place a coin in the volume to be evacuated and shake the assembly to show that there is empty space between the vacated plates. Make sure the plates are seated against each other. Suck out air and hold while two people try to pull apart. The pressure holding the plates together is ~ 450 lb. Be careful not to let air in while people are trying to pull the plates apart.
- **Transmission of sound** - place a vibration dampening substance between sound device and base plate. Pump out system till no sound is heard. Turn off pump and have audience listen while you let system up to air.
  - \* **Radio** - tune radio to strong station and turn up volume so it is slightly distorted. When you place the radio in the chamber the sound will be muffled.
  - \* **Photo sensitive device** - demonstrate in air with flashlight. Demonstrate in vacuum and discuss the difference between transmission of sound and light.
  - \* **Bursting balloon** - see drawing for setup in vacuum.
- **Adiabatic expansion** - demonstrate with LCD thermometer first. To demonstrate a cloud, wipe inside of vacuum jar with a heavily moistened cloth and turn down room lights. Turn on pump and using a flashlight or laser show the formation of the cloud. This will quickly contaminate the pump oil so limit the number of times you demonstrate clouding.

A more dramatic way to demonstrate cloud formation is to pump system out without and water present and then turn off pump. Place a heavily moistened cloth over the vent and vent system. Immediately close vent and turn on pump.
- **Triple point of water (latent heat of vaporization)**- The pumping speed of this system is barely adequate for this demonstration so you must use a desiccant. Place the desiccant in a small dish (can be made with Al foil). Place 2-3ml of ice water in the graduated cylinder and turn on pump. Be patient!