

# Educational Innovations<sup>LLC</sup>®

## FIR-150 Fire Syringe Demo

When the piston in the transparent cylinder is rapidly depressed using a quick, firm stroke over dry cotton or paper tissue fibers, ignition occurs. The compression of the air causes the temperature of the gas to rise rapidly, igniting the material at the base of the cylinder resulting in a bright flash. This is one of the most impressive demonstrations of the heat produced when a gas is rapidly compressed and is the principle behind how a diesel engine functions.

The Fire Syringe is very sensitive to moisture, so to insure the proper results you should first clean the apparatus thoroughly. No cleansers or solvents are necessary. Simply wipe the piston thoroughly using a clean, dry paper towel. Next, twist a piece of paper towel into a long slender swab, and clean the chamber all the way to the bottom. The goal is to remove all oil from the inside of the chamber. A small amount of oil on the o-rings is sufficient lubrication.

Next, place a small piece of dry material in the chamber of the syringe. Paper or cotton fibers are common samples. Our personal favorite is cotton from cotton balls. You want only a “thin wisp” of cotton fibers for each demonstration. Pluck it off the edge of a cotton ball and then “tease out” the fibers to maximize the surface area of your cotton sample. Push the sample to the bottom of the chamber with a pencil or other long thin object.

Place the piston into the mouth of the chamber and thread the collar back onto the syringe. Place the syringe on a sturdy table. Get a firm grip on the handle and force the piston straight down, **FAST AND HARD**. If it does not fire, withdraw the piston all the way until it is loose inside the collar (this allows fresh oxygen to enter the chamber through the small hole in the collar) and force the piston straight down again, **FAST AND HARD**. You may need to pump it repeatedly four or five times, withdrawing the piston to the collar each time, before you get a flash. This can take a little practice, so don't be discouraged if it doesn't flash the first time you try it.

If you don't get a flash after several tries you may have used up your fuel sample (you may have noticed little puffs of smoke indicating some combustion). You will need to remove the collar and retract the plunger. Use your paper towel swab or pencil to remove the used material from cylinder. The swab will also displace the “used” air from the cylinder, allowing more fresh air to refill the cylinder.

**WARNING:** Under **NO** circumstances should you use flash paper, liquid fuels, match heads, gun powder, or any fuels not specifically recommended in the instructions. Such volatile fuels could cause the Fire Syringe tube to shatter. Safety glasses are recommended for use with this product.



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