

Educational Innovations[®]

#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.

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 toilet tissue. If you have access to a desiccator, it is helpful to store your fuel fibers in it. Ensuring you have a dry piece of toilet tissue (not the kind that contains "lotion"), tear off a small piece (about 1 cm square). To ensure the paper doesn't pick up moisture from your hands, handle the sample as much as possible with tweezers. Crumple the paper slightly, and push it 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. This can take a little practice, so don't be discouraged if it doesn't flash the first time you try it. It may be helpful to prepare a couple of pieces of toilet paper or cotton fiber in advance.

If you don't get a flash, you may see a little puff of smoke. The oxygen in the cylinder will have been consumed, so 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 fresh air to refill the cylinder.

WARNING: Under NO circumstances should you use flash paper, as it will cause the glass tube to shatter. Safety glasses are recommended for use with this product.



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