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Coleman Vacu-Print™

TECHNICAL NOTES

Background

The Coleman Vacu-Print™ equipment allows you to glue-fume evidence in an air-evacuated, sealed chamber. Vacuum technology for glue fuming is relatively new. This method will develop latent fingerprints without having excessive residue coat the surface of the evidence, and it will be easier to handle the evidence. Because there is no residue buildup on the evidence, dye-staining for fluorescent examination is more effective. Dyes such as Rhodamine 6G and Ardrox adhere to the glue residue on the item. When there is excessive buildup of the glue residue, the dye stains all of it, causing the entire surface to fluoresce, perhaps obscuring ridge detail.

Safety

CAUTION: Do not place pressurized items such as sealed soda cans, sealed glass bottles or aerosol cans in the chamber. They can expand rapidly or explode as air pressure is evacuated from the chamber, potentially causing injury.

Equipment

The components of the Coleman Vacu-print set consist of a vacuum pump and a fuming chamber. The fuming chamber has a gauge, a release valve and a hose mount on it. The gauge indicates the amount of vacuum pressure measured in inches of mercury. The release valve is used to allow air back into the chamber. The hose mount is used to connect the hose from the pump to the chamber. The vacuum pump (if purchased with this equipment) is 1⁄3 horsepower rated 3 CFM and includes oil. Read the instruction books that come with the vacuum pump to learn about care and maintenance. However, ignore the part about changing the oil in the pump after every use. It might not be necessary to change the oil but once per year, depending on your usage. Note the names of the various parts of the vacuum pump in the diagram shown in this instruction sheet. Follow the directions for tightening the Oil Filter Plug and Drain Valve and fillthe pump with the oil included in the shipping box.

Components

The Coleman Vacu-print is supplied with the following parts for your assembly:

1-4700	Table Top Chamber OR,
1-4701	Long (rifle) Chamber
1-4702	Vacuum Pump
1-4707	Lid and O-ring for Table Top Chamber OR,
1-4709	Lid and O-ring for Long Chamber
1-4711	Vacuum Charge Hose
	Air Release Valve (photo A)
	Male Connector (photo B)
	Air Gauge (photo C)
	Connector for Air Gauge (photo C)
	Tube of Silicon Grease

Photo A

Photo B

Photo C

Chamber set up:

The chamber has three holes drilled and tapped in the side wall. In these holes the brass fittings will be placed. Each fitting should be wrapped with plastic thread tape prior to assembly to assure a good air seal. Care should be taken when threading the fittings into the holes as not to cross-thread the fittings. If they are cross-threaded the holes will have to be re-tapped to correct the threads. All pieces should be hand tightened then seated with a ¼ turn with a wrench. Do not over tighten as the threads of the chamber will strip.

The air valve (photo A) is to be threaded into the middle hole of either chamber. The sizing connector (photo C) is to be threaded into the top hole of the Table Top Chamber or the hole nearest the opening of the Long Chamber prior to connecting the Air Gauge. After the connector is seated, then thread the Air Gauge into the connector. The male connector (photo B) is placed in the bottom hole of the Table Top Chamber or the hole farthest from the opening of the Long Chamber. The assembly should look like Photo D.

The lid (photo E) is covered with a tacky paper to protect it from scratches. Carefully peel the paper from the lid. The O-ring will need to have silicone grease applied to it prior to use. Remove the O-ring from the lid and apply a light coating of grease to both sides. It is advisable to wear latex gloves to keep your hands clean. Squeeze a small amount of

Photo D

Photo E

silicone grease from the tube onto one finger. Lightly spread the grease between the finger and thumb then message the O-ring, spreading the grease evenly over the entire surface. Add more grease to the fingers as necessary to adequately cover the O-ring. After the grease is applied replace the O-ring into the lid channel. Be sure the O-ring is seated firmly into the groove.

The vacuum charge hose is attached to the male connector (photo B) then to the vacuum pump.

Vacuum pump set up:
(Note: this section is for FJC Vacuum Pumps)
Remove the pump and bottle of oil from the box. PUMP IS SHIPPED WITHOUT OIL. DO NOT OPERATE UNTIL OIL IS ADDED. Place the pump on a level surface, remove the red oil cap and add pump oil until the oil level is even with the fill line in the watch window. (Photo F) Replace oil cap.
Plug in pump and operate for about a minute to disperse oil in system.
Attach blue vacuum hose to the vacuum chamber and the vacuum pump. The hose will attach to the top port. (Photo G) Do not remove the cap from the second port, doing so will not allow the pump to draw a vacuum. Fittings should be finger tight, do not use a wrench to attach hoses to either the pump or chamber.
For maintenance and troubleshooting questions, please refer to the operating manual included with the pump.

Photo F

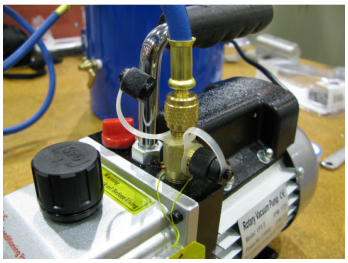
Photo G

Method

Place the items of evidence inside the Coleman Vacu-Print™ chamber. It is not necessary to unfold garbage bags or to leave large amounts of space between items of evidence. If using liquid glue, put a small volume (2 or 3 ml) in a small dish or folded-up piece of aluminum foil. Or, if using the Hard Evidence™ pouches, cut off a half-inch strip, open it up and attach it to the inside wall of the chamber with tape. For best results, we recommend using Hard Evidence™ pouches. Put the lid on the chamber and close the release valve.
Turn on the vacuum pump. The pump will draw down the pressure automatically in the chamber. Depending on the conditions in your laboratory a small amount of vapor may be visible exhausting from the pump. This is a normal occurrence; this may be the result of humidity in the chamber or the laboratory. When the pressure gauge reads around 25 inches of mercury, turn the pump off. It should take less than two minutes to reach the proper pressure. The system will hold the pressure until released. Leave the items in the chamber under vacuum for about twenty minutes. If items are left longer (even overnight), there is no danger of over-fuming.

To release the pressure, slowly open the petcock on the chamber and allow the chamber to equalize. It is also possible to release the pressure by removing the second cap on the pump. (Photo H)

Remove the lid, taking care to stand back from the opening of the chamber. There may be a strong odor of glue fumes, and it may be an irritant to the eyes, nose and throat. Take out the evidence. It is recommended to allow the items to sit in the air for about 10 to 15 minutes before dusting or processing with liquid staining chemicals. This helps to harden the developed latent prints.

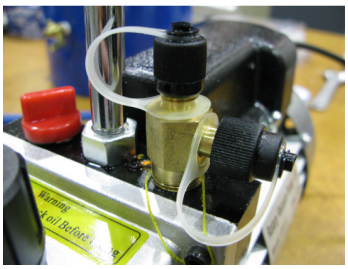

Photo H

Dual Connector

A Dual Connector (in a "Y' shape) is available if you wish to operate the two chambers with the same pump. The Dual Connector attaches to the pump and the hoses from the chambers are attached to it. Place evidence in both chambers. Close the hose on the Dual Connector to one of the chambers and start the pump. It will evacuate the other chamber. When the first chamber is under vacuum, close the hose on the Dual Connector to it. Open the hose on the Dual Connector to the second chamber and run the pump to evacuate it. It is not recommended to operate the pump and evacuate both chambers simultaneously. It would take too much time to do so. Set up your evidence and glue in one chamber and evaluate it. Then, you can set up and evaluate the second chamber.

Examination

Most latent prints developed with glue fuming in the aquarium style of processing will have white ridges and will be quite noticeable, but the disadvantage is that there will also be residue on the background surface. With this vacuum method the latent prints will not be as visible, but they will show up as sharp, clear prints when viewed with a Forensic Light Source or UV light after treatment with the appropriate dye or powder. Sometimes, however, the latent prints will be very difficult to see; therefore, each piece of evidence must be carefully inspected. Oblique lighting from a flashlight will be helpful. It is suggested that these prints be photographed before other processes are used. The latent prints can be visually enhanced by dusting with a regular or magnetic fingerprint powder contrasting with the background. Once dusted with powder, some glue-fumed latent prints can be lifted with regular lifting tape. The latent prints are quite durable and usually can be lifted more than once. Sometimes the second lift is clearer than the first.

Photography

Visible, contrasting prints can be photographed in the usual way. However, photography of white, glue-developed prints on light-colored or transparent objects may need some different lighting. If the object is transparent, place a piece of paper of contrasting color behind it and photograph as normal. Or, move the light source behind the object. The light will shine through the transparent areas, but the latent prints will appear dark, as no light will shine through them. If the object is light-colored and not transparent, it may be necessary to dust with black powder or use fluorescent dyes and powders on the latent print to provide the needed contrast. If using fluorescent dyes or powders, it will be necessary to photograph the latent prints using the same forensic light source wavelength as used to visualize the latent print with the eye.

Helpful Hints

- Be careful not to drop or chip the plastic lid. If it is chipped too badly, it will not seal properly and a vacuum will not be achieved.
- Clean the chamber with Lightning Powder CA Remover between each use to avoid heavy build up of residue.
- Let the evidence sit for 10-15 minutes in the air before dusting or dye staining.

Ordering Information

Catalog No. 1-4700 ..... Coleman Vacu-Print™ Table-top Chamber
Catalog No. 1-4701 ..... Coleman Vacu-Print™ Long (rifle) Chamber
Catalog No. 1-4702 ..... Vacuum Pump/Motor with hose
Catalog No. 1-4703 ..... Vacuum Pump/Motor with hose, 220 volt for export
Catalog No. 1-4704 ..... Dual Connector
Catalog No. 1-4705 ..... Vacuum Pump Oil, one quart
Catalog No. 1-4501 ..... Loctite® Liquid Glue, 1 oz.
Catalog No. 1-4620 ..... Hard Evidence™ Pouch, 20 pack
Catalog No. 1-4661…….. Hard Evidence Cleaner, 2oz.
Catalog No. 1-4662…….. Hard Evidence Cleaner, 32oz.
Catalog No. 1-4663..... CA Remover, 32oz.