

*** * * OPERATOR'S MANUAL FOR DEVELOPER * * ***

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1. The DEVELOPER is capable of being applied for the development of latent fingerprints which are deposited on all varieties of substrates, with the exception of those substrates with black porous surfaces.
2. The portability of the DEVELOPER makes very convenient to use anywhere and it is extremely easy to handle.
3. The DEVELOPER is highly sensitive to latent fingerprints.

Reagent

1. The DEVELOPER is a solution of Ruthenium tetroxide (RuO₄) and organic solvent.(United States Patent Number 5,378,492)
2. The DEVELOPER is deep yellow, transparent, non-flammable and does not dissolve oils. The fumes from it give off an ozonic odor and irritate the eyes and respiratory tract.

Fumer

1. This device is used for blowing fumes out of the DEVELOPER by making bubbles in the solution with an air pump or compressor.
2. The device is composed of a bubble glass cylinder which has a cap with an air blow nozzle and a pipe for fumes to exit.

The Method for Developing Latent Prints

This DEVELOPER method can be applied for developing prints either by a fuming method or a liquid method.

1. Fuming method

There are three ways for developing latent prints using this method: Direct, Indirect. And Lifting.

(1) Direct method

Blow the fumes out of solution with the Fumer directly on surfaces such as paper (containing thermo-sensitive paper), clothes, leather, wood, plastics, glass, metal, human skin, walls and so on. The fumes react with organic compounds, particularly fatty oils or fats contained in sebaceous containments contained in latent print residues, turning them black or brownish black. If you require more deeply developed prints, blow over again.

(2) Indirect method

Place the substrates in a plastic bag and then blow the fumes out in the same way as in the direct method or in case of immovable objects such as walls. Door, etc., place plastic sheets over such objects and blow the fumes out on the top of the object and then the fumes will reach the lower part of the object by being pulled down with gravity.

Soon after blowing the fumes out in the bags or under the plastic sheets, as the case may be, mix the fumes by pinching and moving back and forth with your fingertips the outside of the closed bag or the plastic sheets. The prints will appear in about two or three minutes after blowing out the fumes.

Compared with the direct method, this method requires a little more time before the prints will appear, but does eliminate the ozonic odor and is very economical for developing prints on large substrates. The ozonic odor which is present in plastic bags or under plastic sheets should naturally dissipate more quickly if alcohol is sprayed on them. Please note the fumes are non-combustible when mixed with alcohol fumes because of the solvent fumes.

(3) Lifting method

In the case of developing latent prints which are deposited on smooth surfaces such as glass, metal, non-porous processed paper and wood, etc, first the RTX solution in the fumer should be sprayed (vaporized) over the surface where latent prints are assumed to have been deposited just as in developing by the above-mentioned direct methods.

Then, any kind of adhesive Teflon tape, gummed (adhesive) tape or friction plastic tape should be placed on each of the developed prints, and each tape should be strongly pressed with a rubber roller only one time. Then each of the prints on it again, each of the lifted prints become much clearer than before. It is quite possible that the method (in particular adhesive Teflon) is applied to prints deposited on human skin, too.

Note: since the developed prints will appear in the reverse, you must take extra care to identify them.

2. Liquid method

Dip substrates, in particular those such as adhesive tapes, cellophane tapes and plastic tapes with sticky surfaces, directly into the solution which is poured in glass or ceramic vessels corresponding to the size of the particular substrate. As soon as the substrates are dipped into the solution, the images of the prints appear, particularly on sticky surfaces.

CAUTION

1. This method of developing latent prints should be carried out before the other methods which require the application of Aluminum powder, Ninhydrin and Cyanoacrylate, etc., because these chemicals interfere with the effectiveness of the DEVELOPER or the fumes from it. After being applied onto the substrates, however, the method does not interfere with the effectiveness of the other methods.
2. The method should be done in a fume hood, with adequate ventilation or in a fume chamber, if possible.
3. Please wear plastic or rubber gloves when using the solution, but when you use it without them, your hands will get black, please spray Hypochloride (NaOCl) on them, or remove the black stain and wash thoroughly with water and remove them.
4. The DEVELOPER should absolutely not be sprayed or blown out directly toward the human face.
5. In the case the Sodium Hypochloride (NaOCl) solution is used on substrates, it is better that the solution and its residues are completely wiped up with either a wet cloth or paper.
6. Even though black precipitates may form on the bottom of vessel containing the DEVELOPER, as long as the solution remains pale yellow, its effectiveness will hardly vary.

7. *After finishing to use the DEVELOPER, never put the remained solution back into the original vessel. Turn off two cocks on the fumer, in which the solution is remained, and keep it in a dark place as is, and use it alike. If the remained solution turns colorless during the keeping, it is ineffective.*
8. *The shelf life of the product is more than one year unless it touches water vapor or is mixed with water or organic substances, for example oil. The product in a brown glass bottle capped tightly should be kept in a dark place at the normal room temperature, not in a refrigerator. The black emages of prints developed with RTX are exactly kept forever as they are unless they are wiped up either with a piece of wet cloth or paper containing such an oxidizer as hypochloride (NaOCl) 3% aqua solution or alcohol.*

REFERENCES

Merk Index, 1982, P.1195 (8162), says the RuO₄ fumes with ozonic odor from the DEVELOPER irritate the eyes and the respiratory tract but does not indicate that they are poisonous or toxic to humans.

MSDS, Material Safety Data Sheet, by Kenzoh Mashiko, Ibaraki-ken Japan, says RTX's LD₅₀ is 5570 mg/kg, oral, mouse. Chemicals with more than 5000 mg/kg of LD₅₀ are non-toxic or non-poisonous in practice.

MSDS, Material Safety Data Sheet, by 3M Center, St.Paul, Minnesota, says the solvent of the DEVELOPER is not hazardous to the environment, or flammable.