

Labino® TrAc Finder



FORENSIC LIGHT SOURCE

Crime Scene Investigation

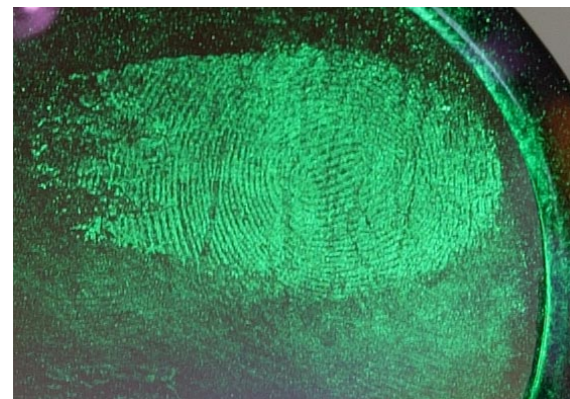


MAKES IT BRIGHT

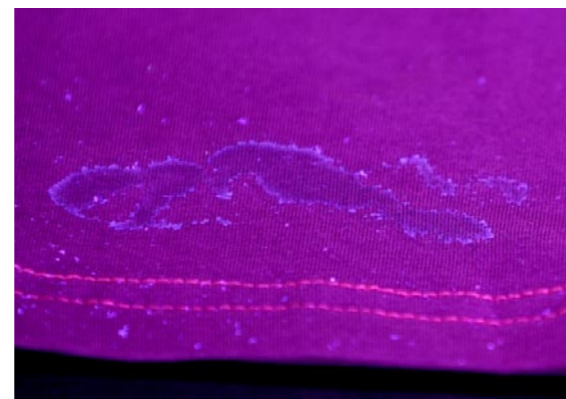
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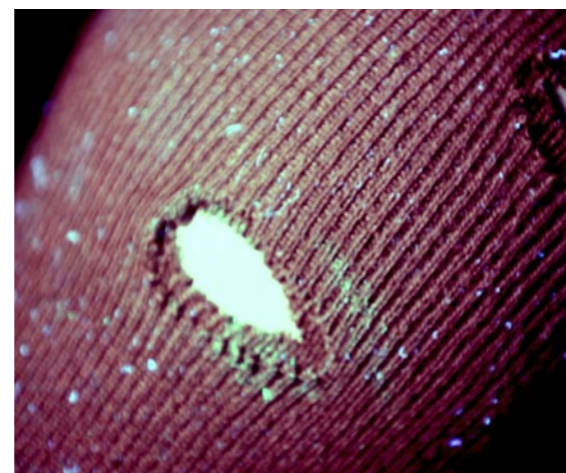
FINGERPRINT



SEMINAL FLUID



BLOOD



SALIVA

Introducing the Labino TrAc Finder



Labino® TrAc Finder = Crime Kit + TrAc Lamp*

Crime Kit

4 FORENSIC FILTERS + 3 FORENSIC GOGGLES + 1 PRO CARRYING CASE

- 1 UV Crime Filter (310-400 nm)
- 1 General Crime Filter (400-525 nm)
- 1 Blue Crime Filter (415-485 nm)
- 1 Green Crime Filter (485-530 nm)
- 1 Yellow Goggles
- 1 Orange Goggles
- 1 Red Goggles

TrAc Lamp*

CHOOSE LAMP MODEL

- Compact with handle on top
- Duo with pistol handle

CHOOSE LIGHT BEAM

- Super-intense "Spotlight"
- Wider-beamed "Midlight"



Models: Compact (TrAc Light) and Duo (TrAc Light PRO)

Labino "TrAc" series is comprised of **several models** of portable battery operated lamps. The operating time, charging time and weight vary for each model. Detailed technical information about each lamp can be found on Labino's website. Please visit www.labino.com

* Lamp purchased separately, thus providing ultimate flexibility for the user.

Main Features

High Intensity - Wide Light Beam – Interchangeable Filters

The Labino® TrAc Finder is a revolutionary alternative light source. It is among the most powerful forensic light sources with the widest light beam available on the market today. The TrAc Finder also has a unique interchangeable filter system which offers incredible flexibility to the user.

Lamp – Filters – Goggles - Case

The TrAc Finder consists of a POWERFUL battery-operated UV lamp of your choice* from Labino's portable "TrAc" series and a Crime Kit. The Crime Kit contains 4 interchangeable forensic filters and 3 forensic goggles, all neatly packed in a rugged durable case that is easy to carry. The filters are easy to change and simply "snap-on" and "snap-off" the front of the lamp. The TrAc Finder is easy to operate and requires only minimal additional instruction.

*Lamp purchased separately

Designed for Forensic Science

Labino's TrAc Finder was developed especially for those working with criminal forensic science, such as crime scene examiners, crime laboratory analysts and forensic scientists. The extreme intensity, wide light beam and unique filter system make the TrAc Finder one of the most user-friendly forensic lamps on the market.

Inspections in Daylight

The Labino TrAc Finder is an ultra-powerful high intensity lamp. Together with our specially developed forensic filters and goggles the probability of finding fluorescent traces of substances in conditions that were previously not possible is greatly increased. The Labino "Spotlight" is so intense that it is possible to conduct searches and investigations even in daylight conditions, without the need for darkening the crime scene.

Flexibility

The TrAc Finder is highly suitable for laboratory and field work. Due to the high intensity (up to 45,000 micro Watts/cm² at 38 cm) and long lasting Labino light bulbs (approx. 2000 hours), the TrAc Finder is a cost effective alternative to other more expensive and complicated light sources.

Laboratory

The TrAc Finder provides intense illumination over a wide area. It is lightweight, easily portable, quiet to operate, and the lamp frame remains cool during operations. The TrAc Finder can easily be attached to a friction arm* for stationary laboratory work. *friction arm sold separately

Field investigations

It takes less than one minute to pack the TrAc Finder in its rugged pro case, making it an ideal choice for crime scene units. Transporting the case is easy since a typical pro case fully loaded with filters, goggles and a battery-operated TrAc Light® lamp weighs less than 7 kilos.



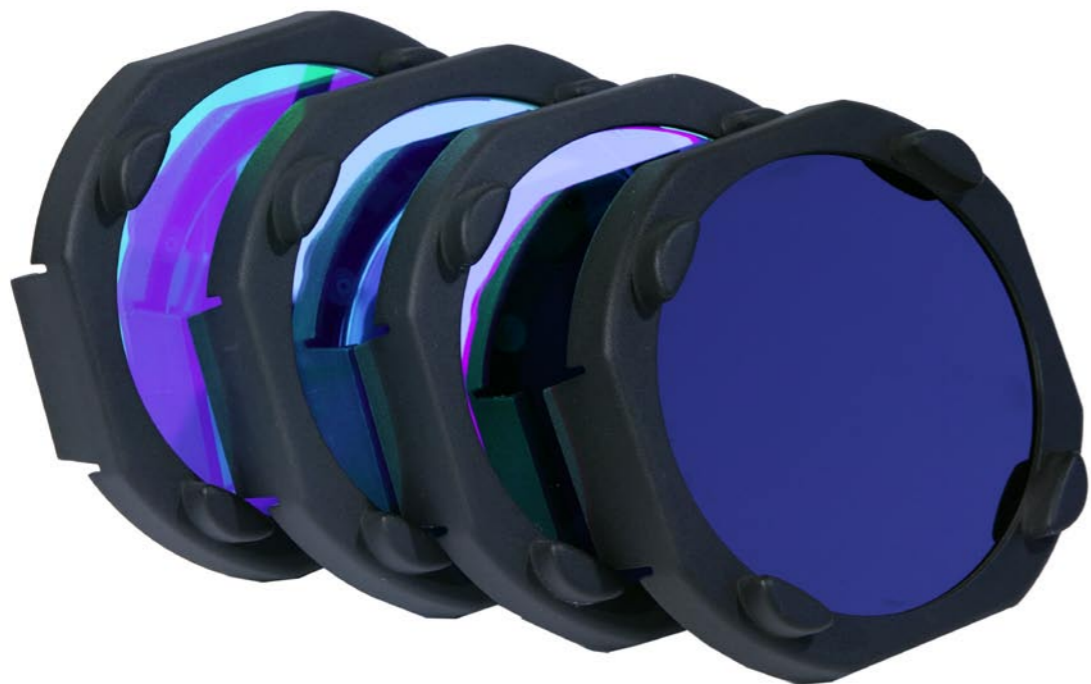
Strengths and Benefits

It is the combination of strengths listed below that make the **Labino TrAc Finder** such a remarkable product.

STRENGTHS	BENEFITS
Intense light	Better illumination at the crime scene Improved contrast Daylight investigations are possible Possibility to find more traces than with other lamps
Light, compact models	Portable - easy to transport and maneuver
Easy to use - no complicated parts	Short amount of time required to learn
Robust, IP65 certified	Shock-resistant. Suitable for outdoor use, even in bad weather
One lamp with interchangeable filters	All-in-one product makes work easier
No fan	Quiet. No filter to change. Water-tight. Dust proof. Low maintenance
Turn on/ off repeatedly	Quick start-up. Lamp can be switched on/off to save batteries.
Spare parts in warehouse	Quick service – fast delivery of spare parts
Global service centers	Fast service
Cost effective	Suitable for field and laboratory operations
Wide range of lamps	Choose the model which best suits your needs
TrAc Light at the crime scene	<ul style="list-style-type: none"> • Compact, no cables, integrated battery/electronics, 1.2 hrs battery time
TrAc Light PRO in the laboratory	<ul style="list-style-type: none"> • Duo unit, light-weight hand unit, 2.5 hours operating time
Spotlight reflector	<ul style="list-style-type: none"> • Extremely intense. Possible to conduct examinations and searches in daylight
Midlight reflector	<ul style="list-style-type: none"> • Large viewing area with intense light

Forensic Filters

The Labino TrAc Finder includes 4 easy-to-change forensic filters that can quickly be “clicked-on” and “clicked-off” the front of the lamp.



Forensic Filters	Wavelength
UV Crime Filter	310-400 nm (peaks at 365 nm)
General Crime Filter	400-525 nm
Blue Crime Filter	415-485 nm
Green Crime Filter	485-530 nm

UV Crime Filter (310-400 nm)

- Cuts away wavelengths outside of 310-400 nanometer range.
- Can be used when searching for traces of blood. Blood does not fluoresce but rather absorbs UV light and appears black. Effective on dark fabric and other soft materials. Can also be used to find fibers.
- Some body fluids, such as saliva, urine, and semen may fluoresce and appear a light yellow color when illuminated with UV light and when using the UV Crime Filter. Some narcotics may also fluoresce when using this filter.
- In some cases, yellow goggles improve the contrast.

General Crime Filter (400-525 nm)

- Cuts away wavelengths outside of the 400-525 nanometer range.
- Often used to get a quick overall view of the crime scene and to locate potential traces of substances.
- Orange, yellow and red goggles can be effective depending on the investigation and scene.

Blue Crime Filter (415-485 nm)

- Cuts away wavelengths outside of the 415-485 nanometer range.
- Often used in combination with fluorescent dye like Basic Yellow 40, or Ardocks and ultraviolet light after cyanoacrylate development of latent fingerprints.
- Best used together with yellow goggles. Sometimes used with orange goggles, depending on light conditions, material and state of substance.

Green Crime Filter (485-530 nm)

- Cuts away wavelengths outside of the 485-530 nanometer range.
- Works well for biological substances especially if the background is fluorescent and if the Blue Crime Filter isn't sufficient to show traces.
- Mostly used with orange or red goggles.
- This filter is optimal when using DFO* method for developing fingerprints.

Forensic Goggles

Three forensic goggles – red, orange and yellow – are included in the Crime Kit. Each pair of these lightweight wrap-around goggles comes with its own protective case.

Labino forensic goggles are specifically intended for use together with Labino forensic filters. Some substances and traces are more visible to the human eye when seen through forensic goggles. The effect of combining certain forensic goggles with certain forensic filters depends often on the light conditions, surface that the evidence is on, and the state of the substance or trace.



Yellow goggles

- Transmits 2% at 480 nm.

Orange goggles

- Transmits 2% at 549 nm.

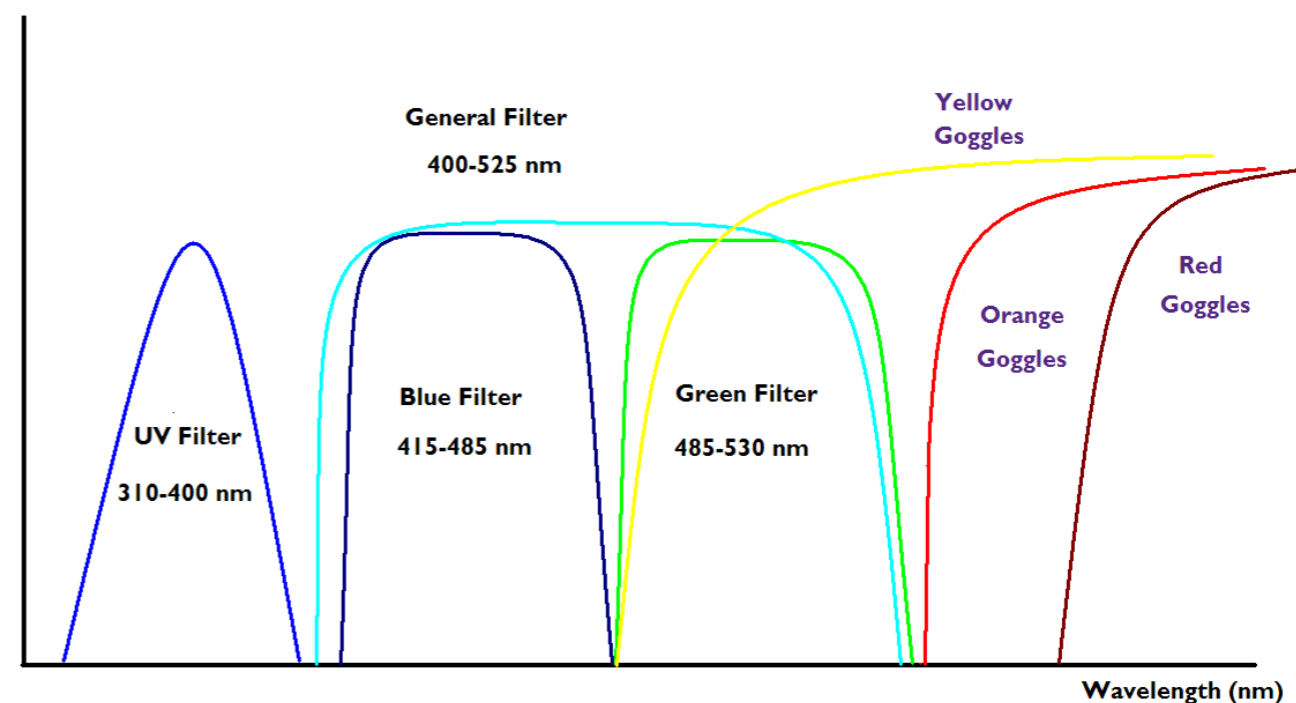
Red goggles

- Transmits 2% at 583 nm.

Graph A

This graph illustrates how light is transmitted through the various Labino crime filters and the transmission curves for Labino crime goggles.

Intensity of Light



Graph A: Note: This sketch is a generalization which describes how fluorescence works in forensic investigations.

Forensic Light Sources, Evidence and DNA

Using a Forensic Light Source

Forensic light sources are commonly used in crime scene investigations to help detect traces of potential evidence. A wide range of substances, including many biological traces and some narcotics, naturally fluoresce when illuminated with sufficient light of the right wavelength. Some substances, for example, fluoresce best when illuminated with light that is actually outside of the ultraviolet light spectrum, which is why Labino's TrAc Finder includes four forensic filters.

Alternative light sources such as the Labino TrAc Finder are used out in the field by investigators and in the laboratory by forensic analysts. A forensic light source makes it possible to observe traces that otherwise would be invisible to the human eye in normal light conditions. This in turn enables the investigator to photograph and collect samples for testing.

The Importance of Evidence Collection

Fingerprints, trace evidence and other physical evidence that may contain DNA have become increasingly important in criminal investigations in the past few decades. Proper identification, collection, transportation and storage of DNA evidence may independently and objectively link or eliminate a suspect/victim to a crime, disprove an alibi or assist in developing important investigative leads. It can also prove invaluable for exonerating the innocent.

What Is DNA?

DNA, or deoxyribonucleic acid, is the building block for an individual's entire genetic make-up; virtually every cell in the human body contains DNA. The DNA in people's blood is the same as the DNA in their saliva, skin tissue, hair, and bone. Importantly, DNA does not change throughout a person's life and each person's DNA is different from every other individual's, except for identical twins.

Examining Physical Evidence

Hundreds of varieties of physical evidence are routinely submitted for examination to forensic science laboratories however evidence that can be subjected to DNA analysis is generally limited to things that are biological in nature.

Biological:

The following is a list of biological materials from which DNA is most often isolated and analyzed:

- Blood and bloodstains
- Saliva and sweat
- Semen and seminal stains
- Tissues and cells
- Vaginal fluids
- Bones and organs
- Hairs with follicles
- Urine (can contain blood)

Non-Biological:

- Fingerprints (in some cases the retrieval of DNA may be possible)
- Subcutaneous bruising on live and dead bodies
- Narcotics
- Fibers
- Accelerants and hydrocarbons

Examples of Investigations

With its portability, wide light beam and easy-to-change filters, the Labino TrAc Finder is a popular choice among investigators. The TrAc Finder is well-suited to investigations such as:

- Sex Crimes
- Arson
- Automotive Accidents | Automotive Theft
- Document Analysis | Forgery Detection
- General Crime Scene Searches
- Latent Fingerprint Examination
- Burglaries | Robberies
- Environmental Abuse and Illegal Dumping

Using Filters and Goggles

The TrAc Finder was designed to be easy to use. Knowing which filters to use and when, however is not an exact science. The investigator often acquires this knowledge through years of experience. This is because no two crime scenes are ever identical and the state and condition of material, substances and traces can vary.

We recommend first making a "general sweep" of the crime scene using the UV Crime Filter. Most substances that are inclined to fluoresce will. The next step is to snap on the other filters, one at a time of course, as various filter/goggle combinations often improve the contrast and hence visibility. Different materials, and in particular background materials become fluorescent under different wavelengths, which is why you will need to use the goggles. The goggles block out the interfering reflection, hence enabling you to see the fluorescent potential evidence.

CRIME FILTER	BANDWIDTH	GOGGLES	APPLICATION or ITEM
UV	310-400	CLEAR*. YELLOW sometimes improves contrast	UV FLUORESCENT DYES AND POWDERS, BODY FLUIDS, SALIVA, SOME ACCELERANTS
GENERAL	400-525	ORANGE, YELLOW or RED	BITE MARKS, BRUISING, BASIC YELLOW, ARDROX
BLUE	415-485	YELLOW or ORANGE	BIOLOGICAL STAINS (SEMEN, URINE, PROTEINS), HAIR, FIBER, BONE
GREEN	485-530	ORANGE or RED	NINHYDRIN TREATED SAMPLES, RHODAMINE DYE

*Clear UV blocking goggles sold separately

Changing Filters

Changing forensic filters is quick and easy. The filters can easily be snapped in place on the front of the lamp and they are interchangeable. Before changing filters you will need to ensure that the lamp is turned off. To lift off the existing filter frame you just hook your fingers under the frame and pull. The frame should easily lift off. Once you have chosen which new filter you want to use – UV, blue, green or general – you simply snap it in place over the clear glass protection filter. It's then safe to turn the lamp on. It will reach full power in 5-15 seconds.

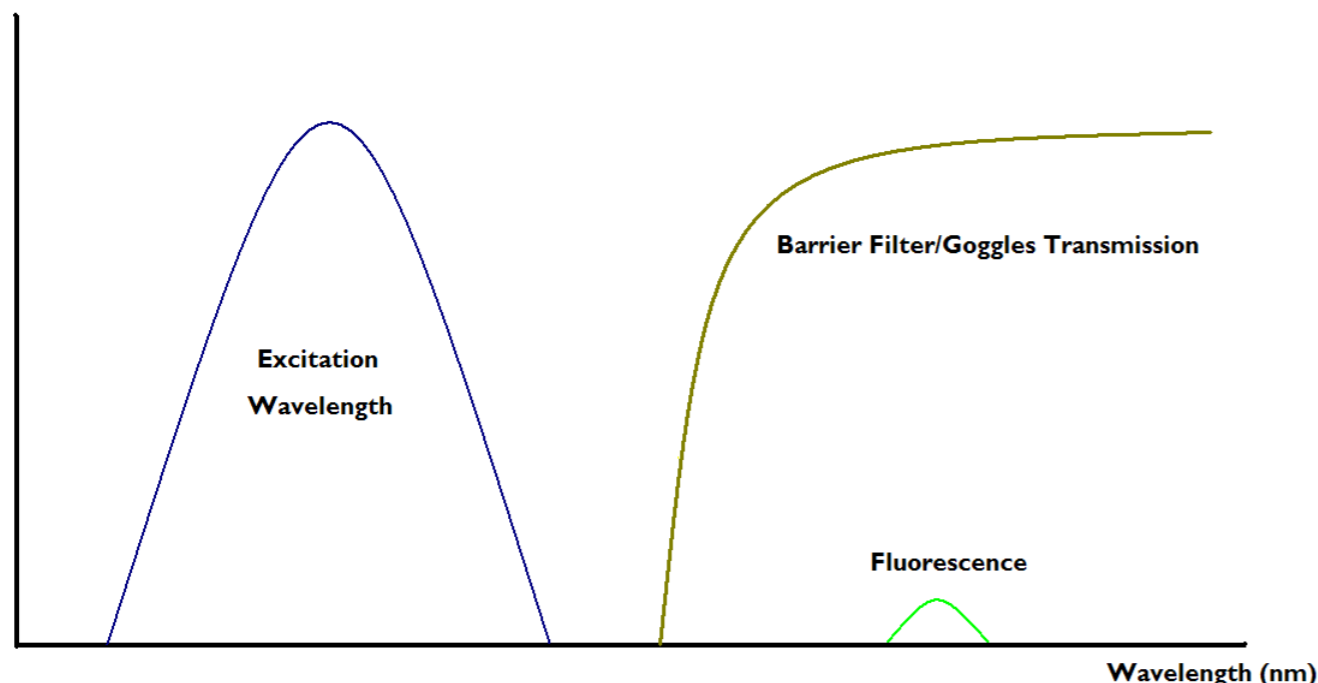


Technical Data

Graph B

This graph illustrates what happens when a substance is illuminated with light of sufficient intensity and the right wavelength. Some of the energy is absorbed by the area that is illuminated but most of it is reflected. There is often so much reflection in fact that it can be difficult to see the fluorescence without using an additional barrier filter, such as goggles. The role of the goggles is to cut away the reflection so that the fluorescence can be seen.

Intensity of Light



Graph B: Note: This sketch is a generalization which describes how fluorescence works in forensic investigations.

Example 1: TrAc lamp* with black UV filter

If you were to use a Labino lamp* with the UV Crime Filter, you would be able to see the fluorescence. This is because UV light is invisible to the human eye and therefore despite its intensity, you are not able to see the reflection. The UV Crime Filter also removes hazardous UVB radiation, making the lamp safer for the user.

Example 2: TrAc lamp* with blue crime filter

If you were to use a Labino lamp* together with a Blue Crime Filter for example, you would NOT see the fluorescent substance because you would be “blinded” by the blue reflection. Therefore you need either goggles or another sort of barrier filter. (The Labino Blue, Green and General Crime Filters remove 100% of the UV light transmitted from the lamp). **What effect would goggles or another type of barrier filter have?** The goggles filter away the blue reflection but let the fluorescent light pass through. The fluorescence has a higher wavelength and the goggles do not filter this away. This enables you to see the fluorescent trace.

Example 3: TrAc lamp* with no additional forensic filter

If you were to use a Labino UV lamp* without any additional filter (i.e. Black UV, Blue, Green, or General), you would NOT see the fluorescent substance because there would be so much white light that it would essentially “blind you”. Your eyes would not be able to detect any fluorescent material, hence making the investigation next to impossible. Also note that the light would contain such significant amounts of UV light (very high intensity) that it could be a hazard for the user.

*Assumes that the Labino lamp is fitted with a Labino DUV35 light source.

Technical Questions

What happens when a substance is illuminated with light and why does a substance fluoresce?

When the molecules in the substance absorb the light, the electrons contained in the molecule become stimulated and start to move. The electrons move outwards from their circular sphere and then fall back to their original position. When these electrons fall back, they release energy. This “output” of energy is lower than the initial “input” of energy from the light source. The lower energy has a longer wavelength that in this case falls into the visible range of light. It is this longer wavelength of energy that is visible to the human eye and this is called fluorescence.

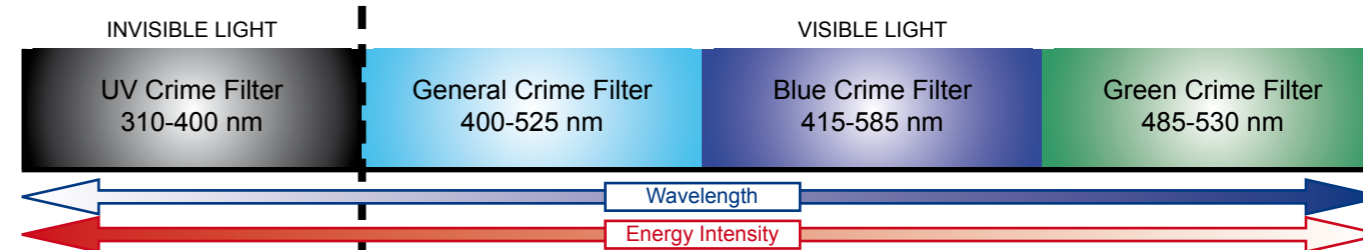
What is the range of wavelengths that a TrAc Finder lamp emits?

A Labino lamp fitted with the DUV35 bulb (UV light source) with the clear glass protection filter emits light between 300 and 700 nanometers.

What is the purpose of using forensic filters?

Essentially, when you choose a forensic filter, you are choosing which wavelength you are going to use, and this of course influences which substances you can see. Depending on what you are looking for, you add a filter that cuts away the unwanted wavelengths. That is because you don't want to see all possible substances, such as detergents for example, or cleaning agents and so forth. If for example you place a Blue Crime Filter on the front of a Labino lamp*, then you would only see substances that fluoresce within those wavelengths that the blue filter permits (415-485 nm).

*Assumes that the Labino lamp is fitted with a Labino DUV35 light source.



Common Terms

Below is a general list of terms commonly used when discussing forensic lamps and forensic science.

Excitation wavelength: Light emitted from the light source (ALS) that creates fluorescence – this is the excitation wavelength. The wavelength needed varies depending on the characteristics of the substance. This is the wavelength that is absorbed by the sample and which makes the electrons excited.

Fluorescence: Fluorescence occurs when light of a visible color is emitted from a substance under stimulation or excitation by light. Fluorescence can be induced in certain substances by stimulation with light (energy) of a correct wavelength. The energy (light) that is absorbed by a substance is emitted back with a lower energy due to loss of energy in the molecules. Stokes law states that the wavelength of the fluorescent light is always longer than that of the exciting radiation. This is the “Stokes shift”. The light that is emitted is called fluorescence.

Barrier Filter: For example goggles or camera filter. What a barrier filter is doing is filtering away the reflected light from the excitation light and makes the fluorescence visible. Otherwise the viewer can be “blinded” by the reflection.

Absorption Filter: Absorption filters are commonly manufactured from dyed glass or pigmented gelatin resins. Absorption filters pass certain wavelengths of light while blocking or absorbing others.

Interference Filter: An interference filter reflects one or more spectral bands or lines and transmits others. It is more of an “energy filter”. It blocks various wavelengths. The effect of this is a more distinct cut-on and cut-off of the transmitted wavelengths. The Labino Blue, Green and General filter use this technique. This means higher transmission over the whole wavelength span.

MPXL: MPXL lamp stands for Micro Power Xenon Light. This technology combined with our specially designed electronics and light bulbs (both UV and white) enables Labino to produce lamps that are among the most powerful on the market.

Clear Glass Protection Filter: The primary purpose of the Clear Protection Filter is to filter away the dangerous UVC and UVB wavelengths that exist below the UVA range. Visible and UVA light passes through the Clear Protection Filter. It also enables the Labino lamp to be classified as IP65 certified since lamps fitted with this filter are both water and dust resistant (when installed with an o-ring).



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