

# UV-PREPARATIONS AND THEIR APPLICATION IN THE TEXTILE INDUSTRY

Let us first consider some fundamental principles of light. In order to generate light, it is necessary to excite a luminescent body through application of energy. For example, when switching on a light switch, Current is allowed to flow through the filament of the electric bulb and the latter begins to illuminate. To produce a "yellow" light, some grains of common salt are thrown into the flame of a burner and the bluish-red flame immediately turns "yellow".

The wavelength of light is measured in nanometres ( abbreviated to nm ) or in Ångstrom ( abbreviation Å ).

$1 \text{ nm} = 10^{-7} \text{ cm}$ .

$1 \text{ Å} = 10^{-8} \text{ cm}$ .

The human eye perceives light in the range of 380 to 780 nm. Below 380 nm and above 780 nm, light is invisible to the human eye, and one differentiates accordingly:

above 780 nm "infra red light" and

below 380 nm "ultra violet light".

The latter is far more rich in energy than infra red light.

In the case of ultra violet light, the subject of the present paper, we have :

- a.) a short wave radiation of about 254 nm and
- b.) a long wave radiation of about 366 nm.

Re. a ): The short wave radiation is furthest removed from "visible" light. It is used, amongst other things, for chemical analysis purposes. Short wave rays very rapidly give rise to unexpected shin burns and also damage the eyes. For this last mentioned reason, it is essential to wear protective goggles whenever working with short wave light.

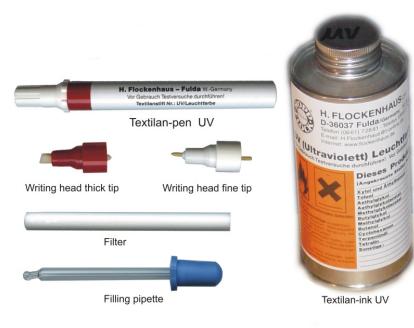
Re. b): Long wave light of about 366nm lies closest to visible light. It energises the fluorescence of many natural and artificially produced materials. Moreover, the long wave rays are not harmful to the skin or eyes even with prolonged exposure.

For example, if a UV-dyestuff is applied to a piece of fabric, the dyestuff is invisible to the human eye. However, when switching of a UV-lamp with long wave radiation, the particles of the UV-dye begin to radiate, due to excitation through the UV light, i.e. the marked position illuminates, and can be seen by the human eye.

Wherever there is a need in the textile industry, to invisibly mark faults, UV-luminescent dyes have proved highly successful for many years. Various UV-preparations are being offered for the above purpose by one of the companies eminent in this specialist field. In this regard, the author offers some advice in the following chapters.

**UV Inks** – In the case of UV-inks and the necessary accessories, it is the our opinion that this is the best, cheapest and simplest method of UV marking. "Textilan-UV-luminescent dyes", filled with UV-Textilan-ink, resemble know felt tip pens. Before marking, simply remove the cap and mark the desired position and that is the end of the job. The ink is absorbed by the cloth, i.e. it adheres and is invisible.

Obviously, the fabric should not have been intensively treated beforehand with optical brightener, since this itself illuminates under UV light. After the marking operation, the cap should be replaced on the pen to prevent the UV-ink from evaporating. It is easy to refill the



pens and in addition, worn individual parts, i.e. the writing point and filter can also be replaced. To refill the pen, a small pipette is used and the pen itself holds about 2 to 3 ccm. If the pen is overfilled, there is danger that the pen will overflow or leak.

The UV-ink is built up on the basis of aromatic hydrocarbons. It can naturally also be applied with a brush or with a spray gun.

## UV-INKS based on water-borne systems

The formulations of inks No. 3633 and 4885 are based on water-borne systems. The ink/pen can be used for marking and work better on well absorbing surfaces. The UV inks 3633 and 4885 are milky-white and UV Valve pen are filled with. The marks adhere excellent. Under UV-light (366nm) can be well seen and shine in green or red. Available as UV Valve pens and in pump bottles.

The inks to refill are delivered in:

- 50 ml. bottle
- 250 ml. bottle
- 1000 ml. bottle



Pump bottle with spray is available in:

- 50 ml. bottle with atomizer. Spray volume per stroke : 0,5 ml +/-0,2
- 250 ml. Pump bottle. Spray volume per stroke : 1,2 ml ± 0,1
- 1000 ml. Pump bottle. Spray volume per stroke : 1,2 ml ± 0,1



**Caution:** Protect against frost! Ink and Pens shake well before use!

Please test before use!

## UV inks No. 4886 and 4887 are based on water-borne systems

The formulations of UV inks No. 4886 and 4887 are based on water-borne systems. The pens can be used for marking and work better on well absorbing surfaces. The UV inks 4886 and 4887 is clear and is filled in a UV pens. The ink adheres well to the surface. Under UV-light (366nm) the marks are easily visible and shine in blue or green.

The inks to refill are delivered in:

- 50 ml. bottle
- 250 ml. bottle
- 1000 ml. bottle



Pump bottle with spray is available in:

- 50 ml. bottle with atomizer. Spray volume per stroke : 0,5 ml +/-0,2
- 250 ml. Pump bottle. Spray volume per stroke : 1,2 ml ± 0,1
- 1000 ml. Pump bottle. Spray volume per stroke : 1,2 ml ± 0,1



The UV-pens can be refilled. The filter, writing head and cap of the pens, which can also be replaced, can be delivered separately.

The UV marker 4886 is capable for marking the starting line during thin layer chromatographically analyses (TLC).



**Caution:**

Please store pens horizontally at room temperature!

Protect against frost!

Ink Shake well before use!

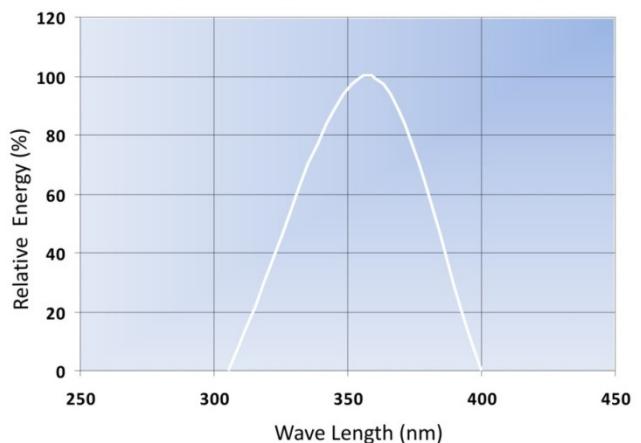
**Please test before use !**

# UV-LAMPS

In our offer you find for each range of application an UV lamp with the suitable UV area. Marks on the base of UV inks can be made visible with these lamps.

The UV lamps offered by us are optimally tuned to our UV ink assortment.

UV Schwarzlicht Diagramm für unsere UV Lampen



## UV lamp battery operated

### Characteristics:

Input voltage: 220V 50/60 Hz  
UV Tube: 8 Watt  
Dimensions: 500x45x45 mm  
Weight: 260 g

## UV grid lamp 220V

### Characteristics:

Input voltage: 220V 50/60 Hz  
UV Tube: 8 Watt  
Dimensions: 500x45x45 mm  
Weight: 260 g

## UV LED

### Characteristics:

Input voltage: 3xAAA  
UV Tube: 12 LED  
Dimensions: 95x30  
Weight: 100 g



## UV handlamp 5000

### Characteristics:

Input voltage: 220V 50/60 Hz  
UV Tube: 8 Watt  
Dimensions: 500x45x45 mm  
Weight: 260 g

## UV Tischleuchte mit Standfuss

### Characteristics:

Input voltage: 220V 50/60 Hz  
UV Tube: 11 Watt  
Dimensions: 840x300 mm  
Weight: 1,90 kg

## UV Tischleuchte mit Tischklemme

### Characteristics:

Input voltage: 220V 50/60 Hz  
UV Tube: 11 Watt  
Dimensions: 840x300 mm  
Weight: 1,90 kg

## UV Rechargeable battery

### Characteristics:

Input voltage: 220V50/60Hz  
UV Tube: 2x6Watt)  
Dimensions: 500x45x45mm  
Weight: 260 g

# **UV-MARKING- PEN**

– By contrast, UV-marking pens are in the form of thick “wax crayons” something similar to felt tip pens.

## **UV-MARKIERUNGSSTIFT**

The marking pens serve to mark the desired position, and the mark thus applied is then pressed or ironed with a warm iron, so that the wax melts and diffuses into the cloth. After this stage, the mark is not visible to the eye. Naturally, such UV-cartridges or marking pens can be used only with woollen or wool/mixture fabrics. The wax must be absorbed by the fibres and wool does this best of all.

If such UV-preparations were applied to pure cotton or pure polyester fabrics, a stain would inevitably remain after pressing.

## **Examples of usage for UV compounds**

UV-Pens for marking in green, red and blue

There are many possible uses in numerous fields of technology, in mineralogy, in criminology (marking of bank notes or anti-theft devices by marking valuables) etc and especially in the here addressed textile industry.

As is well known, faults in cloth are always tagged by a ribbon. The manufacturer receives a rebate in the form of fabric or money for the tagged fault. If the manufacturer, however, returns the finished suit or coat back to the cloth mill stating that there is a fault which is not tagged, the cloth mill will have great difficulties in proving the existence of such a ribbon.

This, however, is always possible under the UV lamp when the fault labelling has been done with UV-ink. Invisible marking of button holes is extremely uncomplicated for the manufacturer. A UV-light attached to the sewing machine makes it possible to easily see where to sew.

Antique- and carpet dealers can sign valuables and carpets invisibly and durably. The carpet dealer signs the finished carpet on a certain spot on the rear. Should the carpet be stolen and then found, it is only necessary to search for the sign on the appropriate place with the UV-lamp to prove ownership.

### **Application Instructions.**

Must be tried before use. After use replace cap so that UV-Ink can not evaporate. The greater the material absorbancy, the better the fastness of the UV Ink and the water- based UV- ink .

That is: adherence and absorbancy is better on wood, paper, fabric and carpet than on glass or plastic.

It is better to use the Ink or water-based UV- ink on the rear of carpets and pictures, because here there is no mechanical strain. After dry- Cleaning, the carpet should be signed again.

The UV-permanent ink is wipe and waterproof, therefore marking with this ink can also be put under mechanical strain. Without mechanical strain and dry-cleaning marking with the UV-Textilan Ink and water-based UV-ink kann be seen for years under an UV-lamp. Tests have shown that the UV-marking can be read with ease even after 10 years.

The lettering can easily be checked by a small battery driven or UV LED lamp. The darker the room, the more visible the lettering under the UV-lamp is.

In principle, before constantly using UV-inks and UV-marker pens, the user should carry out trials. In this way, it is possible to achieve a notion of the result and the possibilities of usage. Examples of usage for UV compounds.