

Tag - You're It. A Discussion of Philatelic Luminescence

by Dave Parsons

What is Luminescence? Luminescence is the glow of a substance when exposed to UV light.

What does this have to do with stamps? In the late 1950s, many nations were looking for faster, more efficient ways to process ever-increasing quantities of mail. Post-marking and sorting the mail was a tedious, time-consuming task that was mostly done by hand. Machines were developed that could find the postage stamps, flip and turn the mail fed into it and then apply postmarks. To assist this process a nearly invisible substance was added to stamps so that machinery could detect them. Taggants and some inks that glow when exposed to ultraviolet light were added to stamps. A UV light would find the postage stamps that had taggant applied and the machinery would flip the letters so that all the stamps were in the same position and then apply the postmarks.

The United States Post Office began testing of tagging in 1963 on select issues and by 1966 all air post stamps were ordered to be tagged. After January 1967 almost all U.S. stamps were tagged.

What is the difference between phosphorescence and fluorescence? If the luminous coating or ink on a stamp continues to glow for a short time when the UV light is switched off, then the coating on the stamp is phosphorescent.

If the stamp ceases to glow when the UV light is switched off, it is called fluorescent. The luminescent coating applied to a stamp is called "tagging" or "taggant." Once a stamp has had taggant applied, it is referred to as being "tagged," and so is a stamp printed on paper coated with taggant prior to printing.

How do U.S. tagged stamps appear? Two popular tags come from the inclusion of **zinc-orthosilicate** which when exposed to strong **shortwave** UV light glows a bright color that ranges from **yellow-green to bluish green**. **Calcium Silicate glows an orange-red color (i.e. U.S. airmails Scott# C91).**

There are 3 methods for applying taggant to U.S. stamps. Other countries have deployed other methods which will be demonstrated later. The first method employed was **overall tagging**. Overall tagging is a clear coating that is applied to stamps **after** the design has been printed, but usually **before** perforation. This is done so that the liquid tagging doesn't flow through the perf holes onto the backs of the stamps. When viewing under UV, there is a haze of fluorescence over the stamp design underneath. This haze tints the design green and often masks the true colors of the stamp. See example 2175a on right.

The second method is **block tagging**. Taggant is applied to the stamp in a block shape, usually covering the design and leaving the margins clear. The blocks can also be small or larger than the design. The rubber mats used to apply the taggant can deteriorate over time causing flaking, cracking or breaks or other anomalies. See 2175 on right.

The third method is **prephosphored tagging**. The taggant is **added to the raw paper before** the design is printed. The appearance of the tagging depends on whether the paper is coated or not. **Prephosphored coated** stamps have a very **solid appearance** under UV and are called **Solid Tagged**. The coated paper allows the taggant to attach evenly to the surface of the smooth paper. See 2175c on right.



Prephosphored uncoated stamps have a **mottled or grainy** appearance under UV and are referred to as **Mottled Tagged**. The paper is uncoated, so the taggant soaks into the paper and pools in the fibers in an uneven way. See 2175d & e above.

The same stamps above when exposed to Long Wave U/V have a much different appearance, as shown on the right.

Further examples of these methods are shown below.

Stamps can also be printed with the phosphorescence added **directly to the printing ink**. The result is a stamp that glows only in certain parts of the stamp design where that ink is applied.



Taggant can also be applied **in a band** or a stripe that runs across several stamps.

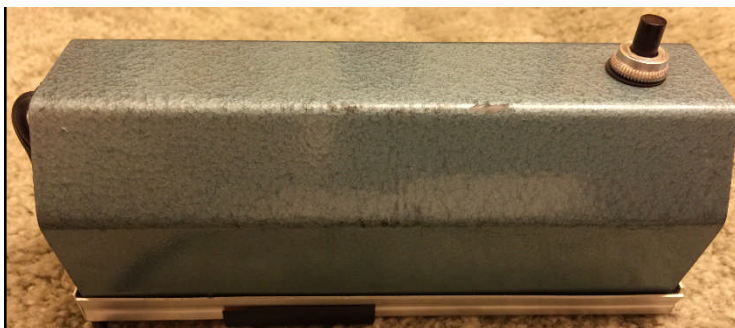
Untagged errors occur when tagging is missing or only partly applied to stamps which should be tagged. These errors are only confirmed in mint stamps as taggants can be removed over time.

How can we determine if a stamp is tagged?

To examine tagging it is necessary to use a UV light. For U.S. stamps shortwave UV (254nm) is needed, but for most Canadian and many foreign stamps a longwave (365nm) UV will suffice.

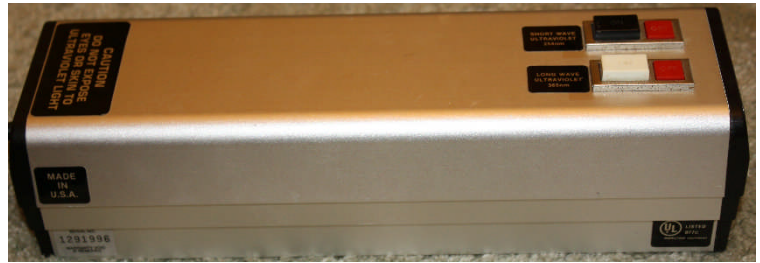


Pictured is a portable SW/LW UV light. Dual frequency models can be found on eBay for \$40+. A SW only model is listed for \$23. Advantages: small, light, portable for field/shows, less expensive. Cons: less powerful, harder to see faint tagging, uses batteries, power output declines with lesser battery output, more delicate.



An alternative is AC powered lamps. These units offer more power. The units to the left are a Spectroline dual SW/LW unit which can be found on eBay for \$100+- used; and lower- a vintage Raytech LS-4 SW/LW model for \$40+.

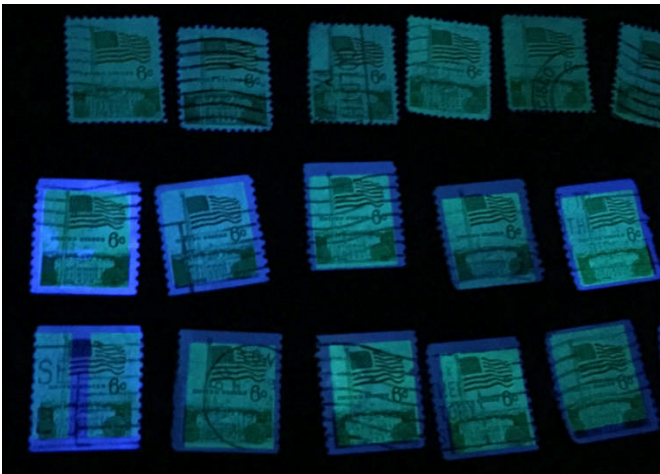
Advantages of these devices are more power output allowing better detection, sturdier, and no need for batteries. Disadvantages are larger size and weight, need for AC plug, and more expensive.



Note: Continued long-term exposure to **the light can damage your eyes or skin**. The light can cause a "**sunburn**" type irritation. Wearing anti-glare or sun-glasses can reduce the effects.

In any purchase it is important to find a lamp with short-wave (254nm) capability for U.S. tagging detection. Long-Wave works for many foreign countries using fluorescence for tagging.

In practice how can this be used? It is possible to look for tagging on a large scale then focus on findings.



The image depicts a grouping of U.S. Scott# 1338 and 1338A exposed to SW UV. Here we can see large block and small block tagging, but also an interesting condition in the lower left corner. Using a powerful SW lamp allows the user to scan large volumes of stamps detecting different tagging varieties. This was especially useful to the author in looking at the many different banding differences in Machin stamps.



The 1338A has been enlarged to show an error in the block tagging. Evidently the mat used to apply the taggant did not line up with the stamp and caused the block to slip to the middle of the stamp. This type of error is common but is interesting to see.



The stamp to the left (U.S. Scott# 1384) shows a block shift error similar to the stamp above.



Canadian Stamps have some bold and beautiful tagging. Most tagging can be seen with a long wave UV. This 1935d Hockey All-Star stamp has fluorescent tagging in the shape of a circle around the inner design. Very bright and easy to see. Canada started tagging stamps in 1962.



Great Britain began tagging in 1960 with the Wilding series. The first commemorative tagging started in 1962. Phosphorescent bands appeared on some of these commemoratives such as the #425p shown at the left. The yellow arrows indicate banding areas, compare to original non-UV photo on the right stamp.



The GB Machin series employed a wide range of tagging varieties. The MH64 stamps here exhibit: left band, center band, and right band tagging.



Luminescence comes in many styles as indicated here. Clockwise from top left: Machin Yellow center band, Red glow from 10¢ U.S. air mail, block tagging on 45¢ air mail, overall tagging for U.S. high value \$4.95 forest stamp and border fluorescence for \$1.25 Canada Year of the Horse.

Luminescence opens up a new way of looking at stamps that from casual observation look the same. The collector can expand horizons by considering the differences associated with phosphorescence and fluorescence. More detailed information about tagging and also the use of UV in detecting forgeries/repairs can be found in a paper entitled "The Story of Fluorescence" which can be viewed at <http://www.raytechultraviolet.com/support/pdfs/downloads/StoryofFluorescence.pdf>

Thanks go to Angore at Stamporama, TBR stamps on eBay, and Janet Klug at Linn's for articles detailing luminescence.

Dave Parsons is a member and his collecting interests include U.S. used and BOB, Mint U.S. Commemoratives, Canada, Great Britain, Australia, New Zealand, Switzerland, South Africa and Liberia. He can be reached by email at da.parsons@gmail.com.

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