



## Radioactive Antiques

Some antiques, particularly those containing radium, were made and sold before the health effects of radiation were fully understood.

- Certain radioactive materials were used in antiques because of their unique color.
- Antiques containing radioactive material can continue to emit very low levels of radiation for thousands of years, if not longer.
- Antiques that contain radioactive materials are usually not a health risk if they are in good condition.

### About Radioactive Antiques

Along with furniture, clothing, jewelry, dishes and other treasures sold at flea markets and antique shops, you just might find some items that contain radioactive material. Some antiques, particularly those containing radium, were made and sold before scientists understood the health effects of radiation. Certain radioactive materials were used in antiques because of their unique color. For example:

- **Clocks, watches and dials** that glow in the dark without the use of a battery may contain radium or tritium.
- **Ceramics** made until the 1970s may have glazes colored with radionuclides.
- **Vaseline glass** or canary glass contains a small amount of uranium. This gives the glass its yellow-green color. It also makes the glass glow bright green under a black light.
- **Cloisonné jewelry** gets some of its yellow, orange and off-white colors from small amounts of uranium in the glaze.

Radioactive antiques can continue to emit very low levels of radiation for thousands of years, if not longer. The amount of radiation these items emit is small. However, it will often register on a hand-held Geiger counter.

### CLOCKS, WATCHES AND DIALS

Glow-in-the-dark paint is now made without radioactive material, but in the early 1900s radioactive materials were used to make paint that glowed. Radium is one type of radioactive material that could be found in antiques. When radium was discovered in the early 1900s, people were fascinated by its mysterious glow and it was added to many everyday products. Adding radium to paint makes it glow-in-the-dark. This paint was used in clock and watch faces and hands. This glow-in-the-dark paint was also used on airplane dials and gauges, allowing people to read clocks, gauges and dials at night with no other light. During World War II, radium dials and gauges allowed pilots to fly at night without cockpit lights. This helped the pilots avoid being seen by the enemy.



Radium was used to make clock faces and hands glow in the dark in the early 1900s.

Radium is highly radioactive. It emits alpha, beta and gamma radiation. If it is inhaled or swallowed, radium is particularly dangerous. Once inside the body, it emits radiation directly to living tissue, where it damages cells. In the past, many workers who painted clock or instrument dials with radium ended up with cancer. To create fine tips on their paint brushes for small surfaces, many radium dial painters licked the bristles of their paintbrushes. In doing this, they often swallowed some of the radioactive paint. Many of these workers developed bone cancer, usually in their jaw. By the 1970s, radium was no longer used on watch and clock dials.

## CERAMICS

Before the 1970s, many companies used radioactive minerals to color glazes. The most commonly used minerals were uranium<sup>i</sup>, thorium<sup>ii</sup> and potassium. These elements emit alpha, beta and/or gamma radiation. These glazes can be found on floor and wall tiles, pottery and other ceramics. Uranium was used in the glazes on Cloisonné jewelry to make orange, yellow and green colors.

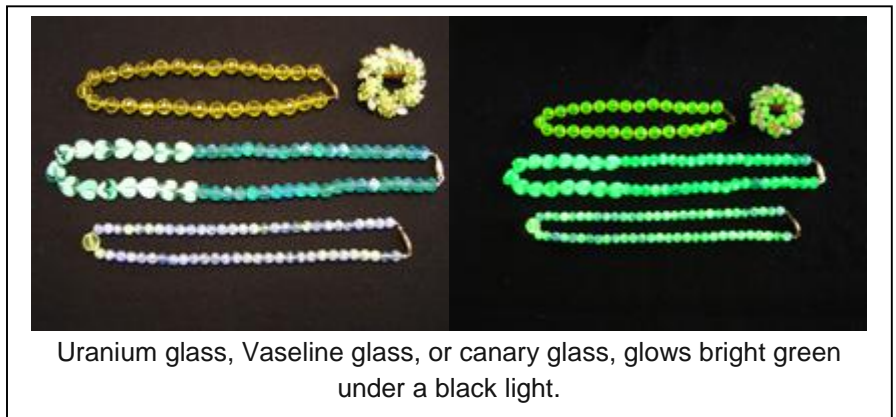
**Caution:** Do not try to take apart radium dial clocks, watches or instruments.

## GLASS

For hundreds of years, glassmakers used small amounts of uranium to create yellow or green glass. In the 1800s, this glass' yellow tint led to the nicknames "Vaseline glass" and "canary glass." Under an ultraviolet or "black" light, the uranium causes the glass to glow bright green.

After 1970, U.S. glassmakers and ceramics makers stopped using radioactive minerals for color. They are still used in a few other countries.

Sometimes ceramics and glass with radioactive coloring agents still enter the United States from these countries.



Uranium glass, Vaseline glass, or canary glass, glows bright green under a black light.

## Rules and Guidance

Generally, federal and state governments do *not* regulate antiques. However, there are a few exceptions, depending on where the radioactive material came from and the level of radioactivity.

### U.S. NUCLEAR REGULATORY COMMISSION (NRC)

NRC establishes regulations for licensing the sale, use, and disposal of radioactive materials. Licensing requirements for the use of radioactive materials in consumer products are based on the quantity and radioactivity of the materials. Generally, NRC does *not* regulate antiques, but there are a few exceptions depending on the origin of the radiation source and the source strength.

### U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA's Superfund program cleans up badly contaminated sites. Contamination at some of these sites includes antiques containing radioactive materials. For example, one clean-up site contained more than one million World War II aircraft gauges with radium dials. Many of these radioactive sources were leaking.

## U.S. DEPARTMENT OF TRANSPORTATION (DOT)

DOT sets rules for shipping hazardous materials by highway, rail, air and boat. Radioactive materials above a certain levels are treated as hazardous materials.

## What you can do

Radioactive antiques are usually not a health risk if they are in good condition. However, adding additional radioactive pieces to your collection could increase your health risk. To ensure that your health risk is minimal:

- **Do not** attempt to take apart radium watches or instrument dials.
- **Do not** use ceramics like orange-red Fiestaware or Vaseline glass to hold food or drink.
- **Dispose** of any broken radioactive antiques. For instructions on proper disposal, contact your state or local radiation control program<sup>iii</sup>.

## Where to learn more

You can learn more about radioactive antiques by visiting the resources available on the following webpage: <http://www3.epa.gov/radtown/antiques.html#learn-more>.

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<sup>i</sup><http://www2.epa.gov/radiation/radionuclides/uranium.html>

<sup>ii</sup><http://www2.epa.gov/radiation/radionuclides/thorium.html>

<sup>iii</sup> <http://www.crcpd.org/Map/>