

# **Discussion of PVC Contamination on Coins**

Including actual examples of silver coins showing PVC damage

Recently, I had the privilege of purchasing a small part of a collection that had been in storage for some 50 years. The vast majority of coins in the collection had been kept in classic 2"x2" Kraft envelopes, with many of those coins first inserted into cellophane. The collection had essentially been hidden away in a typical home environment, resulting in various degrees of toning of many of the coins. For example, coins which had been stored in cellophane essentially remained in precisely the same condition as the day they were stored. Today, they look about as fresh as 50 year old coins can possibly look, in some cases with absolutely not the slightest hint of tone, and nothing to detract from their fresh, pure appearance. I estimate that approximately 25% of the collection was stored in this manner.

The majority of the collection, perhaps 70% of it, was comprised of coins stored directly in the paper envelopes, with no cellophane protecting surfaces from contact with the chemical-laden paper. In these cases, toning varies from extremely dark, essentially jet-black (in the case of silver coins), to coins that were surprisingly unaffected by the paper. However, the large majority of the coins stored directly in paper display a moderate and attractive range of magenta and orange toning on both sides.

A tiny minority of the coins in this collection were stored in PVC holders, and it these coins are the focus of today's article, where the potential damaging consequences of such storage will be explored.

## **What is PVC?**

"PVC" is an acronym that stands for "polyvinyl chloride", and it is a chemical found in certain kinds of 2x2 "flips" in which coins are stored. Typical flips that contain PVC also contain plasticizers to make them pliable and easier to manage. (Flips without plasticizers are more brittle and susceptible to breakage as they are folded and refolded to allow for insertion or removal of coins.) However, PVC also appears in other mediums of coin storage, such as large plastic sheets into which coins can be inserted directly.

When PVC, in combination with the plasticizer, is acted upon by heat, light or some other catalyst, it has the propensity to break down chemically into more basic compounds, such as chlorine gas, or worse yet, *hydrochloric acid*. Needless to say, acids of any sort are not an accommodating environment for metal objects, including coins. Chlorine gas begins depositing greenish slime on the coin, and the acid immediately begins to etch the metal and cause irreversible damage.

In addition to the potential damage that PVC breakdown, softflips that contain plasticizers may leach additional oily pollutants out of the plastic holder and adhere the PVC to a coin's surface. This material will appear as a greasy "ooze" on the surface of a coin, and is somewhat sticky to the touch.

## **What are the symptoms of PVC damage?**

The image to the left shows a dozen Roosevelt dimes that have been stored in a pliable, plastic page that contains PVC. Look carefully at the image, and you will discover that three of the coins display the classic greenish look that PVC damage is known for. They are the second in the top row, and first and fourth coins in the second row. The extent to which the bottom row of dimes has toned is suspicious as well, as I personally removed this sleeve of coins from an airtight outer sleeve, and without exposure to the environment, there is no reason air-deprived coins would tone so darkly - unless something else is present to cause the excessive toning. The key point here is that a coin need not be showing the greenish tint to be suffering from PVC damage; be wary of any excessive toning, or toning that is unexpectedly occurring in what appears to be an isolated storage environment.

In addition to the obvious symptoms of greenish ooze, coins with PVC adhering to them often give off a peculiar odor that is very much like that given off by a fresh shower curtain.

In the next two images, you will observe that many of the coins display the ominous greenish tone which is now understood to be a classic sign of PVC damage. Note that one of the dimes has been removed from the bottom row, and what is left behind is a greenish ring of leached PVC that occurred where the rim of the dime was in contact with the plastic. Note also the darkly toned dimes along the right-hand side. Again, this packet of coins was stored in a completely air-tight plastic outer sleeve, and it is not the surrounding air which was responsible for the dark toning; it is something in the plastic that is causing the disturbing symptoms.



The next two images will leave no doubt in your mind as to precisely what PVC damage looks like on a coin. You can see that in those areas where the plastic is in direct contact with the high points of the coin's design, and where there has been a buildup of the greenish ooze, the metal is obviously



"etched" and permanently damaged. Of course, these particular coin do not have high financial value, but the damage is irreversible, and the coins are essentially ruined from a collecting standpoint. If these were valuable coin, then conservation would be necessary, and can go a long way

toward restoring the appearance of a coin damaged by the effects of PVC but again, where the metal has been etched by the hydrochloric acid, nothing can be done to repair or reverse the damage.

### **What can be done about PVC damage once it has occurred?**

Regardless of whether a coin's surface has become etched, and therefore permanently damaged, if a coin suffers from PVC contamination, then it should be curated to remove the offending substance and prevent further deterioration of the coin's surface. I have found that the simple application of acetone will safely remove the PVC residue, and leave behind a surface that is clean and contaminant-free. However, especially where uncirculated coins are concerned, it must be applied with extreme care, as any attempts to rub the coin's surface may result in unwanted hairlines, and reduce the condition of the coin even further.

An alternative method that I prefer and recommend is to use Blue Ribbon, as it not only effectively removes the PVC, but it has a lubricant that diminishes the potential of hairlining the coin. In either case, the application of the acetone or Blue Ribbon requires brushing it on with a Q-tip, so again, use caution and be careful to avoid causing unwanted hairlines on the coin's surface.

The next image displays three coins, all of which have suffered from PVC contamination. The top coin has been curated with the recommended application of Blue Ribbon, and you can see that although the high points of the coin remain etched, the PVC has been removed, and the coin no longer bears a greenish tint, as do the lower two coins.



### **How do coins with PVC look after they've been curated?**

Below is an example of twelve silver Washington quarters, each one suffering from PVC contamination. Included are the results after the coins have been curated. The left-hand images that include the Q-tip still bearing removed PVC depict the coins prior to conservation, and the right-hand images show the coins after successful curation. Although the coins appear much nicer after curating, there is no substitute for planning the storage medium for your coins carefully, and avoiding the prospect of PVC damage on your coins altogether.

