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Lead sulfide damage to classic postage stamps

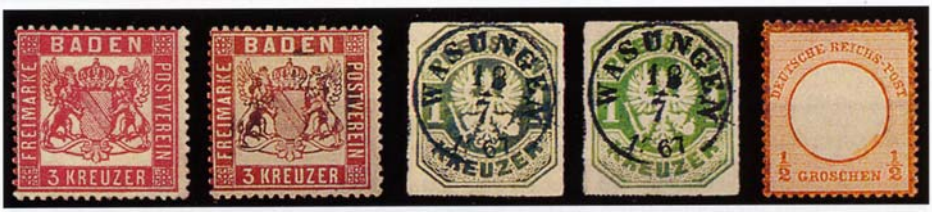
The following statements reflect the author's personal opinion. There are no definite scientific findings for the thesis that PVC film is responsible for damage to classic postage stamps.

In the year 2000 I contacted a well-known album manufacturer and expressed my great concerns that, in my opinion, commercial PVC film could cause serious damage to classic stamps. These PVC plastics are used by different manufacturers for so-called transparent albums, protective covers for album sheets or envelopes and for a great number of other storage devices for stamps and entires.

According to my long years of observation, a great number of classic stamps and a smaller number of post-classic stamps have increasingly suffered serious discolorations and other damage to the paper structure since the mid-70s. The analysis of the deteriorations that had obviously occurred recently nearly always revealed that these stamps had been kept under PVC plastics which I am convinced are the cause of the partly serious damage. In addition to usual stamps, high-value stamps and covers were also more and more affected; that included some irretrievable philatelic cultural assets.

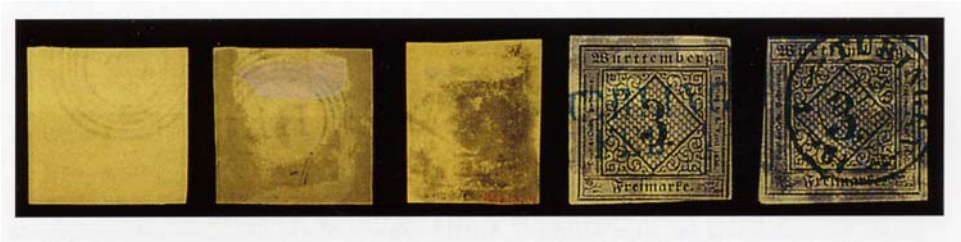
The following three types of damage could be observed:

I) We know classic postage stamps which, due to their color composition, tend to oxidize, especially orange, yellow and red shades. To a certain extent, these stamps were subject to discoloration already in the past; however, these changes normally occurred due to improper storage conditions like humidity and temperature. Since about 1975, the increase in discolored stamps that had been kept under PVC film has become alarming. What was new, however, was the discoloration of other shades like blue and green. In all cases it could be observed that the stamp colors darkened and often turned out to be all black. It was further observed that certain stamps that had been kept under almost airtight PVC film generally discolored after a shorter or longer period of time, while the same stamps kept differently, for example in commercial mounts on cardboard album sheets or in stock books, did not suffer any damage.



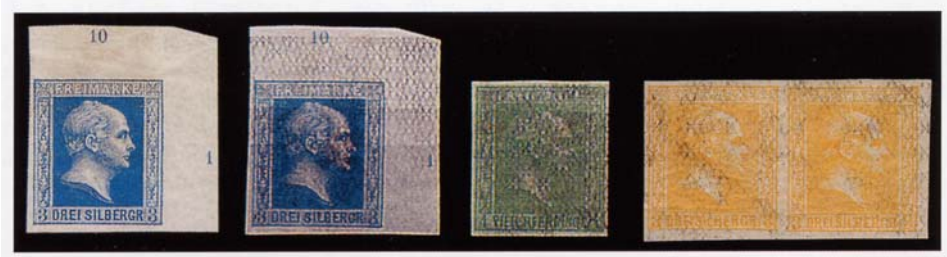
Lead sulfide damage of category I (examples, 1st and 4th from left: original shades)

II) Moreover, there was a conspicuously high number of damaged stamps among those that had been printed on colored paper, for examples the first issues of the old German states of Baden, Prussia and Württemberg. The values printed on yellow or rose paper were particularly affected. These stamps had become glassy, showed black discolorations on both sides, and - in their final stage - were really ruined and close to self-disintegration. In former times, such damage could only observed with stamps that had been subjected to massive heat (e.g. during wartime).



Typical lead sulfide damage of category II (far left: original shade)

III) The third group of stamps affected were produced with a normally invisible burelage as a protection against forgery (such as the second and third issue of Prussia or certain stamps of the North German Federation). Under normal circumstances this black or brown-black burelage becomes visible only through chemical manipulation (e.g. hydrogen sulfide) and reduces the value of the affected stamp considerably. Here, too, an extremely increased number of damaged stamps could be noticed during the past decades.



Typical lead sulfide damage of category III (far left: original condition)

Damaged stamps had been collected

– in ring binders where the normal cardboard album sheets were protected by a transparent cover of commercial PVC plastic. These protective covers are perforated on the left side while the other sides are sealed, so that there is hardly any contact with the ambient air.

– in so-called transparent albums. These have plastic sheets glued on cardboard sheets so that – when the plastic is folded over – the reverse of the stamps can be easily viewed. There are also stamp and cover albums available that are fully made of plastic, and in which one can insert little plastic stock cards. With this type of storage, too, the stamps and entires are largely cut off from the ambient air because the plastic film sticks together due to its adhesive force and thus creates sort of an interior climate.

– in envelope covers or stock cards made of PVC plastic. Here, it could be observed that in those cases where there was an exchange with the ambient air (for example covers with several open sides or covers that had not been pressed together for a longer period of time) there was hardly any damage.

No significant chemical changes could be noticed when the stamps were kept under commercial mounts, in commercial illustrated albums with or without mounts, in stock books, attached to paper with hinges, and so on. Protective covers that are corrugated inside and thus permit an exchange with the ambient air also seem to be largely harmless for storing the problematic stamps.

Efforts to Prevent Future Damage:

Unfortunately, my efforts of June 2000 with the above-mentioned album manufacturer were not successful. Any connection between the damaged stamps and the PVC film was strictly denied.

On 16 November 2001, I therefore sent a letter with a detailed description of the problem and numerous examples to the Federal Association of German Stamp Dealers (APHV), the Federal Association of German Stamp Auctioneers (BDB), and the Federation of Philatelic Experts (BPP). From my point of view, there was an immediate need for action in order to prevent future damage. The Auctioneers' Association and the Federation of Philatelic Experts supported my efforts. The APHV was in a conflict of interests since those album and PVC film manufacturers who are mainly affected are members of the APHV, just like the majority of the shopkeepers and mail-order dealers who sell the albums and other accessories in question.

At the suggestion of the associations I obtained an expert opinion from the Paper Technology Foundation PTS in Munich, which had been recommended by the Federal Institute for Materials Research and Testing in Berlin. In its opinion No. 2779 dated 30 April 2002, the PTS explains the probable cause of the damage in a way that is also understandable for non-experts:

> *"Since the value-reducing discoloration of the stamps occurs only very slowly (...) in the dark, the cause can only be low-molecular migratable compounds traces of which were contained in the PVC film from the very beginning or which develop over time through ageing processes and form dark colored compounds with constituents of the stamps. Looking at it from this point of view, it is noticeable that the PVC film contains a sulfurous tin stabilizer (...) and the stamps have a high content of lead*

(...) which can be explained with the usual stamp production methods of that time. In our opinion both substances – the sulfurous tin stabilizer in the PVC film and the lead in the stamps – react with each other after slow migration processes; the final product of that reaction is lead sulfide, a black heavy metal salt of low solubility. The production of extremely small traces of lead sulfide should be sufficient already to cause the observed discoloration of the stamps."

This opinion appeared to be so unambiguous that there was cause for hope that the album manufacturers in question would take the necessary steps to prevent further damage.

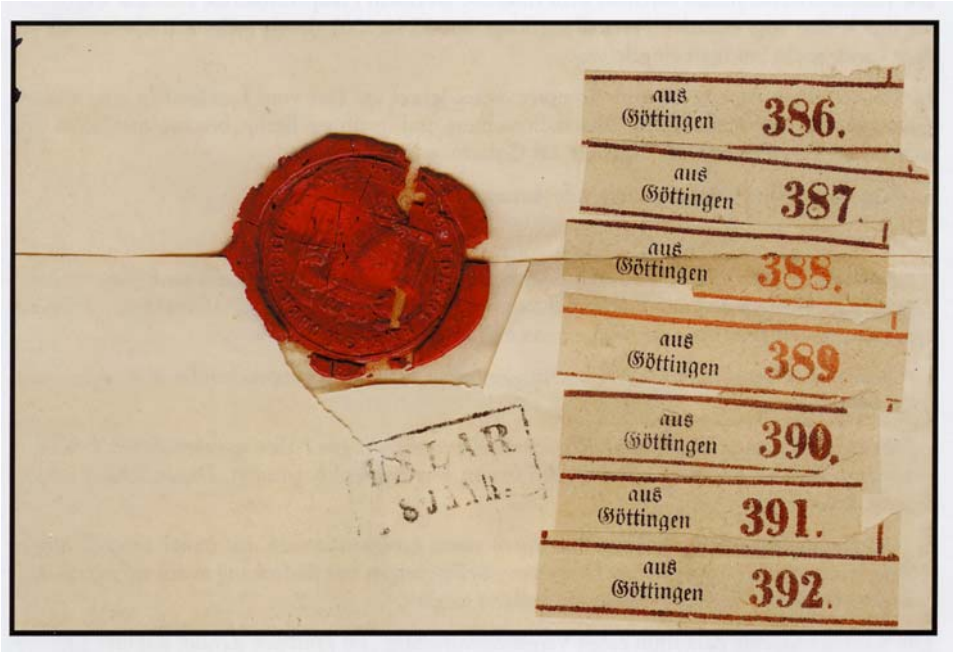
Two album manufacturers, however, obtained opposing opinions with the aim to challenge the central statement of the PTS opinion. The opinion by the Otto-Graf-Institut of the University of Stuttgart (dated 08 October 2002) contests a migration (i.e. an escape) of the sulfur from the PVC film; so does the opinion by the Steinbeis-Transferzentrum in Reutlingen (dated 10 March 2003). According to the statements by the PTS as well as comments by the Federal Institute for Materials Research and Testing in Berlin and the Swiss Materials Science and Technology Institute EMPA, however, these migrations are a fact. An EMPA letter dated 10 February 2002 states:

"The problem of migration is not a theory but a fact. Therefore, limits have been established for packaging materials for food and medical products. (...) If similar standards applied to plastic covers for postage stamps the risk would be considerably reduced. (...) Precautionary measures could be taken for the future, but a residual risk will always remain."

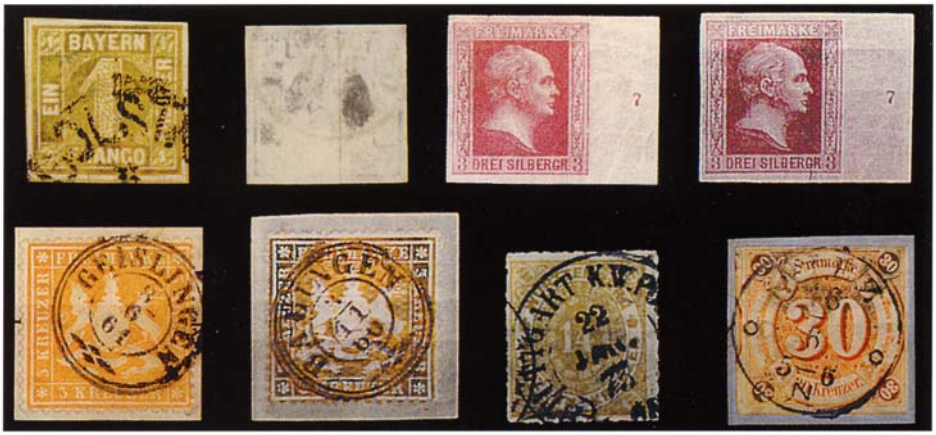
An EMPA opinion of 19 June 1995 obtained by an album manufacturer, which that album manufacturer made available to a collector who had suffered damage (for its discharge!) states:

"...Lead salts which are used e.g. as stabilizers can also react with certain printing colors. Such interactions can eventually lead to a visible change or even destruction of the postage stamps and thus make them worthless."

My urgent appeal to the album manufacturers and the APHV to inform the public about the problem as a measure of consumer protection, in order to largely preclude such damage in the future, were to no avail. In its letter dated 21 February 2003, the publishing house Schwaneberger-Verlag took the view "…that the collectors should be informed again about the problem." The minutes of the annual general meeting of the Bavarian Stamp Dealers' Association (see "APHV-Nachrichten 4/2003") read: *"There was an extensive discussion about the PVC problem. Its result was: The experience made over the years and confirmed repeatedly shows that damage to certain classic postage stamps is caused by the PVC film of the companies (author's note: names of companies follow). There was general agreement that manufacturers themselves should provide their products with a warning note or a disclaimer for the stamps affected."*



The more than 1mm thick wax seal created a cavity on this cover that had been kept under a PVC cover. The package labels attached in that area retained their original color. The others have become darker due to the direct contact with the PVC film.



Further examples of typical lead sulfide damage (top row 3rd and bottom row 1st from left: original shades). According to our observations, some ten of thousands of partly valuable stamps have been damaged since 1975 due to being kept under PVC film.

My conviction that the keeping of the stamps under PVC film was responsible for the numerous lead sulfide damages was shared by virtually all philatelic specialists and experts for classic stamps, by dealers, auctioneers and a great number of collectors who had suffered damages and who had partly underpinned the description of their experience with PVC film through affidavits.

Thereupon I decided to publish the lessons learned so far in one of my auction catalogs. Shortly afterwards I received an interim injunction from two renowned album manufacturers from Southern Germany prohibiting me from publishing these facts.

The subsequent proceedings before the Regional Court of Stuttgart resulted in a settlement on 08 April 2003 which only allowed me *"...to make statements about a suspected harmfulness of album materials of the above type, and such statements shall either include all manufacturers or not state any manufacturer's name at all."* The costs of the proceedings had to be borne by the petitioning album manufacturers, while each party had to bear its own settlement costs.

The album manufacturers are obviously not interested in a main proceedings. This was therefore initiated by my lawyer by means of a so-called negative action for a declaratory judgment on 27 October 2003 before the Regional Court of Stuttgart.

This proceedings lasted until this summer. Unfortunately, the opinion of the Federal Institute for Materials Research and Testing in Berlin requested by the regional court did not lead to any result that would be positively usable in court. The opinion states:

> *"In summary, the following statements can be derived:*
>
> *If the black discoloration is caused by the formation of lead sulfide (PbS) – which is obvious – additional factors (e.g. microclimate, temperature) must be decisive for favoring the formation of PbS.*
>
> *Such a microclimate could have occurred when keeping stamps under the PVC film in question.*
>
> *It cannot be ruled out that the sulfur is present in the PVC film in question in a chemical form that favors a reaction with the lead in the postage stamps. This conclusion, however, is not compelling.*
>
> *A final clarification will only be possible by a long-term experiment with previously undamaged stamps under different ambient conditions, that are covered with sulfurous and non-sulfurous PVC film."*

The court thereupon proposed a settlement *"with a view to the expert's statement that he could perform a long-term experiment, but not guarantee that this would lead to a conclusive result."* I finally agreed to that settlement. Due to the lack of support, especially from the side that had suffered the damage, it appeared hardly reasonable to me to continue litigating in this matter for another few years. My letter to the president

of the German Philatelic Society BDPH (dated 04 November 2002) with detailed descriptions and arguments was not even answered! Also, other than the BDB and the BPP, the BDPH board had ostentatiously rejected a symbolic participation of the BDPH in my legal costs risk that had been proposed by the president of the BPP. The presiding judge expressed his astonishment at the fact that, apart from myself, neither those who had suffered damage nor the collectors' associations would take legal action against the album manufacturers.

The wording of this settlement read:

"1. The plaintiff is permitted to claim that he is convinced that the use of transparent album sheets, PVC album sheets and PVC protective covers of any manufacturer whatsoever leads to a black discoloration and/or destruction of so-called classic postage stamps, i.e. stamps from the 19th century that contain lead.

2. The plaintiff undertakes, however, to also add that this is not based on positive scientific findings. He further undertakes not to expressly name the defendants in the formulation "any manufacturer whatsoever".

3. With this agreement, any and all claims relating to the matter of the proceedings are settled.

4. The plaintiff will bear one third of the costs of the proceedings, the defendants one third each."

From our point of view, this result is not satisfying. I am convinced that the annual lead sulfide damage presumably caused by the PVC film amounts to millions of Euros worldwide. The longer the endangered stamps are kept under PVC film, the greater I consider the hazard of further irreparable damage. Since this problem has been known since the early 1980s, a considerable part of this damage could have been avoided. After becoming aware of the circumstantial evidence against the PVC film, a recall of sheet covers and transparent album sheets for classic postage stamps would have been mandatory. To date, the album manufacturers have not even issued warning notes or disclaimers.

According to my observations, for example, of the stamps of the first German Empire issue (shields) that are kept in a transparent album sheet, the red ½ Groschen and 2 Kreuzer small shield (Michel numbers 3 and 8) will sooner or later change color to brownish or black. Other stamps too, like the green ⅓ Groschen and 1 Kreuzer small shield (Michel numbers 2 and 7), will turn darker and lose their original color, while the remaining orange shield values (2 Kreuzer small shield and ½ Groschen and 2 Kreuzer large shield - Michel numbers 15, 18 and 24) do not change color. The loss on just this one album sheet is very high. I have seen dozens of damaged MNH numbers 3 and 8 over the years. The sale of these transparent album sheets should have been stopped long ago, just as the sale of the illustrated sheets for the old German states and all classis issues worldwide until about 1875. These transparent album sheets could've been easily replaced with normal illustrated sheets with mounts.

Summary

– According to my records, more than 100 different stamps of the old German States tend to more or less discolor when kept under commercial PVC film. The same applies to some dozens of later issues, especially of the German Empire, Danzig and others, as well as a great number of classic stamps from all over the world. There is no evidence that the same stamps will discolor when kept under normal conditions in other albums or receptacles. It can be proved through color photos from auction catalogs, illustrated color certificates or statements from collectors or dealers affected that the damaged stamps had been in a flawless color condition prior to being placed under the PVC film. The counterarguments of the album manufacturers that the damage was caused by environmental influences must be considered refuted since the stamps affected by color and paper damage had survived being kept in different receptacles, considerable temperature changes and two or three wars unharmed for up to 150 years.

– I am convinced that there is plenty of circumstantial evidence for the thesis that the sulfurous stabilizer contained in the PVC plastic causes the discolorations by escaping in slow migration processes and forming a chemical compound with the lead contained in the printing and paper color. This compound leads to the formation of lead sulfide, a black heavy metal salt that can cause the serious discolorations even if present only in extremely small traces. In all cases the colors turn darker, partly to become all black. This thesis is e.g. supported by an opinion of the Paper Technology Foundation PTS in Munich.

– Positive scientific findings for this suspicion are still outstanding.

– To date the album manufacturers concerned have refused to take the appropriate steps and inform the consumers about the serious concerns or consider recalls.

– Only the BDB and the BPP have supported my efforts in this matter. Particularly alarming is the indifferent behavior of the BDPH as the representative body of the collectors. Through their inactivity the BDPH and APHV can become partially responsible for damage that has already occurred and damage that will occur in the future. As early as 2002, I had requested the BDPH to modify regulation 7.3 of the exhibition regulations (“The sheets to be displayed must be submitted in transparent protective covers.”). Different distinguished exhibitors who have suffered considerable lead sulfide damage told me that they had placed their album sheets in PVC covers only because of that regulation. This sentence is still contained in the latest exhibition regulations. A longer article by Wolfgang Maassen in the May 2003 issue of the PHILATELIE, however, deserves to be commended. The remaining part of the media has addressed this topic only in short news items.

– There is still an urgent need for action to prevent future lead sulfide damage. In my opinion, this includes a recall of transparent illustrated album sheets for classic postage stamp issues until 1875 and clear warnings on all PVC plastic receptacles containing a sulfurous stabilizer, that are intended for keeping stamps and covers.

– I have no concerns about using PVC film for keeping modern stamps that are printed with artificial colors.

Recommended precautionary measures:

– If you are keeping classic stamps and covers in a commercial ring binder and the sheets are provided with PVC protective covers, we recommend you in your own interest to remove those covers immediately. A recommended protection could be cellophane, glassine or similar sheets placed in front of the album sheets or protective covers made of different plastics. Covers that are corrugated inside on one side and thus obviously permit a permanent contact with the ambient air can be used without problems according to our experience.

– If you are keeping classic stamps and covers in a commercial transparent album (illustrated or not), please select another storage method in your own interest. A transparent album sheet consists of a cardboard sheet and a plastic sheet glued onto it. Recommendable are cardboard album sheets (illustrated or not, without PVC protective cover) with polystyrene mounts or adhesive corners for entires. It can be considered an established fact that commercial mounts do not form any chemical compounds with the stamps inside. According to my observations, however, they do not protect the stamps if they are kept under PVC film.

– If you are keeping classic stamps and covers in albums, stock cards and the like that are made completely of PVC plastic, please select another storage method in your own interest. According to our observations, protective covers of PVC that are open on several sides can be used as short-term transport receptacles without problems; this applies also if they were not kept in a way that they were pressed together for a longer period of time.

– PVC film can be useful as short-term transport packages for covers, miniature sheets or auction lots and the like. If you receive auction lots in plastic film or lot cards made of PVC, remove the packaging after receipt in your own interest.

- Please support our efforts to minimize future damage through PVC film. It you have suffered damage yourself, contact your album manufacturer, the philatelic press, the BPDH (Mildred-Scheel-Straße 2, D-53175 Bonn) or the APHV (Barbarossa-Platz 2, D-50674 Köln).

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October 25, 2007