

What do these terms mean?

De-Acidification

Here are two methods to de-acidify large quantities of paper. Our basis for this topic is the leaflet on acid-related decay of paper (originally published in German as "Merkblatt Säurezerfall von Papier") from the company Schempp. For more on the causes of acid deterioration please see [What does acid free mean?](#)

Paper decay

Depending on how far the paper is already damaged, it's still possible to preserve its condition or at least preserve the information written on the paper. In the latter case, we can attempt this by finding a replacement medium, preferably by filming or digitalizing the content. Don't wait until it's too late. If you can no longer turn the pages without the pages falling apart, then it'll be too late to film or digitalize the paper's content.

As long as the pages remain intact, there is a way to preserve them. First, it's important to de-acidify (neutralize) them and – if possible – to re-stabilize the paper fibers. This is relatively simple for single sheets of paper or for small amounts of acid papers: through wet de-acidification in a dip tray, by using a spray method, by introducing an alkaline reserve, or reinforcement with glue. If that doesn't help, the paper can be split and a new core can be added. All these methods require a great deal of effort and they're not technically suitable or financially feasible when large amounts of paper require treatment.

Methods of De-Acidification

Today, there are several ways you can de-acidify paper on a mass scale. These methods are quite varied and some of their effects are questionable. This mainly applies to dry methods, where powder-like substances are blown over the books or individual pages.

Methods with verifiable effects (e.g. involving a clear increase in the pH value of the paper and not just on the paper's surface, combined with integrating a long-term effective alkaline reserve) have been seen involving the full dipping of objects in a liquid or aerosol-formed de-acidification medium.

These methods are included in both methods listed below involving liquid media:

1. **The "Papersave" Method** for mass paper de-acidification was developed by the company Battelle Ingenieurtechnik GmbH (no longer in business). This method used a non-watery medium. Here, since paper swelling is avoided, it's possible to de-acidify bound objects such as books, bound sets of newspapers, bound or stapled files and similar objects. The technique involves the following: objects are placed into baskets and are moved into a treatment chamber where they dry, are flooded over with the

de-acidification medium and then dried again. From today's view of development, this method (with a very few limitations) is estimated as well-suited for books and newspapers. In contrast, de-acidification of contents contained in files can be problematic. Filing systems are not structured in a homogeneous way: omnibuses, bundles and mixed collections can contain various types of paper, with different types of substances used for writing, printing, copying or stamped markings on the papers. There is a chance that substance combinations could occur that cause certain inks, stamp colours, ballpoint pen pastes and other inks to run. There are many criteria that exclude certain objects from mass de-acidification using this technique. You may have a better overview when dealing with books: selecting books based on suitable criteria and avoiding the risk of consequential damage as much as possible. Unsuitable book objects often include volumes with leather and parchment (vellum) spines and covers and red fabric covers. However, in the case of filed record material, the choice is much more difficult. Overall, the colour red presents a problem because red tends to run: a red cover or binding, or a printed colour, stamped ink or ink, even red pens can be affected. Since entire books are treated while remaining closed, it's not possible to stabilize the pages, e.g. by adding glue.

2. **The Bückeburger Method**, developed by the company Neschen AG, uses a watery medium and involves single page treatment. The pages are one by one introduced to one or more de-acidification baths (depending on the type of de-acidification equipment) and then dried. In order to reduce the waves (rippling effects) that will arise, the collection of papers have to be pressed together. Any initial problems with colours that run etc. mainly can be solved so that hardly any side effects occur. The main advantage of this method is that papers are not just de-acidified and buffered, but they're also greatly stabilized. This method is especially suited for application to file records. Of special mention is the option of de-acidifying pages that are not suitable for mechanical de-acidification, e.g. because a photo is attached, or the page is already too weak to remove it separately and hand treat it parallel to the mechanical de-acidification activity. As well, prior to de-acidification metal parts can be removed, large rips mended and the file records covered in foil.

Mass de-acidification can allow preservation of original substances for many years, together in combination with producing another replacement medium viewing for the content, avoidance of direct use of the records and the creation of optimal storage conditions. The time gained in preserving the materials while technology has the chance to progress can be decisive in allowing existing records to be preserved for the future with the help of other better, or completely different techniques.