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Technical Knowledge
Folder No. 8

Archivability of recycled paper

Information regarding purchasing paper for public administration

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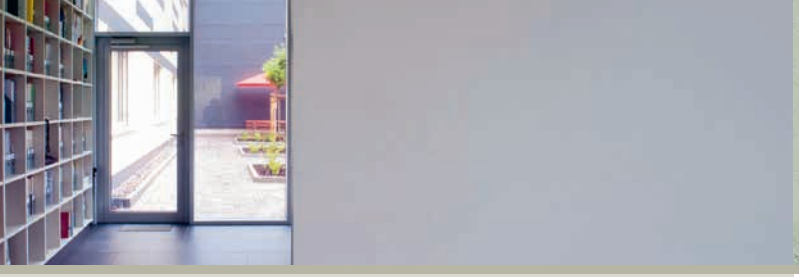

KLUG's expertise. Preserving VALUES. Securing the FUTURE.

For more than 150 years, KLUG-CONSERVATION has been a trusted partner in the preservation of movable cultural assets. Preserving values means more than protection: it safeguards identity, history and cultural legacy.

Our guiding principle, "Preserving values," is both a promise and a source of motivation. By ensuring product authenticity and providing guaranteed quality, we build trust, credibility and long-term reliability. Honesty, a spirit of partnership and respectful dialogue form the foundation for long-lasting collaboration.

Working closely with clients, industry partners, academies and universities, we develop innovative, solution oriented concepts. This collaborative approach ensures the highest standards of quality and creates a lasting advantage in knowledge – insights we are pleased to share through our „Technical Knowledge Folders".

KLUG-CONSERVATION combines traditional paper expertise with state-of-the-art innovation. This unique combination enables us to ensure sustainable preservation of cultural assets at the highest professional level.

Information regarding purchasing paper for public administration

The public administration attaches great importance to using environmentally friendly paper containing a maximum proportion of recovered paper. Only some of the documents issued on such paper actually end up in the archives for long-term storage. Compliance with the standard EN ISO 9706 is imperative for paper to be considered as long-term ageing resistant.

A position paper on the "Archivability of recycled paper" was published in Germany by the German Environment Agency (Umweltbundesamt – UBA) in February 2014 under the motto "Recycling paper with the Blue Angel is ageing-resistant and promotes a circular economy". The contents of this paper however contradict the arguments advanced nationally and internationally by professional representatives of archives and libraries for decades, while not providing any new insights.

DIN EN ISO 9706
DIN 6738

Decomposition of paper – a silent catastrophe

Large proportions of our written cultural heritage are threatened by the silent catastrophe of paper decomposition due to ageing. According to a survey of experts conducted in 2013, cultural artefacts equivalent to a shelf length of approximately 1,500 km are affected in German archives of public bodies and can now only be used to a limited extent or not at all. Reasons for this lie in the composition of industrially manufactured papers and their production methods.

Two "ageing-resistant paper" standards are currently applicable in Germany alone: DIN 6738 and EN ISO 9706 – a material standard. Only EN ISO 9706 is however explicitly dedicated to the "requirements for ageing-resistance" of uncoated paper qualities. In addition to minimum strength properties, this standard states specifications for paper composition regarding alkali reserve and absence of easily oxidised material, i.e. residual lignin and reducible sulfur (Kappa number <5 according to ISO 302:2015). In line with ISO 6588-1:2012, a cold water extract is moreover required to have a pH of at least 7.5.

Representatives of the paper industry, dominated by the DIN Standards Committee Paper, Board and Pulps (NPa 21), developed DIN 6738:2007, which is also intended to position recycled paper in the market. The only criterion quoted by the standard is the stability of strength properties. These are tested after an artificial ageing process (80°C/65% relative humidity) allowing so-called lifespan classes to be derived. According to DIN 6738, papers of the highest lifespan class (LSC 24-85), i.e. those in which at least 85% of the minimum strength properties are retained after an artificial ageing process of 24 days, may be called "ageing-resistant". The standard however explicitly points out that this claimed ageing resistance based on LSC 24-85 "is only fulfilled in case of gentle handling and storage". It moreover refers to the state of the art according to which "uncoated papers reach this lifespan class if their cold aqueous extract has a pH of 7.5 – 9.5, they are exclusively composed of bleached cellulose and/or rags and have a calcium carbonate content of at least 2% (w/w) (DIN 6738:2007, Note 1)

DIN EN ISO 9706

DIN 6738

The production process causes recycled papers to actually contain a high proportion of easily oxidised substances, such as e.g. lignins, which contribute to a potentially damaging formation of acids. Upper limits for these are only specified by EN ISO 9706. The addition of a high alkaline reserve after all only slows down the acidic hydrolysis of paper. Residual lignin content causes acid to be formed in paper as well as being responsible for fast yellowing and darkening of paper. This is not only detrimental to the legibility of the original, but also to digitalisation and microfilming. The proposal to create a new ISO standard solely dedicated to the "mechanical durability" of paper – with the argumentation that optical properties do not play a role for most applications – was rejected by the Committee for Paper Technology with reference to the applicable EN ISO 9706.

Damage prevention is more economic than repair

No significant difference can be determined when comparing the price of ageing-resistant paper conforming to EN ISO 9706 with recycled papers that do not satisfy this standard. Using unsuitable recycled paper may however lead to high technical, organisational and financial expenditure. A life cycle assessment of so-called "environmentally friendly paper qualities" should furthermore be at least considered.

To make them suitable for long-term archiving, papers with a "Blue Angel" certification first have to be stabilised and possibly even deacidified using a cost-intensive and complicated quantitative method. Depending on the relevant method, the cost of deacidification of a linear meter of shelved archived goods is between EUR 1,000 and EUR 1,300. Apart from the ecological impact of the utilisation of chemicals, the additional costs expected for deacidification of non-ageing-resistant papers would exceed the archives' budgets for the preservation of stored cultural artefacts by far.

»Blue Angel«, ageing resistance and EN ISO 9706 are irreconcilable

The requirements of EN ISO 9706 are completely irreconcilable with the demands on recycled paper classified as "environmentally friendly paper" bearing a "Blue Angel" certification. This is because the paper qualities required for the latter have to be composed of 100% recovered paper, as well as contain at least 65% so-called "lower and medium paper grades". Adequate durability for long-term archiving cannot be expected from such papers, as shown in a study by the Library of Congress in 2014.

Although EN ISO 9706 also permits recovered paper to be used for paper production, the qualities of recovered paper used must be "superior", e.g. primary fibres from paper manufacturing or recovered paper qualities consisting exclusively of bleached cellulose and/or rags. Such recycled papers cannot however be certified with the "Blue Angel" ecolabel. This hurdle represents a big disadvantage for suppliers in the market who are able to meet the specifications technically, but who do not subject themselves to a "Blue Angel" certification.

Calls for bids stating the "Blue Angel" ecolabel as an exclusion criterion are not permissible by public procurement law.

Conclusion

The only way to prevent the quantity of unique cultural heritage requiring deacidification from increasing further relentlessly is for the public administration to consistently use ageing-resistant papers conforming to EN ISO 9706. Recycled paper that does not fulfil this standard may only be used by administrative bodies or associated organisation units if the papers do not have to be archived. The most effective ecological contribution is of course sparing use of paper at all levels!

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