Storage of book collections

Preventive care

Preventive preservation is an ongoing process that is necessary throughout the life of library collections. It represents a set of measures to limit the rate and extent of degradation of materials by developing and implementing appropriate and proven procedures for storage, display, packaging and transport. The degradation of plastics cannot be prevented, reversed or stopped, but it is possible to at least slow down the degradation processes.
General care rules or display conditions apply to all synthetic materials in library collections. Whether in a depository or in an exhibition or display, conditions should be within the ranges shown in Table 1 and, above all, there should be no rapid changes in temperature and humidity, as damage such as cracks may form. Library collections should also be kept in a dark, cool and dry room (generally, lowering the temperature slows chemical reactions and the rate of migration of plasticizers from plastics such as plasticized PVC). Other conditions are ventilation, isolation of materials from each other (e.g. cellulose nitrate from other objects), a dry and stable environment, minimizing pollutant concentrations, use of UV filters, and reliable monitoring of conditions in the repository (for CN, for example, sulpho naphthalene-based indicators such as cresol red and purple).

Table 1 Storage/exhibition conditions

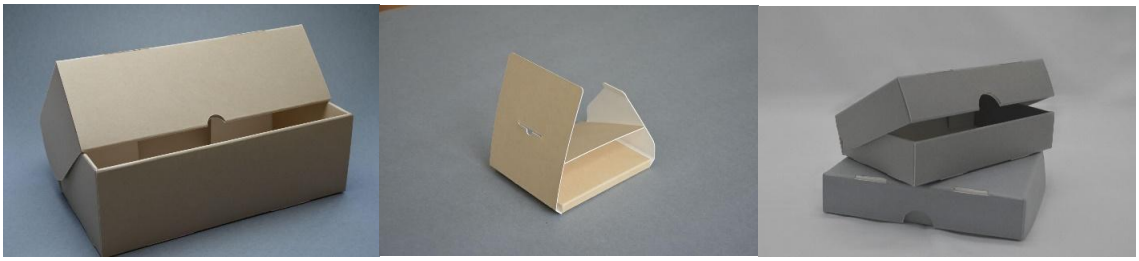
	in general	**attachments**		
		CN	**PVC**	**PUR**
light	50-150 lux	50 lux		
relative humidity	30-50 %	20-30 %	20-30 %	20-30 %
temperature	up to 20° C	2-5° C	5° C	18±20° C

Protective packaging

In libraries, books are often protected by covers, protecting the outer parts of the book from dirt and mechanical wear. The covers can be made of paper or plastic. In National Library (NL) practice, covers that were not produced with the book are referred to as secondary covers. If a material with an adhesive layer (e.g. self-adhesive film) is used for the protective layer of the boards or covers, the book is laminated and this type of protection is called secondary lamination.

Because of the negative effects of some plastics on the materials of book bindings and the risk of creating an unsuitable microclimate between the foil and the cover, secondary covers are removed from books and replaced with another form of protection, most often with boards, covers, boxes made of paper or cardboard meeting strict standards for archiving library collections.
It is advisable to isolate or segregate book collections and their attachments that show degradation and may damage other materials with appropriate packaging that will ideally limit degradation. Various absorbents are used to capture the gaseous pollutants released, such as activated carbon (e.g. for CN), available as textiles, paper or fleece, and mineral sorbents, which often significantly reduce the moisture content and can therefore pose a certain risk (most often zeolites, e.g. for AC). Books made of CN and unplasticized PVC should not be enclosed in packaging, but should be in a breathable packaging where no gaseous pollutants can accumulate. The plasticized PVC is enclosed in non-absorbent inert materials such as polyester packaging to prevent loss of the plasticizer. Loss of plasticizer poses a greater hazard to plasticized PVC than dehydrochlorination.

For the production of protective book covers with cellulose nitrate elements, the negative effect of alkaline-reserve cardboard (e.g. Boxboard, Klug) or ordinary grey cardboard made from recycled paper was not observed in the case of cardboard and paperboard covers, which was verified by tests based on the modified ISO 177 standard and the Oddy test. Alkaline boards and cartons better trap the released nitrogen oxides from CN and therefore protect other books from the effects of aggressive acidic pollutants. For the early detection of the release of undesirable substances, means based on pH indicators are used.
The synthetic materials commonly used in the Czech Republic are shown in Table 2.

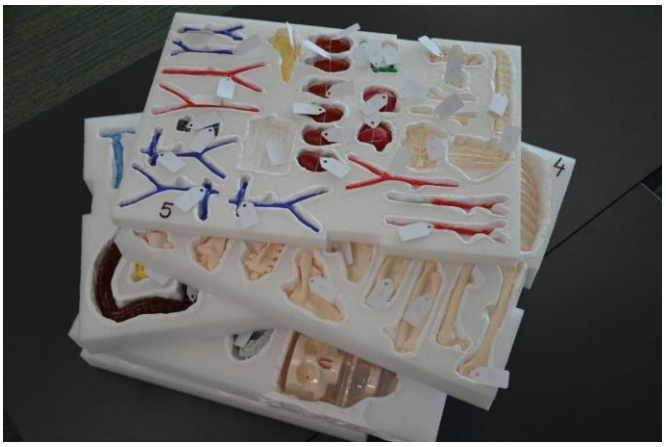


Alkaline cardboard Boxboard packaging for storing book collections

Table 2 Synthetic materials and their use in the Czech Republic

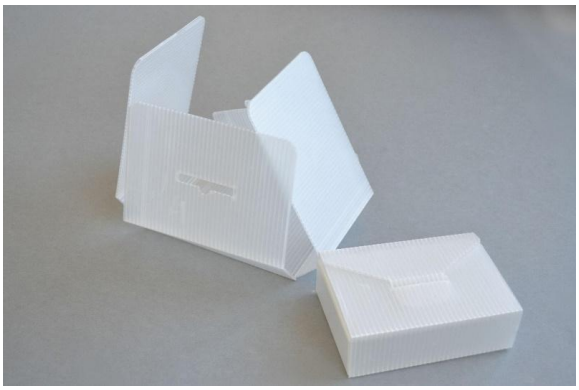
Synthetic materials	Characteristics	Use
Melinex	polyethylene terephthalate film	for interleaving degraded plastics; isolation from other materials; protection against dust, abrasion and contamination

Tyvek	non-woven polyethylene fabric	protection against dust and impact during transport
Fleece	polyester filling	combined with Tyvek for padding
Plastazote	polyethylene foam	securing objects in storage areas (models, toys); cushion material for packing, storage, transport (easy to carve beds)
Polymethyl methacrylate		for display stands in showcases
Polypropylene		for pads, crates and stands
Corrugated Plastic Cardboard (Coroplast)	copolymer of polypropylene and polyethylene	for the production of boxes, packaging
Foil with silicone coating	polyester	for objects with a sticky surface
Microfibre textiles	polyester and polyamide mixture	cleaning cloth



LDPE foam boards with Tyvek lining for storing 3D book attachments

Storage of the attachment in a Klug alkaline corrugated cardboard box



Coroplast - Corrugated Plastic Packaging