Perception and Conservation of an Ersatz Material: Bookcloth

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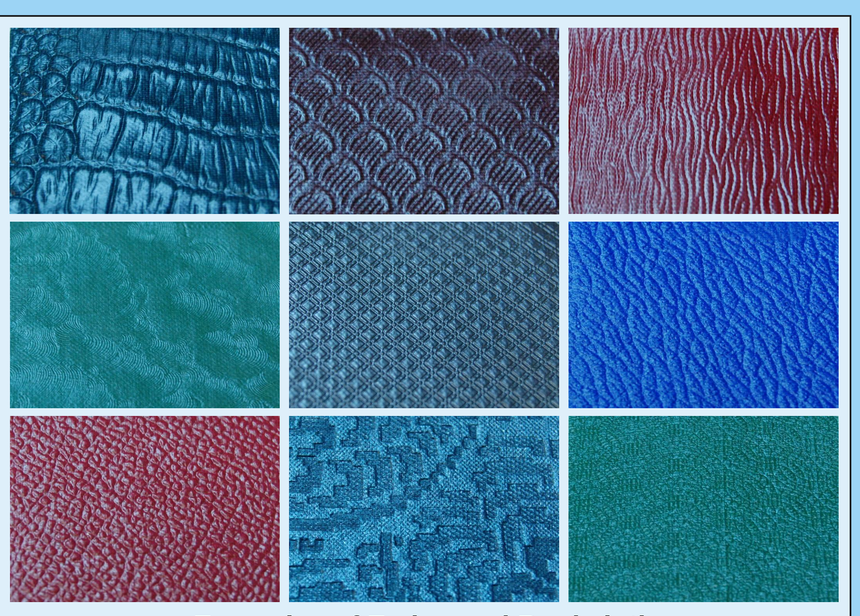
(The British Library, 96 Euston Road, London, NW1 2DB)

What is Bookcloth?

Bookcloth, or buckram, is a general terms for woven fabric (usually plant fibre, and frequently cotton) used to cover books, and employed as an inexpensive substitute for leather. The material is treated with a polymeric material which acts as a filler, either coating or more thoroughly impregnating the underlying fabric. These polymers include starch, pyroxylin, cellulose acetate, polyester and acrylic, often with the addition or dyes and glazing agents. The fabric may be rolled or embossed to give a characteristic finish.

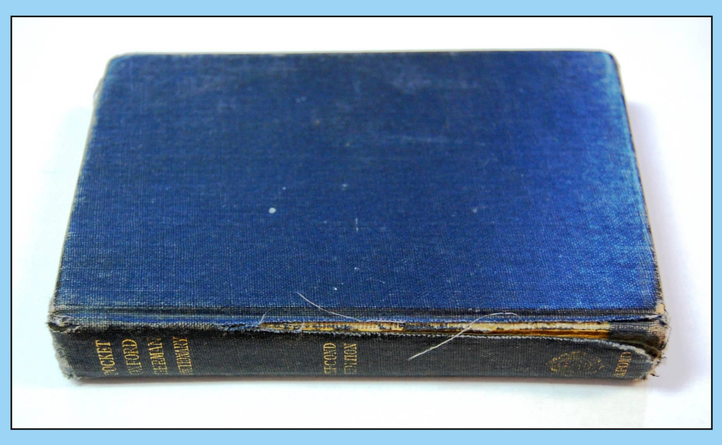


Examples of Embossed Bookcloth

Use of Bookcloth

Since its introduction in the 19th century, bookcloth has been employed as an inexpensive substitute for leather to cover bound volumes; the material can be tooled and decorated in a similar way, and may even be embossed with a grain to more closely mimic leather.

Heavier fabrics, such as drills, twills and sheeting, are usually coated. These materials are suitable for decorative embossing (often in imitation of leather), and the weave pattern is generally obscured; they have a good resistance to water and to microbial attack. Lighter fabrics (typically muslins) are generally impregnated with pyroxylin, and tend to retain their weave pattern; they have the same water and pest resistance as coated fabrics, but often have a greater mechanical durability (these properties are also superior to those of the starch filled fabrics which they replaced for higher quality editions).



History of Bookcloth

The early history of fabric as a book-covering is obscure. Hessian was used as a covering material in the 1760s, but was aesthetically unpleasing. William Pickering (early 1820s) used calico, but this tended to disintegrate when exposed to moisture in the glue unless lined with paper. Recognisable bookcloth was developed in London in 1823 (by Archibald Leighton), who used dyed calico loaded with a starch filler and then glazed, improving its moisture resistance, although this material still had a poor appearance and finish (with an obvious thread pattern). Embossed bookcloths were in use by the early 1830s, disguising the weave structure and more closely mimicking leather.

By the 1940s, bookcloth was sufficiently popular and widely used that it became available as a commercial product, superseding the practice of bookbinders preparing their own fabrics. From this point, impregnation, embossing and gold blocking techniques developed rapidly, and by the middle of the 19th century the materials had largely replaced leather for standard editions of books. Pyroxylin (gelatinised nitrocellulose) treated fabrics were introduced in about 1910, and as a wider range of synthetic polymers became available throughout the 20th century so many of these also found use in bookcloth.

Perception of Bookcloth and Conservation Practice

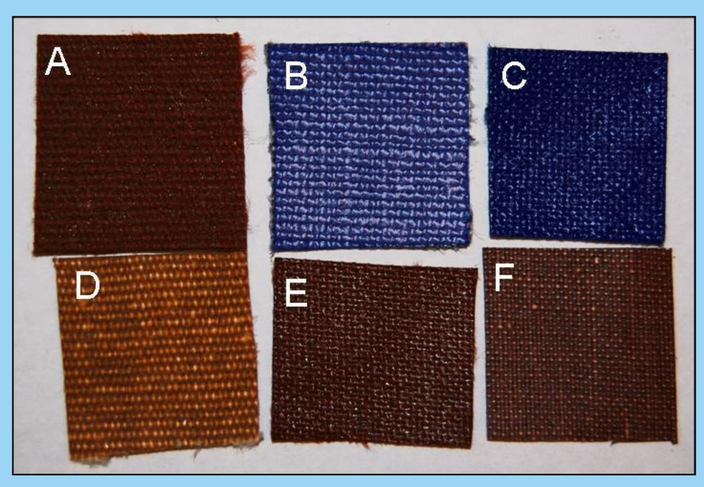
Despite the similarities between leather-bound and bookcloth-bound volumes, however, they have traditionally be regarded and treated in very different manners, with a significantly greater worth usually being placed on the ‘real’ leather rather than its ersatz substitute - for example, in past conservation treatments leather covers would be conserved or at least retained, whereas bookcloth covers (even heavily worked and embellished ones) were often not valued in the same way. The particular conservation issues associated with bookcloth are also significantly different to those of leather: although the fabric component is generally fairly stable, many unstable polymers (such as cellulose nitrate and cellulose acetate) have been used as the filler in the past, and even modern bookcloth may be prone to rapid degradation depending on its composition. This dependence on the polymeric component means that even materials with similar appearances may behave in markedly different fashions.

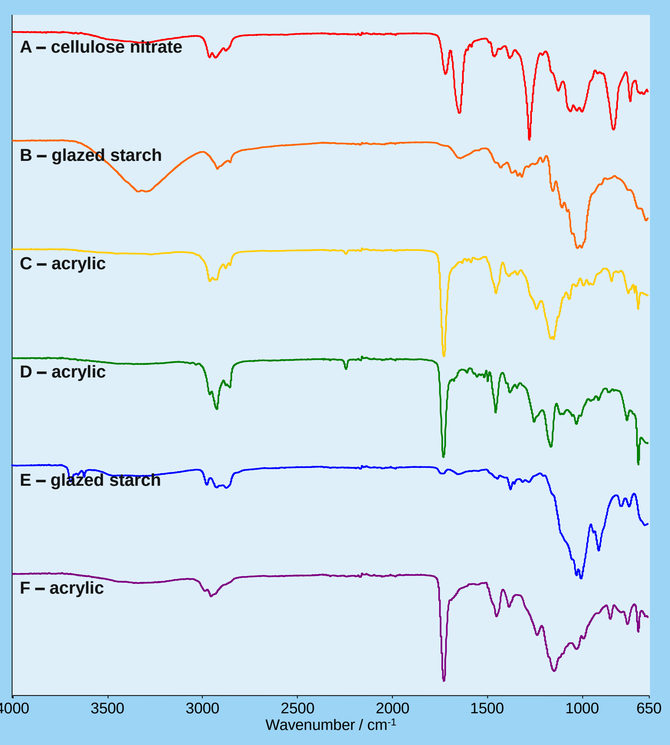
The value of bookcloth covers is now recognised and these materials would be conserved and retained as any other important aspect of the book, and an indicator of its history, provenance and usage.

Properties of Bookcloth

Some of the potential problems associated with bookcloth are highlighted by the following data. Six apparently similar samples of modern bookcloth were investigated by FTIR spectroscopy, to characterise the polymeric filler, and by Oddy testing, to assess their long term stability.

The FTIR spectroscopy shows a range of polymers have been added to the fabric - cellulose nitrate, acrylic and glazed starch; similar analysis showed the underlying fabric to be cotton in all six cases. The results of the Oddy testing show that the three samples containing acrylic are stable, but the other three materials release significant quantities of reactive volatiles, making them unsuitable for conservation purposes.





Sample	Description	Cu	Pb	Ag	pH
A	Brown, medium weave, heavy coating	(×)	✓	×	7
B	Blue, coarse weave, heavy coating	✓	×	✓	6-7
C	Blue, medium weave, medium coating	✓	✓	✓	7-8
D	Beige, coarse weave, medium coating	✓	✓	✓	7
E	Brown, medium weave, heavy coating	(×)	×	✓	6-7
F	Brown, fine weave, light coating	✓	✓	✓	7

Oddy Testing

Oddy testing measures the likelihood of a material releasing damaging volatiles as it ages. A sample (~1g) is placed in a sealed tube with vial of water (1ml) and three clean metal token (copper, silver and lead) suspended on a polyester thread. As control, water and a set of tokens are placed in an empty tube. These are then placed in an oven at 80 °C for 28 days; corrosion of the Cu token indicates the presence of volatile oxidants; of the Pb token, volatile acids; and of the Ag token, volatile sulphur compounds:

✓ - pass (no corrosion) (×) - fail (minor corrosion) × - significant fail (extensive corrosion)

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