

THE LAMINATION OF CARTOGRAPHIC EDITIONS

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Document restoration by lamination - thermoplastic films and composite materials application on paper by the use of a Yugoslavian impregnator (« Strojotechna ») - have been conducted in the Document Conservation Department of the National Library of Russia (NLR) since 1968.

Before introduction and during further working, the method was studied in details, the results were accounted in several articles and reports and therefore, the object of the present information is to direct our attention to some features of laminating just only cartographic editions.

Individual leaves, book jackets, soft covers, newspapers, posters and maps are restored by the lamination method in the National Library of Russia. There are two press plates, heated by electricity, and two rollers in the impregnator. Between the plates, the materials are heated up and the film is softened; between the rollers, the softened film is pressed into the pores and cavities of paper. For processing, a packet is to be made up : two outer rigid liners, two inner antiadhesion liners and a restored document with a film placed on the both sides of it (or on one side - according to the chosen method).

Now, the most suitable film, which is produced by home industry, is a polyethylene film. Good results are also obtained with the composite materials which have a polyethylene underlay in their structure :

- polyethyleneterephthalate (lavsan) film with polyethylene underlay,
- polyamide film with polyethylene underlay, a restoration composite worked out in the National Library of Russia,
- restoration paper with polyethylene underlay.

In all cases, when restoration material containing polyethylene is used, its attachment by pressing is accomplished at 115°C and at 1 minute exposure of a packet between the plates. These conditions have no injurious affect on paper and colour print.

Film application permits to increase the durability of document, to protect the paper from dirt and dust, diminishes the effect of light and air pollution, helps

documents to bear possible changes in keeping conditions of storage, protects them from moisture.

An important side of multicoloured maps restoration is the increase of colour saturation after film attaching : blue colour becomes more blue, red colour becomes more red, etc. Owing to this, the outward appearance of a document improves considerably. One of the main damages, caused to maps by readers, is the abrasion of paper and print. The film, even being thin, permits to protect a document from abrasion.

The increase of paper durability by lamination depends on many factors - kind and thickness of the film, mode of attaching it - on one or on both document sides - paper composition and mass of a square meter, degree of its damage. As a rule, the maps are printed on dense paper with the mass equal to 70 - 160 g/m², consisting of wool cellulose with durable semi-finished additives; as long ago as the 1960ies, according to the standard there was bleached rag pulp in the composition of cartographic paper, later and now; according to the present standards cotton lint is added in it. The paper such as that is permanent enough, durable and it is well strengthened by the application of thin polyethylene film (30 μ thick) even without restoration paper.

For instance, a modern map is printed on paper with the mass of 120 g / m² and folding resistance equal to 7 double folds. After application of a 30 μ thick film on both sides of the map, the value of this index increases to 100 double folds. However, such strengthening is sufficient only when maps are of small format, are stored in the form of separate sheets and are rarely given to readers.

In case of often using and folding up for storage, when they are to be bended and unbended many times, the lamination with thin film is not enough : they need additional strengthening with paper or cloth. A special note should be taken to the spots which undergo bending - unbending. On the paper with the mass equal to 140 g / m² and more, coated with thin film, these spots are destroyed sometimes even more rapidly than without coating and, so, need protection.

The use of the impregnator permits to restore the maps of different formats. If the size of a map is smaller than the working size of the impregnator plates (1 050 x 750 mm), the process is easy and does not take a long time. The maps of large formats are cut in two or in several parts and every part is laminated separately - the film is applied so as to reserve a vacant strip of film (or with restoration material). The parts of the map are joined on a table by the use of a special device for film welding or a solderer. There are several versions of map lamination with film:

1. film and restoration material (paper, cloth) application only on the reverse side,
2. film application on the right side, film and restoration material - on the reverse side,
- 3 film application on both sides,
4. film and thin restoration paper application on the right side, film and dense paper (cloth) on the reverse side.

Besides the already mentioned, the essential versions, many additional ones are used, they are bound up with local strengthening of a document in the spots of breaks, bends, on corners, etc.

Lamination is far from being used for all kinds of documents. This accounts in the main for two undesirable occurrences:

1. When the film is applied, the texture of paper surface changes. If we use polyethylene film the texture depends on a liner, it is possible to make the paper surface glossy, mat, rough, linen-faced, etc. But, in all cases, the texture of the paper surface will differ from the original one.
2. Removal of the film from a document presents a complicated problem. It is possible to do it by heating in a solvent. According to safety regulations, this process is to be realised in special conditions. Therefore, on applying the film on a document, it is necessary to remember possible irreversibility of restoration.

The foregoing shortcoming limits the use of the method. Now, in the National Library of Russia, the modern maps (dated from the 20th century) which are in intensive handling are restored by lamination. Recently, the curators of the collection proposed to laminate the maps dated from the earlier period - the 19th century. Many of them are in a bad condition. It will take plenty of time to restore them, so the maps may not « live » till restoration. Long term restoration practice showed that the laminated maps are well preserved. Apparently, this problem - the lamination of the maps dated from the 19th century - will be solved in the nearest future by curators and restorers in common. Now, this work is carried out as an experiment and only with the damaged maps which has some duplicates.

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