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# PRELIMINARY CONSIDERATIONS AND THE FACTORS INVOLVED IN LINING TREATMENTS OF BLACK AND WHITE FIBER BASE PHOTOGRAPHS

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*Presented at the 2011 PMG Winter Meeting in Ottawa, Canada.*

## **Abstract**

This presentation will summarize the development of a research project done at the National School of Conservation in Mexico City. Its main objective was to create a document about general preliminary considerations of lining treatments in photographs and the description of the factors that influence their effectiveness.

This document is not only a recipe of materials and methods, but also it explains concepts about factors and their ethical, theoretical and material considerations. It defines the key considerations that will contribute to an objective assessment and comparison of the lining treatment results - using starch, methyl cellulose and hydroxypropyl cellulose. It shows furthermore the risks and irreversible damage of the treatment, and also when a lining methodology statement should not be considered. Of course, the results of further investigations will be discussed, as well as the conclusions of this project.

## **Introduction**

This text presents a short overview of a research project done in the year 2009 at the National School of Conservation in Mexico City. It is titled “Preliminary considerations and the factors involved in lining treatments of black and white fiber base photographs”. (The definition of “lining” is: “the treatment in which one adheres a flexible support to the entire surface of the primary support of the photograph”).

This study came from the efforts to answer the following questions after observing different results from lining treatments in several photographs:

Why did certain problems occur during the lining treatments? Lining paper supports were torn. The tears opened. The photographs were cockled and curled.

Why did the physical characteristics of the surface changed and the cracks opened?

What are the advantages of each lining treatment methodology? ;Is it possible to compare the results of these treatments? And how?

These and many other questions without comprehensive answers worried me after I observed the different results from lining treatments done during the postgraduate course and in my private practice experience.

After these, came even more questions, such as:

Who had reported similar results in other countries? What are the experiences of foreign conservators about this topic?

Is such an invasive, risky and expensive treatment necessary? If so, which factors can influence the outcome of the lining results?

Trying to answer these questions motivated me to develop this research project. The main objective was to write a document about general preliminary considerations to lining treatments in photographs, describing the factors that influence the effectiveness of these lining methods. The two specific objectives were: Comparing and evaluating written reports on lining treatments of black and white fiber-base prints in Mexico and other countries, and designing a table that would contain all the variables that influences the results of this treatment.

The research was divided in three steps. I will explain quickly each one.

Step 1. The goal of this step was to learn about the experience of conservators with lining treatments, using starch, and cellulose ether as adhesives, so I searched the conservation literature from Mexico and other countries. Also a questionnaire was sent to conservators.

The information from bibliographic references about the materials, the methodologies, the advantages, disadvantages and general comments of lining treatments were organized in different tables. The experiences reported were from USA, France and Mexico. (the information can be seen at the web site <http://especialidadfotografia.blogspot.com/p/proyectos-finales.html>)

To collect unpublished information, I designed a questionnaire and I sent it to conservators colleagues in other countries. So I got information about their past and present experience in lining the photographs, the materials they have used and the reasons for doing this treatment, nowadays. The responses were enriched by their conservation experience. In general, all the respondents thought that it is necessary to discuss and review the materials and methods used in this treatment.

Step 2. With the information collected in both formats, the variables that influence the effectiveness of the treatment were identified (like the fiber orientation of the paper, the humidity conditions, the photographic processes treated, the formats, the drying techniques, etc.)

Step 3. Based on the review of the paper conservation catalog, the tables I described before, and my own experience, I wrote a document entitled *Preliminary considerations in lining treatments of black and white fiber base photographs and the factors that influence in the effectiveness of the lining treatments*. I will describe only the table of content of this document.

The document begins with the definition and the purposes of a lining treatment in photographs, followed by three topics about the preliminary considerations that the conservator has to discuss before doing and justifying a lining. The tasks are: the assessment of the photograph's value and significance versus damage; the theoretical considerations, and the risks depending on the photographic process.

I.- Then I describe the factors that influence lining treatments' results. There are many variables to consider. To perform a treatment without considering each of these factors and/or to restore with a deficient skill could create an irreversible damage to the aesthetic, material value, and significance of the photograph. I will present, in general terms, each topic.

1.- First, I describe the importance of the materials used. In the document I explain definitions, advantages, disadvantages, risks, and examples, etc. I start with the adhesives like starch and the cellulose ethers because they are the ones that I have used. I describe general characteristics and types. Here I introduce a table with the information gathered during the step 1 indicating where these adhesives are used.

Country	Adhesive
Mexico	Pure wheat starch and pure rice starch, from Lineco®. Methylcellulose M5012® , Klucel G®
USA	Wheat starch , Aytex-P Starch®, klucel G® , Methocel® , Methocel A4M® (4000 cp)
France	Starch, Tylose®, Klucel G® , Methocel ®

Then I explain the use of the starch and cellulose ethers, including the paste mixtures reported in different countries, the application method, with or without reactivating the adhesive; the adhesive viscosity and the importance of the proportion, type and paste mixtures.

2.- The lining paper support is an important factor to consider. I explain general characteristics, type of paper (kozo, gampi, Western papers), the fiber type, facture, length and fiber direction, weight, color, and the humidity state of the lining paper before using it in a wet lining methodology.

Country	Paper
Mexico	Japanese papers like Tengucho 116® (10gr), taizan 140 ® (36 gr), Hozui Roll® (24gr), kozo S® (24), tenguyo tosa®, sekishu torinoko gampi® (20 gr), usuyo gampi® (9gr), kizukishi® (12gr), thin kozo® (9gr), médium kozo® (25 gr)
USA	Lightweight western papers, smooth western papers like Rising Mirage , Japanese paper like RK0, RK1, Usugami , NAO, RK NO. 17® , lens, minter dry tear strips Kozo tissue ®, Gampi®, Kisukishi (kozo) ® · PTI supra.
France	Japanese paper like kizuki kozo ®de 9 à 30 g., tenguyo 9 gr. kozo, Bollaré®.

Here, I show you only the index of the next variables like:

3.- The condition of the photograph before treatment.

4.-The humidity conditions of the conservation lab.

5.- Damages of the photograph such as tears and folds.

6.- Losses in the support of the photographs.

7.- The surface on which you brush the adhesive: paper lining or photograph reverse.

8.- The team work. The number of conservators has to correspond with the requirements and sizes of the photograph. Constant communication and good relationship is important.

9.- Drying process. I divide it in three types: Under weight, under tension and a combination. During the drying step, I consider essential if the photograph is facing down or up. The drying time is a very important variable. The document explains the characteristic of each type of lining method, and the person that reported it, where, and the adhesives and papers used in different countries.

Here is a resume of the different drying processes:

#### DRYING UNDER WEIGHT

- 1.- Wet lining
  - 1.1 Wet lining/reactivate.

#### TENSION

- 1.- Total restrain
  - 1.1 Total restrain upon dacron & Formica-glass support
  - 1.2 Total restrained upon stretch dacron
- 2.- Suction table
  - 2.1 Suction table/Total restrained & stretched dacron
- 3.- Peripheral tension
  - 3.1 Peripheral & Formica-glass
    - Peripheral & Mylar® & Formica-glass
    - Peripheral & Hollytex® & Formica-glass
  - 3.2 Peripheral & stretched dacron

#### WEIGHT + TENSION

1. Weight after wet lining /Remoisten and peripheral tension in stretched dacron
- 2.- Weight after aqueous lining&strips / Peripheral Tension
  - 2.1 Peripheral tension in a wooden surface
  - 2.2 Peripheral tension in a stretched dacron surface

II. Finally I propose a TABLE (database) that recaps all the factors. During the last years the excel file has been filled with my experience and with information about photographs lined during the courses at the University. The columns describe general information and the variables. Here I resume them.

#### **General information about the photograph**

- The drying lining methodology's name
- Conservator's name
- Include an image before lining treatment
- Include an image after lining treatment
- Describe the photographic process
- Dimensions
- Damages that justify a lining treatment
- Photographic details before and after lining treatment.

**Materials used in the lining treatment****-Adhesives**

- Brand name
- Adhesives mixture/ proportion
- Describe the preparation of each adhesive
- Why did you choose this adhesive (s)?

**-Lining paper**

- Brand name
- Hand made or machine paper
- Fiber direction
- Why did you use this paper?

**Lining treatment methodology**

- Was the lining paper humidified or wetted?
- How did you humidify the lining paper before the treatment? (with brush, spray, immersion, etc.)
- Describe the mending material of tears before lining treatment.
- Describe the filling of losses in the photographic support before lining treatment.
- Where did you apply the adhesive? On the reverse of the photograph surface or on the lining paper?
- Describe the humidity and temperature conditions of the conservation lab.

**Drying process**

- Describe if the photograph was dried facing up or facing down. Why?
- Describe the drying process (with weight, tension, a combination, etc.)
- Describe the drying time (hours, weeks, months, etc.)

**General comments.**

- Advantages
- Disadvantages

When the conservator writes down and shares the materials and methodologies used, their results can be assessed in a better way. From the experiences in Mexico, reported in the database, I conclude that it has been important to consider the following factors.

**\*LOW HUMIDITY CONDITIONS** in the conservation lab: Under 20% RH and 28 °C in the lab, we had problems with wet treatments: the aqueous adhesives and the photographs were dried very quickly, so the peripheral tension during drying was very strong depending on the humidity in the photograph, for example. During the peripheral drying on glass or Formica, the edges of the paper lining support were torn. Also the fiber direction and length of the fibers of the paper lining support were very important factors during the drying steps. The ones with large fiber had better results.

If the tension was too strong and it was possible to tear the paper lining support, it was useful to put peripheral strips first, and then applied the lining paper support upon the photograph with an

aqueous adhesive. Then, we dried it without tension and weight. Next day, the photograph was moistened and then dried it with peripheral tension. We had to control the humidity during this final drying (we put a plastic over the photograph so the evaporation of the water was slower).

## Conclusions

This first document about the previous considerations and factors have been shared with Mexican and foreign colleagues. It's posted on the website <http://especialidadfotografia.blogspot.com/p/proyectos-finales.html>. It also would probably contribute information to chapter 19 of the Photographic Materials Group Conservation Catalog "Backing, lining and mounting" at the [http://www.conservation-wiki.com/index.php?title=Photographic\\_Materials](http://www.conservation-wiki.com/index.php?title=Photographic_Materials).

The update and the review of the materials, methodologies and results of lining photographs and the actual theoretical opinion and practice of conservators, allow us to understand the evolution of the conservation lining practice.

My research is not solely a recipe of materials and methods; it also explains concepts about factors and their ethical, theoretical and material considerations. It defines the key considerations that will contribute to an objective assessment and comparison of the lining treatment results - using starch, methyl cellulose and hydroxypropyl cellulose. It shows furthermore the risks and irreversible damage of the treatment, and also when a lining treatment should not be considered.

As a conservation educator, I use the information of this project to teach photograph conservation treatments with a clear methodology.

The database of variables that I propose have been filled with the results of the lining treatments that my students and I have done in Mexico during the last three years at the Postgraduate Course of Photograph Conservation at the National School for Conservation (ENCRYM). The table, which describes the different treatments, has allowed me to compare methodologies. I will link this table in a web site, so conservators of different institutions and countries can fill it with their lining treatments experiences in photographs. This project proposes other future research lines for example the comparison of the different drying methods.

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