



DEUTSCHES  
HYGIENE-MUSEUM  
DRESDEN



**RECOMMENDATIONS FOR THE PRESERVATION  
OF WAX MOULAGES AT UNIVERSITIES AND HOSPITALS  
AND IN MUSEUMS AND OTHER COLLECTIONS**

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## INTRODUCTION

These recommendations, drawn up within the framework of the project “Wax Moulages: A Valuable Handicraft Threatened with Extinction,”<sup>1</sup> were formulated by an interdisciplinary group of experts from the fields of restoration and conservation, medicine and medical history, natural sciences, cultural studies, and curatorship.<sup>2</sup>

Wax moulages are three-dimensional reproductions of pathologically affected parts of the body. They are made from a direct plaster cast, into which a wax mixture is poured. The resulting rough wax model is colored in the presence of the patient or on the basis of original diagnostic findings. Moulages produced in this manner are extraordinarily realistic looking, which made them highly valued as teaching aids in medical education from the end of the 19th century until the 1930s. With the breakthrough of color slide technology moulages became less important. Many institutions disposed of their holdings or stored them under often inappropriate conditions. In some cases the exposure of unprotected moulages to external influences resulted in severe damage, which in turn often led to inappropriate repairs or attempts at touching up. Despite these circumstances many moulages have survived, and a revival of interest in them can be observed.<sup>3</sup> Their use as teaching materials in medical education, where they serve as visual aids in seminars and exams at hospitals and universities, is increasing again. Moreover from today’s perspective the moulage is an object of medical, cultural and historical significance; as cultural goods worthy of preservation and protection, moulages are increasingly finding a place in museum collections.

<sup>1</sup> The project was supported by the federal Kulturstiftung (Cultural Foundation) and the Kulturstiftung of the Länder (states) within the framework of the KUR program (Konservierung und Restaurierung von mobilem Kulturgut / Conservation and Restoration of Movable Cultural Goods) and was carried out from 2008-2010 at the Deutsches Hygiene-Museum Dresden (German Hygiene Museum in Dresden). The recommendations are based on research results from this project; additional research could lead to new findings of relevance to the recommendations.

<sup>2</sup> See the list of authors in Appendix 1.

<sup>3</sup> Information on collections is gathered on the internet platform [www.moulagen.de](http://www.moulagen.de) and is available for comparative research and the exchange of expertise.

## OBJECTIVE AND STARTING POINT

The recommendations are intended to assist all those responsible for ensuring the long-term preservation of wax moulages. For this reason they also encompass concrete suggestions and practical advice. With a focus on conservation and restoration work, key factors for the appropriate treatment of these extremely fragile objects are defined. The recommendations take their orientation from current ethical guidelines and standards for museums based on international principles for the preservation and restoration of art monuments, first formulated in the 1960s.<sup>4</sup>

The recommendations must mediate between two poles: as cultural goods moulages require the greatest possible protection, as teaching aids they are subject to use and therefore are exposed to risks.

Precautionary measures must be taken even for moulages that are used exclusively for teaching purposes, in order to ensure their continued survival through careful treatment. Accordingly, the following recommendations are intended to give equal consideration to the moulage as a museum object and as a teaching object and to offer not only optimal but also compromise solutions. A compromise course, however, should be followed only after evaluation of all potential risks and only in the context of an interdisciplinary exchange of expertise.

The key objective of all actions remains the long-term preservation of the historic moulages that have been passed down to us.

<sup>4</sup> International Council of Museums (ICOM): ICOM-Code of Ethics for Museums, 1986 (revised edition 2004); also: International Council of Monuments and Sites (ICOMOS): Venice Charter, 1966 (originally 1964); European Confederation of Conservator-Restorers' Organisations (ECCO): Professional Guidelines, 2002; Deutscher Museumsbund / ICOM-Deutschland: Standards für Museen, 2006.

## I. COMMENTARY

The recommendations for the preservation of wax moulages cover four fields of action, with concrete information provided for each. As a prelude to the recommendations, objectives and procedures for each of the four fields are explained below and illustrated with the help of examples.

### 1. THE SURVEY

The first step in the preservation of wax moulages is the survey. It includes a visual inspection and the registration or inventorization of an institution's entire holdings. The goal is to use the information thus collected as the basis for interpreting the current condition of the moulages, assessing existing risks, and planning measures that may need to be carried out. All damages observed on the moulages are recorded within the framework of the survey, as are the prevailing conditions of the collection's surroundings and the intended use of the moulages. Cracks in the wax or the wooden support, for example, are signs of embrittlement of these materials or changes in their dimensions. This can often be traced back to climatic fluctuations. Because these damages can greatly endanger the preservation of moulages, precautionary measures to improve the climatic situation are urgently needed in such situations. Previously damaged elements such as broken glass panes or highly exposed pieces such as fingers also present increased risks. Preventive conservation measures to protect endangered components from impact or pressure are necessary here, as are active conservation measures for the consolidation of already damaged areas.

### 2. PREVENTIVE CONSERVATION

Preventive conservation encompasses all measures that optimize the surroundings of wax moulages. The goal is to slow down the aging process and material changes, to stop the advancement or generation of damages, and to delay the necessity of executing direct measures on the moulages for as long as possible.

Climate and light, storage and use, transport and packing, lending and temporary exhibition are all critical factors that preventive conservation must take into consideration. Thus it is necessary to guarantee as constant a climate as possible, since severe and frequent fluctuations facilitate embrittlement of the wax in particular and the formation of efflorescence or exudation. At the same time precautionary measures must be taken to keep climate values within the established safe range, since at high temperatures there is danger of the wax softening, at low temperatures wax joints are more sensitive to breakage, and high relative humidity is conducive to the growth of mold. Also as part of preventive conservation work, high illumination and UV values should be reduced and long-term lighting curtailed, since these intensify discoloration or yellowing of the wax and can cause paint to fade. Transport to other institutions or even within the same building always involves vibrations, which can promote

the formation and progression of cracks and breakage. Therefore provisions must be made to ensure procedures that involve as little vibration as possible. In this context preventive conservation measures include the exclusion of particularly fragile or already damaged moulages from lending. If long-term hanging of a moulage is no longer possible because of age-related material fatigue, alternative methods for storage and exhibition must be developed and applied.

These and other preventive conservation measures necessary for the preservation of moulages become apparent on the basis of the preceding survey. Their instigation and coordination is the task of the curator of the collection. Some of the work, such as measuring and recording temperatures, can be executed by the curator. However, certain steps require the advice of and execution by a trained restorer with a university degree<sup>5</sup> or consultation with another specially qualified expert (for example a climate technician).

### **3. ACTIVE CONSERVATION**

Active conservation includes all measures that are undertaken directly on a wax moulage. Its goal is the stabilization and protection of the existing materials, in order to prevent the advancement of damages that have already developed. Reattachment of a broken or loose piece of a moulage, for instance, would fall within the framework of active conservation. The removal of dirt is also an active conservation measure since components of grime can damage a moulage or serve as a medium for organic pests.

Preservation of the authenticity of the moulages is of paramount importance in the course of active conservation work, i.e., the original materials should be accepted in their naturally aged appearance (for example discolored wax). Likewise traces of previous treatments must be acknowledged as part of an object's history and in general should be left (for instance amended descriptions of diseases).

The optimization of a moulage's surroundings and the execution of preventive conservation measures are prerequisites for the lasting effect of active conservation work. Thus the reattachment of loose pieces can only lead to long-term stability if vibration-free storage and careful use of a moulage are guaranteed.

Active conservation measures are to be carried out exclusively by restorers with university degrees. The competence of the collection curator ends with the observation of existing damages, and it is then his duty to initiate active conservation work by calling in the restorer.

<sup>5</sup> Generally heritage conservation offices and larger museums assist in locating a restorer.

#### **4. RESTORATION**

The goal of restoration is to preserve the aesthetic effect of the moulage or the “readability” of the pathology depicted. Examples of restoration measures include filling in gaps in the wax surface or retouching areas where the paint has abraded or flaked off.

Restoration measures are always characterized by subjective perceptions, and therefore restoration should be undertaken only in exceptional cases and only after preventive and active conservation work has been carried out. Restoration work should only be done by a restorer with a university degree, in continuous consultation with the collection curator, doctors, medical historians and natural scientists.

## II. RECOMMENDATIONS

Advice for concrete implementation of a survey, of preventive and active conservation work, and of restoration work is provided below. For each of the four fields the focus is first on the actions or conditions whose execution or guarantee is necessary for the preservation of wax moulages, and then on additional, desirable measures. Although the latter involve greater expenditure and effort, their realization produces optimal circumstances for effective, long-term survival of moulages.

### BASIC REQUIREMENTS

The following circumstances and procedures are fundamental for the preservation of wax moulages:

- 1) committed and responsible collection curators;
- 2) interdisciplinary cooperation among collection curators, restorers, doctors and medical historians, museologists, cultural studies experts and natural scientists;
- 3) execution of active conservation and restoration measures by restorers with university-level training and a specialization in artistic handicrafts or folklife collections.

The following special characteristics of moulages must be taken into consideration when individual procedures are implemented:

- 1) Moulages are usually part of extensive collections. Individual actions on selected pieces are justifiable only after precautionary measures have been taken to protect the entire ensemble.
- 2) The moulage should always be considered in its entirety. In addition to the wax corpus itself, it is also necessary to preserve the textile or paper mounting, the support, the display case, and paper labels or stickers.
- 3) Every moulage has its own specific combination of materials and therefore its own special set of problems and needs. Proposed approaches and plans of action thus require careful consideration and must be adjusted if necessary before they are implemented. Blanket solutions for the preservation of moulages can only be formulated in a limited way.

## 1. THE SURVEY

The survey is the main task of the collection curator and is a vital component in the preservation of wax moulages. Through the collection and documentation of all information regarding a moulage, the survey provides the foundation for all subsequent measures.

### **Necessary Action**

- a) Inventory the moulages, with attention given to all their materials: wax corpus, textile and paper mounting, support, display case, paper labels and stickers; also survey the containers used previously for storage or presentation of the moulages, i.e., cupboards and display cabinets.<sup>6</sup>
- b) Define the function of the moulage (use as teaching aid or museum object).
- c) Record the moulage's condition, specifying and localizing all damages that are detected.<sup>7</sup>
- d) Survey climatic conditions and exposure to light by recording relevant data: determine climatic values using thermometers to measure temperature; determine illumination values with a lux meter. Measurements must be taken close to the object using calibrated or gauged equipment.
- e) Survey the current situation and established procedures regarding storage, use, transport, packing, lending and temporary exhibition of the moulages.
- f) Assess the risks, e.g., severe endangerment to protruding elements or potential problems resulting from previous damages, frequent use in teaching, permanent exhibition, etc.
- g) Document all the information collected both visually and in writing and update all data at appropriate intervals.

### **Desirable Action**

- h) Measure light and climate continuously for more than 24 hours, e.g., by means of thermohygrographs or data loggers for climate measurements, or have an overall report on the light and climate situation prepared by experts in the field (climate technician or restorer with specialization in the field of preventive conservation).
- i) Research information on the history of the object and the collection and on the methods used to produce the moulages, for instance view historic photos to clarify the date of pre-existing damages.

<sup>6</sup> Uniform questionnaires have proved to be of practical assistance for surveying the condition of moulages (see Protocol I in Appendix 2).

<sup>7</sup> In surveying damages to moulages it is helpful to work with specially drawn up forms for recording their condition and mapping damages (see Protocol II and III in Appendix 2).

- j) Have scientific analyses of materials carried out by specialized laboratories, in particular to aid interpretation of damages such as discoloration of the wax or coatings on wax, paper or glass surfaces.

## 2. PREVENTIVE CONSERVATION

Preventive conservation optimizes the surroundings of wax moulages and thus works against the progression of existing damages and the emergence of new ones. Initiated and coordinated by the collection curator, preventive conservation work should be undertaken following the survey but before any other measures. The factors climate, light, storage, use, transport, packing, lending and temporary exhibition all play a determining role in the surroundings of moulages.

### 2.1. Climate

#### Necessary Action

- a) Ensure that climatic values remain as constant as possible, not only in the place in which the moulages are generally housed, but also for any change of location.

*Note: Climatic fluctuations can already be caused by cleaning a room with damp cleaning equipment or by ventilating when the outdoor climate diverges significantly from the indoor climate.*

- b) Ensure a room temperature of 18-22 °C (for a temperate Central European climate zone).
- c) Ensure a relative humidity of 50-55 % (for a temperate Central European climate zone). Special warning: there is danger of the growth of microorganisms (mold, etc.) at relative humidity values > 60 %.

#### Desirable Action

- d) Reduce climatic fluctuations to a minimum: maximum temperature change of 1 °C per hour, maximum relative humidity change of 2.5 % per hour.<sup>8</sup>

<sup>8</sup> See Andreas Burmester, Wulf Eckermann: Sollwerte für die relative Feuchte und die Temperatur direkt am betreffenden Objekt, in: Fachinstitut Gebäude-Klima e. V. (ed.): Raumklima in Museen, Bietigheim-Bissingen 1999, p.15.

## 2.2 Light

### Necessary Action

- a) Avoid influx of daylight on the objects by using windowless storage or exhibition rooms or reduce daylight by means of curtains, blinds, shades, protective films, etc.
- b) Reduce the length of time during which objects are illuminated, e.g., turn off lights when objects are not in use or exhibits are not open, use timer clocks or movement sensors, put shades or curtains on display cases, regularly exchange the moulages displayed in permanent exhibitions.
- c) Avoid climatic fluctuations and a rise in the temperature of wax moulage surfaces, e.g., by installing lights at a sufficient distance from the moulage and forgoing lights inside display cases.

### Desirable Action

- d) Reduce the illumination level to 50 lux and the UV share to  $75\mu\text{W}/\text{lumen}$ .<sup>9</sup>
- e) Use only appropriate lighting equipment (halogen lamps, fluorescent tubes, LEDs and optical fiber light guides) and employ UV and infrared filters.

## 2.3 Storage

### Necessary Action

- a) Comply with all the above-mentioned conditions for climate and light; this means that non-climate-controlled basements and attics as well as exterior walls should be avoided as storage locations.
- b) Prohibit the piling or stacking of moulages; store particularly endangered moulages in a flat position only.

*Note: Because flat storage of moulages encompasses the least risk, for conservation reasons it is generally the preferred solution, in particular for storage situations that are considered permanent. This goal is easier to achieve if the moulages are never needed for presentation. If storage in a hanging position cannot be avoided, for instance in rooms that simultaneously serve as exhibition space, regular control of the moulages by trained restorers is necessary.*

<sup>9</sup> See Bedienungsanleitung ELSEC 7640 Light & UV Monitor, p. 4.

- c) Avoid vibrations and unnecessary movement and contact, for instance through storage in sufficiently stable built-in fixtures or containers, through good accessibility for each unit stored, and through a system for efficient location by means of inscriptions on the containers with numbers or photos of the moulages.
- d) Include storage rooms in fire prevention provisions.
- e) Ensure protection from pollutants, dust and pests, for instance by removing inappropriate materials such as conventional foamed plastics and cardboard, pressboard, felt and adhesives, by packing moulages in archival quality materials such as boxes made of archival cardboard, by closing leaks in exterior walls, by installing protective measures such as window screens, and by allowing removal of moulages from their storage units only for the shortest possible periods.
- f) Ensure cleanliness of the spaces used for storage, for instance through regular cleaning with appropriate cleaning agents that introduce as little dampness as possible.
- g) Control the moulages and the containers, furniture and spaces used in their storage regularly – and at least once a year – for damaging organisms or pests (in particular insects and mold).<sup>10</sup>

#### **Desirable Action**

- h) Reduce the infiltration of pollutants through special precautionary measures, for instance by storing moulages in enameled steel cabinets and by using special pollution filters to clean the air supply.

## **2.4 Use**

#### **Necessary Action**

- a) Comply with all the above-mentioned conditions for climate and light; this means that the use of moulages should be limited to interior spaces in particular.
- b) Restrict access and use, for instance by limiting the number of people with authorized access and by supervising and registering all users.
- c) Instruct external users regarding the handling of moulages, or issue mandatory rules for usage, e.g., prohibitions against unwieldy equipment, felt tip pens, food, etc. in the vicinity of moulages.

<sup>10</sup> Specially drawn up forms have also proved practical for controlling the emergence and treatment of damaging organisms (see Protocol V in Appendix 2).

- d) Refrain from passing moulages around and avoid direct contact with the wax surfaces; when contact is unavoidable, clean, lint-free synthetic gloves (for instance latex, vinyl, nitrile rubber) must always be used.
- e) Put moulages down on stable, cushioned surfaces only.

#### **Desirable Action**

- f) Use moulages only in closed display cases.
- g) Limit use to as short a period of time as possible, for instance by combining meetings involving various specialists and by specifying regular opening hours or periods during which use is allowed.

## **2.5 Transport, Packing, Lending and Temporary Exhibition**

### **Necessary Action**

- a) Comply with all the above-mentioned conditions for climate and light; this means that all loan inquiries and exhibition plans should be carefully considered in advance since a change in location always involves climatic fluctuations and an exhibition always means exposure to more light.
- b) Plan all the procedures undertaken in preparation for an exhibition with precision; move the moulages into the exhibition space only after all construction work is finished and the lighting is installed.
- c) Display moulages in closed showcases only.
- d) Use dustproof, vibration-free, theft-proof showcases; allow at least two weeks of drying time after sealing or painting inside the case (four weeks for acrylic or epoxy resin finishes); install polyethylene foil as a barrier between the moulage's contact surface and the bottom of the showcase.
- e) Presentation of moulages by hanging should be allowed only after assessment of their stability by a restorer; regular controls of hanging moulages must be conducted.
- f) Do not allow unstable moulages to be subjected to exhibition, transport or lending.

***Note:** In many cases moulages initially appear to be intact and stable. However, numerous types of damage such as fine cracks in the wax or loosened hair are only discernible under detailed examination. Very often the risks connected with these damages can only be assessed based on special knowledge of the characteristics of wax as a material. Conclusions regarding the true condition of a moulage or the risks to which it is exposed therefore always necessitate close inspection. Whether or not it is necessary to call in an expert (restorer) must be decided on a case to case basis.*

- g) For house-internal transport, moulages should either be carried in stable containers or transported via stable table top carts; transport containers and vehicles must be provided with soft padding in order to avoid vibration.
- h) For external transport, choose protective packing materials and transport systems that are appropriate for the prevailing climatic conditions and the attendant circumstances.  
*Note: At cold temperatures in particular, wax reacts very sensitively to vibrations and impact. Accordingly, demands on packing and transport of moulages are higher during the winter months. The use of climate-controlled containers is absolutely necessary for the transport of moulages by air.*
- i) Make inquiries in advance regarding conditions at the exhibition location (for instance by means of a facility report).<sup>11</sup>
- j) Clearly regulate loans through binding specifications for the borrower regarding transport, climate and light at the exhibition location, etc. in accordance with these recommendations.
- k) Secure legal advice regarding the loan contract and insurance of the moulages as artistic goods.
- l) Carry out or require controls and documentation of the condition of the moulages at all exhibition locations, using a lending protocol.<sup>12</sup>

#### **Desirable Action**

- m) Have the condition of the moulages assessed by a restorer before lending or transport; have a courier (preferably a restorer) accompany and supervise all stops on a loan tour.  
*Note: Under some circumstances the borrower will cover the costs of examinations before and after lending, as well as the attendance of a courier (and if applicable also a restorer).*
- n) Use table top carts with air-filled tires for house-internal transport.
- o) Have external transport carried out by movers specialized in the handling of art objects, preferably overland and in air-conditioned (cooled), air-cushioned, theft-proof trucks.
- p) Have objects that are going on loan packed in climate-controlled containers by a restorer and/or by a specialized art moving firm, under the supervision of the lender (allow a 24-hour conditioning period for packing and unpacking the climate-controlled container).
- q) Use showcases made of low-pollutant materials (for sealing materials and adhesives in particular).
- r) Display moulages flat or on a slant at an angle of maximum 30°; allow the latter only after assessment of a moulage's stability by a restorer.

<sup>11</sup> A facility report form that can be downloaded for free can be found on the website of the Deutscher Museumsbund: <http://www.museumsbund.de>.

<sup>12</sup> See Protocol IV in Appendix 2.

### 3. ACTIVE CONSERVATION

Active conservation counteracts the progress of existing damages or the emergence of new ones. Whether or not a wax moulage is in need of active conservation work becomes apparent in the course of the survey. Calling for bids, awarding contracts and otherwise initiating active conservation measures are tasks for the collection curator. The following points must be considered:

#### 3.1 Inclusion of All Components of a Moulage, Various Types of Damage

##### Necessary Action

- a) Moulages generally consist of very different elements and materials, all of which are to be preserved as part of the historic object. The wax corpus plays a central role and is therefore to be handled with priority, but the following components must all be included in active conservation work:
- moulage corpus
  - support
  - textile or paper mounting
  - display case
  - labels recording the diagnosis and the moulage maker
  - patient card (kept separate or on the back of the support)
  - hanging fixtures
- b) Moulages can exhibit numerous different types of damage. Based on their occurrence, frequency, and state of progression, such damages present various risks to the materials of the object as a whole. In accordance with the wax corpus's central significance, in general the damages there present the greatest danger. They should be treated within the context of active conservation, as should the damages listed below for all parts of a moulage:
- wax corpus: break or crack in the wax, detachment from the support, loose or detached parts (wax fragments, hair, glass eyes, etc.), soiling of the surface
  - support: break or crack, severe deformation or swelling, insect or mold attack, soiling of the surface
  - mounting: tear, loosening from the wax corpus or the support, insect or mold attack, detachment of paint layers, soiling of the surface
  - display case: break or crack in the box frame or glass panes, loose or detached parts (in particular adhesive tapes to secure glass panes, corner joints on the box frame, connection between the backside and the frame), deformation of the box frame, insect or mold attack

- diagnosis-label, maker's sticker and patient card: tear or crease in the paper, loosening or detachment from the support, insect or mold attack, soiling of the surface
- hanging fixtures: loosening from the support or the display case, corrosion of metal elements

### 3.2 Assigning Work and Calling for Bids

#### Necessary Action

- a) Moulages, like cultural goods in general, place high demands on active conservation work. Accordingly, practical implementation of active conservation measures calls for special theoretical knowledge as well as craftsmanship, as taught in the framework of restoration studies at a university level. If damages such as those mentioned above occur, any intervention on the object must be entrusted exclusively to restorers with a university degree.
- b) The call for bids for active conservation measures on moulages must require that the work include:
  - detailed examination and research to be carried out before work is performed on the object, and
  - documentation of the measures carried out, including information on the materials used, technical product data and the source of products.

#### Desirable Action

- c) Test conservation methods and materials using samples before application to the original.<sup>13</sup>
- d) Have scientific analyses done on damages or damaged materials (for instance discoloration of the wax mass, mold on wax and paper).

<sup>13</sup> The conservation of wax objects is a relatively young discipline within restoration sciences. No information from long-term studies is available. Calls for bids for conservation work should therefore specify that methods and materials should be tested before their application to the original and that documentation of the measures carried out, including data on the materials used, is absolutely necessary.

## 4. RESTORATION

Restoration includes all work carried out on the wax moulage itself that is aimed at preserving its aesthetic effect or is concerned with its medical “readability.” These measures do not affect the preservation of the historic fabric and therefore are to be undertaken only after preventive and active conservation work is completed. Instigation of this work or the call for bids and the awarding of restoration contracts are again tasks for the collection curator. The following points must be considered:

### 4.1 Preservation of Authenticity

#### Necessary Action

a) Restoration is characterized by subjective perceptions and, as a matter of principle, should be carried out only in exceptional cases. Narrow boundaries, based on the principle of preserving the authenticity and history of an object, define all restoration work. The following points are applicable:

- Arbitrary treatments based on assumptions must be completely precluded.
- It must be possible to differentiate analytically between historic materials and any added materials; the latter must be permanently reversible.
- Restoration work cannot cause any danger to or destruction of original historic fabric.

***Note:** Close cooperation among various disciplines is imperative. For instance if a gap in the wax is to be filled in, decisions regarding the filling material and the application method require the special expertise of a restorer and/or a chemist. For decisions regarding the appearance of the area after filling, on the other hand, the knowledge of a medical expert is absolutely essential.*

Additional principles can be taken over from active conservation work, so that the following points also apply to restoration work:

## 4.2 Assigning Work and Calling for Bids

### Necessary Action

- a) Any intervention on the object must be entrusted exclusively to restorers with a university degree.
- b) The call for bids for restoration work on moulages must require that the work include:
  - detailed examination and research to be carried out before work is performed on the object, and
  - documentation of the measures carried out, including information on the materials used, technical product data and the source of products.

### Desirable Action

- c) Test restoration methods and materials using samples before application to the original.<sup>14</sup>
- d) Have scientific analyses made of damages or damaged materials (for instance efflorescence on wax surfaces).

<sup>14</sup> The restoration of wax objects is likewise a relatively young discipline within restoration sciences. No long-term studies are available. When restoration measures are instigated, preliminary testing of the materials and methods to be used is desirable, and documentation of all steps taken is absolutely necessary.

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**Translated from the German by Margaret Thomas Will, Dresden**

**PROTOCOL I**

**Survey: Object Data**

**PROTOCOL II**

**Survey of the Condition**

**PROTOCOL III**

**Localization/Mapping of Damages**

**PROTOCOL IV**

**Loans**

**PROTOCOL V**

**Long-Terms Survey of Mold-Pests-Efflorescence**



**PROTOCOL II**

Protocol prepared by / date:

**SURVEY OF THE CONDITION**

PHOTO	<b>Identifying name for the moulage</b>	
	<b>Inventory number</b>	
	<b>Location</b>	
	<b>Date of origin</b>	
	<b>Dimensions (in cm)</b>	<input type="checkbox"/> flat <input type="checkbox"/> hanging height: ____ width: ____ depth: ____
	<b>Brief description of the depiction</b>	
<b>Components/Materials</b>		
		<input type="checkbox"/> (A) Moulage corpus / material: _____ <input type="checkbox"/> (B) Mounting / material: _____ <input type="checkbox"/> (C) Support / material: _____ <input type="checkbox"/> (D) Diagnosis label / material: _____ <input type="checkbox"/> (E) Stickers, tags / material: _____ <input type="checkbox"/> (F) Display case / material: _____ <input type="checkbox"/> (G) Other / material: _____

Evaluation of the condition	Comments on the condition
<input type="checkbox"/> intact and stable <input type="checkbox"/> damaged but stable <input type="checkbox"/> instable and in need of conservation <input type="checkbox"/> defective, emergency stabilization necessary	

Damages (mark A, B, C, D, E, F, G respectively as applicable, see above)					
<input type="checkbox"/> breakage	ABCDEFG	<input type="checkbox"/> soiling	ABCDEFG	<input type="checkbox"/> loosened connection	ABCDEFG
<input type="checkbox"/> crack/tear	ABCDEFG	<input type="checkbox"/> coating (mold, efflorescence)	ABCDEFG	<input type="checkbox"/> missing components	ABCDEFG
<input type="checkbox"/> hole	ABCDEFG	<input type="checkbox"/> insect damage	ABCDEFG	Previous treatments:	
<input type="checkbox"/> gap/missing piece	ABCDEFG	<input type="checkbox"/> unraveling threads	ABCDEFG	<input type="checkbox"/> adhesions	ABCDEFG
<input type="checkbox"/> scratch/nick	ABCDEFG	<input type="checkbox"/> protruding threads	ABCDEFG	<input type="checkbox"/> additions	ABCDEFG
<input type="checkbox"/> roughened surface	ABCDEFG	<input type="checkbox"/> real hair damaged		<input type="checkbox"/> overpainting	ABCDEFG
<input type="checkbox"/> abraded surface	ABCDEFG	<input type="checkbox"/> real hair missing		<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> deformation	ABCDEFG	<input type="checkbox"/> glass eye damaged		<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> discoloration	ABCDEFG	<input type="checkbox"/> glass eye missing		Other:	
<input type="checkbox"/> spotting	ABCDEFG	<input type="checkbox"/> corrosion	ABCDEFG	<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> loss of coloration	ABCDEFG	<input type="checkbox"/> loosening of adhesive tape		<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> paint abrasion/loss	ABCDEFG	<input type="checkbox"/> clouding of glass panes		<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> loosening	ABCDEFG			<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> crease	ABCDEFG			<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> fold	ABCDEFG			<input type="checkbox"/> _____	ABCDEFG
<input type="checkbox"/> ripple	ABCDEFG			<input type="checkbox"/> _____	ABCDEFG

**LOCALIZATION/MAPPING OF DAMAGES**

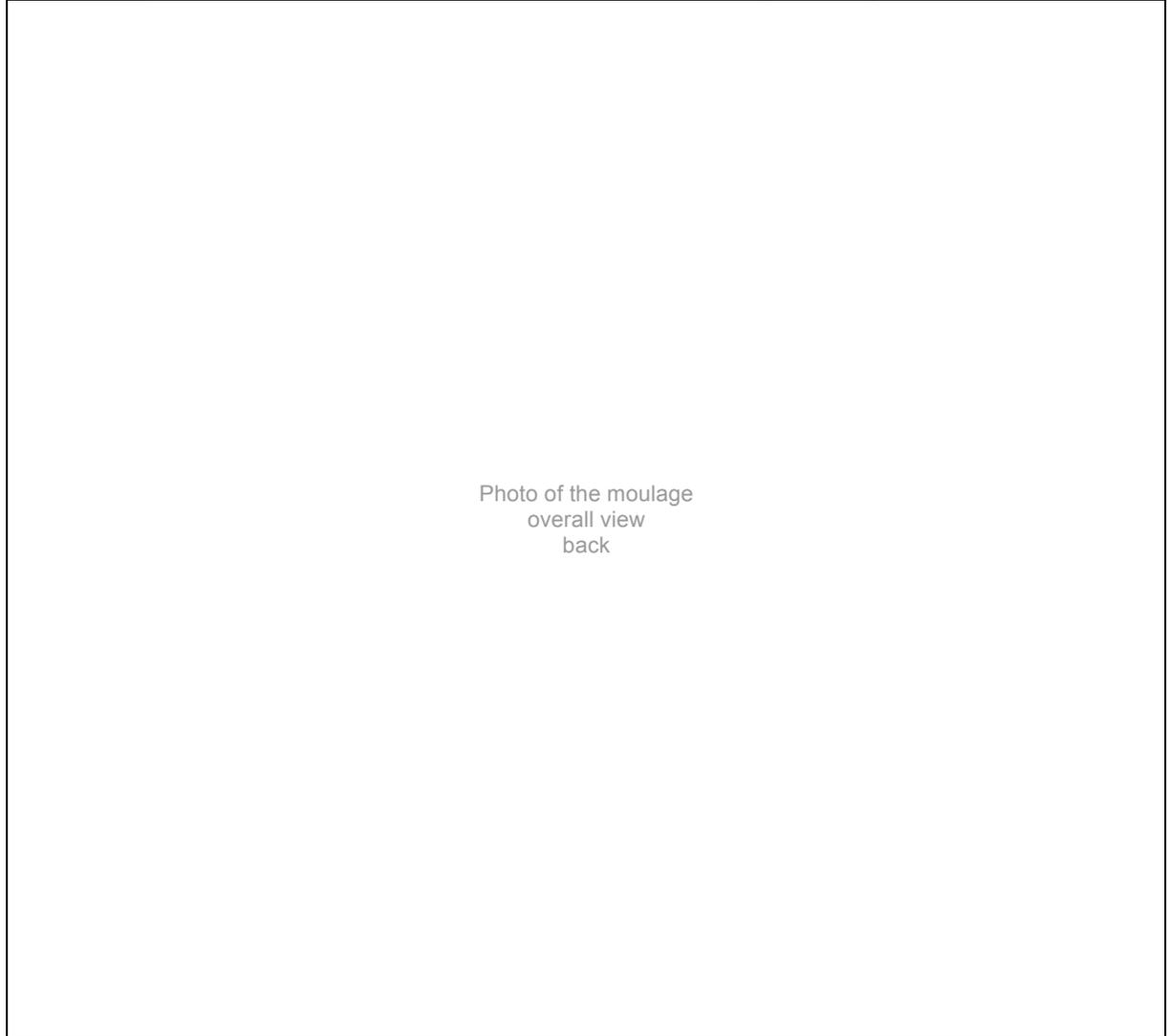
Identifying name for the moulage		Evaluation of the condition
Location		<input type="checkbox"/> intact and stable <input type="checkbox"/> damaged but stable <input type="checkbox"/> instable and in need of conservation <input type="checkbox"/> defective, emergency stabilization necessary
Date of origin		
Inventory number		

Photo of the moulage  
overall view  
front

1 breakage 2 crack/tear 3 hole 4 gap/missing piece 5 scratch/nick 6 roughened surface 7 abraded surface 8 deformation 9 discoloration 10 spotting 11 loss of coloration 12 paint abrasion/loss 13 loosening 14 crease 15 fold 16 ripple	17 soiling 18 coating (mould, efflorescence) 19 insect damage 20 unraveling threads 21 protruding threads 22 real hair damaged 23 real hair missing 24 glass eye damaged 25 glass eye missing 26 corrosion 27 loosening of adhesive tape 28 clouding of glass panes 29 removal of sample 30 previous treatments 31 _____ 32 _____
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**LOCALIZATION/MAPPING OF DAMAGES**

<b>Identifying name for the moulage</b>		<b>Evaluation of the condition</b>
<b>Location</b>		<input type="checkbox"/> intact and stable <input type="checkbox"/> damaged but stable <input type="checkbox"/> instable and in need of conservation <input type="checkbox"/> defective, emergency stabilization necessary
<b>Date of origin</b>		
<b>Inventory number</b>		



1 breakage 2 crack/tear 3 hole 4 gap/missing piece 5 scratch/nick 6 roughened surface 7 abraded surface 8 deformation 9 discoloration 10 spotting 11 loss of coloration 12 paint abrasion/loss 13 loosening 14 crease 15 fold 16 ripple	17 soiling 18 coating (mould, efflorescence) 19 insect damage 20 unraveling threads 21 protruding threads 22 real hair damaged 23 real hair missing 24 glass eye damaged 25 glass eye missing 26 corrosion 27 loosening of adhesive tape 28 clouding of glass panes 29 removal of sample 30 previous treatments 31 _____ 32 _____
--	--

**LOCALIZATION/MAPPING OF DAMAGES**

Identifying name for the moulage			Evaluation of the condition
Location			<input type="checkbox"/> intact and stable <input type="checkbox"/> damaged but stable
Date of origin			<input type="checkbox"/> instable and in need of conservation
Inventory number			<input type="checkbox"/> defective, emergency stabilization necessary
Photo of the moulage detail/close-up showing damage		Photo of the moulage detail/close-up showing damage	
Photo of the moulage detail/close-up showing damage		Photo of the moulage detail/close-up showing damage	
1 breakage 2 crack/tear 3 hole 4 gap/missing piece 5 scratch/nick 6 roughened surface 7 abraded surface 8 deformation 9 discoloration 10 spotting 11 loss of coloration 12 paint abrasion/loss 13 loosening 14 crease 15 fold 16 ripple	17 soiling 18 coating (mould, efflorescence) 19 insect damage 20 unraveling threads 21 protruding threads 22 real hair damaged 23 real hair missing 24 glass eye damaged 25 glass eye missing 26 corrosion 27 loosening of adhesive tape 28 clouding of glass panes 29 removal of sample 30 previous treatments 31 _____ 32 _____		

**PROTOCOL IV**

Protocol prepared by / date: 1/2

**LOANS**

**Protocol IV is to be used only in conjunction with a copy of Protocol III – Localization/Mapping of Damages.**  
 Any changes in condition during the lending period are to be localized on the damage map and dated.

<b>EXHIBITION</b> (title, location, dates)	
PHOTO	<b>Identifying name for the moulage</b>
	<b>Inventory number</b>
	<b>Date of origin</b>
	<b>Location</b>
	<b>Dimensions (in cm)</b> <input type="checkbox"/> flat <input type="checkbox"/> hanging height: _____ width: _____ depth: _____
	<b>Insurance value</b>
	<b>Components/materials of the moulage</b>
	<b>Brief description of the depiction</b>
<b>Brief description of the condition (see Protocol III, Localization/Mapping of Damages)</b>	
<b>CONDITIONS FOR LENDING</b>	
<p><b>Climate in the exhibition space:</b>          Temperature: 18-22 °C, variation of max. 1 °C per hour          Relative humidity: 50-55 %, variation of max. 2.5 % per hour          Climatic conditions are to be kept as stable as possible.</p> <p><b>Lighting in the exhibition space:</b>          Illumination level: max. 50 lux; UV-share: max. 75µW/lumen          No direct sunlight, no lighting within the display cabinets (with the exception of LEDs, optical fiber light guides), if possible no direct spotlights; spotlighting only allowed at a sufficient distance from the object and in compliance with established safe values.</p> <p><b>Presentation/mounting:</b>          Exhibition in dustproof, low-pollutant display cases, flat or on a stable slant of max. 30° (only in consultation with the lender), with polyethylene foil (such as Mylar) between the moulage and the floor or slant of the display case.</p> <p><b>Handling:</b>          Direct contact with the moulage to be kept to a minimum, use of synthetic gloves (latex, vinyl, nitrile rubber) is absolutely necessary.</p> <p><b>Other precautions:</b>          Interim storage of the transport containers in clean, theft-proof spaces with the same climatic conditions as described above.</p>	

**PROTOCOL IV**

Protocol prepared by / date: 2/2

**LOANS**

**Protocol IV is to be used only in conjunction with a copy of Protocol III – Localization/Mapping of Damages.**  
Any changes in condition during the lending period are to be localized on the damage map and dated.

**EXHIBITION**

<b>Identifying name for the moulage</b>	<b>Inventory number</b>
---	-------------------------

**PACKING**

- |   |   |
|---|---|
| <input type="checkbox"/> wooden container<br><input type="checkbox"/> climate-controlled container<br><input type="checkbox"/> metal container<br><input type="checkbox"/> cardboard container<br><input type="checkbox"/> foamed plastic | <input type="checkbox"/> foil<br><input type="checkbox"/> tissue paper<br><input type="checkbox"/> other: _____<br><input type="checkbox"/> other: _____<br><input type="checkbox"/> other: _____ |
|---|---|

**CHANGES UPON ARRIVAL AT THE EXHIBITION LOCATION**

- no changes  
 yes; description (please also enter on Protocol III, Localization/Mapping of Damages):

Date, place, capacity and signature of the lender	Date, place, capacity and signature of the borrower
_____	_____

**CHANGES BEFORE THE RETURN TRANSPORT**

- no changes  
 yes; description (please also enter on Protocol III, Localization/Mapping of Damages):

Date, place, capacity and signature of the lender	Date, place, capacity and signature of the borrower
_____	_____

**CHANGES AFTER THE RETURN TRANSPORT**

- no changes  
 yes; description (please also enter on Protocol III, Localization/Mapping of Damages):

Date, place, capacity and signature of the lender	Date, place, capacity and signature of the borrower
_____	_____

**PROTOCOL V**

Protocol prepared by/date: 1/4

**LONG-TERM SURVEY OF MOLD – PESTS – EFFLORESCENCE**

<b>Identifying name for the moulage</b>		PHOTO
<b>Inventory number</b>		
<b>Location</b>		
<b>Date of origin</b>		
<b>Dimensions (in cm)</b>	<input type="checkbox"/> flat <input type="checkbox"/> hanging	
height: _____	width: _____ depth: _____	
<b>Components/materials of the moulage</b>		
<b>Brief description of the depiction</b>		
<b>DAMAGE PHENOMENON</b>		
<input type="checkbox"/> <b>MOLD</b>	<input type="checkbox"/> <b>INSECT DAMAGE</b>	<input type="checkbox"/> <b>EFFLORESCENCE</b>
<b>Affected components/localization</b>		
<input type="checkbox"/> Moulage corpus	<input type="checkbox"/> Mounting	<input type="checkbox"/> Support/Display case <input type="checkbox"/> Diagnosis label/stickers
<b>Description/appearance</b>		
previously observed/ documented <input type="checkbox"/> yes _____ <input type="checkbox"/> no _____	previous investigations/ analyses/sample removal <input type="checkbox"/> yes _____ <input type="checkbox"/> no _____	previous measures/ removal/ treatment <input type="checkbox"/> yes _____ <input type="checkbox"/> no _____
<b>Measures</b>	<b>Recommendations</b>	
<input type="checkbox"/> suspicion recorded, referred to _____	<input type="checkbox"/> removal of mold/efflorescence recommended	
<input type="checkbox"/> quarantine/location _____	<input type="checkbox"/> treatment of pests recommended	
<input type="checkbox"/> documented (photos, written) _____	<input type="checkbox"/> quarantine recommended	
<input type="checkbox"/> removal of sample: where/by whom _____	<input type="checkbox"/> analysis recommended	
<input type="checkbox"/> analysis: means/result _____	<input type="checkbox"/> further controls recommended	
<input type="checkbox"/> removal/treatment _____	<input type="checkbox"/> _____	
<input type="checkbox"/> _____		
<b>Appearance after treatment</b>		





