



Module Nine of Ten

Physical Management and Storage of Microforms

TRAINING *in* PRESERVATION MICROFILMING

Module Nine of Ten

Physical Management and Storage of Microforms

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National Library of Australia

2003



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Introduction

Welcome to Physical Management and Storage of Microforms.

This module introduces you to best practice in the storage and the physical management of microforms. It also deals with storage problems and disaster recovery of microforms.

Prerequisites

This is the ninth of a series of training modules about preservation microfilming. In order to work through this module you need to have satisfactorily completed the modules, **Preservation Microfilming—Basics and Preservation of Materials**.

It will also help if you have completed the modules:

- I **Preparation for Microfilming**
- I **Maintaining Microfilming Equipment**
- I **Operating Microfilming Equipment—Cameras**
- I **Jacketing and Splicing Microfilm**
- I **Processing and Duplicating Microforms**
- I **Microfilm Quality Control Inspection.**

These will give you background information which you should find useful before you start on this module.

Learning outcomes

When you have successfully completed this module, you will be able to:

- I prepare masters, second and third generations of microforms for storage according to best practice guidelines
- I survey microfilm collections to determine condition and suitability of storage arrangements
- I assist in the implementation of a disaster management/recovery program.

In competency-based training models, the **learning outcomes** closely relate to the term **elements of competency**.

Recognition of current competencies (RCC)

You may already have knowledge, experience and skills which are relevant to this module.

This means that if you wish to complete a formal Preservation Microfilming course, you may not have to study all of it.

Please discuss this with your course coordinator, or lecturer. Evidence of your microfilming competence and/or an assessment, such as a practical test, will be required.

Assessment

If you are formally studying the Preservation Microfilming course, you must meet certain **performance criteria** in order to demonstrate your competency in each unit or module.

These criteria form the basis of your assessment. They are listed at the beginning and end of each topic.

As you work your way through the training materials, you will need to keep a record of the performance criteria and other learning activities that you have completed.

Conditions

In order to complete this module you will also need access to a **collection of microforms of different ages** for assessing, either in your own workplace, or by arrangement with another organisation.

A polarising filter for checking the film base was supplied with the module, **Microform Quality Control Inspection**.

Cotton gloves were supplied with the module, **Processing and Duplicating Microforms**.

Contact your lecturer or mentor immediately if you have any difficulty in getting access to these resources so that an alternative can be arranged.

Activities

There are two types of learning activities in this module which are indicated by the icons below.

■ Activity

Responses to these activities are written in this book. They are usually short tasks which keep you involved with the issues you are considering and may also require you to apply what you are learning.

Some of the activities in these training materials require you to perform tasks such as loading a camera or operating a processor. A lecturer or assessor will observe you performing the tasks and then examine the results or the product (e.g. the newly processed microfilm) to check that it meets requirements. Major activities are marked with the symbol .

● Reflect

Here you will be asked to think about key issues, usually in consultation with workplace colleagues, and come to some conclusions. The purpose of these activities is to allow you to share your understanding with others, and benefit from wider experience than your own.

You will need to be prepared to discuss your findings or conclusions with your assessor or lecturer who will be signing off the relevant **performance criteria**.

▲ Submit

When this icon appears, you are ready to record in the **Log book** that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities** for a topic.

You can record these in the **Log book** simply by marking the boxes in the shaded columns with a **✓ yes** or **✗ no**.

You can then ask your lecturer or assessor to verify that you can meet the **performance criteria** and that you have satisfactorily completed the **activities**.

If you work through the various activities along the way, you will find the assessment activities relatively easy to complete.

Resources



There are a number of resources available on preservation and preservation microfilming. A librarian can help you find out where these resources are available.

Below are a few:

Printed materials

Adcock, Edward P. (ed. & comp.) 1998, *Principles for the Care and Handling of Library Material*, International Preservation Issues, number 1, IFLA-PAC, Paris.

Address: IFLA Core Programme for Preservation and Access (PAC) Bibliotheque Nationale de France, 2, rue Vivienne, 75084 Paris Cedex 02, France.

(Available online at IFLA website as *Principles for the care and handling of library material*, <<http://www.ifla.org/VII/4/news/pchlm.pdf>>, accessed 4 May 2003.)

Alegbeleye, Bunmi, 1996, 'How Should Preservation Procedures be Implemented in Africa', *International Preservation News*, no. 13, December, pp. 9–11.

(A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VII/4/pac.htm4>>, accessed 12 May 2003.)

Berthon, Hilary 2001, 'Preserving together: collaborative library activities in Australia', *International Preservation News*, no. 24, May, pp. 22–25.

(A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VII/4/pac.htm4>>, accessed 12 May 2003.)

Canadian Cooperative Preservation Project 1993, *Guidelines for Preservation Microfilming in Canadian Libraries*, Prepared by the National Library of Canada for the Canadian Cooperative Preservation Project, Ottawa.

Dean, John 1999, 'Collection care and preservation of Southeast Asian materials', *International Preservation News*, no. 20, December, pp. 10–14.

(A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VII/4/pac.htm4>>, accessed 12 May 2003.)

Dean, John 2000, 'National and Regional Preservation Planning – background to the establishment of cooperative programs,' in *Proceedings of the International Meeting on Microform Preservation and Conservation Practices in Southeast Asia: Assessing Current Needs and Evaluating Past Projects*, February 21–24, 2000, Chiang Mai University, Chiang Mai. pp. 19–20. Available from SEACAP website, <<http://www.seacap.chiangmai.ac.th/>> accessed 12 May 2003.

Dean, John & Henchy, Judith 2001, 'Preservation in Southeast Asia: a new beginning', *International Preservation News*, no. 24, May, pp. 15–19.

(A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VII/4/pac.htm4>>, accessed 12 May 2003.)

Doig, Judith 1997, *Disaster Recovery for Archives, Libraries and Records Management Systems in Australia and New Zealand*, Charles Sturt University, Wagga Wagga.

Harvey, Ross 1993, *Preservation in Australian and New Zealand Libraries: Principles, Strategies and Practice for Librarians*, 2nd edn, Charles Sturt University, Wagga Wagga.

Heritage Collections Council Secretariat, Department of Communications, Information Technology and the Arts 1998, *ReCollections: Caring for Collections Across Australia*, Heritage Collections Council Secretariat, Department of Communications, Information Technology and the Arts Canberra. (See especially parts *Caring for Cultural Material 1 and 2*, and *Damage and Decay*.)

(The resource *ReCollections* is also available online from the Museums Australia website, <<http://amol.org.au/recollections/>>, accessed 15 May 2003.)

Heritage Collections Council 2002 *Guidelines for environmental control in cultural institutions*, Heritage Collections Council, Consortium for Heritage Collection and their Environment, Canberra.

IFLA-PAC 2000, *Safeguarding Our Documentary Heritage*, (CD Rom), UNESCO Memory of the World Programme, Paris.

Lin, Zuzao 1999, 'The Traditional and Modern Preservation of Library Rare Books and Precious Rare Material in China', *International Preservation News*, no. 19, July, pp. 8–11.

(A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VII/4/pac.htm4>>, accessed 12 May 2003.)

Maidment, Ewan 1998, 'Roving the Pacific: Pacific Manuscripts Bureau Microfilming in the Pacific Islands', *Microform and Imaging Review*, Vol. 27 no. 2, Spring, pp. 55–62.

Maidment, Ewan 2001, 'PAMBU: Microfilming in the Pacific Islands', *International Preservation News*, no. 24, May, pp.7–10. (A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VI/4/pac.htm4>>, accessed 12 May 2003).

Microform and Imaging Review 1972–, (journal), quarterly, K. G. Saur, Munich, Germany.

Micrographics Year Book 1981–2001 (annual), G. G. Baker, Windlesham, Surrey, UK. (Last edition 2001).

Museums Australia (Inc.) 1996, *Previous Possessions, New Obligations: A Plain English Summary of Policies for Museums in Australia and Aboriginal and Torres Strait Islander Peoples*, Department of Museums Australia Inc., North Fitzroy, Victoria.

Museums Australia (Inc.) 1998, *Caring for Our Culture: National Guidelines for Museums, Galleries and Keeping Places*, Department of Communications and the Arts, Canberra.

National Library of Australia 1998, *Guidelines for Preservation Microfilming in Australia and New Zealand*, National Library, Canberra.

National Preservation Office 2000, *Guide to Preservation Microfilming*, The Office, London.

National Preservation Office 1994, *Preservation: a Training Pack for Library Staff*, National Preservation Office, British Library, London.

Perumal P & Wheeler Michael 1997, 'Traditional Practices for the Control of Insects in India', *V&A Conservation Journal*, April, pp. 8–9.

Reilly James 1994, 'The case for Image Stabilizing Treatment of Microfilm', in Elkington, Nancy E, ed. *RLG Archives Microfilming Manual*, Research Libraries Group, Mountain View, California, pp.168–170.

Sudarsono, Blasius 2000, 'Best practice for the conservation of original texts and film negatif', in Proceedings of the International Meeting on Microform Preservation and Conservation Practices in Southeast Asia: Assessing Current Needs and Evaluating Past Projects, February 21–24, 2000, Chiang Mai University, Chiang Mai. pp.78–83. Available from SEACAP website, <<http://www.seacap.chiangmai.ac.th/>> accessed 12 May 2003.

SEACAP (Southeast Asian Consortium for Access and Preservation) 2000, Proceedings of the International Meeting on Microform Preservation and Conservation Practices in Southeast Asia: Assessing Current Needs and Evaluating Past Projects, February 21–24, 2000, Chiang Mai University, Chiang Mai. (Available from the SEACAP website, <<http://www.seacap.chiangmai.ac.th/>>, accessed 4 May 2003.)

Wendell, Laura 2001, 'Taking care of books', *International Preservation News*, no. 25, August, pp. 6–9.

(A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VI/4/pac.htm4>>, accessed 12 May 2003).

Standards (relevant):

American National Standard for Imaging Media – Stability of Color Photographic Images-Methods for Measuring, ANSI IT9.9 1990 and ANSI/NAPM IT9.11 1993.

American National Standard for Imaging Media (Photography) – The Effectiveness of Chemical Conversion of Silver Images Against Oxidation – Methods for Measuring. ANSI/NAPM IT9.15 1993.

American National Standard for Imaging Media – Processed Safety Photographic Films – Storage ANSI/NAPM IT9.11 1993

ANSI/AIIM MS23–1998 Standard for Information and Image Management – Standard recommended practice for production, inspection and quality assurance of first-generation silver microfilm of documents.

American National Standard for Imaging Media/Association for Information and Image Management – Inspection of Stored Silver Gelatin Microforms for Evidence of Deterioration. ANSI/AIIM MS 45–1990.

AS 3674 –1989. Storage of microfilm.

MP 25 – 2002 Basic Guide to microfilming – Miscellaneous Standard. Standards Australia.

See also the list of international standards in the **Learning Guide**.

Internet sites

(As internet sites change frequently, you may need to use a search engine to identify the latest location)

AICCM (Australian Institute for the Conservation of Cultural Material Inc.), <<http://www.aiccm.org.au/>>, accessed 15 May 2003. Address: GPO Box 1638, Canberra ACT 2601, Australia.

AIIM (Association for Information and Image Management), <<http://www.aiim.org/>>, accessed 4 May 2003, and its sub group the Film-based Imaging Association, <<http://www.fbi.aiim.wegov2.com/>>, accessed 14 May 2003. The film-based imaging association has a buyers guide of U.S. manufacturers and distributors of micrographic equipment and supplies. Address: 1100 Wayne Avenue, Suite 1100, Silver Spring MD 20910 USA

ANSI (American National Standards Institute)

<<http://www.ansi.org>> accessed 15 May 2003.

ANSI administers and coordinates the U.S. standardisation system. Address: Customer Service, American National Standards Institute, 25 West 43rd Street, New York, NY 10036.

Artlab Australia, <<http://www.artlab.sa.gov.au/>>, accessed 3 May 2003.

(Artlab provides a range of conservation and preservation information and services.)

Address: Artlab Australia, 70 Kintore Avenue, Adelaide South Australia 5000, Australia.

BSI Group (British Standards Institution), <<http://www.bsi-global.com>>, accessed 13 May 2003.

The source of information and supply of British microfilming standards.

BSI Group 389 Chiswick High Road, London, W4 4AL, UK.

CLIR (Council on Library and Information Resources),

<<http://www.clir.org/>>, accessed 3 May 2003.

Address: 1755 Massachusetts Avenue, NW, Suite 500 Washington DC 20036, USA

COOL (Conservation Online), <<http://palimpsest.stanford.edu/>>, accessed 14 May 2003.

Hosted by Stanford University, USA, this is a comprehensive source for online information for preservation in libraries and archives.

ECPA (European Commission on Preservation and Access),

<<http://www.knaw.nl/ecpa/expo.htm>>, accessed 3 May 2003.

Hosts GRIP – which is a Gateway for Resources and Information on Preservation.

Address: Royal Netherlands Academy of Arts and Sciences, Kloveniersburgwal 29, P.O. Box 19121 NL-1000 GC Amsterdam, The Netherlands.

EXTOXNET (Extension Technology Network),

<<http://ace.orst.edu/>>, accessed 16 May 2003. Provides

information about pesticides for non-experts.

G.G. Baker and Associates, <<http://www.ggbaker.com/>>, accessed 15 May 2003.

This organisation provides detailed advice about micrographic systems. The web site includes links to suppliers and also provides background information about areas of microfilming from jacketing to linking with electronic document management systems.

Address: Saffron Hill, Chedworth, Glos. GL54 4AL UK.

IFLA (International Federation of Library Associations and Institutions) Preservation and Conservation (PAC) Core Programme, <<http://www.ifla.org/VII/4/admin/general.htm#1>>, accessed 15 May 2003.

IFLA-PAC Bibliotheque Nationale de France, Address: 2, rue Vivienne, 75084 Paris Cedex 02, France.

- See also *Principles for the care and handling of library material*, <<http://www.ifla.org/VII/4/news/pchlm.pdf>>, accessed 15 May 2003.

- A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VII/4/pac.htm#4>>, accessed 15 May 2003.

- The IFLA-PAC Centre at the National Library of Australia maintains a *Documentary Heritage Preservation Register*. This provides information about preservation projects in the Southeast Asian and Pacific regions such as microfilming, training, basic conservation and collection surveys, <<http://www.nla.gov.au/dhpr/>>, accessed 15 May 2003.

IPI (Image Permanence Institute)

<<http://www.rit.edu/~661www1/>>, accessed 15 May 2003. The IPI is a university-based research laboratory devoted to image preservation.

Address: Rochester Institute of Technology, 70 Lomb Memorial Drive Rochester NY 14623-5064, USA.

ISO (International Organisation for Standardisation),

<<http://www.iso.ch/>>, accessed 15 May 2003.

Address: ISO Central Secretariat PO Box 56 CH-1211 GENÈVE Switzerland.

Library Preservation and Conservation Tutorial – Southeast Asia.

Designed for librarians and conservators in Southeast Asia, it has a range of information on preservation, including microfilming, <<http://www.librarypreservation.org/>>, accessed 15 May 2003.

The Microfilm Shop, <<http://www.microfilm.com/>>, accessed 15 May 2003.

Provides product information, news and views with a focus on business applications.

MICROLINK-L is an email discussion list on preservation microfilming jointly owned by the National Library of Australia and the State Library of South Australia,

<http://www.nla.gov.au/nla/listserv/microlink_l.html>, accessed 15 May 2003.

Museums Australia, <<http://amol.org.au/>>, accessed 15 May 2003.

Address: PO Box K36 Haymarket NSW 1238.

(The resource *ReCollections* is also available online from the Museums Australia website, <<http://amol.org.au/reollections/>>, accessed 15 May 2003.)

National Library of Australia <<http://www.nla.gov.au/>>, accessed 15 May 2003.

Address: Canberra, ACT 2600, Australia

National Library of Australia. *Policy on Preservation Copying of Collection Materials*, <<http://www.nla.gov.au/policy/micro.html>>, accessed 15 May 2003.

National Library of Australia. Anica – Australian Network for Information on Cellulose Acetate,

<<http://www.nla.gov.au/anica/index.html>>, accessed 15 May 2003.

See also MICROLINK-L

<http://www.nla.gov.au/nla/listserv/microlink_l.html>, accessed 15 May 2003, and IFLA-PAC Documentary Heritage Preservation Register <<http://www.nla.gov.au/dhpr/>> accessed 15 May 2003.

The National Preservation Office (UK).

Address: British Library, 96 Euston Road London, NW1 2DB, UK

<<http://www.bl.uk/services/preservation/>>, accessed 15 May 2003.

NEDCC (North East Document Conservation Center),

<<http://www.nedcc.org/>>, accessed 15 May 2003. A U.S. site with a list of other internet resources about preservation. A number of their publications are available online.

NSSN: a National Resource for Global

Standards, <<http://www.nssn.org>>, accessed 15 May 2003.

Provides a fee-based information service which includes international standards and technical data. Address: Customer Service, American National Standards Institute, 25 West 43rd Street, New York, NY 10036.

PAMBU (Pacific Manuscripts Bureau),

<<http://rspas.anu.edu.au/pambu/>>, accessed 15 May 2003. Based in the Research School of Pacific and Asian Studies, Australian National University, the aim of the Pacific Manuscripts Bureau is to locate and preserve archives, manuscripts and other unpublished or semi-published material through microfilm.

Address: PAMBU, Research School of Pacific and Asian Studies, Australian National University, Canberra, ACT, 0200, Australia.

Preservation Resources is a division of OCLC. (Online Computer Library Center Inc.),

<<http://www.oclc.org/oclc/presres/microfilm.htm>>, accessed 15 May 2003.

It offers services such as preservation microfilming to libraries, including duplicating, scanning and polysulfide treatment.

RLG DigiNews is a newsletter conceived by the members of the Research Libraries Group's PRESERV community. Funded in part by the Council on Library and Information Resources (CLIR) from 1998-2000, it is available internationally via the RLG PRESERV web site, <<http://www.rlg.org/preserv/>>, accessed 15 May 2003. Address: Research Libraries Group 1200 Villa Street Mountain View, CA 94041-1100 USA.

SEACAP (Southeast Asian Consortium for Access and Preservation), <<http://www.seacap.chiangmai.ac.th>>, accessed 14 May 2003.

The aim of SEACAP is to encourage and support collaboration amongst libraries, archives and other institutions and interested individuals in order to preserve and provide access to the published and documentary heritage of the region.

Smith, Wendy *Sources of online information about caring for collections*, <<http://www.alia.org.au/~wsmith/>>, accessed 4 May 2003.

Spring Singapore, <<http://www.psb.gov.sg>>, accessed 15 May 2003.

The source for information and supply of Singapore Codes of Practice relating to microfilming.

PSB Building, 2 Bukit Merah Central, Singapore 159835.

Standards Australia, <<http://www.standards.com.au>>, accessed 14 May 2003. Address: GPO Box 5420 Sydney NSW 2001, Australia.

UNESCO *Memory of the World Programme*,

<<http://whc.unesco.org/nwhc/pages/home/pages/homepage.htm>>, accessed 15 May 2003.

Topics 1 & 2

The nature of microfilm and storage of microforms

Performance criteria

You will have achieved the performance criteria for this topic when you can:

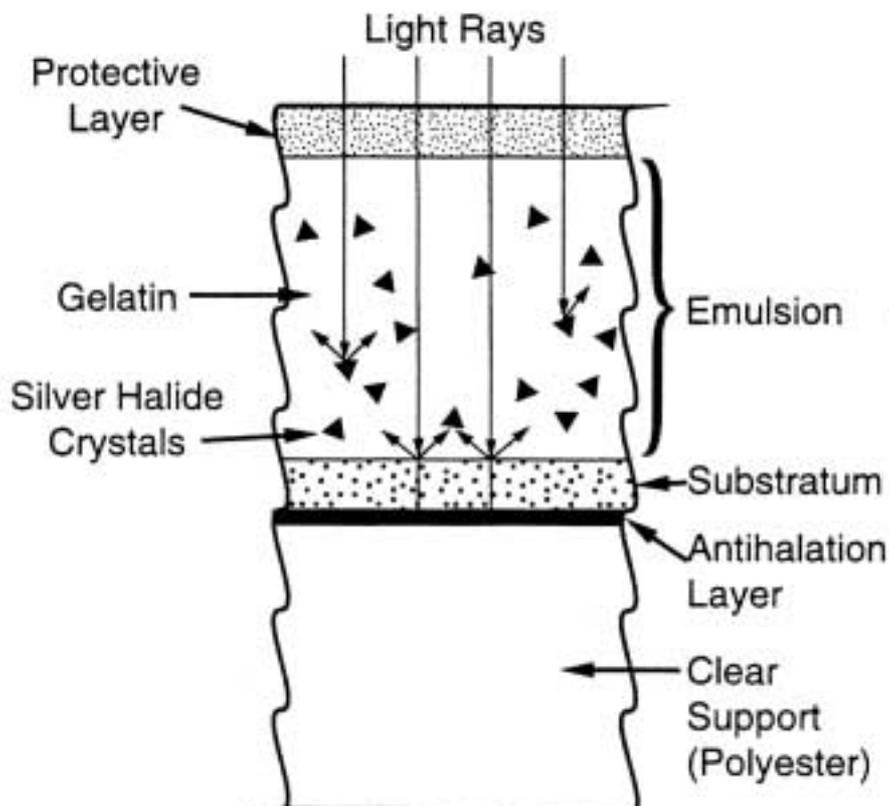
- I identify best practice storage conditions for microforms
- I identify best practice in storage enclosures
- I label microforms to ensure that they are arranged in a logical order
- I file microforms in a logical order.

The nature of microfilm

All the careful work that goes into producing preservation-standard microfilm can be swiftly undone if the film is not stored correctly. This module deals with the long-term preservation and storage of microforms, beginning with the nature of the film itself.

Silver halide microfilm

Silver halide film consists of a film base, an emulsion and a protective layer and other support layers. A cross section of silver halide microfilm is shown in the diagram below.



Cross section of silver halide microfilm

Reproduced by permission from Preservation Microfilming: A Guide for Librarians and Archivists, Second Edition edited by Lisa Fox and the Association of Research Libraries, © 1995 by the American Library Association

The *protective layer* is a clear coating that reduces scratching.

The *emulsion* is a light sensitive coating that captures the image. It is made of silver halide particles suspended in gelatin. Other layers provide a backing and also bind the emulsion to the *base*. The base is the film support.

Earlier modules have highlighted that the film base must be **polyester** for preservation microfilming. Cellulose acetate bases have a much shorter lifespan and ultimately deteriorate, giving rise to the 'vinegar syndrome'.

When light strikes the emulsion, the silver halide crystals are converted to metallic silver. At this point the image forms. This image is *latent* (invisible).

Conventional processing produces a negative image with clear print on a black background. The process is called *image reversing*—dark areas on the original become light on the silver halide copy.

This is because the parts of the film emulsion that have been exposed to light turn to *black metallic silver grains*.

The areas *not* exposed to light (e.g. the print on a page) remain as clear film.

Diazo film

Diazo film, used for service copies, has an emulsion of diazonium salts.

These salts are dispersed when they are exposed to UV (ultraviolet) light transmitted through a master microform. The salts migrate to areas that correspond to the light areas in the master. Ammonia fumes are generally used to develop the latent image. The ammonia combines with the diazonium salts to produce deeply coloured dyes (usually blue or black).

Diazo film is *image maintaining*—dark areas on the master are also dark on the diazo copy.

Vesicular film

Also intended for service copies, vesicular film similarly uses diazonium salts as the light-sensitive element. The salts are suspended in a *polymer*.

To expose the film, UV light is transmitted through the master film. Nitrogen gas is formed and becomes trapped in the polymer where the light strikes. Heat is then applied to soften the polymer. The nitrogen expands to form tiny bubbles in exposed areas. When the bubbles cool they become stable and rigid. They scatter the light to create the visible image.

Vesicular film is *image reversing*.

Colour microfilm

The colour film typically used in preservation microfilming programs is a silver dye bleach film. The exposed film has a dye image.

According to Lisa Fox, Ilfachrome colour microfilm has been tested by the Image Permanence Institute (IPI) and appears to be capable of lasting several hundred years (Fox 1996, p.9, p.173). However, at the current stage of development, the dyes still fade and change colour over time.

To keep colour film from deteriorating, the masters should be stored in the dark at low temperature and humidity.

 See the colour film standards listed in the **Resources** list at the beginning of this module.

Black and white film currently remains the most widely-used option for preservation work.

Quality of microfilm stock and life expectancy

The manufacture of the various types of film stock is governed by national and international standards to ensure the highest quality of the film itself.

The life expectancy (LE) of various types of film stock—together with factors which can cause deterioration—are summarised in the table below. The LE ratings are based on information provided in *Preservation Microfilming* (Fox 1996, pp. 172-174) and the Australian and New Zealand *Guidelines* (National Library of Australia 1998, p. 4).

It is recommended that different film types are stored separately from one another i.e. silver halide film should be stored separately from diazo and vesicular films. (This is discussed further in the ANSI/AIIM MS 23 - 1998 Standard, section 15.6 'Intermixing film types'.)

Comparison of film stock—life expectancy and deterioration factors

| Film stock | Life expectancy (LE) | Comment on LE | Deterioration factors | Comment on deterioration factors |
|---------------------------------|--|---|---|---|
| silver halide on polyester base | LE of up to 500 years if it is: <ul style="list-style-type: none"> • manufactured and processed to international quality standards • housed in preservation-standard containers • stored under optimum conditions of temperature and humidity | the only film stock suitable for preservation of masters | <ul style="list-style-type: none"> • human—poor handling • poorly maintained equipment | <ul style="list-style-type: none"> • gelatin layer scratches easily • should not apply to master copy if handled and stored correctly |
| | | | <ul style="list-style-type: none"> • mould | <ul style="list-style-type: none"> • can occur at high temperature and humidity |
| | | | <ul style="list-style-type: none"> • redox blemishes (reddish or orange coloured spots or rings—see below) | <ul style="list-style-type: none"> • caused by combination of exposure to high temperature, high humidity and atmospheric pollutants |
| diazo | LE of at least several decades—possibly up to 100 years, depending upon storage conditions | <ul style="list-style-type: none"> • suitable for service copies • dyes may fade, clear parts of film may stain over time | water and humidity | <ul style="list-style-type: none"> • more sensitive to damage by water and humidity than other stock |
| | | | mould | <ul style="list-style-type: none"> • can occur at high temperature and humidity |
| | | | light | <ul style="list-style-type: none"> • can cause image to deteriorate if exposed to light for more than 3 hours in reader |
| vesicular | LE of at least several decades - possibly up to 100 years, depending upon storage conditions | <ul style="list-style-type: none"> • suitable for service copies • tough and durable | pressure | <ul style="list-style-type: none"> • bubbles can collapse due to pressure |
| | | | high temperature | <ul style="list-style-type: none"> • continuous high temperature can deform bubbles |

Long-term storage and polysulfide treatment

Silver halide film on a polyester base has a life expectancy of 500 years if it is manufactured, processed and stored according to international standards. However, while it is possible to control manufacturing and processing, it can be difficult to guarantee consistent storage conditions throughout the 500 year life of the camera master.

Redox blemishes

Redox blemishes are a typical long-term storage problem. These blemishes are reddish or orange-coloured spots or rings in microfilm that are caused by a combination of exposure to high temperature, high humidity and atmospheric pollutants. Pollutants that are particularly damaging include peroxides, sulfur dioxide, ozone, and nitrogen dioxide. These are present in the air in most large cities. They may also be released by inappropriate storage enclosures (e.g. using rubber bands to restrain film).

Polysulfide treatment

One way of preventing redox blemishes is by polysulfide treatment. This is a process in which silver compounds are used to convert the silver in silver gelatin film into silver sulfide. The silver sulfide resists oxidation caused by high temperature, high humidity and atmospheric pollutants. Polysulfide treatment may be applied to the master during film processing or afterwards, as an additional step. The Image Permanence Institute (IPI) has conducted much of the research into the cause and treatment of redox blemishes.

 The address and web site of the IPI are listed under **Resources** at the beginning of this module.

Two polysulfiding brands currently available are Silverlock ' and Kodak Brown Toner. Silverlock was originally developed by the IPI. Polysulfide treatment is now available from a number of specialist microfilming organisations such as, **Preservation Resources**.

 See **Resources** list.

The standard ANSI/NAPM IT9.15 1993 tests whether the silver conversion has been successful.

 Further details are available in the **Resources** list at the beginning of this module under Standards.

 Further information on the polysulfide treatment is provided in the article by James Reilly (Reilly 1994).

Lisa Fox asks the question:

*Who should use polysulfiding? The response is, Any institution that is not 100 per cent certain that its master negative will be totally protected **for the next 500 years** from the storage conditions that can result in silver deterioration.*

(Fox 1996, p.200).

■ Activity 9.1

Deterioration in microfilm and causes

What kinds of deterioration have you observed in microfilm or microfiche MASTER copies which you have used or handled, and what factors caused the deterioration?

Give examples below. (for example scratching, water damage, redox blemishes, mould, tearing, faded images)

You may need to carefully check through some microform collections to help you answer this. Ask your colleagues for their suggestions also.

a) Kinds of deterioration in microfilm or fiche masters

b) Factors that caused the deterioration

Best practice in storage conditions

Proper storage ensures that microform masters—and the knowledge that they contain—is preserved for future generations.

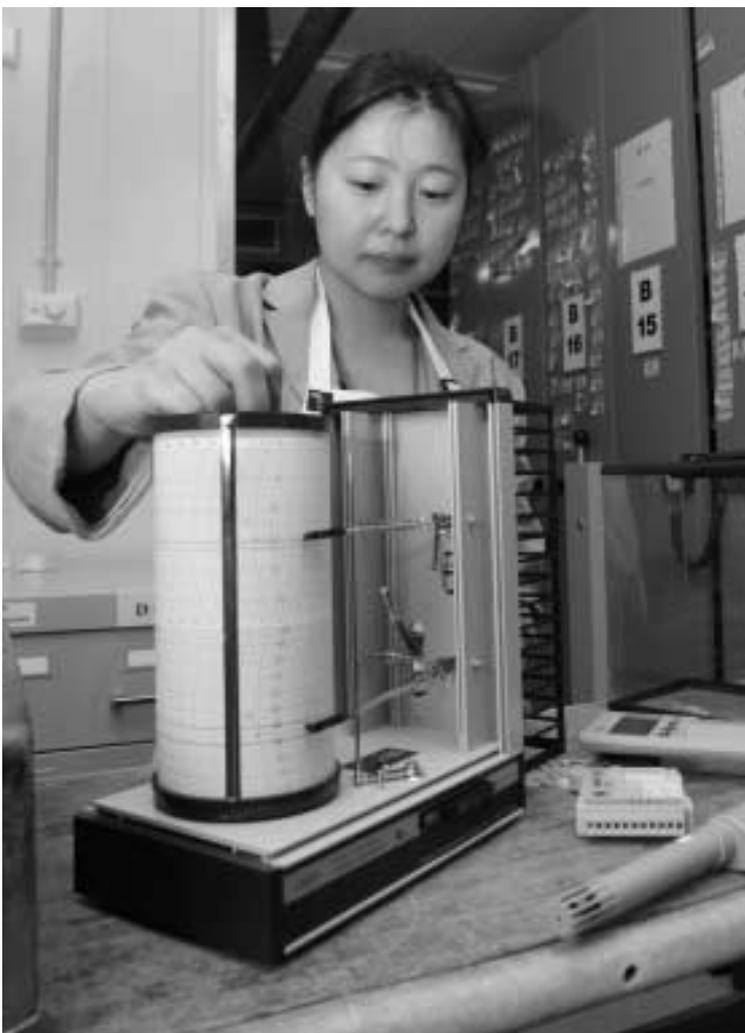
The first generation master films should ideally be stored under strictly controlled conditions. These conditions are specified by a number of standards such as ANSI/NAPM IT9.11 1993 and AS3674.

Lowering storage temperature, relative humidity, or both, increases the life expectancy of master films. A lower storage temperature can compensate for a higher relative humidity level to provide the same life expectancy.

The best environmental option is a *cold storage vault*.

Ideally, films are stored on shelves *off the floor* to help increase air circulation and reduce the risk of damage from flooding. Films stored in cold storage conditions need a period of acclimatisation or adjustment before they are taken into or out of the vault to minimise the stress of sudden environmental change and condensation.

In some countries, the national library coordinates cold storage and/or special storage facilities for master microforms. Check with your national library, or another major library in the region, or the IFLA regional centre for further information. These organisations will also have special requirements for separately storing polyester and acetate films. (See below under, **Best practice in storing problem film bases.**)



The National Library of Australia's cold storage area for microfilms

The table below gives a summary of best practice environmental storage conditions. The right hand column gives the best possible options.

The recommended levels have been taken from *Preservation Microfilming* (Fox 1996, p. 217) and the Australian and New Zealand *Guidelines* (National Library of Australia 1998, p. 69).

Best practice in environmental storage for microforms

| Feature | Comment | Best option |
|---------------------|--|---|
| maximum temperature | 21°C 15°C 10°C ↓ ↓ ↓ | <ul style="list-style-type: none"> • cold storage vault • a lower temperature ensures longer LE |
| relative humidity | ↑ ↑ ↑ 20–30% 20–40% 20–50% | <ul style="list-style-type: none"> • a stable relative humidity of about 35% |
| | <ul style="list-style-type: none"> • should not fluctuate more than ± 5% in a 24 hour period | |
| air | <ul style="list-style-type: none"> • air conditioning to keep temperature and relative humidity at recommended levels • air filters to remove dust and pollution | |

Ideally, master colour film should be stored at a temperature no higher than 3°C.

Storage of second generation printing masters

If possible, second generation printing masters should be stored under similar environmental conditions, but in a separate location.

This reduces the risk of losing the valuable information in the microfilms in the event of a disaster, such as a fire or flood.

The reality

As highlighted in the module, **Preservation of Materials**, in many countries and climates it can be extremely difficult to come close to the levels in the table above. The option of air conditioning and cold storage can be far too costly.

In arid zones, fluctuations of temperature between night and day may be severe. Harsh winds can blow large quantities of dust and sand into a building. In tropical zones relative humidity will be very high, especially during the monsoon season.

In tropical and arid climates it is especially important to follow Ross Harvey's principles of LOW and SLOW:

- keep the temperatures as low as possible
- slow the rate of change in temperature and relative humidity.

(Harvey 1993)

Topics 1, 2 and 3 of the module, **Preservation of Materials** highlight that traditional building methods and a well-maintained building can help to provide a stable environment.

Make sure that roof gutters are cleaned out, cracks and holes are repaired in walls and ceilings, and leaky roofs are checked. These steps will improve the stability of the humidity and temperature inside. Make sure the air can circulate, for example, with fans.

The most stable area of a non-air conditioned building is an internal room on the ground floor. This is because it has other layers to protect it against climatic changes. Basements can also provide a cool temperature—but they must be checked first for dampness.

Always store films off the ground on shelves (or even on blocks or pallets) to help reduce the risk of damage by flooding.

The experimental system of *hermetic sealing* (discussed under, **Best practice in storage enclosures**) may have the potential for storing microfilms relatively cheaply in the long term.

■ Activity 9.2

Environmental storage of microfilm masters

a) Describe the environment in which master microforms are currently stored in a collection that you have used (e.g. temperature and relative humidity).

b) How does the environment compare to the best practice principles in the table above?

c) Can you make any simple suggestions for improvements? (e.g. storing the films off the floor, improving air circulation)

d) Are you, or any of your colleagues, aware of a special storage facility for master microforms in the region? (If yes, give details.)

e) If no, whom could you ask to find out information about special storage facilities for storing master microforms? (list contacts and organisations)

Best practice in storing problem film bases

Microforms on cellulose acetate/triacetate (and even more so on cellulose nitrate) bases will deteriorate much more rapidly than film on a polyester base. Acetate films should be copied onto a polyester base film for long-term storage.

Cellulose acetate

As described in earlier modules, cellulose acetate and triacetate film generally deteriorates as a result of the 'vinegar syndrome' giving off a vinegar smell. The base of acetate film becomes brittle and shrinks, causing the base to buckle from the emulsion.



Surface of acetate microfilm damaged due to 'vinegar syndrome'

Acetate base film should never be stored with polyester base preservation masters. It should be isolated (stored separately) from all other films until it can be duplicated onto a polyester base. While awaiting duplication, the acetate film should be stored in an environment that is as cold as possible. (The Australian and New Zealand *Guidelines* recommends an ideal temperature of 8°C and 30-35% relative humidity, but again, this will depend upon available facilities.)

Acetate film can be identified by using a polarising filter. A simple test to identify acetate is described in the module, **Microform Quality Control Inspection**. A polarising filter for testing acetate film is also been supplied with that module.

As well as checking visually, the extent of deterioration of acetate film can be checked by using special test strips called **AD strips** that are available from the Image Permanence Institute (IPI). This is discussed further in Topics 3 and 4.

Cellulose nitrate

Cellulose nitrate film can be extremely unstable and should be handled with great care. It has not been manufactured since about 1951.

If your organisation has any cellulose nitrate film, it should be isolated (stored separately) from all other films.

There are special tests that can identify cellulose nitrate film. One of the safest is a float test.

If you suspect that any film may be on a cellulose nitrate base, check with a professional conservator, your national library or the IFLA regional office for further advice.

■ Activity 9.3

Storage of acetate films

Case study

Your organisation has a number of microfilm masters that need to be stored. Some of them are on an acetate base and some are on a polyester base.

How would you store them in the best possible way within the available resources?

Best practice in storage enclosures

Enclosures

All master microfilms should be stored in preservation-standard storage enclosures (e.g. boxes, envelopes/sleeves). Ideally, second generation microfilms should also be stored within the same standard of enclosures.

Hermetic sealing

A system for storing master negative microfilms in hermetically-sealed pouches has been used in Indonesia for some years. This system is relatively cheap. (Sudarsono 2000, p.81). The film is stored in aluminium foil pouches. These consist of:

- an outside laminate of polyester on the outside to help resist deterioration through handling
- a middle part of aluminium foil which serves as a barrier to foreign substances and gases
- an inside layer of *polyethylene* to aid in the sealing process.

Nitrogen is then injected to replace the air before the pouch is sealed.

It should be emphasised that hermetic sealing is still regarded as experimental. The system cannot yet be recommended until further research takes place. Further research is currently being coordinated through SEACAP (Southeast Asian Consortium for Access and Preservation) which is testing the system in a number of Southeast Asian libraries and archives.



Further details are available from the SEACAP website.

The following table summarises some best practice features of enclosures and related materials. They mirror the key features of microform packaging which are highlighted in Topic 1 of the module, **Microform Quality Control Inspection**.

| Enclosure feature | Best practice |
|--|--|
| boxes or pouches | <ul style="list-style-type: none"> • should be acid-free and lignin-free • plastic materials must be polyester, tested polypropylene or polyethylene • enclosures made of metals, cellulose acetate or papers with waxes or other ingredients that may transfer to the microfilm are unacceptable |
| envelopes or sleeves (for fiche) | <ul style="list-style-type: none"> • should be acid-free, lignin-free or polypropylene |
| Related materials | Best practice |
| spools | <ul style="list-style-type: none"> • only preservation-standard, inert plastic spools should be used |
| restrainers (fasteners used to control or prevent roll film from unwinding) | <ul style="list-style-type: none"> • should be acid-free and lignin-free • rubber bands and paper clips should not be used as these will damage the microfilm |
| labels | <ul style="list-style-type: none"> • should follow the specifications of the organisation that has ordered the microfilming, e.g. listing reel titles, dates • labels with unstable adhesives and inks known to bleed must not be used on masters or printing masters |

■ Activity 9.4

Storage enclosures

a) What kind of storage boxes does your organisation use for storing microfilm masters?

b) Can you suggest any improvements to the storage boxes and related materials that are used by your organisation?

Arrangement and labels

While the arrangement and labelling of microforms will vary between organisations, some basic principles of best practice can be applied.



Microfilm boxes with each generation of film clearly labelled

© Photograph courtesy of State Library of South Australia

| Features | Best practice |
|---------------------------|--|
| order | <ul style="list-style-type: none">• should be arranged in a logical order that does not cause confusion and does not need a lot of resources to maintain |
| types of microforms | <ul style="list-style-type: none">• diazo, vesicular and silver halide films should be stored in different locations• this is critical in the case of silver halide preservation master film, which should never be stored with other types of film |
| generations of microforms | <ul style="list-style-type: none">• should be stored in <i>three separate locations</i>• this is good risk management practice in case of disaster• the master and printing master should ideally be stored according to the environmental conditions described earlier (e.g. the master is stored in cold storage) |
| labels | <ul style="list-style-type: none">• should list <i>title, date range and microform number</i> (if used) e.g. <i>Straits Times</i> (title) 1992-1993 (date range) MF 120 (microform number)• labels should clearly distinguish between first generation master, printing master and use copy e.g. Master, Duplicate Negative, Service Copy• labels with unstable adhesives and inks known to 'bleed through' must <i>not</i> be used on masters or printing masters. |

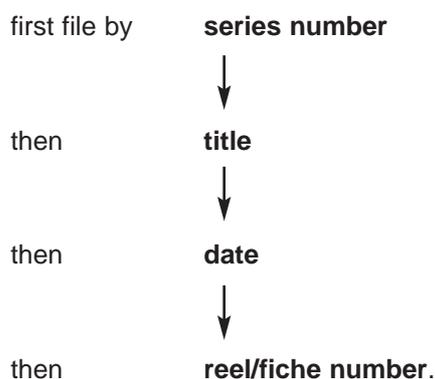
Filing microforms

Microfilm

Microfilm will normally be filed in logical order, by:

- number e.g. series number
- title or heading.

Most organisations will have a preferred sequence of filing. for example:





Microfilm arranged in order

© Photograph courtesy of State Library of South Australia

Microfiche

Filing of fiche will follow the same principles. In addition, some use copies of fiche may have different colour-striped headings for different series. These can be easily identified so that they can be filed together.



Microfiche arranged in order

Activity 9.5

Microform labels

Create labels for the following microforms and file them, in order, in the following table. Use the best practice suggestions from the table under, **Arrangement and labels**.

- ▮ Tropical Observer Jan – June 2000 Series Number MF 353 Reel 1-master
- ▮ Polynesian News 1953 Series Number MF 461 fiche 1/2-master
- ▮ Tropical Observer Jan – June 2000 Series Number MF 353 Reel 1-second generation printing master
- ▮ Polynesian News 1953 Series Number MF 461 fiche 1/2-second generation printing master
- ▮ Fiche 2/2-master Polynesian News 1953 Series Number MF 461
- ▮ Papua Times 1974-1975 Series Number MF 354 Reel 2 -second generation printing master
- ▮ China Week 1954-1956 Series Number MF 313 Reel 1-master
- ▮ Series Number MF 354 Papua Times 1974-1975 Reel 1-master
- ▮ Reel 2-master Tropical Observer July-Dec 2000 Series Number MF 353
- ▮ Fiche 2/2-second generation printing master Polynesian News 1953 Series Number MF 461
- ▮ China Week 1954-1956 Series Number MF 313 Reel 1-second generation printing master
- ▮ Papua Times 1974-1975 Series Number MF 354 Reel 2 -master
- ▮ Series Number MF 354 Papua Times 1974-1975 Reel 1-second generation printing master
- ▮ Reel 2-second generation printing master Tropical Observer July-Dec 2000 Series Number MF 353

Create labels and file the items in order in the boxes below

| | | | | | |
|--------------------------|---------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| FILM MASTERS | Series Number | Series Number | Series Number | Series Number | Series Number |
| | Title | Title | Title | Title | Title |
| | Date | Date | Date | Date | Date |
| | Generation e.g. master | Generation | Generation | Generation | Generation |
| | Reel or fiche number | Reel or fiche number | Reel or fiche number | Reel or fiche number | Reel or fiche number |
| PRINTING MASTERS FILM | Series Number | Series Number | Series Number | Series Number | Series Number |
| | Title | Title | Title | Title | Title |
| | Date | Date | Date | Date | Date |
| | Generation e.g. master | Generation | Generation | Generation | Generation |
| | Reel or fiche number | Reel or fiche number | Reel or fiche number | Reel or fiche number | Reel or fiche number |

| FICHE MASTERS | Series Number | Series Number | PRINTING MASTERS FICHE | Series Number | Series Number |
|------------------|-------------------------|-------------------------|---------------------------|-------------------------|-------------------------|
| | Title | Title | | Title | Title |
| | Date | Date | | Date | Date |
| | Generation | Generation | | Generation | Generation |
| | Reel or fiche number | Reel or fiche number | | Reel or fiche number | Reel or fiche number |

Summary

- ❑ All the careful work that goes into producing preservation-standard microfilm can be swiftly undone if the film is not stored correctly.
- ❑ It is essential to understand the nature of microfilm and the composition of various film types, in order to understand the special storage requirements.
- ❑ Colour microfilm requires the most specialised storage facilities, including darkness, low temperature and humidity.
- ❑ Polysulfide treatment is a specialist treatment to prevent *redox blemishes* in microfilm. These blemishes can be caused by high levels of pollution.
- ❑ The best environmental storage option is a *cold storage vault*.
- ❑ In any storage arrangement, microfilms should be stored on shelves *off the floor* to help increase air circulation and reduce the risk of damage from flooding.
- ❑ In many countries, the option of air conditioning and cold storage is far too costly. In these cases, it is especially important to follow Ross Harvey's principles of LOW and SLOW:
 - keep the temperatures as low as possible
 - slow the rate of change in temperature and relative humidity.
- ❑ The most stable area of a non-air conditioned building is an internal room on the ground floor.
- ❑ Acetate base film should never be stored with polyester base preservation masters. Acetate film should be stored separately from all other films until it can be duplicated onto a polyester base.
- ❑ If your organisation has any cellulose nitrate film it should be treated with great caution. It should be isolated (stored separately) from all other films. If you suspect that any film may be on a cellulose nitrate base, check with a professional conservator, your national library or the IFLA regional office for further advice.
- ❑ All master microfilms should be stored in preservation-standard storage enclosures (e.g. boxes, envelopes/sleeves).
- ❑ Arrangement of stored microfilms should be logical, with the three generations stored separately from one another.
- ❑ The labels should clearly distinguish masters from second generation printing masters and from service (use) copies.
- ❑ Microforms will normally be filed in logical order, by:
 - number e.g. series number
 - title or heading.

Checklist

In order to test your understanding of this material, work through the checklist below.

If you can answer 'yes' to each question, and you have completed the activities for this topic, you are now ready for your lecturer or assessor to verify that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities**.

If you are in any doubt about any of the content, you should read through the material again, consult some of the references mentioned in the section entitled **Resources**, talk to your work colleagues or contact your lecturer or mentor.

I can:

- I identify best practice storage conditions for microforms
- I identify best practice in storage enclosures (e.g. boxes)
- I label microforms to ensure that they are arranged in a logical order
- I file microforms in a logical order.

▲ Submit

You are now ready to record in your **Log book** that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities** for this topic.

You can record these by marking off the boxes in the shaded columns with a ✓ **yes** or ✗ **no**.

You can then ask your lecturer or assessor to verify this information.

Topics 3 & 4

Management of existing microform collections, surveys and disaster recovery

Performance criteria

You will have achieved the performance criteria for this topic when you can:

- I use given criteria to survey microform collections
- I identify best practice strategies for disaster recovery of microforms.

After the microforms have been created and placed in storage, steps need to be taken to ensure that they are well looked after for the long term.

This section provides information about how to:

- I look after existing microform collections
- I assess the extent of deterioration in microform collections
- I respond to damage to a microform collection following a disaster.

Controlling use

In order to protect the master and printing masters from damage, it is important to put careful strategies into place to control their use. These strategies reduce the chances of the first and second generation microforms being used by mistake.

The following are some examples of strategies that control the use of first and second generation microforms. Some organisations use a combination of these strategies.

| Strategies controlling use of masters/ printing masters | Description |
|--|---|
| separate storage | <ul style="list-style-type: none">• storing all three generations in different locations |
| restricted access | <ul style="list-style-type: none">• restricting access to the masters and printing masters |
| clear labelling and signs | <ul style="list-style-type: none">• on boxes, envelopes and the shelves• labels should state the generation e.g. master or printing master• signs should state that these copies are not to be used for reading by the staff or other users |
| clear listing in catalogues and finding aids | <ul style="list-style-type: none">• listing which generation is available for use and where it is stored |
| educating staff | teaching staff about: <ul style="list-style-type: none">• the different generations of microforms• the role of each generation• the damage that unintended handling can cause (e.g. fingerprints, scratching) |

● Reflect 9A

Damage to microform collections

Are you aware of any examples where damage has been caused to the masters or printing masters through accidental handling by staff or other users?

Ask your colleagues to comment on their experiences.

Can you think of strategies that could control the use of *first* and *second* generation microforms in your organisation—and so reduce the risk of accidental damage?

Assessing deterioration in existing microform collections

An important part of managing microform collections is assessing the extent of deterioration of items. Many of these existing microforms may, or may not, have been produced to preservation standards in the past.

As outlined in Topics 1, 2 and 3 of the module, **Preservation of Materials**, one of the common ways of assessing the extent of damage is to conduct a *collection survey*. The collection survey uses sampling techniques and certain criteria to give a snapshot of the collection at the time of the survey.

The size of the sample depends on the size of the microform collection and whether or not it has been created to a variety of standards over time. A minimum sampling rate used in the National Library of Australia is one reel in every ten, and at least one reel from every title. Alternatively, the ANSI/AIIM standard *Inspection of Stored Silver Gelatin Microforms for Evidence of Deterioration* (ANSI/AIIM MS 45-1990) recommends a minimum sample rate of one reel in 1000, or of 100 samples (rolls, fiche etc.).

Some examples of the criteria for surveying microform collections are given in the form below, which has been reproduced from Appendix 15 of the *Guidelines for Preservation Microfilming in Australia and New Zealand* (National Library of Australia 1998, p.118).

Many of the quality inspection criteria from Topic 1 of the module, **Microform Quality Control Inspection** could also be included in the survey. The section on film condition includes a visual and 'smell' test for the **vinegar syndrome** in acetate film. More precise measurements of the extent of deterioration in acetate film can be made with **AD strips**, which are available from the Image Permanence Institute (IPI).

A proper collection survey takes time to plan and carry out. The first task is to think about what you want to find out and include these points in the survey questions.



AD strips for measuring deterioration in acetate film

© Photograph courtesy of State Library of South Australia

Following up the survey

When the survey is completed it is important that the information is used in managing the collection. From the sample evaluated it is possible to make a prediction about the state of microfilms filmed at a similar time. Copies should be made of deteriorating masters—especially those which are deteriorating due to the vinegar syndrome. Similarly, copies should be made of any other damaged or missing reels or missing generations.

Ongoing inspections

Surveys should not be a once-only affair. They should be conducted every few years to assess the rate of deterioration as part of ongoing collection management.

■ Activity 9.6

Microform collection survey



For this activity you will need access to a collection of *microforms of different ages* for assessing.

A polarising filter for checking the film base was supplied with the module, **Microform Quality Control Inspection**.

Cotton gloves were supplied with the module, **Processing and Duplicating Microforms**.

Check first with your supervisor, the librarian or curator to make arrangements to survey the microform collection at a mutually agreeable time.

Your task is to carry out a mini collection survey of 5 items from a microform collection to which you have access.

Include in your samples microforms of *different ages* and *types* from different parts of the collection.

Remember to handle the microforms items carefully with cotton gloves.

Use the polarising filter to check for the film base.

Complete the details on the survey forms.

Sample survey form for microform collections

NEWSPAPER TITLE CALL NO.....
 REEL NO PUBLISHER.....
 DATE FILMED FILMED BY.....
 COMMISSIONED BY DATE ACQUIRED.....
 FILM BASE POLARITY.....
 EMULSION TYPE.....

PHYSICAL CONDITION

EXTENT OF DEFECT

| DEFECT | FEW | 1/4 | 1/2 | 3/4 | WHOLE |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| STAINS | <input type="checkbox"/> |
| DISCOLOURATION | <input type="checkbox"/> |
| SCRATCH | <input type="checkbox"/> |
| MOULD | <input type="checkbox"/> |
| MICROSCOPIC | | | | | |
| BLEMISHES | <input type="checkbox"/> |
| FOREIGN MATTER ON FILM | <input type="checkbox"/> |
| FINGER PRINTS | <input type="checkbox"/> |

FILM CONDITION

SMELL
 LIFTING EMULSION
 CURLING/SPLITTING/
 BRITTLENESS
 FILM STICKING TOGETHER
 NUMBER OF SPLICES

TYPE OF SPLICES.....
 COMMENTS.....

| | TYPE | CONDITION |
|------------|-------------|-----------|
| BOX | CARDBOARD | GOOD |
| | PLASTIC | FAIR |
| | METAL | POOR |
| REEL | PLASTIC | GOOD |
| | | FAIR |
| | METAL | POOR |
| RESTRAINER | RUBBER BAND | GOOD |
| | CARDBOARD | FAIR |
| | TAPE | |
| | NOTHING | POOR |

OVERALL ASSESSMENT

1 2 3 4 5

further sampling required

INSPECTED BY _____

DATE _____

Sample survey of microform collections

© Reproduced from National Library Australia, 1998. Guidelines for Preservation Microfilming in Australia and New Zealand. Appendix 15

Sample survey form for microform collections

NEWSPAPER TITLE CALL NO.....
 REEL NO PUBLISHER.....
 DATE FILMED FILMED BY.....
 COMMISSIONED BY DATE ACQUIRED.....
 FILM BASE POLARITY.....
 EMULSION TYPE.....

PHYSICAL CONDITION

EXTENT OF DEFECT

| DEFECT | FEW | 1/4 | 1/2 | 3/4 | WHOLE |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| STAINS | <input type="checkbox"/> |
| DISCOLOURATION | <input type="checkbox"/> |
| SCRATCH | <input type="checkbox"/> |
| MOULD | <input type="checkbox"/> |
| MICROSCOPIC | | | | | |
| BLEMISHES | <input type="checkbox"/> |
| FOREIGN MATTER ON FILM | <input type="checkbox"/> |
| FINGER PRINTS | <input type="checkbox"/> |

FILM CONDITION

SMELL
 LIFTING EMULSION
 CURLING/SPLITTING/
 BRITTLENESS
 FILM STICKING TOGETHER
 NUMBER OF SPLICES

| | TYPE | CONDITION |
|------------|-------------|-----------|
| BOX | CARDBOARD | GOOD |
| | PLASTIC | FAIR |
| | METAL | POOR |
| REEL | PLASTIC | GOOD |
| | | FAIR |
| | METAL | POOR |
| RESTRAINER | RUBBER BAND | GOOD |
| | CARDBOARD | FAIR |
| | TAPE | |
| | NOTHING | POOR |

TYPE OF SPLICES.....
 COMMENTS.....

OVERALL ASSESSMENT

1 2 3 4 5

further sampling required
 INSPECTED BY _____
 DATE _____

Sample survey form for microform collections

NEWSPAPER TITLE CALL NO.....
 REEL NO PUBLISHER.....
 DATE FILMED FILMED BY.....
 COMMISSIONED BY DATE ACQUIRED.....
 FILM BASE POLARITY.....
 EMULSION TYPE.....

PHYSICAL CONDITION

EXTENT OF DEFECT

| DEFECT | FEW | 1/4 | 1/2 | 3/4 | WHOLE |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| STAINS | <input type="checkbox"/> |
| DISCOLOURATION | <input type="checkbox"/> |
| SCRATCH | <input type="checkbox"/> |
| MOULD | <input type="checkbox"/> |
| MICROSCOPIC | | | | | |
| BLEMISHES | <input type="checkbox"/> |
| FOREIGN MATTER ON FILM | <input type="checkbox"/> |
| FINGER PRINTS | <input type="checkbox"/> |

FILM CONDITION

SMELL
 LIFTING EMULSION
 CURLING/SPLITTING/
 BRITTLENESS
 FILM STICKING TOGETHER
 NUMBER OF SPLICES
 TYPE OF SPLICES.....
 COMMENTS.....

| | TYPE | CONDITION |
|------------|-------------|-----------|
| BOX | CARDBOARD | GOOD |
| | PLASTIC | FAIR |
| | METAL | POOR |
| REEL | PLASTIC | GOOD |
| | | FAIR |
| | METAL | POOR |
| RESTRAINER | RUBBER BAND | GOOD |
| | CARDBOARD | FAIR |
| | TAPE | |
| | NOTHING | POOR |

OVERALL ASSESSMENT

1 2 3 4 5

further sampling required

INSPECTED BY _____

DATE _____

Sample survey form for microform collections

NEWSPAPER TITLE CALL NO.....
 REEL NO PUBLISHER.....
 DATE FILMED FILMED BY.....
 COMMISSIONED BY DATE ACQUIRED.....
 FILM BASE POLARITY.....
 EMULSION TYPE.....

PHYSICAL CONDITION

EXTENT OF DEFECT

| DEFECT | FEW | 1/4 | 1/2 | 3/4 | WHOLE |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| STAINS | <input type="checkbox"/> |
| DISCOLOURATION | <input type="checkbox"/> |
| SCRATCH | <input type="checkbox"/> |
| MOULD | <input type="checkbox"/> |
| MICROSCOPIC | | | | | |
| BLEMISHES | <input type="checkbox"/> |
| FOREIGN MATTER ON FILM | <input type="checkbox"/> |
| FINGER PRINTS | <input type="checkbox"/> |

FILM CONDITION

SMELL
 LIFTING EMULSION
 CURLING/SPLITTING/
 BRITTLENESS
 FILM STICKING TOGETHER
 NUMBER OF SPLICES

TYPE OF SPLICES.....
 COMMENTS.....

| | TYPE | CONDITION |
|------------|-------------|-----------|
| BOX | CARDBOARD | GOOD |
| | PLASTIC | FAIR |
| | METAL | POOR |
| REEL | PLASTIC | GOOD |
| | | FAIR |
| | METAL | POOR |
| RESTRAINER | RUBBER BAND | GOOD |
| | CARDBOARD | FAIR |
| | TAPE | |
| | NOTHING | POOR |

OVERALL ASSESSMENT

1 2 3 4 5

further sampling required

INSPECTED BY _____

DATE _____

Sample survey form for microform collections

NEWSPAPER TITLE CALL NO.....
 REEL NO PUBLISHER.....
 DATE FILMED FILMED BY.....
 COMMISSIONED BY DATE ACQUIRED.....
 FILM BASE POLARITY.....
 EMULSION TYPE.....

PHYSICAL CONDITION

EXTENT OF DEFECT

| DEFECT | FEW | 1/4 | 1/2 | 3/4 | WHOLE |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| STAINS | <input type="checkbox"/> |
| DISCOLOURATION | <input type="checkbox"/> |
| SCRATCH | <input type="checkbox"/> |
| MOULD | <input type="checkbox"/> |
| MICROSCOPIC | | | | | |
| BLEMISHES | <input type="checkbox"/> |
| FOREIGN MATTER ON FILM | <input type="checkbox"/> |
| FINGER PRINTS | <input type="checkbox"/> |

FILM CONDITION

SMELL
 LIFTING EMULSION
 CURLING/SPLITTING/
 BRITTLENESS
 FILM STICKING TOGETHER
 NUMBER OF SPLICES

| | TYPE | CONDITION |
|------------|-------------|-----------|
| BOX | CARDBOARD | GOOD |
| | PLASTIC | FAIR |
| | METAL | POOR |
| REEL | PLASTIC | GOOD |
| | | FAIR |
| | METAL | POOR |
| RESTRAINER | RUBBER BAND | GOOD |
| | CARDBOARD | FAIR |
| | TAPE | |
| | NOTHING | POOR |

TYPE OF SPLICES.....
 COMMENTS.....

OVERALL ASSESSMENT

1 2 3 4 5

further sampling required

INSPECTED BY _____

DATE _____

● Reflect 9B

Findings of the microform collection survey

What did you learn about your microform collection from the collection survey?

Can you make any projections about other types of film created at the same time?

What needs to be done?

Discuss your findings and ideas with colleagues and your supervisor or manager.

Disaster management and recovery

Disaster management is described in Topic 4 of the module, **Preservation of Materials**. It involves a number of key stages including:

- I prevention and risk assessment—checking out the hazards and helping to prevent problems
- I preparation—having a *disaster plan* that includes realistic responses and practical supplies for an emergency.

● Reflect 9C

Disaster management and recovery

Revise the section on disaster management and recovery in Topic 4 of the module, **Preservation of Materials**.

What kind of disaster would be most likely to damage the microform collection in your organisation?

What practical steps could your organisation take to reduce the potential damage to microforms in the event of a disaster (e.g. storage of items, having a disaster plan)?

Ask your colleagues for suggestions.

Best practice strategies for disaster recovery of microforms

Water damage

Water is a common cause of damage to collections through:

- I rain
- I rising damp
- I leaks
- I open streams and rivers nearby
- I burst pipes
- I underground streams
- I overflowing sinks in kitchens and washrooms
- I sprinkler faults
- I damaged fire hoses.

The publication *ReCollections: Managing Collections*, emphasises that 95% of all disasters result in water-damaged materials and that mould will develop within two to three days in a warm, humid climate. (Heritage Collections Council Secretariat, *ReCollections: Managing Collections*, 1998, p. 63)

For these reasons, salvage of water-damaged material is usually the first priority. Dry material can be repackaged for reformatting and/or repair immediately after the water-damaged material has been salvaged.

Disaster support services

A number of film manufacturers offer a *free* disaster support service to users who:

- I use that manufacturer's micrographic products
- I use that manufacturer's chemistry to process films
- I process films according to the manufacturer's specifications.

This is generally a free 'rewash and dry' disaster recovery service. Contact your nearest film supplier for further details.

Best practice strategies for recovery of water-damaged microforms

The following is a list of best practice strategies for recovery of water-damaged microforms. The information has been drawn from:

- I the Australian and New Zealand *Guidelines* (National Library of Australia 1998, p.72)
- I the resource *ReCollections: Managing Collections* (Heritage Collections Council Secretariat 1998, pp.59-82)
- I information supplied by Artlab Australia.

Best practice strategies for recovery of water-damaged microforms

| Type of microform | Priority | Salvage method | Comments |
|-------------------------------|--|--|---|
| silver halide roll films | <ul style="list-style-type: none"> • keep wet • immerse in clean water • arrange for rewashing in a processor, preferably within 48 hours | <ul style="list-style-type: none"> • keep wet until drying can begin • pack immersed in clean water inside plastic bags inside bucket or box for transport • arrange for films to be rewashed and dried | <ul style="list-style-type: none"> • do not freeze |
| silver halide fiche - jackets | <ul style="list-style-type: none"> • keep wet • immerse in clean water • arrange for rewashing in a processor, preferably within 48 hours • otherwise, air-dry within 48 hours | <ul style="list-style-type: none"> • keep wet until drying can begin, but not longer than 48 hours • pack immersed in clean water inside plastic bags inside bucket or box for transport • if rewashing in a processor is <i>not</i> possible: <ul style="list-style-type: none"> – air-dry jackets emulsion-side up on blotters, or peg to drying line if there is sufficient border | <ul style="list-style-type: none"> • do not freeze |
| diazo or vesicular microforms | <ul style="list-style-type: none"> • wash under cold running water • air-dry within 48 hours | <ul style="list-style-type: none"> • air-dry jackets emulsion-side up on blotters, or peg to drying line if there is sufficient border • to pack fiche, interleave them and pack in crates or cartons | <ul style="list-style-type: none"> • do not freeze |

Advice on the recovery of water-damaged microforms

- l Always handle wet or damaged microforms very carefully to prevent further damage.
- l Film and fiche which has been wet and allowed to dry before recovery is likely to be stuck together or stuck to enclosures.
- l These items may also be affected by stains or salts.
- l Do not try to separate these items without proper re-wetting.
- l Protect film from dust and grit.

Other disasters

Microforms which have been affected by heat, smoke, building collapse or other disasters may not be able to be recovered. They will need to be assessed by someone who is an expert, such as a conservator or an experienced microfilmer.

Reducing risk by separate storage

If master microforms are stored in a different location to the second generation printing masters and service copies, this will reduce the risk of all the information being lost during a disaster. In the event of a disaster, it is then possible to create new copies from a set stored at another location.

■ Activity 9.7

Microform disaster recovery services

- a) Arrange with your supervisor or manager to contact the regional office of the manufacturer which supplies your organisation with microfilm (e.g. by letter, fax, email or telephone).
- b) Can the manufacturer offer your organisation a free disaster support service for microfilms that have been water damaged? Yes No
- c) If yes, what steps would your organisation need to take to use this service effectively (e.g. contact the manufacturer, transport the films in containers)?

- d) If no, ask your manager to help you find out if there are any other microfilm manufacturers or organisations which offer a disaster support service for damaged microfilms in your country—either free, or for a fee.

Summary

- I Steps need to be taken to ensure that microforms are well looked after for the long term. These include controlling use, assessing deterioration and preparing a disaster response.
- I *Controlling access* to masters and second generation microfilms reduces the chances of them being used and damaged by mistake.
- I *Collection surveys* can help assess the extent and pattern of damage of microfilms in a collection. From the sample surveyed it is possible to make a prediction about the condition of microfilms which were filmed at the same time.
- I As a follow up, copies should be made of missing or damaged reels, and missing generations of film.
- I Disaster management includes prevention and risk assessment (checking out the hazards) as well as having a *disaster plan* which includes practical information for an emergency.
- I Follow best practice principles for retrieving water-damaged films. Do not freeze them.

Checklist

In order to test your understanding of this material, work through the checklist below.

If you can answer 'yes' to each question, and you have completed the activities for this topic, you are now ready for your lecturer or assessor to verify that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities**.

If you are in any doubt about any of the content, you should read through the material again, consult some of the references mentioned in the section entitled **Resources**, talk to your work colleagues or contact your lecturer or mentor.

I can:

- I use given criteria to survey microform collections
- I identify best practice strategies for disaster recovery of microforms.

▲ Submit

You are now ready to record in your **Log book** that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities** for this topic.

You can record these by marking off the boxes in the shaded columns with a ✓ **yes** or ✗ **no**.

You can then ask your lecturer or assessor to verify this information.

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Background

The training materials have been developed by the National Library of Australia, in collaboration with the State Library of South Australia and under the auspices of IFLA PAC, and will be provided to people within the Asia and Pacific regions as a training resource. The materials will also be used within Australia as part of an accredited TAFE training course.

The training materials consist of 10 modules, 6 wall charts, a Log Book, a Learning Guide and a Glossary/Index.

We expect that users will both read a printed version of the materials and download them as PDF files from the National Library of Australia's website – www.nla.gov.au

