UNIT 5 NON-BOOK MATERIALS

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5.0 OBJECTIVES

After reading this Unit, you will be able to:

- understand the nature and characters of the materials of which these are composed;
- describe the technology involved in recording information on them; and
- discuss the procedures relating to their care, handling and storage from the point of view of their proper preservation and use.

5.1 INTRODUCTION

We are now in an era in which ‘information’ plays a role much more vital than even before. In the evolution of our Society the influence of ‘information’ is growing every day, both in depth and extent. The emergent information technologies today challenge our libraries to respond to this rapid technological change. The libraries can no longer remain unaffected and continue to restrict their scope of activities centering around only the traditional paper based media (which have been discussed. in detail in the preceding Unit).

Consequently, today’s libraries are having steadily growing variety of materials, other than paper. These falls under a generally accepted generic term: non-book materials. In the earlier days, however, by non-book we meant those media, which were all paper-based, but issued in formats other than of a conventional book, such as, periodicals, reports, pamphlets, newspapers, newspaper clippings, maps, atlases and so on.
That distinction between book and non-book is no longer in vogue because of the invasion of an umpteen number of products printed or recorded in some way or other on materials other than paper, and these non-paper products in today’s context are classified as ‘non-book’.

This currently used generic term ‘non-book’ includes two broad categories: *print* and *nonprint*. The non-print media, as distinct from print-media, are those on which printed words or visuals are not directly represented, such as magnetic tapes, digital recordings etc., as against media like films, film-strips, photographs, slides etc. which bear the direct impressions of words or visuals. Non-book materials which are generally available in our libraries today can be categorized as follows:

<table>
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<th>Non-Book materials</th>
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<td><strong>Visual</strong></td>
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<td>- Photographs</td>
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<td><strong>Micro-Documents</strong></td>
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<td>- Microprint</td>
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<td>- Microlex</td>
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Fig. 5.1: Non-Book Materials in Libraries

In this Unit we will discuss the problems relating to the care, handling, storage, general maintenance and use of some of the more commonly used materials under this category.

Self Check Exercise

1) Categorise the type of non-book materials available in the library.

Note:  
   i) Write your answer in the space given below.
   ii) Check your answer with the answers given at the end of this Unit.

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5.2 PRESERVATION OF NON-BOOK MATERIAL: BASIC CONSIDERATIONS

For care and handling of audio-visual materials, various standards, such as, International (ISO), British (BSI), American (ANSI) and German (DIN) already exist. Several of the
audiovisual archives associations have also produced draft guidelines on conservation and preservation. There is, in fact, no dearth of guidelines, but most of these guidelines and Standards deal with storage, fire precautions, specifications for film and photographic bases, and exhibitions. These guidelines are, no doubt, useful, but those can only be taken as non-comprehensive, interim measures. The long-term efficiency of some of these prescriptions is yet to be conclusively established, because the inherent durability of the materials has not yet been fully established.

However, there are certain basic considerations, which are applicable to all non-book materials, as are for book-materials, and are well established principles from the preservation point of view. These are concerned with physical environment, security and circulation.

5.2.1 Physical Environment

**Temperature**: When dealing with various media formats, no single temperature can be prescribed, because the composition of each of the material is different from the other. However, for the media being considered here, an approximate range can be established. The highest temperature recommended by various authorities for media formats is 75°F for videotapes and cassettes; for magnetic tapes the range is between 65°F and 68°F, while floppy disks can accommodate a range between 50°F and 125°F, though these two extremes are not encouraged.

Ideally, the temperature should be somewhere between 60°F as the optimum for the whole range to media formats and for human comfort.

This temperature range has been prescribed for materials which are being actively used in a library or information centre. For an archival collection, however, a range lower by about 10°F at both ends (i.e., 50°F and 60°F) is generally recommended.

Whatever temperature is decided upon, it is important that it remains as constant as possible. Any fluctuation of more than a few degrees can harm materials. For this reason, the following precautions are needed:

a) the collection should not be stored close to the doorways or windows;

b) Where materials are removed for use from long storage, it will invariably cause temperature variation of more than a few degrees; therefore, the material should not be put to use immediately. A process of ‘staging’ is required. It enables the item to adjust itself to the changed environmental temperature in gradual steps.

**Relative Humidity**: Relative humidity is an expression of the moisture content of the atmospheric air. These non-book materials, like all book-materials, are sensitive to this factor. Here again, as in the case of temperature, there is no single relative humidity prescribed for all materials. However, a range of 45% + 5% relative humidity is considered suitable, with 47% as the optimum.

**Dust and other Atmospheric Pollutants**: No environment is completely dust and pollution free. Measures can be taken to minimise the effect. Air conditioning (which is the only means to control temperature and relative humidity) with filtration systems are beneficial. As further precaution, the materials should always be positioned away from the doorways, windows and vents.
**Light:** Another environmental consideration concerns sunlight and excessive fluorescent lighting. These factors can be damaging to all types of materials. For example, slides will turn dull and brown or yellow when exposed to too much light; a floppy disk or a phonograph record will become useless in no time, if kept in bright light.

Therefore, the use of non-fluorescent lighting systems, and storing of materials away from windows to avoid the effect of direct sunlight are helpful measures. If, however, positioning near the windows cannot be avoided, the window-panes should be tinted so as to cut off ultraviolet rays of the sun, use of window curtains is also an effective option.

**Magnetic Fields:** Many materials, such as audiotapes, sound tracks of various media, videotapes etc. are on magnetic tapes or housed in electromagnetic storage devices. The main problems with these magnetic recordings are undesirable erasing of the magnetic signals, separation of the emulsion from the base material, print through, and tape breakage.

Audio and video tapes placed within any magnetic field will either be erased or will develop static charge. The storage location for such materials should, therefore, be in an area free from magnetic fields, any strong magnets or electric motors.

Most magnetic tapes have their own containers, as with audio and video cassettes. These containers reduce damage caused by dust or sunlight. But the problem of magnetism requires that the storage shelves are made of wood or of any non-magnetic metal, free from vibrations and shock. The racks should be electrically grounded, if made of metal, and should be placed away from any electronic fixtures or power lines by a distance of at least a few feet; the farther the better.

### 5.2.2 Security

The preservation and conservation measures are designed to protect the materials from natural erosion, but security focuses on protection against human problems such as vandalism and pilferage. Therefore, the storage procedure should give serious attention to the security aspect.

It will be necessary to store materials in such a location and manner that these cannot be accessed without assistance from some member of the staff, and are used only under supervision. This is a basic difference between book-access and non-book access. This aspect should receive serious consideration.

### 5.2.3 Circulation Policy

In order to arrive at a common ground a balance between security and service has to be evolved. This necessitates a well-thought-out circulation policy. In the process of evolving a judicious circulation policy, the fundamental consideration should be, among others:

a) whether or not a particular item should be permitted to leave the library without involving any risk;

b) are proper facilities, available in the library for consultation of all non-book materials in-house;

c) the number of hours the collection is open for consultation;

d) is it possible to identify some items which can be allowed to circulate outside, while keeping the others for in-house consultation only;

e) has the library adequate staff to supervise in-house consultation of all non-book materials;
f) has the particular user, who intends borrowing an item has the required equipment in perfect shape in his/ her personal possession.

A strict in-house circulation policy has certain in-built advantages; but if such a policy is entirely guided by strict security and preservation considerations, it can be considered to be out of tune with the fundamental concept of libraries as user-oriented institutions.

The relation between circulation and preservation is central and at the same time difficult. The purpose of the library is to provide maximum services to its clientele, but loaning out some items means that their usefulness will be shortened. This is a paradoxical situation indeed.

5.2.4 Maintenance and Upkeep of Equipments

Non-book materials like videotapes, films, audio tapes, slides, transparencies, film strips etc. all require additional equipments for their usage. These items are all susceptible to damage caused by improperly maintained hardware. For example, for magnetic tapes tape-players have to be used, the heads of which are to be cleaned and checked regularly to prevent accumulation of dirt and static charge to minimise scratching of the tapes. Phonographic records make contact with the stylus of the player. It is not enough to use only quality stylus, because one of the most common factors contributing to record damage is the dirty or worn-out stylus. The diamond stylus is expensive, yet it is considered worth its cost in view of its preservation value. One way of reading phonograph records is by the use of lasers. With laser discs there is no surface contact; but the laser technology is still rather new and quite expensive. For wider use of this technology the librarians will have to wait a little longer, and till then they have to adopt methods which prolong the life of the records to whatever extent possible.

5.2.5 Storing

It is now generally agreed that non-book materials like phonograph records, tapes, films etc. should be stored in a vertical position. Vertical storage will prevent warping of phonograph records, help protect tapes and films, which are generally damaged by the excess weight on their edges when laid horizontally. Slides and photographs are also best stored vertically. For materials, especially like slides and prints use of individual containers is very important. For photographs the use of acid-free envelopes, made of plastic material is a convenient method of storing. Plastic resists moisture and will not grow misty with age. Inter-leaved acid-free black paper can help protect them from excessive light.

Cabinet are useful for housing slides, prints, negatives and other materials. The cabinets should be so designed as to ensure easy filing and access.

5.2.6 Handling

Proper handling of non-book materials which are mostly delicate is extremely important. Handling involves both the user and the librarian. The user must know the correct handling procedure imparted to him/ her by the librarian. Before educating the user it is important that the librarian himself/ herself is fully aware of the proper handling of materials, as well as of the hardware used. For this, proper training for them should be designed. For the users, it will be worthwhile to include maintenance brochures along with the materials for their guidance.

5.3 VARIETY OF NON-BOOK MATERIALS AND THEIR PRESERVATION

Keeping in mind the basic considerations applicable to all non-book materials, which have been discussed in the preceding paragraphs, the nature and characteristics of the
various media and general guidelines for their care, handling and storage can be summarised as follows:

5.3.1 Film Media

Photographic film has a layer of emulsion attached to a polyester base material. The image is created in the emulsion by chemical response to light and is fixed there by processing with other chemicals.

The various types of media falling under this category are:

a) **Film-strip:** It is a collection of images which take two different forms: the single or half-frame, and the double - or full-frame. The single-frame strip is usually passed through the viewer or projector vertically, whereas the double-frame strip is projected horizontally. Film-strips are generally supplied in small circular canisters and are accompanied by notes explaining the content of the images in the individual strips.

b) **Slide:** The photographic slide, sometimes referred to as a transparency is a single frame cardboard or plastic frame. Glass is sometimes used to cover and protect the film within the mounting frame. Slides are produced in various formats of different dimensions, starting with 35 mm. and going up to 250 mm square, the latter is suitable for use with the help of an Overhead Projector.

c) **Cine film:** The cine film is a sequence of images. When these images are projected on a screen at the correct speed, the images give the appearance of a continuous movement. The cine films are issued in various formats: 35 mm and 16 mm with sound-track, 16 mm without sound, and 8 mm which is now obsolete (the old stock of 8 mm films have now been transferred on to videotapes or videodiscs).

d) **Microforms:** There are various types of microforms, such as, 35 mm roll-film, 16 mm roll-film; aperture cards; and microfiche. All these types of microforms are discussed separately in Unit 15.

Self Check Exercise

2) Categorise different types of film media.

**Note:**

i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

Care and Handling of Film Media

Good care and maintenance of film materials, which are concerned with the following points, constitute the basic procedures for their long-term preservation.
The films should be changed and inspected after each use. This can be done by using soft brush or puffer. Those items, which are not frequently used, should be inspected regularly and rewound at intervals.

The equipments used for screening/display must be kept clean and dust free.

In handling, films should not be jarred or dropped. This may produce scratches.

Use of bent containers or reels should be avoided. This can damage films severely.

Films should be handled only by the edges, and should not be twisted.

Film materials taken out of the air-conditioned storing, should be allowed to reach room temperature before these are screened/displayed.

Film materials should be projected/viewed only by equipments mounted safely.

Only qualified staff should be allowed to handle the media and the equipments.

Film materials should be stored out of sun-light, which bleaches. In sunlight colours fade with prolonged exposure.

Films should be stored in dust free containers. The polyester base attracts dust, which damages the film surface.

The containers should not be composed of materials harmful to film materials, such as those having acidic, sulphur or peroxide contents.

Glass covering even film may induce formation of Newton’s rings if trace of water is trapped between two layers. The rings are rainbow-like effects which change shape with the heat of projection. So, films under glass cover should be absolutely dry.

High humidity encourages bacterial and fungal growth in photographic emulsions and high temperature affects films badly in the long run. Hence humidity and temperature of the storing area should be as prescribed earlier.

Care and Handling of Microforms

The microforms are used mainly for preservation purpose, but their use can’t be restricted and, hence, there should always be at least two copies of the same document, one master and the other working copy. Master copies are seldom used or referred to. They are only used for duplicating purpose. Master copies should always be prepared by using silver halide microfilm, which has a permanent life. The microforms require careful handling and sophisticated storage environment. The following are some points requiring careful implementation:

i) Unfavourable environmental condition is a major storage problem and hence, an efficient air conditioning system working round the clock is a must. A temperature of 12-16 degree Celsius and relative humidity of 30-35 per cent provides an ideal storage environment. Since obtaining such lower limits of temperature in tropical climate increases the operational cost considerably, a temperature of 20-22 degree Celsius and relative humidity of 45-50 per cent provides a workable solution.

ii) The microform storage area should be free from dust particles and other contaminants.

iii) Microforms should be stored in closed housings, in drawer type cabinets. The Microforms should not be stacked horizontally, but shelved in the upright, vertical position to prevent warpage. Excessive weight or pressure on the films must be avoided.
iv) Microforms should be covered in boxes, envelops, folders and other enclosures which are chemically stable and free from acid or peroxides. The microform enclosures should be made of acid free paper or plastic. Paper enclosures with slightly rough or matte surface are recommended. Among plastic materials, cellulose triacetate, polyethylene and polypropylene are generally inert and chemically stable.

v) Microforms of different types, such as silver halide and diazo should not be filed at one place. Nitrate based films should not be stored in the same room, where acetate and polyester based films are stored.

vi) Microforms should be handled gently. Finger prints may contain oils, dirt, lotions and other contaminants which can damage images. Careless handling can damage images by scratches and hence the film should be held by its edges. White cotton lint free gloves are recommended for use while handling microforms.

vii) Eating, drinking and smoking should be prohibited in the microform storage area. Boiling of water or otherwise creation of water vapours should also be prohibited in the storage area.

viii) Before using the microforms, the microform reader, reader-printer should be properly inspected and defective equipment should not be used.

ix) The master copies of microforms must be inspected periodically for fungus, brittleness, dislocation and other defects.

x) Deteriorating microforms should be removed from storage area immediately.

Self Check Exercise

3) Write at least two do’s and don’ts in care and handling of microforms.

Note:  
i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.

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5.3.2 Magnetic Materials

Magnetic storage media serve broadly three information management applications, viz. i) data storage; ii) Audio recording; and iii) Video recording. The data storage group of magnetic media is used by the computers, while the other two categories are used by specialised instruments, like audio record-player, video cassette player, etc. This category of materials are available in the form of tapes (sound and video) and discs.

a) Tapes

Tapes are made of a polyester base to which oxides of iron and chromium are attached. By magnetisation and rearrangement of the magnetic fields borne by these oxides, a message is recorded on the tape. This message (whether sound or video) can be ‘read’ by
a device in the playback machine. Magnetic tapes used for data storage are read by special drives attached with the computers.

**Magnetic tapes:** Magnetic tapes are the oldest of all magnetic media. The magnetic tapes vary in width from 4mm to 0.5 inches. It may be packed on open reels, in cartridges or cassettes of various size and shape. The commonly used open reel tape measures 10.5 inches in diameter and contain 2,400 feet of tape. Thinner tapes are also available with more footage of tape in the same 10.5 diameter reel. The storage capacity varies with linear recording density measured in bytes per inch. Depending on the recording density tapes are available, that can store 150 megabytes to 1.35 gigabytes of data. The IBM 3480 magnetic tape cartridge introduced in 1984 is a convenient and compact medium that records data on a half inch magnetic tape storing 200 megabytes of data in, 540 feet space. The cartridge measures, 4" x 5" x 1" size. Digital Audio Tape (DAT) is now being used to store backup data from servers and computers. They are comparatively small in size having a dimension of 7.2 x 5.4 x 1 cm. and width of 3.8 mm. They come in the form of cartridges.

**Audio tapes:** Audio tapes are available in two types of format: open reel and cassette. They are available in various playing speeds and recording formats viz. monaural, stereophonic, and quadraphonic and have tracking configurations like 2 track and 4 track.

**Video tapes:** Video tapes are made of chromium dioxide or metal as the major constituent of the magnetic coating. In 1971, Sony Corporation introduced the first video recording U-matic system to use magnetic tape cassettes. The U-matic tapes measure 3/4 inch in width. In 1975, Sony introduced Betamax recorder using 1/2 inch video tape cassettes. This video cassette measure 6.1 inches wide by 3.8 inches high by 1 inch deep. In 1977, the Victor Company of Japan introduced VHS video cassettes. The cassette size is 7.4"x 4"x 1". The VHS video cassettes are identified by a code indicating recording time in minutes, when the recorder is operated at the normal play condition. The common length of VHS cassettes are T -120, having a two hour run time. Later on two other VHS version of video cassettes have been developed. They are: Super- VHS (S- VHS) and VHS-Compact (VHS-C). The image of S-VAS is of high quality and the cassette measure 4"x 2.5"x 0.5" in size. Now 8mm tape video cassettes are available in the market. A higher version of this Hi8 cassettes are used for digital recording. These cassettes measure 3.7"x 2.5"x 6" and the tape length varies from few minutes to more than one hour.

**b) Discs**

Magnetic discs are used with computers. They can be categorised as hard disk and floppy discs. Hard disks are stored within the computer service area.

**Floppy disks:** The floppy used for recording digital data for computers are thin circular plastic sheets. These are usually covered with ferric oxide, like magnetic tapes. These discs are supplied in card or plastic covers, from which these should never be removed. Some discs are supplied in completely sealed containers. The density of information packed on to the recording surface is very high. Considerable effort is needed to protect it from any damage.

As with magnetic tape, the degree of proximity between the head that records or reads the data coded magnetically, and the disc is extremely important. On this depends the accuracy of reading. It is, therefore, essential that dust and dirt do not gather at all on the head and the disc. It is also essential that the magnetic surface is not touched by hand and
is kept covered as far as possible. Any greasy material picked up when touched by hand is disastrous.

Floppy disks are still most widely used magnetic media, because of their easy portability and the facility for saving and deleting files as and when required. Nowadays only 3.5 inch diskettes having 1.44 megabyte of storage capacity are available. Other formats viz. 5.25 inch and 8 inch are now obsolete.

**Hard disks:** Hard disks are high performance storage media having application in on-line and rapid access to data. A hard disk is made up of a stack of rotating metal disks on which data are stored. These are usually fixed inside the computer and hence are not physically accessible to the users. This implies that the care and maintenance of hard disks are performed by the hardware engineers and users are only required to know the operating procedures. Also, as the magnetic media rotate at a very high speed and data are read and recorded by a magnetic head. It is more vulnerable to damaged due to head crush or other hardware malfunctioning.

**Stability of Recorded Information**

Stability of recorded information in case of magnetic tapes has been reported to be between 10-20 years. Whereas, the life span of a video cassette is more than 20 years. As such, magnetic media are considered medium-term storage media having life span of 10 years. As discussed previously, stability here denotes the period of time during which a given medium permits reliable recording and retrieval of information. Reliability is determined by absence of permanent read/write errors in the recorded information. Error-free operation denotes one error per trillion recorded bytes (12.2 gigabytes). The magnetic media are vulnerable to accidental erasure by magnetic field, improper handling, inter-layer transfer, media wear and environmental effects.

**Erasure:** In magnetic media, such as disks and tapes, recorded information can be erased by application of an opposing magnetic force of sufficient coercivity. Coercivity is defined as the field strength required to accomplish demagnetisation of the medium. It is measured in units called “Oersteds”. The potentiality of accidental erasure is enormous as many office instruments and products are having magnetic properties. However, to completely erase information, the strength of a magnetic field must exceed the coercivity of the magnetic medium on which the information is recorded. The coercivity of a small bar magnet commonly encountered in homes and offices is 550-650 oersteds. Many commercially available magnets exceeds 700 oersteds coercivity and are so small that can be concealed in a pocket. Coercivity value of some magnetic recording materials is given in Table 1.

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<thead>
<tr>
<th>Material</th>
<th>Coercivity value in Oersteds</th>
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<tr>
<td>Premium grade magnetic tapes</td>
<td>270-330</td>
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<tr>
<td>Magnetic tape coated with ferric oxide</td>
<td>270-420</td>
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<tr>
<td>IBM 3480 tape cartridge</td>
<td>490-550</td>
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<tr>
<td>Cobalt surfaced VHS video Cassettes</td>
<td>620-720</td>
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<tr>
<td>Super- VHS video cassettes</td>
<td>900</td>
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<tr>
<td>8mm video cassettes</td>
<td>1500</td>
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</table>

**Media wear:** Heavy use of magnetic media results in wearing of both media and read/write heads. The magnetic coating of the tape or diskette accumulates debris and hence recording and playback is affected adversely. Wearing of magnetic media and read/write
heads occur due to adhesion, abrasion and corrosion. Adhesive wear particularly occurs when the magnetic media and read/write head is in prolonged stationary contact. It is very common in video cassettes due to continuous replay of a particular frame. The abrasive wear occurs when a hard material slides over a softer surface. It produces scratches on media. Corrosion results from oxidation or other chemical actions and increases abrasive wear.

Inter-layer transfer: The magnetic field of the media may effect its own part and this is called inter-layer transfer. When magnetic tape, cartridges and video cassettes are wound, flux line from one layer of tape can migrate to adjacent layers causing transfer of recorded signals. It is usually common in audio-cassettes having long wavelengths, representing low and mid frequency signals.

Self Check Exercise

4) Write at least three sentences on Stability of Magnetic Media.

Note: i) Write your answer in the space given below.
    ii) Check your answer with the answers given at the end of this Unit.

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Care and Handling of Magnetic Material

The stability of recorded information in magnetic media is vulnerable to damage due to its inherent magnetic nature as well as due to various external conditions and events. Inadvertent erasure can lead to loss of vital information. Inter-layer transfer and wear can effect the usability of the media. Similarly, careless handling and improper storage would damage recorded information. There should always be 2 copies of magnetic media—one storage copy and the other working copy. Information content of hard disks should also be kept as backup. The following are some points on storage and care of magnetic media requiring proper implementation:

i) The magnetic media storage area should be properly air conditioned with a temperature of 17-20°C Celsius and relative humidity ranging from 35-45 per cent. The temperature and humidity should be constantly maintained round the clock.

ii) Magnetic tapes should be enclosed in polyethylene bags. Similarly audio and video cassettes should be kept in plastic containers.

iii) The storage area should be dust-free, as very small dust particle can make portion of magnetic media unreadable.

iv) Storage area must be cleaned using vacuum cleaner.

v) Magnetic tapes and diskettes should be shelved in the upright, vertical position and should not be stacked horizontally.
vi) Magnetic media should be handled gently. Information recorded space of the media should not be touched as finger prints, skin oils etc. may damage information.

vii) Eating, drinking and smoking should be prohibited in the storage area. Boiling of water or otherwise creation of water vapour should also be prohibited in the storage area.

viii) Magnets should be strictly prohibited in the storage as well as working area of magnetic media. While in transit at least 3” should be maintained between magnetic media and external magnetic fields.

ix) Direct sunlight must be avoided to fall upon magnetic media.

x) Keep the magnetic media inside their container, while not in use.

xi) Do not write directly on a diskette. Use previously prepared adhesive label.

xii) Use write protect tabs, to prevent the inadvertent over-writing or deletion of information recorded on floppy disks.

xiii) Equipments that are used in utilising magnetic media should be properly handled.

xiv) Magnetic media should be subjected to periodic rewinding to avoid accumulated stress on tapes for long term storage.

xv) Periodic checking of magnetic media should be done for corrective measures.

xvi) For longer life of magnetic media, periodic copying on to new media at regular interval is recommended. However, in case of audio and video cassettes, this may result in loss of image and or sound quality.

5.3.3 Plastic Materials

Materials under this category can be divided into three sections:

- Transparent plastic
- Vinyl discs
- Optical Storage System

**Transparent Plastics**

These are flat, transparent acetate or polyester sheets and are available in various thickness commonly ranging from 0.05 mm to 0.25 mm. These are available either as single flat sheets or in rolls.

These sheets are used for projection with the help of overhead projectors. The text can be written on them by using special quick-drying ink. In addition, self-adhesive film and letters can be attached to the surface. These plastic sheets can be printed also by photocopiers, laser printers and other standard printing processes.

**Vinyl disc**

It is composed of a strong plastic material on which audio recordings are made. The discs are marketed in 17.8 cm (7”), 25.4 cm (10”), and 30.5 cm (12”) diameter size. The disc has a central hole which fits with the spindle of the turn-table. The inter-table provides for 33 1/3, 45 and 78 revolutions per minute (RPM).
Optical Storage Systems

This technology is most commonly used in producing Compact discs (CD). The disc is made of plastic material. On the plastic surface there is a spiral of pits backed by an aluminised reflective surface. The surface is protected by a strong transparent lacquer. The recording is either an analogue or a digital version of the original. In either case the presence or shape of the pits is ‘read’ by a laser beam reflected from the mirror-like surface. In this process of reading there is no physical contact with the surface of the lacquer. As such, no damage can occur through using the disc. Different versions of Compact Disks available in the market are: CD Audio, CD-ROM, CD-V, CD-I, CD-R, CD-RW.

The Digital Versatile/ Video Disc (DVD) is the new generation of optical disc storage technology. It is replacing laser discs fast as it has the capacity of holding 28 times more data than CDs. DVDs are available in variety of formats: DVD-ROM, DVD-R, DVD-Video, DVD-R/RW, DVD+R/RW, DVD-RAM, DVD-VR, DVD-AR, DVD-SR and DVD-A.

Care and Handling of Plastic Materials

Plastic sheets are not generally used for any long lasting purpose. So long as the document printed or written on them are in need, the sheets are kept flat to avoid wrinkles. These are kept free from moisture to avoid sticking together. If several sheets are kept together one above the other, it is necessary that these are separated by sheets of paper kept in between.

On the other hand, the plastic material from which disc is made, is fairly strong. The major care which the disc will need is to protect the groove on it from dust and dirt, and to clean the surface, as well as the stylus of the player before using the disc each time. The pick-up stylus physically vibrates along the groove as the disc is played. As a result, the grooves gradually wear out. This is a natural process of decay. The less number of times a disc is played, the longer it lasts. Use of worn-out stylus quickens the process of decay. So the use of such a stylus should be strictly avoided.

Careful handling of discs to avoid their dropping down or scratching on their surface is essential. The discs should be as level as possible on the turn-table, when played.

Bending and warping due to exposure to heat and damp are very common. Such damage may also be caused as a result of uneven pressure on the surface.

Disks should, therefore, be stored in controlled temperature and humidity. Each individual disc should be placed in the paper sleeve, the opening of which should be against a sealed edge of a cardboard cover in which it is placed. The discs, so covered, are stored vertically, not leaning in either direction. It is not advisable to stack several discs together, stacked one above the other.

Though optical storage media can withstand high wear, proper storage condition and handling is essential for their life span. The stability of optical disks mentioned above are in an office environment, but environmental precautions are necessary as oxidation and corrosion may destroy the protective layer and subsequently damage encoded information. The potential damage to optical disks can be minimised by carefully implementing the following points:

i) Optical disks require minimum climate control and can be stored in temperature between 5-50 degree Celsius and 10-90 per cent humidity.

ii) Storage and work area should be regularly cleaned. Disk drives should be cleaned before use.
iii) If rewritable optical disks are stored, magnets should not be allowed in the storage area.

iv) Optical disks should be kept in their plastic cartridges. Shelving must be done in a vertical, upright position. Heavy objects should not be kept on the top of optical disks.

v) For removing dust from the disks, a soft, lint-free cloth should be used and wiping must be done in a circular motion from the centre to the outer edges.

vi) Optical disks should regularly be visually inspected for corrective action.

vii) Optical disks containing valuable information meant for long-term storage should be copied from time to time to increase their estimated life span.

viii) All equipments used for optical disks should be in proper operating conditions. Defective instruments should not be used and be repaired immediately.

5.4 SUMMARY

In this Unit, the preservation and conservation of non-book materials e.g., film media, magnetic materials and plastic materials are discussed in detail.

The basic consideration for the preservation of non-book materials such as physical environment, security and circulation has been discussed.

Finally, the care, handling and storage aspects of different types of non-book materials have been discussed individually.

5.5 ANSWERS TO SELF CHECK EXERCISES

1) The categories of non-book materials available in the libraries are:
   a) Visual
      i) Still photographs, slides, etc.
      ii) Moving - Film-strips, cine films, video cassettes and disc.
   b) Audio
      i) Sound recording, gramophone record, compact disc (CD),
      ii) Digital audio technology (DAT), Audio tape, audio cassette.
   c) Microforms

2) The different types of film media are:
   a) film strip
   b) slides
   c) cinefilms
   d) microforms

3) Do's:
   i) Microforms should be stored in air conditioned room having temperature of 20-22 degree Celsius and relative humidity of 45-50 per cent.
   ii) Keep microforms in closed drawer type cabinets and shelve them upright in a vertical position.
Don’ts:

i) Do not store nitrate based films and acetate/polyester films together.

ii) Do not touch information content area of microforms. This may damage the information.

4) Magnetic media are non-archival storage devices having stability of recorded information between 10-20 years. The magnetic media are vulnerable to accidental erasure by a sufficiently coercive opposite magnetic force. Also, inter-layer transfer, improper handling, media wear and environmental conditions can considerably effect the stability of information in magnetic media.

5.6 KEY WORDS

Non-book Media : The generic term used for different types of non-paper media such as magnetic media, optical media, film media etc.

Stylus : Sharp needle tipped with diamond or sapphire used to reproduce sound by setting in the groove of a record as it turns on a record player.

Warping : Bending or twisting or distortion of materials.

5.7 REFERENCES AND FURTHER READING


