

# Care, Handling and Storage of Motion Picture Film

Collection Care Workshop

# Collection care

- Film should always be held by its edges to avoid leaving finger prints on picture and sound areas.
- All film is subject to fading, particularly integral tri-pack color positives, such as Ektachrome® , Ansco®, or Agfa ®. As with all other materials, this fading -- as well as other chemical and physical deterioration -- are impossible to stop entirely. With proper care, handling and storage, the rate of deterioration can be slowed and the usable life of a film can be extended significantly, over several decades.
- For 35mm nitrate-based film, as for all other materials, the rate of deterioration depends largely on the conditions under which it is stored, how it is handled, and on the ingredients and care used in manufacturing its base. If a film is not marked as safety film, it should be considered to be nitrate until examined for nitrate markings or tested chemically.

# Types of Film

- Nitrate film should be copied onto a new base before deterioration starts. Cans of nitrate film that have remained closed for some time should be opened in unconfined, well-ventilated spaces. If gasses given off by decomposing nitrate-based film are trapped in a confined space -- such as in a sealed can -- they can ignite at temperatures above 100° F. Nitrate film is highly flammable, ignites easily, and cannot be extinguished after burning has begun.
- Ideally, temperature and humidity levels for storage should be kept constant and at a maximum of 50° F/10° C and 50% RH.

# Types of Film

- Acetate film, like nitrate film, is subject to continuous decomposition, especially if kept under poor storage conditions. Eventually acetate-based film will suffer from the so-called "vinegar syndrome," derived from the strong acetic acid (like vinegar) smell the film emits as it deteriorates. One advantage acetate film has over nitrate film is that it is not truly flammable; if subjected to a flame it just smolders.
- Polyester-based film is chemically more stable than nitrate and acetate film. The emulsion layer on all film bases can shrink over time, especially on the bases of nitrate and acetate film. Since polyester bases do not shrink as much as the emulsion layers, a concern exists that expansion and contraction of the emulsion layer on a polyester base will eventually cause it to separate from the base.

# Types of film

- Unlike Technicolor® film prints, tri-color pack film prints produced since the early 1950s, such as Ektachrome®, Ansco®, and Agfa® can fade in less than ten years. For optimum long-term storage of such tri-color films, keep them at temperatures of less than 0°C and with an appropriately low level of relative humidity.
- Kodachrome® , (made by Kodak after 1940), and mainly used for films sold to the home market (16mm, 8mm), has faded relatively little. Integral tri-pack reversal positive film, also used primarily in the home market, has faded far less than negative-positive film stocks used commercially since the early 1950s.

# Storage advice

- Although fading is less of a problem for black-and-white projection copies on acetate or polyester film base, deterioration can begin within little more than a decade. Storing them at the lowest humidity and temperature achievable with constant stability is recommended. At the minimum, printed copies should be kept under conditions that do not exceed 50° F and 50% RH. Ideally, they should be stored at 37° F and 20-30% RH. It may be better to store films in an insulated storage unit with its own conditioning plant. Humidity levels are often easier to maintain in a unit of this kind than in an ordinary room and it is also less expensive in terms of electricity required.

# Collection training on film

- Films should always be wound evenly, and never too tightly, with the emulsion side out. Metal film storage cans or plastic boxes should be uniform in size, stored flat, and never stacked more than twelve inches high. Never put paper or any other loose material in the film storage can or box. Decomposing nitrate films and acetate films suffering from the vinegar syndrome must always be stored separately from one another and apart from other films.
- Common sorts of film damage are shrinkage, brittleness, buckling, scratching, and perforation damage. Nitrate and acetate films can shrink or become brittle or both, through loss of moisture, solvents, or plasticizer. Shrinkage and brittleness can be reversed temporarily; buckling is difficult to cure. Scratches can be minimized.

# Collection training of film

- Perforations are subjected to considerable stress and are often damaged. Two or three missing perforations can be patched with a special polyester adhesive tape made for the purpose. If more than a few perforations are missing, and if the original film is shrunken, it can only be patched by cementing in an undamaged section from a film with the same shrinkage level. (These remedies, as with most restoration efforts, should only be undertaken by a trained professional).