Identifying and Handling Nitrate Film

Here is some basic information about how to identify nitrate film, the hazards of handling nitrate film and information about shipping and housing nitrate film.

Hazards

Nitrate can be very dangerous, mainly because it is highly flammable. Nitrate film burns at a higher temperature than even gasoline. Chemically, nitrate film is very similar to gunpowder. Once ignited a nitrate fire cannot be extinguished, because the combustion process generates its own oxygen. A nitrate fire also generates nitric acid fumes. These are highly poisonous and can be lethal if inhaled. Nitrate fires are violent and fast-burning. In some countries or states it is even a criminal offence to store nitrate on any premises which has not been approved for this purpose by the fire authorities.

In most countries there are laws which regulate how nitrate is stored and shipped: in Britain, for example, the storage and handling of nitrate film is covered by the Dangerous Substances and Explosive Atmospheres (DSEAR) regulations found here: http://www.hse.gov.uk/fireandexplosion/dsear.htm. The US complies with the National Fire Protection Association code 40 (NFPA 40) for storage and handling, and with the Department of Transportation code of federal regulations CFR49 for the transportation of hazardous material.

Safety

Nitrate need not be feared, but respected. A nitrate fire can easily hurt you and your property, but there are precautions you can take. The best way to avoid a nitrate fire is to handle the film very carefully and thoughtfully.

- Do not smoke anywhere near the film.
- Do not keep the nitrate film near a heat source, direct sunlight, hot lamps or around numerous electrical equipment.
- Do not store in air tight containers. The film must be allowed to breathe and off-gas.

Although some believe that nitrate can spontaneously ignite if it is stored for a long time in very hot and dry conditions, no-one has ever been able to prove this for sure and suspected incidents are rare. Almost all fires begin after a reel has been ignited by another source, usually involving human error.

Identification:

The first step to figuring out if you have nitrate film is determining what gauge of film you have.

Take a ruler and measure the width of the film in millimeters from outer edge to outer edge. If you have an image on your film, do not use that as your gauge. All non-nitrate film stocks are referred to as “safety”, as safety films are not hazardous materials. If you have any measurement other than 35mm (or slightly less if the film has shrunk) then chances are you do not have nitrate film. Due to the flammability, amateur film for home use was not made of nitrate and was often smaller than 35mm.

If you do have 35mm film then there is a chance that you may have nitrate film. Most (though not all)

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35mm film stock manufactured before 1951 is nitrate. The next step is to determine what year your film is from. If you do not already know when your film is from then do a basic search on such sites like the Internet Movie Database (www.imdb.com). Any film produced in the United States after 1950 cannot be nitrate film. If you have a film that you believe to be made before 1950 then you will need to do a basic visual inspection of the reel to determine whether you have a vintage nitrate print or a safety copy made after 1950. In Europe, nitrate film was produced through the first years of the 1950s and on rare occasions has been found in films from the early 1960s. If you have a film you believe to be from Europe that could fall under these qualifications and are uncertain of the film stock then please seek out further expertise by visiting your nearest institution.

If you unwind the film a few feet then you should be able to read some information along the edges, beside the perforations. Most film stock made after 1920 was marked with what type of stock it was created from with the words "Nitrate Film", "Safety Film" or sometimes just the letter "S" which denotes that the stock is safety. If any of these phrases can be read along the edges in black writing then you know what you have. Make sure that you are reading the black writing and not any white writing on black – this would be an imprint from the negative from which it was made, which is not necessarily of the same film stock.

Another way of identifying the year the film was manufactured is by checking edge codes. These are markings along the edges (reading length wise) that denote when the film was made. Along the area where "Nitrate" or "Safety" can be read, if the words "Kodak" or "Eastman" can be read then you can reference your symbols at this website: http://www.historicphotoarchive.com/f1/ekcode.html

If these words or symbols cannot be seen then there are sometimes "tick" marks that denote if the film is nitrate or safety. Again along the edges of the film (not within the picture or the frame) if a small black mark runs the length of the film (parallel to the edge and the image)

You can use the following simple pointers to establish whether a film you have is likely to be nitrate.

* As a general rule your film can only be nitrate if it is 35mm wide, with perforations along both edges and was manufactured before 1951.
* The word 'nitrate' printed between one row of perforations and the edge of the film indicates that your film is likely to be nitrate, but if it was made between 1948 and the mid-50s the marking does not establish that beyond doubt and you will need to further inspect the film.
* The word 'safety' printed between one row of perforations and the edge of the film indicates that your film is likely to be safety film, but if it was made between 1948 and the mid-50s the marking again does not establish that beyond doubt.
* If your film is 16mm wide (which can have perforations on both sides or just one), it is almost certainly not nitrate. Small quantities of 16mm nitrate are believed to have been made in the Soviet Union and China in the '50s and '60s, but none is known to have been exported to the west.
* If your film is 8mm wide (perforations on one side only) or 9.5mm (perforations in the center, between each frame) wide, it is not nitrate.
* If your film smells of vinegar it is not nitrate.
* If your film smell like mothballs or camphor then there is a small chance it could be made of nitrate and further inspection will have to be done.
* If your film shows signs of bubbling, a honey-like goo, or a fine rust-colored powder, you probably have nitrate that is in an advanced stage of deterioration.
* If a film has no markings then you should assume that it is nitrate.

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then the film is safety. If any tick marks run towards the image area width wise then these denote that the film is nitrate.

There are a few exceptions that do not follow these general rules. One of which are the negatives of "Movette" film which are 17mm but happen to be on nitrate stock. While there are other ways to tell if your film is nitrate or safety, they tend to be subjective and therefore are not always accurate. If in doubt, always assume you are dealing with nitrate film and contact an archive who can assist you in identifying your film.

Shipping:

If you believe an item to be nitrate then it cannot be shipped by a standard postal or courier service. A certified courier with the relevant skills, training and equipment to ship flammable solids is required, such as FedEx or PackAir. Before they accept shipment, you should tell them that this item is (or could be) UN materials classification no. 1324, category 4.1 (flammable solids). Expect that shipping will cost more than usual. Nitrate must never, under any circumstances, be carried as passenger baggage (either cabin baggage or checked) by commercial air carriers and caution must be used when transporting nitrate in a vehicle.

If you have nitrate and are looking for a facility that is able to either verify for you that it is nitrate or for a facility that will accept your film as a donation (few places will take nitrate as a deposit) then feel free to contact any of the labs or archives below:

Jim Hahn – Nitrate Film Curator

Academy of Motion Picture Arts and Sciences Archive
1313 North Vine Street • Hollywood, CA 90028
Ph: (310) 247-3000 x.383
jhahn@oscars.org

Todd Wiener – Motion Picture Archivist

UCLA Film & Television Archive
1015 North Cahuenga Blvd. • Los Angeles, CA 90038-2616
Ph: (323)462-4921 x40 • Fx: (323)469-9055 • twiener@ucla.edu • www.cinema.ucla.edu

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Deborah Stoiber – Nitrate Vault Manager

George Eastman House - Louis B. Mayer Conservation Center
900 East Ave • Rochester, NY 14607
Ph: (585)889-8140 or (595) 271-3361 • dstoiber@geh.org

George Willeman – Nitrate Vault Manager

Library of Congress – National Audio-Visual Conservation Center
19053 Mt. Pony Rd. • Culpeper, VA 22701
Ph: (202)707-0150 • gwil@loc.gov.

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Arthur Wehrhahn – Manager

The Museum of Modern Art – Celeste Bartos Preservation Center
Sawmill Road • Salem Route 367 • Hamlin, PA 18427
Ph: (570)689-2226 • arthur_wehrhahn@moma.org
NOTE: The Film Preservation Center would consider accepting donations into their permanent collection and are willing to assist in identifying nitrate material.

Liz Coffey – HFA Film Conservator

Harvard Film Archive
24 Quincy Street • Cambridge, MA 02138
Ph: (617)496-8647 • coffey@fas.harvard.edu
http://hcl.harvard.edu/hfa/

Robert David – CEO

The CinemaLab
2735 South Raritan Street • Englewood, Colorado 80110
Ph: (303)783-1020 • Fx: (303) 806-0555 fax • Robert@theCinemaLab.com

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Meg Labrum – Chief Curator

National Film and Sound Archive
McCoy Circuit • Acton, ACT 2601 • Australia
Ph: +61-2-6248-8104 • meg.labrum@nfsa.gov.au
www.nfsa.gov.au (new web address, effective July 1st, 2008)

Note: *Donations of nitrate film are accepted only after consultation with our curatorial staff. No temporary storage unless agreed upon with curatorial staff.*

Catherine Cormon – Film Collections

Nederlands Filmmuseum
Postbus 74782 • 1070 BT Amsterdam • The Netherlands
Ph: +31 20 58 91 400 • Fx: + 31 20 68 33 401 • ccormon@filmmuseum.nl

For donations of nitrate contact:

Ms Leontien Bout • Legal Dept.
lbout@filmmuseum.nl

Note: *Languages: Dutch, English, French, German, Italian, Spanish*
Accepts only donations of materials that fit the collection policy, and will re-direct other materials to a better-suited institution. Can offer technical support to potential donors to help them determine if their material will be suitable for us, should they not know what it is

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Kasandra O'Connell – Head of Irish Film Archive

Irish Film Institute
6 Eustace Street • Temple Bar,Dublin 2.
Ph:+353 1 6795744 • Fx: +353 1 677 8755 • koconnell@irishfilm.ie
www.irishfilm.ie

Note: *The Irish Film Institute is unable to keep nitrate film over night but they can identify it and will consider accepting nitrate film if contacted in advance.*

Deborah Steinmetz – Director and Client Services Librarian

Steven Spielberg Jewish Film Archive
Jerusalem • 91905 • Israel.
Ph: 972-2-5881511 • Fx: 972-2-5812061
http://www.spielbergfilmarchive.org.il

Note: *Can only temporarily store a film*

Dick Millais – Vice Present Marketing

IVC Digital Film Center
2777 North Ontario Street • Burbank, CA 01504
Ph: (818)569-4949 - Fax: 818-569-4949 - dmillais@ivchd.com

Note: *IVC is one of the only places that transfers nitrate to data formats.*

Greg Wilsbacher – Director and Curator

Newsfilm Library – University of South Carolina
Columbia, SC 29208
Ph: (803)777-6841 - (803) 777-4756 [fax] - gregw@sc.edu

The British Film Institute:
The best way for the public to contact The BFI National Archive with any queries is to go to www.bfi.org.uk then click on Contact Us there is a drop-down menu for National Archive Enquiries. These enquires are regularly read by experienced BFI staff and forwarded to the best person, so it really is the best way to ensure that the right people are contacted.
NOTE: Abbott's Data Store is the only commercial organization in the United Kingdom which stores nitrate film. http://www.abbotgroup.co.uk/

Also available to citizens in the United Kingdom are the archives found at the Film Archive Forum: www.bufvc.uk/faf Check their list of archives to contact the institution nearest to you.

If you have any questions feel free to contact the co-chairs of AMIA's Nitrate Film Interest Group at rparker@oscars.org, jessijones@oscars.org, or mlevesque@oscars.org