

VINEGAR SYNDROME

The scourge of film collectors the world over!

Vinegar Syndrome has been making big news with film collectors in all formats for quite some time. Any signs of this syndrome within a collection is of paramount concern as it can spread to every other film within near distance to it and effectively destroy a whole collection within a short period of time. Many collectors are put off by the very word Vinegar, without really understanding what it is.

1 - Symptoms

The easy way to tell Vinegar Syndrome is by the pungent odour that emanates from a film, and can only be likened to the acetic smell of vinegar. Although Vinegar Syndrome varies in intensity and smell, even the slightest hint of a smell that remotely resembles vinegar is of concern to the film collector because it is an indication that the film stock is in a state of deterioration. Ultimately, the slightest of smells will deteriorate to extremely unpleasant smells, and along with this the film will buckle, soften and become un-runable.

To understand just what Vinegar Syndrome is we have to firstly look at how the film stock is made. Modern 35mm Safety Film stocks from the early 1950s, and 16mm film from 1938 (prior to 1938 they were mostly made from a "Diacetate" base) until today, are made predominantly from a base called "Triacetate".

Triacetate is a polymer, manufactured from a chemical reaction involving cellulose and acetic acid, just as Nitrate film is made from cellulose and nitric acid. Because of the way the film substrate is made, there will always be an inherent amount of 'free' acetic acid, generally trapped between the substrate and the emulsion. This is normal, and under cool conditions of storage, around 10 degrees Celcius, Vinegar Syndrome may never make an appearance.

2 - Causes

The trouble really begins with heat and high humidity. These cause the film to start doing a back-flip by trying to break down into the two main substances that formed the base material in the first place, i.e. cellulose and acetic acid.

The area of the film that seems to be the most affected is between the substrate and emulsion. A build up of humidity, combined with heat will cause acetic acid to burst through the emulsion as a gaseous substance, creating microscopically small holes through the emulsion as it escapes into the air and gives us the typical vinegar odour that exudes from acetic acid.

With time the symptoms will get worse, with acidity levels rising sharply in relation to time, and film deterioration becoming extreme within a matter of only a few months.

3 - Stabilisation

It is possible to stabilise Vinegar Syndrome in several ways, but it is extremely important to isolate any affected film from other 'good' film as soon as the syndrome is first detected.

Stabilisation is at best a short-term solution, often involving some expense. Film may be placed in a humidity controlled refrigerator or freezer to lessen the effect of deterioration, or a commercial substance such as 'Molecular Sieves', may be placed inside cans holding affected film.

There are also many ways to lessen the odour, but these will not stop deterioration, and ultimately the film may not smell so bad, but it will be guaranteed un-runable.

To date nobody has come up with a conclusive answer to repairing film damaged by Vinegar Syndrome.

What has to be considered is finding a substance that acts as a plasticiser on Triacetate film base, without effectively laminating the whole film and making it un-showable because it can no longer be focused, due to the additional thickness of the film base caused by the plasticising agent

4 -Treatment

In several years of running a small film archive and theatre in Queensland, where temperature and humidity vary dramatically, the Vinegar Syndrome problem was certainly prone to damage prints easily. Although cold storage was a viable option for us, it did nothing about keeping the film in a useable condition.

After much experimentation on film that had the Vinegar Syndrome and was not considered valuable enough to preserve, a solution was found that not only halts the current outbreak of the syndrome, but repairs the damage done to the film as well.

Experimentation was limited to treating effected film with a substance that we were confident would act as a plasticiser on the substrate, coupled with an agent to lessen the smell during the healing process.

The early work was promising, but did not appear to be a permanent solution, with Vinegar Syndrome re-appearing after some 4 to 6 months of initial treatment. Careful microscopic investigation of the emulsion showed that although old holes caused by the acetic acid breakthrough had healed, new holes had formed, seemingly next to the repaired holes.

Slight changes were made to the plasticiser base material, ensuring a higher degree of purity in its manufacture.

Treatment is simple, effective and long lasting, although it is not a permanent solution, with some prints reacting more favourably than others in terms of how long the treatment lasts. Certainly some prints, in fact the vast majority, showing no recurring symptoms after periods of up to two years.

The treatment may be safely reapplied to films over long periods without any damage to the film being caused by Liquid Film Plasticiser.

'Liquid Film Plasticiser' is on the market in 25ml bottles fitted with an eye-dropper for ease of application. Packed with full instructions, the Vinegar Syndrome Elimination Kit will have sufficient 'Liquid Film Plasticiser' to treat about ten full length 16mm features, or ten 2,000' spools of 35mm film. The cost of each repair kit is US\$40, posted Airmail to anywhere in the world, you can pay by Bid Pay, International Money Order or Bank Cheque, or within Australia only, by personal Cheque, Money Order, or C.O.D. Postage.

The kit is available only from:

The Redcliffe Picture Palace
151 Sutton Street
Redcliffe, Queensland
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