

Platter Patter

Platters - you either love 'em or hate 'em. Once the film is carefully "made up" or spliced on the platter, little attention is needed. When things go wrong, all hell breaks loose. Simple problems like an out-of-frame splice are easy to understand, find, and fix. The sources of dirt buildup or print scratches are harder to pinpoint, but usually have a well-defined cause.

Other problems like "brain wrap", "static cling", and "platter fling" are more elusive, and strike when least expected. The industry has recently converted to the use of print films with a polyester base. It is more durable with high tensile strength which makes it resist tearing. These features have virtually eliminated perforation damage and film breaks. But, it is more prone to causing static charges if the film jams or fails to feed properly, and the tensile strength can be a liability.

Static Problems

The first wide-scale reports of "static cling" were in the Winter of 1995, with the release of *The American President*. Static caused laps of film feeding from the inside of the feed roll on the platter to stick together. This either caused a film jam as extra laps were pulled into the "brain" or the platter speed to gyrate wildly, sometimes throwing the film off the platter ("platter fling"). Most of those problems did not happen to involve Kodak film, however we saw it as an industry problem. Our recommendations include maintaining 50 to 60 percent relative humidity in the booth, treating non-conductive platter surfaces and rollers with topical anti-stats like Static Guard spray, and properly grounding equipment. Platter manufacturers subsequently modified designs to include more conductive surfaces and more of a "twist" as the film leaves the feed roll and tension-sensing fail-safes.

Those measures helped but didn't resolve all of the issues. Static attracts dirt. It can also cause annoying shocks. Unprocessed color print stock was protected by a very conductive carbon "rem-jet" layer that prevented static buildup and marking during high-speed printing in film laboratories. The opaque black rem-jet was removed during processing, leaving the processed prints with essentially no conductivity to dissipate static charge. Kodak and other film manufacturers independently were developing polyester print films with transparent conductive anti-static backside coatings that would stay on the film to provide static protection, even after processing. These "process-

surviving anti-stats" successfully controlled static in film labs. They also reduced dirt attraction in theatres, but we realized something more was needed to control the subtle "static cling" that can occur between film laps on platters.

Kodak Helps Reduce "Static Cling"

Kodak refined the formulation of its proprietary anti-static backing technology when the company developed its new generation of Kodak Vision color print films in 1998. We also developed an anti-static process additive that labs can add to the final wash in the print film process. Kodak began providing this additive to film laboratories around the world in early 1999. It provides the same benefits with all print films.

Since these two steps were taken, reported incidents of "static cling" have decreased substantially.

"Platter Fling"

"Platter Fling" is generally caused by gyrations in speed due to static cling or the film roll getting off-center and causing the platter to speed up and throw the roll. It usually happens on the last reel, a few minutes before the end of the movie, when there is little film left on the platter. The solution is to restrain the outside of the feed roll, so it stays centered on the platter. At least six suction- cup platter clips or adhesive film retainers (e.g., Teco "Stick-A-Poo") should be used, evenly spaced around the roll. Another tactic is to use a restraining ring around the roll -- a plastic "Hula Hoop" serves well for smaller features, or a ring can be made out of a section of heavy duty garden hose or flexible plastic pipe. Never tape the end of the film (it may jam), and don't simply tuck the film end under the roll (it will make it more likely to slide). It's always a good idea to add extra tail leader, if only to keep the last few frames of picture from dragging on the floor as the platter runs out.

Winding Problems

Sometimes the print does not wind evenly on the platter. The roll may cone or dish away from the platter surface, or it may take on the shape of a polygon, rather than a perfect circle (aptly called "spoking"). These effects are often due to excessive film curl or improper winding tension. At very low humidity the film's gelatin emulsion loses enough moisture to the dry air to temporarily shrink, causing the film to cup-in toward the emulsion. When excessive, this "positive curl" can pre-vent the film from winding evenly, and can even cause scratches when the image area of the curled film comes in contact with the center of undercut rollers and guide bars.

Ideally, film should lie nearly flat, with only a slight amount of positive curl. This usually is achieved by maintaining the recommended relative humidity of 50 to 60 percent RH. A simple guide is to observe a short clip of film that has acclimated to the projection room--it should lie nearly flat, with only a very small amount of positive curl. If the film curls in toward the emulsion by more than a few millimeters, raise the relative humidity, but not over 60 percent, as excessive moisture can make the gelatin emulsion soft and sticky.

Uneven winding and "spoking" are also affected by winding tension, and how the film is guided onto the take-up roll. Use just enough tension to wind a tight roll, and be sure guide rollers are positioned properly, so the film winds evenly, without riding up on itself, or rubbing flat on the platter.

Winding Orientation

Winding orientation (emulsion-in or emulsion-out?) can affect winding quality, "static cling" propensity, and focus performance. Film with a slight amount of positive curl bends easier in towards the emulsion, so it may be more likely have an extra lap pull in due to static cling when it is wound emulsion-in toward the "brain" of the platter (soundtrack side down). Film that is essentially flat, or even has some negative curl (high moisture content) may be more prone to pull in if it is wound base-in (soundtrack side up). If "static cling" is a problem, changing the winding orientation may help. For optimum focus performance (reduced focus flutter), emulsion-in winding orientation is specified by SMPTE Recommended Practice RP39, but this applies mostly to situations where the roll has a much smaller diameter than on a platter, where "core set" is less of an issue. When winding film on cores or reels, the film should be wound emulsion-in, but on a platter, use the orientation that gives the best winding and pay-out.

Platter Scratches

A common source of print scratches from platter operation is when the film is not guided properly onto the take-up roll. If the film is guided too low onto the platter as it winds, the image area may rub against the surface of the platter as it rotates. Rough spots or burrs on the platter surface can scratch the image, causing a characteristic horizontal or slightly diagonal scratch. This can be avoided by carefully positioning the guide rollers of the make-up table and the platter column, and periodically checking the platter surface and rollers for burrs and rough spots.

If guide rollers are mispositioned, scratches can be caused by the film riding onto the flange of the rollers. This is important with gimbaled rollers that guide the film into the projector, and back to the platter. Always double-check to make certain that the film is riding "true" on the rollers. Longitudinal scratches can some-times be caused if the film pulls-in on undercut rollers or guide bars. Excessive curl (very dry conditions) or excessive tension are possible reasons. These problems are minimized by keeping the relative humidity between 50 and 60 percent, and keeping rollers free of burrs and rough spots.

Dirt Buildup

Because they eliminate the need for rewinding, and reduce film handling, platters generally help reduce dirt buildup on the print. Most dirt is picked up on the head and tail of the print, where the film may drag on the dirty floor during threading or run-out. The extra handling around splices may also introduce dirt, especially if the film is not handled properly. Always keep the print (even leader) off the floor and from contact with any surface during splicing, make-up, or threading. Handle film by the edges only, ideally using lint-free film-handlers gloves. Use high-quality splicing tape and trim splices carefully to avoid sticky areas around splices that can attract dirt, and even cause the film to stick together and jam.

On-line film cleaners should be used to remove any buildup of loose dirt from the print each time it is shown. Particle Transfer Roller (PTR) film cleaners are especially effective and economical. PTR film cleaning rollers are made of soft polyurethane that has a slightly sticky surface that removes dirt from the print without scratching. The PTR film cleaning rollers can easily be washed to remove any dirt buildup, and reused again and again. FPC, a Kodak subsidiary, sells PTR film cleaning rollers.

Prints made on Kodak Vision color print film should stay much cleaner because of the anti-static backing, but a clean booth and proper film handling are still recommended.

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