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RP 39-1993
Revision of RP 39-1970

# SMPTE RECOMMENDED PRACTICE

# Specifications for Maintaining an Emulsion-In Orientation on Theatrical Release Prints



## Introduction

As the result of investigational work by members of the Society, a paper was published in the June 1965 issue of the SMPTE Journal, *Effect of Winding on the Projection Performance of 35mm Motion-Picture Film*, documenting the improvement in screen image quality to be gained when theatrical release prints are wound, used, and stored consistently in an emulsion-in orientation. Other advantages include minimal focus drift and a much lower tendency toward flutter and in-and-out of focus.

It is recognized that many details of the projection process can influence screen image quality, and that the print winding procedures are but one part of this process. On the other hand, prints normally circulate through a large number of theaters and maintenance of the film in good condition has always been a responsibility shared among many. Therefore, it is proposed to describe this element of good projection in a recommended practice so that it can be more widely utilized, and its advantages added to the many other beneficial practices that can be independently controlled in each theater.

The specifications mentioned herein are designed to provide a simple and smooth transition from the traditional emulsion-out handling to the recommended emulsion-in orientation and its advantages.

## 1 Scope

**1.1** This practice specifies the necessary handling changes in the laboratory, film exchange, and projection room to achieve the emulsion-in orientation of theatrical release prints.

**1.2** The practice also describes the advantages to be gained by the change to emulsion-in orientation of theatrical release prints.

**1.3** The practice further discusses the consequences of returning to the emulsion-out orientation during the exhibition life of theatrical release prints.

**1.4** The practice suggests, in the annex, the various minor modifications that might be necessary in equipment used for projection, film rewind, and film inspection.

## 2 Definitions

**2.1 emulsion-in:** When the film is examined on the reel, the emulsion side of each lap faces toward the hub of the reel.

**2.2 emulsion-out:** When the film is examined on the reel, the emulsion side of each lap faces toward the rim of the reel.

**2.3 current procedures:** This practice represents a change from the common U.S. practice of having the projector supply reel emulsion-out, the projector take-up reel emulsion-in, and in the rewinding, converting to emulsion-out. This practice specifies that the film be kept emulsion-in throughout its processed life.

## 3 Description

The following procedures are recommended if maximum benefit is to be derived from the proposed change in release print winding orientation:

**3.1** The release print must be wound emulsion-in at the first winding after processing, and must be wound emulsion-in every time thereafter. A single winding in the emulsion-out orientation, even briefly, will reduce the benefits very noticeably.



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**3.2** Specifically, the release print film should be wound emulsion-in on standard cores, as it exists from the processing machine. The emulsion-in orientation should be maintained when the new print is mounted onto shipping reels at the film exchange. Any subsequent handling of the release print in the film exchange, whether for inspection or rewind, should also be in the emulsion-in orientation only.

In the projection room, the film reel should be loaded in the upper projector magazine so that the film will come from the front of the reel in a clockwise rotation. It should be emulsion-in on the take-up reel (as is now common practice). During rewinding, the film should be wound from top to top, or bottom to bottom, to maintain the emulsion-in orientation.

## 4 Objective

**4.1** Data and experimentation have shown that when a reel of print film has been maintained in an emulsion-in orientation from the time it was originally processed, its behavior during projection and the resultant screen image quality are greatly improved. There is a negligible amount of focus drift, and a much lower tendency toward flutter and in-and-out of focus.

**4.2** If the print film should inadvertently be wound emulsion-out, its physical properties quickly revert to the current level of performance in evidence now, and its projection properties and screen image quality would become the same as if the film had never been wound emulsion-in.

**4.3** Unless the film is wetted and dried, as by reprocessing, the disadvantages of even a single emulsion-out winding are self-correcting only over a long period of many weeks.

**4.4** The benefits derived from emulsion-in winding, however, should not be minimized. It should be stressed that the increase in screen image quality is a significant one, particularly in large, first-run theaters.

**4.5** A complete changeover to the emulsion-in winding orientation of release prints by the motion-picture industry would be a formidable task. The breaking of deeply ingrained film-handling habits would not be easy to accomplish. It is hoped, however, that the recommended emulsion-in winding orientation will be accepted by leaders in the industry, and that this will become the first step toward the eventual complete changeover.

**Annex A** (informative)
**Additional data**

**A.1** In some projection equipment, it may be necessary to make minor modifications in the upper film magazine to accommodate the new clockwise rotation. Before changes are made in the mechanical parts of projectors, local municipal fire codes must be checked to determine that such changes are not inconsistent with the requirements of applicable law. If the modification of the upper film magazine on the projector has necessarily eliminated the valve rollers, the back wall of that magazine must contain a label or decal specifying the current Underwriters Laboratories requirements and also a warning against the use of flammable films in the modified equipment. Since there is the possibility of abrasion as the film enters the upper valve rollers from a different angle, some projector manufacturers have made available a simple conversion kit for providing the proper film guidance at that location. It is also feasible to install a small roller just above the valve rollers to accomplish the same objective.

For those installations which have reel-end alarms, a kit is available for making the proper modifications to clockwise rotation. Reel alarm systems are also available for clockwise use.

**A.2** Projection rooms which are using commercial automatic rewind systems that will not allow top-to-top rewinding without causing film abrasion against the outer case, can modify their equipment by installing a flanged, undercut idler roller just beneath the case obstruction. Another method, which may be more expedient, is to introduce a twist in the film and rewind in the previously accustomed manner.

Commercial, foot-operated power rewinds, which are employed in some film exchange facilities, can be used without modification if there is no need to wind in both directions. Under present conditions, utilizing the emulsion-out winding orientation, it is possible to wind in both directions under power. Inspection of these units has indicated that the reversal of the motor rotation in the film reel magazine on the left side of the unit would provide the necessary modification to allow power wind in both directions.