RP 20-2003
Revision of RP 20-1995

SMPTE RECOMMENDED PRACTICE

Specifications for 16-mm Registration Test Film

1 Scope

1.1 This practice specifies the subject material and the dimensions and location of the subject material for a 16-mm test film of high accuracy to assist the user in achieving several quantitative visual tests (see annex A.1.)

1.2 The film can be used to test motion-picture projectors and printers.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

ANSI/SMPTE 109-1998, Motion-Picture Film (16-mm) — Perforated 1R and 2R

SMPTE 7-1999, Motion-Picture Film (16-mm) — Camera Aperture Image and Usage

SMPTE 233-2003, Motion-Picture Film (16-mm) — Projectable Image Area and Projector Usage

3 Dimensions

The dimensions and location of the target areas shall be as specified in the figures. The patterns in figures 3 and 4 appear in the nine circular areas of the test pattern shown in figures 1 and 2.

4 Description

4.1 The test film shall be produced as a camera original film photographed on high-contrast, high-definition, positive-type motion-picture stock made in accordance with ANSI/SMPTE 109.

4.2 The diffuse density of the background area shall be 1.80 ± 0.10.

4.3 The camera and projector image areas shall be in accordance with SMPTE 7 and SMPTE 233.

4.4 The resolution targets shall be photographed in a magnification which results in the concentric rings reading in lines per millimeter on the film (20, 30, 40, 50, and 60). The rosette in the center shall indicate a measurement from 60 to 240 lines per millimeter (see annex A.6).

Approved
October 20, 2003

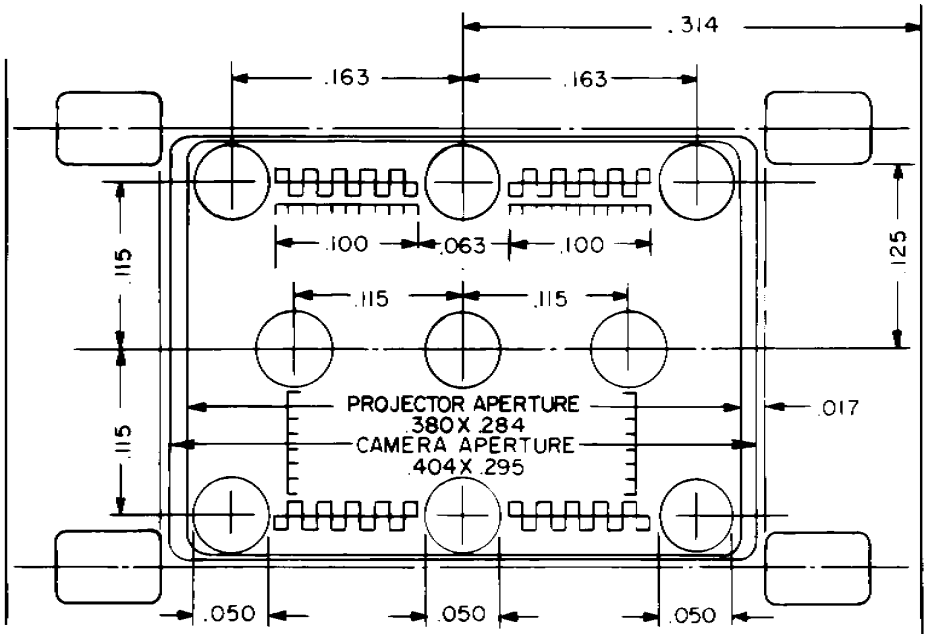

Figure 1 – Test pattern

Figure 2 – Reproduction of test pattern

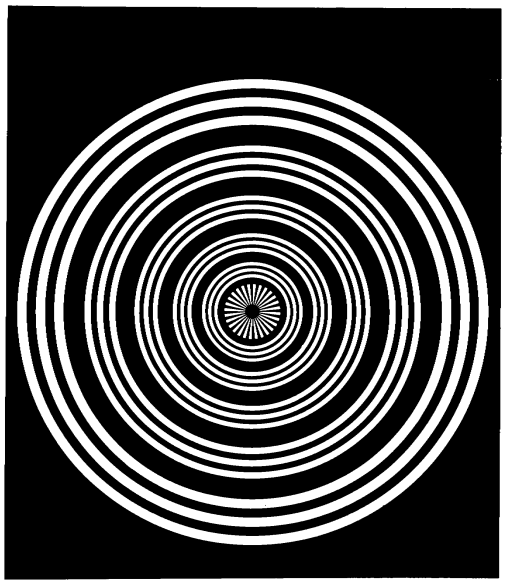

Figure 3 – Enlargement of target area

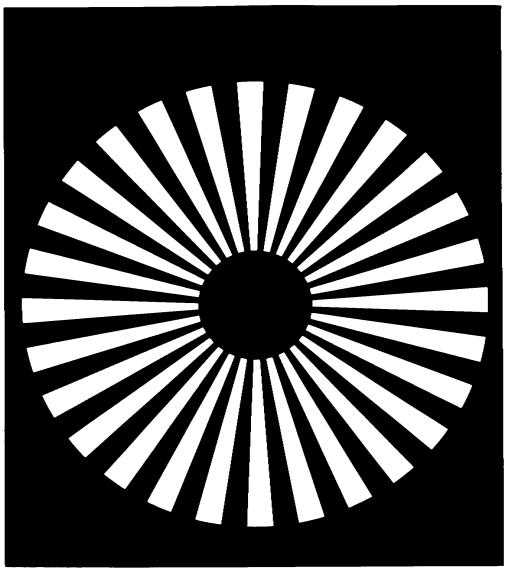

Figure 4 – Enlargement of rosette

Annex A (informative)
Additional data

A.1 Visual tests

The following quantitative visual tests can be performed:

Tests	Projector	Printer		
		Contact		Optical
		Continuous	Step	Step
Steadiness (jump and weave)	X	X*	X	X
Aperture alignment	X	X	X	X
Double-exposure alignment		X	X	X
Shutter adjustment (travel ghost)	X			X
Framing accommodation	X			X
Focus X				X
Resolution X		X	X	X
Field flatness	X	X	X	X

*The perforation pitch of the test film is not optimum for continuous contact printers and its value for this purpose may be limited.

A.2 Magnification

If the image of the test film target is projected to 30 in × 40 in (762 mm × 1016 mm), it will be enlarged 100 times.

A.3 Jump and weave

The triangular areas in the centers of the vertical and horizontal framelines can be used to measure jump and weave and aperture misalignment. Each line in these areas is 0.001 in (0.03 mm) wide. The lines are spaced 0.001 in (0.03 mm) apart.

A.4 Aperture centering and size

The inner rectangle represents the nominal projectable area. The horizontal and vertical scales have least divisions of 0.001 in (0.03 mm). They provide useful information when film is double-exposed in a printer to check registration.

A.5 Travel ghost

The white blocks are 0.010 in (0.25 mm) square and will quickly indicate travel ghost caused by incorrect shutter adjustment. They also provide a quick check on the ability to frame above and below center position. Travel ghost is a blurring effect seen on the screen and evidenced by vertical tails or light streaks added to the projected images of the more transparent areas on the test film. It is caused by the projector shutter being out of synchronism with the intermittent mechanism. If the ghost is above the blocks, the shutter closes late; if the ghost is below the blocks, the shutter opens early.

A.6 Resolution

Resolving power in lines per millimeter can be read directly from the test target to the limit permitted by the film stock used. Resolution targets are spaced one in the center, four equidistant from the center, and one in each of the four corners. The outside diameter of the target on the film is 0.050 in (1.27 mm) and will fill the area covered by an average microscope using a 10X objective (see 4.4).

A.7 Field flatness

Side-to-side out-of-focus is determined from the difference in softness of the sides. Quantitative differences can be determined from resolution charts. Circle charts at the middle of the field permit quick focus adjustment and detection of in- and out-of-focus effects.

A.8 Striping

The user may apply magnetic record and balance stripes to this film by post-process means. If this is done, the dimensions of the film image should be checked to determine if change has been produced by the striping process. It is anticipated that striping will not significantly affect the performance of the test film. However, the user is cautioned that the proximity of the film image to the limiting aperture may be altered due to striping thickness. Also, the frictional characteristics of the test film may be changed, which could affect film transport in the user's apparatus.