STANDARDS ADOPTED

by

THE SOCIETY OF MOTION PICTURE ENGINEERS

January 1928

DIMENSIONAL STANDARDS

for Cutting, Splicing, and Perforating
Motion Picture Film,
and
For the Apertures, Projection Lens Diameters, and Sprockets of
Motion Picture Projectors.

Also

RECOMMENDED PRACTICE

in the Taking and Projection of Motion Pictures

The Society of Motion Picture Engineers

Its Aims and Accomplishments.

THE SOCIETY was founded in 1916, its purpose as expressed in its constitution being, "advancement in the theory and practice of motion picture engineering and the allied arts and sciences, the standardization of the mechanisms and practices employed therein, and the maintenance of a high professional standing among its members."

The Society is composed of the best technical experts in the various research laboratories and other engineering branches of the industry in the country, as well as executives in the manufacturing and producing ends of the business. The commercial interests also are represented by associate membership in the Society.

The Society holds two conventions a year, one in the spring and one in the fall, the meetings being generally of four days' duration each, and being held at various places. At these meetings papers are presented and discussed on various phases of the industry, theoretical, technical, and practical. Demonstrations of new equipment and methods are also often given. A wide range of subjects is covered, and many of the authors are the highest authorities in their distinctive lines.

The papers presented at the convention together with the full discussions are printed as Transactions after each meeting. These Transactions form the most complete technical library in existence of the motion picture industry. They are sent to each member of the Society and may be obtained by non-members at a very nominal sum,

From the Hon. Secretary:

L. C. PORTER

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PERMANENT MAILING ADDRESS
Engineering Societies Building
29 West 39th St., New York, N. Y.

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SOCIETY OF MOTION PICTURE ENGINEERS

DIMENSIONAL STANDARDS

1. Dimensions of Newly Cut and Perforated Film.

a. Standard 35 mm negative film

The dimensions for this material are shown in chart No. 1.

b. Standard 35 mm positive film

The dimensions for this material are shown in chart No. 2. It will be noted that two forms of perforation may be used with this material, both forms being recognized as standard by the Society.

c. Safety standard 28 mm positive and negative film

The dimensions for these materials are shown in chart No. 3.

d. Standard 16 mm positive and negative film

The dimensions for these materials are shown in chart No. 4.

2. Frame Line.

a. Standard 35 mm film

The frame line shall be half way between two successive perforations on each side of the film.

b. Safety standard 28 mm film

The center of the frame line shall pass through the center of a perforation on each side of the film.

3. Film Splicing Specifications.

Standard dimensional specifications for the making of film splices for laboratory and exchanges are given in chart No. 5.

4. Lantern Slide Mat Opening.

3.0 inches (76.20 mm) wide
by
2.25 inches (57.15 mm) high.

5. Motion Picture Projector Sprockets.

a. Take-up sprocket

The take-up sprocket which is a hold back sprocket on a motion picture projector, should be designed to have the same pitch as the perforations on film which has shrunk to the maximum amount occurring in films of commercially useful condition as supplied by exchanges. This value of shrinkage is taken as 1.5% and the dimensions of the standardized take-up sprocket are computed accordingly.

The essential dimensions are: Base diameter 0.9321 inches (23.67 mm). Tooth thickness (at base) 0.050 inches (1.26 mm).

Other dimensions of the standard take-up sprocket are given in chart No. 6.

b. Intermittent and feed sprockets

The intermittent and feed sprockets should be designed to have the same pitch as the perforations on newly processed film which is 0.13% less than the pitch of newly cut and perforated film, see charts 1 and 2.

The dimensions of the standard intermittent and feed sprockets are computed to conform to these requirements.

The essential dimensions are: Base diameter 0.9452 inches (24.01 mm). Tooth thickness (at base) 0.050 inches (1.26 mm).

Other dimensions of the standard intermittent and feed sprockets are given in chart No. 7.

6. Dimensions of Motion Picture Projection Aperture.

a. Standard 35 mm film

Width 0.9060 inches (23.01 mm).
Height 0.6795 inches (17.26 mm).

b. Safety standard 28 mm film

Width 0.748 inches (19.00 mm).
Height 0.551 inches (14.00 mm).

7. External Diameter of Projection Lenses.

a. No. 1 Projection Lens

External diameter of lens barrel $2\frac{1}{32}$ inches (51.59 mm).

b. No. 2 Projection Lens

External diameter of lens barrel $2\frac{23}{32}$ inches (70.65 mm).

RECOMMENDED PRACTICE

1. **Aperture Size.**

   The existing ratio of 3 to 4 between height and width of picture should be retained when introducing any new size of film.

2. **Leaders and Trailers.**

   These should be opaque with markings embossed on them. In a multiple reel story each trailer and the leader immediately following should be marked with the same title.

3. **Thumb Mark.**

   The thumb mark on a lantern slide should be located in the lower left hand corner next to the reader when the slide is held so that the slide can be read normally against the light.

4. **Take-Up Pull.**

   This should not exceed 15 ounces at the periphery of a 10 inch reel, or 16 ounces on an 11 inch reel.

5. **Projection Lens Height.**

   The standard height from the floor to the center of the projection lens of a motion picture projector should be 48 inches.

6. **Projection Angle.**

   This should not exceed 12 degrees.

7. **Standard Observation Port.**

   This should be 16 inches (40.6 cm) square with its center 5 feet 3 inches (160 cm) above the floor when the projection angle is zero, the center of the aperture to be lowered 1 inch (25.45 mm) for each one degree drop in angle of projection.

8. **Projector Speed.**

   The standard practice should be the projection of 80 feet of standard film per minute with a maximum of 85 feet and a minimum of 75 feet.

9. Camera Cranking Speed.

A camera taking speed of 60 feet of standard film per minute with a minimum of 55 feet and a maximum of 65 feet should be used when normal action is desired, in connection with the Society of Motion Picture Engineers' recommended practice of 80 feet per minute projection speed.

10. Projector Lens Mounting.

The projector lens should be mounted in such a manner that light from all parts of the aperture shall have an uninterrupted path to the entire surface of the lens.

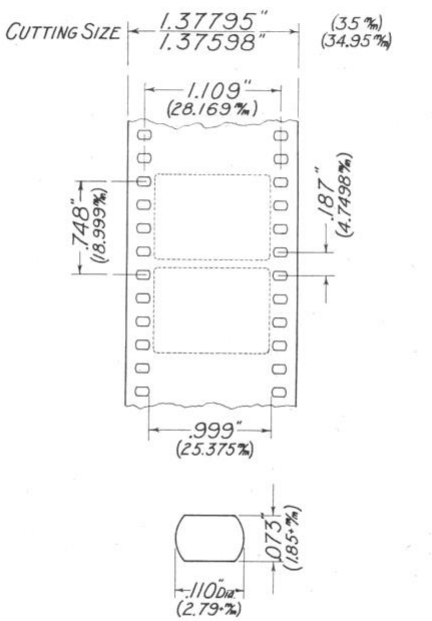
11. Projection Lens Focal Length.

The focal length of motion picture projection lenses should increase in $\frac{1}{4}$ inch steps up to 8 inches and in $\frac{1}{2}$ inch steps from 8 to 9 inches.

12. Projection Objectives, Focal Markings.

Projection objectives should have the equivalent focal length marked thereon in inches and quarter and halves of an inch, or in decimals, with a plus (+) or minus (−) tolerance not to exceed 1 per cent of the designated focal length also marked by proper sign following the figure.

STANDARD 35 M/M NEGATIVE FILM



CUTTING & PERFORATING SIZE.

CHART 1

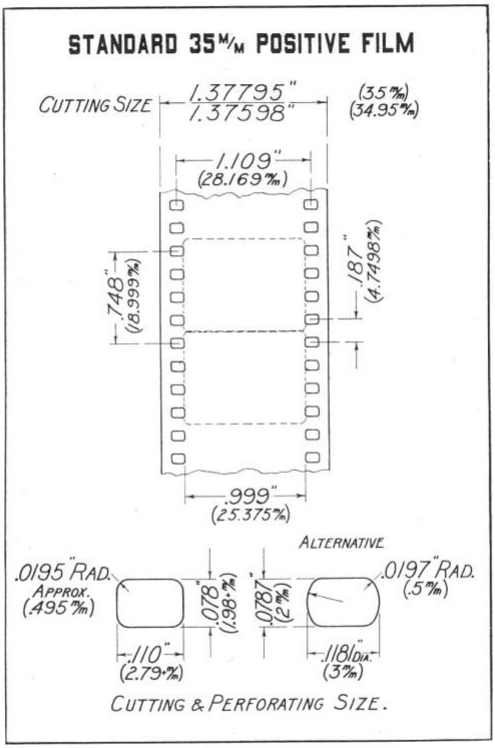
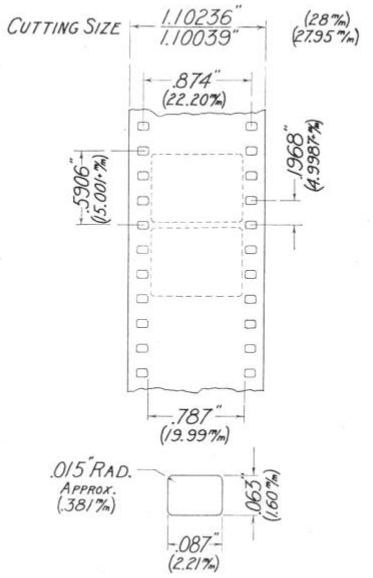

STANDARD 35M/M POSITIVE FILM
CUTTING SIZE
1.37795"
1.37598"
(35%)
(34.95%)
1.109"
(28.169%)
.748"
(18.999%)
.187"
(4.7498%)
.999"
(25.375%)
ALTERNATIVE
.0195" RAD.
APPROX.
(.495%)
.078"
(1.98%)
.0787"
(2%)
.0197" RAD.
(.5%)
.110"
(2.79%)
.1181" DIA.
(3%)
CUTTING & PERFORATING SIZE.

CHART 2

SAFETY STANDARD
28 M/M POSITIVE & NEGATIVE FILM



CUTTING & PERFORATING SIZE.

CHART 3

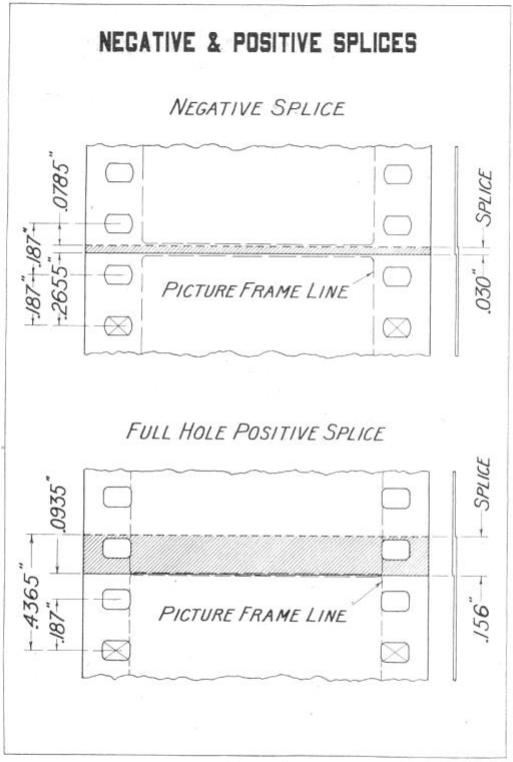

NEGATIVE & POSITIVE SPLICES
NEGATIVE SPLICE
.0785"
.187"
.187"
.2655"
PICTURE FRAME LINE
SPLICE
.030"
FULL HOLE POSITIVE SPLICE
.0935"
.4365"
.187"
PICTURE FRAME LINE
SPLICE
.156"

CHART 5

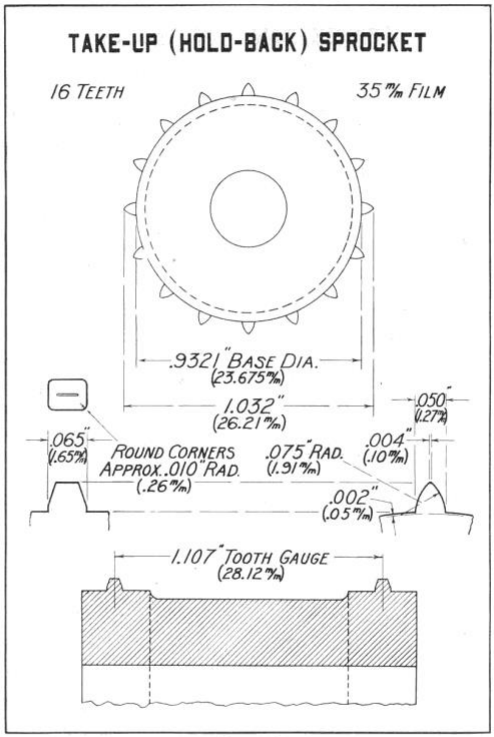

TAKE-UP (HOLD-BACK) SPROCKET
16 TEETH
35 m/m FILM
.9321" BASE DIA.
(23.675 m/m)
1.032"
(26.21 m/m)
.050"
(1.27 m/m)
.065"
(1.65 m/m)
ROUND CORNERS
APPROX. .010" RAD.
(.26 m/m)
.075" RAD.
(1.91 m/m)
.004"
(.10 m/m)
.002"
(.05 m/m)
1.107" TOOTH GAUGE
(28.12 m/m)

CHART 6

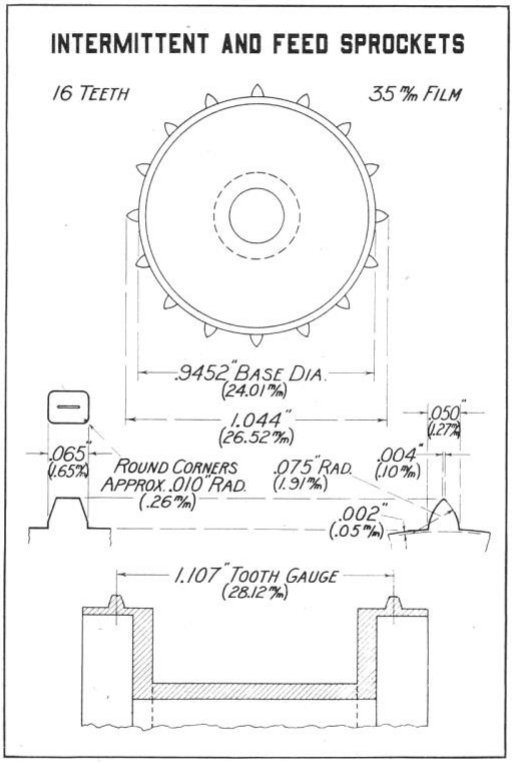

INTERMITTENT AND FEED SPROCKETS
16 TEETH
35 m/m FILM
.9452" BASE DIA.
(24.01 m/m)
1.044"
(26.52 m/m)
.050"
(1.27 m/m)
.065"
(1.65 m/m)
ROUND CORNERS
APPROX .010" RAD.
(.26 m/m)
.075" RAD.
(1.91 m/m)
.004"
(.10 m/m)
.002"
(.05 m/m)
1.107" TOOTH GAUGE
(28.12 m/m)

CHART 7

QUALIFICATIONS FOR MEMBERSHIP

ACTIVE MEMBER—An Active member shall not be less than 25 years of age and shall be:

(a) A motion picture engineer by profession. He shall have been in the practice of his profession for a period of at least three years and shall have taken responsibility for design, installation, or operation of systems or apparatus pertaining to the motion picture industry.

(b) A person regularly employed in motion picture or closely allied work, who by his inventions or proficiency in motion picture science or as an executive of a motion picture enterprise of large scope, has attained a recognized standing in the motion picture art. In the case of such an executive, the applicant must be qualified to take full charge of the broader features of motion picture engineering involved in the work under his direction.

ASSOCIATE MEMBER—An Associate member shall not be less than 21 years of age and shall be:

A person who is interested in or connected with the study of motion picture technical problems or the application of the same.

When, in the judgment of the Board of Governors, an applicant is not suited for the grade of membership for which he has applied, but is eligible to the other grade of membership, the applicant shall be so notified by the Secretary and shall be given the opportunity of changing his application accordingly.

No application shall be approved by the Board of Governors until they have satisfied themselves of the fitness of the applicant.

Applications should be mailed to the Chairman of the Membership Committee or to the Secretary. When the applicant is accepted for membership by the Board of Governors he will be so notified, in writing, by the Secretary.

All checks should be made payable to SOCIETY OF MOTION PICTURE ENGINEERS.

ENTRANCE FEES AND DUES

The entrance and transfer fees, payable on admission to the Society, or upon transfer, are as follows:

Admission to grade of Active member	$30.00
Admission to grade of Associate member	$20.00
The transfer fee from Associate to Active grade is the difference between the admission fee, or	$10.00

The annual dues are as follows:

For Active members	$20.00
For Associate members	$10.00

REFERENCES

Applicants shall give references to the members of the Society as follows:

For grade of Active .....Two (2) Active members.

For grade of Associate....One (1) Active member.

References should be named who have personal knowledge of the Applicant's experience. It is suggested that Applicants give more than the required number of references.

FORM 7001-B 12-15-29

PRINTED IN U. S. A.