standards and recommended practices

Draft American National Standards

Three Draft American National Standards are published here for a trial period and public review.

PH22.10, Specifications for Projector Usage of 16 mm Motion-Picture Film, is a revision of the 1964 issue which has been expanded to include the information originally specified in PH22.16-1965, Specifications for Projector Usage of 16 mm Motion-Picture Film Perforated One Edge. The combined document does not reflect a technical change but has been written to facilitate its use.

PH22.183, Method of Measuring Modulation Factor of Photographic-Type Sound Level Motion-Picture Test Films, specifies a new and simple procedure for calibrating photographic sound records. The procedure is based upon the use of a scanning-beam chopper to produce the output voltage signal required for level calibration which is then compared to the signal produced by the sample under test.

PH22.184, Motion-Picture Raw Stock Identification and Labeling, was developed by the Society's Film Dimensions Committee in an effort to standardize the information which should be included by the manufacturer of motion-picture raw stock to cover the physical specifications and packaging characteristics.

Comments on these proposals should be addressed to Alex E. Alden, Staff Engineer, at Society Headquarters before December 1, 1972. The proposals have been submitted to American National Standards Committee PH22. Consequently, all comments received through *Journal* publication will be reviewed prior to conclusion of action by the Committee.

Proposed SMPTE Recommended Practice

A Proposed SMPTE Recommended Practice is published here for a trial period and public review. RP 49, Leaders for Preprint Material Used in the Manufacture of 8 mm Prints Intended Solely for 8 mm Type R or S Cassettes and Cartridges for Nontelevision Use, was developed by the Society's 16 & 8 mm Committee to specify a modification of the Universal Leader by providing additional black frames for use in projector cartridges.

Comments on the proposal should be addressed to Alex E. Alden, Staff Engineer, at Society Headquarters prior to December 1, 1972. If no adverse criticism is received by that date, the Proposed SMPTE Recommended Practice will be submitted to the Board of Governors for final approval.

Proposed Withdrawal of SMPTE Recommended Practice

Inasmuch as the data specified in the practice are now duplicated in SMPTE Recommended Practice RP 27.3-1972, Specifications for Safe Action and Safe Title Areas Test Pattern for Television Systems, the Standards and Television Committees have agreed to withdraw SMPTE Recommended Practice RP 8-1968, Safe Action and Safe Title Areas for Television Transmission.

If no adverse criticism of this proposed action is received by December 1, 1972, the recommendation for withdrawal will be submitted to the Board of Governors for final approval.

Approved International Recommendation

IEC Publication 347 is the newly published International Electro Technical Commission (IEC) standard for transverse track (quadruplex) video tape recorders. It has been prepared by IEC Subcommittee 60B-Video Recording, a subcommittee of Technical Committee 60-Recording. Preparation of the document began at the first meeting of SC 60B, held in Paris in March, 1969. Further contributions and refinements were made at meetings of SC 60B held in Baden Baden, Germany (1970) and Oslo, Norway (1971). Representatives of the USA have participated in each of the meetings of SC 60B, including the 1972 gathering held in Florence, Italy, in March, 1972. The main USA input to the work of SC 60B has been through SMPTE. More specifically, Alex Alden, SMPTE Staff Engineer, is Technical Advisor to the USA National Committee for IEC SC 60B. Mr. Alden has appointed an ad hoc group to advise him on video recording matters, made up of members of the American National Standards Institute (ANSI) C98 Committee, the SMPTE Engineering Committee on Video Tape Recording, and the SMPTE Vice President for Engineering.

As is well known, the ANSI C98 standards sponsored by SMPTE for the 525 line television system were the first standards prepared anywhere in the world for quadruplex video tape recording systems. The engineering work necessary for preparation of the C98 documents has been the responsibility of the SMPTE VTR Committee since 1958. The content of existing and proposed C98 American National Standards is contained in IEC Publication 347. No conflicts are known to exist between the IEC publication and the C98 documents. On the contrary, both the work of preparing updated revisions of the existing body of C98 documentation within the SMPTE VTR Committee, and the preparation of IEC Pub. 347 have progressed together in tandem for the past 4 years.

With regard to the standards for 625 line television systems specified in Publication 347, the primary basis for the IEC work was the 1968 EBU specification for recording systems to be used with 625 line systems. The EBU specification, in turn, was largely derived from the original SMPTE work as reflected in C98 documentation.

Publication 347 represents the best thinking of experts from many parts of the world and is a milestone in the international standardization of video tape recording systems.

The Chairman of SC 60B is J. Roizen (USA) and the Secretary is Chas. Akrich (France). USA representatives to the various meetings of SC 60B have included C. E. Anderson (Ampex Corp.), F. Faist (ABC Television Network), A. Luther (RCA Corp.) and F. Remley (University of Michigan).

Copies of the document and other IEC and ISO standards are available from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

Approved Generic Terms for 8 mm Films

The recent development of the super 8 system initiated a need to standardize specific generic terms to positively differentiate between the two formats of films 8 millimeters in width. The Society, taking the recommendation of the 16 & 8 mm Committee, has standardized the terms *super 8* and *regular 8* for use in American National Standards and SMPTE Recommended Practices. For clarity in titles of standards and for optional use in the text, the ISO designators, *8 mm Type S* and *8 mm Type R* are equally applicable. The term *8 mm* without a modifier should be used only when there is a deliberate intent to include all films 8 millimeters in width, regardless of format. — A.E.A.

Draft American National Standard

Specifications for Projector Usage of 16 mm Motion-Picture Film

PH22.10

Revision and Consolidation of PH22.10-1964 and PH22.16-1965

1. Scope

This standard specifies the position of the emulsion and the rate of projection for 16 mm motion-picture film perforated one or two edges, and the projector thread-up distance between sound and picture for 16 mm motion-picture film with sound.

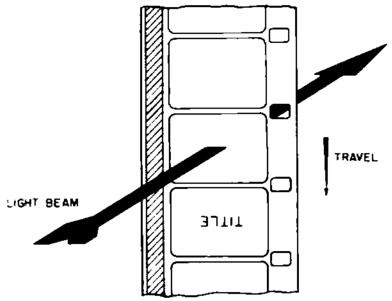
2. Emulsion Position

For original reversal film, the emulsion side shall be toward the projection lens. For prints, the emulsion position is dependent upon the process of preparation; however, the preferred position for most uses, including telecine, is also emulsion side toward the projection lens. (See Note below.)

3. Projection Rate

3.1 The rate of projection for film perforated two edges not used for sound shall normally be 18 or 24 frames per second, depending upon its intended use. Amateur films are usually photographed at 18 frames per second and should be projected at that rate. Professional films may be photographed at any rate from time lapse to high speed but are generally intended for projection at 24 frames per second, except when special study is desired.

3.2 The rate of projection for film containing a sound record shall be 24 frames per second for both photographic and magnetic sound, except for films photographed at 18 frames per second having post-process recorded magnetic sound which should be projected at 18 frames per second.



Film as Seen from the Light Source in the Projector

4. Relationship Between Sound and Picture

The projection thread-up path for motion-picture films containing a sound record, regardless of projection rate, shall place the sound-scanning point ahead (in the direction of film travel) of the center of the picture being projected. Counting the frame in the projector picture aperture as zero (0), the sound-scanning point shall be opposite the center of the 26th frame for photographic sound or the 28th frame for magnetic sound to accommodate film with sound, as specified in American National Standard Dimensions of Photographic Sound Record on 16 mm Motion-Picture Prints, PH22.41-1969, and Draft American National Standard Dimensions for Magnetic Sound Record on 16 mm Motion-Picture Prints (Revision of PH22.112-1958). If there is a significant distance between the average observer and the loudspeaker when the sound record is reproduced, the distance from the center of the projected aperture to the sound-scanning point may need to be shortened in the projector thread-up to bring the picture and sound into synchronization for the average observer (because of the slower rate of travel of sound compared to that of light). If the average loudspeaker-to-audience distance is greater than 50 feet, the projector thread-up distance between projected picture and sound scan should be shortened by one frame for each nominal 50 feet of distance from loudspeaker to average audience.

NOTE: When a relatively small number of prints is required, contact prints are often made from 16 mm original materials, resulting in the emulsion position toward the light source (contrary to Section 2). The majority of 16 mm release prints are printed by contact from a 16 mm intermediate or by reduction from a 35 mm intermediate in order to protect the originals. The resulting prints generally have the emulsion side toward the projection lens. This permits intercutting of prints and originals without requiring a change of focus during projection.

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Draft American National Standard

Method of Measuring Modulation Factor of Photographic-Type Sound Level Motion-Picture Test Films

PH22.183

1. Scope

This standard specifies a method of measuring the sound level of photographic test films in all motion-picture film formats, and the equipment needed to implement the method.

2. Definitions

2.1 Modulation Factor in a Sound Reproducer. In the calibration of a sound reproducer, the peak-to-peak amplitude of the output voltage resulting from the periodic interruption of the sound-scanning beam with an opaque shutter when there is no film in the optical path, shall be defined as a Modulation Factor of 1.00.

2.2 Modulation Factor of a Sound Test Film. The modulation factor of a sound test film shall be the ratio of that peak-to-peak output voltage obtained by reproducing its sine wave record on a calibrated reproducer, to the peak-to-peak amplitude which corresponds to a Modulation Factor of 1.00 in that sound reproducer (Section 2.1).

2.3 Maximum Modulation Factor of a Sound Test Film. The ratio of the peak-to-peak output voltage obtained by reproducing a fully modulated, unbiased track to the peak-to-peak amplitude which corresponds to a Modulation Factor of 1.00 in that sound reproducer. This Maximum Modulation Factor is a function of the film type, the printing-exposure process, the geometry of the recorder, the photographic processing and, at times, of other variables.

2.4 Percent Modulation in a Sound Recorder. In the calibration of a sound recorder, the maximum usable peak-to-peak amplitude of the recording light beam shall be defined as 100 Percent Modulation in the Recorder.

2.5 Percent Modulation of a Sound Test Film. It has been customary, in examining photographic sound records, to estimate by dimensional measurements on the variable-area records what modulation had been applied in the sound recorder. The ratio of the maximum modulated width of the recorded record, divided by the permissible modulated width as defined by the applicable American National Standard on positioning of the sound record, has been assumed equivalent to the Percent Modulation in the Sound Recorder, and is expressed in the same units (Section 2.4).

2.6 Interconversions of Terms. It is obvious that Modulation Factor of a Sound Test Film and Percent Modulation of a Sound Test Film, as defined in Sections 2.2 and 2.5, have different basic assumptions. Interconversions can only be made after the associated parameters have been determined quantitatively.

2.7 Calibration of Sound Test Films. The Modulation Factor of Sound Test Films is determined by comparison of the peak-to-peak voltage output of the sine wave test film, with the peak-to-peak output voltage from the scanning beam chopped by an opaque shutter. The waveform obtained in this calibration of the reproducer (Section 2.1) may vary between a square wave and a sine wave as limits, but a steep-sided trapezoidal waveform is preferred.

2.8 Calibration of a Reproducer Level Meter. The sine wave test film is in turn used to establish a reference level on a vu meter so that the complex waveform of actual program sound records can be compared to the level of the reference, the vu meter providing a known averaging function of waveform.

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3. Test Method

3.1 To measure the Modulation Factor of a photographic-type sound test film, it is necessary to calibrate the reproducer, then to reproduce the sound record and, finally, to compare the two results.

3.2 Calibration of the Reproducer

3.2.1 Provision shall be made for the sound record scanning beam to be interrupted by a mechanical shutter giving nominally equal ON and OFF durations (symmetrical waveform), at a nominally constant frequency of interruption.

3.2.2 The frequency of interruption shall be the nominal value specified for the test film being calibrated ± 5 percent.

3.2.3 With no film in the reproducer and the shutter operating, the amplitude of the output signal voltage is measured between corresponding points on the top and bottom of the output voltage wave, preferably at the center of the flat portions. This amplitude is defined as a Modulation Factor of 1.0 in the sound reproducer (Section 2.1).

3.3 Reproduction of the Test Film. With the test film running in the reproducer and the shutter withdrawn or locked open, the peak-to-peak amplitude of the output voltage from the sine wave recording on the test film is measured.

3.4 Calculation of Modulation. The ratio of the amplitude measured in Section 3.3 to that measured in Section 3.2.3 is the Modulation Factor of the recording (Section 2.2).

4. Test Equipment

4.1 Sound Reproducer

4.1.1 The sound reproducer shall meet or exceed the flutter specification in the test film standard for the test film being calibrated.

4.1.2 The accuracy of this measurement is not affected by harmonic distortion at the output of the reproducer, so long as the total harmonic distortion for an output level corresponding to a Modulation Factor of 1.0 in the sound reproducer does not exceed 0.5 percent. This measurement shall be confirmed by inserting an electrical signal in series with the photocell while the photocell is illuminated.

4.1.2.1 The photocell shall be illuminated by the sound-scanning beam, operated in the usual manner with no film in the optical path. The photocell can, therefore, be expected to have its maximum influence on the distortion of the reproducing system.

4.1.2.2 The input signal shall be a sine wave from a signal generator, operating at the frequency specified for the signal level test film, and set to produce an output from the sound reproducer corresponding to that for a Modulation Factor of 1.0.

4.1.2.3 The harmonic distortion shall be measured at the output of the sound reproducer.

4.1.3 The optical system shall be equipped with a shutter of drum, dish, vibratory, or other type to interrupt the light beam as specified in Section 3.2. The location of the shutter in the light beam shall be such that the time of transition from light to dark or vice versa shall be as small a proportion of the total cycle time as is practical.

4.1.4 The phase distortion of the reproducing system shall be such that when the output voltage wave during the measurement specified in Section 3.2.3 is displayed on an oscilloscope, the top and bottom of the output voltage wave are flat within a permissible tilt limit not exceeding 1 percent of the peak-to-peak deflection.

4.1.5 The width of the scanning beam at the film plane shall be the nominal value specified for reproducing the standard record width on the film format being measured, ± 1 percent. Alternatively, any width within the tolerance specified for the appropriate film format may be used, the actual width measured to ± 1 percent and a mathematical correction made to the measurement as specified in Appendix A2.

4.1.6 The location, azimuth, and focus of the scanning beam shall be adjusted by using the appropriate test films for the film format in use.

4.1.7 The uniformity of illumination by the scanning beam shall be within 5 percent over the width of the beam. Alternatively, a correction for non-uniformity may be made as described in Appendix A2.

4.2 Voltage Measuring System for Reproducer Calibration

4.2.1 Cathode-Ray Oscilloscope Method. The voltage amplitude measurements specified in Sections 3.2.3 and 3.3 are conveniently made with a cathode-ray oscilloscope. An attenuator is recommended, but not required. If one is used, it shall be such that the cathode-ray tube deflections, while making the measurement specified in Sections 3.2.3 and 3.3, are the same amplitude when the film being measured has the nominal percentage modulation specified in the appropriate test film standard.

4.2.2 Sampling Meter Method. Rather than the oscilloscope, a peak-to-peak meter that can sample the waveform at the specified point on the cycle may be used.

4.3 Monitoring of Test Film during Calibration. It is recommended that a meter continually observed, or a chart recorder, be employed to supplement the oscilloscope during test film calibration. Peak-to-peak measurements are to be made on the oscilloscope; observation of signal voltage uniformity and amplitude modulation from the test film, together with an estimate of the film's performance and suitability in subsequent practical use are to be determined from the meter or chart recorder.

4.3.1 *The meter shall be as specified in Section 5.2.*

4.3.2 The chart recorder shall be an average *reading type* (an exponent of 1.0 to 1.4 is acceptable), and the dynamic response time shall be approximately the same as that of a vu meter specified in Section 5.2.

4.4 Frequency Meter. A frequency meter or counter with an accuracy of at least ± 0.5 percent shall be used to measure the frequency of the signals in Sections 3.2.3 and 3.3.

5. Use of Test Films

5.1 *Establishment* of Reference Level. The test film is intended to define a reference level in practical sound reproducers, against which level the output of program recordings may be compared.

5.2 Measurement of Level. The output levels of the test film and of the program recordings are to be compared on a vu meter, as specified in American National Standard Volume Measurements of Electrical Speech and Program Waves, C16.5-1954 (Reaffirmed 1961), for predictable relationship between the sine wave of the test film and the complex waveform of the program.

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

A1. Shutter Design

The dimensions of the shutter relative to the light beam should be such that the output voltage waveform is a trapezoid with the rise and fall times as small a proportion of the cycle time as is practical.

Possible errors associated with the waveform of the signal generated by the shutter are seldom important. As long as the shutter opening is wider than the light beam, a fairly accurate measurement can be made. However, it is much easier to make an accurate measurement if the shutter opening is much larger in cross-section than the light beam, and if there is no tilt to the top and bottom portions of the output wave.

A2. Sound-Scanning Beam

The most serious factor affecting the accuracy of measurement is the uniformity of illumination of the scanning beam. Since the slit width is greater than the modulated width of the image on the film, any drop in illumination toward the ends of the slit will give too low an output voltage for an apparent Modulation Factor of 1.0. If the change in illumination is more than a few percent, the distribution of illumination must be determined in order to calculate a correction factor. This can be done by finding the difference in area between a curve for uniform distribution and the curve of the actual distribution. For the region of the slit image that is covered by the film modulation, the distribution is of little importance. There-

fore, the distribution in this region should be ignored when determining the correction factor.

Another factor is the width of the scanning beam. Any departure from nominal values directly and proportionally affects the measurement of the Modulation Factor. The output from the film is not so affected because the record is essentially opaque outside of the area allotted for modulation. For this reason, 4.1.5 specifies that either the scanning beam at the film plane be within 1 percent of the nominal value or that the length be measured and the data corrected by calculation. Too long a slit could conceal the effect of non-uniform illumination.

A3. Philosophy of Calibration

By defining a Modulation Factor of 1.0 in a Sound Reproducer in Section 2.1, this standard establishes a more reproducible reference, but does depart from some previous practices. Many test films for photographic-type sound records have employed variable-area recording, and attempted to specify modulation on the basis of the geometry of the record as in Section 2.5. Such a reference is subject to a number of uncertainties, some of which are indicated in Table I, which examines the 16 mm format as defined by American National Standard Dimensions of Photographic Sound Record on 16 mm Motion-Picture Prints, PH22.41-1969. Comparable conclusions could be drawn from the standards for any format.

Table I

Maximum Attainable Modulation Factor of a Sound Record (Sec 2.3)[1, 2]
(Illustrative Figures, Not to be Used for Calibration)

	Perfect Record[3]	Reflection Losses at Film Surfaces[4]	Reflection and Adsorption Losses From $d_{min} = 0.1$[5]	Typical Variable Density Record $d_{min} = 0.3$[6]
Variable-Area Recording				
Scanning Beam Width 0.071 in nom	0.79 — 0.96	0.73 — 0.88	0.62 — 0.70	—
Maximum Modulated Record Width 0.060 ± 0.004 in				
Variable-Density Recording				
Scanning Beam Width 0.071 in nom	1.00[7]	0.92[7]	0.79[7]	0.50
Maximum Modulated Record Width 0.075 ± 0.004 in				

(1) These values assume the scanning beam width is exactly equal to the "nominal" value. Departures from this width will widen the distribution of possible modulation values.

(2) Modulation of the sound reproducer output voltage is subject to further uncertainty, in that the spectral characteristics of some records and some photodetectors will reduce the modulation still further.

(3) *A theoretical recording in which the clear areas of the record have zero density, and the margins are* completely opaque.

(4) A record in which the fog and absorption in the clear areas are zero, and the losses are only the reflection-refraction losses at the two film/air interfaces (Magnitude nominal and estimated).

(5) A "poor" variable-area record in which the total of fog plus base density plus other losses provides a density of 0.1 in the clear areas (Nominal).

(6) In order to place a variable-density recording on the most useful portion of the Density vs Log E Curve, minimum densities typically exceed those used for variable-area recordings.

(7) If guiding and positioning are perfect, the minimum record has the same width as the nominal scanning beam, and further alignment losses are introduced.

The usefulness of test films calibrated by the geometric method is limited by such major uncertainties in the proper interpretation of 100 percent modulation when using the test film to establish an output level of the reproducer. Obviously, the same uncertainties apply to program record as to test record, and the combination of the two in calibration followed by application may lead to confusing discrepancies in reproduction levels.

Calibration of the test films on the basis of Modulation Factor in a Sound Reproducer not only reduces these uncertainties, but also has the advantage of making more obvious the origin of apparent errors in reproduction.

Draft American National Standard

Motion-Picture Raw Stock Identification and Labeling

PH22.184

1. Scope

This standard specifies the information to be included by the manufacturer covering the physical specifications and certain packaging characteristics of motion-picture raw stock. The suggested location of this information on the manufacturer's label is also specified.

2. Film Identification

2.1 The physical specifications of the raw stock shall be contained in one sequential listing, preferably in one line but allowing a continuance on a second line if there are space restrictions.

2.2 The method of identifying the cutting and perforating physical specifications and the sequence in which the information should appear when included shall be as follows:

2.2.1 The film width shall be specified in its nominal millimeter equivalent. For example, the common, currently available film widths are 8, 16, 32, 35, 65, and 70, and designated as shown.

2.2.2 If the end-use width is narrower than the parent width, or if the film is an intermediate or negative film whose subsequent print has an end-use width narrower than the parent width, the end-use width shall follow the parent width after a solidus; for example, 35/16, 35/8, and 16/8. Use of the millimeter abbreviation, mm, following the width designation is not preferred but is optional.

2.2.3 The number of rows of perforations in the parent width film shall be listed in the Arabic numeral followed by the letter R; for example, 1R, 2R, 3R.

2.2.4 The perforation shape shall be indicated by a code letter or combination of letters. The letter designation for the perforation shape shall be as specified in the Note or the appropriate film dimensions standard.

2.2.5 The perforation pitch shall be as specified in its appropriate millimeter equivalent without the decimal point; for example, 3810, 4234, 4750, and 7620. It is recognized that it has been the practice to specify the perforation in its inch equivalent without the decimal point. Therefore, a manufacturer may include the inch equivalent of the perforation pitch in parentheses without the decimal point; for example, 3810 (1500), 4234 (1667), 4750 (1870), and 7620 (3000).

2.2.6 The arrangement of rows of perforations shall be specified by numerals separated by a dash to indicate how the rows of perforations are placed on the film. This designation is necessary only when the film stock is wider than its end-use and more than one combination of perforation rows is possible. The total number of rows for the perforation type and end-use considered is determined by including all rows of all combinations.

The perforation rows shall be numbered starting at the reference edge. The reference edge is that edge of the strip nearest to the row of perforations which is retained on one of the slit prints (i.e., not discarded in any subsequent slitting). The row(s) of perforations which is discarded will always be given the number 0. Negative or intermediate films which are not slit may contain the 0-numbered row of perforations if that perforation row corresponds

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to the discard row of perforations on the subsequent print stock.

For all films with nonsymmetrical perforation rows, there could be two different windings for the same numbered rows of perforations. Film perforated 16/8 1-3 would be 1-3 regardless of winding, but the winding could be A or B, depending upon the location of the reference edge.

2.2.7 A designation of emulsion orientation shall be specified. If the emulsion side of the film is in, it shall face toward the center of the wound roll, and the designation EI shall be used. If the emulsion side of the film is out, it shall face away from the center of the wound roll, and the winding designation EO shall be used.

2.2.8 The designation of winding orientation is indicated only when a nonsymmetrical format is involved, and shall be specified as A or B in compliance with American National Standard Designation of A and B Windings for Motion-Picture Raw Stock, PH22.75-1969.

2.2.9 The designation M shall be included if the film has been striped with a magnetic coating for sound recording. Magnetic striping is usually placed on the base of the product; however, variations are possible when it is believed important to the end-use. To identify the location of the stripe, the symbol MB may be used when the magnetic material is on the base side and the symbol ME when it appears on the emulsion side.

3. Spooling Specifications

3.1 The roll length (which in some cases may be the usable length) shall be specified on the label and designated in feet and meters. In lieu of or in addition to the separate designation, the roll length may be included as part of the sequential listing of physical specifications following the item designated in Section 2.2.9 with the length specified first in meters and parenthetically in feet; e.g., 304.8 (1000). When the designation of length applies to the slit width (not a usual practice), the designation SL shall follow the length specification.

3.2 Currently, there is no national standard nomenclature for the device (core, spool, reel or cartridge) containing the film. If such standard nomenclature is derived, it should be indicated in the sequential listing or separately.

4. Characteristics and Specifications of the Label

4.1 The label may be any color and of any suitable material. The shape shall be a simple geometric form and of a size consistent with legibility.

4.2 The line(s) of physical specifications (Sections 2 and 3 above) shall be distinct and placed prominently in the upper half of the label. The line(s) may also be used on other parts of the individual or bulk film containers.

4.3 The manufacturer's notices (e.g., warranty, disclaimer, open in darkness, safety film, etc.) shall be grouped together in one area of the label, preferably the lower portion.

4.4 The description of the film product shall include the primary intended use of the film together with the manufacturer's product code identification and trade name. Examples of common uses of motion-picture films are: negative, positive or print, intermediate, internegative, reversal, and leader.

NOTE: The nomenclature system adopted several years ago for the titles of American National Standards contains a reference to the perforation types used for 35 mm films. However, symbols for 16 mm, 8 mm, and super 8 perforation shapes were not included. The list below specifies the symbols used for identifying perforation shapes. The symbols differ from those previously used and represent recent international agreement.[1] It is anticipated that revisions of American National Standards on film dimensions will incorporate the new symbols in their titles and that these documents will specify the symbols for any new perforation shapes.

PH22.184

Perforation Shape Symbols

KS — 35 mm, 65 mm, 70 mm positive type (known internationally as P)

BH — 35 mm negative (known internationally as N)

DH — 35 mm Dubray-Howell

SE — 16 mm and 8 mm (8 mm Type R)[2]

S — Super 8 (8 mm Type S)

SC — Soviet CinemaScope

AC — American CinemaScope (now preferred and documented as CS)

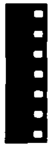
[1] At this time, these symbols represent the American National Standards proposal. International acceptance, modification, or counter proposal is pending.

[2] This perforation designation was recommended for adoption to the International Organization for Standardization but, to date, has not been accepted. Caution is, therefore, advised when incorporating the SE designator in any labeling used in international distribution. Currently, draft ISO documents propose no symbol identifier for 16 and 8 mm-type perforations.

Appendix

(The Appendix is not a part of this American National Standard, but is included for information purposes only.)

Listed below is the recommended method of applying the specifications for film identification and spooling (contained in Sections 2 and 3 above) to most of the existing motion-picture film sizes and formats. The emulsion orientation, winding, magnetic coating and length are hypothetical and included to supplement the perforation format and gauge specifications shown to illustrate possible applications of this standard.



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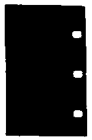
8 1R S4234(1667) EOB 15.2(50)



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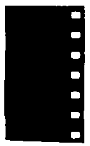

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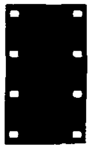

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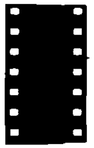

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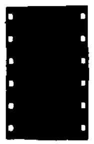
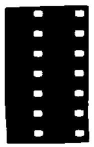
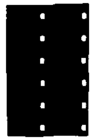


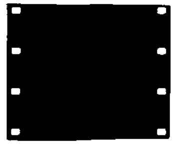
16/8 2R S4234(1667) 1-4 EI M 305(1000)



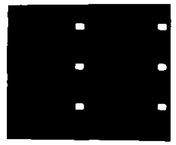
16/8 2R SE3810(1500) 1-3 EIB 305(1000)



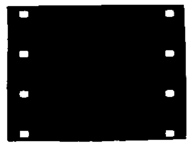
16/8 2R S4227(1664) 1-3 EOA M 610(2000)



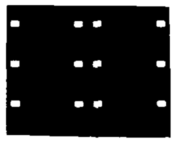
32/16 2R SE7620(3000) 1-4 EI 610(2000)



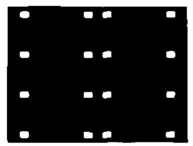
32/16 2R SE7605(2994) 1-3 EIB M 610(2000)



35/16 2R SE7620(3000) 1-4 EO 610(2000)



32/16 4R SE7620(3000) 1-2-3-4 EO 305(1000)



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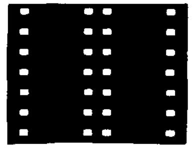
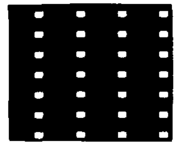


35/8 4R SE3810(1500) 1-4-5-8 EO 610(2000)



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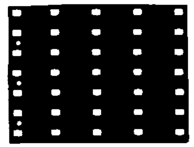
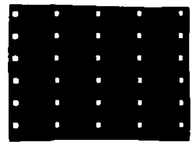


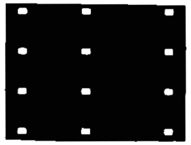
35/8 5R SE3810(1500) 1-3-5-7-0 EIA 610(2000)

35/8 2R SE3802(1497) 1-0 EOB 610(2000)



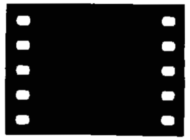
35/8 5R S4234(1667) 1-3-5-7-0 EIA M 610(2000)

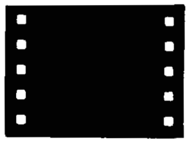
35/8 2R S4227(1664) 1-0 EIB 610(2000)

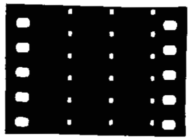

35/16 3R SE7620(3000) 1-3-0 EIA 610(2000)


35 2R KS4750(1870) EI 610(2000)


35 2R DH4750(1870) EI 610(2000)


35 2R BH4740(1866) EI 30.5(100)


35 2R AC4750(1870) EO 610(2000)


35/8 3R S4234(1667) 1-3-5 2R BH4740(1866) EIA 610(2000)


55 2R AC4750(1870) EI 610(2000) (Type I)


55 2R AC4750(1870) EI 610(2000) (Type II)


65 2R KS4740(1866) EI 305(1000)


70 2R KS4750(1870) EO 610(2000)

PH22.184

PROPOSED

SMPTE RECOMMENDED PRACTICE — RP 49

Leaders for Preprint Material Used in the Manufacture of 8 mm Prints Intended Solely for 8 mm Type R or S Cassettes and Cartridges for Nontelevision Use

Introduction

Both 8 mm Type R and 8 mm Type S prints used in cassettes and cartridges are made with varying sound-to-picture separation distances. Therefore, sufficient head and tail leaders should be provided in the manufacture of 8 mm prints to accommodate the various sound systems.

1. *Scope*

This recommended practice specifies the head and tail leaders for preprint materials used solely for the manufacture of 8 mm prints intended for use in 8 mm Type R and 8 mm Type S cassettes and cartridges for other than television systems.

2. *Description*

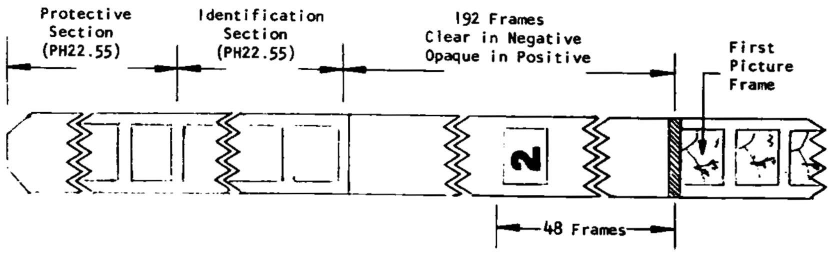
2.1 Head Leader (See figure).

2.1.1 Protective and Identification Sections shall be as specified in American National Standard Specifications for Leaders and Cue Marks for 35 mm and 16 mm Sound Motion-Picture Release Prints. PH22.55-1966.

2.1.2 The following 192 frames to the first frame of picture material shall be free of any markings or printed material and shall be clear in negative material and opaque in positive material, except for the 48th frame ahead of the first picture frame which shall be identified with the figure 2.

2.1.3 The head leader for the corresponding sound record shall contain a sound cue one frame long. The sound cue should be in editorial synchronism with the 48th frame ahead of the first picture frame (identified with the figure 2 in the leader).

2.2 Tail Leader. The tail leader shall be as specified in American National Standard PH22.55-1966.



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