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AMERICAN NATIONAL STANDARD

American National Standard

ANSI C78.380-1997

AMERICAN NATIONAL STANDARD

FOR ELECTRIC LAMPS—

HIGH INTENSITY DISCHARGE LAMPS, METHOD OF DESIGNATION

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
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Revision of ANSI C78.380-1984 (R1993)

AMERICAN NATIONAL STANDARD

for electric lamps:

High-Intensity Discharge Lamps, Method of Designation

Secretariat

National Electrical Manufacturers Association

Approved May 12, 1997

American National Standards Institute, Inc.

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Foreword (This Foreword is not part of ANSI C78.380-1997.)

This is a revision of ANSI C78.380-1984 (R1993).

Suggestions for improvement of this standard should be submitted to the Secretariat C78, National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.

This standard was processed and approved by Accredited Standards Committee on Electric Lamps C78, and its Sub-Committee, C78-4 for High-Intensity Discharge Lamps. Committee approval of the standard does not necessarily imply that all committee members voted for that approval. At the time it approved this standard, the C78 Committee had the following members:

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John P. Krissinger and
Michael M. Minarczyk, Co-technical Coordinators
Randolph N. Roy, Secretariat

Organization Represented:	*Name of Representative:*
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Duro-Test Corporation	Herbert Strauss
Edison Electric Institute	William Maguire (Delegate)
ETL Testing Laboratories	Craig Davenport
GE Lighting	John Krissinger
Illuminating Engineering Society	Rita M. Harrold
National Electrical Manufacturers Association	(vacant) (Delegate)
OSRAM SYLVANIA INC.	Peter Bleasby
Philips Lighting Company	Al Rousseau
Underwriters Laboratories, Inc.	David Belt

At the time it approved this standard, the C78-4 Sub-Committee had the following members:

Michael Tanner, Chair C78-4
GlennGarbowicz, Vice-Chair

Organization Represented:	*Name of Representative:*
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	Glenn Garbowicz (Alt.)
American Electric	Greg Steinman
	Alex Pope (Alt.)
City of Los Angeles	Michael M. Cates
Cooper Lighting	Tom Burnet
Deltona Lighting Products, Inc.	Don Briner
Duro-Test Corporation	Larry Sheinberg
ENTERGY	William A. Maguire
ETL Testing Laboratories	Michael Neary
GE Lighting	David Korow
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GE Lighting Systems	Byron Collins
	Michael Owens (Alt.)
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Indy Lighting, Inc.	Ted Yahraus
Lithonia/Hi-Tek Lighting	Fred Carpenter
MagneTek	Bob Boydston

Manufacturera de Reactores, S.A.	Ernesto Mendoza Estrada
OSRAM SYLVANIA INC.	Richard Parrott
Philips Lighting Company	Sam Carleton
	Bill Simpson (Alt.)
Underwriters Laboratories, Inc.	David Belt
Venture Lighting International	Tom Harding
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AMERICAN NATIONAL STANDARD **ANSI C78.380-1997**
Revision of ANSI C78.380-1984 (R1993)

for electric lamps:

High-Intensity Discharge Lamps, Method of Designation

1 Scope

This standard describes a system for the designation of high-intensity discharge lamps, including compact, enclosed-arc discharge light sources such as mercury, metal halide, high-pressure sodium, and similar types of lamps. For convenience, low-pressure sodium lamps, although technically not high-intensity discharge lamps, are included with the group.

A form is provided, herein, for the use of lamp manufacturers to request a designation assignment, an alternative design, or a change.

2 Purpose

2.1 The purpose of the designation system covered by this standard is to provide convenient and nationally applicable lamp identification symbols, which may be used for both manufacturing and ordering purposes. The designations will assure the user of the interchangeability of lamps bearing the same symbol. Guidance is given as to which characteristics are important (key) to assure electrical interchangeability, physical interchangeability, and safety interchangeability.

2.2 The lamp characteristics data given by a manufacturer on a High-Intensity Discharge Lamp Designation Request Form[1] and the Guidelines contained in ANNEX D, become the basis for the assignment of a designation. They have not been approved by the American National Standards Institute (ANSI) and do not constitute an American National Standard. Similarly, any consolidated listing of assigned designations with associated characteristics does not constitute an American National Standard.

3 Normative references

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

ANSI C78.379-1991 (R1994), *American National Standard for Electric Lamps—Incandescent and High-Intensity Discharge Reflector Lamps—Classification of Beam Patterns*

ANSI C79.1-1994, *American National Standard Nomenclature for Glass Bulbs Intended for Use with Electric Lamps*

ANSI C81.61-1990 (R1996), *American National Standard for Electrical Lamp Bases*

[1] Available from the American National Standards Institute, 11 West 42nd St., New York, NY 10036

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ANSI C82.9-1996, *American National Standard Definitions for High-Intensity Discharge and Low Pressure Sodium Lamps, Ballasts and Transformers*

CFR 21CFR Part 1040.30, *U.S. Code of Federal Regulations*

4 Definitions

In addition to the general definitions given in this section, a glossary of terms used in conjunction with a Request Form is presented in section 9.

Electrical Interchangeability—The ability to properly install a replacement lamp in a particular installation where electrical characteristics of lamps and luminaires are compatible in regard to characteristics such as voltage, current, power, open circuit voltage, etc.

Physical Interchangeability—The ability to properly install a replacement lamp in a particular installation, based on physical characteristics such as base type, bulb size, lamp length, etc.

Safety Interchangeability—The ability of a replacement lamp to be operated safely in an installation that has characteristics identified for the proper use of the lamp.

Key Characteristic—An electrical, physical characteristic, or safety criterion identified as having a critical effect on the interchangeability of lamps.

Alternative Design—A lamp with key electrical, physical characteristic, or safety criterion that are the same as an existing lamp, but utilizing different features that do not affect interchangeability.

Designation Program—The procedures and requirements of this standard are formulated to provide designations for lamps.

Reflector Lamp—A discharge lamp in which part of the bulb, of suitable shape, is coated with a reflecting material so as to control the light.

Note: HID reflector lamps typically employ R or PAR-shaped bulbs.

Lamp Manufacturer—A manufacturer who produces finished lamps and offers them for sale.

Sponsor—The originator of a Lamp Designation Request Form.

5 Description of a designation

5.1 General

A lamp designation shall consist of a combination of letters and numbers in the following sequence:

- Lamp Type Classification Letter ❶
- Electrical Characteristic Number ❷
- Physical Characteristic Letters ❸
- Safety Code Letters ❹
- Suffix Symbols Operating Position ❺
- Additional Suffix Symbols❻ (If required)

Authorized optional suffix letters or numbers may be added to supplement the standard lamp designation and to identify special characteristics.

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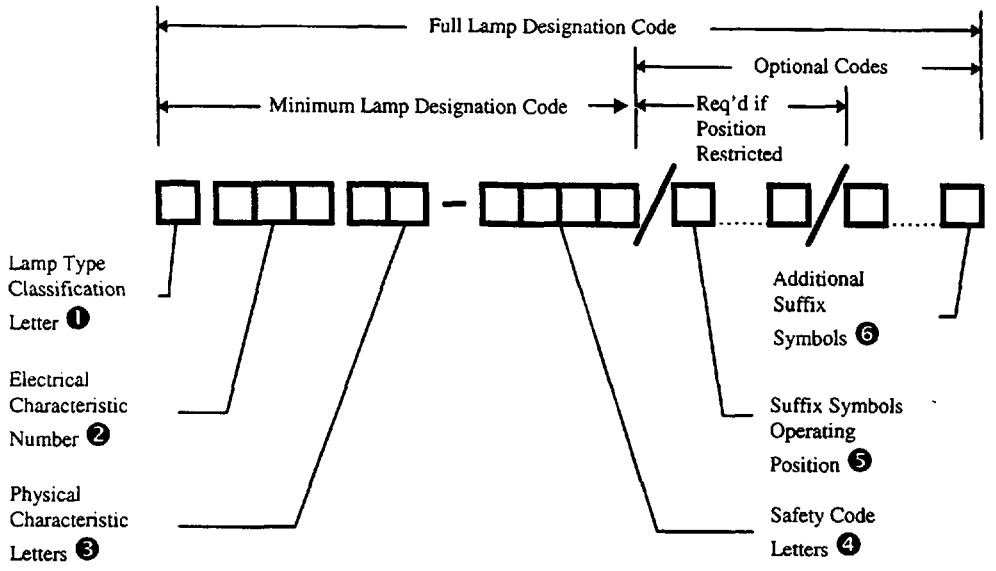

Other than the use of hyphens or virgules, as defined in this standard, there shall be no spaces or other undefined symbols or separators used in a designation.

5.2 Lamp type classification letter ❶

The first letter of a designation represents the high-intensity discharge lamp classification. Classification letters are capital letters from the following list of authorized letters.

B – Self-ballasted mercury lamps
H – Mercury lamps
L – Low-pressure sodium lamps
M – Metal halide lamps
S – High-pressure sodium lamps

Note: When designations of other types of high-intensity discharge lamps are requested, other letters shall be chosen to represent the new classifications. A single letter, other than those already assigned, shall be assigned by the consulting body to represent each additional class of high-intensity discharge lamp.

5.3 Electrical characteristic number ❷

A number shall follow directly after the classification and it represents the set of all key electrical characteristics of the lamp in question, so as to ensure electrical interchangeability. One set of numbers is the source for all assignments of characteristic numbers, regardless of the related classification letter. For example, when the number 33 is assigned to a mercury lamp as H33, that number is not available for assignment to a lamp in another classification.

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Key electrical characteristics are:

- Lamp voltage, rated
- Lamp operating current
- Lamp starting current
- Lamp wattage, rated
- Minimum open circuit voltage, rms
- Minimum open circuit voltage, peak
- Maximum operating and starting current crest factor
- Pulse height, where applicable
- Minimum pulse width, where applicable
- Pulse Repetition Rate (per half cycle), where applicable

5.4 Physical characteristic letters ❹

Physical characteristic letters shall follow directly after the electrical characteristic number. They represent the set of key physical characteristics of the lamp in question, so as to ensure physical interchangeability.

Key physical characteristics shown in ANNEX A are categorized by:

- Base designation
- Bulb shape and diameter (major diameter)
- MOL, for single-ended lamps
- Distances B and C, for double-ended lamps
- LCL, for single-ended, non-reflector lamps

5.5 Safety code letters ❺

The Lamp safety code preceded by a hyphen shall be a four letter designation. The first letter shall represent the CFR code. The next three letter fields shall represent a group of safety requirements. (See ANNEX B)

First Letter:

- Code from Federal Regulation 21 CFR 1040.30.

Following Letters:

- Fixture Requirement
- Bulb Temperature
- Base Temperature

5.6 Lamp wattage

Lamp Wattage shall be shown on the bulb.

5.7 Suffix symbols ❺ & ❻ (if required)

One or more sets (select the number of spaces required to adequately describe the feature) of alphanumeric symbols may be added to represent features of the lamp that are not covered by the previous alphabetical or other symbols. Each suffix symbol set shall be preceded by a virgule. Suffix symbols have been established for such features as; ❺ Required operating position restrictions (e.g. Base-Up ±15) as shown in Table 1 below and ❻ Lamp Suffix Symbols (e.g. Suffix Symbol "DX") as listed in ANNEX C. Other symbols could be requested by the manufacturer as the need arises.

Other Authorized suffix symbols are shown in ANNEX C.

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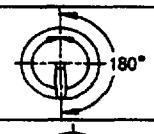
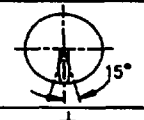
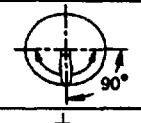
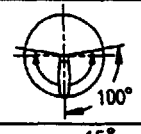
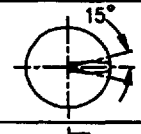
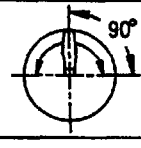
When appropriate for proper application of a lamp, a symbol for operating position of the lamp shall be added. Such a symbol may be made up of two parts; (a) letter(s) indicating position of lamp base and (b) angular tolerance around that position.

The following position code letters have been established:

Letters	Description
No symbol or /U	Universal, any position, no limitation
/BU	Base-up
/BUH	Base-up through horizontal
/HOR	Horizontal
/BD	Base-down
/BDH	Base-down through horizontal
/BUBD	Base-up or base-down

Table 1 – Examples of Operating Position Symbols

Position Code Letters	Description	Diagram
(No code letters) or U	No Limitation	
BU15	Base-Up ±15°	
BUH	Base-Up through Horizontal	
BU100	Base-Up ±100°	
HOR15	Horizontal ±15°	
BDH	Base-Down through Horizontal	

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5.8 Example designations

5.8.1 An illustration of a typical designation for a mercury lamp, as provided by this standard, is as follows: (See ANNEX A, B)

Example Designation: H33ZC-ROGD

H	Mercury lamp classification. (Section 5.2)
33	Characteristic number representing the key electrical characteristics. (Section 5.3, ANNEX A)
ZC	Characteristic alphabetical symbol representing the key physical characteristics. (Section 5.4, ANNEX A)
-R	Regular Lamp (ANNEX B)
O	Open fixture permissible (ANNEX B)
G	Bulb Maximum Temperature (400°C - ANNEX B)
D	Base Maximum Temperature (210°C - ANNEX B)

Note: Details regarding characteristics of lamps for which designations have already been assigned may be obtained from the Administrator.

5.8.1.1 The manufacturer may request the addition of supplementary suffix symbols to indicate color. The presence of such a suffix is indicative of a lamp with different performance characteristics than a clear lamp. (See ANNEX C)

Example Designation: H33ZC-ROGD/DX

/DX	Optional suffix (deluxe white color - ANNEX C)

5.8.1.2 For the same mercury lamp as above having provisions for permanent extinction of the arc after breakage of the outer envelope, the designation would be: (See ANNEX B)

Example Designation: H33ZC-TOGD/DX

-T	Lamp designated to permanently extinguish the lamp arc within a specified time after the envelope is punctured or broken. Remainder of designation represents the same characteristics as described in the preceding example.

5.8.2 An illustration of a typical designation for a metal halide lamp, as provided by this standard, is as follows: (See ANNEX A,B and Table 1)

Example Designation: M47GH-RSJD/BU15

M	Metal halide lamp classification. (Section 5.2)
47	Characteristic number representing the key electrical characteristics. (Section 5.3, ANNEX A Electrical)
GH	Characteristic alphabetical symbol representing the key physical characteristics. (Section 5.4, ANNEX A Physical)
-R	Regular Lamp (ANNEX B)
S	Open fixture (Restricted Position) (ANNEX B)
J	Bulb Maximum Temperature range (425° - ANNEX B)
D	Base Maximum Temperature (210°C - ANNEX B)
BU15	Base-Up ±15 (All other positions **REQUIRE** enclosure. – Table 1)

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5.8.2.1 The manufacturer may request supplementary suffix symbols to the above standard designation to indicate other characteristics. The designation would be: (See ANNEX C)

Example Designation: M47GH-RSEC/BU15/3K

/3K 3000 Kelvin Color (See ANNEX C)

6 Criteria for assignment of designations

6.1 Classification letters as defined in 5.2 shall be assigned directly in relation to the lamp described on a High-Intensity Discharge Lamp Designation Request Form.

6.2 Characteristic numbers shall be assigned from a sequential series of unused numbers starting with 01. Characteristic number assignments shall be made in sequence unless a special situation dictates otherwise.

A different number shall be assigned for each unique set of key electrical characteristics, as denoted in 5.3, regardless of the related classification letter. Key electrical characteristics are identified on the Designation Request Form with an asterisk.

A lamp for which a Request Form is filed with the administrator shall be considered to have the same characteristic number as one previously assigned if all the key electrical characteristics are within the defined electrical limits assigned in ANNEX D.

6.3 The alphabetical symbol shall be assigned in accordance with the translation table of Appendix A. The letters I, O, Q, and U shall not be used.

A different symbol shall be assigned for each unique set of key physical characteristics denoted in 5.4. Key physical characteristics are identified on the Request Form with an asterisk.

Reflector bulbs with external dimples (i.e. RD60 bulb) shall be interpreted as being equivalent to a bulb without a dimple (i.e. R60 bulb).

A lamp for which a Request Form is filed with the administrator shall be considered to have the same alphabetical symbols as one previously assigned if all of the key lamp characteristics are within the tolerances of the lamp characteristics assigned in ANNEX D.

Existing designations that were previously assigned could have values beyond those assigned in ANNEX B and D, but all newly assigned designations after the implementation date of this standard shall be within the assigned limits.

6.4 The Federal CFR code, as defined in 5.5, shall be assigned as appropriate.

6.5 The fixture application, bulb and base requirements shall be assigned as appropriate (see ANNEX B).

6.6 Optional suffix symbols shall be assigned from the list of authorized symbols, per Section 5.7.

6.7 Attention shall be given to the lamp manufacturer's advice about any other characteristics, features, or application restrictions that may affect the need to identify a lamp with a separate designation. Item 31 on the Request Form should be used by the manufacturers to supply advice.

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6.8 Criteria for alternative design

If the requested alternative design does not affect interchangeability, as denoted by the key electrical, physical characteristic, and safety criterion of section 5, it is acceptable. A suffix letter supplied by the sponsor, shall be acceptable if defined by the authorized list of 5.7.

6.9 Criteria for change

If the requested change will not affect electrical, physical, or safety interchangeability, it is acceptable.

Conversely if interchangeability is affected in any way, changing a key characteristic by more than the tolerance specified in ANNEX D, it shall be necessary to file for a new designation.

7 Administration of this standard

7.1 Administrator

This standard shall be administered by the Secretary of Accredited Standards Committee C78 through the offices of the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.

7.2 Participants in high-intensity discharge lamp designation program

Any domestic, foreign lamp manufacturer, or distributor who wishes to obtain designation assignments may participate by filing an initial Request Form with the Administrator.

7.3 Consulting body

Subcommittee C78-4 of Accredited Standards Committee C78 shall maintain this standard. In addition, it shall serve as a consulting body to which the Administrator or participants may bring questions or other matters needing resolution.

7.4 Procedure for assigning and recording lamp designations

7.4.1 When an electric lamp manufacturer requires a designation for a high-intensity discharge lamp, they shall file with the Administrator a fully completed High-Intensity Discharge Lamp Designation Request Form (see section 8) in duplicate. The completed Request Form shall list all key characteristics that are necessary to describe a lamp sufficiently to allow assignment of a designation in accordance with this standard. The box at the top of the Request Form relating to a new designation should be checked.

7.4.2 The Administrator may reject any Request Form that provides insufficient information.

7.4.3 Assignment of a designation shall not be given over the telephone. Requests to reserve designations for further use shall not be accepted.

7.4.4 Upon receipt of a completed Request Form, the Administrator shall take one of the actions outlined in 7.4.4.1 through 7.4.4.4.

The Administrator shall search their current records to determine if the information on the Request Form defines a unique set of characteristics, per the criteria of Section 6.

7.4.4.1 If a designation has not been assigned to a lamp having the same characteristics as those on the Request Form, the Administrator shall assign and record a designation for such a lamp in accordance with the requirements of this standard and shall promptly inform the requesting manufacturer of the designation assigned.

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7.4.4.2 If a designation has already been assigned to a lamp having the same characteristics based on the criteria of Section 6 as given on the Request Form, the Administrator shall inform the filing manufacturer of the existing designation that may be used for his product.

7.4.4.3 In the event the new designation request has characteristics almost identical to the current lamp data records and the Administrator cannot discriminate the designation based on Section 6, then the Administrator shall circulate the new Request Form and seek advice from other participants in the High-Intensity Discharge Lamp Designation Program as to whether the same or a new designation should be recorded.

7.4.4.4 In addition, the Administrator shall review the form for special information that would identify safety or other special considerations which may require assignment of a new designation.

7.4.5 After a designation has been assigned and recorded, the Administrator shall circulate copies of the completed Request Form to the manufacturers participating in the High-Intensity Discharge Lamp Designation Program for 60 day review period.

Non-participants in the program may obtain copies from the administrator for a nominal charge per copy.

7.5 Procedure for assigning and recording a change in the characteristics, of an existing lamp designation

7.5.1 When a lamp manufacturer desires to a change the design of an existing lamp, he shall file with the Administrator a High-Intensity Discharge Lamp Designation Request Form in duplicate. The appropriate box at the top of the form should be checked. The completed form shall list only the characteristic(s) being changed. Attach the original Lamp Designation Request with the changes highlighted.

7.5.2 Upon receipt of a request for change, the Administrator shall send copies of it to members of Subcommittee C78-4 and others participating in the High-Intensity Discharge Lamp Program for their review.

If a requested change will not affect electrical, physical, or safety interchangeability, the requested change would be expected to be acceptable. Conversely if interchangeability were affected in any way, the change could be unacceptable to one or more participating manufacturers and they could object.

If no objections are received by the Administrator within 60 days after circulation of copies, the file shall be updated accordingly and the Administrator shall notify the participants that the change has been made.

7.6 Resolution procedure

If a participant does not concur with a circulated Request Form, covering a new designation, alternative design, or proposed change, the Administrator should be notified within the aforementioned 60 days. Matters that are not resolved by the Administrator shall be referred to Subcommittee C78-4 for resolution. The Administrator shall then notify participants that an objection has been filed.

8 High-intensity discharge lamp designation request form

The official Request Form is presented in its entirety at the end of this document.

The glossary and instructions for the Request Form, section 9, provide the necessary guidance for proper entry of the required data onto the form.

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9 Glossary and instructions for lamp designation request form

The information in this section provides definitions for the terms that appear on the Request Form along with additional explanations to aid in proper completion of the form. The numbers listed refer to the corresponding line of the Request Form.
(1.) Lamp Classification - Shall be filled in with the full name of the classification as defined in 5.2.

Physical characteristics

The physical characteristics of a lamp are to be described by item 2 through 18 on the Request Form.

There are two groups of characteristics; key and supplementary characteristics. Key physical characteristics are identified with an asterisk on the Request Form.

(2.) Physical Interchangeability with Designation—Provides room for the optional entry of an existing alphabetical symbol, in case the manufacturer believes that the new lamp is physically interchangeable with a previously established lamp.

(3.) Base Designation—Entry shall be made by use of the code designation shown on the data sheets of ANSI C81.61. Additional descriptive terms may be appropriate as: E39, mogul screw base.

Special bases shall be defined by a drawing to be attached to the Request Form. The drawing shall describe sufficient detail to ensure interchangeability.

(4.) Bulb

(4.1) Bulb Shape Code—The shape code in accordance with ANSI C79.1 shall be entered.

(4.2) Bulb Diameter—Shall be shown in accordance with ANSI C79.1. The diameter shall be given in both the English (eighth-of-an-inch) units and metric (millimeters) units.

(4.3) Bulb Finish—Relates to the condition of the outer envelope of the lamp. Example entries are:

Clear
Diffuse
Phosphor coated.

(5.) MOL (Maximum Overall Length)—For single-ended lamps; the MOL shall be entered in both millimeters and inches.

For double-ended lamps, distance B (end to opposite contact) and distance C (contact to contact) shall be entered in both millimeters and inches.

Note: OAL (Overall length) is not needed as a primary dimension. However, a lamp standard sheet for a reflector lamp with an external dimple will identify the length from the base eyelet to the apex of the curve of the bulb face.

(6.) LCL (Light Center Length)—For single-ended lamps; is the distance from the reference plane (eyelet contact for screw bases) to the center of the light emitting area of the lamp. It shall be shown as a nominal value with ± tolerances in both millimeters and inches.

(7.) Effective Arc Length—The value of this parameter shall be entered as a nominal distance in both millimeters and inches. It applies for all arc tubes, including those with essentially opaque end coatings that extend beyond the electrode tips and for non-linear arc tubes. For end-coated tubes the effective arc length is the apparent lighted length and for bowed tubes it is the chord length. This item does not apply for lamps with diffuse bulbs.

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(8.) Arc Tube Position—Refers to the relationship between the arc tube axis and the bulb axis. This shall be entered as:

parallel - when the axes are parallel
transverse - when the axes are at 90° to each other.

(9.) Operating Position—The allowable operating position for the lamp shall be entered. If there is no limitation, the word "any" should be entered, rather than leaving a blank space. Established suffix symbols, per 5.7, may be entered if the suffix should be used as part of the overall designation.

(10.) Maximum Permissible Base Temperature—The upper temperature limit of the base for operation of the lamp in a luminaire shall be entered and shown in degrees Celsius.

(11.) Maximum Permissible Bulb Temperature—The upper temperature limit of the bulb in a luminaire to maintain performance and endurance of the materials shall be entered.

(12.) Getter Area Bulb Temperature—If necessary, enter the limiting bulb temperature in the area of the lamp getter.

(13.) Beam Angle—This parameter is based on a cone to 50% of the maximum center beam intensity as defined in ANSI C78.379.

(14.) UV Application—Shall be shown as: "primary" function or "secondary" function. Also, the indication shall be given, by checking either the "yes" or "no" blank, as to the need for use with a UV Filter.

Note: For instance, an application as a sun lamp would be considered to be a "primary" UV application.

(15.) UV Range—Requires no entry unless different from the 320 to 380 nm range. Also, the indication shall be given, by checking either the "yes" or "no" blank, as to the need for use with a UV Filter.

(16.) Moisture Protection—Relates to the capability of the lamp to withstand being splashed by water or other liquids. An entry indicating the need for such protection shall be made by checking either "yes" or "no".

(17.) Use in Enclosed Luminaire—The need for use of the lamp in an enclosed luminaire shall be indicated by checking the appropriate blank; Required, Optional, or Position Dependent.

(18.) Other Physical Characteristics—Space is provided for free-form entry of physical characteristic information not covered elsewhere. Also, reference should be made to any statements modifying previously listed physical characteristics.

Lamp electrical operating characteristics

General

The operating characteristics shall be shown for 100 hour lamps. The values shall refer specifically to the lamp position where position is an influencing factor. If the operating characteristics are the same for vertical and horizontal arc tube positions, the spaces shall be filled in under the Vertical heading only. The electrical data shall be specified for a particular temperature(s) which is to be indicated on the lamp designation request.

(19.) Electrically Interchangeable with Lamp Designated—Is an item to provide room for entry of the lamp classification letter and characteristic number in the case where the manufacturer believes that the new lamp is electrically interchangeable with an already established lamp.

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(20.1) Lamp Voltage, rated—Shall be shown as the rated lamp voltage, rms. For self-ballasted lamps this item shall be interpreted as the nominal line voltage, rms.

(20.2) Lamp Voltage, range—Shall be shown as the minimum and maximum volts, rms. For self-ballasted lamps, it shall be shown as the allowed line voltage ranges, rms.

(21.) Lamp Current—The nominal lamp operating current shall be entered.

(22.) Lamp Wattage, rated—The lamp's rated wattage shall be entered. This rating shall be the nominal operating wattage, as rounded to an integer value. Rounding is limited to ± 2% of the objective or average measured power consumption.

(23.) Reference Ballast—Values for the following parameters 23.1, 23.2, 23.3, and 23.4 shall be entered.

(23.1) Rated Input Voltage—The rated input voltage of the reference ballast shall be entered in the appropriate "vertical" or "horizontal" lamp position column.

(23.2) Reference Current—The reference current of the reference ballast shall be entered in the appropriate column.

(23.3) Impedance—The impedance of the reference ballast shall be entered in the appropriate column.

(23.4) Power Factor—The power factor of the reference ballast shall be entered in the appropriate column.

(23.5) Lamp Current—The appropriate AC or DC current shall be selected.

Lamp starting voltage requirements

(Specified for a specific starting temperature lower limit.)

(24.) OCV, No External Pulse—For those systems with no external pulse provided, the open circuit voltage characteristics of 24.1 and 24.2 shall be entered for the appropriate temperature levels.

(24.1) Minimum OCV, rms—The minimum rms value of the open circuit voltage to start and sustain the lamp shall be entered in the appropriate column.

(24.2) Minimum OCV, peak—The minimum peak value of the open circuit voltage to start and sustain the lamp shall be entered in the appropriate column.

(25.) OCV, External Starting Pulse—For those systems with an external starting pulse provided, the open circuit voltage characteristics of 25.1 and 25.2 shall be entered for the appropriate lag or lead ballasting system.

(25.1) Minimum OCV, rms—The minimum rms value of the open circuit voltage at a stated temperature required to start and sustain the lamp shall be entered in the appropriate column.

(25.2) Minimum OCV, peak—The minimum peak value of the open circuit voltage required to start and sustain the lamp shall be entered in the appropriate column.

(26.) External Pulse Requirements—Where applicable, values for the following parameters listed in 26.1, 26.2, 26.3, and 26.4 shall be entered.

(26.1) Pulse Height (min.)—The minimum peak voltage required to start and sustain the lamp.

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(26.2) Pulse Height (max.)—The maximum peak voltage allowed to be placed across the lamp base.

(26.3) Minimum Pulse Width—Shall be shown in microseconds (μs) at the specified level of voltage for the peak height shown in 26.1.

(26.4) Minimum Pulse Repetition Rate—The minimum number of pulses per cycle and referenced to the type of ballast, required to start and sustain the lamp. For example:

1 per cycle
1 per half cycle, symmetrical

(26.5) Pulse Position—For the appropriate lag or lead ballasting system, values shall be shown as the number of electrical degrees beyond the voltage zero crossing.

(27.) Maximum Voltage Limits—For lamps not requiring starting pulses, maximum limits shall be shown as voltage peak, in the first second of operation and in the continuous state after the first second that can be applied to the lamp base.

Starting and operating current requirements

(28.) Lamp Starting Current—Shall be shown as amperes rms, minimum and maximum.

(29.) Maximum Allowable Current Crest Factor—Shall be shown as the maximum value allowable for the lamp.

Special electrical requirements

(30.) Sustaining Requirements for Metal Halide Lamps

(30.1) Same as electrical characteristics—Is an item to provide entry of a characteristic number, in the case when the manufacturer believes that the new lamp is electrically interchangeable with an already established lamp.

(30.2) Lamp Reignition Voltage Spike Requirements—The maximum voltage of the reignition spike shall be specified. Also, the specifications for the linear ballast for measurement of the spike shall be specified.

(30.3) Slope, Peak Current, Overshoot, Off-time, and Sustaining Voltage Requirements—Enter additional information about these parameters as necessary.

(31.) Other Requirements—Space is provided for entry of electrical system requirements not covered by items 19 through 30.3.

(32.) Additional—Space is provided for entry of any notes the manufacturer wishes to add concerning suffix numbers, etc.

Note: Items 33 through 38 on a Request Form shall be completed by the Administrator.

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ANNEXES
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ANNEX A1
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by Proposed NEW Physical Code

New	Committee	Old			MOL	LCL			Electrical Design			Ext. Start (LAG) MIN OCV		Ext. Start (LEAD) MIN OCV		Pulse	Pulse
Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)	ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	Height V	Width µS@V
AA	Retire	~~EC~~	Fc2	T8	177	88±3	M57	ANSI	130	1.50	175	382		280	560	3750	2 @ 3500
AA	Retire	~~EB~~	Fc2	T8	177	88±3	M58	ANSI	130	2.15	250	382		280	560	3750	2 @ 3500
AA	Retire	~~EC~~	Fc2	T8	177	88±3	M96	ANSI	130	1.50	175	382		280	560	3750	2@3500
AA	Retire	~~EB~~	Fc2	T8	177	88±3	M97	ANSI	130	2.15	250	382		280	560	3750	2@3500
AB	No Change	AB	ADMED	T10	143	87	H44	C78.40	130	0.85	100						
AC	New Code	AH	E39	T15	248	146	S124	ANSI	100		200						
AC	New Code	AH	E39	T15	248	146	S125	ANSI	100		200						
AD	New Code	SB	E39	E23.5	197	127±3	S120	ANSI	52		100						
AD	New Code	MF	E39	E23.5	197	127	S121	ANSI	52		70						
AD	New Code	MS	E39	E23.5	197	127±3	S122	ANSI	52		50						
AD	New Code	RZ	E39	E23.5	197	127±3	S123	ANSI	55		150						
AD	New Code	MC	E39	E23.5	197	----	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
AD	New Code	SB	E39	E23.5	197	127±3	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
AD	New Code	RZ	E39	E23.5	197	127±3	S55	ANSI	55	3.20	150	110		108		2500	1@2250
AG	New Code	AH	E39	T14.5	248	146	S129	ANSI	100		350						
AJ	New Code	PS	R7s	T7.5	138	----	M81	C78.DRAFT	95	1.80	150	230	325	TBD	TBD	4K-6K	2@3600
AJ	Retire	~~FP~~	RSC-R7s	T7	138	69±4	M92	ANSI	100	1.10	100	216				3300	1.0@3K
AR	New Code	AY	E26	B21	165	96	H38	ANSI	130	0.90	100						
AR	Retire	~~AZ~~	E26	B21	165	96	H38	ANSI	130	0.90	100						
AR	New Code	AY	E26	B21	165	96	H43	ANSI	130	0.64	75						
AR	Retire	~~AZ~~	E26	B21	165	96	H43	ANSI	130	0.64	75						
AR	Retire	~~AX~~	E26	B21	165	95	H45	ANSI	90	0.53	40						
AR	Retire	~~AZ~~	E26	B21	165	95	H45	ANSI	90	0.53	40						
AS	New Code	AR	E39	T16	280	178	H33										
AW	New Code	WC	RSC	T8	256	128	S51	ANSI	100	4.60	392	198				2500	1@2250
BB	Retire	~~PF~~	E40	T100	430	260±5	M82	ANSI	230	10.30	2000	380				4500	1@4000
BB	Retire	~~PW~~					M84	ANSI	220	18.00	3600	380				4500	1@4000
BC	New Code	AF	PG12	T10	149	91	S104	ANSI			50						
BC	New Code	NZ	PG12	T10			S105	ANSI			100						
BC	New Code	AF	PG12	T10	149	91	S99	ANSI	45	0.90	35	108				3500	0.5@3150
BS	No Change	BS	E39	R40	178	----	H39	ANSI	130	1.45	175						
BV	Retire	~~BW~~	E39	R40	191		H39	ANSI	130	1.50	175						
CF	Retire	~~BF~~	E26	EL24	172	118	H42	ANSI	125	1.15	125						
CF	Retire	~~BG~~	E26	EL24	172	118	H42	ANSI	125	1.15	125						
CR	New Code	VK	R7s				M103	ANSI									
CR	New Code	VK	R7s				M80	ANSI									
CS	Retire	~~CL~~	E39	BT37	295	185±5	S64	ANSI	135	3.25	360						
CS	Retire	~~CM~~	E39	BT37	295	185±5	S64	ANSI	135	3.25	360						
CS	Retire	~~CK~~	E39	BT37	295	185±5	S64	ANSI	135	3.25	360						
CX	New Code	HT	E39	E23.5	191	127	H38	C78.40	130	0.85	100						
CX	New Code	JA	E39	E23.5	191	----	H38	C78.40	130	0.85	100						
DC	New Code	PX	R7s	T6	120	----	M85	C78.1381	95	0.95	75	230*	325*	230*	325*	4K-6K	2@3600
DC	New Code	TN	RSC	T6	120	----	M91	C78.DRAFT	100	1.10	100	235	332	----	----	4K-6K	2@3600
DC	Retire	~~NR~~					S62	ANSI									
DC	Retire	~~NR~~					S88	ANSI	90	0.98	70	230				4000	2@3600
DK	New Code	DL	E26	B17	131	----	H45	C78.40	90	0.53	40						
DK	New Code	EL	E26	B17	131	80	H45	C78.40	90	0.53	40						
DK	New Code	DL	E26	E17	131	----	H46	C78.40	95	0.60	50						
DK	New Code	EL	E26	E17	131	80	H46	C78.40	95	0.60	50						
DR	New Code	VM	Fc2				M109	ANSI									
DR	New Code	PR	Fc2	T8	169	----	M80	C78.DRAFT	100	3.00	250	230	325	TBD	TBD	4K-6K	2@3600
DT	Retire	~~DT~~	E26	B21	153	103±5	H95	ANSI	115	0.80	80						
DV	New Code	HK	E26	R40	178	----	B94	C78.1380		2.22	250						
DV	New Code	HN	E26	R40	178	----	B94	C78.1380		2.22	250						
DV	New Code	HY	E26*	RD40	178	----	B94	C78.1380		2.22	250						
EF	No Change	EF	R7s	T10	254	127±4	M108										
EG	New Code	~~EFR~~					M108										
EJ	Retire	~~EA~~	E39	E18	124	146	H33	ANSI	135	3.20	400						
EJ	New Code	VA	E39	E18	248	146±3	S50	C78.42	100	3.00	250	198		198*		2.5K-4K	1@2250
EJ	Retire	~~VJ~~	E39	E18	248	146±3	S50	ANSI	100	3.00	250	198				2.5K-4K	1@2250
EJ	New Code	WA	E39	E18	248	146±3	S51	C78.42	100	4.60	400	198		198*		2.5K-4K	1@2250
EJ	New Code	WG	E39	E18			S51	ANSI	100	4.60	400						
EJ	New Code	MN	E39	E18	248	146±3	S66	C78.42	100	2.40	200	198		198*		2.5K-4K	1@2250
EJ	New Code	MR	E39	E18	248	146±3	S67	C78.42	100	3.60	310	198		198*		2.5K-4K	1@2250
EM	New Code	ED	Fc2	T10	254	127±4	M108	ANSI									
EM	New Code	EE	Fc2	T10	254	127±4	M108										
ER	New Code	VC	E39	E28	228	----	S50	C78.42	100	3.00	250	198		198*		2.5K-4K	1@2250
ER	New Code	SD	E39	BT28	228	127±3	S56	C78.42	100	1.80	150	198		198*		2.5K-4K	1@2250
ER	New Code	SE	E39	BT28	228	----	S56	C78.42	100	1.80	150	198		198*		2.5K-4K	1@2250

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ANNEX A1
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by Proposed NEW Physical Code

New	Committee	Old			MOL	LCL			Electrical Design			Ext. Start (LAG) MIN OCV		Ext. Start (LEAD) MIN OCV		Pulse	Pulse
Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)	ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	Height V	Width µS@V
EW	Retire	~~YG~~					~~B78~~										
EW	Retire	~~YD~~					~~B78~~										
EW	New Code	YE					~~B78~~				750						
EW	New Code	YF					~~B78~~				750						
EW	Retire	~~DA~~	E39	R57	324	203	H33	ANSI	135	3.20	400						
EZ	New Code	AH	E39	T15	248	154	S126	ANSI									
FM	New Code	JE	E39	PS40	248	178±6	~~B76~~	C78.1340		2.10	450	220					
FM	New Code	JF	E39	PS40	248	——	~~B76~~	C78.1340		2.10	450	220					
FM	New Code	JG	E39	PS40	248	——	~~B76~~	C78.1340		2.10	450	220					
FN	New Code	FP					H32	ANSI	135	0.66	75						
FO	New Code	FP					H37	ANSI									
FX	New Code	FY	E39	R52	299		H32	ANSI	135	0.66	75						
FX	New Code	DN	E39	R52	299	——	H33	ANSI	135	3.20	400						
FX	New Code	FY	E39	R52	299	——	H33	ANSI	132	3.20	400						
GC	New Code	AH	E39	T15	248	154	S106	ANSI									
GF	New Code	LL	E26	A23	139	89	H38	C78.40	130	0.85	100						
GF	New Code	MP	E26	A23	139	——	H38	C78.40	130	0.85	100						
GH	New Code	GV	E39	BT56	391	241	H34	C78.40	135	8.00	1000						
GH	New Code	GW	E39	BT56	391	——	H34	C78.40	135	8.00	1000						
GH	New Code	KY	E39	BT56	391	——	H34	C78.40	135	8.00	1000						
GH	New Code	GV	E39	BT56	391	241	H36	C78.40	265	4.00	1000						
GH	New Code	GW	E39	BT56	391	——	H36	C78.40	265	4.00	1000						
GH	New Code	KY	E39	BT56	391		H36	C78.40	265	4.00	1000						
GH	New Code	PA	E39	BT56	391	241±6	M47	C78.1376	263	4.10	1000	530	750	380°			
GH	New Code	PB	E39	BT56	391	——	M47	C78.1376	263	4.10	1000	530	750	380°			
GH	New Code	PC	E39	BT56	391	241±6	M48	C78.1379	268	6.20	1500	530	750	410°			
GJ	New Code	WA	E39	E18	248	19±3	S51	ANSI	102	4.60	400						
GN	Retire	~~XG~~	RSC	T8	334		S52	ANSI	250	4.70	1000	456				3000	4@2700
GS	No Change	GS	ADMEDSK	PAR38	138	——	H44	C78.40	130	0.85	100						
GT	Retire	~~XB~~	RSC	T8	191	95.5	S50	ANSI	100	3.00	250	198		198		2500	1@2250
GZ	No Change	GZ	E26	E17	134	87±3	M100	ANSI	90	0.36	32						
HE	No Change	HE	E26	PS35	227	167±4	B94	C78.1380		2.22	250						
HG	No Change	HG	E39	PS35	239	167±4	B94	C78.1380		2.22	250						
HL	Retire	~~HL~~					H33	ANSI	135	3.20	400						
HM	No Change	HM	E26	ED28	216	139±8	B94	C78.1380		2.22	250						
HP	No Change	HP	E39	ED28	211	136±12	B94	C78.1380		2.22	250						
HR	Retire	~~HR~~	E39	R80	340		H34	ANSI	135	8.20	1000						
HR	No Change	HR	E39	R80	340		H36	ANSI	265	4.00	1000						
HS	Retire	~~HS~~					H33	ANSI									
HZ	No Change	HZ	E39	RD40	188	——	B94	C78.1380		2.22	250						
JC	No Change	JC	E39	BT37	292	——	~~B76~~	C78.1340		2.10	450	220					
JM	No Change	JM	MDSK	PAR38	138	——	H44	C78.40	130	0.85	100						
JW	No Change	JW	E39	PAR36	76	——	H43	ANSI	130	0.66	75						
JW	Retire	~~JW~~	E39	PAR36	76	——	H46	ANSI	90	0.60	50						
KA	New Code	KB	E39	BT28	211	127	H37	C78.40	130	2.10	250						
KA	New Code	KC	E39	BT28	211	——	H37	C78.40	130	2.10	250						
KA	New Code	KB	E39	BT28	211	127	H39	C78.40	130	1.50	175						
KA	New Code	KC	E39	BT28	211	——	H39	C78.40	130	1.45	175						
KA	New Code	PE	E39	BT28	211	127±5	M57	C78.1377	132	1.50	175	382	540	280°			
KA	New Code	PF	E39	BT28	211	——	M57	C78.1377	132	1.50	175	382	540	280°			
KA	New Code	PG	E39	BT28	211	127±5	M58	C78.1378	133	2.10	250	382	540	300°			
KA	New Code	PG	E39	BT28	211	——	M58	C78.1378	133	2.10	250	382	540	300°			
KA	New Code	PH	E39	BT28	211	127±5	M59	NEW	135	3.25	400						
KA	New Code	PH	E39	BT28	211	——	M59	NEW	135	3.25	400						
KD	Retire	~~KL~~	E26	PAR38	110	——	H43	ANSI	130	0.66	75						
KD	Retire	~~KL~~	E26	PAR38	11		H44	ANSI	130	0.85	100						
KD	Retire	~~MX~~	E26	PAR38			S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250
KE	New Code	KL	E26	PAR30	125	——	M130	ANSI	90		39						
KF	New Code	BM	E26	R40	178	——	H38	ANSI	130	0.90	100						
KF	New Code	BP	E26	R40	178	——	H38	ANSI	130	0.85	100						
KF	New Code	BM	E26	R40	178	——	H39	ANSI	130	1.50	175						
KF	New Code	BP	E26	R40	178	——	H39	ANSI	130	1.50	175						
KK	No Change	KK	E26	PAR20	95	——	M130	ANSI	90		39						
KP	New Code	JH	E39	R60	258	——	~~B76~~	C78.1340		2.10	450	220					
KP	New Code	JJ	E39	R60	258	——	~~B76~~	C78.1340		2.10	450	220					
KP	New Code	JK	E39	R60	258	——	~~B76~~	C78.1340		2.10	450	220					
KS	Retire	~~VE~~	R12.5S	T6	273		S50	ANSI									
KS	Retire	~~VF~~	R12.5S	T6	273		S50	ANSI	100	3.00	250	198				2500	1@2250
KS	Retire	~~WE~~	R12.5S	T6	273		S51	ANSI	100	4.60	400	198				2500	1@2250

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ANNEX A1
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by Proposed NEW Physical Code

New Codes	Committee Proposal	Old Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	ANSI	Electrical Design Volts	Amps	Watts	Ext. Start (LAG) MIN OCV RMS	PEAK	Ext. Start (LEAD) MIN OCV RMS	PEAK	Pulse Height V	Pulse Width μS@V
KV	Retire	~~KV~~	E26	G40	177	110	~~H38~~	ANSI	130	0.85	100						
LA	Retire	~~MZ~~	E26	T10	143	88±3	~~S62~~	ANSI	52	1.60	70	110				2.5K-4K	1@2250
LE	New Code	VH	XR7s				M109										
LN	New Code	FS	E39	R60	277	—	~~H33~~		135	3.20	400						
LN	Retire	~~LN~~	E39	R60	277		~~H33~~	ANSI	135	3.20	400						
LN	New Code	FS					~~H37~~	ANSI									
LN	Retire	~~LN~~					~~H37~~	ANSI									
LS	Retire	~~LS~~	E39	BT37	324	178	~~H33~~	ANSI	135	3.20	400						
LV	Retire	~~LV~~					~~S91~~	ANSI									
LW	Retire	~~LW~~					~~S92~~	ANSI									
LX	Retire	~~LX~~	E39	BT56	397	245±7	~~S93~~	ANSI	145	7.50	940						
LY	Retire	~~LY~~					~~S92~~										
LZ	Retire	~~LZ~~					~~S92~~										
MB	New Code	MZ	E26	T10	108	73	~~S127~~	ANSI	52		50						
MY	Retire	~~MY~~	E26	PAR38	110		~~S62~~	ANSI	52	1.60	70	110				2.5K-4K	1@2250
NB	Retire	~~FG~~	E39	R80	399	—	~~H34~~	ANSI									
NC	New Code	NA	E39	BT46	368	241	~~H35~~	C78.40	265	2.80	700						
NC	New Code	ND	E39	BT46	368	—	~~H35~~	C78.40	265	2.80	700						
NE	New Code	FA	E39	R80	425	—	~~H36~~	ANSI	265	4.00	1000						
NE	New Code	FB	E39	R80	425	—	~~H36~~	ANSI	265	4.00	1000						
NE	New Code	FC	E39	R80	425	—	~~H36~~	ANSI	265	4.00	1000						
NG	Retire	~~VH~~	RSC	T6	256		~~S50~~	ANSI	100	3.00	250	198		198		2.5K-4K	1@2250
NG	Retire	~~WF~~	RSC	T6	256		~~S51~~	ANSI	100	4.60	400	198		198		2.5K-4K	1@2250
NV	New Code	MD	E39	E23.5	197	—	~~S55~~	C78.42	55	3.20	150	110				2.5K-4K	1@2250
NV	New Code	SC	E39	E23.5	197	127±3	~~S55~~	C78.42	55	3.20	150	110				2.5K-4K	1@2250
NV	New Code	ME	E39	E23.5	197	127±3	~~S62~~	C78.42	52	1.60	70	110				2.5K-4K	1@2250
NV	New Code	MF	E39	E23.5	197	—	~~S62~~	C78.42	52	1.60	70	110				2.5K-4K	1@2250
NV	New Code	MS	E39	E23.5	197	127±3	~~S68~~	C78.42	52	1.18	50	110				2.5K-4K	1@2250
NV	New Code	MT	E39	E23.5	197	—	~~S68~~	C78.42	52	1.18	50	110				2.5K-4K	1@2250
Obsolete	Obsolete	DG	E39	BT37	292	178	~~H1~~	Obsolete	135	3.20	400						
Obsolete	Obsolete	GL	E39	BT37	292	178	~~H1~~	Obsolete	135	3.20	400						
Obsolete	Obsolete	HL	E39	R60	261		~~H1~~	Obsolete	135	3.20	400						
Obsolete	Obsolete						~~H10~~	Obsolete									
Obsolete	Obsolete						~~H11~~	Obsolete									
Obsolete	Obsolete	GV	E39	BT56	391	241	~~H12~~	Obsolete	135	8.00	1000						
Obsolete	Obsolete	GW	E39	BT56	391	241	~~H12~~	Obsolete	135	8.00	1000						
Obsolete	Obsolete	HR	E39	R80	340		~~H12~~	Obsolete	135	8.20	1000						
Obsolete	Obsolete	KY	E39	BT56	391	241	~~H12~~	Obsolete	135	8.00	1000						
Obsolete	Obsolete						~~H13~~	Obsolete									
Obsolete	Obsolete						~~H14~~	Obsolete									
Obsolete	Obsolete	FA	E39	R80	399		~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete	FB	E39	R80	399		~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete	FC	E39	R80	399		~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete	GV	E39	BT56	391	241	~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete	GW	E39	BT56	391	241	~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete	HR	E39	R80	425		~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete	KY	E39	BT56	391	241	~~H15~~	Obsolete	265	4.00	1000						
Obsolete	Obsolete						~~H16~~	Obsolete									
Obsolete	Obsolete	MA	E39	BT37	292	178	~~H17~~	Obsolete	265	1.70	425						
Obsolete	Obsolete						~~H18~~	Obsolete									
Obsolete	Obsolete						~~H19~~	Obsolete									
Obsolete	Obsolete						~~H2~~	Obsolete									
Obsolete	Obsolete						~~H20~~	Obsolete									
Obsolete	Obsolete						~~H21~~	Obsolete									
Obsolete	Obsolete	KB	E39	BT28	210	127	~~H22~~	Obsolete									
Obsolete	Obsolete	KC	E39	BT28	210	127	~~H22~~	Obsolete									
Obsolete	Obsolete	FE	E26	T10	143	7.6	~~H3~~	Obsolete	250	0.40	85						
Obsolete	Obsolete	FG	E26	T10	143	7.6	~~H3~~	Obsolete	245	0.40	85						
Obsolete	Obsolete	AB	E26	T10	143	8.7	~~H4~~	Obsolete	100	1.10	100						
Obsolete	Obsolete	HT	E39	PS25	181	127	~~H4~~	Obsolete	130	0.90	100						
Obsolete	Obsolete	HW	E26	R40	162		~~H4~~	Obsolete	130	0.90	100						
Obsolete	Obsolete	JA	E39	PS25	181	127	~~H4~~	Obsolete	130	0.90	100						
Obsolete	Obsolete	KB	E39	BT28	211	127	~~H5~~	Obsolete	130	2.10	250						
Obsolete	Obsolete	KC	E39	BT28	211		~~H5~~	Obsolete	130	2.10	250						
Obsolete	Obsolete						~~H6~~	Obsolete									
Obsolete	Obsolete						~~H7~~	Obsolete									
Obsolete	Obsolete						~~H8~~	Obsolete									
Obsolete	Obsolete	FJ		T9.5	1397		~~H9~~	Obsolete	535	6.10	3000						
PL	New	PL	E39	E18	248	140±3	~~M58~~	NEW	135	2.10	250						

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ANNEX A1
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics
Sorted by Proposed NEW Physical Code

New	Committee	Old			MOL	LCL			Electrical Design			Ext. Start (LAG) MIN OCV		Ext. Start (LEAD) MIN OCV		Pulse Height	Pulse Width
Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)	ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V
PL	New Code	PL	E39	T18	248	146±3	M59	C78.1375	135	3.25	400	382	540	295*			
PL	Retire	~~PZ~~	E39	ED18	248	146±3	S50	ANSI	100	3.00	250	198		198	175	2500	1@2250
PM	Retire	~~PM~~	RSC	T7	250		M79	ANSI	250	6.70	1500	350					
PN	Retire	~~PN~~	E40/45	T14.5	220	150±5	M80	ANSI	100	3.00	250						
PO	New Code	PPA	G12	T6	90	56	M130	ANSI	90		39						
PP	Retire	~~PP~~	G12	T8	84	56	M81	ANSI	95	1.80	150	230				4K-6K	2@3600
PP	Retire	~~PP~~	G12	T8	84	56	M85	ANSI	90	0.97	75	230				4K-6K	2@3600
PV	Retire	~~PV~~					M83	ANSI	125	9.50	1000	230				4500	1@4000
PY	Retire	~~PY~~	FC2	T30	206	103±5	M86	ANSI	120	3.50	360	198	280			3000	1@2700
PZ	Retire	~~PZ~~	E40/45	T46	285	175±5	M86	ANSI	120	3.50	360	198	200			3000	1@2700
QA	No Change	QA	EP39	BT56	391	232	M47	ANSI	255		1000						
QA	New Code	QB	EP39	BT56	391	232	M48	ANSI	268		1500						
QC	No Change	QC	EX39	BT28	211	127	M57	NEW	130	1.50	175						
QC	New Code	QD	EX39	BT28	211	—	M57	NEW	130	1.50	175						
QC	New Code	QC	EX39	BT28	211	127	M58	ANSI	133		250						
QC	New Code	QD	EX39	BT28	211	—	M58	ANSI	133		250						
RA	No Change	RA	BY22d	T16	216	135	L69	C78.41	57	0.35	18	300					
RB	No Change	RB	BY22d	T16	311	185	L70	C78.41	70	0.60	37	390					
RC	No Change	RC	BY22d	T16	425	240	L71	C78.41	109	0.59	56	410					
RD	No Change	RD	BY22d	T20.5	528	290	L72	C78.41	112	0.94	91	420					
RE	No Change	RE	BY22d	T20.5	775	415	L73	C78.41	164	0.95	135	540					
RF	No Change	RF	BY22d	T20.5	1120	580	L74	C78.41	240	0.91	185	600					
RG	No Change	RG	BY22d	T12	150	95	L77	C78.41	55	0.20	10	340					
RV	Retire	~~RK~~	E26	B17	145	89±2	S55	ANSI	55	3.20	150	110		108		2500	1@2250
RV	New Code	RN	E26/24	B17	145	93±9	S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250
RV	New Code	RP	E26/24	B17	145	—	S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250
RX	Retire	~~VG~~					B78										
RX	Retire	~~VH~~					B78										
RX	Retire	~~VJ~~					B78										
RX	Retire	~~VK~~					B78										
SR	New Code	SL	E26	PAR38	148	—	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
SR	New Code	SM	E26/24	RD38	158	—	S76	C78.42	52	0.83	35	110				2.5K-4K	1@2250
TA	New Code		EP39	BT28	211	127	M57	NEW	130	1.50	175						
TA	New Code		EP39	BT28	211	—	M57	NEW	130	1.50	175						
TA	New Code		EP39	BT28	211	127	M58	NEW	133	2.10	250						
TA	New Code		EP39	BT28	211	—	M58	NEW	133	2.10	250						
TB	New Code		EP39	BT37	292	178±6	M59	NEW	135	3.25	400						
TB	New Code		EP39	BT37	211	—	M59	NEW	135	3.25	400						
TC	Retire	~~GA~~	E39	PAR56	127	29	H39	ANSI	130	1.50	175						
TC	Retire	~~GB~~	E39	PAR56	127	29	H39	ANSI	130	1.50	175						
VL	No Change	VL	Fc2				M103	OSI									
WL	Retire	~~WG~~	E39	R53			S50	ANSI	100	3.00	250	198					1@2250
WL	Retire	~~WD~~	E39	R53			S51	C78.1350 OLD	100	4.60	400	198				2500	1@2250
WV	New Code	YT	E26	RD40	183	—	B87	C78.1342		1.40	160						
XA	Retire	~~XA~~	E39	T18	383	220	S52	C78.1352 OLD	250	4.70	1000						
XB	No Change	XB	E39/CER	E25	383	222±6	S52	C78.42	250	4.70	1000	456		456*		3.0K-5K	4@2700
XB	No Change	XB	E39/CER	E25	382	220±3	S52										
XC	Retire	~~XC~~	R12.5S	T6	375		S52	ANSI	250	4.70	1000	380				3000	4@2700
XD	Retire	~~XD~~	E39	T28	408	240	S52	ANSI	250	4.70	1000	456				3000	4@2700
XF	Retire	~~XF~~	E39	BT28	211	127±3	S63	ANSI	130	1.50	150						
XH	Retire	~~XH~~	E39	BT28	250	160±5	S65	ANSI	130	2.10	215						
YA	Retire	~~YA~~					B78	ANSI									
YB	Retire	~~YB~~					B78										
YL	No Change	YL	E26	E23.5	178	—	B87	ANSI		1.40	160						
YN	No Change	YN	E26	PS30	186	—	B87	C78.1342		1.40	160						
YO	New Code	YS	E26	R40	178	—	B87	C78.1342		1.40	160						
YP	No Change	YP	E26	RL38	147	—	B87	C78.1342		1.40	160						
YR	No Change	YR	MED SKIRT	RL38	166.5	—	B87	C78.1342		1.40	160						
ZB	New Code	YM	E26	PS30	205	—	B87	C78.1342		1.40	160						
ZB	New Code	HD	E26	PS30	205	151±8	B94	C78.1380		2.22	250						
ZC	New Code	JB	E39	BT37	292	178±6	B76	C78.1340		2.10	450	220					
ZC	New Code	JD	E39	BT37	292	—	B76	C78.1340		2.10	450	220					
ZC	New Code	CD	E39	BT37	292	178	H33	C78.40	135	3.20	400						
ZC	New Code	GL	E39	BT37	292	—	H33	C78.40	135	3.20	400						
ZC	Retire	~~MA~~	E39	BT37	292	178	H40	ANSI	265	1.70	425						
ZC	New Code	PJ	E39	ED37	292	178	M128	ANSI	135		400						
ZC	New Code	PJ	E39	ED37	292	178	M131	ANSI	135		350						

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Transition Table Relating Assigned Key Lamp Characteristics
Sorted by Proposed NEW Physical Code

New	Committee	Old			MOL	LCL			Electrical Design			Ext. Start (LAG) MIN OCV		Ext. Start (LEAD) MIN OCV		Pulse	Pulse
Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)	ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	Height V	Width µS@V
ZC	New Code		E39	BT37	292	178	M47	NEW			1000						
ZC	New Code	PJ	E39	ED/BT37	292	178±6	M59	C78.1375	135	3.25	400	382	540	295*			
ZC	New Code	PK	E39	ED/BT37	292	—	M59	C78.1375	135	3.25	400	382	540	295*			
ZC	Retire	~~NJ~~	E39	BT37	292	178±4	M89	ANSI	235	3.30	750						
ZC	Retire	~~NJ~~					M91	ANSI									
ZC	New Code	NH	E39	BT37	292	178	S111	ANSI									
ZC	Retire	~~NE~~	E39	BT37	292	178±6	S50	C78.1351 OLD	100	3.00	250	198				2500	1@2250
ZC	New Code	WB	E39	E37	292	—	S51	C78.42	100	4.60	400	198		198*		2.5K-4K	1@2250
ZC	Retire	~~MJ~~	E39	BT37	292	178±6	S64	ANSI	130	3.30	360						
ZC	Retire	~~MK~~	E39	BT37	292	178±6	S64	ANSI	130	3.30	360						
ZL	New Code	AV	E26	E17	139	—	H38	C78.40	130	0.85	100						
ZL	New Code	AN	E26	B17	139	89	H43	C78.40	130	0.66	75						
ZL	New Code	AV	E26	E17	139	—	H43	C78.40	130	0.64	75						
ZL	Obsolete	TW	E26	ED17	138	86±3	~~M101~~	ANSI			75						
ZL	Obsolete	TX	E26	ED17	138		~~M101~~	ANSI			75						
ZL	New Code	TW	E26	ED17	138	86±3	M102	C78.DRAFT	95	1.80	150	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	TX	E26	ED17	138	—	M102	C78.DRAFT	95	1.80	150	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	TS	E26	B17	138	86±3	M107	ANSI			150						
ZL	New Code	TT	E26	B17	138	—	M107				150						
ZL	New Code	TL	E26	ED17	138	86±3	M110	C78.DRAFT	85	0.68	50	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	TM	E26	ED17	138	—	M110	C78.DRAFT	85	0.68	50	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	TW	E26	ED17	138	86±3	M57	NEW	130	1.50	175						
ZL	New Code	TX	E26	ED17	138	—	M57	NEW	130	1.50	175						
ZL	New Code	SJ	E26	B17	138	87	M90				100						
ZL	New Code	SK	E26	B17	138	—	M90				100						
ZL	New Code	TW	E26	ED17	138	86±3	M90	C78.DRAFT	100	1.10	100	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	TX	E26	ED17	138	—	M90	C78.DRAFT	100	1.10	100	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	SI	E26	B17	138	—	M98	C78.DRAFT	85	0.90	70	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	SJ	E26	B17	138	86±3	M98	C78.DRAFT	85	0.90	70	235	332	—	—	3.0K-4K	1@2.7K
ZL	New Code	SG	E26/24	B17	138	89±6	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
ZL	New Code	SH	E26/24	B17	138	—	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
ZL	New Code	LG	E26/24	B17	138	89±5	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
ZL	New Code	LH	E26/24	B17	138	—	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
ZL	New Code	LP	E26/24	B17	138	87±6	S68	C78.42	52	1.18	50	110				2.5K-4K	1@2250
ZL	New Code	LR	E26/24	B17	138	—	S68	C78.42	52	1.18	50	110				2.5K-4K	1@2250
ZL	New Code	HA	E26/24	E17	138	87±5	S76	C78.42	52	0.83	35	110				2.5K-4K	1@2250
ZL	New Code	HB	E26/24	E17	138	—	S76	C78.42	52	0.83	35	110				2.5K-4K	1@2250
ZN	Retire	~~MH~~					S62	ANSI									
ZN	New Code	MG	E39	BT28	211	127±3	S63	ANSI	130	1.50	150						
ZN	Retire	~~MH~~	E39	BT28	211	127±3	S63	ANSI	130	1.50	150						
ZN	New Code	MG	E39	BT28	211	127±3	S64										
ZN	New Code	ML	E39	BT28	211	127	S65	ANSI	130	2.10	215						
ZN	Retire	~~MM~~	E39	BT28	211	127	S65	ANSI	130	2.10	215						
ZW	New Code	YV	E26	R40	178	—	B87	C78.1342		1.40	160						
ZW	Retire	~~NG~~	E39				H32	Obsolete	130	0.66	75						
ZW	Retire	~~BN~~	E26	R40	178	114	H39	ANSI	130	1.50	175						
							H23	?									
							H24	?									
							H25	Obsolete									
							H26	?									
							H27	?									
							H28	?									
							H29	?									
							H30	?									
							H31	?									
							H41	?									
			E39	BT28	211	127	M132	OSI	135	2.63	320	NA	NA	245	465	2700	1.3@?
	Ceramic / Cable / Spade			T8	254	127	M133	OSI	265	6.30	1500	NA	NA	320@1.8 cf	740@1.8cf	3600	1@?
	Ceramic / Cable / Spade			T9	254	127	M134	OSI	260	8.50	2000	NA	NA	375@1.8 cf	675@1.8cf	3600	1@?
			E39	BT37	292	178	M135	OSI	135	3.25	400	NA	NA	245	465	2700	1.3@?
							M60	?									
							M61	?									
							S49	?									
							S53	?									

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ANSI C78.380-1997
Revision of ANSI C78.380-1984 (R1993)

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ANNEX A2
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the OLD Physical Code

												Ext. Starting (LAG)		Ext. Starting (Lead)		Pulse	Pulse
Old	Committee	New			MOL	LCL			Electrical Design			MIN OCV		MIN OCV		Pulse Height	Pulse Width
Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)	ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V
AB	No Change	AB	ADMED	T10	143	87	H44	C78.40	130	0.85	100						
AB	Obsolete	Obsolete	E26	T10	143	8.7	H4	Obsolete	100	1.10	100						
AF	New Code	BC	PG12	T10	149	91	S104	ANSI			50						
AF	New Code	BC	PG12	T10	149	91	S99	ANSI	45	0.90	35	108				3500	0.5@3150
AH	New Code	AC	E39	T15	248	146	S124	ANSI	100		200						
AH	New Code	AC	E39	T15	248	146	S125	ANSI	100		200						
AH	New Code	AG	E39	T14.5	248	146	S129	ANSI	100		350						
AH	New Code	EZ	E39	T15	248	154	S126	ANSI									
AH	New Code	GC	E39	T15	248	154	S106	ANSI									
AN	New Code	ZL	E26	B17	139	89	H43	C78.40	130	0.66	75						
AR	New Code	AS	E39	T16	280	178	H33										
AV	New Code	ZL	E26	E17	139	----	H38	C78.40	130	0.85	100						
AV	New Code	ZL	E26	E17	139	----	H43	C78.40	130	0.64	75						
AY	New Code	AR	E26	B21	165	96	H38	ANSI	130	0.90	100						
AY	New Code	AR	E26	B21	165	96	H43	ANSI	130	0.64	75						
~~AY~~	Retire	AR	E26	B21	165	95	H45	ANSI	90	0.53	40						
~~A2~~	Retire	AR	E26	B21	165	96	H38	ANSI	130	0.90	100						
~~A2~~	Retire	AR	E26	B21	165	96	H43	ANSI	130	0.64	75						
~~A2~~	Retire	AR	E26	B21	165	95	H45	ANSI	90	0.53	40						
~~BF~~	Retire	CF	E26	EL24	172	118	H42	ANSI	125	1.15	125						
~~BG~~	Retire	CF	E26	EL24	172	118	H42	ANSI	125	1.15	125						
BM	New Code	KF	E26	R40	178	----	H38	ANSI	130	0.90	100						
BM	New Code	KF	E26	R40	178	----	H39	ANSI	130	1.50	175						
~~BN~~	Retire	ZW	E26	R40	178	114	H39	ANSI	130	1.50	175						
BP	New Code	KF	E26	R40	178	----	H38	ANSI	130	0.85	100						
BP	New Code	KF	E26	R40	178	----	H39	ANSI	130	1.50	175						
BS	No Change	BS	E39	R40	178	----	H39	ANSI	130	1.45	175						
~~BV~~	Retire	BV	E39	R40	191		H39	ANSI	130	1.50	175						
~~CA~~	Retire	TC	E39	PAR56	127	29	H39	ANSI	130	1.50	175						
~~CB~~	Retire	TC	E39	PAR56	127	29	H39	ANSI	130	1.50	175						
CD	New Code	ZC	E39	BT37	292	178	H33	C78.40	135	3.20	400						
~~CL~~	Retire	CS	E39	BT37	295	185±6	S64	ANSI	135	3.25	360						
~~CM~~	Retire	CS	E39	BT37	295	185±6	S64	ANSI	135	3.25	360						
DG	Obsolete	Obsolete	E39	BT37	292	178	~~H1~~	Obsolete	135	3.20	400						
DL	New Code	DK	E26	B17	131	----	H45	C78.40	90	0.53	40						
DL	New Code	DK	E26	E17	131	----	H46	C78.40	95	0.60	50						
DN	New Code	FX	E39	R52	299	----	H33	ANSI	135	3.20	400						
~~DP~~	Retire	EW	E39	R57	324	203	H33	ANSI	135	3.20	400						
~~DT~~	Retire	DT	E26	B21	153	103±5	H95	ANSI	115	0.50	80						
~~EA~~	Retire	EJ	E39	E18	124	146	H33	ANSI	135	3.20	400						
~~EB~~	Retire	AA	Fc2	T8	177	88±3	M58	ANSI	130	2.15	250	382		280	560	3750	2@3500
~~EB~~	Retire	AA	Fc2	T8	177	88±3	M97	ANSI	130	2.15	250	382		280	560	3750	2@3500
~~EG~~	Retire	AA	Fc2	T8	177	88±3	M57	ANSI	130	1.50	175	382		280	560	3750	2@3500
~~EG~~	Retire	AA	Fc2	T8	177	88±3	M96	ANSI	130	1.50	175	382		280	560	3750	2@3500
ED	New Code	EM	Fc2	T10	254	127±4	M108	ANSI									
EE	New Code	EM	Fc2	T10	254	127±4	M108										
EF	No Change	EF	R7s	T10	254	127±4	M108										
~~EFR~~	New Code	EG					M108										
EL	New Code	DK	E26	B17	131	80	H45	C78.40	90	0.53	40						
EL	New Code	DK	E26	E17	131	80	H46	C78.40	95	0.60	50						
FA	New Code	NE	E39	R80	425	----	H36	ANSI	265	4.00	1000						
FA	Obsolete	Obsolete	E39	R80	399		~~H16~~	Obsolete	265	4.00	1000						
FB	New Code	NE	E39	R80	425	----	H36	ANSI	265	4.00	1000						
FB	Obsolete	Obsolete	E39	R80	399		~~H16~~	Obsolete	265	4.00	1000						
~~FC~~	Retire	NB	E39	R80	399	----	H34	ANSI									
FC	New Code	NE	E39	R80	425	----	H36	ANSI	265	4.00	1000						
FC	Obsolete	Obsolete	E39	R80	399		~~H16~~	Obsolete	265	4.00	1000						
FE	Obsolete	Obsolete	E26	T10	143	7.6	~~H3~~	Obsolete	250	0.40	85						
FG	Obsolete	Obsolete	E26	T10	143	7.6	~~H3~~	Obsolete	245	0.40	85						
FJ	Obsolete	Obsolete		T9.5	1397		~~H9~~	Obsolete	535	6.10	3000						
FP	New Code	FN					H32	ANSI	135	0.66	75						
FP	New Code	FO					H37	ANSI									
FS	New Code	LN	E39	R60	277	----	H33		135	3.20	400						
FS	New Code	LN					H37	ANSI									
FY	New Code	FX	E39	R52	299		H32	ANSI	135	0.66	75						

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ANNEX A2
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the OLD Physical Code

												Ext. Starting (LAG)		Ext. Starting (Lead)		Pulse	Pulse
Old	Committee	New			MOL	LCL			Electrical Design			MIN OCV		MIN OCV		Pulse Height	Pulse Width
Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)	ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V
FY	New Code	FX	E39	R52	299	—	H33	ANSI	132	3.20	400						
~~GL~~	Obsolete	Obsolete	E39	BT37	292	178	~~H1~~	Obsolete	135	3.20	400						
GL	New Code	ZC	E39	BT37	292	—	H33	C78.40	135	3.20	400						
GS	No Change	GS	ADMEDSK	PAR38	138	—	H44	C78.40	130	0.85	100						
GV	New Code	GH	E39	BT56	391	241	H34	C78.40	135	8.00	1000						
GV	New Code	GH	E39	BT56	391	241	H36	C78.40	265	4.00	1000						
GV	Obsolete	Obsolete	E39	BT56	391	241	~~H12~~	Obsolete	135	8.00	1000						
GV	Obsolete	Obsolete	E39	BT56	391	241	~~H15~~	Obsolete	265	4.00	1000						
GW	New Code	GH	E39	BT56	391	—	H34	C78.40	135	8.00	1000						
GW	New Code	GH	E39	BT56	391	—	H36	C78.40	265	4.00	1000						
GW	Obsolete	Obsolete	E39	BT56	391	241	~~H12~~	Obsolete	135	8.00	1000						
GW	Obsolete	Obsolete	E39	BT56	391	241	~~H15~~	Obsolete	265	4.00	1000						
GZ	No Change	GZ	E26	E17	134	87±3	M100	ANSI	90	0.36	32						
HA	New Code	ZL	E26/24	E17	138	87±5	S76	C78.42	52	0.83	35	110				2.5K-4.0K	1@2250
HB	New Code	ZL	E26/24	E17	138	—	S76	C78.42	52	0.83	35	110				2.5K-4.0K	1@2250
HD	New Code	ZB	E26	PS30	205	151±8	B94	C78.1380		2.22	250						
HE	No Change	HE	E26	PS35	227	167±4	B94	C78.1380		2.22	250						
HG	No Change	HG	E39	PS35	239	167±4	B94	C78.1380		2.22	250						
HK	New Code	DV	E26	R40	178	—	B94	C78.1380		2.22	250						
~~HL~~	Retire	HL					H33	ANSI	135	3.20	400						
HL	Obsolete	Obsolete	E39	R60	261		~~H1~~	Obsolete	135	3.20	400						
HM	No Change	HM	E26	ED28	216	139±8	B94	C78.1380		2.22	250						
HN	New Code	DV	E26	R40	178	—	B94	C78.1380		2.22	250						
HP	No Change	HP	E39	ED28	211	136±12	B94	C78.1380		2.22	250						
~~HQ~~	Retire	HR	E39	R80	340		H34	ANSI	135	8.20	1000						
HR	No Change	HR	E39	R80	340		H36	ANSI	265	4.00	1000						
HR	Obsolete	Obsolete	E39	R80	340		~~H12~~	Obsolete	135	8.20	1000						
HR	Obsolete	Obsolete	E39	R80	425		~~H15~~	Obsolete	265	4.00	1000						
~~HS~~	Retire	HS					H33	ANSI									
HT	New Code	CX	E39	E23.5	191	127	H38	C78.40	130	0.85	100						
HT	Obsolete	Obsolete	E39	PS25	181	127	~~H4~~	Obsolete	130	0.90	100						
HW	Obsolete	Obsolete	E26	R40	162		~~H4~~	Obsolete	130	0.90	100						
HY	New Code	DV	E26	RD40	178	—	B94	C78.1380		2.22	250						
HZ	No Change	HZ	E39	RD40	188	—	B94	C78.1380		2.22	250						
JA	New Code	CX	E39	E23.5	191	—	H38	C78.40	130	0.85	100						
JA	Obsolete	Obsolete	E39	PS25	181	127	~~H4~~	Obsolete	130	0.90	100						
JB	New Code	ZC	E39	BT37	292	178±6	~~S75~~	C78.1340		2.10	450	220					
JC	No Change	JC	E39	BT37	292	—	~~S75~~	C78.1340		2.10	450	220					
JD	New Code	ZC	E39	BT37	292	—	~~S75~~	C78.1340		2.10	450	220					
JE	New Code	FM	E39	PS40	248	178±6	~~S75~~	C78.1340		2.10	450	220					
JF	New Code	FM	E39	PS40	248	—	~~S75~~	C78.1340		2.10	450	220					
JG	New Code	FM	E39	PS40	248	—	~~S75~~	C78.1340		2.10	450	220					
JH	New Code	KP	E39	R60	258	—	~~S75~~	C78.1340		2.10	450	220					
JJ	New Code	KP	E39	R60	258	—	~~S75~~	C78.1340		2.10	450	220					
JK	New Code	KP	E39	R60	258	—	~~S75~~	C78.1340		2.10	450	220					
JM	No Change	JM	MDSK	PAR38	138	—	~~H44~~	C78.40	130	0.85	100						
JW	No Change	JW	E39	PAR36	76	—	~~H43~~	ANSI	130	0.66	75						
~~JW~~	Retire	JW	E39	PAR36	76	—	~~H46~~	ANSI	90	0.60	50						
KB	New Code	KA	E39	BT28	211	127	H37	C78.40	130	2.10	250						
KB	New Code	KA	E39	BT28	211	127	H39	C78.40	130	1.50	175						
KB	Obsolete	Obsolete	E39	BT28	210	127	~~H22~~	Obsolete									
KB	Obsolete	Obsolete	E39	BT28	211	127	~~H6~~	Obsolete	130	2.10	250						
KC	New Code	KA	E39	BT28	211	—	H37	C78.40	130	2.10	250						
KC	New Code	KA	E39	BT28	211	—	H39	C78.40	130	1.45	175						
KC	Obsolete	Obsolete	E39	BT28	210	127	~~H22~~	Obsolete									
KC	Obsolete	Obsolete	E39	BT28	211		~~H6~~	Obsolete	130	2.10	250						
KK	No Change	KK	E26	PAR20	95	—	M130	ANSI	90		39						
~~KL~~	Retire	KD	E26	PAR38	110	—	~~H43~~	ANSI	130	0.66	75						
~~KL~~	Retire	KD	E26	PAR38	11		~~H44~~	ANSI	130	0.85	100						
KL	New Code	KE	E26	PAR30	125	—	M130	ANSI	90		39						
~~KV~~	Retire	KV	E26	G40	177	110	~~H38~~	ANSI	130	0.85	100						
KY	New Code	GH	E39	BT56	391	—	H34	C78.40	135	8.00	1000						
KY	New Code	GH	E39	BT56	391		H36	C78.40	265	4.00	1000						
KY	Obsolete	Obsolete	E39	BT56	391	241	~~H12~~	Obsolete	135	8.00	1000						
KY	Obsolete	Obsolete	E39	BT56	391	241	~~H15~~	Obsolete	265	4.00	1000						

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ANNEX A2
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Transition Table Relating Assigned Key Lamp Characteristics Sorted by the OLD Physical Code

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	ANSI	Electrical Design Volts	Amps	Watts	Ext. Starting (LAG) MIN OCV RMS	PEAK	Ext. Starting (Lead) MIN OCV RMS	PEAK	Pulse Height V	Pulse Width µS@V
LG	New Code	ZL	E26/24	B17	138	89±5	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
LH	New Code	ZL	E26/24	B17	138	----	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
LL	New Code	GF	E26	A23	139	89	H38	C78.40	130	0.85	100						
~~LN~~	Retire	LN	E39	R60	277		H33	ANSI	135	3.20	400						
~~LN~~	Retire	LN					H37	ANSI									
LP	New Code	ZL	E26/24	B17	138	87±6	S68	C78.42	52	1.18	50	110				2.5K-4.0K	1@2250
LR	New Code	ZL	E26/24	B17	138	——	S68	C78.42	52	1.18	50	110				2.5K-4.0K	1@2250
~~LS~~	Retire	LS	E39	BT37	324	178	H33	ANSI	135	3.20	400						
~~LV~~	Retire	LV					S91	ANSI									
~~LW~~	Retire	LW					S92	ANSI									
~~LX~~	Retire	LX	E39	BT56	397	245±7	S93	ANSI	145	7.50	940						
~~LY~~	Retire	LY					S92										
~~LZ~~	Retire	LZ					S92										
MA	Obsolete	Obsolete	E39	BT37	292	178	~~H17~~	Obsolete	265	1.70	425						
~~MA~~	Retire	ZC	E39	BT37	292	178	H40	ANSI	265	1.70	425						
MC	New Code	AD	E39	E23.5	197	——	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
MD	New Code	NV	E39	E23.5	197	——	S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250
ME	New Code	NV	E39	E23.5	197	127±3	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
MF	New Code	AD	E39	E23.5	197	127	S121	ANSI	52		70						
MF	New Code	NV	E39	E23.5	197	----	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
MG	New Code	ZN	E39	BT28	211	127±3	S63	ANSI	130	1.50	150						
MG	New Code	ZN	E39	BT28	211	127±3	S64										
~~MH~~	Retire	ZN					S62	ANSI									
~~MH~~	Retire	ZN	E39	BT28	211	127±3	S63	ANSI	130	1.50	150						
~~MJ~~	Retire	ZC	E39	BT37	292	178±6	S64	ANSI	130	3.30	360						
~~MK~~	Retire	ZC	E39	BT37	292	178±6	S64	ANSI	130	3.30	360						
ML	New Code	ZN	E39	BT28	211	127	S65	ANSI	130	2.10	215						
~~MM~~	Retire	ZN	E39	BT28	211	127	S65	ANSI	130	2.10	215						
MN	New Code	EJ	E39	E18	248	146±3	S66	C78.42	100	2.40	200	198		198*		2.5K-4.0K	1@2250
MP	New Code	GF	E26	A23	139	----	H38	C78.40	130	0.85	100						
MR	New Code	EJ	E39	E18	248	146±3	S67	C78.42	100	3.60	310	198		198*		2.5K-4.0K	1@2250
MS	New Code	AD	E39	E23.5	197	127±3	S122	ANSI	52		50						
MS	New Code	NV	E39	E23.5	197	127±3	S68	C78.42	52	1.18	50	110				2.5K-4.0K	1@2250
MT	New Code	NV	E39	E23.5	197	----	S68	C78.42	52	1.18	50	110				2.5K-4.0K	1@2250
~~MX~~	Retire	KD	E26	PAR38			S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250
~~MY~~	Retire	MY	E26	PAR38	110		S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250
~~MZ~~	Retire	LA	E26	T10	143	88±3	S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250
MZ	New Code	MB	E26	T10	108	73	S127	ANSI	52		50						
NA	New Code	NC	E39	BT46	368	241	H35	C78.40	265	2.80	700						
ND	New Code	NC	E39	BT46	368	----	H35	C78.40	265	2.80	700						
~~NG~~	Retire	ZW	E39				H32	Obsolete	130	0.66	75						
NH	New Code	ZC	E39	BT37	292	178	S111	ANSI									
~~NJ~~	Retire	ZC	E39	BT37	292	178±4	M89	ANSI	235	3.30	750						
~~NJ~~	Retire	ZC					M91	ANSI									
~~NR~~	Retire	DC					S62	ANSI									
~~NR~~	Retire	DC					S88	ANSI	90	0.98	70	230				4000	2@3600
NZ	New Code	BC	PG12	T10			S105	ANSI			100						
PA	New Code	GH	E39	BT56	391	241±6	M47	C78.1376	263	4.10	1000	530	750	380*			
PB	New Code	GH	E39	BT56	391	——	M47	C78.1376	263	4.10	1000	530	750	380*			
PC	New Code	GH	E39	BT56	391	241±6	M48	C78.1379	268	6.20	1500	530	750	410*			
PE	New Code	KA	E39	BT28	211	127±5	M57	C78.1377	132	1.50	175	382	540	280*			
PF	New Code	KA	E39	BT28	211	----	M57	C78.1377	132	1.50	175	382	540	280*			
PG	New Code	KA	E39	BT28	211	127±5	M58	C78.1378	133	2.10	250	382	540	300*			
PG	New Code	KA	E39	BT28	211	----	M58	C78.1378	133	2.10	250	382	540	300*			
PH	New Code	KA	E39	BT28	211	127±5	M59	NEW	135	3.25	400						
PH	New Code	KA	E39	BT28	211	----	M59	NEW	135	3.25	400						
PJ	New Code	ZC	E39	ED37	292	178	M128	ANSI	135		400						
PJ	New Code	ZC	E39	ED37	292	178	M131	ANSI	135		350						
PJ	New Code	ZC	E39	ED/BT37	292	178±6	M59	C78.1375	135	3.25	400	382	540	295*			
PK	New Code	ZC	E39	ED/BT37	292	----	M59	C78.1375	135	3.25	400	382	540	295*			
PL	New	PL	E39	E18	248	146±3	M58	NEW	133	2.10	250						
PL	New Code	PL	E39	T18	248	146±3	M59	C78.1375	135	3.25	400	382	540	295*			
~~PM~~	Retire	PM	RSC	T7	250		M79	ANSI	250	6.70	1500	350					
~~PN~~	Retire	PN	E40/45	T14.5	220	150±5	M80	ANSI	100	3.00	250						
~~PP~~	Retire	PP	G12	T8	84	56	M81	ANSI	95	1.80	150	230				4K-6K	2@3600
~~PP~~	Retire	PP	G12	T8	84	56	M85	ANSI	90	0.97	75	230				4K-6K	2@3600
PPA	New Code	PO	G12	T6	90	56	M130	ANSI	90		39						

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ANNEX A2
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the OLD Physical Code

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	ANSI	Electrical Design Volts	Amps	Watts	Ext. Starting (LAG) MIN OCV RMS	PEAK	Ext. Starting (Lead) MIN OCV RMS	PEAK	Pulse Height V	Pulse Width µS@V
PR	New Code	DR	Fc2	T8	169	——	M80	C78.DRAFT	100	3.00	250	230	325	TBD	TBD	4K-6K	2@3600
PS	New Code	AJ	R7s	T7.5	138	——	M81	C78.DRAFT	95	1.80	150	230	325	TBD	TBD	4K-6K	2@3600
~~PT~~	Retire	BB	E40	T100	430	260±5	M82	ANSI	230	10.30	2000	380				4500	1@4000
~~PV~~	Retire	PV					M83	ANSI	125	9.50	1000	230				4500	1@4000
~~PW~~	Retire	BB					M84	ANSI	220	18.00	3600	380				4500	1@4000
PX	New Code	DC	R7s	T6	120	——	M85	C78.1381	95	0.95	75	230*	325*	230*	325*	4K-6K	2@3600
~~PY~~	Retire	PY	FC2	T30	206	103±5	M86	ANSI	120	3.50	360	198	280			3000	1@2700
~~PZ~~	Retire	PZ	E40/45	T46	285	175±5	M86	ANSI	120	3.50	360	198	200			3000	1@2700
QA	No Change	QA	EP39	BT56	391	232	M47	ANSI	255		1000						
QB	New Code	QA	EP39	BT56	391	232	M48	ANSI	268		1500						
QC	No Change	QC	EX39	BT28	211	127	M57	NEW	130	1.50	175						
QC	New Code	QC	EX39	BT28	211	127	M58	ANSI	133		250						
QD	New Code	QC	EX39	BT28	211	——	M57	NEW	130	1.50	175						
QD	New Code	QC	EX39	BT28	211	——	M58	ANSI	133		250						
RA	No Change	RA	BY22d	T16	216	135	L69	C78.41	57	0.35	18	300					
RB	No Change	RB	BY22d	T16	311	185	L70	C78.41	70	0.60	37	390					
RC	No Change	RC	BY22d	T16	425	240	L71	C78.41	109	0.59	56	410					
RD	No Change	RD	BY22d	T20.5	528	290	L72	C78.41	112	0.94	91	420					
RE	No Change	RE	BY22d	T20.5	775	415	L73	C78.41	164	0.95	135	540					
RF	No Change	RF	BY22d	T20.5	1120	580	L74	C78.41	240	0.91	185	600					
RG	No Change	RG	BY22d	T12	150	95	L77	C78.41	55	0.20	10	340					
~~RK~~	Retire	RV	E26	B17	145	89±2	S55	ANSI	55	3.20	150	110		108		2500	1@2250
RN	New Code	RV	E26/24	B17	145	93±9	S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250
RP	New Code	RV	E26/24	B17	145	——	S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250
RZ	New Code	AD	E39	E23.5	197	127±3	S123	ANSI	55		150						
RZ	New Code	AD	E39	E23.5	197	127±3	S55	ANSI	55	3.20	150	110		108		2500	1@2250
SB	New Code	AD	E39	E23.5	197	127±3	S120	ANSI	52		100						
SB	New Code	AD	E39	E23.5	197	127±3	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
SC	New Code	NV	E39	E23.5	197	127±3	S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250
SD	New Code	ER	E39	BT28	228	127±3	S56	C78.42	100	1.80	150	198		198*		2.5K-4K	1@2250
SE	New Code	ER	E39	BT28	228	——	S56	C78.42	100	1.80	150	198		198*		2.5K-4K	1@2250
SG	New Code	ZL	E26/24	B17	138	89±6	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
SH	New Code	ZL	E26/24	B17	138	——	S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250
SI	New Code	ZL	E26	B17	138	——	M98	C78.DRAFT	85	0.90	70	235	332	——	——	3.0K-4.0K	1@2.7K
SJ	New Code	ZL	E26	B17	138	87	M90				100						
SJ	New Code	ZL	E26	B17	138	86±3	M98	C78.DRAFT	85	0.90	70	235	332	——	——	3.0K-4.0K	1@2.7K
SK	New Code	ZL	E26	B17	138	-----	M90				100						
SL	New Code	SR	E26	PAR38	148	-----	S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250
SM	New Code	SR	E26/24	RD38	158	-----	S76	C78.42	52	0.83	35	110				2.5K-4.0K	1@2250
TL	New Code	ZL	E26	ED17	138	86±3	M110	C78.DRAFT	85	0.68	50	235	332	——	——	3.0K-4.0K	1@2.7K
TM	New Code	ZL	E26	ED17	138	-----	M110	C78.DRAFT	85	0.68	50	235	332	——	——	3.0K-4.0K	1@2.7K
TN	New Code	DC	RSC	T6	120	-----	M91	C78.DRAFT	100	1.10	100	235	332	——	——	4K-6K	2@3600
~~TP~~	Retire	AJ	RSC-R7s	T7	138	69±4	M92	ANSI	100	1.10	100	216				3300	1.0@3K
TS	New Code	ZL	E26	B17	138	86±3	M107	ANSI			150						
TT	New Code	ZL	E26	B17	138	——	M107				150						
TW	Obsolete	ZL	E26	ED17	138	86±3	~~M101~~	ANSI			75						
TW	New Code	ZL	E26	ED17	138	86±3	M102	C78.DRAFT	95	1.80	150	235	332	——	——	3.0K-4.0K	1@2.7K
TW	New Code	ZL	E26	ED17	138	86±3	M57	NEW	130	1.50	175						
TW	New Code	ZL	E26	ED17	138	86±3	M90	C78.DRAFT	100	1.10	100	235	332	——	——	3.0K-4.0K	1@2.7K
TX	Obsolete	ZL	E26	ED17	138		~~M101~~	ANSI			75						
TX	New Code	ZL	E26	ED17	138	-----	M102	C78.DRAFT	95	1.80	150	235	332	——	——	3.0K-4.0K	1@2.7K
TX	New Code	ZL	E26	ED17	138	——	M57	NEW	130	1.50	175						
TX	New Code	ZL	E26	ED17	138	——	M90	C78.DRAFT	100	1.10	100	235	332	——	——	3.0K-4.0K	1@2.7K
~~TZ~~	Retire	PL	E39	ED18	248	146±3	S50	ANSI	100	3.00	250	198		198	175	2500	1@2250
VA	New Code	EJ	E39	E18	248	146±3	S50	C78.42	100	3.00	250	198		198*		2.5K-4K	1@2250
~~VB~~	Retire	GT	RSC	T8	191	95.5	S50	ANSI	100	3.00	250	198		198		2500	1@2250
VC	New Code	ER	E39	E28	228	-----	S50	C78.42	100	3.00	250	198		198*		2.5K-4K	1@2250
~~VE~~	Retire	KS	R12.5S	T6	273		S50	ANSI									
~~VE~~	Retire	ZC	E39	BT37	292	178±6	S50	C78.1351 OLD	100	3.00	250	198				2500	1@2250
~~VF~~	Retire	KS	R12.5S	T6	273		S50	ANSI	100	3.00	250	198				2500	1@2250
~~VG~~	Retire	WL	E39	R53			S50	ANSI	100	3.00	250	198					1@2250
~~VH~~	Retire	NG	RSC	T6	256		S50	ANSI	100	3.00	250	198		198		2.5K-4K	1@2250
~~VJ~~	Retire	EJ	E39	E18	248	146±3	S50	ANSI	100	3.00	250	198				2.5K-4K	1@2250
VK	New Code	CR	R7s				M103	ANSI									
VK	New Code	CR	R7s				M80	ANSI									
VL	No Change	VL	Fc2				M103	OSI									
VM	New Code	DR	Fc2				M109	ANSI									

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ANNEX A2
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the OLD Physical Code

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	ANSI	Electrical Design Volts	Amps	Watts	Ext. Starting (LAG) MIN OCV RMS	PEAK	Ext. Starting (Lead) MIN OCV RMS	PEAK	Pulse Height V	Pulse Width µS@V
VN	New Code	LE	XR7s				M109										
WA	New Code	EJ	E39	E18	248	146±3	S51	C78.42	100	4.60	400	198		198*		2.5K-4K	1@2250
WA	New Code	GJ	E39	E18	248	19±3	S51	ANSI	102	4.60	400						
WB	New Code	ZC	E39	E37	292	—	S51	C78.42	100	4.60	400	198		198*		2.5K-4K	1@2250
WC	New Code	AW	RSC	T8	256	128	S51	ANSI	100	4.60	392	198				2500	1@2250
~~WD~~	Retire	W1	E39	R53			S51	C78.1350 OLD	100	4.60	400	198				2500	1@2250
~~WE~~	Retire	KS	R12.5S	T6	273		S51	ANSI	100	4.60	400	198				2500	1@2250
~~WF~~	Retire	NG	RSC	T6	256		S51	ANSI	100	4.60	400	198		198		2.5K-4K	1@2250
WG	New Code	EJ	E39	E18			S51	ANSI	100	4.60	400						
~~XA~~	Retire	XA	E39	T18	383	220	S52	C78.1352 OLD	250	4.70	1000						
XB	No Change	XB	E39/CER	E25	383	222±6	S52	C78.42	250	4.70	1000	456		456*		3.0K-5.0K	4@2700
XB	No Change	XB	E39/CER	E25	382	220±3	S52										
~~XC~~	Retire	XC	R12.5S	T6	375		S52	ANSI	250	4.70	1000	380				3000	4@2700
~~XD~~	Retire	XD	E39	T28	408	240	S52	ANSI	250	4.70	1000	456				3000	4@2700
~~XE~~	Retire	GN	RSC	T8	334		S52	ANSI	250	4.70	1000	456				3000	4@2700
~~XF~~	Retire	XF	E39	BT28	211	127±3	S63	ANSI	130	1.50	150						
~~XH~~	Retire	XH	E39	BT28	250	160±5	S65	ANSI	130	2.10	215						
~~XK~~	Retire	CS	E39	BT37	295	185±5	S64	ANSI	135	3.25	360						
~~YA~~	Retire	YA					B78	ANSI									
~~YB~~	Retire	YB					B78										
~~YC~~	Retire	EW					B78										
~~YD~~	Retire	EW					B78										
YE	New Code	EW					B78				750						
YF	New Code	EW					B78				750						
~~YG~~	Retire	RX					B78										
~~YH~~	Retire	RX					B78										
~~YJ~~	Retire	RX					B78										
~~YK~~	Retire	RX					B78										
YL	No Change	YL	E26	E23.5	178	—	B87	ANSI		1.40	160						
YM	New Code	ZB	E26	PS30	205	—	B87	C78.1342		1.40	160						
YN	No Change	YN	E26	PS30	186	—	B87	C78.1342		1.40	160						
YP	No Change	YP	E26	RL38	147	—	B87	C78.1342		1.40	160						
YR	No Change	YR	MED SKIRT	RL38	166.5	—	B87	C78.1342		1.40	160						
YS	New Code	YO	E26	R40	178	—	B87	C78.1342		1.40	160						
YT	New Code	WV	E26	RD40	183	—	B87	C78.1342		1.40	160						
YV	New Code	ZW	E26	R40	178	—	B87	C78.1342		1.40	160						
	Obsolete	Obsolete					~~H10~~	Obsolete									
	Obsolete	Obsolete					~~H11~~	Obsolete									
	Obsolete	Obsolete					~~H13~~	Obsolete									
	Obsolete	Obsolete					~~H14~~	Obsolete									
	Obsolete	Obsolete					~~H16~~	Obsolete									
	Obsolete	Obsolete					~~H18~~	Obsolete									
	Obsolete	Obsolete					~~H19~~	Obsolete									
	Obsolete	Obsolete					~~H2~~	Obsolete									
	Obsolete	Obsolete					~~H20~~	Obsolete									
	Obsolete	Obsolete					~~H21~~	Obsolete									
	Obsolete	Obsolete					~~H6~~	Obsolete									
	Obsolete	Obsolete					~~H7~~	Obsolete									
	Obsolete	Obsolete					~~H8~~	Obsolete									
	New Code	TA	EP39	BT28	211	127	M57	NEW	130	1.50	175						
	New Code	TA	EP39	BT28	211	—	M57	NEW	130	1.50	175						
	New Code	TA	EP39	BT28	211	127	M58	NEW	133	2.10	250						
	New Code	TA	EP39	BT28	211	—	M58	NEW	133	2.10	250						
	New Code	TB	EP39	BT37	292	178±6	M59	NEW	135	3.25	400						
	New Code	TB	EP39	BT37	211	—	M59	NEW	135	3.25	400						
	New Code	ZC	E39	BT37	292	178	M47	NEW			1000						
							H23	?									
							H24	?									
							H25	Obsolete									
							H26	?									
							H27	?									
							H28	?									
							H29	?									

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ANSI C78.380-1997
Revision of ANSI C78.38-1984 (R1993)

ANNEX A2
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the OLD Physical Code

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	ANSI	Electrical Design Volts	Amps	Watts	Ext. Starting (LAG) MIN OCV RMS	PEAK	Ext. Starting (Lead) MIN OCV RMS	PEAK	Pulse Height V	Pulse Width µS@V
							H30	?									
							H31	?									
							H41	?									
			E39	BT28	211	127	M132	OSI	135	2.63	320	NA	NA	245	465	2700	1.3@?
		Ceramic / Cable / Spade		T8	254	127	M133	OSI	265	6.30	1500	NA	NA	320@1.8cf	740@1.8cf	3600	1@?
		Ceramic / Cable / Spade		T9	254	127	M134	OSI	250	8.50	2000	NA	NA	375@1.8cf	675@1.8cf	3600	1@?
			E39	BT37	292	178	M135	OSI	135	3.25	400	NA	NA	245	465	2700	1.3@?
							M60	?									
							M61	?									
							S49	?									
							S53	?									

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ANNEX A3
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the Electrical Code

		Electrical Design			Ext. Starting (LAG) MIN OCV		Ext. Starting (Lead) MIN OCV		Pulse Height	Pulse Width
ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V
~~H1~~	Obsolete	135	3.20	400						
~~H1~~	Obsolete	135	3.20	400						
~~H1~~	Obsolete	135	3.20	400						
~~H2~~	Obsolete									
~~H3~~	Obsolete	250	0.40	85						
~~H3~~	Obsolete	245	0.40	85						
~~H4~~	Obsolete	100	1.10	100						
~~H4~~	Obsolete	130	0.90	100						
~~H4~~	Obsolete	130	0.90	100						
~~H4~~	Obsolete	130	0.90	100						
~~H5~~	Obsolete	130	2.10	250						
~~H5~~	Obsolete	130	2.10	250						
~~H6~~	Obsolete									
~~H7~~	Obsolete									
~~H8~~	Obsolete									
~~H9~~	Obsolete	535	6.10	3000						
~~H10~~	Obsolete									
~~H11~~	Obsolete									
~~H12~~	Obsolete	135	8.00	1000						
~~H12~~	Obsolete	135	8.00	1000						
~~H12~~	Obsolete	135	8.20	1000						
~~H12~~	Obsolete	135	8.00	1000						
~~H13~~	Obsolete									
~~H14~~	Obsolete									
~~H15~~	Obsolete	265	4.00	1000						
~~H15~~	Obsolete	265	4.00	1000						
~~H15~~	Obsolete	265	4.00	1000						
~~H15~~	Obsolete	265	4.00	1000						
~~H15~~	Obsolete	265	4.00	1000						
~~H15~~	Obsolete	265	4.00	1000						
~~H15~~	Obsolete	265	4.00	1000						
~~H16~~	Obsolete									
~~H17~~	Obsolete	265	1.70	425						
~~H18~~	Obsolete									
~~H19~~	Obsolete									
~~H20~~	Obsolete									
~~H21~~	Obsolete									
~~H22~~	Obsolete									
~~H22~~	Obsolete									
H23	?									
H24	?									
H25	Obsolete									
H26	?									
H27	?									
H28	?									
H29	?									
H30	?									
H31	?									
H32	ANSI	135	0.66	75						
H32	ANSI	135	0.66	75						
H32	Obsolete	130	0.66	75						
H33										
H33	C78.40	135	3.20	400						
H33	ANSI	135	3.20	400						
H33	ANSI	135	3.20	400						
H33	ANSI	135	3.20	400						
H33		135	3.20	400						
H33	ANSI	132	3.20	400						
H33	C78.40	135	3.20	400						
H33	ANSI	135	3.20	400						
H33	ANSI									
H33	ANSI	135	3.20	400						
H33	ANSI	135	3.20	400						
H34	ANSI									
H34	C78.40	135	8.00	1000						
H34	C78.40	135	8.00	1000						

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)
~~DG~~	Obsolete	**Obsolete**	E39	BT37	292	178
~~GL~~	Obsolete	**Obsolete**	E39	BT37	292	178
~~HL~~	Obsolete	**Obsolete**	E39	R60	261	
	Obsolete	**Obsolete**				
~~FE~~	Obsolete	**Obsolete**	E26	T10	143	7.6
~~FG~~	Obsolete	**Obsolete**	E26	T10	143	7.6
~~AB~~	Obsolete	**Obsolete**	E26	T10	143	8.7
~~HT~~	Obsolete	**Obsolete**	E39	PS25	181	127
~~HW~~	Obsolete	**Obsolete**	E26	R40	162	
~~JA~~	Obsolete	**Obsolete**	E39	PS25	181	127
~~KB~~	Obsolete	**Obsolete**	E39	BT28	211	127
~~KC~~	Obsolete	**Obsolete**	E39	BT28	211	
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
~~FJ~~	Obsolete	**Obsolete**		T9.5	1397	
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
~~GV~~	Obsolete	**Obsolete**	E39	BT56	391	241
~~GW~~	Obsolete	**Obsolete**	E39	BT56	391	241
~~HR~~	Obsolete	**Obsolete**	E39	R80	340	
~~KY~~	Obsolete	**Obsolete**	E39	BT56	391	241
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
~~FA~~	Obsolete	**Obsolete**	E39	R80	399	
~~FB~~	Obsolete	**Obsolete**	E39	R80	399	
~~FC~~	Obsolete	**Obsolete**	E39	R80	399	
~~GV~~	Obsolete	**Obsolete**	E39	BT56	391	241
~~GW~~	Obsolete	**Obsolete**	E39	BT56	391	241
~~HR~~	Obsolete	**Obsolete**	E39	R80	425	
~~KY~~	Obsolete	**Obsolete**	E39	BT56	391	241
	Obsolete	**Obsolete**				
~~MA~~	Obsolete	**Obsolete**	E39	BT37	292	178
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
	Obsolete	**Obsolete**				
~~KB~~	Obsolete	**Obsolete**	E39	BT28	210	127
~~KC~~	Obsolete	**Obsolete**	E39	BT28	210	127
~~FP~~	New Code	**FN**				
~~FY~~	New Code	**FX**	E39	R52	299	
~~NG~~	Retire	**ZW**	E39			
~~AR~~	New Code	**AS**	E39	T16	280	178
~~CD~~	New Code	**ZC**	E39	BT37	292	178
~~DN~~	New Code	**FX**	E39	R52	299	—
~~DP~~	Retire	**EW**	E39	R57	324	203
~~EA~~	Retire	**EJ**	E39	E18	124	146
~~FS~~	New Code	**LN**	E39	R60	277	—
~~FY~~	New Code	**FX**	E39	R52	299	—
~~GL~~	New Code	**ZC**	E39	BT37	292	—
~~HL~~	Retire	**HL**				
~~HS~~	Retire	**HS**				
~~LN~~	Retire	**LN**	E39	R60	277	
~~LS~~	Retire	**LS**	E39	BT37	324	178
~~FG~~	Retire	**NB**	E39	R80	399	—
~~GV~~	New Code	**GH**	E39	BT56	391	241
~~GW~~	New Code	**GH**	E39	BT56	391	—

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ANNEX A3
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the Electrical Code

		Electrical Design			Ext. Starting (LAG) MIN OCV		Ext. Starting (Lead) MIN OCV		Pulse Height	Pulse Width	Old	Committee	New			MOL	LCL
ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V	Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)
H34	ANSI	135	8.20	1000							~~HR~~	Retire	~~HR~~	E39	R80	340	
H34	C78.40	135	8.00	1000							KY	New Code	GH	E39	BT56	391	—
H35	C78.40	265	2.80	700							NA	New Code	NC	E39	BT46	368	241
H35	C78.40	265	2.80	700							ND	New Code	NC	E39	BT46	368	—
H36	ANSI	265	4.00	1000							FA	New Code	NE	E39	R80	425	—
H36	ANSI	265	4.00	1000							FB	New Code	NE	E39	R80	425	—
H36	ANSI	265	4.00	1000							FC	New Code	NE	E39	R80	425	—
H36	C78.40	265	4.00	1000							GV	New Code	GH	E39	BT56	391	241
H36	C78.40	265	4.00	1000							GW	New Code	GH	E39	BT56	391	—
H36	ANSI	265	4.00	1000							HR	No Change	HR	E39	R80	340	
H36	C78.40	265	4.00	1000							KY	New Code	GH	E39	BT56	391	
H37	ANSI										FP	New Code	FO				
H37	ANSI										FS	New Code	LN				
H37	C78.40	130	2.10	250							KB	New Code	KA	E39	BT28	211	127
H37	C78.40	130	2.10	250							KC	New Code	KA	E39	BT28	211	—
H37	ANSI										~~LN~~	Retire	LN				
H38	C78.40	130	0.85	100							AV	New Code	ZL	E26	E17	139	—
H38	ANSI	130	0.90	100							AY	New Code	AR	E26	B21	165	96
H38	ANSI	130	0.90	100							~~AZ~~	Retire	AR	E26	B21	165	96
H38	ANSI	130	0.90	100							BM	New Code	KF	E26	R40	178	—
H38	ANSI	130	0.85	100							BP	New Code	KF	E26	R40	178	—
H38	C78.40	130	0.85	100							HT	New Code	CX	E39	E23.5	191	127
H38	C78.40	130	0.85	100							JA	New Code	CX	E39	E23.5	191	—
H38	ANSI	130	0.85	100							~~KV~~	Retire	KV	E26	G40	177	110
H38	C78.40	130	0.85	100							LL	New Code	GF	E26	A23	139	89
H38	C78.40	130	0.85	100							MP	New Code	GF	E26	A23	139	—
H39	ANSI	130	1.50	175							BM	New Code	KF	E26	R40	178	—
H39	ANSI	130	1.50	175							~~BN~~	Retire	ZW	E26	R40	178	114
H39	ANSI	130	1.50	175							BP	New Code	KF	E26	R40	178	—
H39	ANSI	130	1.45	175							BS	No Change	BS	E39	R40	178	—
H39	ANSI	130	1.50	175							~~BV~~	Retire	BV	E39	R40	191	
H39	ANSI	130	1.50	175							~~CA~~	Retire	TC	E39	PAR56	127	29
H39	ANSI	130	1.50	175							~~CB~~	Retire	TC	E39	PAR56	127	29
H39	C78.40	130	1.50	175							KB	New Code	KA	E39	BT28	211	127
H39	C78.40	130	1.45	175							KC	New Code	KA	E39	BT28	211	—
H40	ANSI	265	1.70	425							~~MA~~	Retire	ZC	E39	BT37	292	178
H41	?																
H42	ANSI	125	1.15	125							~~BF~~	Retire	CF	E26	EL24	172	118
H42	ANSI	125	1.15	125							~~BG~~	Retire	CF	E26	EL24	172	118
H43	C78.40	130	0.66	75							AN	New Code	ZL	E26	B17	139	89
H43	C78.40	130	0.64	75							AV	New Code	ZL	E26	E17	139	—
H43	ANSI	130	0.64	75							AY	New Code	AR	E26	B21	165	96
H43	ANSI	130	0.64	75							~~AZ~~	Retire	AR	E26	B21	165	96
H43	ANSI	130	0.66	75							JW	No Change	JW	E39	PAR36	76	—
H43	ANSI	130	0.66	75							~~KL~~	Retire	KD	E26	PAR38	110	—
H44	C78.40	130	0.85	100							AB	No Change	AB	ADMED	T10	143	87
H44	C78.40	130	0.85	100							GS	No Change	GS	ADMEDSK	PAR38	138	—
H44	C78.40	130	0.85	100							JM	No Change	JM	MDSK	PAR38	138	—
H44	ANSI	130	0.85	100							~~KL~~	Retire	KD	E26	PAR38	11	
H45	ANSI	90	0.53	40							~~AY~~	Retire	AR	E26	B21	165	95
H45	ANSI	90	0.53	40							~~AZ~~	Retire	AR	E26	B21	165	95
H45	C78.40	90	0.53	40							DL	New Code	DK	E26	B17	131	—
H45	C78.40	90	0.53	40							EL	New Code	DK	E26	B17	131	80
H46	C78.40	95	0.60	50							DL	New Code	DK	E26	E17	131	—
H46	C78.40	95	0.60	50							EL	New Code	DK	E26	E17	131	80
H46	ANSI	90	0.60	50							~~JW~~	Retire	JW	E39	PAR36	76	—
M47	C78.1376	263	4.10	1000	530	750	380*				PA	New Code	GH	E39	BT56	391	241±6
M47	C78.1376	263	4.10	1000	530	750	380*				PB	New Code	GH	E39	BT56	391	—
M47	ANSI	255		1000							QA	No Change	QA	EP39	BT56	391	232
M47	NEW			1000								New Code	ZC	E39	BT37	292	178
M48	C78.1379	268	6.20	1500	530	750	410*				PC	New Code	GH	E39	BT56	391	241±6
M48	ANSI	268		1500							~~QB~~	New Code	QA	EP39	BT56	391	232
S49	?																
S50	ANSI	100	3.00	250	198		198	175	2500	1@2250	~~PE~~	Retire	PL	E39	ED18	248	146±3
S50	C78.42	100	3.00	250	198		198*		2.5K-4K	1@2250	VA	New Code	EJ	E39	E18	248	146±3
S50	ANSI	100	3.00	250	198		198		2500	1@2250	~~VB~~	Retire	GT	RSC	T8	191	95.5
S50	C78.42	100	3.00	250	198		198*		2.5K-4K	1@2250	VC	New Code	ER	E39	E28	228	—

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ANNEX A3
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the Electrical Code

		Electrical Design			Ext. Starting (LAG) MIN OCV		Ext. Starting (Lead) MIN OCV		Pulse Height	Pulse Width	Old	Committee	New			MOL	LCL
ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	uS@V	Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)
S50	ANSI										~~VE~~	Retire	KS	R12.5S	T6	273	
S50	C78.1351 OLD	100	3.00	250	198				2500	1@2250	~~VE~~	Retire	ZC	E39	BT37	292	178±6
S50	ANSI	100	3.00	250	198				2500	1@2250	~~VF~~	Retire	KS	R12.5S	T6	273	
S50	ANSI	100	3.00	250	198					1@2250	~~VG~~	Retire	WL	E39	R53		
S50	ANSI	100	3.00	250	198		198		2.5K-4K	1@2250	~~VH~~	Retire	NG	RSC	T6	256	
S50	ANSI	100	3.00	250	198				2.5K-4K	1@2250	~~VJ~~	Retire	EJ	E39	E18	248	146±3
S51	C78.42	100	4.60	400	198		198*		2.5K-4K	1@2250	WA	New Code	EJ	E39	E18	248	146±3
S51	ANSI	102	4.60	400							WA	New Code	GJ	E39	E18	248	19±3
S51	C78.42	100	4.60	400	198		198*		2.5K-4K	1@2250	WB	New Code	ZC	E39	E37	292	—
S51	ANSI	100	4.60	392	198				2500	1@2250	WC	New Code	AW	RSC	T8	256	128
S51	C78.1350 OLD	100	4.60	400	198				2500	1@2250	~~WD~~	Retire	WL	E39	R53		
S51	ANSI	100	4.60	400	198				2500	1@2250	~~WE~~	Retire	KS	R12.5S	T6	273	
S51	ANSI	100	4.60	400	198		198		2.5K-4K	1@2250	~~WF~~	Retire	NG	RSC	T6	256	
S51	ANSI	100	4.60	400							WG	New Code	EJ	E39	E18		
S52	C78.1352 OLD	250	4.70	1000							~~XA~~	Retire	XA	E39	T18	383	220
S52	C78.42	250	4.70	1000	456		456*		3.0K-5K	4@2700	XB	No Change	XB	E39/CER	E25	383	222±6
S52											XB	No Change	XB	E39/CER	E25	382	220±3
S52	ANSI	250	4.70	1000	380				3000	4@2700	~~XC~~	Retire	XC	R12.5S	T6	375	
S52	ANSI	250	4.70	1000	456				3000	4@2700	~~XD~~	Retire	XD	E39	T28	408	240
S52	ANSI	250	4.70	1000	456				3000	4@2700	~~XE~~	Retire	GN	RSC	T8	334	
S53	?																
S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250	MC	New Code	AD	E39	E23.5	197	—
S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250	SB	New Code	AD	E39	E23.5	197	127±3
S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250	SG	New Code	ZL	E26/24	B17	138	89±6
S54	C78.42	55	2.10	100	110				2.5K-4K	1@2250	SH	New Code	ZL	E26/24	B17	138	—
S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250	MD	New Code	NV	E39	E23.5	197	—
S55	ANSI	55	3.20	150	110		108		2500	1@2250	~~RK~~	Retire	RV	E26	B17	145	89±2
S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250	RN	New Code	RV	E26/24	B17	145	93±9
S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250	RP	New Code	RV	E26/24	B17	145	—
S55	ANSI	55	3.20	150	110		108		2500	1@2250	RZ	New Code	AD	E39	E23.5	197	127±3
S55	C78.42	55	3.20	150	110				2.5K-4K	1@2250	SC	New Code	NV	E39	E23.5	197	127±3
S56	C78.42	100	1.80	150	198		198*		2.5K-4K	1@2250	SD	New Code	ER	E39	BT28	228	127±3
S56	C78.42	100	1.80	150	198		198*		2.5K-4K	1@2250	SE	New Code	ER	E39	BT28	228	—
M57	ANSI	130	1.50	175	382		280	560	3750	2 @ 3500	~~EG~~	Retire	AA	Fc2	T8	177	88±3
M57	C78.1377	132	1.50	175	382	540	280*				PE	New Code	KA	E39	BT28	211	127±5
M57	C78.1377	132	1.50	175	382	540	280*				PF	New Code	KA	E39	BT28	211	—
M57	NEW	130	1.50	175							QC	No Change	QC	EX39	BT28	211	127
M57	NEW	130	1.50	175							QD	New Code	QC	EX39	BT28	211	—
M57	NEW	130	1.50	175							TW	New Code	ZL	E26	ED17	138	86±3
M57	NEW	130	1.50	175							TX	New Code	ZL	E26	ED17	138	—
M57	NEW	130	1.50	175								New Code	TA	EP39	BT28	211	127
M57	NEW	130	1.50	175								New Code	TA	EP39	BT28	211	—
M58	ANSI	130	2.15	250	382		280	560	3750	2 @ 3500	~~EB~~	Retire	AA	Fc2	T8	177	88±3
M58	C78.1378	133	2.10	250	382	540	300*				PG	New Code	KA	E39	BT28	211	127±5
M58	C78.1378	133	2.10	250	382	540	300*				PG	New Code	KA	E39	BT28	211	—
M58	NEW	133	2.10	250							PL	New	PL	E39	E18	248	146±3
M58	ANSI	133		250							QC	New Code	QC	EX39	BT28	211	127
M58	ANSI	133		250							QD	New Code	QC	EX39	BT28	211	—
M58	NEW	133	2.10	250								New Code	TA	EP39	BT28	211	127
M58	NEW	133	2.10	250								New Code	TA	EP39	BT28	211	—
M59	NEW	135	3.25	400							PH	New Code	KA	E39	BT28	211	127±5
M59	NEW	135	3.25	400							PH	New Code	KA	E39	BT28	211	—
M59	C78.1375	135	3.25	400	382	540	295*				PJ	New Code	ZC	E39	ED/BT37	292	178±6
M59	C78.1375	135	3.25	400	382	540	295*				PK	New Code	ZC	E39	ED/BT37	292	—
M59	C78.1375	135	3.25	400	382	540	295*				PL	New Code	PL	E39	T18	248	146±3
M59	NEW	135	3.25	400								New Code	TB	EP39	BT37	292	178±6
M59	NEW	135	3.25	400								New Code	TB	EP39	BT37	211	—
M60	?																
M61	?																
S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250	LG	New Code	ZL	E26/24	B17	138	89±5
S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250	LH	New Code	ZL	E26/24	B17	138	—
S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250	ME	New Code	NV	E39	E23.5	197	127±3
S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250	MF	New Code	NV	E39	E23.5	197	—
S62	ANSI										~~MH~~	Retire	ZN				
S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250	~~MX~~	Retire	KD	E26	PAR38		
S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250	~~MY~~	Retire	MY	E26	PAR38	110	

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Transition Table Relating Assigned Key Lamp Characteristics Sorted by the Electrical Code

		Electrical Design			Ext. Starting (LAG) MIN OCV		Ext. Starting (Lead) MIN OCV		Pulse Height	Pulse Width	Old	Committee	New			MOL	LCL
ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V	Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)
S62	ANSI	52	1.60	70	110				2.5K-4K	1@2250	~~MZ~~	Retire	LA	E26	T10	143	88±3
S62	ANSI										~~NB~~	Retire	DC				
S62	C78.42	52	1.60	70	110				2.5K-4K	1@2250	SL	New Code	SR	E26	PAR38	148	—
S63	ANSI	130	1.50	150							MG	New Code	ZN	E39	BT28	211	127±3
S63	ANSI	130	1.50	150							~~MH~~	Retire	ZN	E39	BT28	211	127±3
S63	ANSI	130	1.50	150							~~XF~~	Retire	XF	E39	BT28	211	127±3
S64	ANSI	135	3.25	360							~~GL~~	Retire	CS	E39	BT37	295	185±5
S64	ANSI	135	3.25	360							~~GM~~	Retire	CS	E39	BT37	295	185±5
S64											MG	New Code	ZN	E39	BT28	211	127±3
S64	ANSI	130	3.30	360							~~MJ~~	Retire	ZC	E39	BT37	292	178±6
S64	ANSI	130	3.30	360							~~MK~~	Retire	ZC	E39	BT37	292	178±6
S64	ANSI	135	3.25	360							~~XK~~	Retire	CS	E39	BT37	295	185±5
S65	ANSI	130	2.10	215							ML	New Code	ZN	E39	BT28	211	127
S65	ANSI	130	2.10	215							~~MM~~	Retire	ZN	E39	BT28	211	127
S65	ANSI	130	2.10	215							~~XH~~	Retire	XH	E39	BT28	250	160±5
S66	C78.42	100	2.40	200	198		198*		2.5K-4K	1@2250	MN	New Code	EJ	E39	E18	248	146±3
S67	C78.42	100	3.60	310	198		198*		2.5K-4K	1@2250	MR	New Code	EJ	E39	E18	248	146±3
S68	C78.42	52	1.18	50	110				2.5K-4K	1@2250	LP	New Code	ZL	E26/24	B17	138	87±6
S68	C78.42	52	1.18	50	110				2.5K-4K	1@2250	LR	New Code	ZL	E26/24	B17	138	—
S68	C78.42	52	1.18	50	110				2.5K-4K	1@2250	MS	New Code	NV	E39	E23.5	197	127±3
S68	C78.42	52	1.18	50	110				2.5K-4K	1@2250	MT	New Code	NV	E39	E23.5	197	—
L69	C78.41	57	0.35	18	300						RA	No Change	RA	BY22d	T16	216	135
L70	C78.41	70	0.60	37	390						RB	No Change	RB	BY22d	T16	311	185
L71	C78.41	109	0.59	56	410						RC	No Change	RC	BY22d	T16	425	240
L72	C78.41	112	0.94	91	420						RD	No Change	RD	BY22d	T20.5	528	290
L73	C78.41	164	0.95	135	540						RE	No Change	RE	BY22d	T20.5	775	415
L74	C78.41	240	0.91	185	600						RF	No Change	RF	BY22d	T20.5	1120	580
~~S75~~	C78.1340		2.10	450	220						JB	New Code	ZC	E39	BT37	292	178±6
~~S75~~	C78.1340		2.10	450	220						JC	No Change	JC	E39	BT37	292	—
~~S75~~	C78.1340		2.10	450	220						JD	New Code	ZC	E39	BT37	292	—
~~S75~~	C78.1340		2.10	450	220						JE	New Code	FM	E39	PS40	248	178±6
~~S75~~	C78.1340		2.10	450	220						JF	New Code	FM	E39	PS40	248	—
~~S75~~	C78.1340		2.10	450	220						JG	New Code	FM	E39	PS40	248	—
~~S75~~	C78.1340		2.10	450	220						JH	New Code	KP	E39	R60	258	—
~~S75~~	C78.1340		2.10	450	220						JJ	New Code	KP	E39	R60	258	—
~~S75~~	C78.1340		2.10	450	220						JK	New Code	KP	E39	R60	258	—
S76	C78.42	52	0.83	35	110				2.5K-4K	1@2250	HA	New Code	ZL	E26/24	E17	138	87±5
S76	C78.42	52	0.83	35	110				2.5K-4K	1@2250	HB	New Code	ZL	E26/24	E17	138	—
S76	C78.42	52	0.83	35	110				2.5K-4K	1@2250	SM	New Code	SR	E26/24	RD38	158	—
L77	C78.41	55	0.20	10	340						RG	No Change	RG	BY22d	T12	150	95
B78	ANSI										~~YA~~	Retire	YA				
B78											~~YB~~	Retire	YB				
B78											~~YC~~	Retire	EW				
B78											~~YD~~	Retire	EW				
B78				750							YE	New Code	EW				
B78				750							YF	New Code	EW				
B78											~~YG~~	Retire	RX				
B78											~~YH~~	Retire	RX				
B78											~~YJ~~	Retire	RX				
B78											~~YK~~	Retire	RX				
M79	ANSI	250	6.70	1500	350						~~PM~~	Retire	PM	RSC	T7	250	
M80	ANSI	100	3.00	250							~~PN~~	Retire	PN	E40/45	T14.5	220	150±5
M80	C78.DRAFT	100	3.00	250	230	325	TBD	TBD	4K-6K	2@3600	PR	New Code	DR	Fc2	T8	169	—
M80	ANSI										VK	New Code	CR	R7s			
M81	ANSI	95	1.80	150	230				4K-6K	2@3600	~~PP~~	Retire	PP	G12	T8	84	56
M81	C78.DRAFT	95	1.80	150	230	325	TBD	TBD	4K-6K	2@3600	PS	New Code	AJ	R7s	T7.5	138	—
M82	ANSI	230	10.30	2000	380				4500	1@4000	~~PT~~	Retire	BB	E40	T100	430	260±5
M83	ANSI	125	9.50	1000	230				4500	1@4000	~~PV~~	Retire	PV				
M84	ANSI	220	18.00	3600	380				4500	1@4000	~~PW~~	Retire	BB				
M85	ANSI	90	0.97	75	230				4K-6K	2@3600	~~PP~~	Retire	PP	G12	T8	84	56
M85	C78.1381	95	0.95	75	230*	325*	230*	325*	4K-6K	2@3600	PX	New Code	DC	R7s	T6	120	—
M86	ANSI	120	3.50	360	198	280			3000	1@2700	~~PY~~	Retire	PY	FC2	T30	206	103±5
M86	ANSI	120	3.50	360	198	200			3000	1@2700	~~PZ~~	Retire	PZ	E40/45	T46	285	175±5
B87	ANSI		1.40	160							YL	No Change	YL	E26	E23.5	178	—
B87	C78.1342		1.40	160							YM	New Code	ZB	E26	PS30	205	—
B87	C78.1342		1.40	160							YN	No Change	YN	E26	PS30	186	—
B87	C78.1342		1.40	160							YP	No Change	YP	E26	RL38	147	—
B87	C78.1342		1.40	160							YR	No Change	YR	MED SKIRT	RL38	166.5	—
B87	C78.1342		1.40	160							YS	New Code	YO	E26	R40	178	—

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ANNEX A3
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the Electrical Code

		Electrical Design			Ext. Starting (LAG) MIN OCV		Ext. Starting (Lead) MIN OCV		Pulse Height	Pulse Width	Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)
ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V							
887	C78.1342		1.40	160							YT	New Code	WV	E26	RD40	183	—
887	C78.1342		1.40	160							YV	New Code	ZW	E26	R40	178	—
S88	ANSI	90	0.98	70	230				4000	2@3600	~~NR~~	Retire	DC				
M89	ANSI	235	3.30	750							~~NJ~~	Retire	ZC	E39	BT37	292	178±4
M90				100							SJ	New Code	ZL	E26	B17	138	67
M90				100							SK	New Code	ZL	E26	B17	138	—
M90	C78.DRAFT	100	1.10	100	235	332	—	—	3.0K-4K	1@2.7K	TW	New Code	ZL	E26	ED17	138	86±3
M90	C78.DRAFT	100	1.10	100	235	332	—	—	3.0K-4K	1@2.7K	TX	New Code	ZL	E26	ED17	138	—
M91	ANSI										~~NJ~~	Retire	ZC				
M91	C78.DRAFT	100	1.10	100	235	332	—	—	4K-6K	2@3600	TN	New Code	DC	RSC	T6	120	—
S91	ANSI										~~LV~~	Retire	LV				
M92	ANSI	100	1.10	100	216				3300	1.0@3K	~~XP~~	Retire	AJ	RSC-R7s	T7	138	69±4
S92	ANSI										~~LW~~	Retire	LW				
S92											~~LY~~	Retire	LY				
S92											~~LZ~~	Retire	LZ				
S93	ANSI	145	7.50	940							~~LX~~	Retire	LX	E39	BT56	397	245±7
B94	C78.1380		2.22	250							HD	New Code	ZB	E26	PS30	205	151±8
B94	C78.1380		2.22	250							HE	No Change	HE	E26	PS35	227	167±4
B94	C78.1380		2.22	250							HG	No Change	HG	E39	PS35	239	167±4
B94	C78.1380		2.22	250							HK	New Code	DV	E26	R40	178	—
B94	C78.1380		2.22	250							HM	No Change	HM	E26	ED28	216	139±8
B94	C78.1380		2.22	250							HN	New Code	DV	E26	R40	178	—
B94	C78.1380		2.22	250							HP	No Change	HP	E39	ED28	211	136±12
B94	C78.1380		2.22	250							HY	New Code	DV	E26	RD40	178	—
B94	C78.1380		2.22	250							HZ	No Change	HZ	E39	RD40	188	—
H95	ANSI	115	0.80	80							~~DT~~	Retire	DT	E26	B21	153	103±5
M96	ANSI	130	1.50	175	382		280	560	3750	2@3500	~~EG~~	Retire	AA	Fc2	T8	177	88±3
M97	ANSI	130	2.15	250	382		280	560	3750	2@3500	~~EB~~	Retire	AA	Fc2	T8	177	88±3
M98	C78.DRAFT	85	0.90	70	235	332	—	—	3.0K-4K	1@2.7K	SI	New Code	ZL	E26	B17	138	—
M98	C78.DRAFT	85	0.90	70	235	332	—	—	3.0K-4K	1@2.7K	SJ	New Code	ZL	E26	B17	138	86±3
S99	ANSI	45	0.90	35	108				3500	0.5@3150	AF	New Code	BC	PG12	T10	149	91
M100	ANSI	90	0.36	32							GZ	No Change	GZ	E26	E17	134	87±3
~~M101~~	ANSI			75							TW	Obsolete	ZL	E26	ED17	138	86±3
~~M101~~	ANSI			75							TX	Obsolete	ZL	E26	ED17	138	
M102	C78.DRAFT	95	1.80	150	235	332	—	—	3.0K-4K	1@2.7K	TW	New Code	ZL	E26	ED17	138	86±3
M102	C78.DRAFT	95	1.80	150	235	332	—	—	3.0K-4K	1@2.7K	TX	New Code	ZL	E26	ED17	138	—
M103	ANSI										VK	New Code	CR	R7s			
M103	OSI										VL	No Change	VL	Fc2			
S104	ANSI			50							AF	New Code	BC	PG12	T10	149	91
S105	ANSI			100							NZ	New Code	BC	PG12	T10		
S106	ANSI										AH	New Code	GC	E39	T15	248	154
M107	ANSI			150							TS	New Code	ZL	E26	B17	138	86±3
M107				150							TT	New Code	ZL	E26	B17	138	—
M108	ANSI										ED	New Code	EM	Fc2	T10	254	127±4
M108											EE	New Code	EM	Fc2	T10	254	127±4
M108											EF	No Change	EF	R7s	T10	254	127±4
M108											~~EFR~~	New Code	EG				
M109	ANSI										VM	New Code	DR	Fc2			
M109											VN	New Code	LE	XR7s			
M110	C78.DRAFT	85	0.68	50	235	332	—	—	3.0K-4K	1@2.7K	TL	New Code	ZL	E26	ED17	138	86±3
M110	C78.DRAFT	85	0.68	50	235	332	—	—	3.0K-4K	1@2.7K	TM	New Code	ZL	E26	ED17	138	—
S111	ANSI										NH	New Code	ZC	E39	BT37	292	178
S120	ANSI	52		100							SB	New Code	AD	E39	E23.5	197	127±3
S121	ANSI	52		70							MF	New Code	AD	E39	E23.5	197	127
S122	ANSI	52		50							MS	New Code	AD	E39	E23.5	197	127±3
S123	ANSI	55		150							RZ	New Code	AD	E39	E23.5	197	127±3
S124	ANSI	100		200							AH	New Code	AC	E39	T15	248	146
S125	ANSI	100		200							AH	New Code	AC	E39	T15	248	146
S126	ANSI										AH	New Code	EZ	E39	T15	248	154
S127	ANSI	52		50							MZ	New Code	MB	E26	T10	108	73
M128	ANSI	135		400							PJ	New Code	ZC	E39	ED37	292	178
S129	ANSI	100		350							AH	New Code	AG	E39	T14.5	248	146
M130	ANSI	90		39							KK	No Change	KK	E26	PAR20	95	—
M130	ANSI	90		39							KL	New Code	KE	E26	PAR30	125	—
M130	ANSI	90		39							PPA	New Code	PO	G12	T6	90	56
M131	ANSI	135		350							PJ	New Code	ZC	E39	ED37	292	178

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ANNEX A3
(Normative)
Transition Table Relating Assigned Key Lamp Characteristics Sorted by the Electrical Code

					Ext. Starting (LAG)		Ext. Starting (Lead)		Pulse	Pulse							
		Electrical Design			MIN OCV		MIN OCV		Height	Width	Old	Committee	New			MOL	LCL
ANSI	ANSI	Volts	Amps	Watts	RMS	PEAK	RMS	PEAK	V	µS@V	Codes	Proposal	Codes	Base	Bulb	(mm)	(mm)
M132	OSI	135	2.63	320	NA	NA	245	465	2700	1.3@?				E39	BT28	211	127
M133	OSI	265	6.30	1500	NA	NA	320@ 1.8cf	740 @1.8cf	3600	1@?			Ceramic / Cable / Spade		T8	254	127
M134	OSI	250	8.50	2000	NA	NA	375 @1.8cf	675 @1.8cf	3600	1@?			Ceramic / Cable / Spade		T9	254	127
M135	OSI	135	3.25	400	NA	NA	245	465	2700	1.3@?				E39	BT37	292	178

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ANNEX B
(Normative)
Safety Code Letters
(as of June 1996)

Federal Regulations

Code	21CFR 1040.30 Classification
R	Regular Lamp (Includes HPS and LPS Lamps)
T	Self Extinguishing Lamp

Fixture Characteristics

Code	Fixture Attributes
E	Enclosed Fixture Required
F	U.V. Filter and Lens interlock Required
H	Reserved for future use when hazardous location standards are developed
O	Open Fixture Permissible
S	Open Fixture (Restricted Position)
X	Restricted (Consult Lamp Manufacturer)

Bulb Maximum Temperature[2]

Code	Temperature (°C)
A	250
B	275
C	300
D	325
E	350
F	375
G	400
H	Reserved for future use when hazardous location standards are developed
J	425
K	450
L	475
M	500
N	600
P	700
R	800
S	900
T	1000

Base Maximum Temperature[2]

Code	Temperature (°C)
A	150
B	170
C	190
D	210
E	230
F	250

[2] These temperatures define the maximum limit to which the lamp may operate without deterioration to the lamp material. Any increase in the operating temperatures above these values may cause short life and/or lamp failures.

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ANNEX B
(Normative)
Safety Code Letters (continued)
(as of June 1996)

Base Maximum Temperature[2]

Code	Temperature (°C)
G	270
H	Reserved for future use when hazardous location standards are developed
J	280

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ANNEX C (Normative) **Additional Suffix Symbols** (as of June 1996)	
/D	Diffuse finish
/D	Deluxe white
/N	Special color, style tone
/C	White coating
/3K	3000 Kelvin color
/4K	4000 Kelvin color
/30K	3000 Kelvin color
/40K	4000 Kelvin color
/WDX	Warm deluxe coating
/W	Warm, 3200K
/DAY	Daylight, 5200K
/GDX	Green deluxe
/BDX	Blue deluxe
/CRI80	Color rendering index
/FL	Flood reflector lamp
/SP	Spot reflector lamp
/VWFL	Very wide flood lamp
/R40	Reflector bulb size
/R52	Reflector bulb size
/PFL	PAR floodlight
/PAR38	PAR bulb size
/PAR56	PAR bulb size
/PAR64	PAR bulb size
/ED17	Special outer bulb size
/ED18	Special outer bulb size
/ED28	Special outer bulb size
/BT37	Special outer bulb size
/SBY	Standby arc tube
/2	Two arc tubes
/IS	Instant restrike
/GG	Glare guard (aluminized dome)
/CARC	Compact arc lamp
/LU	Retrofit to HPS ballast
/LV	Low operating voltage
/POM	Position oriented mogul socket Required

Note: Subcommittee C78-4 is considering a phase-out of these suffix symbols after a set of more generic symbols is established.

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ANNEX D
(Normative)
GUIDELINES FOR ASSIGNING ANSI CODES

This Guideline is to be used as the criterion to determine if a new or existing ANSI Code is to be assigned to the new designation request, under evaluation by the Administrator, based on the Lamp Characteristic and Limits shown.

KEY CATEGORY	CHARACTERISTIC	LIMIT[4]
❷ ELECTRICAL		
	LAMP WATTAGE	± 2%
	LAMP VOLTAGE	± 2%
	LAMP CURRENT	± 2%
	MINIMUM OCV(rms)	+0%/-10%
	MINIMUM OCV(peak)	+0%/-10%
	EXTERNAL PULSE REQUIREMENTS	
	MIN. HEIGHT(kV)	+0%/-10%
	MIN. WIDTH(msec)	+0%/-50%
	MIN. REP. RATE(per 1/2 cycle)	+0/-1
	CURRENT CREST FACTOR	-0/+0.2
❸ PHYSICAL		
	BASE DESIGNATION	NONE
	BULB DESIGNATION	NONE
	MOL	+0/-NA[5]
	LCL	± 10% of EAL[6]
	DOUBLE ENDED LAMPS	
	MAX. BASE EDGE TO CONTACT LENGTH(B)	+0/-1mm
	CONTACT TO CONTACT LENGTH(C)	+0/-1mm
❹ THERMAL		
	MAX.BASE TEMPERATURE	-10%/+0%
	MAX. BULB TEMPERATURE	-10%/+0%

4 LIMIT refers to the range within which no new ANSI code can be issued.

5 NA - Not Applicable

6 EAL - "Effective Arc Length"

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Assigned Designation:_____
(To be assigned by ANSI Administrator)

Date: _____

HIGH-INTENSITY DISCHARGE LAMP DESIGNATION REQUEST FORM
Attention: Secretary, Accredited Standards Committee C78 on Electric Lamps

Note: A lamp designation code may be issued by the Secretary if the requirements of C78.380, Section 7, are satisfied. It is understood that the code is for the convenience of the lighting industry and does not constitute a standard of ANSI (American National Standards Institute).

_____ Request for new designation.

_____ Notification of change in design. (Fill in only the characteristics being changed.) (Final acceptance only after review by Subcommittee C78-4.)
Reason:_____

All items shall be completed in accordance with American National Standard for Electric Lamps - Methods of Designation of High-Intensity Discharge Lamps, ANSI C78.380-1997.

1. Lamp Classification _____

Physical Characteristics

2. Physical Interchangeability with Designation _____
3. *Base Designations _____
4. Bulb
4.1 *Bulb Shape Code _____
4.2 *Bulb Diameter: English (_____ in.)
Metric _____ mm
4.3 Bulb Finish _____
5. *MOL _____mm (_____in.)
*B max _____mm (_____in.)
*C min _____mm (_____in.)
*C max _____mm (_____in.)
6. *LCL _____mm ± _____mm
(_____in.) ± (_____ in.)
7. Effective Arc Length _____mm
(_____in.)
8. Arc Tube Position _____
9. Operating Position _____
10. *Maximum Permissible Base Temp._____
11. *Maximum Permissible Bulb Temp. _____
12. Maximum Getter Area Bulb Temp. _____
13. Beam Angle _____
14. *UV Application _____
UV Filter Req. _____ Y _____No
15. UV Range _____
UV Filter Req. _____ Y._____No
16. Moisture Protection Required:
_____ Y _____No
17. *Use in Enclosed Luminaire ___ Required
_____ Optional ____ Position Dependent
18. Other Physical Characteristics _____
_____

Lamp Electrical Operating Characteristics

19. Electrically Interchangeable with Designation _____

		Vertical	Horizontal
20.1	*Lamp Voltage, rated	_____	_____
20.2	Lamp Voltage, range	_____	_____
21.	*Lamp Current	_____	_____
22.	*Lamp Wattage, rated	_____	_____
23.	Reference Ballast		
23.1	Rated Input Voltage	_____	_____
23.2	Reference Current	_____	_____
23.3	Impedance	_____	_____
23.4	Power Factor	_____	_____
23.5	Lamp Current: AC ____ DC ____		* Key Characteristics

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Lamp Starting Voltage Requirements

You must identify the starting temperature for each family of electrical starting characteristics requested . Each temperature selected shall have all the associated data presented on one request submittal.

		-40°C(-40°F)	-29°C(-20°F)	-18°C(-0°F)	10°C(50°F)	
24.	OCV, No External Pulse					
24.1	*Minimum OCV, rms	_____	_____	_____	_____	
24.2	*Minimum OCV, peak	_____	_____	_____	_____	
25.	OCV, External Starting Pulse	**Circle the temperature that the data below represents.**				

		-40°C(-40°F)	-29°C(-20°F) Lag Ballast	-18°C(-0°F) Lead Ballast	10°C(50°F)
25.1	*Minimum OCV, rms			_____	_____
25.2	*Minimum OCV, peak			_____	_____
26.	External Pulse Requirements				
26.1	*Pulse Height (Min.)			_____	_____
26.2	Pulse Height (Max..)			_____	_____
26.3	*Minimum Pulse Width	___ µs at	_____volts	___µs at	_____ volts
26.4	*Minimum Pulse Repetition Rate, 1 per cycle or 1 per half cycle (Select one by circling)		_____	_____	
26.5	Pulse Position Elect. Deg. past Voltage Zero Crossing			_____	_____

27. Maximum Voltage Limits _____ First Second _____ Continuous

Starting and Operating Current Requirements

28. *Lamp Starting Current _____ min. _____ max.
29. *Maximum Operating and Starting Current Crest Factor _____

Special Electrical Requirements

30. Sustaining Requirements for Metal Halide Lamps.
30.1 Same as elec. Characteristics _____
30.2 Lamp Reignition Voltage Spike (throughout rated lamp life). The reignition voltage spike for any lamp operated in a vertical or horizontal position shall not exceed _____ volts when operated on a linear reactor ballast having the following characteristics:

Rated Input Voltage	_____ volts
Ballast Current	_____ amperes
Impedance	_____ ohms
Power Factor	0.075 ± 0.005
Linearity	Requirement same as for reference ballast (see ANSI C82.5-1983)

30.3 Slope, Peak Current, Overshoot, Offtime, and Sustaining Voltage Requirements

Current Slope	_____ A/mS	Sustaining Voltage	_____ V
Peak Current	_____ A	Offtime	_____ mS
Current Overshoot	_____ mA		

31. Other Requirements

_____
_____
_____
_____

32. Additional

_____
_____
_____
_____

* Key Characteristics

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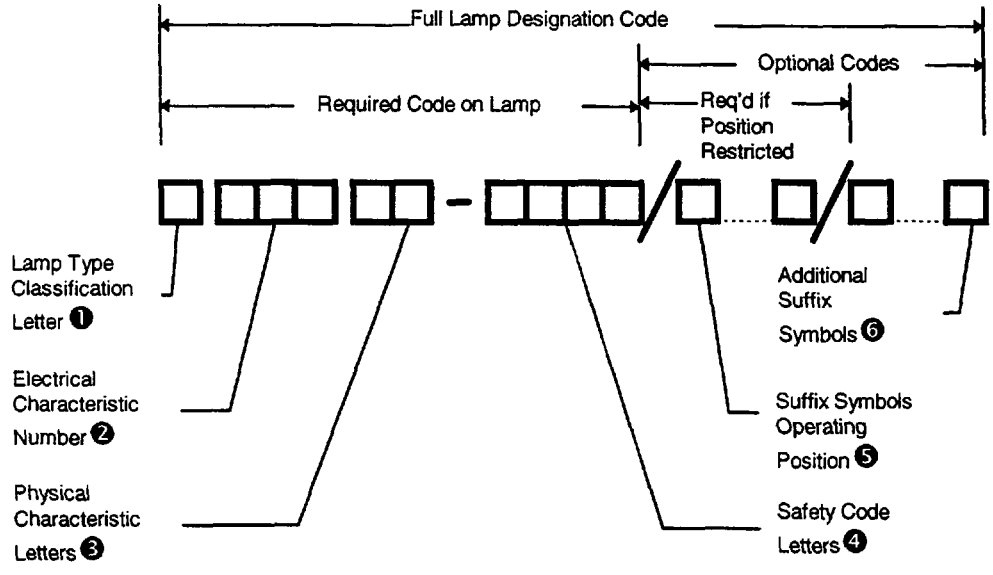
Administrator Action

33. Lamp Classification and Electrical Number _____
34. Physical Symbol _____
35. **Assigned requested new lamp, complete designation**_____

Reference Code Format



36. Requested Lamp characteristics same as lamp designation: _____
New designation not required

37. Requested Lamp characteristics are outside the guidelines of ANSI C78.380. _____
New designation withheld pending further advice from Sub-committee C78.4.

38. Acknowledgment only _____

Date: _____ By: _____

Submitted By: _____

For (Manufacturer or Distributor Name):_____

Address: _____

_____

_____

Phone Number: _____

FAX Number: _____

* Key Characteristics

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