ANSI C78.380a-2004
Amendment to ANSI C78.380-2002

American National Standard

Approved June 1, 2004 | Secretariat: ANSLG - National Electrical Manufacturers Association

for Electric Lamps —

High-Intensity Discharge Lamps, Method of Designation

INSTRUCTIONS:

This document is intended as an amendment of the Luminaire Code Attributes in Annex B of ANSI C78.380-2002

Whether amendments are inserted into the mother document or kept separate as issued is entirely at the discretion of the purchaser.

Discard this instruction sheet when finished.

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Annex B
(Normative)
Other Codes

Luminaire Characteristics	
Code Letter	**Lamp and luminaire attributes[1]**
O	Lamp may be used in an open luminaire. The lamp meets specified containment test requirements[2]. The effective actinic UV output of the lamp shall not exceed 2 mW/klm for a non-reflector lamp or 2 mW/($m^2 \cdot$ klx) for a reflector lamp.
E	Lamp requires an enclosed luminaire that meets industry standards for containment in the event of lamp rupture[3]. The effective actinic UV output of the lamp shall not exceed 2 mW/klm for a non-reflector lamp or 2 mW/($m^2 \cdot$ klx) for a reflector lamp.
F	Lamp requires an enclosed luminaire that meets industry standards for containment in the event of lamp rupture and also provides a UV attenuation barrier and lens interlock[3]. The effective actinic UV output of the lamp exceeds 6 mW/klm for a non-reflector lamp or 6 mW/($m^2 \cdot$ klx) for a reflector lamp.
S	Lamp may be used in an open luminaire if position restrictions[4] are followed. Otherwise, the lamp requires an enclosed luminaire that meets industry standards for containment in the event of lamp rupture[3]. Specified containment test requirements[2] do not apply to this type of lamp. The effective actinic UV output of the lamp shall not exceed 2 mW/klm for a non-reflector lamp or 2 mW/($m^2 \cdot$ klx) for a reflector lamp. This letter is not to be used for luminaire designation on lamps other than metal halide.
X	Restricted (Consult Lamp Manufacturer)

1 The effective actinic UV output noted below is the effective power obtained by weighting the spectral power distribution of the lamp with the UV hazard function S(λ). Information about the relevant UV hazard function is given in ANSI/IESNA RP-27.1-96 Recommended practice for photobiological safety for lamps & lamp systems – general requirements. It only relates to possible hazards regarding UV exposure of human beings. It does not deal with the possible influence of optical radiation on materials, such as damage or discoloration.
2 Quartz Metal Halide lamps must be containment rated per Annex A of ANSI C78.387. Test requirements for Ceramic Metal Halide Lamps are under consideration.
3 UL 1598
4 Follow lamp manufacturer's warnings and operating instructions for the product

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Bulb Maximum Temperature [1]	
Code	**Temperature (°C)**
U	150
A	250
B	275
C	300
D	325
E	350
F	375
G	400
H	Special Temperature - Hazardous Location
J	425
K	450
L	475
M	500
W	550
N	600
X	650
P	700
Y	750
R	800
S	900
Z	950
T	1000

Base Maximum Temperature[1]	
Code	**Maximum Temperature (°C)**
A	150
B	170
C	190
D	210
E	230
F	250
G	270
H	Special Temperature - Hazardous Location
J	280
K	350
L	400
M	450

[1] 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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American National Standard

for electric lamps—

High-Intensity Discharge Lamps, Method of Designation

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ANSI C78.380- 2002
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American National Standard

Approved: September 16, 2002 Secretariat: ANSLG-- National Electrical Manufacturers Association

For Electric Lamps-

High-Intensity Discharge Lamps, Method of Designation

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Foreword (This foreword is not part of American National Standard C78.380-2002).

Suggestions for improvement of this standard should be submitted to the Secretariat C78, American National Lighting Group of the 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 Work Group C78-4. Committee approval of the standard does not necessarily imply that all committee members voted for that approval.

Information concerning the approval of this standard is based on the documents listed in the table below:

Amendment / Change	CDV	RV
Fourth Edition	78(4)/4031	78(4)/4032v2

At the time it approved this standard, the ASC 78 Committee had the following members:

Al Rousseau, Chair, C78
David Mullen, Technical Coordinator
Randolph N. Roy, Secretariat
Ken Denton, Consulting Editor

Organization Represented:	***Name of Representative:***
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Edison Electric Institute	William Maguire (Delegate)
GE Lighting	Edward Yandek
	Selmar Dorsey (alt)
GE Lighting Systems	Mike Owens
	Rebecca Lancaster(alt)
Holophane Lighting Co.	Michael Tanner
Illuminating Engineering Society	Rita M. Harrold
InterTek Testing Services, Inc.	David Ellis
Magnetek	William Brosius
National Electrical Manufacturers Association	William E. Buckson (Delegate)
	Fred Carpenter (alt Delegate)
OSRAM SYLVANIA INC.	Peter Bleasby
	David Mullen(alt)
Philips Lighting Company	Al Rousseau
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At the time of approval of this standard, Subcommittee C78-4 had the following members:

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	Bob Erhardt
	Al Reinken
Aromat	Dail Swanson
Cooper Lighting	Kenneth Simms
	J.C. Johnson
Day-Brite Lighting	Bill Busch
Edison Electric Institute	William Maguire (Delegate)
Eye Lighting International NA	Michael M. Minarczyk
GE Lighting	Selmar Dorsey
GE Lighting Systems	Rebecca Lancaster
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Table of Contents

Foreword iii
1 Scope 1
2 Purpose 1
3 Normative references 1
4 Definitions 2
5 Description of a designation 2
5.1 General 2
5.2 Lamp type classification letter 3
5.3 Electrical characteristic number 3
5.4 Luminaire characteristic letter 4
5.5 Physical characteristic letters 4
5.6 Temperature characteristic letters 4
5.7 Suffix codes 5
5.8 Example designations 6
5.9 Lamp wattage 6
5.10 U.S. code of federal regulations (CFR) 6
6 Classification criteria for assignment of designations 7
6.1 Classification, the alpha-numeric letter 7
6.2 Classification, the electric number 7
6.3 Classification, the luminaire 7
6.4 Classification, the physical 7
6.5 Classification, the lamp bulb and base system 7
6.6 Classification, the optional suffix characteristics 7
6.7 Classification advice 8
6.8 Classification, criteria for change 8
6.9 Classification criteria for reinstatement of de-listed codes 8
7 Administration of this standard 8
7.1 Administrator 8
7.2 Participants in high-intensity discharge lamp designation program 8
7.3 Consulting body 8
7.4 Procedure for assigning and recording lamp designations 9
7.5 Procedure for assigning and recording a change in the characteristics, of an existing lamp designation 10
7.6 Resolution procedure 10
7.7 High-intensity discharge lamp designation request form 10
Annex A1 (Normative) Assigned physical codes 13
Annex A2 (Informative) Transition information from old to new physical codes 17
Annex B (Normative) Other codes 27
Annex C (Normative) C78.380 Guidelines for assigning ANSI codes 29

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AMERICAN NATIONAL STANDARD 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.

2 Purpose

The purpose of the designation system covered by this standard is to provide an identification code for use in ANSI standards. Some lamp marking requirements are also identified. Guidance is given as to which characteristics are important (key) to assure interchangeability.

The lamp characteristic data given by a manufacturer on a High-Intensity Discharge Lamp Designation Request Form 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 C78.379-1994, American National Standard for Electric Lamps - Incandescent and High-Intensity Discharge Reflector Lamps - Classification of Beam Patterns.

ANSI C78.387-1995, American National Standard for Electric Lamps: Metal Halide Lamps – Method of Measuring Characteristics

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

ANSI C81.61-1990, American National Standard for Electrical Lamp Bases.

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

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4 Definitions

In addition to the general definitions given in this section, the Administrator will provide a glossary of terms used in conjunction with a Request Form. See section 8.

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.

Key characteristic - A characteristic identified as having a critical effect on the interchangeability of lamps.

Alternative design - A lamp with key characteristics that are the same but utilize different features that do not affect interchangeability.

Designation program - The procedures and requirements of this standard 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 code shall consist of a combination of letters and numbers in the following sequence:

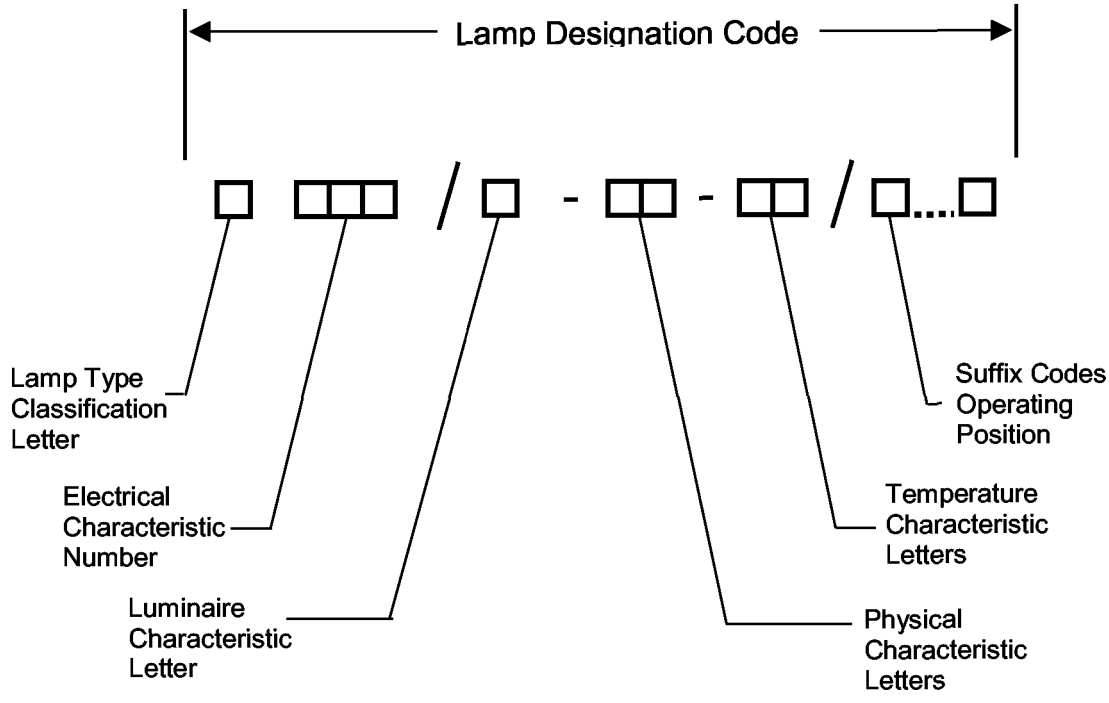
- Lamp Type Classification Letter
- Electrical Characteristic Number
- Luminaire Characteristic Letter
- Physical Characteristic Letters
- Temperature Characteristic Letters
- Suffix Codes for Operating Position (if required)

Metal Halide Lamps (MHL) shall be marked with the first three items. Other HID lamp types shall be marked with the first two items. The marked electrical characteristic number(s) must be appropriate for the lamp. Consult the lamp manufacturer before use on circuits with any code that is not listed on the lamp.

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The code layout is as follows.



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

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

A number shall follow directly after the lamp type 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

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characteristic numbers and can be assigned to only one lamp type classification. 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 even if it has the same set of Key Characteristics.

Key electrical characteristics are:

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

5.4 Luminaire characteristic letter

An appropriate luminaire characteristic letter shall be assigned from the list given in Annex B.

5.5 Physical characteristic letters

Physical characteristic letters, preceded by a hyphen, shall follow directly after the luminaire characteristic letter. They represent the set of key physical characteristics of the lamp in question, so as to ensure physical interchangeability. The key physical characteristics are:

- 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 with clear outer jackets

A listing of the assigned physical characteristic letters is given in Annex A1. The Administrator as required shall add new codes.

5.6 Temperature characteristic letters

Other codes preceded by a hyphen shall follow (See Annex B):

- Bulb Maximum Temperature
- Base Maximum Temperature

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5.7 Suffix codes (if required)

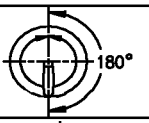
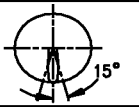
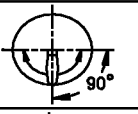
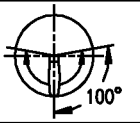
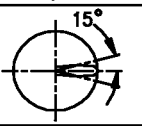
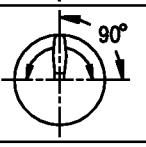
One or more sets (select the number of spaces required to adequately describe the feature) of alphanumeric codes may be added to represent features of the lamp. Each suffix set shall be preceded by a virgule. Suffix codes have been established for required operating position restrictions (e.g. Base-Up ±15) as shown in Table 1. Other codes could be requested by the manufacturer as the need arises.

When appropriate for proper application of a lamp, a code for operating position of the lamp shall be added. Such a code 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
/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 - Operating Position Codes

Position Code	Description	Diagram
(No code letters) or U	Universal, any position	
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 Mercury lamps, illustration of typical designations

An illustration of a typical designation for a mercury lamp, as provided by this standard, is as follows: (See ANNEX A1, B)

Example Designation: H33/O-ZC-GD

H Mercury lamp classification. (see clause 5.2)

33 Electrical characteristic number (see clause 5.3)

O Open luminaire permissible (see clause 5.4)

ZC Physical characteristic letters (see clause 5.5)

G Bulb maximum temperature - 400°C (see clause 5.6)

D Base maximum temperature - 210°C (see clause 5.6)

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

5.8.2 Metal halide lamps, illustration of typical designations

An illustration of a possible designation for a metal halide lamp, as provided by this standard, is as follows: (See ANNEX A1, B and Table 1)

Example Designation: M47/S-GH-JD/U

M Metal halide lamp classification. (Section 5.2)

47 Electrical characteristic number (see clause 5.3)

S Open luminaire (Restricted Position) (see clause 5.4)

GH Physical characteristic letters (see clause 5.5)

J Bulb maximum temperature 425°C (see clause 5.6)

D Base maximum temperature 210°C (see clause 5.6)

U Any operating position

Note: This lamp has a luminaire characteristic code of "S". So although the operating position is not restricted when used in an enclosed luminaire, it would be restricted to the BU15 position in an open luminaire.

5.9 Lamp wattage

Lamp Wattage is not part of the code but shall be marked on the lamp.

5.10 U.S. code of federal regulations (CFR)

Although not a part of this code, marking in accordance with CFR 21CFR part 1040.30, U.S. code of Federal regulations shall be applied when required.

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6 Classification criteria for assignment of designations

6.1 Classification, the alpha-numeric letter

Classification alpha-numeric 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 Classification, the electric number

The electrical characteristic numbers shall be assigned from a sequential series of unused numbers starting with 01. 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. Key electrical characteristics are identified on the Designation Request Form.

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 limits defined in ANNEX C.

6.3 Classification, the luminaire

The Luminaire The luminaire characteristics letter shall be assigned as appropriate (see Annex B).

6.4 Classification, the physical

The physical characteristic letters shall be assigned in accordance with clause 5.5. The letters I, O, U, and Q shall not be used.

A different pair of letters shall be assigned for each unique set of key physical characteristics. Key physical characteristics are identified on the Request Form.

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 assigned the same physical characteristic letters as one previously assigned if all of the key physical characteristics are within the tolerances assigned in ANNEX C.

Existing designations that were previously assigned could have values beyond those assigned in ANNEX B and C, but all newly assigned designations shall be within the assigned limits.

6.5 Classification, the lamp bulb and base system

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

6.6 Classification, the optional suffix characteristics

Optional suffix symbols may be assigned from the list of authorized symbols, per Section 5.7 when necessary.

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6.7 Classification advice

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.

6.8 Classification, criteria for change

If the change will not affect interchangeability, no new code is needed.

Conversely if interchangeability is affected in any way, changing a key characteristic by more than the tolerance specified in ANNEX C, it shall be approved by the procedures of clause 7.5 or it shall be necessary to file for a new designation.

6.9 Classification criteria for reinstatement of de-listed codes

Should the LCD program administrator be notified in writing that a LCD (lamp code designation) number is no longer listed in the appropriate Special Report (SR)(as an example but not limited to SR53-2-1998) the Administrator shall follow paragraph 7.3 and 7.4 of this standard. At the discretion of the Administrator, a service fee will be accessed. Upon receipt of a completed request, the Administrator shall publicize for a 60 day period. If no objections are received by the Administrator within 60 days after publicizing the request, the file shall be updated accordingly and the Administrator shall notify the participants that the reinstatement of a delisted LCD has been made.

The Administrator provides a listing service in the form of publishing LCDs in a SR (Special Report) for public knowledge and for the developing of new or revised industry standards.

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.

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7.4 Procedure for assigning and recording lamp designations

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 7.7) 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.

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

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

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.

Upon receipt of a completed Request Form, the Administrator shall take one of the actions outlined in 1 through 4 shown below.

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.
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.
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 they 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.
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.

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.

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

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

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 manufacturer wishes to lodge an objection to the issuance of a new lamp code designation number, or to a proposed alternative or change to an existing number, The Program Administrator must be notified in writing within 42 days[1] after distribution to the appropriate industry representatives. The Administrator shall then notify the participants that an objection has been filed, and no designation will be assigned to the request, nor will any change in the recorded characteristics be made, pending resolution by the Administrator in consultation with both parties. Should the Administrator be unable to resolve to both parties satisfaction, the item of dispute shall be deferred to the appropriate subcommittee for resolution at their next regularly convened meeting. If by the 61st day, no comments or objections are received, the lamp code designation is considered approved, and any objection received after that time must go through an appeals process, during which the objecting manufacturer must explain in writing why the disputed lamp code was not questioned during the 42 day comment period, and what detrimental effect the new code will have on that company. On/after the 60th day, the company making application for the new code may start using the new Lamp Code Designation.

7.7 High-intensity discharge lamp designation request form

The official electronic version of the Request Form can be obtained from the Administrator along with a glossary of terms and instructions.

[1] The 42 day comment period relates to the letter ballot period, but because of the nature of this work, an additional 18 days is often granted.

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ANNEXES

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Annex A1
(Normative)
Assigned physical codes

New Codes	Committee Proposal	Base	Bulb	MOL (mm)	LCL (mm)
AA	Retire	Fc2	T8	177	88±3
AB	No Change	ADMED	T10	143	87
AC	New Code	E39	T15	248	146
AD	New Code	E39	E23.5	197	127±3
AG	Bad	E39	T14.5	248	146
AJ	New Code	R7s	T7.5	138	-----
AR	New Code	E26	B21	165	96
AS	New Code	E39	T16	280	178
AW	New Code	RSC	T8	256	128
BB	Retire	E40	T100	430	260±5
BC	New Code	PG12	T10	149	91
BS	No Change	E39	R40	178	-----
BV	Retire	E39	R40	191	
CF	Retire	E26	EL24	172	118
CR	New Code	R7s			
CS	Retire	E39	BT37	295	185±5
CX	New Code	E39	E23.5	191	127
DC	New Code	R7s	T6	120	-----
DK	New Code	E26	B17/E17	131	80
DR	New Code	Fc2	T8	169	-----
DT	Retire	E26	B21	153	103±5
DV	New Code	E26	R40, RD40	178	-----
EF	No Change	R7s	T10	254	127±4
EG	BAD				
EJ	New Code	E39	E18	248	146±3
EM	New Code	Fc2	T10	254	127±4
ER	New Code	E39	BT28	228	127±3
EW	New Code	E39	R57	324	
EZ	New Code	E39	T15	248	154
FM	New Code	E39	PS40	248	178±6
FN	New Code				
FO	New Code				
FX	New Code	E39	R52	299	
GC	New Code	E39	T15	248	154
GF	New Code	E26	A23	139	89
GH	New Code	E39	BT56	391	241±6
GJ	New Code	E39	E18	248	19±3
GN	Retire	RSC	T8	334	
GS	No Change	ADMEDSK	PAR38	138	-----

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Annex A1
Assigned physical codes

New Codes	Committee Proposal	Base	Bulb	MOL (mm)	LCL (mm)
GT	Retire	RSC	T8	191	95.5
GZ	No Change	E26	E17	134	87±3
HE	No Change	E26	PS35	227	167±4
HG	No Change	E39	PS35	239	167±4
HL	Retire				
HM	No Change	E26	ED28	216	139±8
HP	No Change	E39	ED28	211	136±12
HR	No Change	E39	R80	340	
HS	Retire				
HZ	No Change	E39	RD40	188	-----
JC	No Change	E39	BT37	292	-----
JM	No Change	MDSK	PAR38	138	-----
JW	No Change	E39	PAR36	76	-----
KA	New Code	E39	BT28	211	127±5
KD	Retire	E26	PAR38	110	-----
KE	New Code	E26	PAR30	125	----
KF	New Code	E26	R40	178	-----
KK	No Change	E26	PAR20	95	----
KP	New Code	E39	R60	258	-----
KS	Retire	R12.5S	T6	273	
KV	Retire	E26	G40	177	110
LA	Retire	E26	T10	143	88±3
LE	New Code	XR7s			
LN	New Code	E39	R60	277	-----
LS	Retire	E39	BT37	324	178
LV	Retire				
LW	Retire				
LX	Retire	E39	BT56	397	245±7
LY	Retire				
LZ	Retire				
MB	New Code	E26	T10	108	73
MY	Retire	E26	PAR38	110	
NB	Retire	E39	R80	399	-----
NC	New Code	E39	BT46	368	241
NE	New Code	E39	R80	425	-----
NG	Retire	RSC	T6	256	
NV	New Code	E39	E23.5	197	127±3
PL	New Code	E39	ED18,T18	248	146±3
PM	Retire	RSC	T7	250	
PN	Retire	E40/45	T14.5	220	150±5
PO	BAD	G12	T6	90	56

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Annex A1
Assigned physical codes

New Codes	Committee Proposal	Base	Bulb	MOL (mm)	LCL (mm)
PP	Retire	G12	T8	84	56
PV	Retire				
PY	Retire	FC2	T30	206	103±5
PZ	Retire	E40/45	T46	285	175±5
QA	No Change	EP39	BT56	391	232
QC	New Code	EX39	BT28	211	127
RA	No Change	BY22d	T16	216	135
RB	No Change	BY22d	T16	311	185
RC	No Change	BY22d	T16	425	240
RD	No Change	BY22d	T20.5	528	290
RE	No Change	BY22d	T20.5	775	415
RF	No Change	BY22d	T20.5	1120	580
RG	No Change	BY22d	T12	150	95
RV	New Code	E26/24	B17	145	93±9
RX	Retire				
SR	New Code	E26/24	RD38, RL38	158	-----
TA	New Code	EP39	BT28	211	127
TB	New Code	EP39	BT37	292	178±6
TC	Retire	E39	PAR56	127	29
VL	No Change	Fc2			
WL	Retire	E39	R53		
WV	New Code	E26	RD40	183	-----
XA	Retire	E39	T18	383	220
XB	No Change	E39/CER	E25	383	222±6
XC	Retire	R12.5S	T6	375	
XD	Retire	E39	T28	408	240
XF	Retire	E39	BT28	211	127±3
XH	Retire	E39	BT28	250	160±5
YA	Retire				
YB	Retire				
YL	No Change	E26	E23.5	178	-----
YN	No Change	E26	PS30	186	-----
YO	New Code	E26	R40	178	-----
YP	No Change	E26	RL38	147	-----
YR	No Change	MED SKIRT	RL38	166.5	-----
ZB	New Code	E26	PS30	205	151±8
ZC	New Code	E39	ED/BT37	292	178±6
ZL	New Code	E26	B/E/ED17	139	89±5
ZN	New Code	E39	BT28	211	127±3
ZW	Retire	E26	R40	178	114

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Annex A2
(Informative)
Transition information from old to new physical codes

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
AB	No Change	**AB**	Admed	T10	143	87	**H44**	130	0.85	100						
AB	Obsolete		E26	T10	143	8.7	**~~H4~~**	100	1.10	100						
AF	New Code	**BC**	PG12	T10	149	91	**S104**			50						
AF	New Code	**BC**	PG12	T10	149	91	**S99**	45	0.90	35	108				3500	0.5@3150
AH	New Code	**AC**	E39	T15	248	146	**S124**	100		200						
AH	New Code	**AC**	E39	T15	248	146	**S125**	100		200						
AH	BAD	**AG**	E39	T14.5	248	146	**S129**	100		350						
AH	New Code	**EZ**	E39	T15	248	154	**S126**									
AH	New Code	**GC**	E39	T15	248	154	**S106**									
AN	New Code	**ZL**	E26	B17	139	89	**H43**	130	0.66	75						
AR	New Code	**AS**	E39	T16	280	178	**H33**									
AV	New Code	**ZL**	E26	E17	139	-----	**H38**	130	0.85	100						
AV	New Code	**ZL**	E26	E17	139	-----	**H43**	130	0.64	75						
AY	New Code	**AR**	E26	B21	165	96	**H38**	130	0.90	100						
AY	New Code	**AR**	E26	B21	165	96	**H43**	130	0.64	75						
~~AY~~	Retire	**AR**	E26	B21	165	95	**H45**	90	0.53	40						
~~AZ~~	Retire	**AR**	E26	B21	165	96	**H38**	130	0.90	100						
~~AZ~~	Retire	**AR**	E26	B21	165	96	**H43**	130	0.64	75						
~~AZ~~	Retire	**AR**	E26	B21	165	95	**H45**	90	0.53	40						
~~BF~~	Retire	**CF**	E26	EL24	172	118	**H42**	125	1.15	125						
~~BG~~	Retire	**CF**	E26	EL24	172	118	**H42**	125	1.15	125						
BM	New Code	**KF**	E26	R40	178	-----	**H38**	130	0.90	100						
BM	New Code	**KF**	E26	R40	178	-----	**H39**	130	1.50	175						
~~BN~~	Retire	**ZW**	E26	R40	178	114	**H39**	130	1.50	175						
BP	New Code	**KF**	E26	R40	178	-----	**H38**	130	0.85	100						
BP	New Code	**KF**	E26	R40	178	-----	**H39**	130	1.50	175						
BS	No Change	**BS**	E39	R40	178	-----	**H39**	130	1.45	175						
~~BV~~	Retire	**BV**	E39	R40	191		**H39**	130	1.50	175						
~~CA~~	Retire	**TC**	E39	PAR 56	127	29	**H39**	130	1.50	175						

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Annex A2
Transition information from old to new physical codes

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
~~CB~~	Retire	TC	E39	PAR 56	127	29	H39	130	1.50	175						
CD	New Code	ZC	E39	BT37	292	178	H33	135	3.20	400						
~~CL~~	Retire	CS	E39	BT37	295	185±5	S64	135	3.25	360						
~~CM~~	Retire	CS	E39	BT37	295	185±5	S64	135	3.25	360						
DG	Obsolete		E39	BT37	292	178	~~H1~~	135	3.20	400						
DL	New Code	DK	E26	B17	131	-----	H45	90	0.53	40						
DL	New Code	DK	E26	E17	131	-----	H46	95	0.60	50						
DN	New Code	FX	E39	R52	299	-----	H33	135	3.20	400						
~~DP~~	Retire	EW	E39	R57	324	203	H33	135	3.20	400						
~~DT~~	Retire	DT	E26	B21	153	103±5	H95	115	0.80	80						
~~EA~~	Retire	EJ	E39	E18	124	146	H33	135	3.20	400						
~~EB~~	Retire	AA	Fc2	T8	177	88±3	M58	130	2.15	250	382		280	560	3750	2@3500
~~EB~~	Retire	AA	Fc2	T8	177	88±3	M97	130	2.15	250	382		280	560	3750	2@3500
~~EC~~	Retire	AA	Fc2	T8	177	88±3	M57	130	1.50	175	382		280	560	3750	2@3500
~~EC~~	Retire	AA	Fc2	T8	177	88±3	M96	130	1.50	175	382		280	560	3750	2@3500
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~~	BAD	EG					~~M108~~									
EL	New Code	DK	E26	B17	131	80	H45	90	0.53	40						
EL	New Code	DK	E26	E17	131	80	H46	95	0.60	50						
FA	New Code	NE	E39	R80	425	-----	H36	265	4.00	1000						
FA	Obsolete		E39	R80	399		~~H15~~	265	4.00	1000						
FB	New Code	NE	E39	R80	425	-----	H36	265	4.00	1000						
FB	Obsolete		E39	R80	399		~~H15~~	265	4.00	1000						
~~FC~~	Retire	NB	E39	R80	399	-----	H34									
FC	New Code	NE	E39	R80	425	-----	H36	265	4.00	1000						
FC	Obsolete		E39	R80	399		~~H15~~	265	4.00	1000						
FE	Obsolete		E26	T10	143	7.6	~~H3~~	250	0.40	85						
FG	Obsolete		E26	T10	143	7.6	~~H3~~	245	0.40	85						
FJ	Obsolete			T9.5	1397		~~H9~~	535	6.10	3000						

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Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
FP	New Code	FN					H32	135	0.66	75						
FP	New Code	FO					H37									
FS	New Code	LN	E39	R60	277	-----	H33	135	3.20	400						
FS	New Code	LN					H37									
FY	New Code	FX	E39	R52	299		H32	135	0.66	75						
FY	New Code	FX	E39	R52	299	-----	H33	132	3.20	400						
GL	Obsolete		E39	BT37	292	178	~~H1~~	135	3.20	400						
GL	New Code	ZC	E39	BT37	292	-----	H33	135	3.20	400						
GS	No Change	GS	Admed	PAR38	138	-----	H44	130	0.85	100						
GV	New Code	GH	E39	BT56	391	241	H34	135	8.00	1000						
GV	New Code	GH	E39	BT56	391	241	H36	265	4.00	1000						
GV	Obsolete		E39	BT56	391	241	~~H12~~	135	8.00	1000						
GV	Obsolete		E39	BT56	391	241	~~H15~~	265	4.00	1000						
GW	New Code	GH	E39	BT56	391	-----	H34	135	8.00	1000						
GW	New Code	GH	E39	BT56	391	-----	H36	265	4.00	1000						
GW	Obsolete		E39	BT56	391	241	~~H12~~	135	8.00	1000						
GW	Obsolete		E39	BT56	391	241	~~H15~~	265	4.00	1000						
GZ	No Change	GZ	E26	E17	134	87±3	M100	90	0.36	32						
HA	New Code	ZL	E26/24	E17	138	87±5	S76	52	0.83	35	110				2.5K-4K	1@2250
HB	New Code	ZL	E26/24	E17	138	-----	S76	52	0.83	35	110				2.5K-4K	1@2250
HD	New Code	ZB	E26	PS30	205	151±8	B94		2.22	250						
HE	No Change	HE	E26	PS35	227	167±4	B94		2.22	250						
HG	No Change	HG	E39	PS35	239	167±4	B94		2.22	250						
HK	New Code	DV	E26	R40	178	-----	B94		2.22	250						
~~HL~~	Retire	HL					H33	135	3.20	400						
HL	Obsolete		E39	R60	261		~~H1~~	135	3.20	400						
HM	No Change	HM	E26	ED28	216	139±8	B94		2.22	250						
HN	New Code	DV	E26	R40	178	-----	B94		2.22	250						
HP	No Change	HP	E39	ED28	211	136±12	B94		2.22	250						
~~HR~~	Retire	HR	E39	R80	340		H34	135	8.20	1000						
HR	No Change	HR	E39	R80	340		H36	265	4.00	1000						

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Annex A2
Transition information from old to new physical codes

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
HR	Obsolete		E39	R80	340		~~**H12**~~	135	8.20	1000						
HR	Obsolete		E39	R80	425		~~**H15**~~	265	4.00	1000						
~~**HS**~~	Retire	**HS**					**H33**									
HT	New Code	**CX**	E39	E23.5	191	127	**H38**	130	0.85	100						
HT	Obsolete		E39	PS25	181	127	~~**H4**~~	130	0.90	100						
HW	Obsolete		E26	R40	162		~~**H4**~~	130	0.90	100						
HY	New Code	**DV**	E26	RD40	178	-----	**B94**		2.22	250						
HZ	No Change	**HZ**	E39	RD40	188	-----	**B94**		2.22	250						
JA	New Code	**CX**	E39	E23.5	191	-----	**H38**	130	0.85	100						
JA	Obsolete		E39	PS25	181	127	~~**H4**~~	130	0.90	100						
JB	New Code	**ZC**	E39	BT37	292	178±6	~~**B75**~~		2.10	450	220					
JC	No Change	**JC**	E39	BT37	292	-----	~~**B75**~~		2.10	450	220					
JD	New Code	**ZC**	E39	BT37	292	-----	~~**B75**~~		2.10	450	220					
JE	New Code	**FM**	E39	PS40	248	178±6	~~**B75**~~		2.10	450	220					
JF	New Code	**FM**	E39	PS40	248	-----	~~**B75**~~		2.10	450	220					
JG	New Code	**FM**	E39	PS40	248	-----	~~**B75**~~		2.10	450	220					
JH	New Code	**KP**	E39	R60	258	-----	~~**B75**~~		2.10	450	220					
JJ	New Code	**KP**	E39	R60	258	-----	~~**B75**~~		2.10	450	220					
JK	New Code	**KP**	E39	R60	258	-----	~~**B75**~~		2.10	450	220					
JM	No Change	**JM**	MDSK	PAR38	138	-----	~~**H44**~~	130	0.85	100						
JW	No Change	**JW**	E39	PAR36	76	-----	~~**H43**~~	130	0.66	75						
~~**JW**~~	Retire	**JW**	E39	PAR36	76	-----	~~**H46**~~	90	0.60	50						
KB	New Code	**KA**	E39	BT28	211	127	**H37**	130	2.10	250						
KB	New Code	**KA**	E39	BT28	211	127	**H39**	130	1.50	175						
KB	Obsolete		E39	BT28	210	127	~~**H22**~~									
KB	Obsolete		E39	BT28	211	127	~~**H5**~~	130	2.10	250						
KC	New Code	**KA**	E39	BT28	211	-----	**H37**	130	2.10	250						
KC	New Code	**KA**	E39	BT28	211	-----	**H39**	130	1.45	175						
KC	Obsolete		E39	BT28	210	127	~~**H22**~~									
KC	Obsolete		E39	BT28	211		~~**H5**~~	130	2.10	250						
KK	No Change	**KK**	E26	PAR20	95	----	**M130**	90		39						

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Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
~~KL~~	Retire	KD	E26	PAR38	110	-----	H43	130	0.66	75						
~~KL~~	Retire	KD	E26	PAR38	11		H44	130	0.85	100						
KL	New Code	KE	E26	PAR30	125	----	M130	90		39						
~~KV~~	Retire	KV	E26	G40	177	110	H38	130	0.85	100						
KY	New Code	GH	E39	BT56	391	-----	H34	135	8.00	1000						
KY	New Code	GH	E39	BT56	391		H36	265	4.00	1000						
KY	Obsolete		E39	BT56	391	241	~~H12~~	135	8.00	1000						
KY	Obsolete		E39	BT56	391	241	~~H15~~	265	4.00	1000						
LG	New Code	ZL	E26/24	B17	138	89±5	S62	52	1.60	70	110				2.5K-4K	1@2250
LH	New Code	ZL	E26/24	B17	138	-----	S62	52	1.60	70	110				2.5K-4K	1@2250
LL	New Code	GF	E26	A23	139	89	H38	130	0.85	100						
~~LN~~	Retire	LN	E39	R60	277		H33	135	3.20	400						
~~LN~~	Retire	LN					H37									
LP	New Code	ZL	E26/24	B17	138	87±6	S68	52	1.18	50	110				2.5K-4K	1@2250
LR	New Code	ZL	E26/24	B17	138	-----	S68	52	1.18	50	110				2.5K-4K	1@2250
~~LS~~	Retire	LS	E39	BT37	324	178	H33	135	3.20	400						
~~LV~~	Retire	LV					S91									
~~LW~~	Retire	LW					S92									
~~LX~~	Retire	LX	E39	BT56	397	245±7	S93	145	7.50	940						
~~LY~~	Retire	LY					S92									
~~LZ~~	Retire	LZ					S92									
MA	Obsolete		E39	BT37	292	178	~~H17~~	265	1.70	425						
~~MA~~	Retire	ZC	E39	BT37	292	178	H40	265	1.70	425						
MC	New Code	AD	E39	E23.5	197	-----	S54	55	2.10	100	110				2.5K-4K	1@2250
MD	New Code	NV	E39	E23.5	197	-----	S55	55	3.20	150	110				2.5K-4K	1@2250
ME	New Code	NV	E39	E23.5	197	127±3	S62	52	1.60	70	110				2.5K-4K	1@2250
MF	New Code	AD	E39	E23.5	197	127	S121	52		70						
MF	New Code	NV	E39	E23.5	197	-----	S62	52	1.60	70	110				2.5K-4K	1@2250
MG	New Code	ZN	E39	BT28	211	127±3	S63	130	1.50	150						
MG	New Code	ZN	E39	BT28	211	127±3	S64									
~~MH~~	Retire	ZN					S62									

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Annex A2
Transition information from old to new physical codes

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
~~MH~~	Retire	ZN	E39	BT28	211	127±3	S63	130	1.50	150						
~~MJ~~	Retire	ZC	E39	BT37	292	178±6	S64	130	3.30	360						
~~MK~~	Retire	ZC	E39	BT37	292	178±6	S64	130	3.30	360						
ML	New Code	ZN	E39	BT28	211	127	S65	130	2.10	215						
~~MM~~	Retire	ZN	E39	BT28	211	127	S65	130	2.10	215						
MN	New Code	EJ	E39	E18	248	146±3	S66	100	2.40	200	198		198*		2.5K-4K	1@2250
MP	New Code	GF	E26	A23	139	-----	H38	130	0.85	100						
MR	New Code	EJ	E39	E18	248	146±3	S67	100	3.60	310	198		198*		2.5K-4K	1@2250
MS	New Code	AD	E39	E23.5	197	127±3	S122	52		50						
MS	New Code	NV	E39	E23.5	197	127±3	S68	52	1.18	50	110				2.5K-4K	1@2250
MT	New Code	NV	E39	E23.5	197	-----	S68	52	1.18	50	110				2.5K-4K	1@2250
~~MX~~	Retire	KD	E26	PAR 38			S62	52	1.60	70	110				2.5K-4K	1@2250
~~MY~~	Retire	MY	E26	PAR 38	110		S62	52	1.60	70	110				2.5K-4K	1@2250
~~MZ~~	Retire	LA	E26	T10	143	88±3	S62	52	1.60	70	110				2.5K-4K	1@2250
MZ	New Code	MB	E26	T10	108	73	S127	52		50						
NA	New Code	NC	E39	BT46	368	241	H35	265	2.80	700						
ND	New Code	NC	E39	BT46	368	-----	H35	265	2.80	700						
~~NG~~	Retire	ZW	E39				H32	130	0.66	75						
NH	New Code	ZC	E39	BT37	292	178	~~S111~~									
~~NJ~~	Retire	ZC	E39	BT37	292	178±4	M89	235	3.30	750						
~~NJ~~	Retire	ZC					M91									
~~NR~~	Retire	DC					S62									
~~NR~~	Retire	DC					S88	90	0.98	70	230				4000	2@3600
NZ	New Code	BC	PG12	T10			~~S105~~			100						
PA	New Code	GH	E39	BT56	391	241±6	M47	263	4.10	1000	530	750	380*			
PB	New Code	GH	E39	BT56	391	-----	M47	263	4.10	1000	530	750	380*			
PC	New Code	GH	E39	BT56	391	241±6	M48	268	6.20	1500	530	750	410*			
PE	New Code	KA	E39	BT28	211	127±5	M57	132	1.50	175	382	540	280*			
PF	New Code	KA	E39	BT28	211	-----	M57	132	1.50	175	382	540	280*			
PG	New Code	KA	E39	BT28	211	127±5	M58	133	2.10	250	382	540	300*			
PG	New Code	KA	E39	BT28	211	-----	M58	133	2.10	250	382	540	300*			

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Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
PH	New Code	KA	**E39**	**BT28**	**211**	**127±5**	**M59**	**135**	**3.25**	**400**						
PH	New Code	KA	**E39**	**BT28**	**211**	**----**	**M59**	**135**	**3.25**	**400**						
PJ	New Code	ZC	E39	ED37	292	178	**M128**	135		400						
PJ	New Code	ZC	E39	ED37	292	178	**M131**	135		350						
PJ	New Code	**ZC**	E39	ED/BT37	292	178±6	**M59**	135	3.25	400	382	540	295*			
PK	New Code	**ZC**	E39	ED/BT37	292	-----	**M59**	135	3.25	400	382	540	295*			
PL	New	**PL**	**E39**	**E18**	**248**	**146±3**	**M58**	**133**	**2.10**	**250**						
PL	New Code	**PL**	E39	T18	248	146±3	**M59**	135	3.25	400	382	540	295*			
~~**PM**~~	Retire	**PM**	RSC	T7	250		**M79**	250	6.70	1500	350					
~~**PN**~~	Retire	**PN**	E40/45	T14.5	220	150±5	**M80**	100	3.00	250						
~~**PP**~~	Retire	**PP**	G12	T8	84	56	**M81**	95	1.80	150	230				4K-6K	2@3600
~~**PP**~~	Retire	**PP**	G12	T8	84	56	**M85**	90	0.97	75	230				4K-6K	2@3600
PPA	BAD	**PO**	G12	T6	90	56	**M130**	90		39						
PR	New Code	**DR**	Fc2	T8	169	-----	**M80**	100	3.00	250	230	325	TBD	TBD	4K-6K	2@3600
PS	New Code	**AJ**	R7s	T7.5	138	-----	**M81**	95	1.80	150	230	325	TBD	TBD	4K-6K	2@3600
~~**PT**~~	Retire	**BB**	E40	T100	430	260±5	**M82**	230	10.30	2000	380				4500	1@4000
~~**PV**~~	Retire	**PV**					**M83**	125	9.50	1000	230				4500	1@4000
~~**PW**~~	Retire	**BB**					**M84**	220	18.00	3600	380				4500	1@4000
PX	New Code	**DC**	R7s	T6	120	-----	**M85**	95	0.95	75	230*	325*	230*	325*	4K-6K	2@3600
~~**PY**~~	Retire	**PY**	FC2	T30	206	103±5	**M86**	120	3.50	360	198	280			3000	1@2700
~~**PZ**~~	Retire	**PZ**	E40/45	T46	285	175±5	**M86**	120	3.50	360	198	200			3000	1@2700
QA	No Change	**QA**	EP39	BT56	391	232	**M47**	255		1000						
QB	New Code	**QA**	EP39	BT56	391	232	**M48**	268		1500						
QC	No Change	**QC**	EX39	BT28	211	127	**M57**	130	1.50	175						
QC	New Code	**QC**	EX39	BT28	211	127	**M58**	133		250						
QD	New Code	**QC**	EX39	BT28	211	----	**M57**	130	1.50	175						
QD	New Code	**QC**	EX39	BT28	211	----	**M58**	133		250						
RA	No Change	**RA**	BY22d	T16	216	135	**L69**	57	0.35	18	300					
RB	No Change	**RB**	BY22d	T16	311	185	**L70**	70	0.60	37	390					
RC	No Change	**RC**	BY22d	T16	425	240	**L71**	109	0.59	56	410					
RD	No Change	**RD**	BY22d	T20.5	528	290	**L72**	112	0.94	91	420					

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Annex A2
Transition information from old to new physical codes

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
RE	No Change	**RE**	BY22d	T20.5	775	415	**L73**	164	0.95	135	540					
RF	No Change	**RF**	BY22d	T20.5	1120	580	**L74**	240	0.91	185	600					
RG	No Change	**RG**	BY22d	T12	150	95	**L77**	55	0.20	10	340					
~~**RK**~~	Retire	**RV**	E26	B17	145	89±2	**S55**	55	3.20	150	110		108	95	2500	2250
RN	New Code	**RV**	E26/24	B17	145	93±9	**S55**	55	3.20	150	110				2.5K-4K	1@2250
RP	New Code	**RV**	E26/24	B17	145	-----	**S55**	55	3.20	150	110				2.5K-4K	1@2250
RZ	New Code	**AD**	E39	E23.5	197	127±3	**S123**	55		150						
RZ	New Code	**AD**	E39	E23.5	197	127±3	**S55**	55	3.20	150	110		108	95	2500	2250
SB	New Code	**AD**	E39	E23.5	197	127±3	**S120**	52		100						
SB	New Code	**AD**	E39	E23.5	197	127±3	**S54**	55	2.10	100	110				2.5K-4K	1@2250
SC	New Code	**NV**	E39	E23.5	197	127±3	**S55**	55	3.20	150	110				2.5K-4K	1@2250
SD	New Code	**ER**	E39	BT28	228	127±3	**S56**	100	1.80	150	198		198*		2.5K-4K	1@2250
SE	New Code	**ER**	E39	BT28	228	-----	**S56**	100	1.80	150	198		198*		2.5K-4K	1@2250
SG	New Code	**ZL**	E26/24	B17	138	89±6	**S54**	55	2.10	100	110				2.5K-4K	1@2250
SH	New Code	**ZL**	E26/24	B17	138	-----	**S54**	55	2.10	100	110				2.5K-4K	1@2250
SI	New Code	**ZL**	E26	B17	138	-----	**M98**	85	0.90	70	235	332	-----	-----	3K-4K	1@2.7K
SJ	New Code	**ZL**	E26	B17	138	87	**M90**			100						
SJ	New Code	**ZL**	E26	B17	138	86±3	**M98**	85	0.90	70	235	332	-----	-----	3K-4K	1@2.7K
SK	New Code	**ZL**	E26	B17	138	-----	**M90**			100						
SL	New Code	**SR**	E26	PAR38	148	-----	**S62**	52	1.60	70	110				2.5K-4K	1@2250
SM	New Code	**SR**	E26/24	RD38	158	-----	**S76**	52	0.83	35	110				2.5K-4K	1@2250
TL	New Code	**ZL**	E26	ED17	138	86±3	**M110**	85	0.68	50	235	332	-----	-----	3K-4K	1@2.7K
TM	New Code	**ZL**	E26	ED17	138	-----	**M110**	85	0.68	50	235	332	-----	-----	3K-4K	1@2.7K
TN	New Code	**DC**	RSC	T6	120	-----	**M91**	100	1.10	100	235	332	-----	-----	4K-6K	2@3600
~~**TP**~~	Retire	**AJ**	RSC-R7s	T7	138	69±4	**M92**	100	1.10	100	216				3300	1.0@3K
TS	New Code	**ZL**	E26	B17	138	86±3	~~**M107**~~			150						
TT	New Code	**ZL**	E26	B17	138	-----	**M107**			150						
TW	Obsolete	**ZL**	E26	ED17	138	86±3	~~**M101**~~			75						
TW	New Code	**ZL**	E26	ED17	138	86±3	**M102**	95	1.80	150	235	332	-----	-----	3K-4K	1@2.7K
TW	New Code	**ZL**	**E26**	**ED17**	**138**	**86±3**	**M57**	**130**	**1.50**	**175**						
TW	New Code	**ZL**	E26	ED17	138	86±3	**M90**	100	1.10	100	235	332	-----	-----	3K-4K	1@2.7K

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Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
TX	Obsolete	**ZL**	E26	ED17	138		**M101**			75						
TX	New Code	**ZL**	E26	ED17	138	-----	**M102**	95	1.80	150	235	332	-----	-----	3K-4K	1@2.7K
TX	New Code	**ZL**	**E26**	**ED17**	**138**	**----**	**M57**	**130**	**1.50**	**175**						
TX	New Code	**ZL**	E26	ED17	138	-----	**M90**	100	1.10	100	235	332	-----	-----	3K-4K	1@2.7K
~~**TZ**~~	Retire	**PL**	E39	ED18	248	146±3	**S50**	100	3.00	250	198		198	175	2500	1@2250
VA	New Code	**EJ**	E39	E18	248	146±3	**S50**	100	3.00	250	198		198*		2.5K-4K	1@2250
~~**VB**~~	Retire	**GT**	RSC	T8	191	95.5	**S50**	100	3.00	250	198		198		2500	1@2250
VC	New Code	**ER**	E39	E28	228	-----	**S50**	100	3.00	250	198		198*		2.5K-4K	1@2250
~~**VE**~~	Retire	**KS**	R12.5S	T6	273		**S50**									
~~**VE**~~	Retire	**ZC**	E39	BT37	292	178±6	**S50**	100	3.00	250	198				2500	1@2250
~~**VF**~~	Retire	**KS**	R12.5S	T6	273		**S50**	100	3.00	250	198				2500	1@2250
~~**VG**~~	Retire	**WL**	E39	R53			**S50**	100	3.00	250	198					1@2250
~~**VH**~~	Retire	**NG**	RSC	T6	256		**S50**	100	3.00	250	198		198		2.5K-4K	1@2250
~~**VJ**~~	Retire	**EJ**	E39	E18	248	146±3	**S50**	100	3.00	250	198				2.5K-4K	1@2250
VK	New Code	**CR**	R7s				~~**M103**~~									
VK	New Code	**CR**	R7s				**M80**									
VL	No Change	**VL**	Fc2				**M103**									
VM	New Code	**DR**	Fc2				**M109**									
VN	New Code	**LE**	XR7s				**M109**									
WA	New Code	**EJ**	E39	E18	248	146±3	**S51**	100	4.60	400	198		198*		2.5K-4K	1@2250
WA	New Code	**GJ**	E39	E18	248	19±3	**S51**	102	4.60	400						
WB	New Code	**ZC**	E39	E37	292	-----	**S51**	100	4.60	400	198		198*		2.5K-4K	1@2250
WC	New Code	**AW**	RSC	T8	256	128	**S51**	100	4.60	392	198				2500	1@2250
~~**WD**~~	Retire	**WL**	E39	R53			**S51**	100	4.60	400	198				2500	1@2250
~~**WE**~~	Retire	**KS**	R12.5S	T6	273		**S51**	100	4.60	400	198				2500	1@2250
~~**WF**~~	Retire	**NG**	RSC	T6	256		**S51**	100	4.60	400	198		198		2.5K-4K	1@2250
WG	New Code	**EJ**	E39	E18			**S51**	100	4.60	400						
~~**XA**~~	Retire	**XA**	E39	T18	383	220	**S52**	250	4.70	1000						
XB	No Change	**XB**	E39/CER	E25	383	222±6	**S52**	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**	250	4.70	1000	380				3000	4@2700

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Annex A2
Transition information from old to new physical codes

Old Codes	Committee Proposal	New Codes	Base	Bulb	MOL (mm)	LCL (mm)	ANSI	Electrical Design			External Starting (LAG)		External Starting(lead)		Pulse Height	Pulse Width
								V	A	W	Min OCV rms	Min OCV peak	Min OCV rms	Min OCV peak		
~~XD~~	Retire	XD	E39	T28	408	240	S52	250	4.70	1000	456				3000	4@2700
~~XE~~	Retire	GN	RSC	T8	334		S52	250	4.70	1000	456				3000	4@2700
~~XF~~	Retire	XF	E39	BT28	211	127±3	S63	130	1.50	150						
~~XH~~	Retire	XH	E39	BT28	250	160±5	S65	130	2.10	215						
~~XK~~	Retire	CS	E39	BT37	295	185±5	S64	135	3.25	360						
~~YA~~	Retire	YA					B78									
~~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		1.40	160						
YM	New Code	ZB	E26	PS30	205	-----	B87		1.40	160						
YN	No Change	YN	E26	PS30	186	-----	B87		1.40	160						
YP	No Change	YP	E26	RL38	147	-----	B87		1.40	160						
YR	No Change	YR	Med Skrt	RL38	166.5	-----	B87		1.40	160						
YS	New Code	YO	E26	R40	178	-----	B87		1.40	160						
YT	New Code	WV	E26	RD40	183	-----	B87		1.40	160						
YV	New Code	ZW	E26	R40	178	-----	B87		1.40	160						

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Annex B
(Normative)
Other codes

Luminaire Characteristics	
Code	**Luminaire Attributes**
E	Enclosed Luminaire Required
F	U.V. Filter and Lens interlock Required
H	Special Luminaire - Hazardous Location
O	Open Luminaire Permissible (Quartz metal Halide lamps must be containment rated per Annex A of ANSI C78.387. Test requirements for Ceramic Metal Halide Lamps are under consideration)
S	Open Luminaire permissible for Metal Halide lamps with position restrictions (Test for containment rating per Annex A of ANSI C78.387 does not apply)
X	Restricted (Consult Lamp Manufacturer)

Bulb Maximum Temperature [2]	
Code	**Temperature (°C)**
U	150
A	250
B	275
C	300
D	325
E	350
F	375
G	400
H	Special Temperature - Hazardous Location
J	425
K	450
L	475
M	500
W	550
N	600
X	650
P	700
Y	750
R	800
S	900
Z	950
T	1000

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
Other codes

Base Maximum Temperature[2]	
Code	**Maximum Temperature (°C)**
A	150
B	170
C	190
D	210
E	230
F	250
G	270
H	Special Temperature - Hazardous Location
J	280
K	350
L	400
M	450

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ANNEX C
(Normative)
C78.380 GUIDELINES FOR ASSIGNING ANSI CODES

This guideline is to be used only as the criterion to determine whether a new or an existing code is to be assigned to a new designation request under evaluation by the Administrator.

KEY CATEGORY	CHARACTERISTIC	LIMIT[4]
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(μsec)	+0%/-50%
	MIN. REP. RATE(per 1/2 cycle)	+0/-1
	PULSE POSITION	≥90% of PEAK OCV
	CURRENT CREST FACTOR	+0.2/-0
	SUSTAINING VOLTAGE (Vs)	+0/-20%
	OFF-TIME	±10%
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
THERMAL		
	MAX.BASE TEMPERATURE	+10%/-0%
	MAX. BULB TEMPERATURE	+10%/-0%

4 LIMIT defines the range within which no new ANSI code can be issued.
5 NA - Not Applicable
6 EAL - “Effective Arc Length”

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