Approved April 14, 1995 © Secretariat ASC C78: National Electrical Manufacturers Association

ANNEX A
(informative)

Guidelines for the Establishment of Wattage Ratings on Fluorescent Lamp Data Sheets

C1. Introduction

A typical ANSI lamp data sheet for a fluorescent lamp type shows values for both a wattage identification rating and a lamp operating characteristic wattage. While "rated wattage" is assigned for identification purposes, the "characteristic wattage" is a value used for the evaluation of results under specific measurement conditions. Since each has a separate purpose, there is no need for them to agree absolutely. However, wide disagreement could provoke questions and might be misleading to readers.

These guidelines should be applied to new lamp types being standardized. They are not to be applied retroactively.

C2. Purpose

The purpose of this appendix is to provide guidelines for the establishment of rated wattage identification of a fluorescent lamp data sheet, relative to its associated characteristic wattage value.

C3. Various Factors Affecting Rated Wattage

C3.1 Application Circuit

Early in the history of the development of fluorescent lamps, preheat, switch-start circuits were used exclusively. Later, rapid-start and instant-start circuits became important also. Presently, additional circuits such as modified rapid-start, high frequency switch-start, high frequency rapid-start, etcetera are coming into use.

Although a type of fluorescent lamp may be designed for operation on one specific circuit, that lamp may be later applied on another circuit(s). Therefore, one particular type of fluorescent lamp might be utilized on one of several different auxiliary circuits. The operating power dissipation of a lamp can be expected to vary depending on the circuit in which it is used.

An overly complicated situation would occur if a lamp's wattage rating reflected the operational results of several different circuits. The more straightforward, simplified approach is the assignment of one rated wattage value, regardless of various applications.

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C3.2 Measurements of Lamp Characteristics on Reference Ballast

Measurements of fluorescent lamps have always been made on reference ballast circuits. Lamp characteristics, including characteristic wattage, are then specified on the lamp data sheet relative to the measurements on the specified reference ballast.

Switch-start reference circuits or rapid-start reference circuits are specified in various ANSI standards. The difference between them is that the latter incorporates continuous cathode heating. Numerically, for the same lamp type, this would amount to a wattage difference of less then 5%. Reference circuits for high frequency operation have not been fully developed yet. Where rapid-start lamp operating characteristics are given, both switch-start and rapid-start characteristics in reality are present. The terms used are arc wattage, which is analogous to operation on a switch-start reference ballast, and total wattage, which includes cathode wattage, and thus represent operation on a rapid-start reference ballast.

With the above two sets of lamp characteristics available, it is not always clear whether "arc wattage" or "total wattage" should be the basis for the "rated wattage".

C3.3 Hierarchy of Lamp Characteristics

When switch-start was the first application for a lamp, the rated wattage value would have been established in relation to that original switch-start data. Once established, no change would be made when new applications and additional reference ballast conditions were added. Any change in rating of a specific lamp would be confusing to consumers. Conversely, a lamp originally developed for use on rapid-start circuits would be assigned a rated wattage relative to lamp characteristics on the rapid-start reference ballast. A dilemma occurs, however, when both applications for the same lamp type have commercial importance.

In one sense, basing a lamp's rated wattage on switch-start specification can be misleading to customers who operate the lamp on a rapid-start circuit. The rating based on switch-start specifications is further removed from the actual power consumption for the rapid-start application. The reverse is true, also. Therefore, it will be beneficial to all if a fixed procedure for assignment of rated wattage is established so that uncertainties are eliminated.

C4. Procedure for Establishing Rated Wattage

C4.1 For lamp types intended only for application on rapid-start circuits, or where rapid-start is the only known application when the lamp data is first approved, the rated wattage shall be based on the rapid-start characteristic wattage (total wattage, including cathode heating wattage).

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C4.2 For lamp types intended for use on more than one type of circuit, the rated wattage shall be based on the most commonly used commercial circuits.

C4.3 A rated wattage value may be rounded to the nearest appropriate value.

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ANSI C78.3 91 ■ 0724150 0501880 8 ■

American National Standard

for Fluorescent Lamps – Instant-Start and Cold-Cathode Types – Dimensional and Electrical Characteristics

ANSI C78.3-1991

ANSI American National Standards Institute
11 West 42nd Street
New York, New York
10036

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ANSI®
C78.3-1991
Revision of
ANSI C78.3-1978
and C78.3a-1985

American National Standard
for Fluorescent Lamps –

Instant-Start and Cold-Cathode Types – Dimensional and Electrical Characteristics

Secretariat

National Electrical Manufacturers Association

Approved July 15, 1991

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Foreword (This foreword is not part of American National Standard C78.3-1991.)

This edition of American National Standard for *Fluorescent lamps – Instant-start and cold-cathode types – Dimensional and electrical characteristics,* ANSI C78.3-1991, has been technically and editorially revised to satisfy an overall objective of improved clarity. The technical changes involve incorporation of data from the supplements ANSI C78.3a and the addition of certain details of ballast design that had been specified in the ballast standard ANSI C82.1. Editorially, this standard has been patterned after ANSI C78.40 with more general information moved to Part I, allowing the data sheets in Part IV to become simplified. Also, each data sheet is now identified with a "lamp abbreviation" and Part II graphically defines lamp dimensions. As an aid to establishing lamp abbreviations for the data sheets in a consistent manner, guidelines have been provided in Part III, annex A.

Essentially the same lamp types are covered as in the preceding edition.

An exception is that the 48-inch, 72-inch, and 96-inch (0.800 ampere) shrouded single pin T12 instant-start lamps are no longer in use and those standards have been removed. Furthermore, there is an addition of the 96-inch, 60-watt, T12, single pin lamp from ANSI C78.3a. Prior to the publication of the 1978 edition, all of the standards for fluorescent lamps had been published as separate standards in the ANSI C78.700 series. Annex B now lists those old individual standards.

Suggestions for improvement of this standard will be welcome. They should be sent to the National Electrical Manufacturers Association, 2101 L Street NW, Washington, DC 20037.

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

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Alfred C. Rousseau, Vice-Chair
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American National Standard for Fluorescent Lamps –

Instant-Start and Cold-Cathode Types – Dimensional and Electrical Characteristics

Part I – General information & requirements

1 Scope

This standard sets forth the physical and electrical characteristics of the principal types of fluorescent lamps intended for application on conventional instant-start circuits. Lamp specifications for both the lamp itself and the interactive features of lamp and ballast are given.

Lamps designed primarily for operation on other types of circuits such as preheat (switch) start and rapid start are specified in other lamp standards. See clause 3.

Lamps for conventional systems relying on auxiliary support from external ballasts are described. The lamps are those designed for 60 Hz operation.

Lamp color is not specified herein.

Certain lamp types covered in this standard may be similar to those in IEC Publication 81. However, additional types are included that are used only in North America and are not specified in the IEC standard.

2 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 C78.1-1978 (R1991), C78.1a-1980 (R1984), C78.1b-1986, C78.1c-1985, and C78.1d-1988, *Dimensional and electrical characteristics of fluorescent lamps – Rapid-start types* [1)]

ANSI C78.2-1978, C78.2a-1988, and C78.2b-1989, *Dimensional and electrical characteristics of fluorescent lamps – Preheat start types* [1)]

ANSI C78.4, *Dimensional and electrical characteristics of single-ended, self-supporting, compact fluorescent lamps* [2)]

ANSI C78.5, *Guide for the performance of self-ballasted lamps* [2)]

ANSI C78.375-1984, *Fluorescent lamps – Guide for electrical measurements* [1)]

ANSI C78.376-1969 (R1991), *Specifications for chromaticity of fluorescent lamps*

ANSI C79.1-1980 (R1984), *Nomenclature for glass bulbs intended for use with electric lamps*

ANSI C81.20-1976, *Specifications for electric lamp bases and holders – Fluorescent types* [3)]

ANSI C82.1-1985, C82.1a-1990, C82.1b-1990 and C82.1c-1990, *Specifications for fluorescent lamp ballasts* [1)]

ANSI C82.2-1984 (R1989), *Fluorescent lamp ballasts – Method of measurement*

ANSI C82.3-1983 (R1989), *Fluorescent lamps – Specifications reference ballasts*

ANSI/IEEE 100-1988, *Dictionary of electrical and electronic terms* [1)]

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1) This standard is under revision. Contact the Secretariat for further information.

2) This standard is under development. Contact the Secretariat for further information.

3) This standard was consolidated to ANSI C81.61-1990.

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3 General

There are four parts to this standard.

Part I contains general information and requirements applicable to instant-start lamps and their operation. Detailed descriptions, references, and explanations for terms used in the lamp data sheets are given in this part.

Part II contains the drawings necessary to define the principles of dimensioning lamps.

Part III contains the annexes.

Part IV contains all of the lamp data sheets.

4 Definitions

The definitions in this clause relate to specific terms used in this standard.

For additional definitions, see the ballast standard, ANSI C82.1 and the electrical dictionary, ANSI/IEEE 100.

4.1 Lamps

4.1.1 fluorescent lamp: A low-pressure mercury electric discharge lamp in which a fluorescing coating transforms some of the ultraviolet energy, generated by the discharge, into light.

4.1.2 instant-start fluorescent lamp: A fluorescent lamp designed to operate in an instant-start circuit.

4.1.3 overall length (OAL): A convenient number assigned to identifying a lamp in relation to the size of the luminaire in which it is to be used.

4.2 Ballasts and circuit characteristics

4.2.1 fluorescent lamp ballast: A device that, by means of resistance, inductance, capacitance or electronic elements, singly or in combination, controls the current, voltage, and waveform to the proper values for starting and operation of fluorescent lamps.

4.2.2 instant-start system: Those systems in which an electric discharge lamp is started by the application of a voltage sufficiently high to eject electrons from the electrodes by field emission, initiate electron flow through the lamp, ionize the gases, and start a discharge through the lamp without previous heating of the electrodes.

4.2.3 crest factor: The ratio of the peak value of lamp current (or voltage) to the root-mean square (rms) value of lamp current (or voltage).

5 Lamp abbreviations

Lamp abbreviations for fluorescent lamps are not officially assigned through any administered designation system. Those used in the data sheets in Part IV are assigned in accordance with the guideline of annex A. There is no requirement for the use of abbreviations for lamp marking.

6 Methods of measurement

Electrical measurements necessary to determine the performance of lamps defined in this standard shall be made in accordance with the lamp measurements standard, ANSI C78.375.

7 Reference ballasts

Reference ballasts used for measurements of fluorescent lamps shall meet the general requirements set forth in the reference ballast standard, ANSI C82.3. It should be noted that the reference ballast standard requires a power factor of 0.075 ± 0.005 for all fluorescent reference ballasts, unless otherwise specified on a lamp data sheet.

8 Product drawings

The drawings included in Part II are product drawings which show the applications of the various coded dimensions that appear on the data sheets. Drawings are only needed to depict families of lamps; the particular values vary within a family in accordance with the values on the relevant lamp data sheet.

No attempt has been made to provide maximum outline drawings to show the space occupied by the lamps. They are not provided because the need for such has not been established.

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9 Lamp physical and dimensional requirements

9.1 Bulb specifications

Each lamp data sheet in Part IV specifies the necessary bulb shape and tube diameter. Bulb shapes are defined in the bulb nomenclature standard, ANSI C79.1. Due to the long established practice of referring to the diameter of fluorescent lamp bulbs in eighths-of-an-inch units, this standard maintains that practice. For example, a 1-inch diameter bulb is called a T8 bulb. Metric diameters are shown in parentheses.

9.2 Base specifications

Bases on finished lamps shall comply with the base standard, ANSI C81.20. Gauges for checking bases are included in that standard. For instant-start applications of medium and mogul bipin bases, the pins are internally shorted.

9.3 Lamp dimensions

9.3.1 Base alignment of finished lamps

Finished lamps shall comply with the dimensions specified on the relevant data sheet in Part IV. Graphical definitions of the dimensional code letters used on the data sheets are given in Part II.

9.3.2 *Base alignment of lamps with G13 medium bipin bases:* Both pins (excluding flanges) of the two bases of an assembled lamp shall pass simultaneously without binding through parallel slots, each 0.120 inch (3.05 mm) in width, suitably spaced longitudinally to receive the lamp.

9.4 Color

Lamp colors are not specified in this standard. Lamp chromaticity is considered to be a variable within each particular type. Color coordinates of 40-watt, T12(T38) lamps for certain colors are defined in the chromaticity standard ANSI C78.376.

10 Lamp electrical characteristics

10.1 Lamp operating characteristics

The values of lamp voltage, current, and wattage shown on the individual lamp data sheets in Part IV are rated values that apply after the lamps have been aged for 100 hours. These values were chosen by consensus to represent the industry average at the time of publication. No manufacturer's average wattage shall exceed the rated value by more than 5% plus 0.5 watts. Fluorescent lamp operating characteristics are based on operation with a 60-Hz sinusoidal power supply and a reference ballast (with cathode heating for rapid start characteristics) having the characteristics shown on the appropriate lamp data sheet and at an ambient temperature of 25°C. Electrical characteristics and light output vary with ambient temperature.

Electrical measurements shall be made in accordance with ANSI C78.375.

10.2 Lamp starting requirements

Lamps shall start at the minimum starting voltages, within the waveshape limitation, as specified on each lamp data sheet under "Information for Ballast Design".

Those starting voltage values are intended to provide reliable starting at the minimum ambient temperatures specified and above, up to a defined upper limit. Upper temperature limits depend upon

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ballast design and operating current, and unless otherwise specified on the lamp data sheets, shall be 110°F (43.3°C). At temperatures near the top of a range, however, initial starting will be secured, but not necessarily immediate restarting.

11 Requirements for ballast design

11.1 General

11.1.1 Ballasts for use with the lamps in this standard shall meet the general requirements for fluorescent lamp ballasts as stated in the ballast standard, ANSI C82.1.

11.1.2 A ballast intended for use with a particular lamp type shall provide the lamp starting and operating values specified on the relevant lamp data sheet.

11.2 Lamp starting requirements

A commercial ballast designed to be used with a particular lamp type shall provide the starting voltage specified on the appropriate lamp data sheet. The specified voltage limits shall be provided at any line voltage between 90% and 110% of the ballast's rated input voltage.

11.3 Operating current waveshape

The waveshape of the lamp current supplied to a fluorescent lamp in an instant-start circuit shall have a crest factor that does not exceed 1.85, unless otherwise specified on a lamp data sheet.

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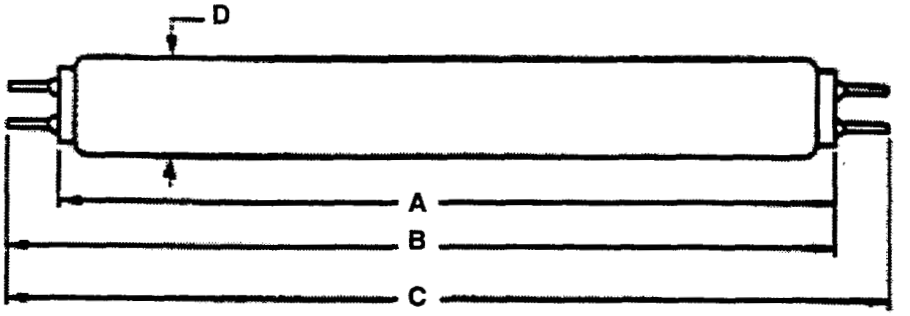
Part II – Principles of dimensioning

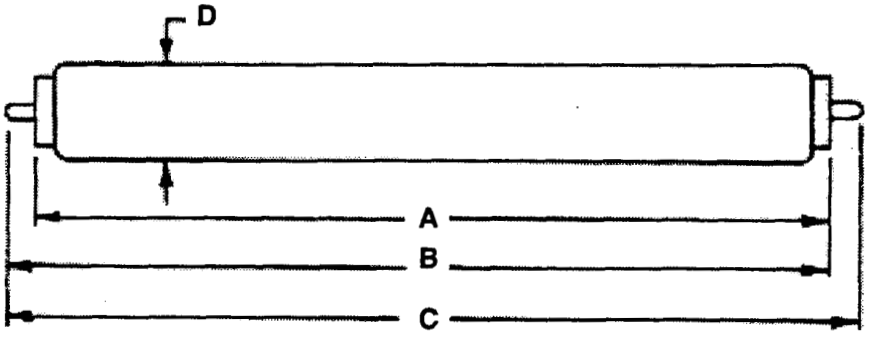
The diagrammatic drawings in this part give graphical definitions of the dimensional code letters used on the individual lamp data sheets. These drawings are intended only to indicate dimensions to be controlled and are to be used in conjunction with the relevant lamp data sheets.

Linear Lamps

G13 and G20 Bases



Fa8 Base



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Part III – Annexes

Annex A
(informative)

Guide for establishing fluorescent lamp abbreviations

A.1 General

There is a need to identify lamp abbreviations for the lamps in this standard. These abbreviations will benefit users of the fluorescent lamp data sheets. A lamp, in this designation system, is identified by wattage, length or shape, bulb size, and circuit application.

This guide is intended to provide a set of rules for reference in deriving abbreviations for lamp data sheets, in a consistent manner. There is no implication that abbreviations derived from this system are to be used or required for commercial literature applications.

A.2 Designation system

Only one abbreviation, under this system, is to be applied to a lamp data sheet. No attempt is made to identify lamp colors.

An abbreviation is comprised of six parts:

1) Lamp rated or nominal wattage;
2) Lamp nominal length;
3) Bulb diameter;
4) Lamp shape, as required;
5) Lamp base, as required;
6) Circuit and/or special description.

The parts of the abbreviation are joined directly together in the above sequence and slashes are used as separators after wattage, bulb diameter, and the lamp shape or lamp base if used. A hyphen may be used if two properties are identified under item 6 above. Otherwise there are no spaces or other separator marks used.

A.2.1 Wattage

All lamps shall be identified by wattage, even though they may not be marketed by wattage.

The wattage values shown shall be the rated or nominal wattage of the lamp. The numerical value of wattage, in watts, shall be followed directly by the letter "W".

A.2.2 Length

The length of a linear lamp shall be expressed in the designation by a number representing the nominal length of the lamp, in inches. Only the numerical value is entered. This length code is based upon a first order assumption that fluorescent lamps are linear lamps.

For those special cases where it is necessary to identify lamp length in metric units, the abbreviations shall contain the letters "mm" immediately following the length value in millimeters.

A.2.3 Bulb diameter

Bulb diameter shall be entered directly following the above length without any separator. The bulb diameter information comprises two sub-parts. The first is a letter to indicate the bulb's cross-sectional shape and the other part is the cross-sectional diameter. The bulb shape is identified by a letter symbol as follows:

T.....Round cross-sectional tubular bulb

PG.....Power groove indented bulb

Bulb diameter values shall be entered in the conventional eighths-of-an-inch system.

For those special cases where it is necessary to identify bulb diameter in metric units, the abbreviation shall contain the letters "mm" immediately following the diameter value in millimeters.

A.2.4 Lamp shape

Exceptions to the linear assumption, such as circular, U-shape, and compact single-ended lamps are called out with a special code in this

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length subclause of the abbreviation. Special descriptions are defined as follows:

U1 .....U-shaped lamp, 1-5/8 inch leg centers

U3 .....U-shaped lamp, 3-5/8 inch leg centers

U6 .....U-shaped lamp, 6-inch leg centers

C8 .....Circular-shaped lamp, 8-inch diameter of circle

C12 .....Circular-shaped lamp, 12-inch diameter of circle

C16 .....Circular shaped lamp, 16-inch diameter of circle

T .....Twin, two parallel legs with a common base

Q.....Quad, four parallel legs, square, with a common base

As new lamps of similar design to the above are standardized, additional numerical values may be used within the established pattern. Radically new lamp shapes will necessitate the establishment of new letter codes and definitions in this clause.

A.2.5 Lamp base

The lamp's base code may be used as part of the designation in certain cases. Those are the cases where the application of the lamp to the correct auxiliary circuit is controlled by means of the base on the lamp. The compact, single-ended family of lamps, for example, employs a variety of bases for use in particular circuits. Proper base codes are noted in the base standard, ANSI C81.61.

A.2.6 Circuit and/or special description

This part of the identification shall follow the slashed separator which follows the bulb diameter or the optional shape and base information when they are provided. It is intended to help the user associate the lamp with the correct auxiliary circuit.

This abbreviation system does not necessarily identify all circuits that a lamp manufacturer may have authorized for use with a particular lamp.

Lamps that are specified for operation at two separate wattage or current levels, on the same type of circuit, are identified in the abbreviation by the lower level only.

Typical circuit identifiers are:

RS .....Rapid start

PH .....Preheat start (starter)

IS.....Bipin base, instant start

SP .....Single pin base, instant start

HO.....800 milliamperes and 1000 milliamperes, high output, rapid start

1.5A.....1500 milliamperes, rapid start

Special descriptions may be necessary in certain cases to separate lamps of similar design. These special identifiers may be used in addition to the above circuit identifications, separated by a hyphen. Special descriptions are defined as follows:

B.....Bactericidal lamp

CC .....Cold cathode

LP.....Low pressure

HP .....High pressure

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A.3 Sample abbreviations

Following are several sample abbreviations with explanations.

30W/36T12/RS	30 watt, 36 inch T12, rapid start
40W/22T12/U6/RS	40 watt, 22 inch T12, U-shaped – 6-inch leg center spacing, rapid start
215W/96T12/1.5A	215 watt, 96 inch T12, 1500 mA, rapid start
37W/24T12/HO	37 watt, 24 inch T12, high output, rapid start
116W/48T12/1.5A	116 watt, 48 inch T12, 1500 mA, rapid start
116W/48PG17/1.5A	116 watt, 48 inch PG17, 1500 mA, rapid start
4W/6T5/PH	4 watt, 6 inch T5, preheat start
30W/36T8/PH-B	30 watt, 36 inch T8, preheat start, bactericidal lamp
40W/60T12/IS	40 watt, 60 inch T12, bipin base, instant start
75W/96TI2/SP	75 watt, 96 inch T12 single pin, instant start
5W/4T4/T/G23/PH	5 watt, 4 inch T4, twin, G23 base, preheat start
13W/5T4/Q/G23-2/PH	13 watt, 5 inch T4, quad, G23-2 base, preheat start
36-39W/16T5/T/2G11/PH-RS	36-39 watt, 16 inch T5, twin, 2G11 base, preheat and rapid start

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Annex B
(informative)

Former designations of C78 fluorescent lamp standards

Prior to the 1978 versions of ANSI C78.1 and ANSI C78.2, fluorescent lamps were specified in individual American National Standards. Those individual standards are listed below.

Title	Former ANSI designation
48 inch 40 watt T12 medium bipin instant-start fluorescent lamp	C78.600-1962
60 inch 40 watt T12 mogul bipin instant-start fluorescent lamp	None
60 inch 40 watt T17 mogul bipin instant-start fluorescent lamp	C78.601-1962
48 inch 40 watt T12 single pin instant-start fluorescent lamp	C78.808-1972
72 inch 57 watt T12 single pin instant-start fluorescent lamp	C78.809-1972
96 inch 60 watt T12 single pin instant-start fluorescent lamp	None
96 inch 75 watt T12 single pin instant-start fluorescent lamp	C78.810-1972
42 inch 25 watt T6 single pin instant-start fluorescent lamp	C78.801-1972
64 inch 38 watt T6 single pin instant-start fluorescent lamp	C78.803-1972
72 inch 38 watt T8 single pin instant-start fluorescent lamp	C78.805-1972
96 inch 51 watt T8 single pin instant-start fluorescent lamp	C78.807-1972
25 millimeter 45 inch cold-cathode fluorescent lamp	C78.1107-1957
25 millimeter 69 inch cold-cathode fluorescent lamp	C78.1106-1957
25 millimeter 93 inch cold-cathode fluorescent lamp	C78.1104-1957

Annex C
(informative)

Bibliography

IEC Publication 81, *Tubular fluorescent lamps for general lighting service*

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Part IV Lamp specification data

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48 Inch 40 Watt T12 Medium Bipin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 40W/48TI2/IS
Nominal wattage ..... 40 watts
Nominal overall length ..... 48 in (1200 mm)
Bulb designation T12 (T38)
Base ..... G13, Medium bipin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	–	47.22	–	1199.4
B (Base face to end of opposite base pin)	47.40	47.50	1204.1	1206.5
C (End of base pin to end of opposite pin end)	47.67	47.78	1210.8	1213.6
D (Bulb outside diameter)	1.41	1.59	35.8	40.4

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)
Wattage (W) 40.5
Voltage (V) 104
Current (A) 0.425

Reference ballast characteristics
Rated input voltage (V) 430
Reference current (A) 0.425
Impedance (ohms) 930

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements
Voltage
At 50°F (10°C) and above, Vrms min 385

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60 Inch 40 Watt T12 Mogul Bipin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 40W/60T12/IS
Nominal wattage ..... 40 watts
Nominal overall length ..... 60 in (1500 mm)
Bulb designation T12 (T38)
Base ..... G20, Mogul bipin
Circuit Application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	–	58.30	–	1480.8
B (Base face to end of opposite base pin)	58.72	58.93	1491.5	1496.8
C (End of base pin to end of opposite pin end)	59.34	59.56	1507.2	1512.8
D (Bulb outside diameter)	1.41	1.59	35.8	40.4

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

Wattage (W) 42
Voltage (V) 107
Current (A) 0.425

Reference ballast characteristics

Rated input voltage (V) 430
Reference current (A) 0.425
Impedance (ohms) 930

Information for ballast design (conditions of clause 10 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 385

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60 Inch 40 Watt T17 Mogul Bipin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 40W/60T17/IS
Nominal wattage ..... 40 watts
Nominal overall length ..... 60 in (1500 mm)
Bulb designation T17 (T53)
Base ..... G20, Mogul bipin
Circuit application ..... Instant Start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	–	58.30	–	1480.8
B (Base face to end of opposite base pin)	58.72	58.93	1491.5	1496.8
C (End of base pin to end of opposite pin end)	59.34	59.56	1507.2	1512.8
D (Bulb outside diameter)	2.00	2.19	50.8	55.5

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

Wattage (W) 42
Voltage (V) 107
Current (A) 0.425

Reference ballast characteristics

Rated input voltage (V) 430
Reference current (A) 0.425
Impedance (ohms) 930

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 385

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48 Inch 40 Watt T12 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 40W/48T12/SP
Nominal wattage ..... 40 watts
Nominal overall length ..... 48 in (1200 mm)
Bulb designation T12 (T38)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	45.10	45.30	1143.0	1150.6
B (Base face to end of opposite base pin)	45.42	45.65	1153.7	1159.5
C (End of base pin to end of opposite pin end)	45.74	46.00	1161.8	1168.4
D (Bulb outside diameter)	1.41	1.59	35.8	40.4

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)
Wattage (W) 39
Voltage (V) 100
Current (A) 0.425

Reference ballast characteristics
Rated input voltage (V) 430
Reference current (A) 0.425
Impedance (ohms) 930

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements
Voltage
At 50°F (10°C) and above, Vrms min 385

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72 Inch 57 Watt T12 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 57W/72T12/SP
Nominal wattage ..... 57 watts
Nominal overall length ..... 72 in (1800 mm)
Bulb designation T12 (T38)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	69.10	69.30	1755.1	1760.2
B (Base face to end of opposite base pin)	69.42	69.65	1763.2	1769.1
C (End of base pin to end of opposite pin end)	69.74	70.00	1771.4	1778.0
D (Bulb outside diameter)	1.41	1.59	35.8	40.4

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)
Wattage (W) 57
Voltage (V) 149
Current (A) 0.425

Reference ballast characteristics
Rated input voltage (V) 525
Reference current (A) 0.425
Impedance (ohms) 1100

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements
Voltage
At 50°F (10°C) and above, Vrms min 475

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96 Inch 60 Watt T12 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 60W/96T12/SP
Nominal wattage ..... 60 watts
Nominal overall length ..... 96 in (2400 mm)
Bulb designation T12 (T38)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	93.10	93.30	2364.7	2369.8
B (Base face to end of opposite base pin)	93.42	93.65	2372.9	2378.7
C (End of base pin to end of opposite pin end)	93.74	94.00	2381.0	2387.6
D (Bulb outside diameter)	1.41	1.59	35.8	40.4

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)
Wattage (W) 60.5
Voltage (V) 157
Current (A) 0.440

Reference ballast characteristics
Rated input voltage (V) 625
Reference current (A) 0.425
Impedance (ohms) 1280

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements
Voltage
At 50°F (10°C) and above, Vrms min 565
Lamp current crest factor ..... 2.00 max

Other special requirements regarding light output factor are under consideration.

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96 Inch 75 Watt T12 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 75W/96T12/SP
Nominal wattage ..... 75 watts
Nominal overall length ..... 96 in (2400 mm)
Bulb designation T12 (T38)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	93.10	93.30	2364.7	2369.8
B (Base face to end of opposite base pin)	93.42	93.65	2372.9	2378.7
C (End of base pin to end of opposite pin end)	93.74	94.00	2381.0	2387.6
D (Bulb outside diameter)	1.41	1.59	35.8	40.4

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

Wattage (W) 75
Voltage (V) 197
Current (A) 0.425

Reference ballast characteristics

Rated input voltage (V) 625
Reference current (A) 0.425
Impedance (ohms) 1280

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 565

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42 Inch 25 Watt T6 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 25W/42T6/SP
Nominal wattage ..... 25 watts
Nominal overall length ..... 42 in (1050 mm)
Bulb designation T6 (T19)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	39.10	39.30	993.1	998.2
B (Base face to end of opposite base pin)	39.42	39.65	1001.3	1007.1
C (End of base pin to end of opposite pin end)	9.74	40.00	1009.4	1016.0
D (Bulb outside diameter)	0.69	0.81	17.5	20.6

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

	@.120 A	@.200 A	@.300 A
Wattage (W)	17.8	25.5	32.5
Voltage (V)	174	150	133
Current (A)	0.120	0.200	0.300

Reference ballast characteristics

Rated input voltage (V)	450	450	450
Reference current (A)	0.120	0.200	0.300
Impedance (ohms)	3200	1960	1350

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 405

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64 Inch 38 Watt T6 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 38W/64T6/SP
Nominal wattage ..... 38 watts
Nominal overall length ..... 64 in (1600 mm)
Bulb designation T6 (T19)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	61.10	61.30	1551.9	1557.0
B (Base face to end of opposite base pin)	61.42	61.65	1560.1	1555.8
C (End of base pin to end of opposite pin end)	61.74	62.00	1568.2	1574.8
D (Bulb outside diameter)	0.69	0.81	17.5	20.6

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

	@.120 A	@.200 A	@.300 A
Wattage (W)	26.8	38.5	50.0
Voltage (V)	267	233	201
Current (A)	0.120	0.200	0.300

Reference ballast characteristics

Rated input voltage (V)	600	600	600
Reference current (A)	0.120	0.200	0.300
Impedance (ohms)	4180	2560	1740

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 540

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72 Inch 38 Watt T8 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 38W/72T8/SP
Nominal wattage ..... 38 watts
Nominal overall length ..... 72 in (1800 mm)
Bulb designation T8 (T25)
Base ..... Fa8, single pin
Circuit application ..... Instant start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	69.10	69.30	1755.1	1760.2
B (Base face to end of opposite base pin)	69.42	69.65	1763.7	1769.1
C (End of base pin to end of opposite pin end)	69.74	70.00	1771.4	1778.0
D (Bulb outside diameter)	0.94	1.10	24.0	27.8

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

	@.120 A	@.200 A	@.300 A
Wattage (W)	25.0	38.0	50.0
Voltage (V)	245	220	195
Current (A)	0.120	0.200	0.300

Reference ballast characteristics

Rated input voltage (V)	600	600	600
Reference current (A)	0.120	0.200	0.300
Impedance (ohms)	4180	2560	1740

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 540

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96 Inch 51 Watt T8 Single Pin Instant-Start Fluorescent Lamp

Lamp description

Lamp abbreviation 51W/96T8/SP
Nominal wattage ..... 51 watts
Nominal overall length ..... 96 in (2400 mm)
Bulb designation T8 (T25)
Base ..... Fa8, single pin
Circuit application ..... Instant Start

Dimensional characteristics (definitions of ANSI C78.2, clause 13 apply)

	Inches		Millimeters	
	Min	Max	Min	Max
A (Base face to base face)	93.10	93.30	2364.7	2369.8
B (Base face to end of opposite base pin)	93.42	93.65	2372.9	2378.7
C (End of base pin to end of opposite pin end)	93.74	94.00	2381.0	2387.6
D (Bulb outside diameter)	0.94	1.10	24.0	27.8

Electrical characteristics

Lamp operating characteristics (conditions of clause 10 apply)

	@.120 A	@.200 A	@.300 A
Wattage (W)	33.5	51.0	67.0
Voltage (V)	325	295	263
Current (A)	0.120	0.200	0.300

Reference ballast characteristics

Rated input voltage (V)	750	750	750
Reference current (A)	0.120	0.200	0.300
Impedance (ohms)	5100	3150	2150

Information for ballast design (conditions of clause 11 apply)

Lamp starting requirements

Voltage
At 50°F (10°C) and above, Vrms min 675

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25 Millimeter 45 Inch Cold-Cathode Fluorescent Lamp

Lamp description

Lamp abbreviation 45T8/CAP/CC
Nominal overall length ..... 45 in (1125 mm)
Bulb ..... 25 mm (1.00 in)
Base type ..... Cap
Diameter of cap ..... 0.69 in (17.5 mm)

Dimensional characteristics

	Inches		Millimeters	
	Min	Max	Min	Max
Lamp length from ends of opposite base caps	44.88	45.13	1140.0	1146.3
Bulb diameter	0.95	1.04	24.1	26.4
Length of cap	0.94	1.00	23.9	25.4

Electrical characteristics

Lamp operating characteristics

	Low pressure	High pressure
Wattage (W)	26	28
Voltage (V)	250	270
Current (A)	0.120	0.120

The preceding lamp operating characteristics are based on operation in a cold-cathode type circuit at an ambient temperature of 25°C (77 °F) with a 60-Hz sinusoidal power supply.

Information for ballast design

Lamp starting requirements

Voltage (see note) ..... 450 V

Note – Ballast open-circuit voltage at rated line voltage.

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25 Millimeter 69 Inch Cold-Cathode Fluorescent Lamp

Lamp description

Lamp abbreviation 69T8/CAP/CC
Nominal overall length ..... 69 in (1725 mm)
Bulb ..... 25 mm (1.00 in)
Base type ..... Cap
Diameter of cap ..... 0.69 in (17.5 mm)

Dimensional characteristics

	Inches		Millimeters	
	Min	Max	Min	Max
Lamp length from ends of opposite base caps	68.88	69.13	1749.6	1755.9
Bulb diameter	0.95	1.04	24.1	26.4
Length of cap	0.94	1.00	23.9	25.4

Electrical characteristics

Lamp operating characteristics

	Low pressure	High pressure
Wattage (W)	34	37
Voltage (V)	330	350
Current (A)	0.120	0.120

The preceding lamp operating characteristics are based on operation in a cold-cathode type circuit at an ambient temperature of 25°C (77°F) with a 60-Hz sinusoidal power supply.

Information for ballast design

Lamp starting requirements

Voltage (see note)	600 V	750 V

Note – Ballast open-circuit voltage at rated line voltage.

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25 Millimeter 93 Inch Cold-Cathode Fluorescent Lamp

Lamp description

Lamp abbreviation 93T8/CAP/CC
Nominal overall length ..... 93 in (2325 mm)
Bulb ..... 25 mm (1.00 in)
Base type ..... Cap
Diameter of cap ..... 0.69 in (17.5 mm)

Dimensional characteristics

	Inches		Millimeters	
	Min	Max	Min	Max
Lamp length from ends of opposite base caps	92.88	93.13	2359.2	2365.5
Bulb diameter	0.95	1.04	24.1	26.4
Length of cap	0.94	1.00	23.9	25.4

Electrical characteristics

Lamp operating characteristics

	Low pressure	High pressure
Wattage (W)	42	46
Voltage (V)	420	450
Current (A)	0.120	0.120

The preceding lamp operating characteristics are based on operation in a cold-cathode type circuit at an ambient temperature of 25°C (77°F) wiui a 60-Hz sinusoidal power supply.

Information for ballast design

Lamp starting requirements

Voltage (see note) ..... 750 V 835 V

Note – Ballast open-circuit voltage at rated line voltage.

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