

OSRAM SYLVANIA: THE LEADER IN ENERGY-SAVING HID LAMPS

UNDERSTANDING HIGH INTENSITY DISCHARGE LIGHTING

A brief description of the catalog format and related terminology will assist the reader in understanding the information presented in this section.

All product families are listed in ascending wattage, followed by alphabetical bulb designation to simplify lamp identification. Performance ratings are based on tests conducted under controlled conditions on AC circuits with auxiliary equipment meeting current published ANSI specifications.

Lamp performance under typical service conditions may vary from rated values. Ratings and specifications are subject to change without notice.

For more information on HID SYSTEM SOLUTIONS, refer to page 101.

ANSI CODE

This is a unique code that describes the class and the electrical characteristics of the lamp and ballast as well as the fixture requirements. The code is developed and assigned by the American National Standards Institute (ANSI). It is intended to aid in matching the lamp to both the correct ballast and to a luminaire with the required features. The ANSI CODE consists of type of lamp (S = HPS, H = Mercury, M = Metal Halide, L = LPS, C = Ceramic Metal Halide), followed by the ballast number, and for metal halide and Ceramic metal halide lamps followed by the fixture requirement (O, E, S, F).

The emergence of electronic ballasts to operate metal halide lamps has produced additional need to separate the lamp designation of quartz and ceramic metal halide lamps, as there can be some important differences in system performance. Therefore the C lamp designation from NEMA has been introduced going forward for future differentiation of ceramic metal halide lamps and they will begin to be labeled accordingly.

ARC LENGTH

Arc length is the dimension of the arc discharge measured from one electrode tip to the other. This is useful for optical design of reflectors and affects fixture efficiency.

AVERAGE LIFE (HOURS)

The average life of a lamp is based on vertical operation (unless otherwise noted) of representative lamps operated under controlled conditions of at least 10 hours per start (except for M1500 and Briteline lamps, which are based on 5 hours per start). Average life is defined as the total operation hours at which 50% (Median) of any group of lamps is still operating (except for most High Pressures Sodium and Mercury lamps, for which 65% of the lamps are operating at the end of life denoted by a "+" next to the life rating). Variations in operating conditions such as bulb and base temperatures and line voltage can also affect lamp life.

Regular operation of lamps with off times less than the hot restrike time will shorten lamp life. For hot restrike values of specific lamp types, please refer to the SYLVANIA Metal Halide Lamp Specification Guide.

Operating cycles shorter than 10 hours per start will reduce lamp life as follows:

- 5 hours / start - Approximately 75% of rating
- 2.5 hours / start - Approximately 55% of rating
- 1.25 hours / start - Approximately 40% of rating

BASE

Most SYLVANIA HID lamp bases for general lighting are made of corrosion-resistant brass with special lubricant to provide easy removal at end of lamp life. See the following pages for all base illustrations.

E26 Medium - Medium (MED) bases are used on lamps in E17 bulbs and are limited to 175W maximum.

E26 Medium Skirted - Medium skirted (Med. Skt.) bases consist of a medium brass base with a skirt, which is mechanically connected to a PAR38 bulb.

E39 Mogul - All (MOG) bases are embossed with letters and numbers representing months and years. The date of installation can be recorded by marking the letter of the current month and the number that coincides with the last digit of the current year.

EX39 Exclusionary Mogul Base - Exclusionary Mogul bases (EXCL MOG) are bases used on metal halide lamps having shrouded arc tubes, permitting them to be used in open fixture applications. These bases are compatible with exclusionary or standard mogul sockets.

E39 POM - Position Oriented Mogul (POM) bases are used on lamps designed to operate only in the horizontal position and require a special POM socket. A pin located on the base engages in a slot within the POM socket ensuring proper operating position of the lamp within the fixture.

Rx7s / R7s Recessed Single Contact - SYLVANIA double-ended HID lamps with recessed single contact (RSC) bases have silver plated contacts to provide maximum electrical contact.

BULB

Each bulb description consists of a letter to indicate bulb shape, followed by numbers that indicate maximum bulb diameter in 1/8 inch increments. For example, a BT37 bulb is a blown shape with a tubular top, 37/8 of an inch or 4 5/8 inches in diameter. Illustrations of bulb shapes are shown on the following pages.

Although SYLVANIA HID bulbs are made of glass designed to resist thermal shock in normal applications, they must be shielded from direct contact with liquids, such as rain, during operation to avoid bulb breakage.

COLOR RENDERING INDEX (CRI)

Color Rendering Index (CRI) is an international scale (numbering system) up to 100 indicating the relative color rendering quality of a light source when compared to a standard reference light source of the same chromaticity (color temperature). The CRI expresses the degree to which colors will appear "familiar" or "natural" under the light source selected. In general, the higher the CRI number, the better the color rendering properties of the light source being measured. The color rendering index of any two like sources should only be compared if those sources have the same correlated color temperature (CCT).

CORRELATED COLOR TEMPERATURE (CCT)

The correlated color temperature of a light source, expressed in Kelvin (K), is a means of describing the appearance or chromaticity of the source. The correlated color temperature of the light source contributes to the visual appearance of the lighted space. "Warm" light sources have a low color temperature (2000-3000K) and feature more light in the red/orange/yellow range. Light with a higher color temperature (>4000K) features more blue and is referred to as "cool."

With new installations, or group relamps, all color performance evaluations should be made after at least 100 hours of operation (at recommended operating cycles) to allow the lamps to stabilize. Additional changes in chemistry within the arc tube over the life of the lamp may also cause the color temperature to shift as the lamp gets closer to the end of its rated life. To minimize color variation within an installation, it is recommended that HID lamps be group relamped and run on equal operating cycles.

DIMMING HID

Most SYLVANIA HID products can be dimmed on stepped, bi-level dimming systems provided specific guidelines are followed. Generally, most Metalarc® metal halide lamps can be dimmed down to 50% of rated wattage depending on the lamp type and operating position. Lumalux® high pressure sodium lamps can also be dimmed down to 50% of rated wattage. In addition to lower light output, HID lamps may shift in overall color and exhibit a lower color rendering index (CRI) when operated in a dimmed mode. Some restrictions apply to both the operation of the ballast and lamp. For more information on dimming, please reference NEMA guidelines or contact a SYLVANIA representative.

FIXTURE REQUIREMENT

Developed by the American National Standard Institute (ANSI), the fixture requirement code describes the type of fixture required for each lamp type. See lamp warnings for additional information and proper operating instructions.

E = Lamps classified as E-type are to be used only in suitably rated enclosed luminaires.

O = Lamps classified as O-type, comply with ANSI Standard C78.389 for containment testing and may be used in open luminaires.

S = When operated within 15 degrees of vertical, this lamp may be operated in an open luminaire provided the installation is not near people or flammable or combustible material, otherwise it must be operated in a suitably enclosed luminaire.

F = F-rated lamps require an enclosed fixture with a U.V filter and lens interlock.

The 2005 NEC requires that luminaires which use a metal halide lamp shall be provided with either a containment barrier that encloses the lamp (historically referred to as an enclosed luminaire) or shall be provided with a means, typically a special lampholder, that will only accept an ANSI Type-O metal halide lamp. (Exception: This requirement will not apply to open luminaires with thick-glass parabolic reflector PAR lamps.)

UNDERSTANDING HIGH INTENSITY DISCHARGE LIGHTING (continued)

FIXTURE REQUIREMENT (continued)

The 2005 NEC also requires that metal halide luminaires for new construction/major renovations in the playing and spectator areas of indoor sports, mixed use, and all purpose facilities, which are subject to physical damage, must be of a type that protects the lamp with a glass or plastic lens. Open luminaires will not be permitted. The use of self-extinguishing lamps is still recommended and permitted for all existing installations.

For more information regarding the use of Type-O, S, and E metal halide systems, please refer to the NEMA white paper on this subject that is freely available at nema.org.

HOT RESTRIKE

In most instances, if an HID lamp experiences a momentary power interruption or sudden voltage drop, the lamp may extinguish. A lamp that is still hot will not restart immediately. Because the arc tube within the lamp must cool down before it can re-start, HID lamps have hot restrike times ranging from 1-15 minutes depending on the product type.

KEY TO DATE OF MANUFACTURE

Consult your SYLVANIA Sales Representative or call 1-800-LIGHTBULB.

LAMP WARNINGS

HID Metal Halide and Mercury lamps are marked with a "T" or "R" on their packaging. These letters provide safety information about the lamp. Below is the text used by the FDA to describe each of the letters.

T: WARNING: This lamp should self-extinguish within 15 minutes after the outer envelope is broken or punctured. If such damage occurs, TURN OFF AND REMOVE LAMP to avoid possible injury from hazardous shortwave ultraviolet radiation.

R: WARNING: This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available.

LIGHT CENTER LENGTH (LCL)

The light center length of HID lamps is a measurement from the center of the arc tube to the bottom of the lamp base.

LUMENS

Initial lumen ratings are based on photometry under controlled conditions of at least 10 hours per start in the prescribed position at rated lamp wattage after 100 operating hours. HQI®, LUMALUX® Super and SOX lamp ratings are based on measurements at constant input voltage. Lamp performance under typical service conditions may vary from rated values. Operating universal METALARC® lamps in off-vertical positions will result in reduced lumen output.

Mean lumens are measured on ANSI reference circuits at rated wattage (HQI, LUMALUX Super and SOX lamp ratings are based on input voltage) at 40% of average rated life except for those lamps with a "+" next to their life rating; these lamps are measured at 50% of average rated life. All measurements are based on ballast operation on systems with current crest factors of 1.8 or less. Higher current crest factors reduce values. In actual applications on CW or CWA ballasts, mean lumens may be higher than published ratings.

Unless otherwise noted, all photometry measurements are made on an ANSI reference ballast at rated lamp wattage.

MAXIMUM OVERALL LENGTH (MOL)

The maximum overall length of single-ended lamps is the maximum distance from the top of the bulb to the bottom of the base. For double-ended lamps, it is the maximum distance from end-to-end (excluding any leadwires).

ORDERING ABBREVIATION

Ordering abbreviation provides a shorthand description of the lamp, using a unique code which can be used when ordering a lamp if you do not know the product number. This information can be found on the lamp etc.

PACKAGE QUANTITY

This identifies the number of lamps contained in a standard shipping carton.

PRODUCT NUMBER

Product number is a five digit number used to identify a specific SYLVANIA lamp and should be used when ordering.

WARM UP TIME

Most HID lamps do not have instant on capabilities. It may take several minutes for the arc tube to stabilize before optimal light output is achieved.

WATTS

Watts shown are nominal lamp watts only.

HOW TO READ PRODUCT INFORMATION - HID

Watts	Bulb	Base	Product Number	Ordering Abbreviation	ANSI Ballast Code	Pkg Qty	Lamp Finish	Operating Position	Fix Req	Avg Rated Life (hrs)	Approx Lumens (initial)	(mean)	CRI	CCT (K)	Symbols & Footnotes
100	E17	E26 Med	67506	LU100/MED	S54	20	Clear	Universal	O	24000+	9500	8000	22	2100	5,34
320	BT37	E39 Excl Mogul	64851	MCP320/C/PS/BU-ONLY/840/BT37 PB	M154/O	6	Coated	Base up within 15" only	O	20000	36000	27000	88	3900	1,10,11,13
360	BT37	E39 Mogul	64655	MS360/SS/BU-HOR	M59/S	6	Clear	BU-HOR	S	20000V 15000H	36000V 30000H	23500V 19000H	65	4000	* 20,23,24
1000	BT37	E39 Mogul	64351	M1000/PS/U/BT37	M141/E	6	Clear	Universal	E	15000V 9000H	110000V 107800H	96000V 86300H	65	3800	2,10

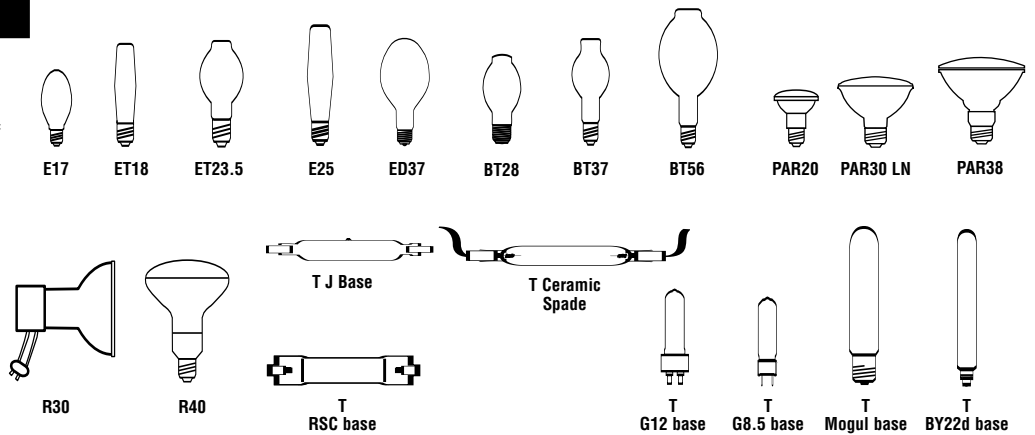
Please refer to the "Understanding High Intensity Discharge" section on previous pages for definitions and explanations of the category headers.

HOW TO READ ORDERING ABBREVIATIONS

MS360/SS/BU-HOR		MCP320/C/PS/BU-ONLY/840/BT37 PB		LU100/D/MED		H39KC-175/DX	
MS	Super METALARC	MCP	Metalarc Ceramic Pro-Tech	LU	Lumalux®	H39	ANSI Ballast Number
360	Wattage	320	Wattage	100	Wattage	175	Wattage
SS	SUPERSAVER	C	Coated	D	Coated	DX	Brite White
BU-HOR	Operating Position: Base up through Horizontal	PS	Pulse Start	MED	Medium Base		Deluxe Coated
		BU-ONLY	Operating Position: Base up only				
		840	80+ CRI; 4000 CCT				
		BT37	Bulb Type				
		PB	Powerball				

BULBS

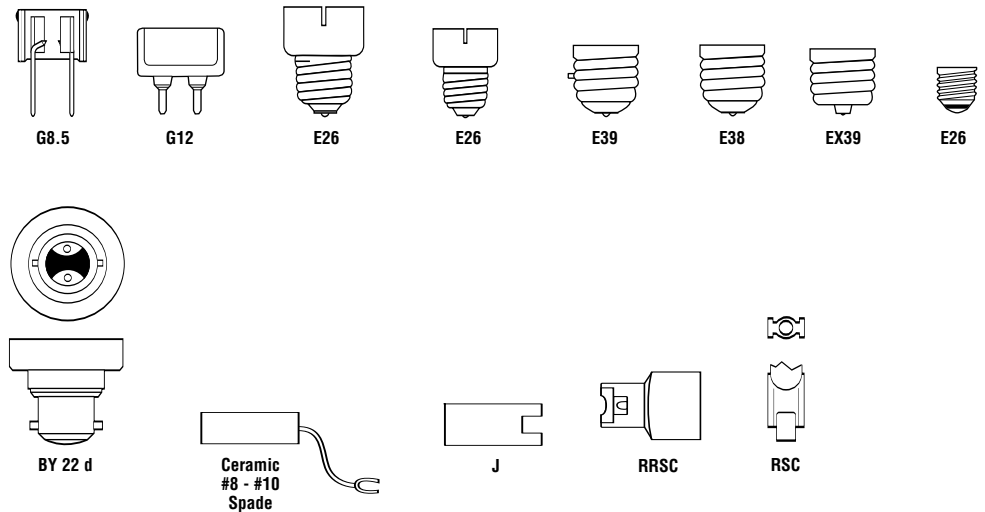
A bulb designation consists of a letter(s) to indicate the shape and a number(s) to indicate the approximate maximum diameter in eighths of an inch. Thus, an E17 lamp is an Ellipsoidal shape and 17/8 of an inch or 2 1/8 inches in diameter. Other letter designations include: BT=Bulbous Tubular; E or ED=Ellipsoidal; ET=Ellipsoidal Tubular; PAR=Parabolic; R=Reflector; T=Tubular.



BASES

Lamps with screw bases have one lead-in wire soldered or welded to the center contact and the other soldered or welded to the upper rim of the base shell.

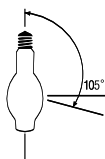
Bases with ceramic bodies have internal leads welded to either silver-plated contacts or external lead wires.



OPERATING POSITIONS

A designated operating positions assure maximum lamp performance. Where it is not specified, the lamp is suitable for operation in any position.

Vertical BU-HOR



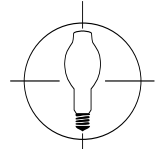
Vertical BD-ONLY



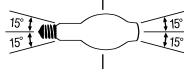
Vertical BU-ONLY



Universal U



Horizontal HOR

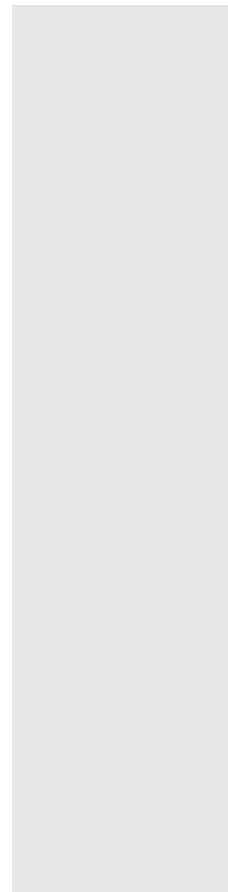
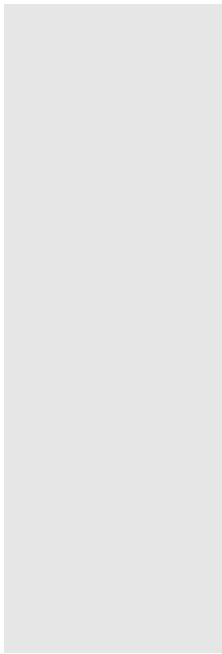
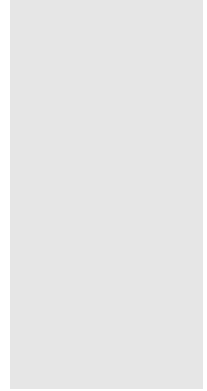
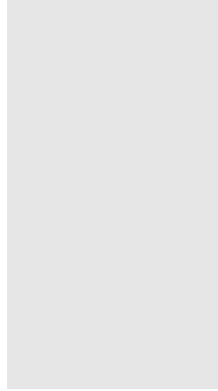
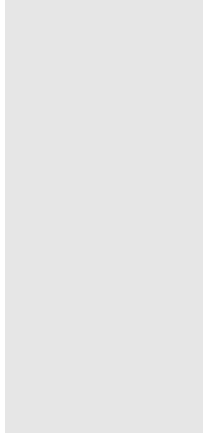
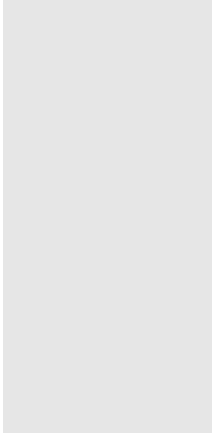


Double Ended HOR



HID BRAND NAME GUIDE

Note: These tables are intended only as guides and may represent another lamp company's most similar product or product family rather than an identical match. Individual manufacturer's performance values should be consulted.



ERROR: rangecheck
OFFENDING COMMAND: show

STACK:

(+)