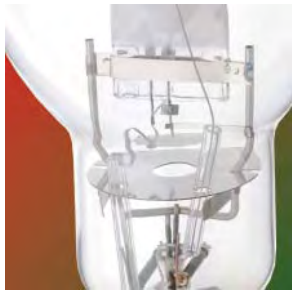
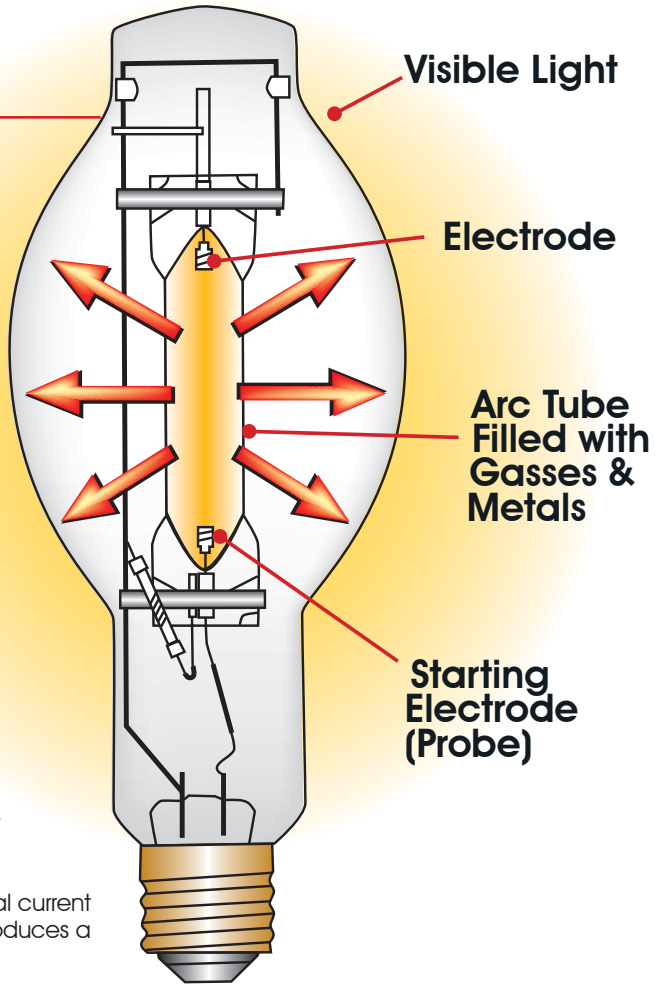
HID Lamps



HID Basics

HOW IT WORKS

The operational concept behind HID lamps is very similar to that of fluorescent lamps. Electrodes are positioned at either end of a tube, whose chamber is filled with gas and metals such as mercury. An electrical charge passes from one electrode to the other. In fluorescent lamps, this charge creates ultraviolet (UV) light, which converts to visible light once it passes through the phosphors on the tube's interior.



In an HID lamp, the electrical arc, gasses and metals are contained in what is known as the arc tube. The arc tube is made from either quartz (used in mercury vapor and metal halide lamps) or transparent ceramic (used in high-pressure sodium lamps because of their high temperature). All arc tubes are housed within a larger outer glass envelope.

Unlike fluorescent lamps, the arc tube of HID lamps is filled with gas at a very high rate of pressure (up to 50 psi). This allows the electrical arc created by the electrodes to operate in the visible part of the spectrum, producing usable light without the addition of phosphors.

Like fluorescents, HID lamps require a ballast to control the electrical current in the arc tube. Certain HID lamps also require an ignitor, which produces a high voltage to pulse the arc tube, allowing the arc to strike.

The biggest difference in HID lamps is the fact that they need a start-up time to reach their full brightness. This usually takes five to 10 minutes, during which time the lamp will flicker until the metal inside fully vaporizes and the lamp reaches is full operating temperature.

Color Shifting

New HID lamps require a "burn in" period of approximately 100 hours before the lamp will reach its true specified color. Until this process is completed, lamps can be unstable and vary in color.

As HID lamps age, chemical changes occur that cause color shifting. The shifts vary depending on the lamp type. Standard probe start lamps tend to shift color about twice as much as pulse start lamps. Results vary from lamp to lamp.

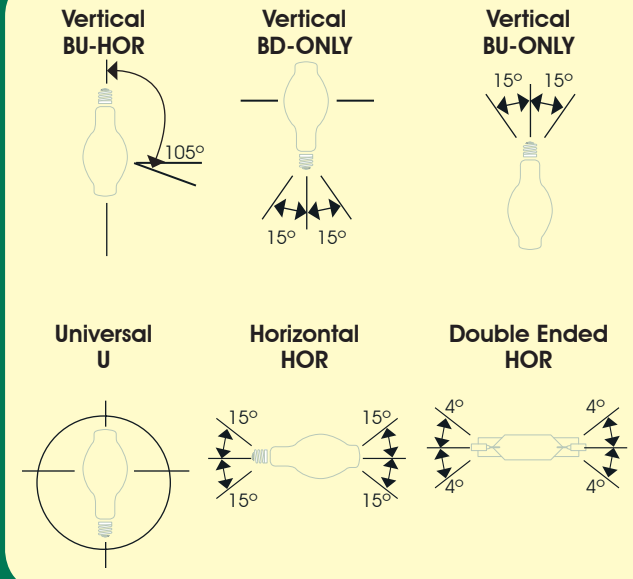
It is recommended to conduct a group relamping once it is determined that a lamp or group of lamps is changing color or failing. This way, the area being illuminated will maintain an even balance of color and light.

FACT:
HID lamp color is rated in kelvins and is reffered to as its Correlated Color Temperature (CCT).

FACT:
Colors are created by using different arc tube designs and changing the mixture of chemicals within the tube.

Burning Positions

Certain HID lamps have been designed to operate in a specific position to achieve targeted life or performance goals. These examples illustrate these burning positions

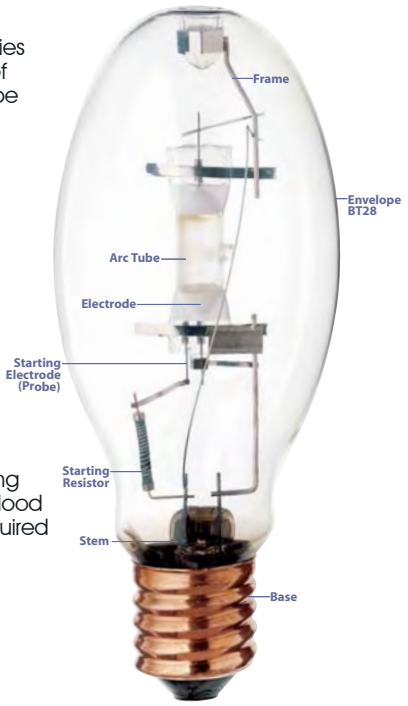


Major HID Categories

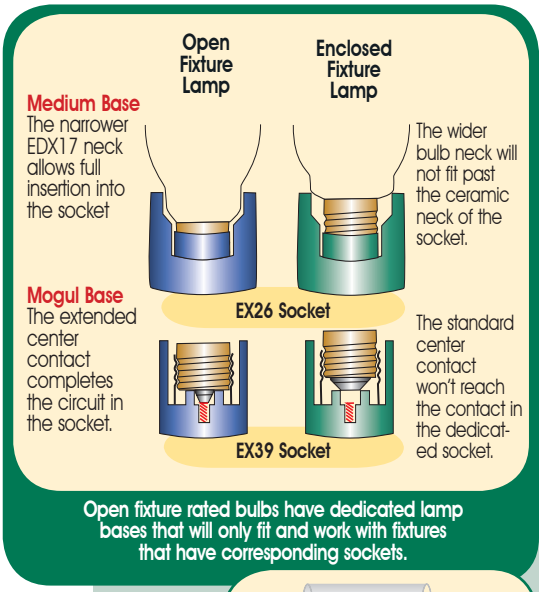
Mercury Vapor

The original of the three HID categories operates by using a small amount of liquid mercury sealed in a quartz tube with argon gas. The arc created by the mercury vapor lamp produces both visible and invisible (UV) light. The visible light is blue-white in color and is best suited for outdoor lighting applications because of its poor color rendering capabilities. Some mercury vapor lamps incorporate phosphors similar to those used in fluorescent lamps to improve color to a certain degree. Mercury vapor lamps can achieve life spans of 10,000 to 24,000 hours.

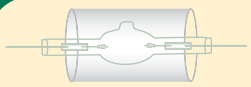
Typical applications:
Street lighting, industrial hi-bay, parking lots, building flood lighting, general flood lighting, places where long life is required and color rendering is not critical.



Open Fixture Applications

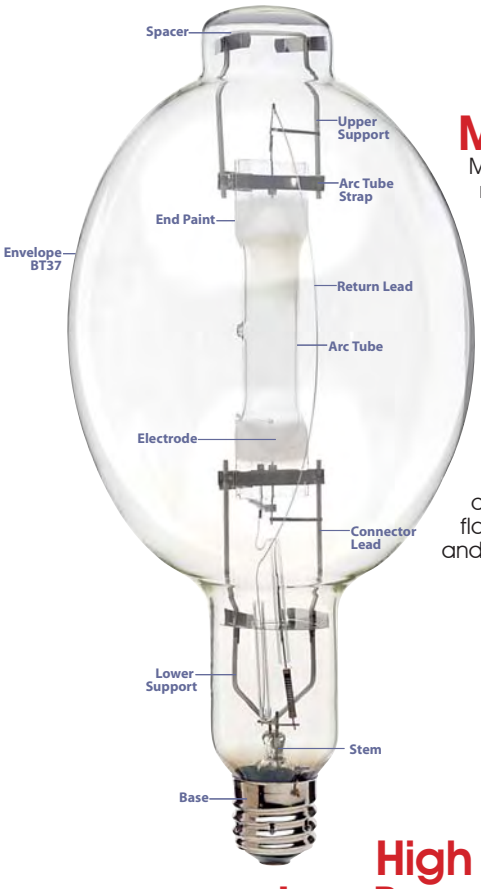


Open fixture rated bulbs have dedicated lamp bases that will only fit and work with fixtures that have corresponding sockets.



There is a series of HID lamps that has a protective glass shroud around the arc tube that acts as a barrier to block any particles from exiting the lamp's outer bulb.

Since the arc tube of the HID lamp is a highly pressurized environment, it is mandatory that the fixture that houses the lamp have a protective lens. This lens will contain glass fragments or other hot particles should the arc tube experience a failure.



Metal Halide

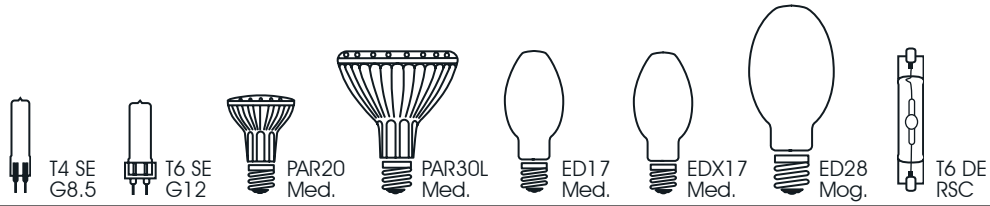
Metal halide lamps are similar to mercury vapor models except for the addition of metal halides of sodium iodide and scandium iodide. Certain metal halide lamps feature other iodides to improve the efficiency and color balance of the lamp. Metal halide represents the most popular and widely used HID category.

Typical applications:
General lighting such as commercial/industrial/outdoor flood lighting where good color and high efficiency are desired.

High Pressure Sodium/ Low Pressure Sodium (SOX)

This series of HID lamps incorporates solid sodium, mercury and xenon or a neon/argon gas mixture within the arc tube. This combination of metals and gasses produces an orange-white light in the high-pressure version and a yellow light in the low-pressure model. Both lamps boast a luminous efficiency that is much greater than its mercury vapor or metal halide counterparts.

Typical applications:
Street lighting, industrial hi-bay, parking lots, building flood lighting and general area lighting.



Metal Halide Lamps 39w - 70w

Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
39	T4 SE	G8.5	S4286 ▲	CDM35/TC/830	Clear	Y	N	M130/E	3000	81	3300	Univ.	9000	3 11/32"	12
	T6 SE	G12	S4288 ▲	CDM35/T6/830	Clear	Y	N	M130/E	3000	81	3400	Univ.	12000	3 5/16"	12
	PAR20	Med	S4284 ▲	CDM35PAR20/M/SP	Clear	Y	Y	M130/O	3000	81	23000*	Univ.	9000	3 3/4"	12
			S4285 ▲	CDM35PAR20/M/FL	Clear	Y	Y	M130/O	3000	81	5000*	Univ.	9000	3 3/4"	12
	PAR30L	Med	S4876 ▲	CDM35PAR30L/M/SP	Clear	Y	Y	M130/O	3000	81	44000*	Univ.	9000	4 3/4"	6
			S4877 ▲	CDM35PAR30L/M/FL	Clear	Y	Y	M130/O	3000	81	7400*	Univ.	9000	4 3/4"	6
50	ED17	Med	S4854 ■	MH50W/U/MED/PS	Clear	Y	N	M110/E	4000	65	3400	Univ.	10000	5 7/16"	12
			S4855 ■	MH50W/C/U/MED/PS	Coated	Y	N	M110/E	3700	70	3400	Univ.	10000	5 7/16"	12
	EDX17	Med	S4846 ■	MP50W/U/MED/PS/3K	Clear	Y	Y	M110/O	3200	65	3400	Univ.	10000	5 7/16"	12
			S4847 ■	MP50W/C/U/MED/PS/3K	Coated	Y	Y	M110/O	3000	70	3300	Univ.	10000	5 7/16"	12
70	ED17	Med	S4856 ■	MH70/U/MED	Clear	Y	N	M98/E	4000	65	5600	Univ.	15000	5 7/16"	12
			S4857 ■	MH70/C/U/MED	Coated	Y	N	M98/E	3700	70	5300	Univ.	15000	5 7/16"	12
	EDX17	Med	S4848 ■	MP70/U/MED	Clear	Y	Y	M98/O	4000	65	5600	Univ.	15000	5 7/16"	12
			S4849 ■	MP70/C/U/MED	Coated	Y	Y	M98/O	3700	70	5300	Univ.	15000	5 7/16"	12
	ED28	Mog	S4230 ■	MH70W/U/ED28/PS	Clear	Y	N	M98/E	4000	65	5600	Univ.	15000	8 5/16"	12
	T4 SE	G8.5	S4287 ▲	CDM70/TC/830	Clear	Y	N	M139/E	3000	83	6400	Univ.	6000	3 11/32"	12
	T6 SE	G12	S4289 ▲	CDM70/T6/830	Clear	Y	N	M139/E	3000	81	6600	Univ.	12000	3 5/16"	12
			S4264 ▲	CDM70T6/942	Clear	Y	N	M139/E	4200	92	6600	Univ.	12000	3 5/16"	12
	T6 DE	RSC	S4865 ■	MH-DE70/3K	Clear	Y	N	M85/E	3000	70	5200	HOR+-15	10000	4 9/16"	25
			S4292 ▲	CDM70/TD/830	Clear	Y	N	M85/M139/E	3000	82	6500	HOR+-15	15000	4 11/16"	12
			S4864 ■	MH-DE70/4K	Clear	Y	N	M85/E	4200	65	5500	HOR+-15	10000	4 9/16"	25
			S4265 ▲	CDM70/TD/942	Clear	Y	N	M85/M139/E	4200	92	6000	HOR+-15	15000	4 11/16"	12

HID Lamps


PAR30L Med.


PAR38 Med.

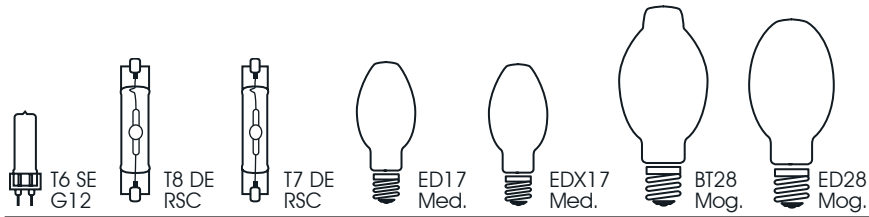

ED17 Med.


EDX17 Med.


ED28 Mog.

Metal Halide Lamps 70w - 150w

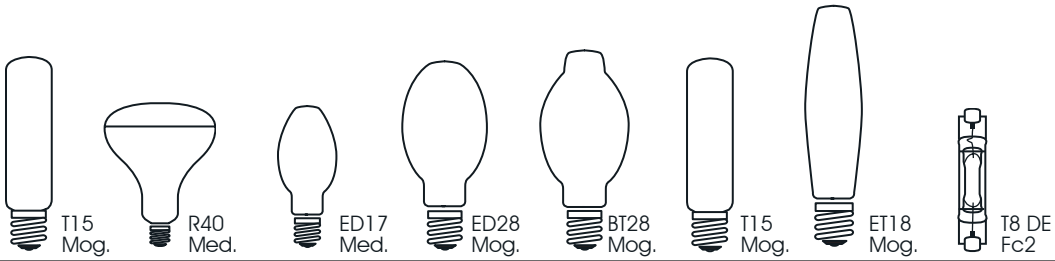
Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
70	PAR30L	Med	S4878 ▲	CDM70/PAR30L/M/SP	Clear	Y	Y	M143/M96/O	3000	83	68000*	Univ.	9000	4 3/4"	12
			S4879 ▲	CDM70/PAR30L/M/FL	Clear	Y	Y	M143/M96/O	4000	83	10000*	Univ.	9000	4 3/4"	12
	PAR38	Med	S4897 ▲	CDM70/PAR38/SP/3K	Clear	Y	Y	M143/M96/O	3000	82	50000*	Univ.	10000	5 5/16"	12
			S4812 ▲	CDM70/PAR38/SP/4K	Clear	Y	Y	M143/M96/O	4000	92	42000*	Univ.	10000	5 5/16"	12
			S4898 ▲	CDM70/PAR38/FL/3K	Clear	Y	Y	M143/M96/O	3000	82	18000*	Univ.	10000	5 5/16"	12
			S4813 ▲	CDM70/PAR38/FL/4K	Clear	Y	Y	M143/M96/O	4000	92	16000*	Univ.	10000	5 5/16"	12
100	ED17	Med	S4858 ■	MH100/U/MED	Clear	Y	N	M90/E	4000	65	9000	Univ.	15000	5 7/16"	12
			S4859 ■	MH100/C/U/MED	Coated	Y	N	M90/E	3700	70	8500	Univ.	15000	5 7/16"	12
	EDX17	Med	S4850 ■	MP100/U/MED	Clear	Y	Y	M90/O	4000	65	8500	Univ.	15000	5 7/16"	12
			S4851 ■	MP100/C/U/MED	Coated	Y	Y	M90/O	3700	70	8100	Univ.	15000	5 7/16"	12
	ED28	Mog	S4231 ■	MH100W/ED28/PS	Clear	Y	N	M90/E	4000	65	9000	Univ.	15000	8 5/16"	12
	PAR38	Med	S4888 ▲	CDM100/PAR38/SP/3K	Clear	Y	Y	M140/M90/O	3000	85	70000*	Univ.	12500	5 5/16"	12
			S4814 ▲	CDM100/PAR38/SP/4K	Clear	Y	Y	M140/M90/O	4000	93	25000*	Univ.	10000	5 5/16"	12
			S4889 ▲	CDM100/PAR38/FL/3K	Clear	Y	Y	M140/M90/O	3000	86	54000*	Univ.	12500	5 5/16"	12
			S4869 ▲	CDM100/PAR38/FL/4K	Clear	Y	Y	M140/M90/O	4000	93	20000*	Univ.	10000	5 5/16"	12
125	ED17	Med	S4232 ■	MH125W/HBU/PS	Clear	Y	N	M150/E	4000	6	12000	BU +/- 90	15000	5 5/16"	12
150	ED17	Med	S4860 ■	MH150/U/MED	Clear	Y	N	M102/E	4000	65	15000	Univ.	10000	5 7/16"	12
			S4379 ■	MH150/U/MED/EM	Clear	N	N	M107/E	4000	65	13500	Univ.	10000	5 7/16"	12
			S4861 ■	MH150/C/U/MED	Coated	Y	N	M102/E	3700	70	14250	Univ.	10000	5 7/16"	12
	EDX17	Med	S4852 ■	MP150/U/MED	Clear	Y	Y	M102/O	4000	65	14250	Univ.	10000	5 7/16"	12
			S4853 ■	MP150/C/U/MED	Coated	Y	Y	M102/O	3700	70	13500	Univ.	10000	5 7/16"	12
	ED28	Mog	S4233 ■	MH150/U/ED28/PS	Clear	Y	N	M102/E	4000	65	14000	Univ.	15000	8 5/16"	12



Metal Halide Lamps 150w - 175w

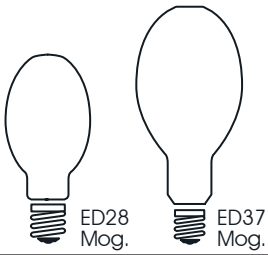
Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
150	T6 SE	G12	S4290 ▲	CDM150T6/830	Clear	Y	N	M142/E	3000	85	14000	Univ.	12000	4 11/32"	12
			S4266 ▲	CDM150T6/942	Clear	Y	N	M142/E	4200	96	12700	Univ.	9000	4 11/32"	12
	T8 DE	RSC	S4866 ■	MH-DE150/3K	Clear	Y	N	M81/E	3000	70	12500	HOR+/-45	10000	5 7/16"	25
	T7 DE	RSC	S4293 ▲	CDM150/TD/830	Clear	Y	N	M142/M81/ M102/E	3000	88	13250	HOR+/-45	15000	5 7/16"	12
	T8 DE	RSC	S4867 ■	MH-DE150/4K	Clear	Y	N	M81/E	4200	65	12000	HOR+/-45	10000	5 7/16"	25
	T7 DE	RSC	S4267 ▲	CDM150/TD/942	Clear	Y	N	M142/M81/ M102/E	4200	96	14200	HOR+/-45	15000	5 7/16"	12
175	ED17	Med	S4862 ■	MH175/U/MED	Clear	N	N	M57/E	4000	65	16000	Univ.	10000	5 7/16"	12
			S4863 ■	MH175/C/U/MED	Coated	N	N	M57/E	3700	70	15250	Univ.	10000	5 7/16"	12
	EDX17	Med	S4828 ▲	MP175/BU-ONLY/MED	Clear	N	Y	M57/O	3600	65	14400	BU +/- 15	10000	5 7/16"	20
	ED17	Med	S4234 ■	MS175/BU/MED/PS	Clear	Y	N	M152/E	4000	65	17500	BU +/- 15	15000	5 7/16"	12
			S4235 ■	MS175/C/BU/MED/PS	Coated	Y	N	M152/E	3700	70	16600	BU +/- 15	15000	5 7/16"	12
	BT28	Mog.	S4829 ■	MH175/U	Clear	N	N	M57/E	4000	65	14000	Univ.	10000	8 5/16"	6
	ED28	Mog.	S4830 ■	MH175/C/U	Coated	N	N	M57/E	3700	70	13300	Univ.	10000	8 5/16"	12
			S4271 ■	MS175/BU	Clear	N	N	M57/E	4000	65	15000	BU +/- 15	10000	8 5/16"	12
	BT28	Mog	S4384 ▲	MP175/BU-ONLY	Clear	N	Y	M57/O	4000	65	14400	BU +/- 15	10000	8 5/16"	6
	ED28	Mog	S4236 ■	MS175/BU/PS	Clear	Y	N	M152/E	4000	65	17500	BU +/- 15	15000	8 5/16"	12
			S4237 ■	MS175/C/BU/PS	Coated	Y	N	M152/E	3700	70	16600	BU +/- 15	15000	8 5/16"	12
		POMB	S4272 ■	MS175/HOR	Clear	N	N	M57/E	4000	65	15000	HOR+/-45	10000	8 5/16"	12
	T15	Mog	S4840 ■	MH175/U/T15	Clear	N	N	M57/E	4000K	65	14000	Univ.	10000	8 5/16"	12
	R40	Med	S4260 ■	MH175W/U/R40/SP15	Clear	N	N	M57/E	4000K	65	65000*	Univ.	10000	6 1/2"	6
			S4261 ■	MH175W/U/R40/FL70	Frost	N	N	M57/E	4000K	65	6500*	Univ.	10000	6 1/2"	6

HID Lamps



Metal Halide Lamps 200w - 320w

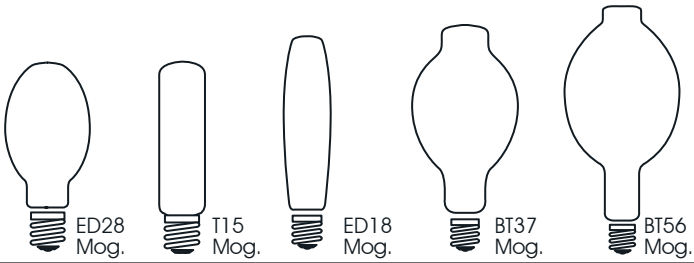
Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
200	ED17	Med	S4238 ■	MS200/BU/MED/PS	Clear	Y	N	M136/E	4000	65	21000	BU +/- 15	12000	5 7/16"	12
	ED28	Mog	S4291 ■	MS200/V/PS	Clear	Y	N	M136/E	4000	65	21000	Vert+/-15	15000	8 5/16"	12
			S4251 ■	MP200/V/UVS/PS	Clear	Y	Y	M136/O	4000	65	20000	Vert+/-15	15000	8 5/16"	12
250	BT28	Mog	S4831 ■	MH250/U	Clear	N	N	M58/E	4000	65	21000	Univ.	10000	8 5/16"	6
	ED28	Mog	S4832 ■	MH250/C/U	Coated	N	N	M58/E	3700	70	19800	Univ.	10000	8 5/16"	12
			S4273 ■	MS250/BU	Clear	N	N	M58/E	4000	65	23000	BU +/- 15	10000	8 5/16"	12
			S4274 ■	MS250/C/BU	Coated	N	N	M58/E	3700	70	22000	BU +/- 15	10000	8 5/16"	12
	BT28	Mog	S4386 ▲	MP250/BU-ONLY	Clear	N	Y	M58/O	4000	65	23000	BU +/- 15	10000	8 5/16"	6
	ED28	Mog	S4239 ■	MS250/V/PS	Clear	Y	N	M153/E	4000	65	25000	Vert+/-15	15000	8 5/16"	12
			S4252 ■	MP250/BU/UVS/PS	Clear	Y	Y	M153/O	4000	65	23800	BU +/- 15	15000	8 5/16"	12
		POMB	S4275 ■	MS250/HOR	Clear	N	N	M58/E	4000	65	23000	HOR+/-45	10000	8 5/16"	12
			S4240 ■	MS250/H75/PS	Clear	Y	N	M153/E	4000	65	22000	HOR+/-75	12000	8 5/16"	12
	T15	Mog	S4841 ■	MH250/U/T15	Clear	N	N	M58/E	4000	65	21000	Univ.	10000	8 5/16"	12
		POMB	S4868 ■	MS250/HOR/T15/3K	Clear	N	N	M58/E	3200	65	23000	HOR+/-45	10000	8 5/16"	12
	ET18	Mog	S4385 ▲	M250/U/ET18	Clear	N	N	M58/E	4000	65	22000	Univ	10000	9 3/4"	10
	T8 DE	Fc2	S4262 ■	MH-DE250W3K/Fc2	Clear	N	N	M80/E	3000	70	20000	HOR+/-45	10000	6 7/16"	25
			S4263 ■	MH-DE250W4K/Fc2	Clear	N	N	M80/E	4200	70	20000	HOR+/-45	10000	6 7/16"	25
320	ED28	Mog	S4241 ■	MS320/V/ED28/PS	Clear	Y	N	M154/E	4000	65	33000	Vert +/- 15	20000	8 5/16"	12
			S4242 ■	MS320/C/V/ED28/PS	Coated	Y	N	M154/E	3700	70	31000	Vert +/- 15	20000	8 5/16"	12
			S4253 ■	MP320/BU/ED28/UVS/PS	Clear	Y	Y	M154/O	4000	65	31000	BU +/- 15	20000	8 5/16"	12
			S4254 ■	MP320/C/BU/ED28/UVS/PS	Coated	Y	Y	M154/O	3700	70	29000	BU +/- 15	20000	8 5/16"	12
		POMB	S4387 ■	MS320/H75/ED28/PS	Clear	Y	N	M154/E	4000	65	30000	HOR+/- 75	20000	8 5/16"	12



Metal Halide Lamps 320w - 400w

Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
320	ED37	Mog	S4255 ■	MP320/BU/ED37/UVS/PS	Clear	Y	Y	M154/O	4000	65	31000	BU +/- 15	20000	11 1/2"	12
350	ED37	Mog	S4243 ■	MS350/V/PS	Clear	Y	N	M131/E	4000	65	35000	Vert +/- 15	20000	11 1/2"	6
			S4244 ■	MS350/C/V/PS	Coated	Y	N	M131/E	3700	70	35000	Vert +/- 15	20000	11 1/2"	6
			S4256 ■	MP350/V/UVS/PS	Clear	Y	Y	M131/O	4000	65	33000	Vert +/- 15	20000	11 1/2"	6
			S4257 ■	MP350/C/V/UVS/PS	Coated	Y	Y	M131/O	3700	70	33000	Vert +/- 15	20000	11 1/2"	6
360	ED37	Mog	S4264 ■	MS360W/BU/EM	Clear	N	N	M165/E	4000	65	36000	BU +/- 15	20000	11 1/2"	6
			S4265 ■	MS360W/C/BU/EM	Coated	N	N	M165/E	3700	70	34000	BU +/- 15	20000	11 1/2"	6
			S4266 ■	MPI360W/BU/EM	Clear	N	Y	M165/O	4000	65	35000	BU +/- 15	20000	11 1/2"	6
			S4267 ■	MPI360W/C/BU/EM	Coated	N	Y	M165/O	3700	70	34000	BU +/- 15	20000	11 1/2"	6
400	ED37	Mog	S4833 ■	MH400/U	Clear	N	N	M59/S	4000K	65	36000	Univ.	20000	11 1/2"	6
			S4834 ■	MH400/C/U	Coated	N	N	M59/E	3700K	70	34000	Univ.	20000	11 1/2"	6
			S4276 ■	MS400/BU	Clear	N	N	M59/E	4000K	65	40000	BU +/- 15	20000	11 1/2"	6
			S4277 ■	MS400/C/BU	Coated	N	N	M59/E	3700K	70	38000	BU +/- 15	20000	11 1/2"	6
			S4245 ■	MS400/V/PS	Clear	Y	N	M159/E	4000K	65	44000	Vert +/- 15	20000	11 1/2"	6
			S4246 ■	MS400/C/V/PS	Coated	Y	N	M159/E	3700K	70	42000	Vert +/- 15	20000	11 1/2"	6
			S4388 ▲	MP400/BU-ONLY	Clear	N	Y	M59/O	3600	65	40000	BU +/- 15	20000	11 1/2"	6
			S4258 ■	MP400/BU/UVS/PS	Clear	Y	Y	M159/O	4000K	65	42000	BU +/- 15	20000	11 1/2"	6
			S4259 ■	MP400/C/BU/UVS/PS	Coated	Y	Y	M159/O	3700K	70	40000	BU +/- 15	20000	11 1/2"	6
		POMB	S4279 ■	MS400/HOR	Clear	N	N	M59/E	4000K	65	40000	HOR +/- 45	20000	11 1/2"	6
			S4280 ■	MS400/C/HOR	Coated	N	N	M59/E	3700K	70	38000	HOR +/- 45	20000	11 1/2"	6
			S4249 ■	MS400/H75/PS	Clear	Y	N	M159/E	4000K	65	40000	HOR +/- 75	20000	11 1/2"	6
	ED28	Mog	S4843 ■	MH400/U/ED28	Clear	N	N	M59/E	4000K	70	36000	Univ.	20000	8 5/16"	12
			S4844 ■	MH400/C/U/ED28	Coated	N	N	M59/E	3700K	65	33900	Univ.	20000	8 5/16"	12
			S4278 ■	MS400/BU/ED28	Clear	N	N	M59/E	4000K	65	40000	BU +/- 15	20000	8 5/16"	12
			S4247 ■	MS400/V/ED28/PS	Clear	Y	N	M159/E	4000K	65	44000	Vert +/- 15	20000	8 5/16"	12
			S4248 ■	MS400/C/V/ED28/PS	Coated	Y	N	M159/E	3700K	70	42000	Vert +/- 15	20000	8 5/16"	12
		POMB	S4281 ■	MS400/HOR/ED28	Clear	N	N	M59/E	4000K	65	40000	HOR +/- 45	20000	8 5/16"	12
			S4250 ■	MS400/H75/ED28/PS	Clear	Y	N	M159/E	4000K	65	40000	HOR +/- 75	20000	8 5/16"	12

HID Lamps

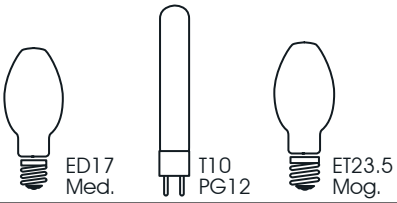


Metal Halide Lamps 400w - 1500w

Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
400	T15	Mog	S4842 ■	MH400/U/T15	Clear	N	N	M59/E	4000K	65	36000	Univ.	15000	9 3/4"	12
		POMB	S4282 ■	MS400/HOR/T15/3K	Clear	N	N	M59/E	3200	65	38000	HOR +/- 45	15000	9 3/4"	12
	ET18	Mog	S4389 ▲	M400/U/ET18	Clear	N	N	M59/E	4000	65	36000	Univ	20000	9 3/4"	10
750	BT37	Mog	S4390 ▲	MS750/PS/BU-HOR/BT37	Clear	Y	N	M149/E	4000	65	80000	BU +/- 90	16000	11 1/2"	6
1000	BT56	Mog	S4835 ■	MH1000/U	Clear	N	N	M47/S	4000	65	110000	Univ.	18000	15 3/8"	6
			S4836 ■	MH1000/C/U	Coated	N	N	M47/E	3700	70	105000	Univ.	12000	15 3/8"	6
			S4283 ■	MS1000/BU	Clear	N	N	M47/E	4000	65	115000	BU +/- 15	12000	15 3/8"	6
	BT37	Mog	S4845 ■	MH1000/U/BT37	Clear	N	N	M47/E	4000	70	110000	Univ.	12000	11 1/2"	6
			S4391 ■	MS1000/BU/BT37/PS	Clear	Y	N	M141/E	4000	65	115000	BU +/- 15	12000	11 1/2"	6
1500	BT56	Mog	S4837 ■	MH1500/HBU	Clear	N	N	M48/E	3400	65	161000	BU+-105	3000	15 3/8"	6
			S4839 ■	MH1500/U/XL	Clear	N	N	M48/E	4000	65	170000	Univ.	6000	15 3/8"	6

Retrofit MH Lamps For High Pressure Sodium (HPS) Fixtures

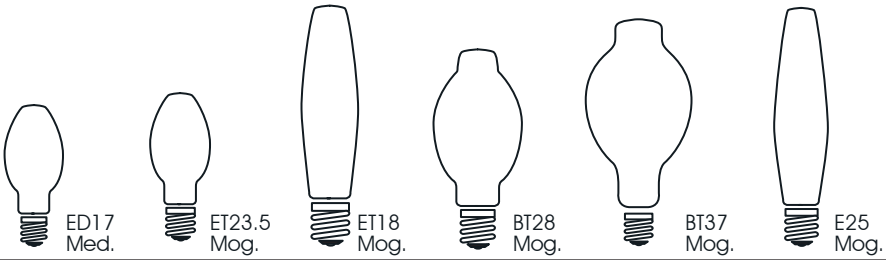
Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	Pulse Start	Open Rated	ANSI Code	Kelvin Temp	CRI	Initial Lumens/ CBCP*	Buring Position	Avg. Rated Hours	MOL	Ctn
250	ED28	Mog	S4268 ■	MS250W/BU/LU **Retrofit for LU250**	Clear	N	N	S50/E	4000	65	18500	BU +/- 15	10000	8 5/16"	12
400	ED37	Mog	S4269 ■	MS400W/BU/LU **Retrofit for LU400**	Clear	N	N	S51/E	4000	65	38000	BU +/- 15	20000	11 1/2"	6
			S4270 ■	MS400W/C/BU/LU **Retrofit for LU400/D**	Coated	N	N	S51/E	4000	65	36000	BU +/- 15	20000	11 1/2"	6



HPS High Pressure Sodium Lamps 35w – 100w

Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	ANSI Code	Kelvin Temp	CRI	Initial Lumens	Avg. Rated Hours	MOL	Carton
35	ED17	Med	S3130	LU35/MED	Clear	S76	2100	22	2250	16000	5 7/16"	12
			S5120 ▲	LU35/D/MED	Coated	S76	2100	22	2100	16000	5 7/16"	20
50	ED17	Med	S3131	LU50/MED	Clear	S68	2100	22	4000	24000	5 7/16"	12
			S5121 ▲	LU50/D/MED	Coated	S68	2100	22	3700	24000	5 7/16"	20
			S4373 ▲	SDW-50W/LV/D	Coated	S104	2700	85	2350	10000	5 7/16"	12
	T10	PG12	S4374 ▲	SDW-T/50W/LV	Clear	S104AF	2700	85	2500	10000	5 7/8"	12
	ET23.5	Mog	S1929	LU50	Clear	S68	2100	22	4000	24000	7 3/4"	12
			S5122 ▲	LU50/D	Coated	S68	2100	22	3700	24000	7 3/4"	20
70	ED17	Med	S3127	LU70/MED	Clear	S62	2100	22	6300	24000	5 7/16"	12
			S5123 ▲	LU70/D/MED	Coated	S62	2100	22	5800	24000	5 7/16"	20
	ET23.5	Mog	S1930	LU70	Clear	S62	2100	22	6300	24000	7 3/4"	12
			S5124 ▲	LU70/D	Coated	S62	2100	22	5500	24000	7 3/4"	20
100	ED17	Med	S3128	LU100/MED	Clear	S54	2100	22	9500	24000	5 7/16"	12
			S5125 ▲	LU100/D/MED	Coated	S54	2100	22	8800	24000	5 7/16"	20
			S4375 ▲	SDW-100W/LV/D	Coated	S105	2700	85	4900	10000	5 7/16"	12
	T10	PG12	S4376 ▲	SDW-T/100W/LV	Clear	S105NZ	2700	85	5200	10000	5 7/8"	12
	ET23.5	Mog	S1931	LU100	Clear	S54	2100	22	9500	24000	7 3/4"	12
			S5124 ▲	LU100/D	Coated	S54	2100	22	8800	24000	7 3/4"	20

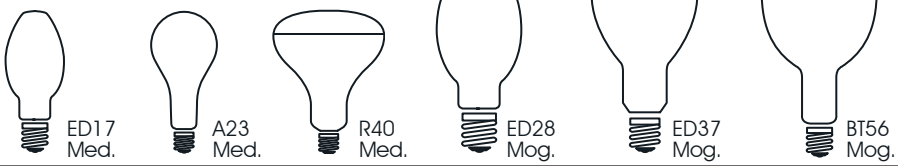
HID Lamps



HPS High Pressure Sodium Lamps 150w – 1000w

Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	ANSI Code	Kelvin Temp	CRI	Initial Lumens	Avg. Rated Hours	MOL	Carton
150	ED17	Med	S3129	LU150/55/MED	Clear	S55	2100	22	16000	24000	5 7/16"	12
			S5127 ▲	LU150/55/D/MED	Coated	S55	2100	22	14500	24000	5 11/16"	20
	ET23.5	Mog	S1932	LU150/55	Clear	S55	2100	22	16000	24000	7 3/4"	12
			S5128 ▲	LU150/55/D	Coated	S55	2100	22	14000	24000	7 3/4"	20
200	ET18	Mog	S5129 ▲	LU200/ECO	Clear	S66	2100	22	22000	24000	9 5/8"	20
250	ET18	Mog	S1940	LU250	Clear	S50	2100	22	28000	24000	9 5/8"	12
	BT28	Mog.	S5130 ▲	LU250/D	Coated	S50	2100	22	26000	24000	8 31/32"	10
310	ET18	Mog	S5131 ▲	LU310/ECO	Clear	S67	2100	22	37000	24000	9 5/8"	20
400	ET18	Mog	S1941	LU400	Clear	S51	2100	22	51000	24000	9 5/8"	12
	BT37	Mog.	S5132 ▲	LU400/D	Coated	S51	2100	22	47500	24000	11 1/2"	10
750	BT37	Mog	S5133 ▲	LU750	Clear	S111	2100	22	105000	24000	11 1/2"	6
1000	E25	Mog	S5124 ▲	LU1000	Clear	S52	2100	22	130000	24000	15 1/16"	6

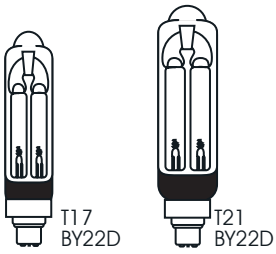
Don't see the lamp you need? Call Customer Service 1-800-43-SATCO



Mercury Vapor Lamps 50w – 1000w

Nominal Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	ANSI Code	Kelvin Temp	CRI	Initial Lumens	Avg. Rated Hours	MOL	Carton
50	ED17	Med	S4294	H46DL-40/50DX	Coated	H45/46	3900	50	1580	6000	5 1/8"	12
75	ED17	Med	S4298	H43AV-75DX	Coated	H43	3900	50	2700	6000	5 7/16"	12
100	A23	Med	S1933	H38MP-100DX	Coated	H38	3900	50	4000	6000	5 7/16"	12
	ED17	Med	S4377	H38AV-100DX	Coated	H38	3900	50	4000	6000	5 7/16"	20
	ET23 1/2	Mog	S1935	H38JA-100DX	Coated	H38	3900	50	4000	10000	7 1/2"	12
	R40/FL	Med	S4378	H38BP-100DX	Coated	H38	3900	50	2450	10000	7 1/2"	12
175	ED28	Mog	S1934	H39KC-175DX	Coated	H39	3900	50	7800	10000	8 1/4"	12
			S1936	H39KB-175	Clear	H39	4500	20	7800	10000	8 1/4"	12
	R40/FL	Med	S4394	H39BP-175DX	Coated	H39	3900	50	5700	10000	7 1/2"	12
250	ED28	Mog	S1937	H37KC-250DX	Coated	H37	3900	50	11200	10000	8 1/4"	12
			S4395	H37KB-250	Clear	H37	4500	20	11200	10000	8 5/16"	12
400	ED37	Mog	S1938	H33GL-400DX	Coated	H33	3900	50	22600	10000	11 5/16"	12
1000	BT56	Mog	S4396	H36GW-1000DX	Coated	H36	3900	50	58000	10000	15 3/8"	6

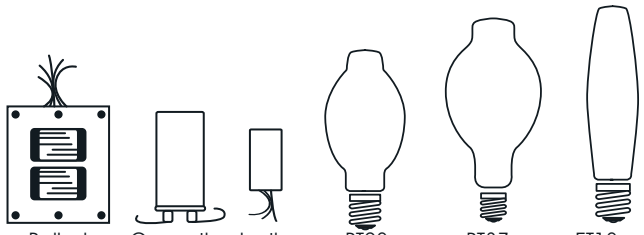
HID Lamps



SOX Low Pressure Sodium Lamps

Watts	Bulb	Base	Satco Product Number	Lamp Code	Finish	ANSI Code	Kelvin Temp	CRI	Initial Lumens	Burning Position	Avg. Rated Hours	MOL	Carton
18	T17	BY22D	S4870 ▲	SOX18	Clear	L69	1800	n/a	1800	BU +/- 110	16000	8 1/2"	12
35	T17	BY22D	S4871 ▲	SOX35	Clear	L70	1800	n/a	4500	BU +/- 110	16000	12 1/4"	12
55	T17	BY22D	S4872 ▲	SOX55	Clear	L71	1800	n/a	7300	BU +/- 110	16000	16 3/4"	12
90	T21	BY22D	S4873 ▲	SOX90	Clear	L72	1800	n/a	13500	HOR+/-20	16000	20 13/16"	12
135	T21	BY22D	S4874 ▲	SOX135	Clear	L73	1800	n/a	22000	HOR+/-20	16000	30 1/2"	12
180	T21	BY22D	S4875 ▲	SOX180	Clear	L74RF	1800	n/a	30000	HOR+/-20	16000	44 3/32"	12

HID Super5 Ballast Kits



Metal Halide Ballast Kits With Lamp

Watts	Satco Code	Description	Ballast Ansi Code	Lamp Included	Lamp Ansi Code	Pack
175	S4397 ▲	M175U/Lamp/Super5/BallastKit	M57 - H39	M175/U BT28	M57/E	1
250	S4398 ▲	M250U/Lamp/Super5/BallastKit	M58 - H37	M250/U BT28	M58/E	1
400	S4399 ▲	M400U/Lamp/Super5/BallastKit	M59 - H33	M400/U BT37	M59/S	1

MH Ballast Kits Include: 5 Tap Ballast (120/208/240/277/480)
Plus: Mogul Base Clear Lamp / Capacitor / Mounting Brackets

High Pressure Sodium (HPS) Ballast Kits With Lamp

Watts	Satco Code	Description	Ballast Ansi Code	Lamp Included	Lamp Ansi Code	Pack
250	S4314 ▲	LU250/ECO/Lamp/Super5/BallastKit	S50	LU250/ECO	S50	1
400	S4315 ▲	LU400/ECO/Lamp/Super5/BallastKit	S51	LU400/ECO	S51	1

HPS Ballast Kits Include: 5 Tap Ballast (120/208/240/277/480)
Plus: Mogul Base Clear Lamp / Capacitor / Igniter / Mounting Brackets

HID Notes

■ = Product by a manufacturer other than Satco

▲ = Product by one of the Primary lamp manufacturers

ANSI Codes

All HID lamps and ballasts are identified by an ANSI code. The purpose of these codes are to make sure that the lamp from one manufacturer is properly matched to any other manufacturers ballast, therefore resulting in safe operation, and produce the designed light output. Especially with the increasing complexities of metal halide product offerings, it is very important that the ballast and lamp ANSI codes are matched before use. The most recent changes to the ANSI lamp codes have added the E, S, and O letter designations. For example, a 400 watt probe start metal halide lamp will have an ANSI code of M59/E, M59/S, or M59/O. This should be used only on a ballast with an ANSI code of M59.

E - Lamps must be used in enclosed luminaires which meet the requirements of UL1598.
S - Lamps are considered "suitable" for open luminaire operation, only if operated in the vertical ±15° position. Lamps do not meet ANSI criteria for containment and must be turned off at least once per week for a minimum of 15 minutes if operated continuously. In addition these lamps must be group relamped before reaching rated lamp life.
O - Lamps can be operated in open or enclosed luminaires within the manufacturer's specified operating position limits. This type meets the ANSI criteria for containment rated operation. Special exclusionary sockets are available for these lamps to ensure that the wrong lamp type is not used.

Rated Life

The rated life of metal halide lamps is based on the point when 50% of the lamps have burned out, based on a burn cycle of 10 hours per start. Various operating conditions affect lamp life. One key factor is operating position. Lamps designated universal can be operated in any position. However, life expectancy and lumen output are sacrificed in certain positions. Published "rated life" for universal lamps is based on operation in the vertical position. "Rated life" for universal lamps operated horizontally is 75% of the published rating. Shorter operating cycles also severely reduce life. At operating cycles shorter than 10 hours per start, life will shorten as follows:

5 hrs per start: Life is approx. 75% of rating
2.5 hrs per start: Life is approx. 55% of rating

Initial Lumen Listings

Rated initial lumens are based on measurements at 100 hours of use, and are based on specified burning position. The measures listed for universal position lamps are based on a vertical burning position; horizontal usage decreases the output by 25 to 30%. For specifics on any particular lamp, call Satco customer service (800-43-SATCO).

Safety Warnings

It is the responsibility of the purchaser to read all safety warnings on the lamp package before use. For more information, call Satco customer service (800-43-SATCO).

Steps to choosing the correct Metal Halide lamp.

1) Determine the correct wattage.
2) Determine the base.
3) Choose the shape. ED and BT style lamps are generally interchangeable
4) Determine the correct size, some wattages come in multiple sizes. For example, 400w lamps are standard ED37, but are also commonly available in an ED28 compact envelope.
5) Determine burning position, BU, BD, Vertical, Horizontal, or Universal.
6) Determine Pulse Start, or Probe Start. Pulse Start is standard on lower wattage lamps, (39 through 150 watts). Probe Start is standard on higher wattage lamps, (175 through 1500 watts), however Pulse Start technology is being used more and more on the higher wattages.
7) Determine whether the project is calling for the newer Ceramic Arc tube lamps. These lamps offer higher color rendering, and Lumen Output than the more traditional Quartz Arc tube lamps.
8) Determine whether fixture requires an Open Rated (Protected) lamp, or an Enclose Rated lamp.
9) All Metal Halide lamps and ballasts are identified with an ANSI code. It is best to make sure that the ANSI code matches between the ballast and lamp.

HID Lamps Notes

Measured vs Perceived Light Levels of HID Lamp

Studies on nighttime visibility demonstrate experimentally that the human eyes is sensitive to different colors of light based on various lighting levels, thus impacting the "true" or "effective" lumen output of a lamp. Recent research shows that the color of a light source has a significant effect on nighttime visibility, which is important since most road accidents happen at night. It is also well known that the eye responds to color differently based on the amount of light available.

While lumens are the standard measurement of light output, light is actually defined as energy evaluated by the eye. Standard lumen measurements are based on the light output response of a person only during high light levels (photopic light), typical of daylight and interior lighting. Light meters measure photopic light as seen by the central region of the eye. When light levels are very low, like starlight, the viewing conditions are referred to as scotopic. Under these conditions, the eyes visual response changes dramatically. Sensitivity to yellow and red light is greatly reduced, while response to blue light is vastly increased. Since lamp lumen measurements have been determined using photopic measurements, the lumen values do not accurately measure the effective light output as perceived by the human eye.

Since the value of a lamp's lumen output is different when considering the shifting color sensitivity of the eye at low levels, the effective lumens will be different from the measurable photopic lumens. As light diminishes from photopic to scotopic conditions, the effective lumens of yellow sodium light sources are reduced, and the effective lumens of the whiter metal halide sources increase. This effect is most dramatic for low pressure sodium (SOX) lamps. Almost all energy output from SOX lamps is yellow, resulting in an artificially high photopic lumen output, yet a very low perceived light output in low light level applications.

Typical metal halide lamps have strong light output in the blue, green and yellow areas, resulting in high lumen output at all light levels. The blue light output of metal halide is in the high sensitivity region of the eye for low light levels. This means that the effective lumens actually increase for a metal halide lamp as the light level reduces and the eye shifts to a blue/green peak sensitivity. The ability to detect fine contrast is also significantly better under metal halide sources than sodium, making it a more effective light source in warehouse and retail applications. Studies have shown that metal halide lighting, in some circumstances, can be up to six times as effective as HPS. This can make a difference in peripheral viewing and dark areas where hidden hazards may be present.

Metal Halide 2005 NEC Changes

The 2005 update to the National Electrical Code (NEC) includes two changes that affect the manufacture and installation of metal halide luminaires. Both changes address methods for preventing risk when metal halide lamps are used.

The purpose of these changes is to prevent possible injury and property damage. Metal halide lamps can explode, shooting hot glass out of the luminaire, or fixture. In an open luminaire - one that does not have a lens - this can result in a fire, personal injury, and property damage. Although violent failure is a rare occurrence (about three incidents per year), the NEC has included these changes to help eliminate the hazard.

In sports facilities, particularly in schools, athletic activity can break the outer jacket of a metal halide lamp used in an open luminaire. When this happens, the arc tube can continue to operate with a damaged or missing outer jacket. This leads to reports of UV over-exposure, including sunburn and a burning sensation around the eyes. The NEC change requires complete lamp enclosure in these facilities, which will provide mechanical protection to reduce the possibility of damage to the outer lamp jacket.

NEC changes for open luminaires

The NEC change regarding open luminaires is the new section 410.73(F)(5) that states, "Metal Halide Lamp Containment. Luminaires (fixtures) that use a metal halide lamp other than a thick-glass parabolic reflector lamp (PAR) shall be provided with a containment barrier that encloses the lamp, or shall be provided with a physical means that only allows the use of a lamp that is Type O."

Therefore, to meet the 2005 NEC requirements, luminaires that use metal halide lamps must either:

- Be enclosed to provide a containment barrier.
- Use a special lampholder that will only accept an ANSI Type O rated metal halide lamp.

NEC 2005 changes for sporting facilities

The NEC change regarding open luminaires is the new section 410.4(E) that states, "Luminaires (fixtures) subject to physical damage, using a mercury vapor or metal halide lamp, installed in playing and spectator seating areas of indoor sports, mixed-use, or all-purpose facilities shall be of the type that protects the lamp with a glass or plastic lens. Such luminaires (fixtures) shall be permitted to have an additional guard."