

**CREATING LIGHT
DEVELOPING THE**

FUTURE

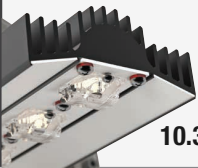


10 TECHNICAL GUIDE

Demanding Environment

Demanding Environment
 
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ALGLAS®
 
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Guide to Specifying Demanding Environment Lighting

EYE Lighting's unique range of demanding environment luminaires are designed to meet high quality and technical standards delivering an exceptional lifespan under extreme conditions with minimal maintenance.

With products providing a range of solutions for high or low temperatures all purpose-built to withstand the rigours demanded by particular industries, practical long life solutions are realised.

Selection Guide

For an optimised installation and to select the right luminaire for specific site constraints, please contact EYE Lighting.

FOOD INDUSTRY

Pascal	-20°C	+30°C
Einstein Agro	-20°C	+40°C

INDUSTRIAL

Celsius 70	-60°C	+25°C
Einstein 133	-20°C	+40°C
Pauli 2 TG	-30°C	+30°C
Pauli 2 TGF	-50°C	+10°C
Pauli 1 HT	-20°C	+80°C

TASK LIGHTING

Bering	-40°C	+25°C
Fahrenheit 70	-30°C	+25°C
Niepc 70 FV	-20°C	+30°C

EMERGENCY LIGHTING

Coulomb	0°C	+30°C
Volta	0°C	+30°C

-80°C

0°C

+80°C

Guide to Specifying Demanding Environment Lighting

5 Strong Points

**ROBUST**

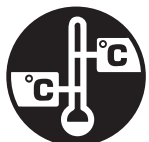
Resulting from our engineering expertise, our luminaires are designed to be shock resistant (IK10). The robustness of the housing, the quality of selected materials and components are a guarantee of long-term investment.

**IMPERVIOUS**

The absolute imperviousness (IP68) of our light fittings reduces surface condensation or frost phenomena due to negative temperatures, as well as internal dust accumulation. The tubular shape prevents from external dirt deposit. The luminaires are resistant to high pressure jet cleaning (IP69K).

**RESISTANT**

The quality of carefully selected materials such as stainless steel or coextruded polycarbonate/methacrylate withstands aggressive chemical corrosion from detergents, oils and hydrocarbons.

**EFFICIENT**

The technical choices (LED, double or triple envelope around the fluorescent lamps) of our luminaires allow lighting to be efficient in low temperatures. These solutions enable an optimum lighting level whilst reducing the number of light fittings and energy wasted.

**SAFE MAINTENANCE**

Safety is a priority of our customers. In this concern we have developed easy fixing brackets and rapid removal systems allowing off-site maintenance: production disruptions and risks of object fallings are then limited.

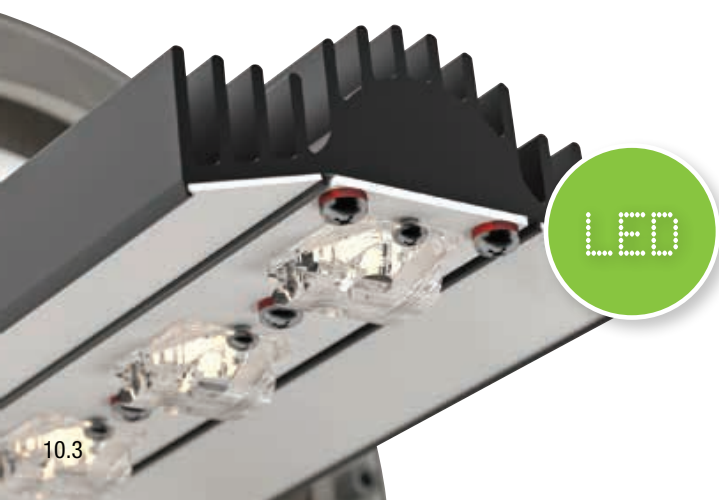
LED Characteristics Explanation

Information provided in the catalogue for every LED product is designed to help make the right choice with LED lighting. Not all LED information is the same and every manufacturer's LED technology can be unique. Therefore it is important to allow an informed decision made on accurate and reliable information. That is why key performance information is included based on industry best practice standards - an example is shown with a detailed explanation.

LED Characteristics

Product Type	Colour Temp. (K)	Ra	Life (hrs) L70/B10	P/U	R/Rx	Driver Efficiency (%)	Power Factor	Efficacy (lm/W)
50W LED	4,000	80	60,000	P	R	>85	>0.95	95.5
1	2	3	4	5	6	7	8	9

- 1 **Product Type** = Enables referencing to exact product in the product range table.
- 2 **Colour Temp. (K)** = approx. colour temperature of the light source.
- 3 **Ra** = Indicates colour rendering index (colour quality).
- 4 **Life (hrs) L70/B10** = Indicates life expectancy of the LEDs combining light output degradation (L70-when light output has reduced to 70% of initial level) and lamp failure expectation (B10 – when 10% of the LEDs have failed to meet operational expectations).
- 5 **P/U** = Protected/Unprotected some LEDs are connected in series or in a series/parallel group. Protected (P) means the failure of a single LED will not affect others in the group. Unprotected (U) means failure of one LED will cause the others in the group to extinguish.
- 6 **R/Rx** = When the LED fails, some luminaires require replacement in their entirety (Rx), some have replaceable LED assemblies (R).
- 7 **Driver Efficiency (%)** = Illustrates driver efficiency.
- 8 **Power Factor** = Indicates LED driver power factor
- 9 **Efficacy (lm/W)** = Lumens/Watt indicates efficacy including all optical and gear losses. It is important to compare figures correctly, Eg - other manufacturers may state LED efficacy which does not include all losses within the system producing a misleading higher figure.



ALGLAS® Finish - Creating Superior Reflector Surfaces

- 1 **Chemical Composition:** The ALGLAS® coating is a thin, transparent, flexible coating of very high quality, heat-cured glass which has been chemically bonded to an aluminium reflector surface.
- 2 **Surface Smoothness:** Surfaces of ALGLAS®, prismatic glass and other types of coatings were assessed using a profilometer to measure smoothness. The traces of prismatic glass and other coatings revealed significantly more light scattering, rippling and roughness than did the ALGLAS® trace. Electron microscope observations confirmed this finding.
- 3 **Coating Continuity:** ALGLAS® coating is continuous and pinhole free. Complete immersion of the reflector in the silicate solution ensures uniform coating of all surfaces.
- 4 **Cleanability:** ALGLAS® finish is smoother than pressed glass and readily lends itself to thorough cleaning with a standard detergent and water.
- 5 **Durability and Safety:** ALGLAS® is a high quality glass coating that is chemically inert, giving it the chemical durability of plate glass. Reflectors coated with ALGLAS® are lightweight and unbreakable, as opposed to heavy conventional prismatic glass reflectors that are breakable and potentially dangerous.
- 6 **Resistance to Chemical Attack:** The ALGLAS® finish is superior to the other coating finishes and comparable to borosilicate glass in resistance to chemical attack (table shows partial list of reagents tested).
- 7 **Optical Performance:** Outstanding smoothness of the ALGLAS® finish results in optimum reflector specularly and the high light transmission of the unique coating results in maximum reflector efficiency. ALGLAS® coated reflectors can be uniformly produced on precision tooling in contrast to the production of pressed glass reflectors where tool degradation, with time, causes imperfections in the prismatic glass surfaces.
- 8 **Resistance to Corrosive Environments:** ALGLAS®-coated samples have remained bright and specular after 2500 hours in salt fog. ALGLAS® finish also showed superior seacoast weathering characteristics over a seven-year period.

Resistance To Chemical Attack

CHEMICAL REAGENTS	REFLECTOR SURFACES
	ALGLAS®
Acids	
Hydrochloric	N
Sulfuric	N
Nitric	N
Hydrofluoric	AV
Bases	
Sodium Hydroxide	AS
Hydroxylamine	N
Salts	
Sodium Chloride	N
Gases	
SO ²	N
NO ²	N

N = No Effect

AS = Attacks Slowly

AV = Attacks Vigorously

Information referenced from *GE Lighting Systems, Inc.* www.gelightingssystem.com

ALGLAS® is a registered trademark of the General Electric Company, USA.

How to Recycle Lamps That Contain Mercury

Foundation Signatory

MANAGEMENT OF WASTE MERCURY-CONTAINING LAMPS¹

Waste management is primarily the responsibility of state, territory and local governments in Australia. Mercury is a toxic heavy metal and the disposal of products that contain mercury is managed differently in the different jurisdictions. If you are a householder, you should check with your State agency or local council to see what the arrangements are for disposing of household waste mercury-containing lamps in your area. Advice on the safe disposal of mercury-containing lamps is available at: www.fluorocycle.org.au

MAKING ARRANGEMENTS TO RECYCLE LAMPS THAT CONTAIN MERCURY

There are two recycling companies in Australia with facilities that process mercury containing lamps. One facility is in Sydney and one is in Melbourne. Waste lamps need to be collected and transported to one of these facilities. Businesses and organisations should make arrangements with a waste collection company that can give assurance that the lamps they collect will eventually be delivered to one of the recycling facilities. Many waste collection companies provide collection bins or boxes that are dedicated to waste mercury-containing lamps and can be installed at your premises. The Yellow Pages or the Internet will help you to identify the waste collection companies that operate in your area. Your business or organisation may be eligible to receive public recognition through the FluoroCycle scheme for recycling all of its waste mercury containing lamps.

FLUOROCYCLE

FluoroCycle is a national, voluntary scheme that is supported by all Australian governments. The scheme started operations on 21 July 2010 and is designed to increase recycling of mercury-containing lamps in Australia - and reduce the number going to landfill. FluoroCycle is focussing initially on the commercial and public lighting sectors, as these sectors are collectively the largest consumers of mercury-containing lamps, accounting for approximately 90 per cent of lighting waste.

LAMPS THAT CONTAIN MERCURY

A variety of lamps used in Australia require mercury to operate. Generally, the higher the power usage or wattage, the more mercury required to operate the lamp. The more common mercury-containing lamps are described below.

- 1 Compact fluorescent lamps (CFLs) contain no more than 5mg of mercury and are used mostly in homes.
- 2 High intensity discharge (HID) lamps contain between 50mg and 1000mg of mercury.
- 3 Linear fluorescent tubes contain no more than 15mg of mercury and are used in most commercial and public buildings.

Mercury-containing lamps are not manufactured in Australia; they are all imported. Approximately 52 million² mercury-containing lamps, of all types, were imported into Australia in 2008.

THE RECYCLING PROCESS

In the recycling process, all components of mercury-containing lamps are recovered and separated, ready for re-use in the manufacture of other products, producing minimal waste. Mercury-containing lamps are crushed. The crushed material is then sorted into individual components: glass, aluminium, other metals, plastics and the mercury containing phosphor powder. The mercury is recovered from the phosphor powder and is mainly used for dental amalgam; the phosphor powder is also used in fertiliser. The glass and metals are used in the manufacture of various products.

¹ In this context, 'lamp' means the glass component of a light fitting, eg the globe or fluorescent tube.

² This figure is based on import data from the Australian Bureau of Statistics and excludes 'other discharge lamps' and lamps in fittings because these lamps may, or may not, contain mercury.



Symbol Explanation

COMPLIANCE MARKINGS

Symbol

RCM

The RCM mark indicates a device's compliance with all applicable ACMA regulatory arrangements - telecommunications, radiocommunications, EMC and EME - and with applicable state and territory electrical equipment safety requirements. Where you see this mark, you can be assured the product passes testing for EMC compliance and safety.



RECYCLABLE

Where the luminaire's construction materials are able to be recycled in Australia or New Zealand.



EMERGENCY

Encompasses all luminaires that provide emergency back-up when the power is turned off.



IMPACT RESISTANCE

Guide

IMPACT RESISTANCE

The IK code is a codification system for indicating the protection degree of the housing against mechanical impacts, according to EN 50102 regulations.

IK CODE	ENERGY (J)
00	-
01	0.15
02	0.20
03	0.35
04	0.50
05	0.70
06	1
07	2
08	5
09	10
10	20

OTHER SYMBOLS

STAINLESS STEEL

This symbol represents all products that are manufactured from stainless steel.



IP RATINGS

Guide

IP Ratings

I.P. (or Ingress Protection) Ratings represent the degree to which a luminaire prevents the penetration of dust, solid bodies and water.

DUST PROTECTION

IP5X protects against the entry of dust sufficiently so as not to interfere with the satisfactory operation of equipment.

IP5X

DUST TIGHT

provides complete protection against the entry of dust.

IP6X

RAIN PROOF

IPX3 protects against spraying water at up to 60° from the vertical.

IPX3

SPLASH PROOF

IPX4 protects against splashing and spraying water from all practicable directions.

IPX4

PROTECTION AGAINST WATER JETS

IPX5 protects against low pressure jets of water from all practicable directions.

IPX5

PROTECTION AGAINST STRONG WATER JETS

IPX6 protects against strong jets of water from all practicable directions.

IPX6

PROTECTION AGAINST IMMERSION

IPX7 protects against the effects of temporary immersion.

IPX7

PROTECTION AGAINST SUBMERSION

IPX8 protects against the effects of continual submersion.

IPX8

PROTECTION AGAINST HIGH PRESSURE/STEAM CLEANING

Protection against high-pressure, high-temperature wash-down applications. Such enclosures are dust tight (IP6X) and also able to withstand high-pressure and steam cleaning.

IP69K

SAFETY CLASSIFICATIONS OF LUMINAIRES

EARTH TERMINAL BLOCK

Class I Luminaire with an earthed terminal block. Earthing protects exposed parts that could become live in the event of basic insulation failure.



CLASS II LUMINAIRE

Class II Luminaires are designed so that protection against electric shock does not rely only on basic insulation, usually achieved by means of reinforced or double insulation.



CLASS III LUMINAIRE

Class III Luminaire protection against electric shock is based on extra low voltage supply not being over 50V of alternating current (AC).



EYE Lighting Industry Associations

ASSOCIATIONS	ABOUT
 DOES IT COMPLY?	Does It Comply? Does It Comply? is a joint initiative between NECA, Voltimum and an industry alliance consisting of reputable manufacturers, suppliers, wholesalers and associations. The aim of the campaign is to raise awareness of electrical product safety and educate users of the dangers of using non-compliant and counterfeit product. For more information visit www.doesitcomply.com.au
	FluoroCycle EYE Lighting is a foundation signatory of FluoroCycle. FluoroCycle is a voluntary product stewardship scheme that seeks to increase the national recycling rate of waste mercury-containing lamps. Lamp recycling can help reduce the amount of mercury being sent to landfill. The scheme targets the commercial and industrial sectors where the bulk of waste lamps are generated. For more information visit www.fluorocycle.org.au
	IES - The Illuminating Engineers Society of Australia and New Zealand The aim of the Society is the advancement of the art and science of illumination and the dissemination of knowledge to all interested parties. The Society's diversified membership includes engineers, architects, educators, students, contractors, manufacturers and designers. For more information visit www.iesanz.org
	ISO 9001 - Quality Management EYE Lighting management systems and all supplier management systems are certified to ISO 9001. For more information visit www.saiglobal.com

EYE Lighting Industry Associations

ASSOCIATIONS	ABOUT
	Lighting Council Australia Lighting Council Australia is the peak body for Australia's lighting industry. Its goal is to encourage the use of environmentally appropriate, energy efficient, quality lighting systems. For more information visit www.lightingcouncil.com.au
	MESCA - Mining & Energy Services Council of Australia The Mining & Energy Services Council of Australia (MESCA) is an industry body created to assist members in developing and enhancing partnerships while maximising their opportunities for contributions to Mining & Energy projects. For more information visit www.mesca.com.au
	NECA - National Electrical and Communications Association The National Electrical and Communications Association (NECA) is the peak industry body that represents the best interests of the electrical and communications contracting industry in Australia. For more information visit www.neca.asn.au
	Voltimum Australia Voltimum is the leading internet portal for the Australian electrical industry. It aims to become the central source of information in Australia for all professionals involved in the design, specification, distribution and installation of electrical products and systems. For more information visit www.voltimum.com.au

Reference - Lighting Standards Australia / New Zealand

All standards are current and applicable at time of publishing.

LUMINAIRES

IEC and AS/NZS 60598.1	Luminaires → General requirements and tests
IEC and AS/NZS 60598.2	Particular requirements (apply as applicable to luminaire type)
IEC CISPR 15, EN 55015 and AS/NZS CISPR 15 (requirements align)	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
IEC CISPR TR 30	Test method on electromagnetic emissions from electronic ballasts for single- and double-capped fluorescent lamps
AS 2293.3	Emergency Escape Lighting and Exit Signs for Buildings
IEC 61547, EN 61547	Equipment for general lighting purposes - EMC immunity requirements
IEC, EN, AS/NZS 61000-3-2	Limits for harmonic current emissions (equipment input current ≤16A per phase)

COMPONENTS

AS/NZS 4783 part 1 and part 2	Performance of Electrical Lighting Equipment → Ballasts for fluorescent lamps where Part 1 Test method Part 2 Energy labelling and minimum energy performance
AS/NZS 4879 part 1 and part 2	ELV Transformers Energy Performance of transformers and electronic step-down convertors for ELV lamps
AS/NZS 4847 part 1 and part 2	Self-ballasted lamps for general lighting services - Minimum Energy Performance Standards (MEPS) requirements
AS NZS 4934 part 1 and part 2	Incandescent lamps for general lighting services - Test methods - Energy performance
IEC and AS/NZS 60155	Glow-starters for Fluorescent Lamps
IEC and AS/NZS 60921	Ballasts for Tubular Fluorescent Lamps → Performance requirements
IEC and AS/NZS 60922	Auxiliaries for Lamps → Ballasts for discharge lamps (excluding tubular fluorescent lamps) → General and safety requirements
IEC and AS/NZS 60923	Auxiliaries for Lamps → Ballasts for discharge lamps (excluding tubular fluorescent lamps) → Performance requirements

Reference - Lighting Standards Australia / New Zealand

All standards are current and applicable at time of publishing.

IEC and AS/NZS 60925	Auxiliaries for Lamps DC Supplied Electronic Ballasts for Tubular Fluorescent Lamps → Performance requirements
IEC and AS/NZS 60927	Auxiliaries for Lamps → Starting devices other than glow-starters) → Performance requirements
IEC and AS/NZS 60928	Auxiliaries for Lamps → AC supplied electronic ballasts for tubular fluorescent lamps → General and safety requirements
IEC and AS/NZS 60929	Auxiliaries for Lamps → AC supplied electronic ballasts for tubular fluorescent lamps → Performance requirements
IEC and AS/NZS 61046	Auxiliaries for lamps → DC and AC supplied electronic step down converters for filament lamps → General and safety requirements
IEC and AS/NZS 61047	Auxiliaries for Lamps → DC and AC supplied electronic step down converters for filament lamps → Performance requirements
IEC and AS/NZS 61048	Auxiliaries for Lamps → Capacitors for use in tubular fluorescent and other discharge lamp circuits → General and safety requirements
IEC and AS/NZS 61049	Auxiliaries for Lamps → Capacitors for use in tubular fluorescent and other discharge lamp circuits → Performance requirements
IEC and AS/NZS 61347.1	Lamp Control Gear → General and safety requirements (IEC 61347-1:2000, MOD) (apply as applicable to control gear type)
IEC and AS/NZS 61347.2.1	Lamp Control Gear → Particular requirements for starting devices (other than glow starters)
IEC and AS/NZS 61347.2.2	Lamp Control Gear → Particular requirements for DC or AC supplied electronic step-down converters for filament lamps (IEC 61347-2-2, Ed. 1.2 (2006) MOD)
IEC and AS/NZS 61347.2.3	Lamp Control Gear → Particular requirements for AC supplied electronic ballasts for fluorescent lamps
IEC and AS/NZS 61347.2.4 Withdrawn at IEC and is being withdrawn by AS/NZS. Replaced by IEC 61347-2-3	Lamp Control Gear → Particular requirements for DC supplied electronic ballasts for general lighting
EC and AS/NZS 61347.2.5 Withdrawn at IEC and is being withdrawn by AS/NZS. Replaced by IEC 61347-2-3	Lamp Control Gear → Particular requirements for DC supplied electronic ballasts for public transport lighting

Reference - Lighting Standards Australia / New Zealand

All standards are current and applicable at time of publishing.

IEC and AS/NZS 61347.2.6

Withdrawn at IEC and is
being withdrawn by AS/NZS.
Replaced by IEC 61347-2-3

Lamp Control Gear

→ Particular requirements for DC supplied electronic ballasts for aircraft lighting

IEC 61347.2.7

Lamp Control Gear

→ Particular requirements for DC supplied electronic ballasts for Emergency lighting

IEC and AS/NZS 61347.2.8

Lamp Control Gear

→ Particular requirements for ballasts for fluorescent lamps (IEC 61347-2-8:2000, MOD)

IEC and AS/NZS 61347.2.9

Lamp Control Gear

→ Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps) (IEC 61347-2-9:2000 MOD)

**IEC and AS/NZS
61347.2.13**

Lamp Control Gear

→ Part 2-13: Particular requirements for DC or AC supplied electronic control gear for LED modules

IEC and AS/NZS 61558.1

Safety of Power Transformers, Power Supplies, Reactors and Similar Products

→ General requirements and test (IEC 61558-1 Ed 2, MOD)

IEC and AS/NZS 61558.2

Safety of Power Transformers, Power Supply Units and Similar Products

→ Particular requirements

Reference - Lighting Standards Australia / New Zealand

All standards are current and applicable at time of publishing.

APPLICATION	
AS/NZS 1158.0	Lighting for Roads and Public Spaces → Introduction
AS/NZS 1158.1.1	Lighting for Roads and Public Spaces → Vehicular Traffic (Category V) Lighting → Performance and design requirements
AS/NZS 1158.1.2	Lighting for Roads and Public Spaces → Vehicular traffic (Category V) lighting → Guide to design, installation, operation and maintenance
AS/NZS 1158.2	Lighting for Roads and Public Spaces → Computer procedures for the calculation of light technical parameters for Category V and Category P lighting
AS/NZS 1158.3.1	Lighting for Roads and Public Spaces → Pedestrian area (Category P) lighting → Performance and design requirements
AS/NZS 1158.4	Lighting for Roads and Public Spaces → Lighting of pedestrian crossings
AS/NZS 1158.6	Lighting for Roads and Public Spaces → Part 6: Luminaires
AS/NZS 1680.0	Interior Lighting → Safe movement (Referenced by ABCB National Construction Code)
AS/NZS 1680.1	Interior and Workplace Lighting → General principles and recommendations

Reference - Lighting Standards Australia / New Zealand

All standards are current and applicable at time of publishing.

AS/NZS 1680.2.1	Interior and Workplace Lighting → Specific applications → Circulation spaces and other general areas
AS/NZS 1680.2.2	Interior and Workplace Lighting → Specific applications → Office and screen-based tasks
AS/NZS 1680.2.3	Interior and Workplace Lighting → Specific applications → Educational and training facilities
AS/NZS 1680.2.4	Interior Lighting → Industrial tasks and processes
AS/NZS 1680.2.5	Interior Lighting → Hospital and medical tasks
AS 1680.3	Interior Lighting → Measurement, calculation and presentation of photometric data
AS/NZS 1680.4	Interior Lighting → Maintenance of electrical lighting systems
AS/NZS 1680.5	Interior and Workplace Lighting → Outdoor workplace lighting
AS 2293.1	Emergency Escape Lighting and Exit signs for Buildings → System design, installation and operation (Referenced by ABCB National Construction Code)
AS/NZS 2293.2	Emergency Evacuation Lighting for Buildings → Inspection and maintenance
AS 2560.1	Sports Lighting → General principles
AS 2560.2.1	Sports Lighting → Specific applications → Lighting for outdoor tennis
AS 2560.2.2	Guide to Sports Lighting → Specific recommendations → Lighting of multipurpose indoor sports centres
AS 2560.2.3	Sports Lighting → Specific applications → Lighting for football (all codes)
AS 2560.2.4	Guide to Sports Lighting → Specific recommendations → Lighting for outdoor netball and basketball

Reference - Lighting Standards Australia / New Zealand

All standards are current and applicable at time of publishing.

AS 2560.2.5	Sports Lighting → Specific applications → Swimming pools
AS 2560.2.6	Guide to Sports Lighting → Specific recommendations → Baseball and softball
AS 2560.2.7	Guide to Sports Lighting → Specific recommendations → Outdoor hockey
AS 2560.2.8	Sports Lighting → Specific applications → Outdoor bowling greens
AS 4282	Control of the obtrusive effects of outdoor lighting

EYE	PHILIPS	SYLVANIA	GE	OSRAM	VENTURE	ILCOS REF-AS/NZ 61231
CERA ARC METAL HALIDE ON HIGH PRESSURE SODIUM REACTOR GEAR						
CMT 50/EX/U	-	-	CMH 50/TT	HCI-TT 50	-	-
CMT 70/EX/U	CDM-TT 70	CMI-TT 70	CMH 70/TT	HCI-TT 70	CM-PLUS TT 70W	MT 70
CMT 70/EX/U/I	-	-	-	-	-	-
CMT 100/EX/U	-	-	CMT 100/TT	HCI-TT 100	CM-PLUS TT 100W	MT 100
CMT 150/EX/HOR	CDM-TT 150	CMI-TT 150	CMT 150/TT	HCI-TT 150	CM-PLUS TT 110W	MT 150
CMT 250/EX/HOR	CDM-TT 250	CMI-TT 250	-	HCI-TT 250	-	MT 250
CERA ARC METAL HALIDE ON MERCURY VAPOUR REACTOR GEAR						
CM 45FLS/EX/HOR	-	CMI 45W/HOR	-	-	-	-
CM 45FLS/EX/BUD	-	CMI 45W/BUD	-	-	-	-
CM 70FLS/EX/HOR	-	CMI 70W/HOR	-	HCI-E/P 70	-	-
CM 115FLS/EX/HOR	-	CMI 115W/HOR	-	-	-	-
CM 230LS/PRO/BUD	-	-	-	-	-	-
CM 230FLS/PRO/BUD	-	-	-	-	-	-
CM 360LS/PRO/BUD	-	-	-	-	-	-
CM 360FLS/PRO/BUD	-	-	-	-	-	-
CMT 220LS/EX/HOR	-	-	-	-	-	-
CMT 360LS/EX/HOR	-	-	-	-	-	-
CMR 115LS/PRO/BUD	-	-	-	-	-	-
CMR 230LS/PRO/BUD	-	-	-	-	-	-
CMR 360LS/PRO/BUD	-	-	-	-	-	-
SELF-BALLASTED MERCURY VAPOUR BT & ELLIPTICAL - CONTROL GEAR NOT REQUIRED						
BHF 100 (E27)	ML 100 ES	-	-	-	-	QB-100-E
BHF 160 (E27)	ML 160 ES	HSB BW 160 ES	ML 160 E27	HWL 160	-	QB-160-E
BHF 250 (E27)	ML 250 ES	-	-	-	-	QB-250-E4-E27
BHF 250 (E40)	ML 250 GES	HSB BW 250 GES	ML 250 E40	HWL 250	-	QB-250-E-E40
BHF 500 (E40)	ML 500 GES	HSB BW 500 GES	ML 400 E40	HWL 500	-	QB-500-E
BHF 750 (E40)	-	-	-	-	-	QB-750-E
BHF 1000 (E40)	-	-	-	-	-	QB-1000-E
STANDARD MERCURY VAPOUR ELLIPTICAL/ BT LAMPS						
HF 50PD (E27)	HPLN50 ES	HSLBW50	H50/27	HQL50W	-	QE-50-H
HF 80PD (E27)	HPLN80 ES	HSLBW80	H80/27	HQL80W	-	QE-80-H
HF 100PD (E27)	-	H38AV-100DX	HR100DX38	-	H38JA-100/DX	QE-100-H
HF 125PD (E27)	HPLN125 ES	HSLBW125	H125/27	HQL125W	-	QE-125-H
HF 175PD (E40)	HPLN175 GES	H37C-175/DX	H175DX39	-	H39KC-175/DX	QE-175-H
HF 250PD (E40)	HPLN250	HSLBW 250	H250DX37/40	HQL250W	H37KC-250/DX	QE-250-H
HF 400PD (E40)	HPLN400	H33GL 400DX HSLBW 400	H400DX33/40	HQL400W	H33GL-400/DX	QE-400-H
HF 700PD (E40)	HPLN700	HSLB700	H700DX35	HQL700W	-	QE-700-H
HF 1000PD (E40)	HPLN 1000	H34GW1000DX HSLBW1000	H1000DX34	HQL1000W	H34GW-1000/DX	QE-1000-H
HF 1000BPD (E40)	-	H36GW1000DX	H1000DX36	-	H36GW-1000/DX	QE-1000-E
STANDARD MERCURY VAPOUR REFLECTOR LAMPS						
HRF 100PD (E27)	-	-	HR100RDXFL38	-	-	QR-100-H
HRF 125PD (E27)	HPLR125	-	-	-	-	QR-125-H
HRF 250PD (E40)	HPLR250	HSR BW 250	H250 R	HQL R 250	-	QR-250-H
HRF 400PD (E40)	#HPLR400	H33DN 400	H400 R	HQL R 400	-	QR-400-H
HRF 700PD (E40)	#HPLR700	-	H700 R	-	-	QR-700-H
HRF 1000PD (E40)	#HPLR1000	-	H1000 R	-	-	QR-1000-H
HRF 100BPD (E40)	-	-	-	-	-	QR-1000-E
HIGH PRESSURE SODIUM OPERATING ON REACTOR GEAR						
NH 75LX (E27)	-	-	-	-	-	SC-75-H/I
NH 75F-LX (E27)	-	SHX69 △	-	-	-	SE-75-H/I
NH 110-LX (E27)	-	-	-	-	-	SC-110-H/I
NH 110F-LX (E27)	SON-H110W △	SHX110 △	SON-H110W △	NAV-E100W △	-	SE-110-H/I
NH 150F-LX (E40)	-	ULX150D △	-	-	-	SE-150-H/I
NH 220-LX (E40)	-	ULX215 △	-	-	-	SC-220-H/I
NH 220F-LX (E40)	SON-H220W △	SHX210 △	SON-H210W △	NAV-E210W △	-	SE-220-H/I
NH 360-LX (E40)	-	ULX360 △	-	-	-	SC-360-H/I
NH 360F-LX (E40)	SON-H350W △	SHX350 △	SON-H350W △	NAV-E360W △	-	SE-360-H/I
NH 660-LX (E40)	-	-	-	-	-	SC-660-H/I
NH 660F-LX (E40)	-	-	-	-	-	SE-660-H/I
NH 940-LX (E40)	-	-	-	-	-	SC-940-H/I
NH 940F-LX (E40)	-	-	-	-	-	SE-940-H/I
NHT 220-LX (E40)	-	-	-	-	-	ST-220-H/I
NHT 360-LX (E40)	-	-	-	-	-	ST-360-H/I
NHT 660-LX (E40)	-	-	-	-	-	ST-660-H/I
NHT 940-LX (E40)	-	-	-	-	-	ST-940-H/I
NHR 75-LX (E27)	-	-	-	-	-	SR-75-H/I
NHR 110-LX (E27)	-	-	-	-	-	SR-110-H/I
NHR 220-LX (E40)	-	-	-	-	-	SR-220-H/I
NHR 360-LX (E40)	-	-	-	-	-	SR-360-H/I
NHR 660-LX (E40)	-	-	-	-	-	SR-660-H/I
NHR 940-LX (E40)	-	-	-	-	-	SR-940-H/I

△ Lower Luminous Flux

Electricity interchangeability. Check physical requirements.

EYE	PHILIPS	SYLVANIA	GE	OSRAM	VENTURE	ILCOS REF:AS/NZ 61231
STANDARD HIGH PRESSURE SODIUM						
NH 70/HV/70S (E27)	-	SHP70/CL/I	LU70/90/I/27	-	-	SC-70-H/I
NH 50F/HV/I/70S (E27)	SON50W-I	SHP50/CO/I	LU/50/90/D/I/27	NAV-E50/I	-	SE-50-H/I
NH 70F/HV/I/70S (E27)	SON70W-I	SHP70/CO/I	LU/70/90/D/I/27	NAV-E70/I	-	SE-70-H/I
NH 70/HV/70S (E27)	-	SHP70/CL/E	LU70/90/27	-	-	SC-70-H/E
NH 70F/HV/70S (E27)	SON70W-E	SHP70/CO/E	L70/90/D/27	NAV-E70E	-	SE-70-H/E
NH 150 (E40)	-	-	-	-	-	SC-150-H/E
NH 250 (E40)	-	-	-	-	-	SC-250-H/E
NH 400 (E40)	-	-	-	-	-	SC-400-H/E
NH 1000 (E40)	-	-	-	-	-	SC-1000-H/E
NH 150F (E40)	SON150	SHP150	LU150/100/D/40	NAV-E150	-	SE-150-H/E
NH 250F (E40)	SON250	SHP250	LU250/D/40	NAV-E250	-	SE-250H/E
NH 400F (E40)	SON400	SHP400	LU400/D/40	NAV-E400	-	SE-400-H/E
NH 1000F (E40)	SON1000W	-	LU1000/D/110	NAV-E1000	-	SE-1000-H/E
NHT 70(E27)	SONT-E70	SHPT70W/E	LU70/90/T12/27	NAV-T70	-	ST-70-H/E
NHT 100 (E40)	SONT-100	SHPT100	LU100/100/T/40	NAV-T100	-	ST-100-H/E
NHT 150 (E40)	SONT150	SHPT150	LU150/100/40	NAV-T150	LU150/100	ST-150-H/E
NHT 250 (E40)	SONT250	SHPT250, LU250	LU250/40	NAV-T250	LU250	ST-250-H/E
NHT 400 (E40)	SONT400	SHPT400, LU400	LU400/40	NAV-T400	LU400	ST-400-H/E
NHT 1000 (E40)	SONT1000	SHPT1000	LU1000 /110/40	NAV-T1000	-	ST-1000-H/E
NHR 150 (E40)	-	-	-	-	-	SR-150-H/E
NHR 250 (E40)	-	-	-	-	-	SR-250-H/E
NHR 400 (E40)	-	-	-	-	-	SR-400-H/E
NHT 1000B (E40)	-	LU1000	LU1000	-	LU1000	ST-1000-E/E
METAL HALIDE ON REACTOR (MV) GEAR (NO IGNITOR)						
M 125-LE/BUH (E27)	-	-	-	-	-	MC-125-H/I
MF 125-LE/BUH (E27)	-	-	-	-	-	ME-125-H/I
M 250-LSH/U (E40)	-	-	-	-	-	-
MF 250-LSH/U (E40)	-	-	-	-	-	-
M 400-LSH/U (E40)	-	-	-	-	-	MC-400-H/I
MF 400-LSH/U (E40)	HPI400WBUS	HSI-HX 400/60/I	-	-	-	ME-400-H/I
MT 400-LSH/BH (E40)	-	-	-	-	-	MT-400-H/I
M 1000-LE/BUH (E40)	-	-	-	-	-	MC-1000-H/I
MF 1000-LE/BUH (E40)	-	-	-	-	-	ME-1000-H/I
STANDARD METAL HALIDE LAMPS						
M 175X/U (E40)	-	M175/U	MVR 175/U	MI175/U/E40	MH175/U	SC-75-H/I
MF 175X/U (E40)	-	M175 C/U	MVR 175/C/U	MI175/C/U/E40	MH175/C/U	SE-75-H/I
M 250X/U (E40)	-	M250/U	MVR 250/U	MI250/U/E40	MH250/U, HIE250	MC-250-H/E
MF 250X/U (E40)	-	M250 C/U	MVR 250C/U	MI250/C/U/E40	MH250/C/U, HIE250C	ME-250-H/E
M 400X/U (E40)	-	M400/U	MVR400/U	MI400/U/E40	MH400/U, HIE400	MC-400-H/E
MF 400X/U (E40)	HPI 400W BU	M400 C/U	MVR 40/C/U	MI400/C/U/E40	MH250/C/U, HIE400C	ME-400-H/E
M 1000BX/U (E40)	-	M1000/U	MVR 1000/U	MI1000/U/E40	MH1000/U	MC-1000-E/E
MF 1000BX/U (E40)	-	M1000C/U	MVR 1000 C/U	MI1000/C/U/E40	MH1000/C/U	ME-1000-E/E
MT 250-BH (E40)	HPIT-250	-	MBI 250T	HQI-T 250W/N/S1	HIT250/HOR/ EURO/4K	MT-250-H/E
MT 400-BH (E40)	HPIT-400	-	KRC 400/T/H/960/440	HQI-T 400W/N/SI	HIT400/HOR/ EURO/4K	MT-400-H/E
MT 1000B-BH (E40)	-	-	-	-	-	MT-1000-E/E
MT 1000B-BH/SRL (E40)	-	-	-	-	-	MT-1000-E/E
MT 1000A-BH/67 (E40)	HPIT-1000	HSIT 1000	-	HQI-T 1000W/D	-	MT-1000-H/E
MT 2000B-BH/L-T (E40)	-	-	-	HQI-T 2000W/N	-	MT-2000-E/I
MRF 400 (E40)	-	-	-	-	-	MR-400-H/E
HIGH OUTPUT METAL HALIDE LAMPS						
M 400SX/BU (E40)	-	MS400 BU*, MS400/PS/BU*	MPR400/VBU/40	-	MS400/BU	MC-400-H/E
MF 400SX/BU (E40)	-	MS400/C/BU*, MS400/PS/C/BU*	MVR400/C/VBU/40	-	MS400/BU	ME-400-H/E
M 1000BSX/BU (GES) (E40) 1000W (Ra65 CLEAR)	-	MS1000/C/BU	MVB1000/C/VBU/40	-	MS1000/C/BU	MC-1000-H/E
MF 1000BSX/BU (GES) (E40)1000W (Ra70 COATED)	-	MS1000/BU	MVR1000/VBU/40	-	MS1000/BU	ME-1000-H/E

*Indicates Quartz Arc Tube **Indicates Ceramic Arc Tube *Denotes electrical compatibility assured, but slight variations in colour temperature & lumen output.



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VOL⁶

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