#### APPLICATION FOR MATERIAL LICENSE

U & NUCLEAR REGULATORY COMMISSION APPROVED BY DAME 3160-0120 Exercise 5-31-87

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION SEND TWO COPIES
OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW
FEDERAL AGENCIES FILS APPLICATIONS MITH:

IF YOU ARE LOCATED IN

U.S. NUCLEAR REQULATORY COMMISSION DIVISION OF FUEL CYCLE AND MATERIAL SAFETY NMSS WASHINGTON, DC. 20668

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT DELAWARE, DISTRICT OF COLUMBIA, MAINE MARYLAND, MARKACHUSETTS, NEW JERSEY NEW YORK, PENNEYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION REGION: NUCLEAR MATERIAL SECTION & 631 PARK AVENUE KING OF PRUSSIA, PA. 19408

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, FUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN IELANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II MATERIAL RADIATION PROTECTION SECTION 101 MARIETTA STREET, SUITE 2900 ATLANTA, DA 30323

PRIVACY ACT STATEMENT ON THE REVERSE

ILLINOIS INDIANA IOWA MICHIGAN MINNESOTA MISSOURI DHIO DR WISCOMSIN SEND APPLICATIONS TO

U.S. NUCLEAR REGULATORY COMMISSION REGION III MATERIALS LICENSING SECTION 199 ROOSEVELT ROAD GUEN ELLYN IL 40137

ARKAMBAS, COLORADO IDAHO KAMBAS LOUISIANA MONTANA NESRASKA NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR RYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION REGION (V. MATERIAL RADIATION PROTECTION SECTION 611 RYAN PLAZA DRIVE, SUITE 1000 ARLINGTON, TX. 78011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON AND U.S. TERRITORIES AND FORSESSIONE IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V MATERIAL RADIATION PROTECTION SECTION 1450 MARIA LANE, SUITE 210 MALNUT ORSEK, LA 94698

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.	REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL
A. NEW LICENSE  S. AMERICANION FOR ICHES NUMBER 31-23515-01E  C. RENEWAL OF LICENSE NUMBER	OSRAM Corp. P.O. Box 7062 Jeanne Drive Newburgh, NY
(a) OSRAM Corp  Charles Street  Maybrook, NY  Mewburgh,	7062 for activity at Charles ive Street, Maybrook, NY NY location)
4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION PETER BL  J. Micha- SUBMITITEMS 5 THROUGH 12 ON EN . 11 PAPER THE TYPE AND SCOPE OF INFORMAT.	el McGarry, III (202) 857-9833
5 RADIOACTIVE MATERIAL . Chemical Anglor physical form and, c. masimum amount which will be presented at any one time. See, attachment	6 PLRPOSEIS FOR WHICH LICENSED MATERIAL WILL BE USED
7 INDIVIDUALISI RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE. N.A.	8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS
8. FACILITIES AND EQUIPMENT N.A.	10 RADIATION SAFETY PROGRAM
11. WASTE MANAGEMENT N.A.	FEE CATEGORY 3.1 AMOUNT ENCLOSED \$60.00
13. CERTIFICATION I MUST ON COMPRHEND BY ADDITION IN THE APPLICANT UNDERSTANDS THE BINDING UPON THE APPLICANT  THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF PREFARED IN CONFORMITY WITH TITLE 10. CODE OF FEDERAL REGULATIONS, PARTIST TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF HARNING. 18 U.S.C. SECTION 1001 ACT OF JUNE 25. 1946, 52 STAT 748 MAKES IT A CO ANY DEPARTMENT OF AGENCY OF THE UNITED STATES AS TO ANY MATTER WITH	OF THE APPLICANT, NAMED IN ITEM 2 CERTIFY THAT THIS APPLICATION IS TS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HERE IN
A Peter A. Bleasb	TITLE
1	TES  A MOULD YOU BE WILLING TO FURNISH COST INFORMATION DOING and THE TOWNS ON ANY S. F., AS ARRONDED ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY S. F., AS ARRONDED ON A RESULATIONS THAT WAY AFFECT YOU? INFO PROJECTION DURING THE IT IS AN ORDER CONTINUES CONTINUES OF THE PROPERTY OF THE P
NOTE OF STREET O	USEONLY
AMOUNT RECEIVED TOWARD NIMES	0310486 851001 B LIC30 23515-01E PDR

### Application for Amendment to License No. 312-3515-01E

### Item

5. Add

Maximum activity per lamp arc tube 120nCi

Maximum activity per starter incorporating glow switch 70nCi

- 6. Add
  - (a) Purpose for which licensed material will be used

The radioactive material, krypton-85, is used as part of the filling gas of lamp arc tubes and of glow switches, to improve the speed of starting and operation.

Completed lamps (containing arc tubes) and starters (containing glow switches) are imported from OSRAM manufacturing locations in Germany for distribution in the United States.

(b) Chemical and Physical Form

The krypton-85 is mixed with the filling gas in the gaseous phase.

- (c) Details of Product Construction
  - (1) For Metal Halide Lamps Type: HQI

HQI-TS 70WNDL (70 watt) HQI-TS 150WNDL (150 watt) HQI-TS 250WNDL (250 watt)

Drawings of typical lamps are attached. Each lamp comprises an outer bulb of transparent quartz, containing an arc tube also of transparent quartz. Metal electrodes sealed into each end of the arc tube connect with the electrical contacts at each end of the outer bulb. Sealing is a simple

annealing process; no other materials are introduced. The filling gas of the arc tube is 100% Argon, mixed with 0.3 millicuries per litre of krypton-85. Variations in construction and filling pressures for each type are shown in Table 1.

(2) For Medical UV Radiation Lamps Type: ULTRAMED

Ultramed UVA/B 400W (400 watt) Ultramed UVA/B 1000W (1000 watt)

Drawings of typical lamps are attached. Each lamp comprises an arc tube of transparent quartz with metal electrodes sealed into each end, connected to the electric contacts. Sealing is a simple annealing process; no other materials are introduced. The filling gas is 100% argon, mixed with 0.08 millicuries per litre of krypton-85. Variations in construction and filling pressures for each type are shown in Table 2.

(3) For Starters (containing glow switches)

Types ST 151 ST 191

Drawings of typical glow switches are attached. Each starter comprises a polycarbonate canister with a bottom plate of laminated plastic which incorporates the two electrical contacts. Within each canister is a radio interference suppression capacitor and a glow switch. The glow switches comprise a sealed glass bottle, inside of which are bi-metal switching contacts. Variations in glow switch construction and filling gas are shown in Table 3.

(d) Method of Containment

See item (c) above.

(e) Testing

(1) For Metal Halide Lamps, Type: HQI

Samples from manufacturing lots are put on long-term burning tests (i.e., the bulbs are lit) to insure conformity with published data.

Prior to final assembly, all arc tubes are checked for leakage. See item (f) below.

Accidental Release to Environment - Each arc tube is enclosed in an outer bulb of quartz, protecting it from damage that would release kr-85 to the environment.

(2) For Medical UV Radiation Lamps, Type: ULTRAMED

Samples from manufacturing lots are put on long-term life tests to insure conformity with published data.

Prior to shipping, each lamp is checked for leakage. See item (f) below.

Accidental Release to Environment - The use of these lamps are restricted to medical UV radiation treatment equipment. The lamps are fully enclosed in the equipment and therefore protected in use against accidental damage that would release kr-85 to the environment.

(3) For Starters, Type: ST(xxx)

Samples from manufacturing lots are life tested, and are required to operate for 5000 consecutive switchings on a cycle of 2 seconds on, 2 seconds off.

Prior to shipping, all starters are checked for leakage. See item (f) below.

Accidental Release to Environment - The glow switches are enclosed by the polycarbonate canisters, protecting them from damage that would release kr-85 to the environment.

(f) Quality Control Procedures.

### Pre-assembly

Quartz, glass materials and canisters are random-checked in factory for dimensions and material thickness. Filling gases are checked for content prior to use to assure that they are chemically correct, and that the activity per litre does not exceed the values given in item (c) above. A check on the bulk supply of filling gas combined with the volume of each arc tube or glow switch insures that the activity of each individual item does not exceed the stated values.

### Finished Product

Finished product is subjected to the following controls. Testing is carried out on 100% of the product shipped to the USA.

(1) For Metal Halide Lamps Type: HQI

Quality control is carried out at the point of manufacture - OSRAM GmbH, Spandau, Berlin, Germany.

Leakage - Prior to final assembly, all arc tubes are held in a sealed container for a minimum of 16 hours. The resultant gas mixture is then analyzed for kr-85 content. If any leakage is detected, the entire lot is rejected. Only arc tubes which pass the leakage test are completed with outer bulbs.

Radioactivity - During final inspection, completed lamps are lit for several minutes to allow a check of electrical and luminous characteristics. Any deviation of arc tube content due to pressure variations or incorrect radioactive content will affect these characteristics, and the item is rejected. This is in addition to the control of the filling gas mixture in the pre-assembly stage.

(2) For Medical UV Radiation Lamps, Type: ULTRAMED

Quality control is carried out at the Nuclear Radiation Department of OSRAM, Munich, Germany.

Leakage - Prior to shipping, each lamp undergoes a leakage test. Arc tubes are held in a sealed container for a minimum of 16 hours. The resultant gas mixture is then analyzed for kr-85 content. If any leakage is detected the entire lot is rejected.

Radioactivity - A random 1% sample is taken to check that the radioactivity does not exceed the values stated in Table 2, and that the radioactive material is krypton-85. This is in addition to the control of the filling gas mixture in the pre-assembly stage.

(3) For Starters, Type ST

Quality control is carried out at the Nuclear Radiation Department of OSRAM, Munich, Germany.

Leakage - The starters are held in a sealed container for 16 hours. The resultant gas mixture is then analyzed. If any leakage is detected, the entire lot is rejected.

Radioactivity - A random 1% sample is taken to check that the radioactivity does not exceed the values stated in Table 3, and that the radioactive material is krypton-85. This is in addition to the control of the filling gas mixture in the pre-assembly stage.

### (g) Labelling and Marking

(1) For Metal Halide Lamps

Model Numbers (Type Numbers)

The following numbers are in use. These numbers are etched on each individual lamp.

HQI-TS70W/NDL HQI-TS150W/NDL HQI-TS250W/NDL

External Making of Each Lamp Carton

Model Number "Arc tube filling gas contains kr-85."

External Marking of Smallest Bulk Package of Complete Lamps

Quantity of Lamps Contained Manufacturer Model Number Lot or Batch Number Quality Control Department Mark

(2) For Medical UV Radiation Lamps

Model Numbers (Type Number)

The following numbers are in use. These numbers are etched on each individual lamp.

UVA/B 400W UVA/B 1000W

### External Marking of Each lamp Carton

Model Number "Filling gas contains kr-85."

## External Marking of Smallest Bulk Package of Complete Lamps

Quantity of Lamps Contained Manufacturer Model Number Lot or Batch Number Quality Control Department Mark

### (3) For Starters

### Model Numbers (Type Number)

The following numbers are in use. These numbers are etched on each individual starter.

ST-191 ST-151

### External Marking of Smallest Bulk Package of Starters

Quantity of Starters Contained Manufacturer Model Number Lot or Batch Number Quality Control Department Mark "Glow switch contains kr-85."

### (h) Quality Control Documentation

A duplicate of the marking on the smallest bulk package is mailed separately by the consigner (OSRAM, Germany) to the consignee (OSRAM Corporation), showing the lot or batch number and the quality control mark.

Smallest bulk packages with the same lot or batch number will be covered by one quality control document.

### (i) Exposure Rate

Exposure rates are shown in Tables 1, 2 and 3.

TABLE 1 - METAL HALIDE LAMPS

	HQI-TS 70WNDL (70 WATTS)	HQI-TS 150WNDL (150 WATTS)	[1] (C. ) (전략) [전략 (전략 ) 다시 (전략 ) [전략 ] (	
Outer bulb material Outer bulb wall thickness(mm)	Transparent Quartz 1.1-1.5	Transparent   Quartz   1.0-1.5	Transparent   Quartz   1.0-1.4	
Arc tube material  Arc tube wall thickness(mm)  Arc tube volume (cm <sup>3</sup> )  Filling pressure(millibar)  KR-85 (nCi)	Transparent Quartz 1.3-1.5 approx 0.9 110 + 10 35	Transparent   Quartz   1.2-1.5   approx 2.5   60 + 4   50	Quartz   1.2-1.7	
Filling gas activity (millicuries/litre)	0.3	0.3	0.3	
Exposure rates:				
<pre>lcm distance form outer bulb surface (millirad/hr) On surface of smallest</pre>	0.003	0.003	0.007	
bulk package (12 lamps) (millirad/hr)	0.004	0.004	0.007	
On surface of individual lamp carton (millirad/hr)	0.002	0.002	0.002	

TABLE 2 - MEDICAL UV RADIATION LAMPS

LTRAMED	ULTRAMED UVA/B 400W	UVA/B 1000W	
Arc tube material  Wall thickness (mm) Arc tube volume (cm <sup>3</sup> ) Filling pressure (millibar) Kr-85 (nCi)	Transparent Quartz 1.3-1.8 approx 4.4 45 + 4 20	lapprox 26.01	
Filling gas activity (millicuries/litre)	0.08	0.08	
Exposure rates:  1cm distance from bulb surface (millirad/hr)	0.0014	0.014	
On surface of individual lamp (millirad/hr)	0.0024	0.021	
On surface of smallest package (millirad/hr)	0.0060	0.012	

TABLE 3 - STARTERS

Starter	Starter ST 191	ST 151	
Canister wall thickness (mm)	0.65-0.95	0.65-0.95	
nottom plate thickness (mm)	1.0	1.0	
Glow switch material Glow switch wall thickness(mm)  Glow switch volume (cm³) Filling gases	glass 0.6-0.75 1.5 Helium Argon Neon	glass	
Filling pressure (millibar) Kr-85 (nCi) Filling gas activity (millicuries/litre)	25 + 2 70	20 + 2 70	
Exposure rates:   lcm distance from canister   surface (millirad/hr)	0.003	0.003	
On surface of smallest bulk (800 pcs) (millirad/hr)	0.006	0.006	

**OSRAM** 

Design Spec.

Metal Halide Lamps

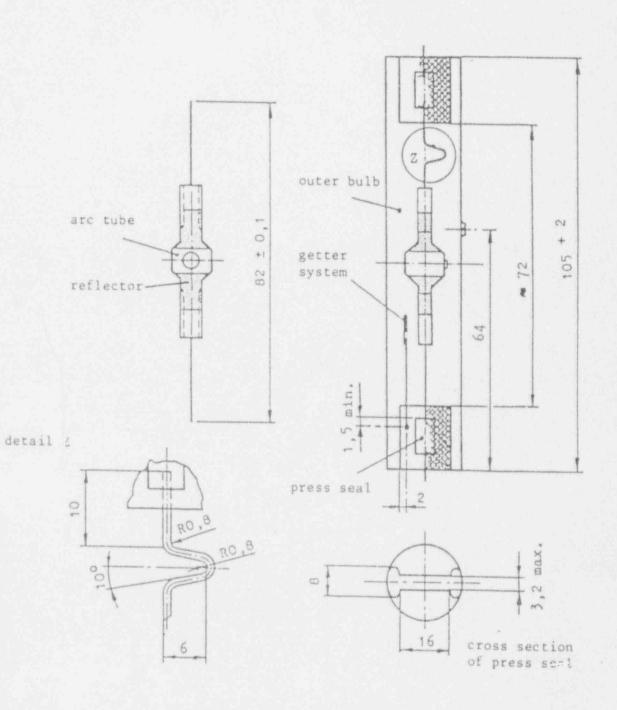
date: 18.3.85

page:

Lamp type:

HQI-TS 70W/NDL

not on scale all dimensions in mm



MANCU Design Spec.

Metal Halide Lamps

page:

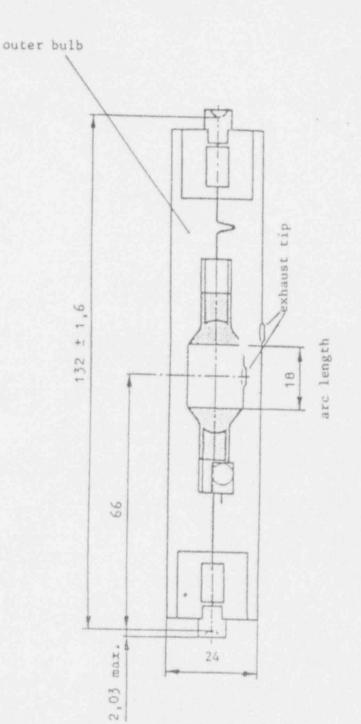
Lamp type:

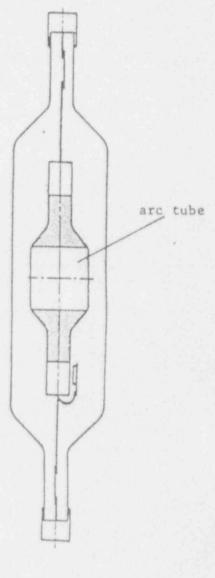
10

date: 19.3.85

I-TS 150W/NDL

not on scale all dimensions in mm





tal Halide Lamps

1 mp type:

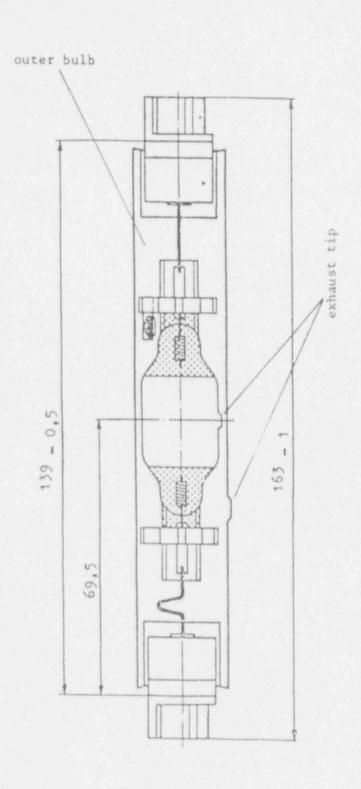
HQI-TS 250 W/NDL

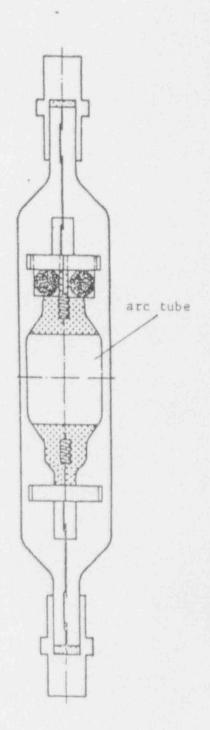
11

Design Spec.

20.3.85 date: page: 1

not on scale all dimensions in mm



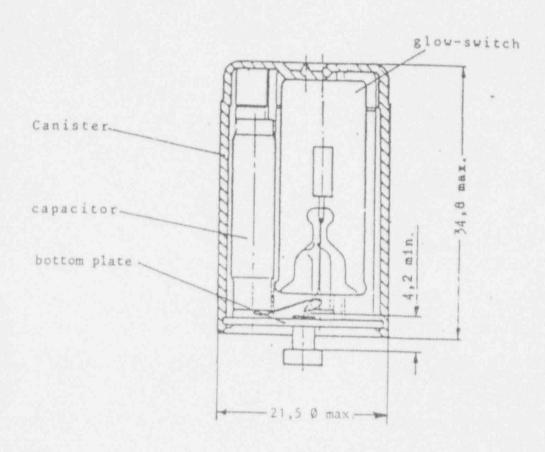


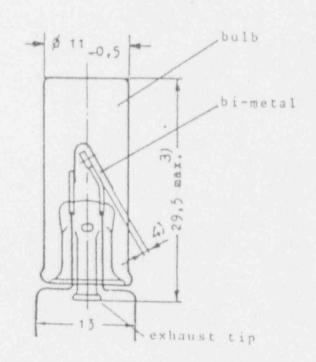
FI./I-M Dr Do

USKAM Design Spec.

Starter

date: 9.4.85 page: 1 ype: St 151





**OSRAM** 

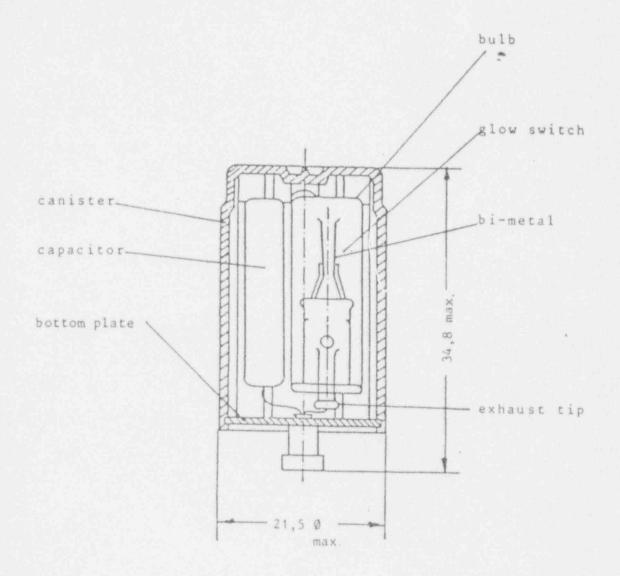
Design Spec.

Starter

'ype: St 191

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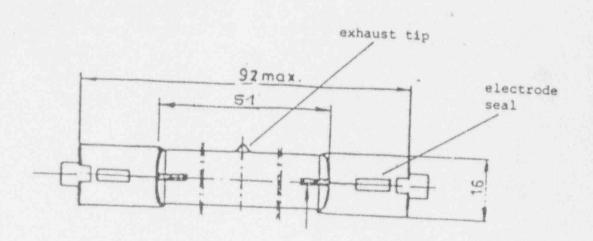
date: 9.4.85 page:



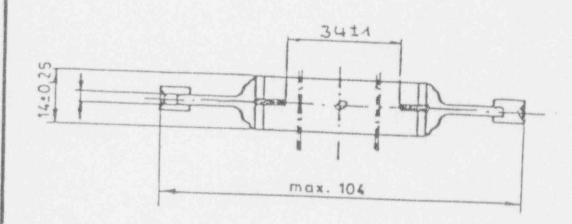
UUILTIII Halide Radiation Lamps Lamp type: Design Spec. JVA/B 400 W. (Ultramed) date. 13.5.85

page: 1

not on scale all dimensions in mm



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OSRAM

Malide Radiation Lamps

Lamp type:

UVA/B 1000 W (Vitasun)

15

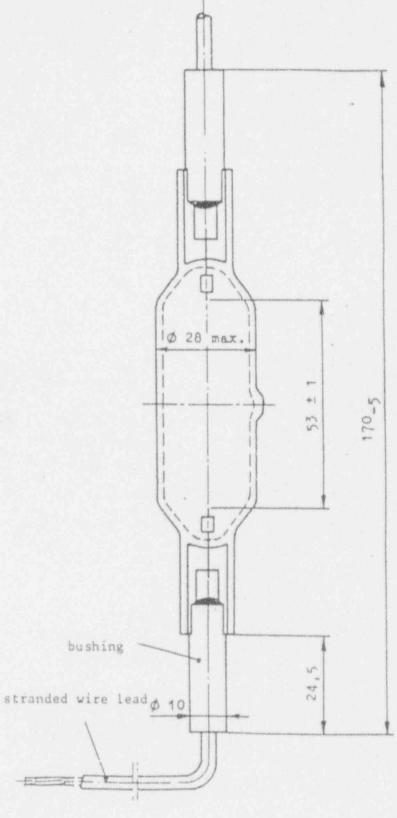
Design Spec.

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all dimensions in mm



Design

Halide Radiation Lamps

Lamp type:

A/B 1000 W (Vitasun)

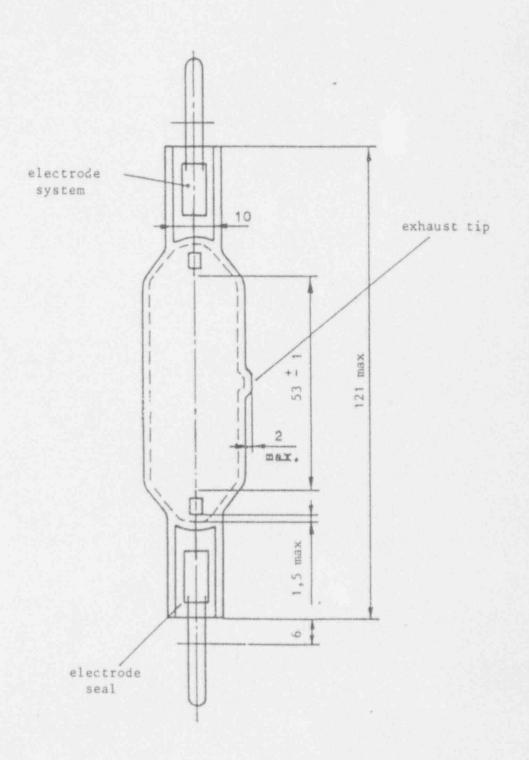
16

Spec. da

date: 21.3.85

page: 2

scale 1:1 all dimensions in mm



Detue: 2 - 20 - 15 | Blatt:

bi-metal --- electrode bulb ..... -flare \_\_cxhaust tube(sealed) lead in wire

Measurements in mm

# DULUX-STM

### OSRAM

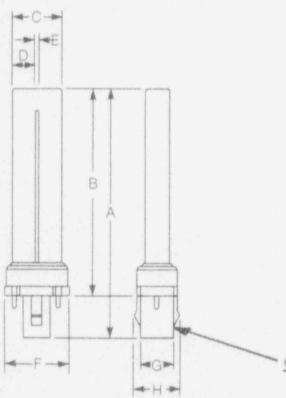
**Compact Fluorescent** 

5-7-9-13 Watt Lamps

**Technical Data** 

### **Physical Information**

dimensions in mm (inches)



	Dukor-S 5W	Dulux-S 7W	Dulian-S SW	Dukes-S 13W
A:	105.0 (4.13)	135.5 (5.33)	167.5 (6.59)	177.0 (6.97)
8:	82.0 (3,23)	112.0 (4.41)	144.0 (5.67)	155.0 (6.10)
C:	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)	27.0 (1.06)
Ď:	12.4 (0.50)	12.4 (0.50)	12.4 (0.50)	12.4 (2.50)
E:	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)
F:	32.5 (1.28)	32.5(1.28)	32.5 (1.28)	32.5 (1.28)
G:	15.8 (0.62)	15.8 (0.62)	15.8 (0.62)	15.8 (0.62)
H:	21.0 (0.83)	21.0 (0.63)	21.0 (0.83)	21.0 (0.83)
Base:	G23	G23	G23	GX23

GLOW SWITCH INCORPORATED IN BASE

### **Technical Information**

	5W	7W	9W	13W
Rated Power (watts):	5.5	7.0	9.0	13.0
uminous Flux and	250	400	600	900
uminous Efficacy (Im/W):	50	57	67	69
amp Current (ampere).	0.180	0.180	0.180	0.300
amp Voltage (V):	35	45	60	60
otor Terreteranges		77	00 K	April 1 and the second
color Rendering Index:		Group	01-86	
perating Poellien			viy	
tarter:		Integrate	ed in Base	
lated Average Life:		10,000 Hrs (based	on min 3 hr per sta	art)
Minimum Starting Temperature (°F)		0.0	AND DESCRIPTION OF THE PROPERTY OF THE PROPERT	Marketine and the State of the

**OSRAM** 

# DULUX-DTM 19

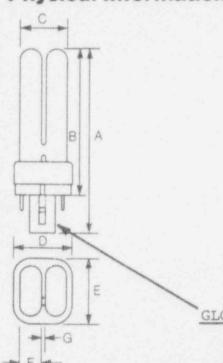
### **OSRAM**

### **Super-Compact Fluorescent**

### 9-13-17-25 Watt Lamps

### **Technical Data**

### Physical Information dimensions in mm (inches)



	Dulux-D 10W	Dulux-D 13W	Dulux-D 18W	Dulux-D 24W
A:	108.0 (4.25)	140.0 (5.51)	170.0 (6.69)	190.0 (7.48)
B:	85.0 (3.35)	117.0 (4.6	147.0 (5.79)	167.0 (6.57)
C:	27.0 (1.06)	27.0	27.0 (1.06)	27.0 (1.06)
D:	34.0 (1.34)	34 (1.34)	4.0 (1.34)	34.0 (1.34)
E:	34.0 (1.34)	(ALCOHOL)	34.0 (1.34)	34.0 (1.34)
F:	12.4 (0.50)	12. (0.50)	12.4 (0.50)	12.4 (0.50)
G:	2.2 (0.00)	2 (0.09)	2.2 (0.09)	2.2 (0.09)
Base:	Gad-N	G24d-1	G24d-2	G24d-3

GLOW SWITCH INCORPORATED IN BASE

### Technical Informati

	Service Control of the Control of th				
	10W	13W	18W	24W	
Nominal Power (watts):	10.0	13.0	17.0	25.0	
Luminous Flux (Im):	600	900	1250	1800	
Luminous Efficacy (Im/W).	67	69	74	72	
Lamp Current (amp):	0.190	0.175	0.200	0.300	
Max Preheat Current (amp):	0.240	0.240	0.240	0.240	
Equivalent Resistance of Cathodes in Series:	160Ω	160Ω	160Ω	160Ω	
Lamp Voltage (V):	60	90	90	110	
Color Temperature:		27	'00 K		
Color Rendering Index:		Group 1 - 86			
Operating Position:	Any				
Starter:	Integrated in Base				
Minimum Ballast Open Circuit Voltage (V):	198	198	198	198	
Rated Average Life:	10,000 + Hrs (based on min 3 hr per start)				
Minimum Starting Temperature (°F)	0° 0° To be determined				

**OSRAM** 

85 FEB 21 AN :20 LEL 23515

OSRAM Corporation Jeanne Drive P.O. Box 7062 Newburgh, New York 12550

February 20, 1985

U.S. Nuclear Regulatory Commission Division of Fuel Cycle and Material Safety, NMSS Washington, D.C. 20555

Gentlemen:

Attached is our application for an exempt-distribution license filed pursuant to 10 C.F.R. §32.14. We have also enclosed a check in the amount of two hundred and ninety dollars (\$290). Please be advised that we are in the process of seeking a possession license from the State of New York.

Peter A. Bleasby

Manager-Commercial Engineering

Enclosure

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