



310 Bishop Ave
Bridgeport, CT 06610

Materials Safety Licensing Branch
Division of Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555

October 4, 2018

Dear Richard Struckmeyer,

This letter is in response to your request for additional information dated September 6, 2018 in regards to our renewal of NRC License # 06-23969-02E and control #609592.

1. We have submitted our renewal for our possession license and responded to their request for additional information.
2. Please refer to the page marked NRC Form 313 Questions 5-11. See answer to Question 5. Please also refer to letter dated July 18 submitted with application section labeled Amount of Gas in Lamps. I believe this information is also listed in Enclosure 10 to this letter.
3. Please see enclosure 1 and 2 attached to this letter. For additional information on construction please refer to letter dated July 18 submitted with application section labeled Details of construction.
4. Please refer to letter dated July 18 sections labeled Measurements and Quality Control. The gas tube is sealed by pinching the ends.
5. Please see the following attachments:
 - Enclosure 3 – Lamp Etch
 - Enclosure 4 – User instruction enclosed in each individual lamp box
 - Enclosure 5 – Individual lamp box label
 - Enclosure 6 – Box Label on case containing 25 individual lamps.
6. Please refer to letter dated July 18 submitted with application section labeled Amount of gas in Lamps. Please also see Enclosure 7, 8 and 9 to this letter.
7. Please refer to enclosure 10 to this letter.

Please feel free to contact me via phone or email with any questions.

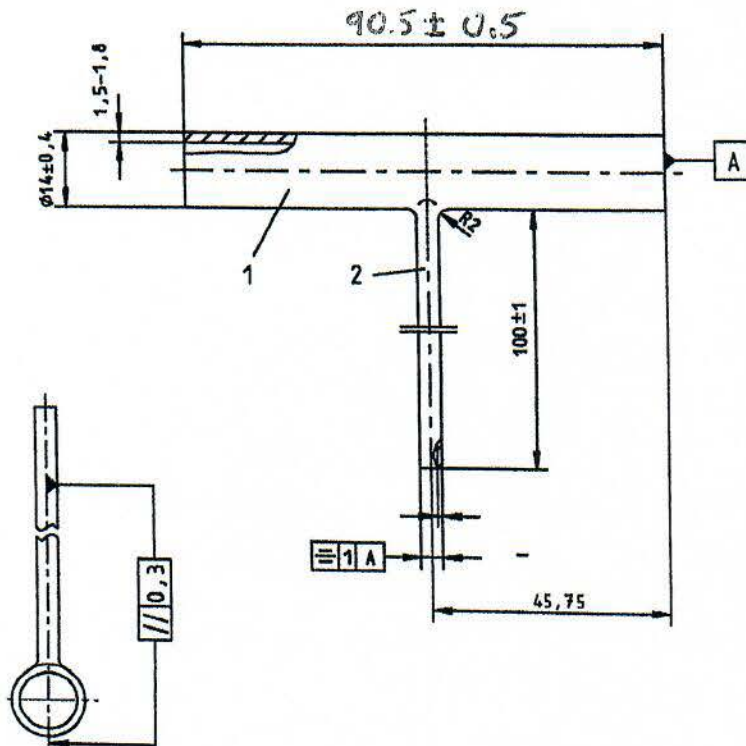
Sincerely,

A handwritten signature in black ink, appearing to read 'RK', with a long horizontal flourish extending to the right.

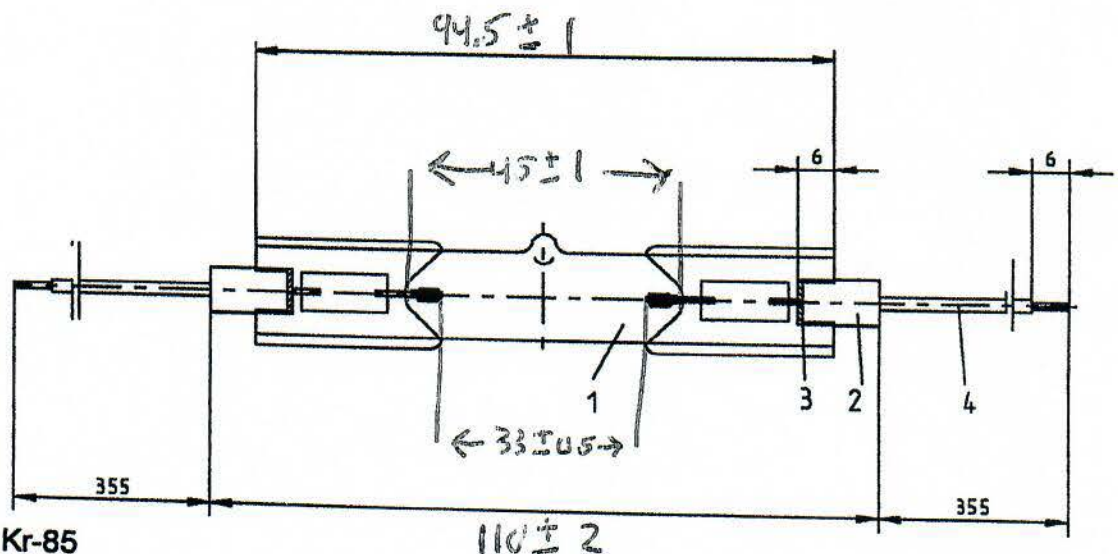
Robert Klem
Superior UV Technologies
917-699-8739

Enclosure:
10 pages labeled

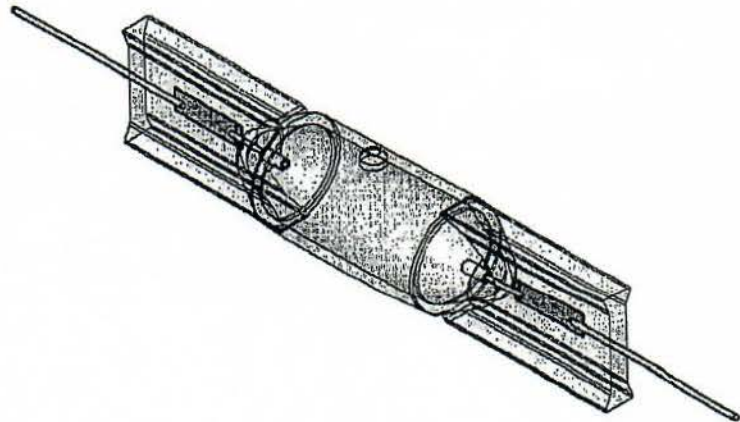
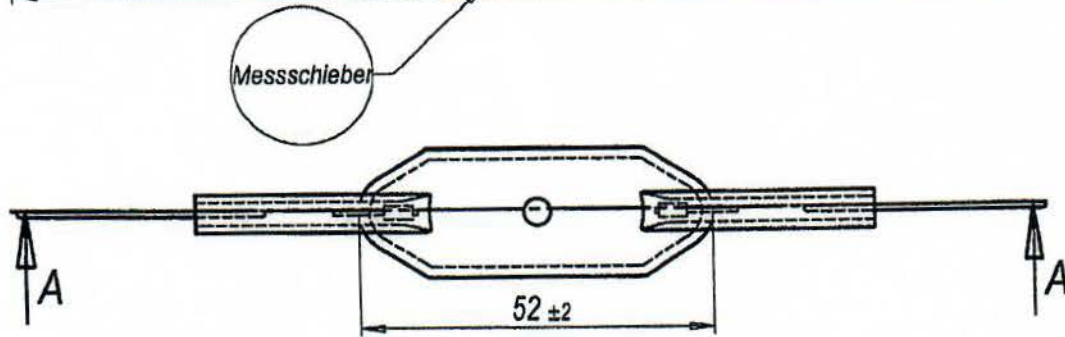
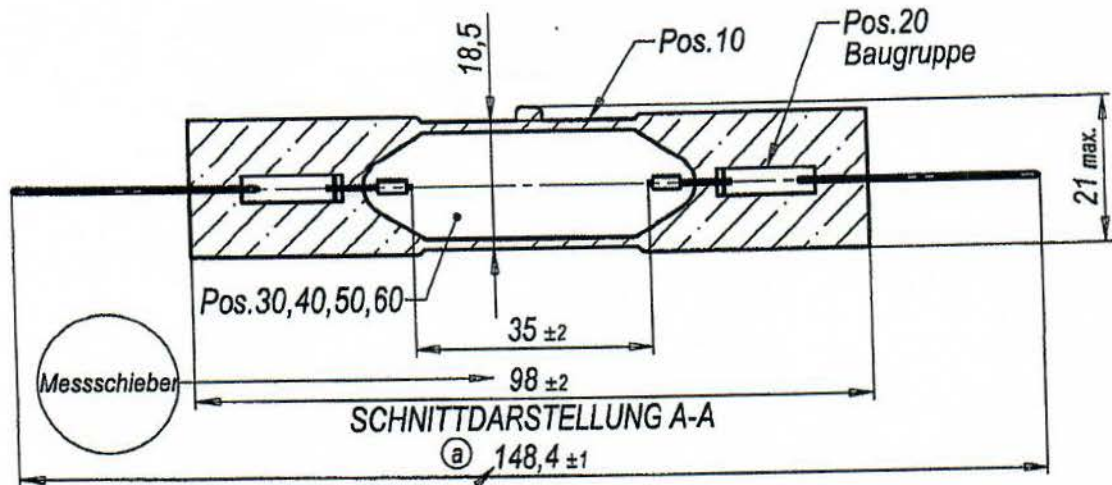
The diagrams below represent a typical arc tube, quartz burner and lamp with socket. The lamp depicted is Solar Elements model #100915 (R7s sockets) or Solar Elements model #100916 (wire leads).



All dimensions shown in millimeters



- 1 – Filling containing Kr-85
- 2 – Ceramic socket
- 3 – Cement to glue the ceramic socket to the quartz arc pinching
- 4 – Wire lead (#100916 only)



Vert.: AV,FB2,EE

Technische Änderungen vorbehalten
subject to be changed without prior notice

BLV Licht- und Vakuumtechnik GmbH
Münchner Str. 10
85643 Steinhöring
www.blv-licht.com
Tel. 08094/906-0; Fax 08094/906-111

ISO
2768mHISO
1302

Maßstab 1:1

1-00/0019/23620000

Artikelnr.: 23620000

	Datum	Name
Bearb.	04.09.06	Mohr
Gepr.	11.9.06	
Norm	11.9.06	

Bezeichnung:

MHL

Zeichnungsnr.:

1-00-0019-00-0051

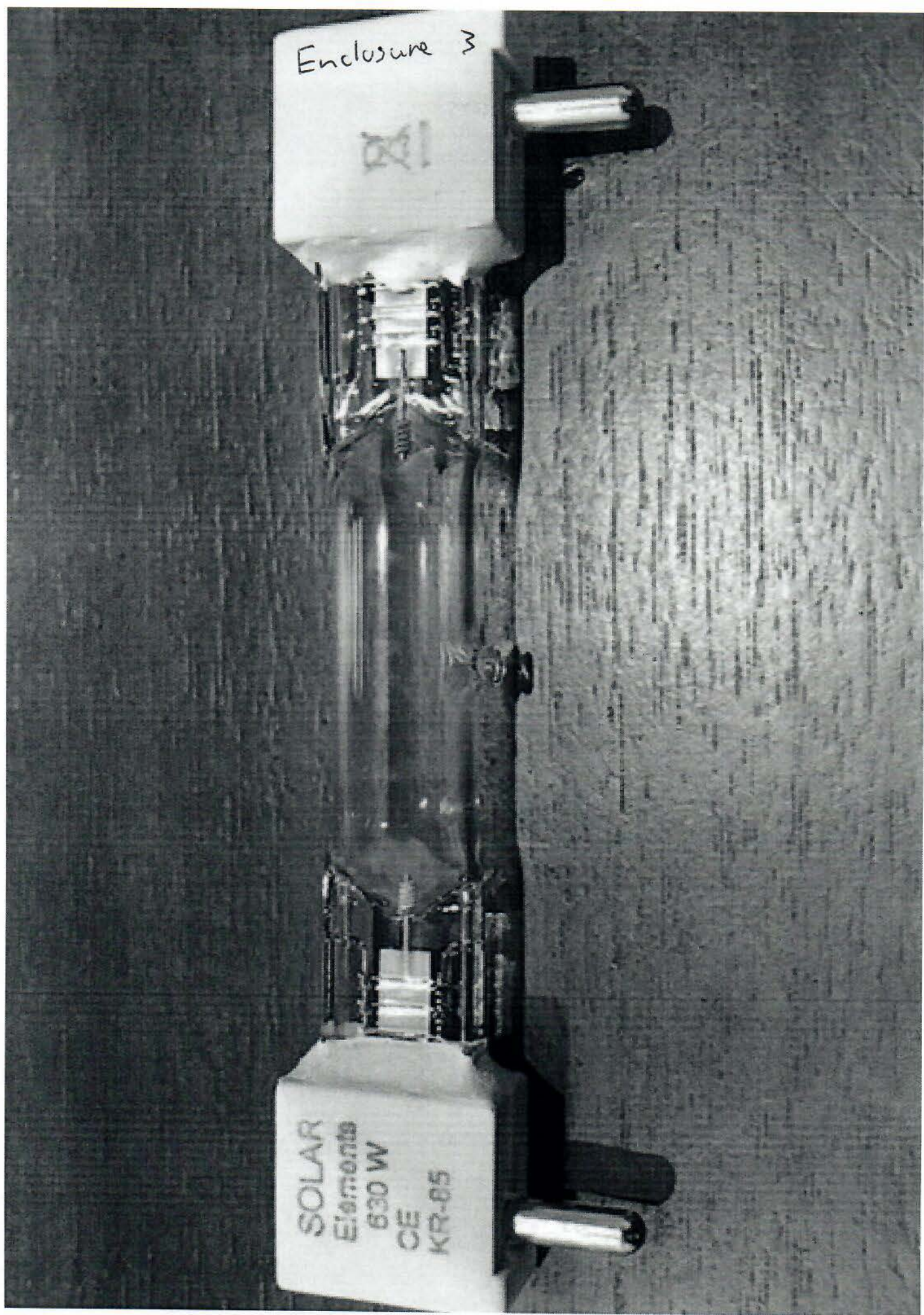
Blatt 1

1 Bl.

a	OAL + Toleranz	11.09.06	MS
Zust.	Änderung	Datum	Name

Enclosure 3

SOLAR
Elements
630 W
CE
KR-85



IMPORTED AND DISTRIBUTED BY



Superior UV Technologies
25 Carriage Drive
Easton, CT 06812
(888) 526-7712

Enclosure 4

User Instructions

THE FOLLOWING INSTRUCTIONS ARE IN COMPLIANCE WITH 'POLICY ON LAMP COMPATIBILITY', 21 CFR 1040.20(e)(2)(iii)

Contraindication: This sunlamp product is contraindicated for use on persons under the age of 18 years.

Contraindication: This sunlamp product must not be used if skin lesions or open wounds are present.

Warning: This sunlamp product should not be used on individuals who have had skin cancer or have a family history of skin cancer.

Warning: Persons repeatedly exposed to ultraviolet sunlamp products should be regularly evaluated for skin cancer.

DANGER - Ultraviolet radiation. Follow instructions. Avoid overexposure. As with natural sunlight, overexposure can cause eye and skin injury and allergic reactions. Repeated exposure may cause premature aging of the skin and skin cancer. **WEAR PROTECTIVE EYEWEAR; FAILURE TO MAY RESULT IN SEVERE BURNS OR LONG-TERM INJURY TO THE EYES.** Medications or cosmetics may increase your sensitivity to the ultraviolet radiation. Consult physician before using sunlamp if you are using medications or have a history of skin problems or believe yourself especially sensitive to sunlight. If you do not tan in the sun, you are unlikely to tan from use of this product.

**Sunlamp - DANGER - Ultraviolet radiation. Follow instructions.
Use ONLY in fixture equipped with a timer.**

Use ONLY in fixture equipped with the appropriate protective filter

**ALWAYS FOLLOW INSTRUCTIONS ACCOMPANYING THE SUNLAMP PRODUCT TO AVOID AND
MINIMIZE POTENTIAL INJURY! ALWAYS WEAR PROTECTIVE EYEWEAR!**

**USE THIS PRODUCT ONLY WHERE THE LAMP IS SPECIFIED AS A REPLACEMENT
OR AS THE ORIGINAL EQUIPMENT PRODUCT BY THE MANUFACTURER!**

Disconnect the fixture before removing and installing the lamp.

Follow the instructions for lamp installation provided in the equipment manual.

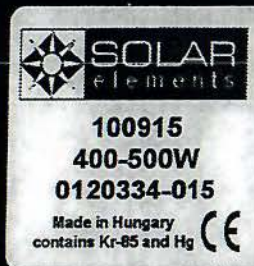
Do not touch the lamp with bare hands. Remove any spots or fingerprints with a clean soft cloth and alcohol.

This product is in conformity with the performance standards for Sunlamp products under 21 CFR 1040.20

**Hg - THIS LAMP CONTAINS MERCURY. MANAGE IN ACCORDANCE WITH LOCAL DISPOSAL LAWS.
SEE WWW.LAMP RECYCLE.ORG OR CALL 1-800-245-4458 FOR LOCAL RECYCLING INFORMATION**

THIS PRODUCT CONTAINS Kr-85. THE PURCHASER IS EXEMPT FROM ANY REGULATORY REQUIREMENTS

PURCHASER SHOULD RETAIN THIS FORM FOR FUTURE REFERENCE



Enclosure 5

25 Pieces



SOLAR
elements

Batch no.:21809111

100917
300-520W
0120334-015

Made in Hungary
contains Kr-85 and Hg



LTH04002-P16-UDP-A16

Enclosure 6



**Aktivität level calculations of the
tanning lamp 23627001**

Ordered Gas from Osram see delivery note: 18.5 MBq/L

Activity level of 1 cm³ is 18.5 kBq at 1 bar = 10⁵ Pa

Activity reduction by filling pressure of only 60 mbar =
 $0.06 \cdot 18.5 \text{ kBq/cm}^3 = 1110 \text{ Bq/cm}^3$

Volume of vessel: length = 4 cm, inner-diameter 1.8 cm
10 cm³

Overall activity $1110 \text{ Bq/cm}^3 \cdot 10 \text{ cm}^3 = 11.1 \text{ kBq}$

NRC Limit for Exempt license lower than 30 $\mu\text{Ci} = 1110 \text{ kBq}$

**Conclusion: The NRC-limit allows 100 time more
activity in one lamp.**

BLV Licht- und Vakuumtechnik GmbH

Münchener Straße 10
85643 Steinhöring
Telefon: +49 (0) 8094 906-0
Internet: www.blv-licht.de
E-Mail: sales@blv-licht.de

Fax Verkauf: +49 (0) 8094 906-164
Fax Verwaltung, Technik: +49 (0) 8094 906-111
Fax Einkauf: +49 (0) 8094 906-136

Geschäftsführer:
Tetsuo Kato
Klaus Ellinger

Bank of Tokyo-Mitsubishi
IBAN DE16 30001 0700 0000 0146 78
Konto, Nr. 511 014 878
Swift code: BOTK DE 33
BLZ: 300 107 00

Handelsregister:
München HRB 55 706
USt-IdNr.: DE131170621
Steuer Nr.: 9159/122/50003

Enclosure 8

Measuring of radiation levels of electron tubes with byproduct material

1. Measurement set up

With a dose meter EG&G LB1236 the background intensity was measured with $0.06 \mu\text{S}$ over 0.49 hours = $0.122 \mu\text{S}$ per hour (see picture lower row). Background activity near Munich given by government measurement are 0.8-1.0 mSv per year ($0.09 - 0.11 \mu\text{Sv}$ per hour) which seems to be comparable. A yearly check report with an inhouse-radiation source sold from Berthold for this device is done.



With arc tube in a distance of 1 cm same measurement was done (see picture). In order to increase the sensitivity we filled this arc-tube with 800 mbar which is at least 20 times more than usual. In addition we omit the absorber but measurements were done in air.

The result is shown in the picture below that we have a dose of $0.13 \mu\text{S}$ in 0.84 hour leading to dose rate of $0.155 \mu\text{Sv/h}$ with arc-tube filled with 20 times higher activity than usually.

Enclosure 9



The difference is about $0.155 - 0.13 \mu\text{Sv/h} = 0.025 \mu\text{S/h}$. The dose conversion factor to the unit of rad is 100 rad/Sv. As a result we calculate 0.0025 mrad per hour which is far under the limit of 1 mrad for quartz lamp vessels filled with 20 times higher activity. Even under this condition one must be aware that natural occurring dose rates are six times higher meaning that normal lamp dose rates are around 50 times lower than natural dose rate.

Dr. Heinz-Jürgen Wesseling/11.10.2017

BLV/Development Department

HP Lamp sales for Superior UV Technologies for 01/01/2017 - 12/31/2017

Lamp Body	Outer diameter	Inner diameter with tolerance +/- 0.15	Arc Length with tolerance +/- 1mm	Total Volume	Volume	uCi at 1 atmosphere	Nominal fill pressure with tolerance +/- 5%	uCi/lamp		
Type	[mm]	[mm]	[mm]	[mm^3]	[Liter]	Volume X 50uCi/litre	(mbar)	Nominal Activity	Quantity Sold	Total uCi/lamp model
250W	14	10.8	15	1373.44	0.001373	0.0687	130	0.00893		
400W	14	10.8	33	3021.56	0.003022	0.1511	130	0.01964		
500W	16	12.8	32	4115.66	0.004116	0.2058	100	0.02058		
600W	16	12.8	45	5787.65	0.005788	0.2894	110	0.03183		
800W	25	21.8	29	10818.84	0.010819	0.5409	160	0.08655		
1000W	28	24.8	48	23174.71	0.023175	1.1587	80	0.09270		
2000W	No Kr85 in 2000W									
Total Sales 2017										

The total radiation activity of all of the lamps sold for 2017 is calculated to be 627 microcuries.

HP Lamp Inventory for Superior UV Technologies Dec. 31, 2017

Lamp Body	Outer diameter	Inner diameter with tolerance +/- 0.15	Arc Length with tolerance +/- 1mm	Total Volume	Volume	uCi at 1 atmosphere	Nominal fill pressure with tolerance +/- 5%	uCi/lamp		
Type	[mm]	[mm]	[mm]	[mm^3]	[Liter]	Volume X 50uCi/litre	(mbar)	Nominal Activity	Quantity Inventoried	Total uCi/lamp model
250W	14	10.8	15	1373.44	0.001373	0.0687	130	0.00893		
400W	14	10.8	33	3021.56	0.003022	0.1511	130	0.01964		
500W	16	12.8	32	4115.66	0.004116	0.2058	100	0.02058		
600W	16	12.8	45	5787.65	0.005788	0.2894	110	0.03183		
800W	25	21.8	29	10818.84	0.010819	0.5409	160	0.08655		
1000W	28	24.8	48	23174.71	0.023175	1.1587	80	0.09270		
2000W	No Kr85 in 2000W									
Inventory Dec 31, 2017										

NRC License Agreement: 0.120 microcuries per source and max storage of 400 microcuries

10
Enclosure