



Test Report issued under the responsibility of:
Intertek Testing Services, NA Inc.

TEST REPORT
IEC 62471
Photobiological safety of lamps and lamp systems

Report Reference No. : 104466224CRT-001
Issue Date : 2020-10-19
Total number of pages : 17

CB Testing Laboratory : **Intertek Cortland**
Address : Intertek Testing Services, NA Inc.
3933 US Route 11
Industrial Park
Cortland, NY 13045
USA

Applicant's name : Energy Harness Corporation
Address : 71 Mid Cape Terrace Suite 8
Cape Coral, FL 33991
USA

Test specification:
Standard : IEC 62471:2006 (First Edition)
Test procedure : cETLus
Non-standard test method : N/A

Test Report Form No. : IEC62471A
TRF Originator : VDE Testing and Certification Institute
Master TRF : Dated 2009-05

Test item description : 2' x 4' Active Air UVC Upper Air Purification Unit

Trade Mark :



Manufacturer : Energy Harness Corporation
Model/Type reference : EHF-UVC-AA2X4-277
Ratings : 120-277 VAC, 50/60 Hz, 1.02A @ 120 VAC, 122W

Testing procedure and testing location:

CB Testing Laboratory:

Testing location/ address: **Intertek Cortland**
Intertek Testing Services, NA Inc
3933 Route 11
Industrial Park
Cortland, NY 13045
USA

Associated CB Laboratory:

Testing location/ address

Tested by (name + signature).....: Kristie Ray *Kristie Ray*
Engineer

Approved by (+ signature): David Ellis *David Ellis*
Senior Project Engineer

Testing procedure: TMP

Tested by (name + signature)

Approved by (+ signature)

Testing location/ address

Testing procedure: WMT

Tested by (name + signature)

Witnessed by (+ signature)

Approved by (+ signature)

Testing location/ address

Testing procedure: SMT

Tested by (name + signature)

Approved by (+ signature)

Supervised by (+ signature)

Testing location/ address

Testing procedure: RMT

Tested by (name + signature)

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Supervised by (+ signature)

Testing location/ address

Summary of testing:	
Tests performed (name of test and test clause): Tests performed (name of test and test clause): 4.2.2 Angular subtense of source and measurement field-of-view 4.3.1 Actinic UV hazard exposure limit for the skin and eye 4.3.2 Near-UV hazard exposure limit for the eye 4.3.3 Retina blue light hazard exposure limit 4.3.4 Retina blue light hazard exposure limit – small source 4.3.5 Retina thermal hazard exposure limit 4.3.6 Retina thermal hazard exposure limit – weak visual stimulus 4.3.7 Infrared radiation hazard exposure limit for the eye 4.3.8 Thermal hazard exposure limit for the skin 5.2.1 Irradiance measurements 5.2.2. Radiance Measurements 5.2.2.2 Alternative method 5.3 Analysis Method 6.1 Continuous Wave lamps – Lamp classification	Testing location: Intertek Cortland Intertek Testing Services, NA Inc 3933 Route 11 Industrial Park Cortland, NY 13045 USA
Summary of compliance with National Differences: EN	
Copy of marking plate: N/A	

Test item particulars

Tested lamp: continuous wave lamps pulsed lamps

Tested lamp system

Lamp classification group.....: exempt risk 1 risk 2 risk 3

Lamp cap: N/A

Bulb: BIINGRII ELECTRONIIC TECHNOLOGY;
S3535P21J0Y001 275nm GL20MIL

Rated of the lamp: Max VF= 7@ 100mA, DC Forward Current = 150

Furthermore marking on the lamp.....: N/A

Seasoning of lamps according IEC standard: No seasoning required

Used measurement instrument.....: See attachment 3

Temperature by measurement.....: 25,3 °C

Information for safety use: See attachment 1

Per Table 1 of IEC 62471-2/TR:2009, at the 20 cm distance the Energy Harness Corporation model EHF-UVC-AA2X4-277 is classified as Exempt for Actinic UV, Near UV, Retinal Thermal Weak Visual Stimulus, Retinal Thermal, Blue Light Radiance Hazard and IR Eye.

Possible test case verdicts:

- test case does not apply to the test object : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement..... : F (Fail)

Testing:

Date of receipt of test item..... : 2020-09-30

Date (s) of performance of tests..... : 2020-10-14

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a comma (point) is used as the decimal separator.
List of test equipment must be kept on file and available for review.

General product information:

The Energy Harness Corporation model EHF-UVC-AA2X4-277 is a 2' x 4' UVC Air Handler. When the Active Airflow UV-C Fixture in full operation, air is drawn through the intake manifold by the centrifugal fan on the opposite side of the fixture. Air travels through the structure's internal chambers, exposing it to 275nm UVC light. The air is drawn through the fixture and exhausted into the room. Sample was tested with the filter removed for worse case results.

The control number is CRT2009301250-001.

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict
4	EXPOSURE LIMITS		
4.1	General		
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure	Information noted	P
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds $10^4 \text{ cd}\cdot\text{m}^{-2}$	see clause 4.3	P
4.3	Hazard exposure limits		P
4.3.1	Actinic UV hazard exposure limit for the skin and eye		P
	The exposure limit for effective radiant exposure is $30 \text{ J}\cdot\text{m}^{-2}$ within any 8-hour period	See table 6.1	P
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, E_s , of the light source shall not exceed the levels defined by:	Equation below	P
	$E_s \cdot t = \sum_{200}^{400} \sum_t E_\lambda(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 30 \quad \text{J}\cdot\text{m}^{-2}$	See table 6.1	P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:	Equation below	P
	$t_{\max} = \frac{30}{E_s} \quad \text{s}$	See table 6.1	P
4.3.2	Near-UV hazard exposure limit for eye		P
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J}\cdot\text{m}^{-2}$ for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, E_{UVA} , shall not exceed $10 \text{ W}\cdot\text{m}^{-2}$.	See table 6.1	P
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:	Equation below	P
	$t_{\max} \leq \frac{10\,000}{E_{UVA}} \quad \text{s}$	See table 6.1	P
4.3.3	Retinal blue light hazard exposure limit		P
	To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$, i.e., the blue-light weighted radiance, L_B , shall not exceed the levels defined by:	Equation Below See table 6.1	P

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Clause	Requirement + Test	Result – Remark	Verdict
	$L_B \cdot t = \sum_{300}^{700} \sum_t L_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t \leq 10^4$ s $t_{\max} = \frac{10^6}{L_B}$	P
	$L_B = \sum_{300}^{700} L_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t > 10^4$ s	P
4.3.4	Retinal blue light hazard exposure limit - small source		
	Thus the spectral irradiance at the eye E_λ , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:	see table 4.2	N/A
	$E_B \cdot t = \sum_{300}^{700} \sum_t E_\lambda(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{J} \cdot \text{m}^{-2}$	for $t \leq 100$ s	N/A
	$E_B = \sum_{300}^{700} E_\lambda \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \text{W} \cdot \text{m}^{-2}$	for $t > 100$ s	N/A
4.3.5	Retinal thermal hazard exposure limit		P
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L_λ , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		P
	$L_R = \sum_{380}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0.25}} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	($10 \mu\text{s} \leq t \leq 10$ s)	P
4.3.6	Retinal thermal hazard exposure limit – weak visual stimulus		
	For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, L_{IR} , as viewed by the eye for exposure times greater than 10 s shall be limited to:		N/A
	$L_{IR} = \sum_{780}^{1400} L_\lambda \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	$t > 10$ s	N/A
4.3.7	Infrared radiation hazard exposure limits for the eye		P
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, E_{IR} , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		P
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0.75} \quad \text{W} \cdot \text{m}^{-2}$	$t \leq 1000$ s	P
	For times greater than 1000 s the limit becomes:		P
	$E_{IR} = \sum_{780}^{3000} E_\lambda \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2}$	$t > 1000$ s	P

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Clause	Requirement + Test	Result – Remark	Verdict
4.3.8	Thermal hazard exposure limit for the skin		P
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:	Equation below	P
	$E_H \cdot t = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda, t) \cdot \Delta t \cdot \Delta \lambda \leq 20\,000 \cdot t^{0,25} \quad \text{J} \cdot \text{m}^{-2}$	See table 6.1	P
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		P
5.1	Measurement conditions		P
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.	Lab conditions 25,3 C 28,7 % RH	P
5.1.1	Lamp ageing (seasoning)		N/A
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.	No seasoning required	N/A
5.1.2	Test environment		N/A
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations.	No specific test environment required by end product standard	N/A
5.1.3	Extraneous radiation		P
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.	No specific test environment required by end product standard	P
5.1.4	Lamp operation		P
	Operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC lamp standard, or	Tested to manufacturer specification	N/A
	– the manufacturer's recommendation	Tested to manufacturer specification	P
5.1.5	Lamp system operation		P
	The power source for operation of the test lamp shall be provided in accordance with:		P
	– the appropriate IEC standard, or	Tested to manufacturer specification	N/A
	– the manufacturer's recommendation	Tested to manufacturer specification	P
5.2	Measurement procedure		P
5.2.1	Irradiance measurements		P
	Minimum aperture diameter 7mm.	100 cm used	P
	Maximum aperture diameter 50 mm.	100 cm used	P

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Clause	Requirement + Test	Result – Remark	Verdict
	The measurement shall be made in that position of the beam giving the maximum reading.	Measurement made in a position to give the maximum reading.	P
	The measurement instrument is adequate calibrated.	Equipment was calibrated as required	P
5.2.2	Radiance measurements	Radiance measurements were derived from the irradiance	P
5.2.2.1	Standard method	Equipment was calibrated as required	N/A
	The measurements made with an optical system.	Radiance measurements were derived from the irradiance	N/A
	The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument.	See above	N/A
5.2.2.2	Alternative method	See above	P
	Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.	See above	P
5.2.3	Measurement of source size		P
	The determination of α , the angle subtended by a source, requires the determination of the 50% emission points of the source.	Irradiance measurements were made with the aperture	P
5.2.4	Pulse width measurement for pulsed sources	Not this type	N/A
	The determination of Δt , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.		N/A
5.3	Analysis methods		P
5.3.1	Weighting curve interpolations		P
	To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.	see table 4.1	P
5.3.2	Calculations		P
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.	The spectral measurements were weighted by the appropriate weighting functions to determine the total weighted energy for each hazard function	P
5.3.3	Measurement uncertainty		P
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	P

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Clause	Requirement + Test	Result – Remark	Verdict
6	LAMP CLASSIFICATION		
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	P
	– for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm	Non-GLS Device	N/A
	– for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm	Measurements made at 200 mm	P
6.1	Continuous wave lamps		P
6.1.1	Except Group		P
	In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		P
	– an actinic ultraviolet hazard (E_s) within 8-hours exposure (30000 s), nor	see Table 6.1 for details Permissible Exposure Time 4,04E+06 Seconds	P
	– a near-UV hazard (E_{UVA}) within 1000 s, (about 16 min), nor	see Table 6.1 for details Permissible Exposure Time 6,82E+08 Seconds	P
	– a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor	see Table 6.1 for details Permissible Exposure Time 4,86E+07 Seconds	P
	– a retinal thermal hazard (L_R) within 10 s, nor	see Table 6.1 for details Permissible Exposure Time 1,43E+17 Seconds	P
	– an infrared radiation hazard for the eye (E_{IR}) within 1000 s	see Table 6.1 for details Permissible Exposure Time 9,98E+09 Seconds	P
6.1.2	Risk Group 1 (Low-Risk)		N/A
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		N/A
	– an actinic ultraviolet hazard (E_s) within 10000 s, nor	Exempt group	N/A
	– a near ultraviolet hazard (E_{UVA}) within 300 s, nor	Exempt group	N/A
	– a retinal blue-light hazard (L_B) within 100 s, nor	Exempt group	N/A
	– a retinal thermal hazard (L_R) within 10 s, nor	Exempt group	N/A
	– an infrared radiation hazard for the eye (E_{IR}) within 100 s	Exempt group	N/A
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 100 s are in Risk Group 1.	Exempt group	N/A

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Clause	Requirement + Test	Result – Remark	Verdict
6.1.3	Risk Group 2 (Moderate-Risk)		N/A
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:	Exempt group	N/A
	– an actinic ultraviolet hazard (E_s) within 1000 s exposure, nor	Exempt group	N/A
	– a near ultraviolet hazard (E_{UVA}) within 100 s, nor	Exempt group	N/A
	– a retinal blue-light hazard (L_B) within 0,25 s (aversion response), nor	Exempt group	N/A
	– a retinal thermal hazard (L_R) within 0,25 s (aversion response), nor	Exempt group	N/A
	– an infrared radiation hazard for the eye (E_{IR}) within 10 s	Exempt group	N/A
	Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard (L_{IR}), within 10 s are in Risk Group 2.	Exempt group	N/A
6.1.4	Risk Group 3 (High-Risk)		N/A
	Lamps which exceed the limits for Risk Group 2 are in Group 3.	Exempt group	N/A
6.2	Pulsed lamps		N/A
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.	Not this type	N/A
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.		N/A
	The risk group determination of the lamp being tested shall be made as follows:		N/A
	– a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)		N/A
	– for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance does is below the EL shall be classified as belonging to the Exempt Group		N/A

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Clause	Requirement + Test	Result – Remark	Verdict

Table 4.1		Spectral weighting function for assessing ultraviolet hazards for skin and eye	
Wavelength ¹ λ , nm	UV hazard function $S_{uv}(\lambda)$	Wavelength λ , nm	UV hazard function $S_{uv}(\lambda)$
200	0,030	313*	0,006
205	0,051	315	0,003
210	0,075	316	0,0024
215	0,095	317	0,0020
220	0,120	318	0,0016
225	0,150	319	0,0012
230	0,190	320	0,0010
235	0,240	322	0,00067
240	0,300	323	0,00054
245	0,360	325	0,00050
250	0,430	328	0,00044
254*	0,500	330	0,00041
255	0,520	333*	0,00037
260	0,650	335	0,00034
265	0,810	340	0,00028
270	1,000	345	0,00024
275	0,960	350	0,00020
280*	0,880	355	0,00016
285	0,770	360	0,00013
290	0,640	365*	0,00011
295	0,540	370	0,000093
297*	0,460	375	0,000077
300	0,300	380	0,000064
303*	0,120	385	0,000053
305	0,060	390	0,000044
308	0,026	395	0,000036
310	0,015	400	0,000030

¹ Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.
 * Emission lines of a mercury discharge spectrum.

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Clause	Requirement + Test	Result – Remark	Verdict

Table 4.2		Spectral weighting functions for assessing retinal hazards from broadband optical sources	
Wavelength nm	Blue-light hazard function B (λ)	Burn hazard function R (λ)	
300	0,01		
305	0,01		
310	0,01		
315	0,01		
320	0,01		
325	0,01		
330	0,01		
335	0,01		
340	0,01		
345	0,01		
350	0,01		
355	0,01		
360	0,01		
365	0,01		
370	0,01		
375	0,01		
380	0,01		0,1
385	0,013		0,13
390	0,025		0,25
395	0,05		0,5
400	0,10		1,0
405	0,20		2,0
410	0,40		4,0
415	0,80		8,0
420	0,90		9,0
425	0,95		9,5
430	0,98		9,8
435	1,00		10,0
440	1,00		10,0
445	0,97		9,7
450	0,94		9,4
455	0,90		9,0
460	0,80		8,0
465	0,70		7,0
470	0,62		6,2
475	0,55		5,5
480	0,45		4,5
485	0,40		4,0
490	0,22		2,2
495	0,16		1,6
500-600	$10^{[(450-\lambda)/50]}$		1,0
600-700	0,001		1,0
700-1050			$10^{[(700-\lambda)/500]}$
1050-1150			0,2
1150-1200			$0,2 \cdot 10^{0,02(1150-\lambda)}$
1200-1400			0,02

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Clause	Requirement + Test	Result – Remark	Verdict

Table 5.4 Summary of the ELs for the surface of the skin or cornea (irradiance based values)					
Hazard Name	Relevant equation	Wavelength range nm	Exposure duration sec	Limiting aperture rad (deg)	EL in terms of constant irradiance $W \cdot m^{-2}$
Actinic UV skin & eye	$E_s = \sum E_\lambda \cdot S(\lambda) \cdot \Delta\lambda$	200 – 400	< 30000	1,4 (80)	30/t
Eye UV-A	$E_{UVA} = \sum E_\lambda \cdot \Delta\lambda$	315 – 400	≤ 1000 > 1000	1,4 (80)	10000/t 10
Blue-light small source	$E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	≤ 100 > 100	< 0,011	100/t 1,0
Eye IR	$E_{IR} = \sum E_\lambda \cdot \Delta\lambda$	780 – 3000	≤ 1000 > 1000	1,4 (80)	18000/t ^{0,75} 100
Skin thermal	$E_H = \sum E_\lambda \cdot \Delta\lambda$	380 – 3000	< 10	2π sr	20000/t ^{0,75}

Table 5.5 Summary of the ELs for the retina (radiance based values)					
Hazard Name	Relevant equation	Wavelength range nm	Exposure duration sec	Field of view radians	EL in terms of constant radiance $W \cdot m^{-2} \cdot sr^{-1}$
Blue light	$L_B = \sum L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$	300 – 700	0,25 – 10	$0,011 \cdot \sqrt{(t/10)}$	10 ⁶ /t
			10-100	0,011	10 ⁶ /t
			100-10000	$0,0011 \cdot \sqrt{t}$	10 ⁶ /t
			≥ 10000	0,1	100
Retinal thermal	$L_R = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	380 – 1400	< 0,25	0,0017	50000/($\alpha \cdot t^{0,25}$)
			0,25 – 10	$0,011 \cdot \sqrt{(t/10)}$	50000/($\alpha \cdot t^{0,25}$)
Retinal thermal (weak visual stimulus)	$L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$	780 – 1400	> 10	0,011	6000/α

IEC 62471			
Clause	Requirement + Test	Result – Remark	Verdict

Table 6.1 Emission limits for risk groups of continuous wave lamps									
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0,001	7,42E-06	0,003	N/A	0,03	N/A
Near UV		E_{UVA}	$W \cdot m^{-2}$	10	1,47E-05	33	N/A	100	N/A
Blue light	$B(\lambda)$	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	2,06E-02	10000	N/A	4000000	N/A
Blue light, small source	$B(\lambda)$	E_B	$W \cdot m^{-2}$	1,0*	N/A	1,0	N/A	400	N/A
Retinal thermal	$R(\lambda)$	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	2545455	233,75	2545455	N/A	2545455	N/A
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	545455	16,15	545455	N/A	545455	N/A
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	5,68E-04	570	N/A	3200	N/A

* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.
 ** Involves evaluation of non-GLS source

Attachment 1

Furthermore remarks:

The subtended angle for the device used in the Energy Harness Corporation model EHF-UVC-AA2X4-277 calculations to determine risk levels was 0,1 radians. The solid angle for the device used in the calculations to determine optical hazard function summations was 0,00785 steradians.

Per Table 1 of IEC 62471-2/TR:2009, the Energy Harness Corporation model EHF-UVC-AA2X4-277 at the 200 mm distance met the exempt group criteria for Retinal Thermal Weak Visual Stimulus, Retinal Thermal, IR Eye Hazards, Actinic UV, Near UV, Blue light Hazard and Skin Thermal Hazards.

Labeling Requirements:

Per Table 1 of IEC 62471-2/TR:2009, Energy Harness Corporation model EHF-UVC-AA2X4-277 is classified as exempt for all hazard categories.

Labeling Requirements: None

Pictures:



Attachment 2

ATTACHMENT TO TEST REPORT IEC 62471 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Photobiological safety of lamps and lamps systems	
Differences according to.....:	EN 62471:2008
Attachment Form No.....:	EU_GD_IEC62471A
Attachment Originator	IMQ S.p.A.
Master Attachment	2009-07
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	GENELEC COMMON MODIFICATIONS (EN)		P
4	EXPOSURE LIMITS		P
	Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB	Information noted	—
	Clause 4 replaced by the following:		P
	Limits of the Artificial Optical Radiation Directive (2006/25/EC) have been applied instead of those fixed in IEC 62471:2006	See appended Table 6.1	P
4.1	General		P
	First paragraph deleted	Information noted	—

Attachment 3

Test Equipment

Equipment				
Description	Model Number	Control Number	Cal Date	Cal Due Date
Hygro-thermometer	Traceable	L202	2020-02-17	2021-02-17
Steel Rule	---	N721	2019-07-11	2022-07-11
Gooch and Housego Spectroradiometer System	Gooch & Housego / OL 750D / 13331416	E288	2020-09-17	2020-10-17
Gooch and Housego-Detector Multiplexor	Gooch & Housego / OL 750-620 / 96101014	E288	2020-02-18	2021-02-18
Gooch and Housego-Automated detector selector	Gooch & Housego / OL 750-630 / 13105048	E288	VBU	VBU
Accessories Box for Automated Spectroradiometric System	Gooch & Housego / OL 750-M-D- Box / none	E288	VBU	VBU
Gooch and Housego-System Controller	Gooch & Housego / OL 750-C Controller/ 95413067	E288	2020-09-17	2020-10-17
Gooch and Housego-DH-310 S-20 PMT Detector Module	Gooch & Housego / OL DH-310 / 02201045	E288	2020-09-17	2020-10-17
Gooch and Housego-DH-320 GE PMT Detector Module	Gooch & Housego / OL DH-320 / 02201045	E288	2020-09-17	2020-10-17
Gooch and Housego-DH-340 PbS Detector Module	Gooch & Housego / OL DH-340/ 08101065	E288	2020-09-17	2020-10-17
Gooch and Housego-Automated detector selector	Gooch & Housego / OL 750-C Controller/ 95413067	E288	2020-09-17	2020-10-17
OL DSM-1D DC Current Mode Detector Support Module	Gooch & Housego / OL DSM-1D DC / 2100171	E288	2020-02-18	2021-02-18
OL DSM-2 AC Voltage Mode Detector Support Module for PbS Detector	Gooch & Housego / OL DSM-2B AC / 195100046	E288	2020-02-18	2021-02-18
OL DSM-1D DC Current Mode Detector Support Module	Gooch & Housego / OL DSM-1D DC / 95100026	E288	2020-02-18	2021-02-18
OL DSM-1D DC Current Mode Detector Support Module	Gooch & Housego / OL DSM-1D DC / 95100027	E288	2020-02-18	2021-02-18
Plug-in Standard of Spectral Irradiance-Spectral Range: 200 nm - 400 nm. For use with OL 750D Monochromator (ICO) to generate UV calibration file	Gooch and Housego / OL 752-12 / 15301082	15301082	2020-04-22	2021-04-22
Optronic OL 730-7Q-2.02M Fiber Optic Probe	Gooch & Housego / OL 730-7Q-2.0 13610400	E288	VBU	VBU
Teflon Cosine Receptor Input Module OL 85-T	Gooch & Housego /OL 85-T/92201085	E288	VBU	VBU
6 inch Diameter Integrating Sphere - 90° ports, PTFE coating, For use with OL IS 670-MOUNT	Gooch & Housego / OL IS-670 / 02100246	E288	VBU	VBU
2 inch Diameter Integrating Sphere - 90° ports, PTFE coating, For use with OL ISA 670-MOUNT	Gooch and Housego / OL IS-270I / 13160087	E288	VBU	VBU
Digital Power Meter	WT1600	E537	2020-02-19	2021-02-19
Current Transformer	411	A203	2020-04-30	2023-04-30