

TEST REPORT IEC 62471 Photobiological safety of lamps and lamp systems

i notobiological safety of lamps and lamp systems		
Report Reference No	GZES180900006131	
Date of issue:	2018-09-25	
Total number of pages:	23	
Testing Laboratory:	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch	
Address:	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China	
:	Guangzhou Tianxin Photoelectric Co., Ltd.	
Address:	#15-1, Jingu South Avenue, Xiutang Village, Huadong Town, Huadu District, Guangzhou, Guangdong, China	
Test specification:		
Standard:		
	☑ EN 62471: 2008	
Test procedure:	SGS-CSTC / Test report	
Non- 6C96 9 : B: = 9	N/A	
Test Report Form No	IEC62471A	
TRF Originator:		
Master TRF:	Dated 2009-05	
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Test item description	LED
Trade Mark:	
Manufacturer:	Same as applicant
Model/Type reference:	TX-R3A140, TX-G3A14, TX-B3A140, TX-Y3A140, TX-W3A140
Ratings:	DC 600 mA



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Testing pro	cedure and testing location:	
⊠ Testi	ing Laboratory:	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch
Testing loc	eation/ address:	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China
☐ Asso	ciated CB Laboratory:	N/A
Testing loc	eation/ address:	BB
Teste	ed by (name + signature):	Simon Cherinon Chen
Appr	oved by (+ signature)::	Alex Tan Hex Tan
☐ Testi	ng procedure: TMP	N/A
Test	ed by (name + signature):	
Appr	oved by (+ signature):	
Testing loc	eation/ address:	
☐ Testi	ng procedure: WMT	N/A
Teste	ed by (name + signature):	
Witn	essed by (+ signature):	
Appr	oved by (+ signature):	
Testing loc	eation/ address:	
☐ Testi	ng procedure: SMT	N/A
Teste	ed by (name + signature):	
Appr	oved by (+ signature):	
Supe	ervised by (+ signature):	
Testing loc	eation/ address:	
☐ Testi	ng procedure: RMT	N/A
Teste	ed by (name + signature):	
Appr	oved by (+ signature):	
Supe	ervised by (+ signature):	
Testing loc	cation/ address:	



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Summary of testing:

The tests were conducted under 600 mA powered by DC current source.

Models TX-R3A140, TX-G3A14, TX-Y3A140 were tested and found to meet the requirement of Exempt Group according to EN 62471: 2008

Models TX-B3A140, TX-W3A140 were tested and found to meet the requirement of Risk Group 1 according to EN 62471: 2008

The test data is based on report GZES141201504431.

Tests performed (name of test and test clause):	Testing location:
All applicable test items.	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou,
	Guangdong, China
Summary of compliance with National Differences:	
European Group Differences and National Differences for EN	62471: 2008 were taken into account.
Copy of marking plate:	

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Test item particulars	
Tested lamp	☐ continuous wave lamps ☐ pulsed lamps
Tested lamp system	
Lamp classification group:	For models TX-R3A140, TX-G3A14, TX-Y3A140 ⊠ exempt For models TX-B3A140, TX-W3A140 ⊠ risk 1
Lamp cap	
Bulb	
Rated of the lamp:	
Furthermore marking on the lamp	
Seasoning of lamps according IEC standard:	
Used measurement instrument	
Temperature by measurement	25 ± 5 °C
Information for safety use:	
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:	2014-12-23
Date (s) of performance of tests	2014-12-23 to 2014-12-29
0	

General remarks:

The test results presented in this report relate only to the object tested.

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"(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.

When determining for test conclusion, measurement uncertainty of tests has been considered.

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General product information:

Model TX-R3A140 can emit red light when powered.

Model TX-G3A14 can emit green light when powered.

Model TX-B3A140 can emit blue light when powered.

Model TX-Y3A140 can emit yellow light when powered.

Model TX-W3A140 can emit white light when powered.



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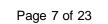
IEC 62471			
Clause	Requirement + Test	Result Remark	Verdic
4	EXPOSURE LIMITS		N/A
4.1	General		N/A
	The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure		N/A
	Detailed spectral data of a light source are generally required only if the luminance of the source exceeds 10 ⁴ cd·m ⁻²	see clause 4.3	N/A
4.3	Hazard exposure limits		N/A
4.3.1	Actinic UV hazard exposure limit for the skin and eye		N/A
	The exposure limit for effective radiant exposure is 30 J·m ⁻² within any 8-hour period		N/A
	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:		N/A
	$E_{s} \cdot t = \sum_{200}^{400} \sum_{t} E_{\lambda}(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 30$ J·m ⁻²		N/A
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		N/A
	$t_{\text{max}} = \frac{30}{E_{\text{c}}}$ s	1	N/A



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	IEC 62471			
Clause	Requirement + Test	Result Remark	Verdict	
	700	4 10 ⁶	N/A	
	$L_{\rm B} \cdot t = \sum_{300}^{700} \sum_{t} L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 10^{6} \qquad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$			
	$L_{\rm B} = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 100 \qquad \qquad W \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t > 10^4$ s	N/A	
4.3.4	Retinal blue light hazard exposure limit - small source	e	N/A	
	Thus the spectral irradiance at the eye E, weighted against the blue-Ax= =6 6 9 C8 > C =6 AXC exceed the levels defined by:	see table 4.2	N/A	
	$E_{B} \cdot t = \sum_{300}^{700} \sum_{t} E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 100 \qquad J \cdot m^{-2}$		N/A	
	$E_{B} = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 1 \qquad W \cdot m^{-2}$	for t > 100 s	N/A	
4.3.5	Retinal thermal hazard exposure limit		N/A	
	To protect against retinal thermal injury, the integrated spectral radiance of the light source, L, weighted by the burn hazard weighting function R() (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by:		N/A	
	$L_{\rm R} = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{50000}{\alpha \cdot t^{0.25}}$ W · m ⁻² · sr ⁻¹		N/A	
4.3.6	Retinal thermal hazard exposure limit weak visual s	stimulus	N/A	
	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	
	$L_{\text{IR}} = \sum_{7 = 0.00}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{6000}{-\alpha} \qquad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	t > 10 s	N/A	
4.3.7	Infrared radiation hazard exposure limits for the eye		N/A	
	The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, $E_{\rm IR}$, over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:		N/A	
	$E_{\text{IR}} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 18000 \cdot t^{-0.75}$ W · m ⁻²		N/A	
	For times greater than 1000 s the limit becomes:		N/A	



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SGS	

IEC 62471			
Clause	Requirement + Test	Result Remark	Verdict
	$E_{\rm IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 10^{-20} \qquad W \cdot \hat{R}$	t > 1000 s	N/A
4.3.8	Thermal hazard exposure limit for the skin		N/A
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		N/A
	$E_{H} \cdot t = \sum_{380}^{3000} \sum_{t} E_{\lambda} (\lambda, t) \cdot \Delta t \cdot \Delta \lambda \le 20000 \cdot t^{0.25}$ J·m ⁻²		N/A
			1
5	MEASUREMENT OF LAMPS AND LAMP SYSTEM	<u>IS</u>	Р
5.1	Measurement conditions	T	Р
	Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.		Р
5.1.1	Lamp ageing (seasoning)		N/A
	Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.		N/A
5.1.2	Test environment		Р
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the 6 %: C6 > C6A 6C96 9 B 6C 68 : recommendations.		P
5.1.3	Extraneous radiation		Р
	Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.		Р
5.1.4	Lamp operation		Р
	Operation of the test lamp shall be provided in accordance with:		Р
	the appropriate IEC lamp standard, or		N/A
	=: B6C 68 : :8 BB: C96 > C		Р
5.1.5	Lamp system operation		Р
	The power source for operation of the test lamp shall be provided in accordance with:		Р
	the appropriate IEC standard, or		N/A
	=: B6C 68 : :8 BB: C96 > n		Р
5.2	Measurement procedure		Р
5.2.1	Irradiance measurements		Р
	Minimum aperture diameter 7mm.		Р



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	IEC 62471		
Clause	Requirement + Test	Result Remark	Verdict
	Maximum aperture diameter 50 mm.		Р
	The measurement shall be made in that position of the beam giving the maximum reading.		Р
	The measurement instrument is adequate calibrated.		Р
5.2.2	Radiance measurements		Р
5.2.2.1	Standard method		N/A
	The measurements made with an optical system.		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.		N/A
5.2.2.2	Alternative method		Р
	Alternatively to an imaging radiance set-up, an irra- diance measurement set-up with a circular field stop placed at the source can be used to perform radi- ance measurements.		Р
5.2.3	Measurement of source size		Р
) =: 9: : B > 26 > C =: 6C < A 7: C9: 9 7 6 source, requires the determination of the 50% emission points of the source.		Р
5.2.4	Pulse width measurement for pulsed sources		N/A
) =: 9: : B > 26 > C =: C B > 26 A A: 9 6 > C 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		Р
5.3.1	Weighting curve interpolations		Р
	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	Р
5.3.2	Calculations		Р
	The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.		Р
5.3.3	Measurement uncertainty		Р
	The quality of all measurement results must be quantified by an analysis of the uncertainty.	see Annex C in the norm	Р
6	LAMP CLASSIFICATION		Р



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	IEC 62471			
Clause	Requirement + Test	Result Remark	Verdict	
			·	
	For the purposes of this standard it was decided that the values shall be reported as follows:	see table 6.1	Р	
	for lamps intended for general lighting service, the hazard values shall be reported as either ir- radiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm		N/A	

for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm



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IEC 62471			
Clause	Requirement + Test	Result Remark	Verdict
	an actinic ultraviolet hazard (E _S) within 1000 s exposure, nor		N/A
	a near ultraviolet hazard (E _{UVA}) within 100 s, nor		N/A
	a retinal blue-light hazard (L _B) within 0,25 s (aversion response), nor		N/A
	a retinal thermal hazard (L_{R}) within 0,25 s (aversion response), nor		N/A
	an infrared radiation hazard for the eye (E _{IR}) within 10 s		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.		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.		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.		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
	for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission		N/A



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	IEC 62471			
Clause	Requirement + Test	Result	Remark	Verdict

able 4.1	Spectral wei	ghting function for assessing u	ultraviolet hazards for sk	in and eye P	
Wav	elength¹	UV hazard function S _{uv}	Wavelength	UV hazard function	
	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 0,00041 0,00037	
	254*	0,500	330		
	255	0,520	333*		
	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	

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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	IEC 62471			
Clause	Requirement + Test	Result	Remark	Verdict

able 4.2	Spectral weighting sources	functions for assessing retinal hazards from	om broadband optical P		
,	Wavelength nm	Blue-light hazard function	Burn hazard function		
	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		1,6		
	500-600	0,16 10 ^[(450-2]	1,0		
	600-700	0,001	1.0		
	700-1050	-7	10 ^{[(700-2}		
	1050-1150		0.2		
	1150-1200		0,2 0,2·10 ^{0,02(1150-}		
	1200-1400		0,02		



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Clause	Requirement + Test	Result	Remark	Verdict

Table 5.4	Summary of the	e ELs for the	surface	of the sl	kin or cornea (irradiance bas	sed values)	Р
Hazard Name	Relevant	equation	raı	length nge m	Exposure duration sec	Limiting aperture rad (deg)	EL in terms stant irra W m	diance
Actinic UV skin & eye	Es	(200	400	< 30000	1,4 (80)	30/	t
Eye UV-A	E _{UVA}		315	400	>1000	1,4 (80)	1000 10	
Blue-light small source	Ев		300	700	>100	< 0,011	100 1,0	
Eye IR	E _{IR}		780	3000	>1000	1,4 (80)	18000/ 1	
Skin thermal	E _H		380	3000	< 10		20000/	0,75

Table 5.5	Sun	mmary of the ELs for the	e retina (radiano	retina (radiance based values)					
Hazard Na	me	Relevant equation	Wavelength range nm	Exposure duration sec	Field of view radians	EL in te constant r W m ⁻²	adiance		
Blue light		L _B !	300 700	0,25 10 10-100 100-10000	0,011 0,1	10 ⁶ , 10 ⁶ , 10 ⁶ ,	/t /t		
Retinal thermal		L _R ! '	380 1400	< 0,25 0,25 10	0,0017		0,25) 0,25)		
Retinal thermal (weak visual stimulus)		L _{IR} ! '	780 1400	> 10	0,011				



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	IEC 6	62471	
Clause	Requirement + Test	Result Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps									
						Emission M	easurement			
Risk	Action spectrum	Symbol	Units	Exempt		Low	risk	Mod	risk	
	'			Limit	Result	Limit	Result	Limit	Result	
Actinic UV	S _{UV}	Es	, B ⁻²	0,001		0,003		0,03		
Near UV		E _{UVA}	, B ⁻²	10		33		100		

Blue light L



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	<u> </u>	- 3	- P	
A	Attachment: European	Group Differences And Nation	nal Differences of IEC 62471	
Clause	Requirement + Test		Result - Remark	Verdict



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	Attachment: European Group Difference	ces And National Differences of IEC 62471	
Clause	Requirement + Test	Result Remark	Verdict

Table 6.1	Emission limit For model TX-		ips of continuo	ontinuous wave lamps (based on EU Directive 2006/25/EC)					
				Emission Measurement					
Risk	Action spectrum	Symbol	Units	Exemp	t	Low	risk	Mod	risk
	op com a			Limit	Result	Limit	Result	Limit	Result
Actinic UV	S _{UV}	Es	, B ⁻²	0,001	0				
Near UV		E _{UVA}	, B ⁻²	0,33	0				
Blue light		L _B	, B ⁻² -1	100	0,3	10000		4000000	
Blue light, small source		E _B	, B ⁻²	0,01*		1,0		400	
Retinal thermal	ı	L _R	, B ⁻² -1		16032				
Retinal thermal, weak visual stimulus**		L _{IR}	, B ⁻² -1	545000					
IR radiation, eye		E _{IR}	, B ⁻²	100	0	570		3200	
Skin thermal		E _H	, B ⁻²	20000/t ^{0.75}		•	0	•	
* (B6AA	8: 9: x 9 6	C >=	69 % C	: 6<×C< > A9	> 6	> 69	9%C		

^{* (}B6AA 8: 9: ×2 9 6 C >= 69 ** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2

The applicable aperture diameters: see 4.2.1

The limitations for the angular subtenses: see 4.2.2

The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.



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	Attachment: European Group Difference	ces And National Differences of IEC 62471	
Clause	Requirement + Test	Result Remark	Verdict

Table 6.1		Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) For model TX-G3A14								
	Action spectrum	Symbol	Units	Emission Measurement						
Risk				Exempt	mpt Low risk		Mod	Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	S _{UV}	Es	, B ⁻²	0,001	0					
Near UV		E _{UVA}	, B ⁻²	0,33	0					

Blue light L_B , B^{-2} -1 100



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Attachment: European Group Differences And National Differences of IEC 62471						
Clause	Requirement + Test	Result Remark	Verdict			

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) For model TX-B3A140							Р		
				Emission Measurement						
Risk	Action spectrum	Symbol	Units	Exemp	t	Low	risk	Mod risk		
	op com um			Limit	Result	Limit	Result	Limit	Result	
Actinic UV	S _{UV}	Es	, B ⁻²	0,001	0					
Near UV		E _{UVA}	, B ⁻²	0,33	0,01					
Blue light		L _B	, B ⁻² -1	100	241	10000	6239	4000000		
Blue light, small source		E _B	, B ⁻²	0,01*		1,0		400		
Retinal thermal	,	L _R	, B ⁻² -1		62393					
Retinal thermal, weak visual stimulus**		L _{IR}	, B ⁻² -1	545000						
IR radiation, eye		E _{IR}	, B ⁻²	100	0	570		3200		
Skin thermal		E _H	, B ⁻²	20000/t ^{0.75}		•	0			
* (B6AA	8: 9: x 9 6	C >=	69 % C	: 6<>E< >A	<u></u> 6 0	s is 0,1 rad	dian.			

⁽B6AA 8: 9: ×C96 C >=

** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2

The applicable aperture diameters: see 4.2.1

The limitations for the angular subtenses: see 4.2.2

The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.



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	Attachment: European Group Difference	ces And National Differences of IEC 62471	
Clause	Requirement + Test	Result Remark	Verdict

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) For model TX-Y3A140							Р		
				Emission Measurement						
Risk	Action spectrum	Symbol	Units	Exempt		Low	Low risk		risk	
	оросичин			Limit	Result	Limit	Result	Limit	Result	
Actinic UV	S _{UV}	Es	, B ⁻²	0,001	0					
Near UV		E _{UVA}	, B ⁻²	0,33	0					
Blue light		L _B	, B ⁻² -1	100	0,2	10000		4000000		
Blue light, small source		E _B	, B ⁻²	0,01*		1,0		400		
Retinal thermal	1	L _R	, B ⁻² -1		686,7					
Retinal thermal, weak visual stimulus**		L _{IR}	, в ^{-2‡ Р.} 1	545000						

IR radiation, eye



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Attachment: European Group Differences And National Differences of IEC 62471					
Clause	Requirement + Test	Result Remark	Verdict		

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) For model TX-W3A140						Р			
				Emission Measurement						
Risk	Action spectrum	Symbol	Units	Exemp	Exempt		risk	Mod	risk	
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	S _{UV}	Es	, B ⁻²	0,001	0					
Near UV		E _{UVA}	, B ⁻²	0,33	0					
Blue light		L _B	, B ⁻² -1	100	133	10000	3768,4	4000000		
Blue light, small source		E _B	, B ⁻²	0,01*		1,0		400		
Retinal thermal	,	L _R	, B ⁻² -1	2	42642					
Retinal thermal, weak visual stimulus**		L _{IR}	, B ⁻² -1	545000						
IR radiation, eye		E _{IR}	, B ⁻²	100	0	570		3200		
Skin thermal		E _H	, B ⁻²	20000/t ^{0.75}			0	•		

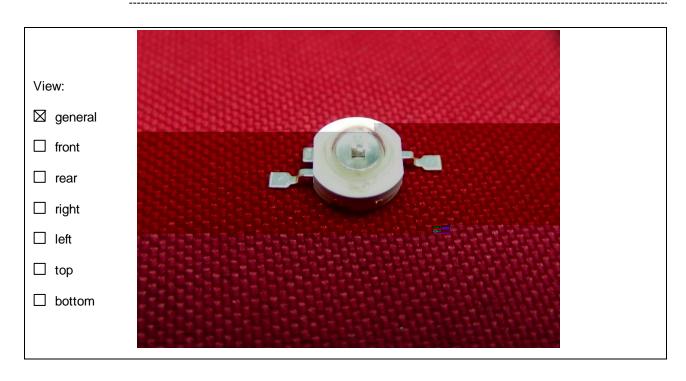
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Attachment: Photo documentation

Details of: View for model TX-R3A140



Details of: View for model TX-G3A14





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Attachment: Photo documentation

Details of: View for model TX-B3A140



Details of: View for model TX-Y3A140





Details of:

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Attachment: Photo documentation

View for model TX-W3A140

View:

☑ general
☐ front
☐ rear
☐ right
☐ left
☐ top
☐ bottom

End of report