

Test report

T-25093573-11-R7



Overall result Pass

Please refer to the following pages for test result summary and notes.

Client information

Client: Mid Ocean Brands B.V.

Address: 7/F, Kings Tower, 111 King Lam Street,

Cheung Sha Wan, Kowloon, Hong Kong



Sample information

Description: MINI TOOL SET WITH LED LIGHT

SKU/style #: IT3874

Country of origin: -Country of distribution: **Europe**

Material/composition: ABS, aluminum

Quantity submitted: 6 pcs

Labeled age grade: -Tested age grade: -

Vendor code: 118518

General information

Sample receipt date: 13-Mar-2025

Testing period: 13-Mar-2025 to 26-Mar-2025

Report date: 31-Mar-2025

QIMA (Hangzhou) Testing Co., Ltd.

Ada Guo

Ada Guo

Physical Laboratory Leader





Result summary

At the request of the client, the following test were conducted:

Test(s) conducted	Conclusion
IEC 62471:2006 Photobiological safety of lamps and lamp systems $^\phi$	Pass
EN 62471:2008 Photobiological safety of lamps and lamp systems ^{ϕ}	Pass

Note:

Test marked with ' $^{\phi}$ ' indicate tests performed in external laboratories. Appendix I attached.

End of the report

The test result(s) and conclusion(s) in this report relate only to the sample(s) as received and the method /regulation section(s) tested as described herein. If it is not further specified in the report, the decision rule for stating conformity is based on the QIMA decision rule. (https://www.qima.com/conditions-of-service#decisionRule). This test report may not be reproduced in whole or in part, without the written approval of QIMA (Hangzhou) Testing Co., Ltd.





Appendix I

Appendix I

The test was performed by QIMA Testing (Shanghai) Limited. Test Report No. T-25143854-13-R1.





Test report

T-25143854-13-R1

Overall result Pass

Please refer to the following pages for test result summary and notes.

Client information

Client: Mid Ocean Brands B.V.

Address: 7/F, Kings Tower, 111 King Lam Street, Cheung

Sha Wan, Kowloon, Hong Kong



Sample information

Description: MINI TOOL SET WITH LED LIGHT

SKU/style #: IT3874

Country of origin: Country of distribution: Europe

Material/Composition: ABS, aluminum

Quantity submitted: 2 pcs

Labeled age grade: -Tested age grade: -

General information

Sample receipt date: 13-Mar-2025 Report date: 28-Mar-2025

Testing period: 13-Mar-2025 to 26-Mar-2025

QIMA Testing (Shanghai) Limited

leslie Thu

Leslie Zhu

Supervisor, Electrical & Electronic Laboratory

Result summary

At the request of the client, the following test were conducted:

Test(s) conducted					
IEC 62471:2006 Photobiological safety of lamps and lamp systems					
EN 62471:2008 Photobiological safety of lamps and lamp systems					
Note: This product is MINI TOOL SET WITH LED LIGHT. Class III. U	Jse the 3 pcs LR4	1 battery, the	e LED is non-r	eplaceable.	
Lamp classification group:	exempt	risk 1	risk 2	risk 3	
Test sample#:T-25143854-13-R-S01					

Verify Report

4	EXPOSURE LIMITS		Р
4.1	General		Р
	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		Р
	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	Р
4.3	Hazard exposure limits		Р
4.3.1	Actinic UV hazard exposure limit for the skin and eye		Р
	The exposure limit for effective radiant exposure is 30 J·m ⁻² within any 8-hour period		Р
	To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, Es, of the light source shall not exceed the levels defined by:		Р
	$E_{\rm s} \cdot t = \sum_{200}^{400} \sum_{t} E_{\lambda}(\lambda, t) \cdot S_{\rm UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 30 \qquad \text{J·m}^{-2}$		Р
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:		Р
	$t_{\text{max}} = \frac{30}{E_{\text{s}}}$ s		Р
4.3.2	Near-UV hazard exposure limit for eye		Р
	For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed 10000 J·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 W·m ⁻² .		Р
	The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:		Р
	$t_{\text{max}} \le \frac{10000}{E_{\text{UVA}}} \qquad \text{s}$		Р
4.3.3	Retinal blue light hazard exposure limit		Р
	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(λ), i.e., the blue-light weighted radiance, L _B , shall not exceed the levels defined by:		Р
	$L_{\rm B} \cdot t = \sum_{300}^{700} \sum_{t} L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 10^6 \qquad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$	for $t \le 10^4 \text{ s}$ $t_{\text{max}} = \frac{10^6}{L_{\text{B}}}$	Р
	$L_{\rm B} = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 100 \qquad \qquad W \cdot m^{-2} \cdot sr^{-1}$	for t > 10 ⁴ s	Р







4.3.4	Retinal blue light hazard exposure limit - small source		NA
	Thus the spectral irradiance at the eye E_{λ_r} weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:	Alpha = 0.0300rad	NA
	$E_{B} \cdot t = \sum_{300}^{700} \sum_{t} E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta t \cdot \Delta \lambda \le 100 J \cdot m^{-2}$ $E_{B} = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 1 W \cdot m^{-2}$	for t ≤ 100 s	NA
	$E_{\rm B} = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta \lambda \le 1 \qquad \qquad W \cdot m^{-2}$	for t > 100 s	NA
4.3.5	Retinal thermal hazard exposure limit		Р
	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:		Р
	$L_{\rm R} = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{50000}{\alpha \cdot t^{0,25}}$ W·m ⁻² ·sr ⁻¹	(10 μs ≤ t ≤ 10 s)	Р
4.3.6	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)	NA	
	where a weak visual stimulus is inadequate to activate the		NA
	$L_{1R} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta \lambda \le \frac{6000}{\alpha} \qquad W \cdot m^{-2} \cdot sr^{-1}$	t > 10 s	NA
4.3.7	Infrared radiation hazard exposure limits for the eye		Р
	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:		Р
	$E_{\text{IR}} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 18000 \cdot t^{-0.75} \qquad \text{W} \cdot \text{m}^{-2}$	t ≤ 1000 s	Р
	For times greater than 1000 s the limit becomes:		Р
	$E_{\rm IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta \lambda \le 100$ W·m ⁻²	t > 1000 s	Р
4.3.8	Thermal hazard exposure limit for the skin		Р
	Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:		Р
	$E_{H} \cdot t = \sum_{380}^{3000} \sum_{t} E_{\lambda}(\lambda, t) \cdot \Delta t \cdot \Delta \lambda \le 20000 \cdot t^{0,25}$ J·m ⁻²		P
5	MEASUREMENT OF LAMPS AND LAMP SYSTEMS		Р
5.1	Measurement conditions		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)		NA





	Seasoning of lamps shall be done as stated in the	NA
- 1 0	appropriate IEC lamp standard.	
5.1.2	Test environment	Р
	For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate	Р
	national standards or manufacturer's recommendations.	P
5.1.3	Extraneous radiation	P
	Careful checks should be made to ensure that extraneous	<u> </u>
	sources of radiation and reflections do not add	Р
	significantly to the measurement results.	
5.1.4	Lamp operation	Р
	Operation of the test lamp shall be provided in accordance with:	Р
	the appropriate IEC lamp standard, or	NA
	the manufacturer's recommendation	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	NA
	the manufacturer's recommendation	Р
5.2	Measurement procedure	Р
5.2.1	Irradiance measurements	Р
	Minimum aperture diameter 7mm.	Р
	Maximum aperture diameter 50 mm.	Р
	The measurement shall be made in that position of the	Р
	beam giving the maximum reading.	•
	The measurement instrument is adequate calibrated.	Р
5.2.2	Radiance measurements	Р
5.2.2.1	Standard method	Р
	The measurements made with an optical system.	Р
	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	Р
	instrument.	
5.2.2.2	Alternative method	NA
	Alternatively to an imaging radiance set-up, an irradiance	
	measurement set-up with a circular field stop placed at	NA
	the source can be used to perform radiance	. 4/ 1
F 2 2	measurements.	
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	Р
	the source.	•
5.2.4	Pulse width measurement for pulsed sources	NA



	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.		NA
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
	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 irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm		NA
	for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm	The distance between lighting surface and detector was 200 mm during the test	P
6.1	Continuous wave lamps		Р
6.1.1	Exempt Group		Р
	In the exempt group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:		Р
	an actinic ultraviolet hazard (E_s) within 8-hours exposure (30000 s), nor		Р
	a near-UV hazard (E _{UVA}) within 1000 s, (about 16 min), nor		Р
	a retinal blue-light hazard (L_B) within 10000 s (about 2,8 h), nor		Р
	a retinal thermal hazard (L _R) within 10 s, nor		Р
	an infrared radiation hazard for the eye (E _{IR}) within 1000 s		Р
6.1.2	Risk Group 1 (Low-Risk)		NA
	In this group are lamps, which exceeds the limits for the except group but that does not pose:		NA
	an actinic ultraviolet hazard (E _s) within 10000 s, nor		NA
	a near ultraviolet hazard (E _{UVA}) within 300 s, nor		NA
	a retinal blue-light hazard (L _B) within 100 s, nor		NA
	a retinal thermal hazard (L _R) within 10 s, nor		NA





		
	an infrared radiation hazard for the eye (E_{IR}) within 100 s	NA
	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.	NA
6.1.3	Risk Group 2 (Moderate-Risk)	NA
	This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:	NA
	an actinic ultraviolet hazard (E_s) within 1000 s exposure, nor	NA
	a near ultraviolet hazard (E _{UVA}) within 100 s, nor	NA
	a retinal blue-light hazard (L_{B}) within 0,25 s (aversion response), nor	NA
	a retinal thermal hazard (L_{R}) within 0,25 s (aversion response), nor	NA
	an infrared radiation hazard for the eye (E _{IR}) within 10 s	NA
	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.	NA
6.1.4	Risk Group 3 (High-Risk)	NA
	Lamps which exceed the limits for Risk Group 2 are in Group 3.	NA
6.2	Pulsed lamps	NA
	Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.	NA
	A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.	NA
	The risk group determination of the lamp being tested shall be made as follows:	NA
	a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)	NA
	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	NA
	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	NA

Table 4.1 Spectral weig	thting function for assessing ultra-	violet hazards for skin and	eye P
Wavelength¹ λ, nm	UV hazard function S _{υν} (λ)	Wavelength λ, nm	UV hazard function S _{υν} (λ)
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	0,00064
303*	303* 0,120 385 0,000		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 mediate wavelengths.



^{*} Emission lines of a mercury discharge spectrum.

ble 4.2	Spectral weighting fur	nctions for assessing retinal hazards from bro	·
V	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-λ)/500]
	1050-1150		0,2
	1150-1200		0,2·10 ^{0,02(1150-λ)}
	1200-1400		0,02





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	ration erture irradiand		EL in terms of constant irradiance W•m ⁻²			
Actinic UV skir & eye	$E_S = \sum E_\lambda \bullet S(\lambda) \bullet \Delta \lambda$	200 – 400	< 30000	1,4 (80)	30/t			
Eye UV-A	$E_UVA = \sum E_\lambda \bullet \Delta \lambda$	315 – 400	≤1000 >1000	1,4 (80)	10000/t 10			
Blue-light sma source	II $E_B = \sum E_\lambda \bullet B(\lambda) \bullet \Delta\lambda$	300 – 700	≤100 >100	< 0,011	100/t 1,0			
Eye IR	$E_{IR} = \sum E_{\lambda} \bullet \Delta \lambda$	780 –3000	≤1000 >1000	1,4 (80)	18000/t ^{0,75} 100			
Skin thermal	$E_H = \sum E_\lambda \bullet \Delta \lambda$	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 du- ration sec	Field of view ra- dians	EL in terms of constant radiance W•m ⁻² •sr ⁻¹)	
				0,25 – 10	0,011•√(t/10)	10 ⁶ /t	
Plue light		- 5 • B() \ • A)	300 – 700	10-100	0,011	10 ⁶ /t	
Blue light		$L_{B} = \sum L_{\lambda} \bullet B(\lambda) \bullet \Delta\lambda$	100-10000	0,0011•√t	10 ⁶ /t		
				≥ 10000	0,1	100	
Retinal		- \(\cdot \) \(\cdot \)	290 1400	< 0,25	0,0017	50000/(α•t ^{0,25})	
thermal		$L_{R} = \sum L_{\lambda} \bullet R(\lambda) \bullet \Delta \lambda$	380 – 1400	0,25 – 10	0,011•√(t/10)	50000/(α•t ^{0,25})	
Retinal thermal (weak visual stimulus)		$L_{IR} = \sum L_{\lambda} \bullet R(\lambda) \bullet \Delta \lambda$	780 – 1400	> 10	0,011	6000/α	

Table 6.1	Emission limit	ts for risk gro	ups of conti	nuous wave	lamps				Р
						Emission M	easurement	:	
Risk	Action spectrum	Symbol	Units	Exe	mpt	Low	risk	Mod	l risk
	op cool ann			Limit	Result	Limit	Result	Limit	Result
Actinic UV	S _{UV} (λ)	Es	W∙m ⁻²	0,001	2.92e-07	0,003	NA	0,03	NA
Near UV		E _{UVA}	W∙m ⁻²	10	1.76e-04	33	NA	100	NA
Blue light	Β(λ)	L _B	W•m ⁻² •sr ⁻	100	4.88e-02	10000	NA	4000000	NA
Blue light, small source	Β(λ)	E _B	W∙m⁻²	1,0*	NA	1,0	NA	400	NA
Retinal thermal	R(λ)	L_R	W•m ⁻² •sr ⁻	28000/α	2.01e+00	28000/α	NA	71000/α	NA
Retinal thermal, weak visual stimulus**	R(λ)	L _{IR}	W•m⁻²•sr⁻	6000/α	1.84e-04	6000/α	NA	6000/α	NA
IR radia- tion, eye		E _{IR}	W∙m ⁻²	100	4.88e+00	570	NA	3200	NA

^{*} Small source defined as one with α < 0.011 radian. Averaging field of view at 10000 s is 0.1 radian.

^{**} Involves evaluation of non-GLS source.

	CENELEC COMMON MODIFICATIONS (EN) EXPOSURE LIMITS				
4					
	Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB		_		
	Clause 4 replaced by the following:				
	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	Р		
4.1	General		Р		
	First paragraph deleted		_		

Table 6.1	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								Р
	Action	Symbol	Units	Emission Measurement					
Risk	spectrum			Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	S _{UV} (λ)	Es	W∙m ⁻²	0,001	2.92e-07	-	-	-	-
Near UV		E _{UVA}	W∙m ⁻²	0,33	1.76e-04	-	1	-	-
Blue light	Β(λ)	L _B	W•m⁻ ²•sr⁻¹	100	4.88e-02	10000	NA	4000000	NA
Blue light, small source	Β(λ)	E _B	W∙m ⁻²	1,0*	NA	1,0	NA	400	NA
Retinal thermal	R(λ)	L_R	W•m⁻ ²•sr⁻¹	28000/α	2.01e+00	28000/α	NA	71000/α	NA
Retinal thermal, weak visual	R(λ)	L _{IR}	W•m⁻ ²•sr⁻¹	545000 0,0017≤ α ≤ 0,011 6000/α	1.84e-04				
stimulus**				$0,011 \le \alpha \le 0,1$	NA				
IR radiation, eye		E _{IR}	W∙m ⁻²	100	4.88e+00	570	NA	3200	NA

^{*} Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.

The action functions: see Table 4.1 and Table 4.2
The applicable aperture diameters: see 4.2.1
The limitations for the applicable aperture of the property of

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.

Note: possible test case verdicts.

P: Pass, Complies with the requirements.

F: Fail, does not comply with the requirements.

NT: Not tested. NA: Not applicable. I: Informative.



^{**} Involves evaluation of non-GLS source

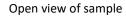
Pictures

Sample photo:

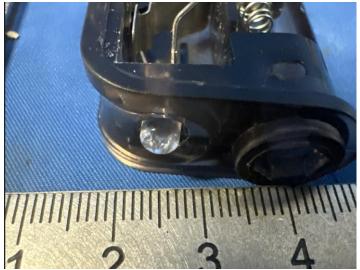




Overview of sample







Overview of LR41

Overview of LED

End of the report

The test result(s) and conclusion(s) in this report relate only to the sample(s) as received and the method /regulation section(s) tested as described herein. If it is not further specified in the report, the decision rule for stating conformity is based on the QIMA decision rule. (https://www.qima.com/conditions-of-service#decisionRule). This test report may not be reproduced in whole or in part, without the written approval of QIMA Testing (Shanghai) Limited.

