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出版日期：2019年09月

LIGHTING & LIGHTING FIXTURE
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"心"标准·新生活
Standard for Life

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首卷语
Preamble

沃特测试是具有多年产品检测经验的专业第三方检测机构，实验室严格按ISO/IEC17025的要求建立，并取得中国合格评定国家认可委员会(CNAS)认可资质、质量技术监督局实验室资质认定(CMA)的资质、国际电工委员会（IECEE）的CB测试实验室资质（CBTL）以及国家质检总局进出口商品检验鉴定业务(AQSIQ)许可资质。同时，公司还是香港机电工程署EMSD认可核证团体、美国国家实验室自愿认可程序NVLAP的认可实验室，美国联邦通讯委员会FCC认可实验室、美国消费品安全委员会CPSC认可实验室、美国能源之星Energy Star认可实验室、美国加州能效CEC注册认可实验室，加拿大工业部IC认可实验室，ELI全球高效照明产品认证认可实验室，是UL、Intertek(ETL-SEMKO)、CSA、TÜV Rheinland、TÜV SÜD等国际权威认证机构的战略合作伙伴和数据认可实验室。

公司是中国第三方检测与检验服务的领先机构，其总部位于深圳、在佛山、东莞、中山、苏州、宁波和香港等地分别设立分支机构，拥有产品安全，EMC电磁兼容，性能和能效，化学测试四大领域的测试能力，作为专业性，综合性，公正性的国际化检测机构，我们秉承科学严谨的工作态度，肩负着中国第三方检测行业发展的重任，诚意的协助每一个客户使其产品达到不断更新的国际标准而不懈努力。

Waltek Services Test Group Ltd. is a professional third-party testing and certification organization with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by CNAS (China National Accreditation Service for Conformity Assessment) AQSIQ, CMA and IECEE for CBTL. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, NVLAP(National Voluntary Laboratory Accreditation Program) ,FCC(The Federal Communications Commission), CPSC(Consumer Product Safety Commission), CEC(California energy efficiency), IC(Industry Canada) and ELI(Efficient Lighting Initiative). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as UL, Intertek(ETL-SEMKO), CSA, TÜV Rheinland, TÜV SÜD, etc.

Waltek Services Test Group Ltd. is one of the largest and the most comprehensive third party testing organizations in China, our headquarter located in Shenzhen and have branches in Foshan, Dongguan, Zhongshan, Suzhou,Ningbo and Hong Kong, Our test capability covered four large fields: safety test. ElectroMagnetic Compatibility(EMC), reliablity and energy performance, Chemical test. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

安全测试服务

在灯具产品的安全标准中，同样也分为IEC和ANSI/UL&CSA两大标准体系，国际电工委员会IEC标准目前为欧洲、澳洲、亚太等绝大多数国家采用，并转换或等同采用为EN、AS/NZS、GB等本国或地区标准。对于灯具产品主要标准为IEC 60598，分为两部分：第一部分是灯具的通用要求。第二部分是特殊要求，分别是固定式、移动式、灯串、应急灯等二十余种灯具的补充要求；镇流器、变压器、驱动及其它灯控装置采用标准EN61347，同样分为两部分：第一部分为灯控装置的安全要求总则。第二部分分别针对钨丝灯、荧光灯、放电灯、霓虹灯等的电子或电感镇流器的补充要求；节能灯光源的标准为EN60968。针对LED灯具、LED光源产品及LED驱动器等三种基本产品分类，其分别沿用各成品或零件之安全标准，对于LED模组新增IEC/EN62031标准，而针对LED光源产品目前推出了“IEC/EN 62560 和IEC/EN 62776 等标准。

ANSI/UL&CSA北美标准系统则与IEC（EN、AS/NZS、GB）标准体系有很大的差别，UL&CSA标准是针对产品而制定不同的标准号，产品标准变得繁多，包括UL1598、UL 153、UL 1573、UL 1574、UL 962、UL 1786、UL924、UL1993、UL588、UL935、UL1029、UL1012、UL2161及相应的CSA规范；北美针对LED产品亦推出了UL8750标准，结合各实际应用产品标准一同使用。

对于浴室、花园等潮湿、户外等场所使用灯具，亦需要进行IP code的测试，IP等级是指电气设备的防尘和防水等级，IP等级中两位代码的具体含义请参考IEC/EN 60529。除此之外，沃特测试还能提供IK外壳机械防护等级等安全方面的测试。

在国际认证方面，我们亦提供CB、GS、TÜV、ENEC、SEMKO、SAA、SABS、UL、CSA、ETL、KC、PSE等各国认证服务，为企业的产品畅行全球保驾护航。

Safety testing service

Here are two lighting standard systems IEC and ANSI/UL&CSA in lighting safety. IEC standard is adopted by most of Europe ,Australia, Asia regions, and transfer into EN,AS/NZS,GB etc local or regional standard. The main standard of lighting should be IEC 60598, it can be divided into two parts: 1st part should be common demand and 2nd part is the additional requirement of fixed lamp, portable lamps, light strings, emergency lights etc. The ballast, transformer, drivers and other lighting control device should follow EN 61347, it can also divided into two parts: 1st part is the general requirement of lighting control device, the 2nd part is the additional requirement for incandescent lamp, fluorescent lamps, discharge lamps, neon lights and other electronic or inductance ballast. Energy saving bulbs follow EN 60968. While the LED lighting, LED light source and LED device ect three basic class products, they should follow the finished products and components safety standard accordingly. LED module have IEC/EN 62031 in addition. While LED light source have IEC/EN 62560 ,IEC/EN 62776 standards etc.
There is big difference between North America standard system and IEC(EN,AS/NES,GB) system. UL&CSA standard have different standard according to different items, they become numerous product standards, such as UL1598, UL153, UL1573, UL1574, UL962, UL1786, UL924, UL1993, UL588, UL935, UL1029, UL1012, UL2161 and the CSA regulation. The LED follow UL8750 and combined with the practical application standards in North America.

For the lighting used in bathroom, garden etc moist and outdoor, they need to arrange IP code test. IP code is stand for dust proof and water proof level of electrical equipment, the details concept of these two code can refer to IEC/EN 60529. Waltek can also provide IK shell level for mechanical protection safety test in additional.

Waltek can also provide CB, GS, TÜV, ENEC, SEMKO, SAA, SABS, UL, CSA, ETL, KC, PSE ect international certification service .

EMF

由于电磁场(electromagnetic fields, EMF) 对人体会造成头晕、呕吐、罹患儿童白血病、成人恶性脑瘤、肌萎缩侧索硬化症、丧失生育功能、癌症等，严重危害着人类的健康。所以在照明领域，为保护暴露其中的人体头部和躯干的中枢神经系统组织，减少其对人身造成的影响，需建立一个评价在照明设备周围空间电磁场的合理方法—即IEC/EN62493标准。

IEC/EN62493的应用范围

本标准应用于照明设备涉及人体暴露于电磁场的评估。该评估由照明设备周边的20 kHz 到10 MHz感应电流密度和100 kHz 到300 MHz的特殊吸收比(SAR)组成

适用产品范围

用于照明为目的,具有产生和分配光的基本功能,并打算连接到低压供电网络上或者用电池工作的所有室内和室外照明设备；一般照明设备指所有工业，住宅，公共场所和街道照明设备；主要功能之一是照明的多功能设备的照明部分。

EMF

Electromagnetic fields, EMF, may lead to dizziness, vomiting, children leukemia, adult malignant brain tumors, amyotrophic lateral sclerosis, loss of reproductive function, cancer etc serious harm. In the lighting field, considering the protection for the central nervous system organization of exposed human head and torso, reducing to human impact, a reasonable evaluation method in the lighting periphery space electromagnetic fields need to establish – the EN62493 standard.

IEC/EN62493 application scope

electromagnetic fields. The assessment is composed of the current density from 20 kHz to 10 MHz via lighting fixture periphery and the special absorption ratio (SAR) from 100 kHz to 300 MHZ.

Application scope

The items major for all indoor and outdoor lighting equipment for lighting purpose has the basic function of light production and distribution, connect to low voltage power supply network or work with battery. General lighting use in industrial, residential, public and street lighting , or the products major function is for lighting and can combine with other multi-function.

EMC测试服务

电磁兼容性(EMC,electromagnetic compatibility) 是指设备或系统在其电磁 环境中符合要求运行并不对环境中的任何设备产生无法忍受的电磁干扰的能力。EMC包括两个方面的要：一方面是指设备在正常运行过 程中对所在环境产生的电磁干扰不能超过一定的限制(EMI)；另一方面是指器具对所在环境中存在的电磁干扰具有一定程度的抗扰度,即电磁敏感性(EMS)。

除了白炽灯(包括卤钨灯在内的所有白炽灯)且未装有调光装置或电子开关,无需进行 EMC 测试外,其他灯具都需进行EMC测试,其它无电子装置的灯具可免做EMS测试。

射频灯具(如:放电灯)应符合FCC part18 部分的要求,认证模式需选择"供应商的符合性申明" (Supplier's Declaration of Conformity即SDoC)或"认证"(Certification)。

LED照明灯具和其他照明灯具应符合 FCC 第15部分的要求，并符合供应商的符合性声明（ SDoC ）或美国认证。

我们沃特测试能够协助提供的服务包括但不仅限于:

EMC testing service

Electromagnetic compatibility (EMC ,electromagnetic compatibility) refers to the equipment or system in its electromagnetic environment and the ability to meet the requirements for running in their environment electromagnetic interference of any equipment of intolerable. EMC includes two requirements : on the one hand refers to the electromagnetic interference device during normal operation of the environment can not exceed a certain limit (EMI); on the other hand refers to the immunity to electromagnetic interference appliances present in the environment in a certain degree,that means electromagnetic susceptibility(EMS).

All the lighting fixture should arrange EMC test,except for incandescent lamps(including halogen lamps)and without dimmer device or electrical switch.

The RF lighting device （for example discharge lighting fixture) should comply with FCC part 18 requirement and complete with Supplier's Declaration of Conformity (SDoC) or Certificationin United State.

The LED lighting fixture and other lighting fixture should comply with FCC part 15 requirement and complete with Supplier's Declaration of Conformity(SDoC)or Certification in United State.

Waltek can assist to offer but not limit as below services:

测试项目/测试标准 Testing Item/Testing standard	
灯具类产品的电磁波干扰检测/CISPR15，EN55015 Electromagnetic Interference Detection For Lighting Products/CISPR15，EN55015	雷击抗干扰检测/ IEC/EN 61000–4–5 Surge/ IEC/EN 61000–4–5
灯具类产品的电磁抗干扰检测/IEC/EN61547 Electromagnetic Immunity Test of Lighting Products/IEC/EN61547	传导抗干扰检测/ IEC/EN 61000–4–6 Conducted Susceptibility/ IEC/EN 61000–4–6
电流谐波检测IEC/EN61000–3–2 Harmonics Current EmissionIEC/EN 61000–3–2	工频磁场抗干扰检测/ IEC/EN 61000–4–8 Power Frequency Magnetic Field Immunity Test/ IEC/EN 61000–4–8
电压闪烁检测IEC/EN 61000–3–3 Voltage Fluctuations FlickerIEC/EN 61000–3–3	电压瞬降抗干扰检测/ IEC/EN 61000–4–11 Voltage Dips and Interruptions/ IEC/EN 61000–4–11
静电放电抗干扰检测/IEC/EN 61000–4–2 Electrostatic Discharge Interference Detection/IEC/EN 61000–4–2	工业、科学、医疗设备/ FCC part18 Industry, Science, Medical Equipment/ FCC part18
辐射抗干扰检测/IEC/EN 61000–4–3 Radiated Immunity/IEC/EN 61000–4–3	含有无意辐射源和有意辐射源的产品/FCC part15 Product that have intentional radiation source and unintentional radiation source/FCC part15)
快速脉冲群抗干扰检测/IEC/EN61000–4–4 Electrical Fast Transients/IEC/EN 61000–4–4	

光生物安全

降低光辐射带来的光生物危害

您能确定您生产的灯和灯系统安全无虑吗？在过去，您也许会觉得这些仅仅与安全和电磁兼容测试有关，而今，需被一并纳入标准的还有光生物安全这一要素。总所周知，过量的辐射会引发眼睛和皮肤方面的疾病 。

光生物安全标准 IEC/EN 62471 评估了各种灯或其他宽带光源的光辐射危害,在标准中,全波段测试范围为 200nm到 300nm，包含了紫外线 、可见光以及红外线 。除了针对产品能量等级的要求外，增加了光生物方面的要求 ，包括辐射强度，辐射亮度等，并根据数据对此产品进行危害分级 ，包括豁免级 ，低危害，中等危害 ，高危害级别 。IEC/EN62471 主要是对宽波段的光进行测量 ，并综合人眼及皮肤对光反应的时间 ，角度，敏感度等进行计算 。

适用产品范围

对除激光以外的所有灯和灯系统 。它不仅对 LED 灯作出相应规定，产品范围还覆盖了白炽灯、荧光灯、气体放电灯、电弧度以及其他照明产品。

关于家用的非定向灯的能效要求的欧盟发挥 244/2009 也同时指定关于UV含量（ UVA/UVB/UVC ）的测试需要按照IEC/EN62471执行（ 包括节能灯/白炽灯/卤素灯 ）。

蓝光危害

IEC 62471针对照明产品的光生物安全作出了描述，以及测试要求及规范，而新型的照明产品，特别是LED产品的应用，导致了照明产品里存在更多的蓝光，而蓝光危害则是在各种颜色的光的危害里，影响最大的一种。因此，2014年，IEC颁布了专门针对照明产品的蓝光危害的标准，或者应该称之为技术报告 —— IEC / TR 62778(Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires ，IEC 62471 中关于光源与灯具中蓝光危害评估的应用 ）。 在IEC 60598–1 第8版中标记和结构的要求中也增加了蓝光危害的相关要求，在引出一些新的概念，如蓝光危害、危险组(RG)，Ethr等的同时 ，也规定了灯具蓝光危害的评价要按照 IEC TR 62778 的要求进行检测和判定 。此标准的制订 ，明确的规定了针对蓝光危害的检测方法以及对辐射能量的限值，从而对控制照明产品对人或其它生物所造成的危害起到一个非常好的效果。一般来说，蓝光在白炽灯泡中存在的量是比较少的，而在荧光灯中存在会稍大于白炽灯 ，而目前的LED灯则是蓝光存在最多的。而对于目前来说，LED作为一种绿色的节能的照明产品，具有许多的优点，比如说寿命长 ，能量损耗低等等 。这样就需要我们对目前广泛应用的LED灯具进行认真的检测与严格的控 制，保留出符合要求的产品，对人们不会有伤害的产品，而淘汰掉哪些对人们有伤害的产品。

Biological Safety

Reduce the optical radiation bring from biological hazard

Are you sure what the lighting and lighting system you produce should be completely safety ? You may think it should be only refer to safety and electromagnetic compatibility testing in the pass . The biological safety should also need to add into our demand nowadays . As it is well known to all , excess radiation will cause eye and skin sickness .

The biological safety IEC/EN 62471 requirement has assessed the optical radiation hazard from all kinds of lighting and broadband light source. This demand identify the wave band test scope should be from 200nm to 300nm , including UV , visible light and infrared ray . Beside the product energy class requirement , it need biological demand in additional , such as radiation intensity , radiance etc . In parallel , the test data should be identified with as exemption , low , middle , high hazard rating . The IEC/EN 62471 major focus on the wide wave band light testing , consolidate calculation the eye & skin reaction time to light , angle , sensitivity etc .

Application scope

All the lighting and lighting systems except for laser. It not only have relevant request for LED , but also cover the incandescent , fluorescent , gas discharge lamps , arc lamps and other lighting products .

EU regulation 244/2009 has energy efficiency test requirement for the domestic non–directional lights , it also show the special test requirement that the UV content (UVA /UVB/UVC) needs to comply with IEC/EN 62471 and take reated execution (including energy – saving / incandescent / halogen lamps) .

Blue Light Hazard

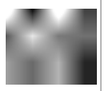
There is a description in IEC 62471 for lighting products of biological safety , testing requirements and specifications . However , new lighting products , especial for LED products , there is more blue lighting . Blue light hazard is one of the largest influence in danger of various colors of light . Therefore , in 2014 , IEC issued new standard, specifically for the blue lighting hazard , maybe should be called technical report – IEC / TR 62778 （ Application of IEC 62471for the assessment of blue light hazard to light sources and luminaires ） . In IEC 60598 –1 version eighth , the section of Marking and Construction, the requirements of blue light hazard were increased . Some new concepts are included in this technical report , such as blue light hazards , risk group （ RG ） , Ethr etc . At the same time , the technical report also provides the assessment method and criterion of blue light hazards . The formulation of this technical report , clearly defined the detection method and the radiation energy limit . It ' s a good effect on the hazard control of lighting products for humans or other living things . In general , the amount of blue light in incandescent bulbs is relatively small , while in fluorescent lamps it is slightly larger than incandescent lamps , while the current LED light is the most common . For the present , LED as a green energy– saving lighting products , has many advantages ,such as long life , low energy consumption , and so on . So we have to use this kind of product , and at the same time , we must control and carry out the detection to get the good product without hazard for people or society .

能效测试

我们沃特测试能够协助提供的服务包括但不仅限于：

Energy efficiency testing

Waltek can assist to offer but not limit as below services:

地区 Area	项目 Program	标志 Logo	是否强制 Mandatory	涉及产品 Involved Product
欧洲 Europe	ErP		强制性 YES	EC NO.244/2009:非定向性家用灯具、EC Reg.NO.245/2009:办公用灯具和路灯、EC Reg.No.1194/2012:发光二极管灯具及相关设备，关于定向照明灯泡、LED灯以及相关装置的生态设计要求紧凑型荧光灯（CFL）/卤素灯/白炽灯/非定向LED灯/双端荧光灯（T5、T8等）/单端荧光灯/高强度气体放电灯（高压钠灯，金属卤化物灯等）/镇流器灯具。定向灯，发光二极管灯(LED)，设计安装于电源和灯之间的设备，包括灯控制器、控制装置和灯具 (除了荧光灯和高强度放电灯的镇流器和灯具)。 EC NO.244/2009:Non–directional household lamps, EC Reg. NO.245/2009: Office lighting and public street light, EC Reg. No.1194/2012: directional lamps, light emitting diode lamps and related equipment, regulation（EU）ecodesign requirements for directional lamps, light emitting diode lamps and related equipment:Compact fluorescent lamps (CFL), halogen, incandescent , non–directional LED light,double–capped fluorescent lamps (T5, the T8, etc.),single–ended fluorescent ,high–intensity gas discharge lamps (high pressure sodium, metal halide lamp, etc.),ballast control lamps. directional lamps, light emitting diode lamps, and the equipment designed for installation between the mains and the lamps (eg.,dimmer,lamp control gear,luminaire, ect.)
美国 Unite States	能源之星 Energy star		自愿性 No	紧凑型荧光灯（CFLs），GU24，整体式LED灯（全方向灯/定向灯/装饰灯），灯具（固态照明灯具、荧光灯具、卤素灯具），荧光灯，荧光镇流器，LED封装/模组/阵列（IES LM–80–2008） Compact Fluorescent Lamps (CFLs) ,GU24,Integral LED lamp (Omnidirectional/Directional/Decorative),Luminaires (Directional SSL, Fluorescent, Halogen), Fluorescent lamps, Fluorescent ballasts, LED package, module or arrays (IES LM–80–2008)
美国 Unite States	DLC		自愿性 No	涉及绝大多数Energy Star暂时没有覆盖到的LED产品，主要包括商用灯具、工业用灯具、户外灯具等 For the LED products which do not covered by Energy Star.Such as commercial,industrial,and outdoor Solid–State lighting Luminaires
美国 Unite States	电光源标签 Lighting fact		自愿性 No	适用于交流市电或者直流电供电的完整灯具，低压12V交流或者直流灯具，可分离电源的LED灯具，现行或者模组化产品等LED 照明产品。 For the AC/DC power supply light kit, or 12V AC,DC lighting luminaries,or the Detachable power LED lamps, or LED module luminaires
美国加州 California	CEC认证 CEC certification		强制性 Yes	电子镇流器、金属卤素灯镇流器、荧光灯、照明灯具、白炽灯及白炽反射灯、便携式LED灯具等产品。 Electronic ballasts, metal halide ballasts, fluorescent lighting, Incandescent lamps and incandescent reflector lamps, Portable LED luminaire and other products.
中国 China	中国能效标识 China energy mark		强制性 Yes	管形荧光灯镇流器、普通照明用双端荧光灯、普通照明用自镇流荧光灯、单端荧光灯、高压钠灯用镇流器、金属卤化物灯、金属卤化物灯镇流器。 Tubular fluorescent lamp ballasts, double–capped fluorescent lamps for general lighting, self–ballasted fluorescent lamps for general lighting, single–ended fluorescent lamps, ballasts of high pressure sodium lamp, metal halide lamps, metal halide lamp ballast
澳洲 Australia	GEMS		强制性 Yes	AS/NZS 4847.1/AS/NZS 4847.2：自镇流紧凑型荧光灯能效要求、AS/NZS 4934.1/AS/NZS 4934.2：钨丝灯能效要求、AS/NZS 4782.1/AS/NZS 4782.2：双端荧光灯效能要求、AS/NZS 4783.1/AS/NZS 4783.2：荧光灯镇流器效能要求 AS/NZS 4847.1/AS/NZS 4847.2:Energy efficiency requirements for Compact Fluorescent Lamps (CFLs) , AS/NZS 4934.1/AS/NZS 4934.2: Energy efficiency requirements for incandescent lamps, AS/NZS 4782.1/AS/NZS 4782.2: Energy efficiency requirements for double capped fluorescent lamps, AS/NZS 4783.1/AS/NZS 4783.2: Energy efficiency requirements for fluorescent lamp ballasts.
韩国 Korea	MEPS		强制性 Yes	白炽灯泡、荧光灯、荧光灯的整流器、紧凑型荧光灯（CFL）等。 Incandescent bulbs, fluorescent lamps, fluorescent lamps ballast, compact fluorescent lamps (CFL) ect
新加坡 Singapore	新加坡能效标识 Singapore energy mark		强制性 Yes	白炽灯泡、钨丝灯、卤钨灯、紧凑型荧光灯（CFL）、LED等。 Incandescent bulbs, Incandescent , Halogen lamp , compact fluorescent lamps (CFL) , LED ect
国际性 Global	ELI认证 ELI certification		自愿性 No	自镇流荧光灯(CFL)/ 双端灯/荧光灯镇流器/LED灯等。 Self–ballasted fluorescent lamps (CFL) / dual side lamp / fluorescent lamp ballasts/LED lamps

光性能测试

照明产品的制造商必须确保其满足全球目标市场的所有性能要求。沃特测试作为专业的光性能检测机构，拥有多名光学技术专家，引进了多台大型先进光性能检测设备，如具有恒温控制积分球的光谱分析系统、拥有隧道长度为30m的大型分布式光度计和紫外辐射分析系统等，能够为照明产业提供各类产品的性能检测服务。我们的专家将竭诚为您解释什么是“存在危险”，即使是最复杂的光度概念。

适用产品范围：

我们可以根据官方的强制标准或您所要求的其他标准，测试各种光源，出具IES格式文件的数据和PDF格式的数据报告。我们可测试各类产品的不同性能，包括半导体照明（LED光源及灯具）、白炽灯、荧光灯及放电灯管、节能灯、HID灯、路灯、汽车照明、交通信号灯、日晒设备、办公照明、庭院照明、平板电视等。

我们沃特测试能够协助提供的服务包括但不仅限于：

测试项目 / Testing item		
色坐标 Color Chromaticity	照度距离 Illumination distance	有效平均照度曲线 AAI Figure
光通量、发光效率 Luminous flux and luminous efficiency	光强数据 Luminous Intensity	光生物安全综合分析 Comprehensive analysis of photobiological safety
色偏差 Color deviation	等光强图 Isocandela diagram	皮肤和眼睛的光化学危害 Photochemical hazard for skin and eye
色容差 Color Consistency	UGR统一眩光值 UGR unified glare rating	紫外辐射综合分析 UV radiation comprehensive analysis
相关色温 CCT	电流 Electric current	等照度图（平面/空间） Isolux diagram （plane/space）
峰值波长 Peak wavelength	频率 Frequency	亮度限制曲线 Brightness limit curve
显色指数 CRI	功率 Power	光强分布曲线/配光曲线 Luminous intensity distribution curve/ Light distribution curve
辐射通量 Radiant flux	电压 Voltage	概算图表 Budgetary Estimate Diagram
光谱分布 Spectral distribution	利用系数 Utilization factor	利用图表 Use chart
光束角 Beam angle	最大允许距高比 Maximum allowable spacing height ratio	灯具概率曲线 Luminaire Budgetary diagram
流明维护及寿命 Electrical parameters	LED模组寿命评估（LM80&TM21） LifeevaluationforLED module (LM80&TM21)	开关周期 Switching cycle

Optical performance testing

The lighting manufacturer must ensure that all the products performance should meet the global target market requirements. As a professional optical performance testing organization, Waltek has numbers of optical technology experts, imports multiple large advanced equipment, such as integrating sphere system with high acuracy array spectro radio meters, large–scale Goniophotometer with a length of 30m tunnel and UV radiation analysis system ect. which can provide all kinds of product performance test service for the lighting industry. Our experts will sincerely explain to you what is "dangerous", even the most complex concept of luminosity.

Application scope

We can test a variety of light sources according to the official mandatory standards or others you required and provide the IES format or PDF format test report . We can test different properties of various products, including semiconductor lighting (LED light sources and lamps), incandescent, fluorescent and discharge lamps, energy saving lamps, HID lamps, street lamps, automotive lighting, traffic lights, sun and equipment, office lighting, garden lighting, flat panel TV.

Waltek can assist to offer but not limit as below services: