



Household Appliances & Sports Equipments

家用电器及运动健身器具



“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), reliability 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 / Safety Testing Services

家用电器是指用于家庭和类似家庭使用条件的日常生活用电器，大到冰箱、洗衣机、空调，小到咖啡壶、果汁机或电熨斗；运动健身器具则泛指家庭或健身中心用以锻炼身体的产品，跑步机、按摩椅、按摩腰带等不属于医疗用途的产品均包含在内。



家电产品测试范围：

家用电器按测试与认证归类，我们可以区分为：

- 加热类器具：如电煎锅、多士炉、烤箱、华夫饼机、比萨饼机、烤面包机、电炒锅、爆米花机、烤肉架、咖啡机、电熨斗、电饭锅、电水壶、保温板、油炸锅、直发器、卷发器、桑拿房、电油汀、电暖器、电热毯等；
- 马达类器具：搅拌机、榨汁机、碎肉机、切片机、果菜机、食物处理器、碎冰机、咖啡研磨机、吸尘器、洗衣机、甩干机、按摩器、跑步机、抽油烟机、电风扇、空气清新机、电动窗帘、剃须刀等；
- 马达与加热混合类器具：带蒸汽功能的清洗机、吹风管、烘干机、空调、烘干机、制面包机、利用热量和吸风的灭蚊灯等。

家用电器由于使用的电源多数直接接到市电，功率消耗较大，又有高温的加热功能及马达转动等，而使用对象可能为老弱妇幼，因此安全的要求要比其他产品显得更为重要。电热类产品对于温度与防火均相当重要，马达类产品则对绝缘及机械伤害需特别的考量。

Household appliances scope refer to daily life use appliances in families and similar conditions range from large household appliances, such as refrigerator, washing machine and air conditioner to small household appliances, such as coffee maker, blender or electric iron; sports and fitness equipment refers to body exercise products used in families or fitness centers such as treadmill, massage chair, massage belt and other products are also included which don't belong to medical use.

Household appliances testing scope

As for testing and certification purpose, the household appliance products can be divided into:

- Heating appliances: such as electric frying pan, toaster, baking oven, waffle maker, pizza maker, bread maker, electric wok, popcorn popper, barbecue grill, coffee maker, electric iron, electric cooker, electric kettle, insulation board, fryer, hair straightener, hair curler, sauna room, electric oil heaters, electric heater electric blankets, etc.
- Motor-type appliance: blender, juicer, meat chopper, slicer, fruit and vegetable peeler, food processor, ice-crushing machine, coffee grinder, vacuum cleaner, washing machines, laundry-dryer, massage appliance, treadmill, range hood, fan, air cleaner, electric curtain, electric razors, etc.
- Motor and heating mixed type appliance: washing machine with steam function, hair dryer, hand dryer, air conditioners, dryer, bread maker, mosquito killing lamp by use of heat and suction, etc.



Safety requirements of household appliances are more important than other products due to they use power mostly directly connected to the mains, high power rate, and high temperature heating function, motor rotation, and old and weak people as users probably use frequently. For electric heating products, both of temperature and fireproofing are very important. But for motor products, insulation and mechanical damage require special consideration.

台、地扇的主要安全测试举例

■ 电机堵转测试: 堵住电机, 在额定电压下让电机持续发热, 考温度保险装置是否起作用。在保护装置不动作的情况下, 绕组温升情况如符合标准要求, 亦视为合格。

■ 摇头测试: 对于有摇头装置的风扇, 进行10万次风扇旋转摇头的耐久性测试。

The Safety Test for portable fans (e.g.)

■ Motor blocking test: block the motor, keep the motor continue heating under declare voltage and then check the temperature protection device whether is functional or not. In case of protection device out of work, if temperature rise of locked motor under standard limit requirements, it is pass.

■ Rotation test: For the fan be with rotation function, need to arrange 100,000 times rotation endurance test.

烤箱的表面温升测试举例

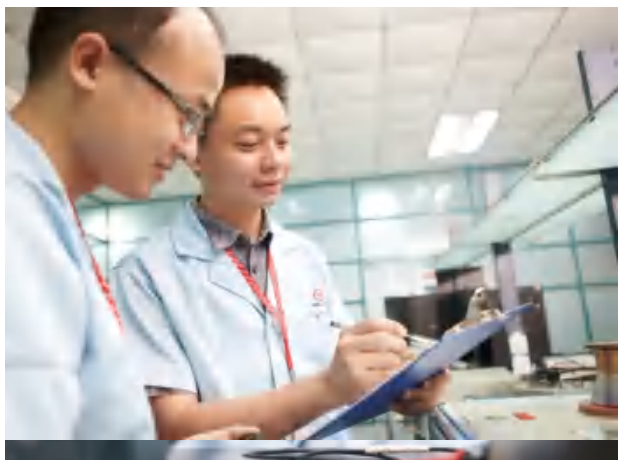
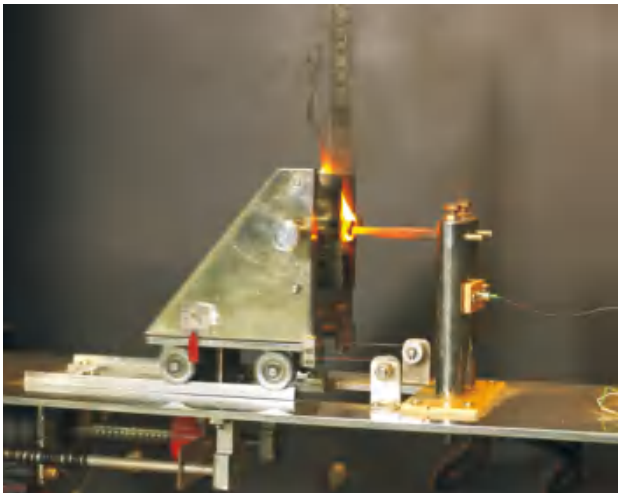
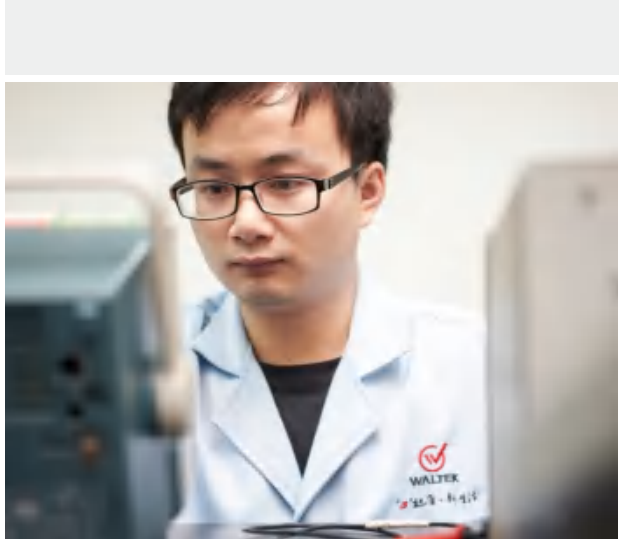
■ 烤箱表面温升测试: 在正常工作状态, 额定功率的条件下, 工作至稳定, 测量烤箱外表面的温升值。温升限值见标准 EN60335-2-9 Table Z101的要求。

■ 外表面免测部分见标准EN60335-2-9 Figure Z103。

The Thermal Test for Oven Surface (e.g.)

■ The thermal test for the surface of oven: in a normal working condition, with rated power, working up to the stable state, then measure the surface temperature of the oven. The requirement of temperature is shown in standard EN60335-2-9 Table Z101.

■ The exception for surface thermal test, please refer to standard EN60335-2-9 Figure Z103.



台、地扇的主要安全测试举例

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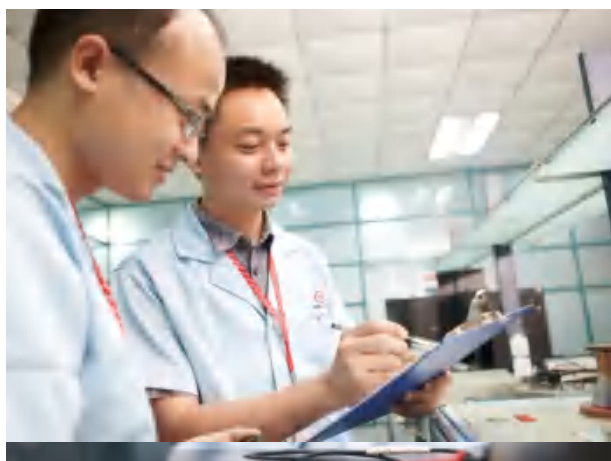
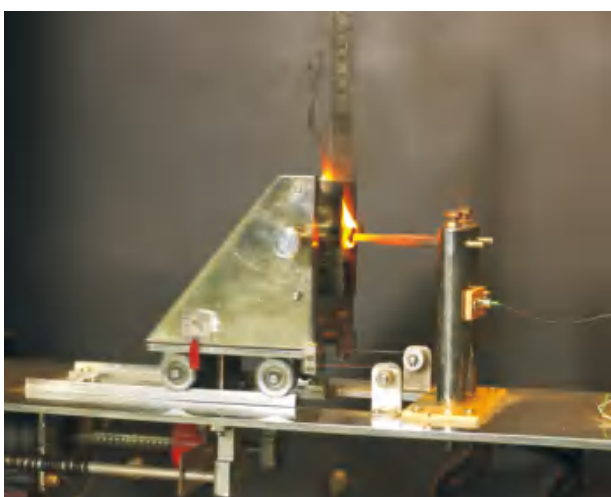
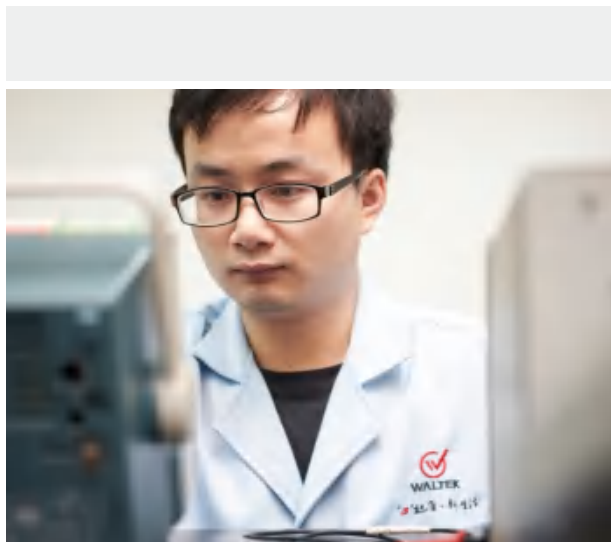
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家用电器产品除了使用通用安全标准IEC 60335-1外，还应遵循的特殊安全标准，详见下表：

Base on general safety standards IEC 60335-1 requirement, the household appliances should follow specific safety standards ,details shown in the table below:

产 品 Product	标准编号 Standard Code	产 品 Product	标准编号 Standard Code	产 品 Product	标准编号 Standard Code
真空吸尘器 vacuum cleaners	IEC 60335-2-2	储水式电热水器 storage water heaters	IEC 60335-2-21	桑拿浴加热器具 Sauna heating appliances	IEC 60335-2-53
电熨斗 electric irons	IEC 60335-2-3	皮肤及毛发护理器具 appliances for skin or hair care	IEC 60335-2-23	使用液体的表面清洁器 surface-cleaning appliances for household use employing liquids or steam	IEC 60335-2-54
离心脱水机 centrifugal dehydrators	IEC 60335-2-4	电冰箱、制冷器具 refrigerators, refrigerating appliances	IEC 60335-2-24	水族箱和花园池塘用电器 electric appliances for use with aquariums and garden ponds	IEC 60335-2-55
洗碗机 dishwashers	IEC 60335-2-5	微波炉 microwave ovens	IEC 60335-2-25	投影仪和类似用途器具 projectors and similar appliances	IEC 60335-2-56
固定灶具、烤架、烤炉 stationary cooking ranges, hobs, ovens	IEC 60335-2-6	钟表 clocks and watches	IEC 60335-2-26	商用电动洗碗机 commercial electric dish washing machines	IEC 60335-2-58
洗衣机 washing machines	IEC 60335-2-7	蓄电池充电器 battery chargers	IEC 60335-2-29	灭虫器 insect killers	IEC 60335-2-59
电动剃须刀、电发剪 electric razors, electric hair clippers	IEC 60335-2-8	房间加热器 room heaters	IEC 60335-2-30	商用电动厨房机器 commercial electric kitchen machines	IEC 60335-2-64
烤架、烤面包机 grills,bread toasters	IEC 60335-2-9	吸油烟机 range hoods	IEC 60335-2-31	空气净化器 air-cleaning appliances	IEC 60335-2-65
地板处理机 floor treatment machines	IEC 60335-2-10	按摩器 massage appliance	IEC 60335-2-32	商用自动售货机 commercial vending machines	IEC 60335-2-75
滚筒式干衣机 tumbler dryers	IEC 60335-2-11	快热式电热水器 instantaneous water heaters	IEC 60335-2-35	高压清洁器和蒸汽清洁器 high pressure cleaners and steam cleaners	IEC 60335-2-79
保温板 insulation boards	IEC 60335-2-12	商用电炉灶、烤箱 commercial electric stoves,toasters	IEC 60335-2-36	电风扇 electric fans	IEC 60335-2-80
电煎锅、油炸锅 electric frying pans, fryers	IEC 60335-2-13	热泵、空调、除湿机 heat pumps,air conditioners, dehumidifiers	IEC 60335-2-40	服务和娱乐器具 amusement machines and personal servicemachines	IEC 60335-2-82
电动食品加工机器 Electric food processing machines	IEC 60335-2-14	泵 pumps	IEC 60335-2-41	电加热坐便器 toilet appliances	IEC 60335-2-84
液体加热器 liquid heaters	IEC 60335-2-15	干衣机、毛巾架 clothes dryers,towel racks	IEC 60335-2-43	织物蒸汽机 fabric steamers	IEC 60335-2-85
废弃食物处理器 abandoned food processors	IEC 60335-2-16	便携式加热器 portable heaters	IEC 60335-2-45	加湿器 humidifiers	IEC 60335-2-98
电热毯、电热垫 electric blankets, electric warming pads	IEC 60335-2-17	口腔卫生器具 oral hygiene appliances	IEC 60335-2-52	多功能沐浴房 Multi-function bathing room	IEC 60335-2-105

EMF- 电磁场对人体的辐射: 此项要求用来评估家用电器在正常使用过程中对使用者产生的磁场辐射强度的大小, 确保产品的磁场辐射在一定的参考水平之下以保护人体安全。测试是根据EN62233标准。

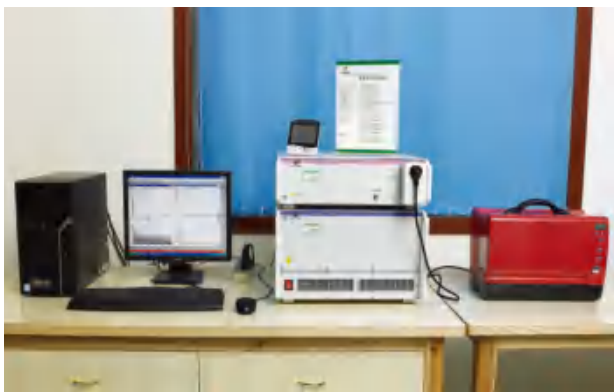
EMF-electromagnetic radiation on the human body: this requirement is used to assess household appliance in normal use, producing radiation intensity of magnetic field to the users, to ensure that the magnetic field radiation of the product is under certain reference levels for the protection of human security. This test is based on the standard EN62233.



EMC测试服务 / EMC Testing Service

家用电器的电磁干扰源主要是在器具内的带换向器电动机运转时产生的火花及机械开关、各种控制器、保护器的动作形成。例如,吸尘器、电吹风、搅拌机、剃须刀等由带有换向器的电动机在运转过程中,电刷与换向器接触形成火花而产生电磁干扰;电饭锅、电熨斗、电烤箱、洗衣机等由于频繁的开关动作而产生电磁干扰;空调启动时所需的大电流会使电网电压暂时下降,电动机等感性负载启动时会导致电源功率因数下降,变频空调中的电力电子器件还会产生电源谐波等;电风扇多功能控制器带有可控硅器件,产生高次谐波骚扰;带遥控的家电、全自动洗衣机、电热水器、微波炉等带有微处理器的家用电器,所采用的二电平数字信号会引起电磁骚扰,而且随着时钟频率的不断提高其骚扰频率可高达数百兆赫;微波炉、电磁炉所产生的电磁能量泄漏,不仅会引起电磁骚扰,而且还将对人体健康造成危害。

CISPR 14-1和CISPR 14-2是家用电器最主要的电磁兼容标准,包括电磁炉(家用电磁感应器具),而微波炉和电磁炉(家用电磁感应器具)属于工业、科学和医疗(ISM)设备的2组B类设备,因此其电磁干扰特性应符合CISPR 11的规定。欧盟地区对应的家用电器电磁兼容标准为EN 55014-1和EN 55014-2,微波炉和电磁炉则为EN55011。



在美国市场,普通家用电器属于FCC Part15规定的无意发射设备(Unintentional RF Equipment),需要采用"供应商的符合性申明"(Supplier's Declaration of Conformity即SDoC)或"认证"(Certification)的方式取得FCC许可。但是,微波炉和电磁炉属于消费类ISM设备,需要满足FCC Part18的要求,认证模式则需选择"供应商的符合性申明"(Supplier's Declaration of Conformity即SDoC)或"认证"(Certification)。

Main electromagnetic interference source of household appliances form commutator motor operate producing sparks or from actions of mechanical switches, kinds of controllers and protectors. For example, vacuum cleaner, hair dryers, blenders, electric razors and other appliances with commutator motors, in the operation of the motor and in the contact between the brush and commutator, will produce sparks and then bring electromagnetic interference; rice cookers, electric irons, oven, washing machines produce electromagnetic interference due to frequent switch on-off action; the start of air conditioner requiring strong current will lead network voltage temporarily decline; motors and other inductive loads will lower the power factor when starting; power electric device in variable frequency air conditioner will produce harmonics; multi-functional controller in fans has silicon controlled rectifier and will produce higher harmonic disturbance; appliances with remote control, automatic washing machine, electric kettle, microwave, and other appliances with microprocessor, by use of II level digital signal will cause electromagnetic interference, and with clock frequency of constantly increasing, its electromagnetic disturbance can up to hundreds of MHz; electromagnetic energy leak of microwave and electromagnetic oven not only will caused electromagnetic disturbance, but also will do harm to human health.

CISPR 14-1 and CISPR 14-2 are major standards of electromagnetic compatibility for household appliances, including induction cooker (home electromagnetic induction appliance). But microwave belong to group 2 class B equipment of industrial, scientific and medical (ISM) equipment, so the electromagnetic interference standard shall comply with the regulations of CISPR 11. In EU, the corresponding EMC standards for household appliances are EN 55014-1 and EN 55014-2, but the standard of microwave is EN55011.

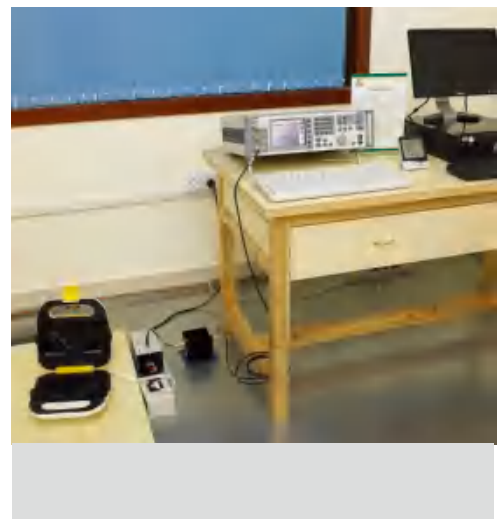
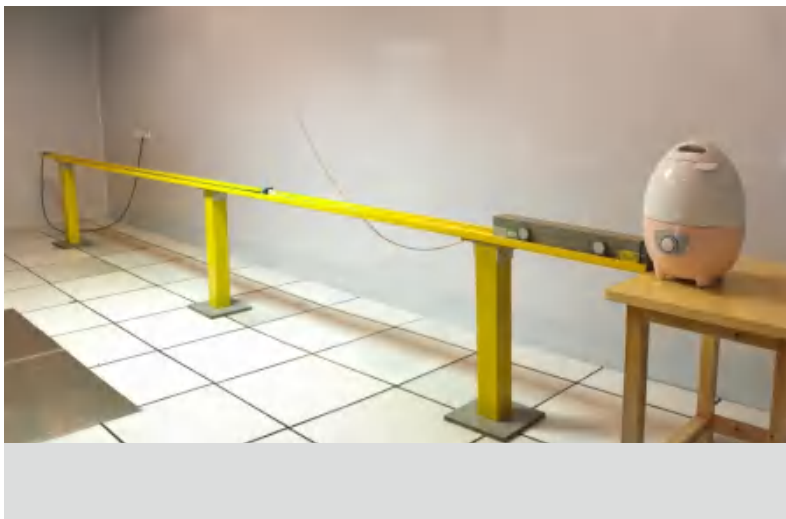


In the US market, common household appliances belong to unintentional emission device (Unintentional RF Equipment) under regulations of FCC Part 15, requires the way of Certification or Supplier's Declaration of Conformity (SDoC) to acquire FCC approval. But, microwave and induction cooker (home electromagnetic induction appliance) belonging to ISM equipment need to comply with the regulations of FCC Part 18. As for certification mode, choosing Certification or Supplier's Declaration of Conformity (SDoC) is required.

常规家用电器和运动健身器具产品使用电磁兼容（EMC）测试标准一览表

The table list all the comment household appliances and sports equipment EMC test standards

CISPR 14-1 / EN 55014-1	家用电器和电动工具的发射 emission of household appliance and electric tools
CISPR 14-2 / EN 55014-2	家用电器和电动工具的抗扰度 immunity to electromagnetic interference of household appliance and electric tools
CISPR 11 / EN 55011	工科医 (ISM) 设备的无线电骚扰 radio-frequency disturbance of industrial, scientific and medical(ISM)equipment
EN 61000-3-2	谐波电流 harmonic current
EN 61000-3-3	电压波动和闪烁限值 limitation of voltage changes, voltage fluctuations and flicker
IEC/EN 61000-4-2	静电放电 electrostatic discharge
IEC/EN 61000-4-3	射频辐射电磁场 radio frequency and electromagnetic field
IEC/EN 61000-4-4	电快速瞬变脉冲群 electrical fast transient and burst
IEC/EN 61000-4-5	浪涌 surge
IEC/EN 61000-4-6	射频场感应引起的传导骚扰 immunity to conducted disturbance, induced by radio-frequency fields
IEC/EN 61000-4-11	电压暂降、短时中断 voltage dip and short interruption
FCC Part 15	含无意辐射源和有意辐射源的产品 device of unintentional radiators and intentional radiators
FCC Part 18	工业、科学、医疗设备 industrial, scientific and medical equipment



能效测试服务 / Energy efficiency testing service

根据《能源效率标识管理办法》,所有中国市场销售的电冰箱、空调、电饭锅、电风扇、家用电磁灶、储水式电热水器、洗衣机等产品都要贴上《中国能效标识》,没有标识的产品一律不准上市销售。

电冰箱、洗衣机、干衣机、洗碗机、空调和烤炉烤箱,在欧盟市场还必须要满足能源效率法规的要求,加贴能效标识。家用电器的能效要求主要体现在能效标识(Energy Labeling)和能源效率要求(EER)两方面。

ERP-家用电器的风险评估:对于电子控制的产品,如果有待机功能,需要在产品待机状态下,能过对控制板进行放电干扰,看是否有不利的情况出现。

According to "Administration Regulation on Energy - efficiency Labeling", all the sales of refrigerators, air conditioners, rice cookers, electric fans, household induction cookers, water storage heaters, washing machines and other products in Chinese market should be stucked "China Energy Label". Products without identification will be not allowed to sale.Refrigerators, washing machines, clothes dryers, dishwashers, air conditioners, ovens and toaster in the EU market must also meet energy efficiency regulations and add energy efficiency labeling. Energy efficiency requirements for household appliances, major in two aspects Energy Labeling and Energy Efficiency Requirements(EER).

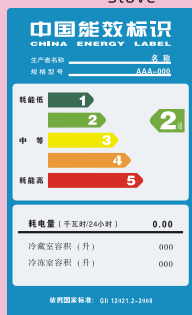
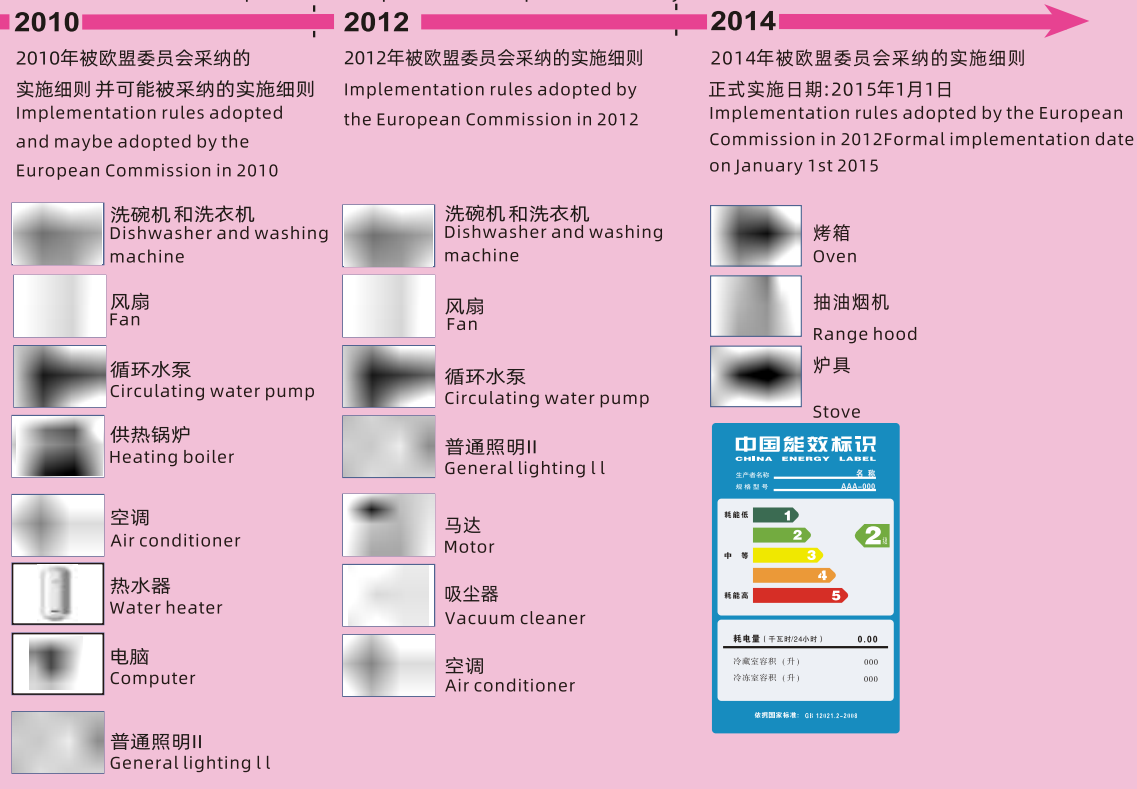
ERP-risk assessment of household appliances: electronic controlling product, if there is a standby function, can pass discharge interference done to the control board in standby mode, to see if there is an adverse situation.

ErP指令时间表ErP Directive timetable

2008年被欧盟委员会采纳的实施细则
Implementation rules adopted by the European Commission in 2008

有待机/关机模式功耗的电子电气类产品

Electrical and electronic products with power consumption of standby and off mode



小于125W风扇ERP指令2009/125/EC
Commission Regulation (EC) NO 206/2012举例
需要做一下测试

- 1.待机, 从2014年1月1日起, 第二阶段待机或off mode要求小于0.5W, 产品具有信息或状态显示待机要求小于1W。
- 2.噪音, 没有限值要求。
- 3.风量测试, 没有限值要求。



针对烤箱, 抽油烟机, 炉具的能效要求, 实施细则为: (EU) No65/2014 (烤箱及抽油烟机的能效标签指令), 和(EU) No66/2014(烤箱, 抽油烟机及炉具等的生态设计要求)。

对于这几类家用电器产品, 除了需要考虑关机与待机模式下的能量损耗, 还需要考虑其正常工作下的能量转化及利用的效率, 和产品设计上是否有增加有效的节能模式等要求。

针对以上几种不同的产品, 还需要对产品的以下参数进行评测:

烤 箱: 腔体容积, 腔体能耗, EEI值;

抽油烟机: 耗电量, EEI值, 风量, 风压, 抽油烟机功率, 时间提升系数, 油脂分离效率, 照明效率, 噪音, 关机或待机功耗;

炉 具: 电炉具的能耗EC或燃气炉具的能耗EE值。

另外, 正式实施后, 分为3个阶段, 每个阶段所要求得能效指标比前一阶段要求更高, 以保证产品能逐步达到最佳的能效要求。

对于咖啡机, 除了需要满足(EC) No 1275/2008 (产品待机或关机模式下的功率损耗的要求)之外, 还需要满足(EU) No 801/2013的要求, 当咖啡机不在主要功能的工作模式下, 该产品应该能提供电源管理的功能, 要求在较短时间内进入到省电模式, 以达到真正节能的目的。

ERP Directive 2009/125/EC of fans with power < 125W
Commission Regulation (EC) NO 206/2012 (e.g.)
Test required below

1. standby test: From January 1st 2014, power of the second stage standby or off mode < 0.5W, power of standby with information and mode display < 1W
2. noise test: no requirement for limit value
3. air volume: no requirement for limit value

As for energy-efficiency requirements of toaster, range hood and stove, implementation rules are (EU) No65/2014 (energy efficiency labeling directive of toaster and range hood) and (EU) No66/2014.(ecological design requirement for toaster, range hood and stove and other appliances).

For these types of household appliances, in addition to considering the energy losses under off and standby mode, also have to consider the efficiency of energy conversion and utilization under normal work. Whether product design adds effective energy-saving mode and other requirement also needs to take into consideration.

For these several kinds of household appliance, evaluation for the following parameters of products are required.

Oven: cavity volume, cavity energy consumption, EEI value;
Range hood: power consumption, EEI value, air volume, air pressure, power, time increase coefficient, grease separation efficiency, lighting efficiency, noise, off or standby power;

Stove: energy consumption EC value of electric stove or energy consumption EE value of gas stove. In addition, after formal implementation, it's divided into three stages. Requirement of energy efficiency index for each stage is much higher than the previous stage, in order to ensure products can gradually meet the best energy efficiency requirements.

For coffee maker, in addition to satisfying (EC) No 1275/2008 (power consumption requirements for product under standby and off mode), it also needs to meet the requirements of (EU) No 801/2013. when the coffee maker is not in the main function operating mode, the product should be able to provide power management function and is required entering into the power saving mode in a short time, in order to achieve real energy saving purpose.



“能源之星”计划包含的家用电器有洗衣机、洗碗机、除湿机、电冰箱、空调、电风扇、电池充电器等。Energy Star是一种自愿性的能效标识，但这项认证已经深入人心，是产品

得以畅销的保障。

冰箱、空调、热水器、洗碗机、洗衣机、干衣机、厨房、电池充电器、电器等家电厂商必须满足美国制定的最低能效要求。

美国联邦贸易委员会 (FTC) 颁布的《电器标签规定》要求大多数电器加贴“EnergyGuide”标签，给出产品能源消耗或能源效率的估计值，以帮助消费者比较后购买高能效电器。



美国加州销售的电池充电器、洗衣机、冰箱等家用电器必须符合 California Energy Commission 的要求。

澳大利亚和新西兰对于家用电器的能效要求体现为能效标签和最低能源性能标准 (MEPS) 两方面。需要加贴能效标签的家用电器有电冰箱和冷冻箱、洗衣机、干衣机、洗碗机和空调 (单相) 5种；MEPS 管制的家用电器有电冰箱和冷冻箱、电热水器 (一般和小型)、空调 (单相和三相) 3种。

Energy Star scheme contains washing machine, dishwasher, dehumidifier, refrigerator, air conditioner, fan, battery charger and other household appliances. Energy Star is a voluntary energy efficiency label, but the certification has enjoyed popular support. It's the safeguard for products to gain best seller.

Manufacturers of refrigerator, air conditioner, water heater, dishwasher, washing machine, clothes dryer, kitchen appliance, battery charger and other electric appliances should meet the lowest energy efficiency requirements formulated by America.

"Appliance Labeling Rule" issued by Federal Trade Commission require most of the appliances should add "Energy Guide" label and provide the estimated value of energy consumption or energy efficiency for products to help consumers buy high energy-efficient appliances after comparison.

Sales of battery charger, washing machine, refrigerator and household appliances in California must comply with the requirements of California Energy Commission.

Energy efficiency requirements for household appliances Australia and New Zealand are embodied in two aspects energy efficiency labeling and Minimum Energy Performance Standards (MEPS). Household appliances which need adding energy efficiency labeling have five kinds: refrigerator and freezer, washing machine, clothes dryer, dishwasher and air conditioner (single phase); Appliances controlled by MEPS have three kinds: refrigerator and freezer, electric water heater (general and small type), air conditioner (single and three phase).





沃特检验集团

Waltek Testing Group Co.,Ltd.

沃特深圳 / Waltek Shenzhen

广东省深圳市宝安区新安街道兴东社区留仙三路6号鸿威工业区厂房B栋、C栋B101

B101, Hongwei Industrial Park, No. 6, Liuxian 3rd Road, Xin'an Street, Bao'an District, Shenzhen 518105, Guangdong, China.

Tel: +86-755-8355 1033 Fax: +86-755-8355 2400

沃特东莞 / Waltek Dongguan

广东省东莞市厚街镇莞太路厚街段77号

No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan 523000, Guangdong, China.

Tel: +86-769-2267 6998 Fax: +86-769-2267 6828

沃特佛山 / Waltek Foshan

广东省佛山市顺德区陈村镇顺联国际机械城2座二楼

2/F, 2nd Building, Sunlink International Machinery City, Chencun Town, Shunde District, Foshan 528313, Guangdong, China.

Tel: +86-757-2381 1398 Fax: +86-757-2381 1381

沃特中山 / Waltek Zhongshan

广东省中山市小榄镇民安北路40号六楼

6F, No. 40 Minan North Road, Xiaolan Town, Zhongshan City, Guangdong, China.

Tel: +86-760-2258 6999 Fax: +86-760-2258 9668

虹彩检测 / HCT-Test

广东省深圳市龙岗区龙岗街道新生社区莱茵路30-9号1-3层 (天基工业园B栋厂房)

Building B, Tianji Industrial Park, Floor 1-3 No.30-9 Laiyin Road, Xinsheng Community, Longgang Street, Longgang District, Shenzhen, Guangdong, China.

Tel: +86-755-8461 6666 Fax: +86-755-8959 4308

沃特苏州 / Waltek Suzhou

江苏省苏州市吴中区吴中大道4499号

No. 4499 Wuzhong Avenue, Wuzhong District, Suzhou 215000, Jiangsu China.

Tel: +86-512-6655 2666 Fax: +86-512-6603 2668

沃特宁波 / Waltek Ningbo

浙江省宁波市高新区凌云路1177号011幢6号1层3区、007幢1号楼5层1区

Zone 3, 1/F, No.6, Building 011; Zone 1, 5/F, No.1, Building 007, No.1177 Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo 315040, Zhejiang, China.

Tel: +86-0574-2791 7833 Fax: +86-0574-8386 8018

沃特检验 / Waltek Testing

广东省深圳市宝安区70区留仙二路鸿威工业园A栋一楼

1/F, Unit A, Hongwei Industrial Park, Liuxian 2nd Road, Baoan, ShenZhen 518105, Guangdong, China.

Tel: +86-755-3366 3308 Fax: +86-755-3366 3309

全国办事处：广州 上海 重庆 成都 厦门 武汉 长沙

微信公众号：



全国免费客服热线：

400-840-2288

info@waltek.com.cn

www.waltek.com.cn

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