中国使用的电热水器和室内加热器的安全、性能、节能标准简介

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中国现行的强制性安全标准

电热水器标准

1. **GB4706.11-1997**《家用和类似用途电器的安全 快热式热水器的特殊要求》
   GB4706.11-1997《 Safety of household and similar electrical appliances Particular requirements for instantaneous water heaters》
   本标准等同采用**IEC60335-2-35： 1991**《家用和类似用途电器的安全 第二部分 快热式热水器的特殊要求》
   IDT IEC 335-2-35:1991 《 Safety of household and similar electrical appliances Part 2: Particular requirements for instantaneous water heaters》

2. GB4706.12-1995《家用和类似用途电器的安全 贮水式电热水器的安全》

GB4706.12-1995《Safety of household and similar electrical appliances--Particular requirements for storage water heaters》

本标准等同采用IEC60335-2-21：1989《家用和类似用途电器的安全 第二部分 贮水式电热水器的特殊要求》 及1号（1990），2号（1990），3号（1992）增补件。

IDT IEC60335-2-21：1989《Safety of household and similar electrical appliances Part2:Particular requirements for storage water heaters》and amendments 1(1990),2(1990),3(1992)

3. GB4706.1-1998《家用和类似用途电器的安全 第一部分：通用要求》

GB4706.1-1998《 Part 1: Safety of household and similar electrical appliances General requirements》

本标准等同采用IEC60335-1：1991《家用和类似用途电器的安全 第1部分 通用要求》及第1号（1994）修正件。

IDT IEC60335-1：1991《 Part 1: Safety of household and similar electrical appliances Part 1: General requirements》 and amendments 1（1994）

室内加热器标准

1. **GB4706.23-2003**《家用和类似用途电器的安全 室内加热器的特殊要求》
   GB4706.23-2003《Safety of household and similar electrical appliances--Particular requirements for room heaters》

   本标准等同采用**IEC60335-2-30：1996**《家用和类似用途电器的安全 第二部分 室内加热器的特殊要求》及第**1**号（**1999**）修正件。
   IDT IEC 335-2-30：1996《Safety of household and similar electrical appliances Part2:Particular requirements for room heaters》and amendments 1 (1999)

2. GB4706.44-1999《家用和类似用途电器的安全 储热式房间加热器的特殊要求》

GB4706.44-1999《Safety of household and similar electrical appliances-Particular requirements for thermal storage room heaters》

本标准等同采用**IEC60335-2-61：1992**《家用和类似用途电器的安全 第二部分 储热式房间加热器的特殊要求》。

IDT IEC 60335-2-61：1992《Safety of household and similar electrical appliances Part2:Particular requirements for thermal storage room heaters》

3. **GB4706.1-1998** 《家用和类似用途电器的安全 第一部分：通用要求》
GB4706.1-1998《 **Part 1: Safety of household and similar electrical appliances General requirements**》

本标准等同采用**IEC60335-1：1991**《家用和类似用途电器的安全 第**1**部分 通用要求》及第**1**号（**1994**）修正件。
IDT IEC60335-1：1991《 **Part 1: Safety of household and similar electrical appliances Part 1: General requirements**》

中国现行的性能标准

贮水式电热水器性能标准

Performance Standard of electric storage water heaters

QB 1238-91《贮水式电热水器性能试验方法》

QB 1238-91《Methods for measuring the performance of electric storage water-heaters》

本标准参照采用**IEC 379**《家用热水器性能试验方法》

This standards referred IEC 379 《Methods for measuring the performance of electric storage water-heaters for household purposes》

快热式电热水器性能标准

Performance Standard of electric instantaneous water heaters

QB 1239-91《快热式电热水器性能试验方法》

QB 1239-91《Methods for measuring the performance of electric instantaneous water-heaters》

家用直接作用式房间电加热器

Household electric direct-acting room heaters

GB/T15470-2002《家用直接作用式房间电加热器性能测试方法》

GB/T15470-2002《Household electric direct-acting room heaters - Methods for measuring performance》

本标准等同采用**IEC 60675:1994**《家用直接作用式房间电加热器性能 测试方法》及修正件**1**（**1998**）。

This standards IDT **IEC 60675:1994**《Household electric direct-acting room heaters - Methods for measuring performance》 and amendment 1(1998)

上述三个性能标准涉及的内容主要有：

The main contents of those three performance standards:

1.产品分类

appliances catalog

2.技术要求

technique requirement

3.试验方法

testing method

4.检验规则

testing regulation

5.标志、包装、运输、贮存

marking、installation、transportation、storage

中国现行的节能认证技术要求
Present China energy-conserving certification's requirement

家用贮水式电热水器节能产品认证技术要求
Household Storage water heaters energy-conserving certification requirement
CCEC/T10-2001《家用贮水式电热水器节能产品认证技术要求》
CCEC/T10-2001 《Requirements for the household electric water heaters energy-conserving certification》
本标准引用的其它标准：
This standards referred these standards:
GB4706.1-1992《家用和类似用途电器的安全 通用要求》

GB4706.12-1995《 Safety of household and similar electrical appliances--Particular requirements for storage water heaters 》

IEC60379-1987 《家用贮水式电热水器性能测试方法》

IEC60379-1987 《Methods for measuring the performance of electric storage water-heaters for household purposes 》

相关标准所涉及的常见产品类型

电热水器产品

储水式电热水器 **storage water heater**

1.封闭式热水器 **closed water heater**

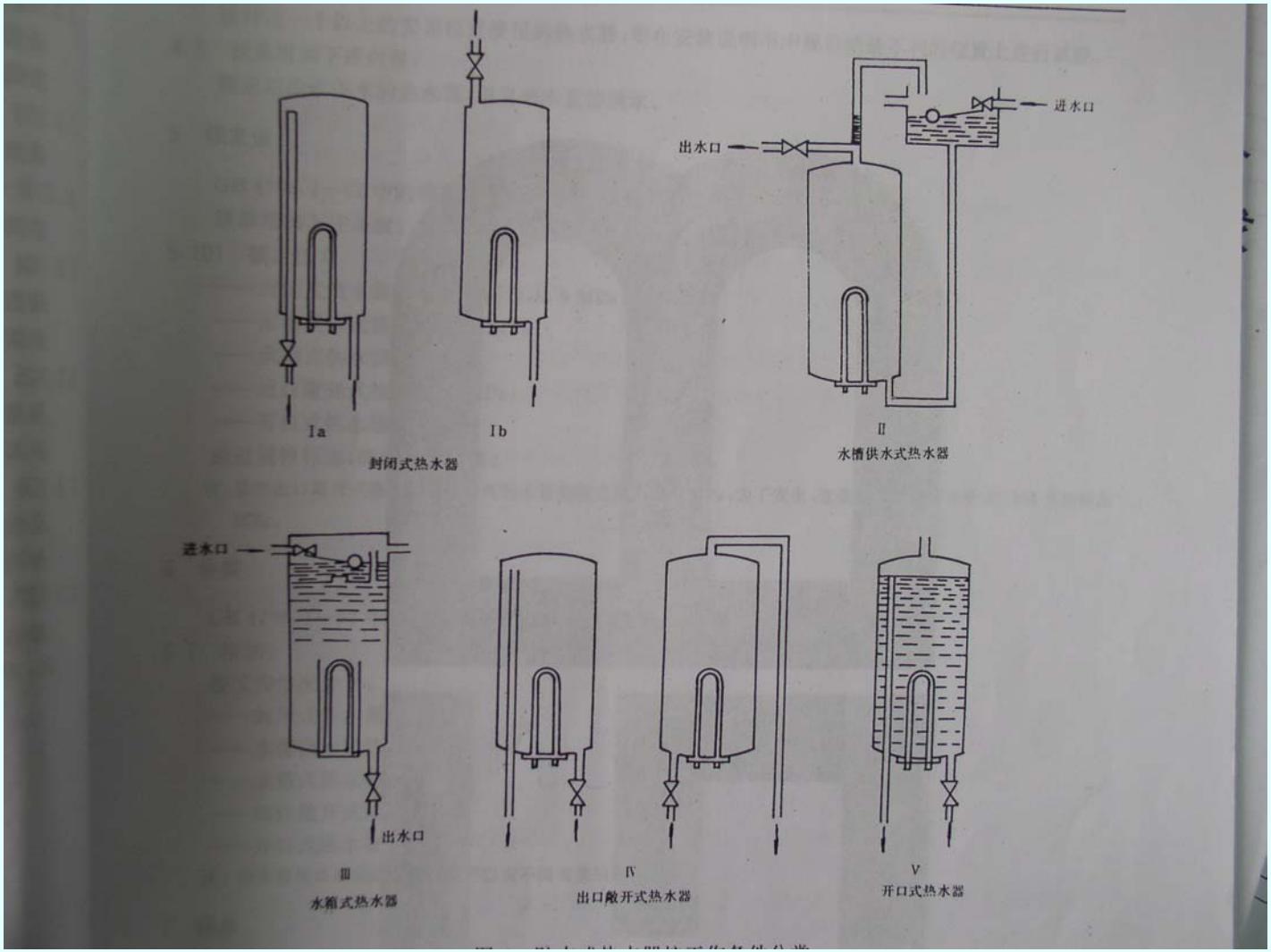
2.水槽供水式热水器 **cistern-fed water heater**

3.水箱式热水器 **cistern-type water heater**

4.出口敞开式热水器 **open-outlet water heater**

5.开口式热水器 **vented water heater**

结 构 示 意 图
construction figure



相关标准所涉及的常见产品类型

电热水器产品

快热式电热水器 **instantaneous**

1.封闭式热水器 **closed water heater**

2.裸露电热元件式热水器 **bare-element water heater**

3.凯装电热元件式热水器 **sheathed-element water heater**

4.敞开式热水器 **open-outlet water heater**

相关标准所涉及的常见产品类型
Relevant standards and appliances catalogue

室内加热器产品

室内加热器 **room heater**

1.板状加热器 panel heaters

2.辐射式加热器 radiant heaters

3.冲液式散热器 liquid-filled radiators

4.风扇式加热器 fan heaters

5.对流式加热器 convector heaters

6.管状加热器 tube heaters

7.花房中使用的加热器 heaters for use in greenhouses

储热式房间家热器 **thermal storage room heater**

1.输出可控式加热器 controlled-output heater

2.输出随机式加热器 free-output heater

家用贮水式电热水器节能产品认证技术要求详解

Household Storage water heaters energy-conserving certification requirement

1.适用本标准的贮水式电热水器应具备以下特征

This standard deals with the storage water heater which have the features as follow:

——单相交流250V或三相440V以下；

Rated voltage being not more than 250V for single-phase, 440V for others.

——用电热元件把水加热至沸点以下；

The heating element shall heat the water below boiling point.

——容量在200L以下；

Rated capacity shall not exceeding 200 l.

——内胆采用金属材料；

The water heater must have the metal container.

——且产品应首先符合GB4706.12-1995及GB4706.1-1992的要求

The water heater must meet with the standard of GB4706.12-1995 and GB4706.1-1992.

2.关键词 Keyword

——每24h固有损耗 Standing loss per 24 h：

将电热水器充满水通电工作，在达到稳定状态后，其在每24h内不排水时的能量损耗，单位：kWh。

3.技术要求 Technical requirements

——输入功率偏差应在+5%至-10%之间；

Rated power input deviation: -10% or +5%

——容积偏差应在+10%至-10%之间；

capacity deviation: -10% or +10%

——电热水器每10L容积水的24h固有损耗值应不大于表1的要求

Water heater's standing loss per 24 h of 10 l shall not exceeding the dates which shown in table 1.

表 1
table 1

容积(L)单位 **capacity** (L)	每10L容积水的24h固有损耗值（λ）单位：kWh **Water heater's standing loss per 24 h of 10 l(λ):**
L≤30	0.28
30＜L≤60	0.25
60＜L＜80	0.22
80≤L≤100	0.18
>100L;≤20	0.16

4.试验方法 testing method

4.1试验条件 testing condition

——电源电压的要求 the requirement of supply voltage

电热水器应在额定电压±1%，额定频率±0.5Hz的条件下工作。如果器具规定了额定电压范围，则试验按器具使用时所在国的供电电压进行。

The water heater are operated at rated power input. If water heater have a range of rated values,it should be operated at the rated power input in locate country's voltage.

The deviation of supply voltage shall not exceeding ±1%.

The deviation of supply frequency shall not exceeding ±0.5Hz.

——试验环境的要求 the requirement of testing ambient

试验室内没有任何外界气流和热辐射作用，环境温度为20℃±2℃，相对湿度不超过85%。

Ambient temperature: 20℃±2℃.

Relative humidity shall not exceeding 85%.

——供水温度和供水压力的要求

the requirement of water temperature and supply water pressure

供水温度保持在**20℃±2℃**，水源压力应保持基本稳定。

Supply water temperature shall keep at 20℃±2℃.

The water pressure shall keep steady.

——热水器安装的要求 **the requirement of installation**

被试热水器应按照制造商提供的说明书的规定安装。

Water heater shall be installation according to instructions provided by the manufacturer.

——试验仪器的要求 **the requirement of testing equipments**

电气测量仪表准确度应不低于±0.5%；

The precision of electric measurement device shall not below ±0.5%.

测量温度用的仪器分辨率为0.1℃,准确度为±0.5℃；

The precision of temperature measurement device shall not below ±0.5℃.

计时器准确度为±2s/h；

The precision of adjustable timer shall not below ±2s/h.

测量湿度用仪表准确度为±1%；

The precision of moist measurement device shall not below ±1%.

测量体积用的仪表精确到0.1L。

The precision of capacity measurement device shall not below 0.1L.

4.2试验方法 testing method

4.2.1首先应对电热水器的容积进行计算

First, calculate the capacity of water heater.

4.2.2然后对电热水器的输入功率进行测量

Then,measure the power input of water heater.

4.2.3电热水器每24h能量损耗的测量

Measure the standing loss per 24 h of water heater

每24h能量损耗E按下列公式计算：

The expressions for calculate the energy standing loss per 24 h of water heater is as following:

$$E=E_1/t_1\times 24$$

式中 in this expressions：

—— E每24h电能损耗，kWh

the energy standing loss per 24 h(kWh)

—— E_1 调温器某次切断电源起，经过至少48h后调温器再次切断电源后止的电能损耗量，kWh

the energy standing loss per 48 h(kWh)

—— t_1 测量电能损耗量E_1时的工作时间，h

the continued time of measurement E_1 (h)

4.2.4不排水测量贮水温度

measurement of the capacity's water temperature

4.2.4.1热电偶的放置

Placement of the fine-wire thermocouples

试验前预先将热电偶紧紧地贴在容器外表上层，每个测试样品放置5点热电偶，如图1、2所示的具体位置：

Before testing, put the fine-wire thermocouples on the capacity's outside surface, one sample shall put on 5 points as shown in figure 1 and 2.

示意图1
figure1

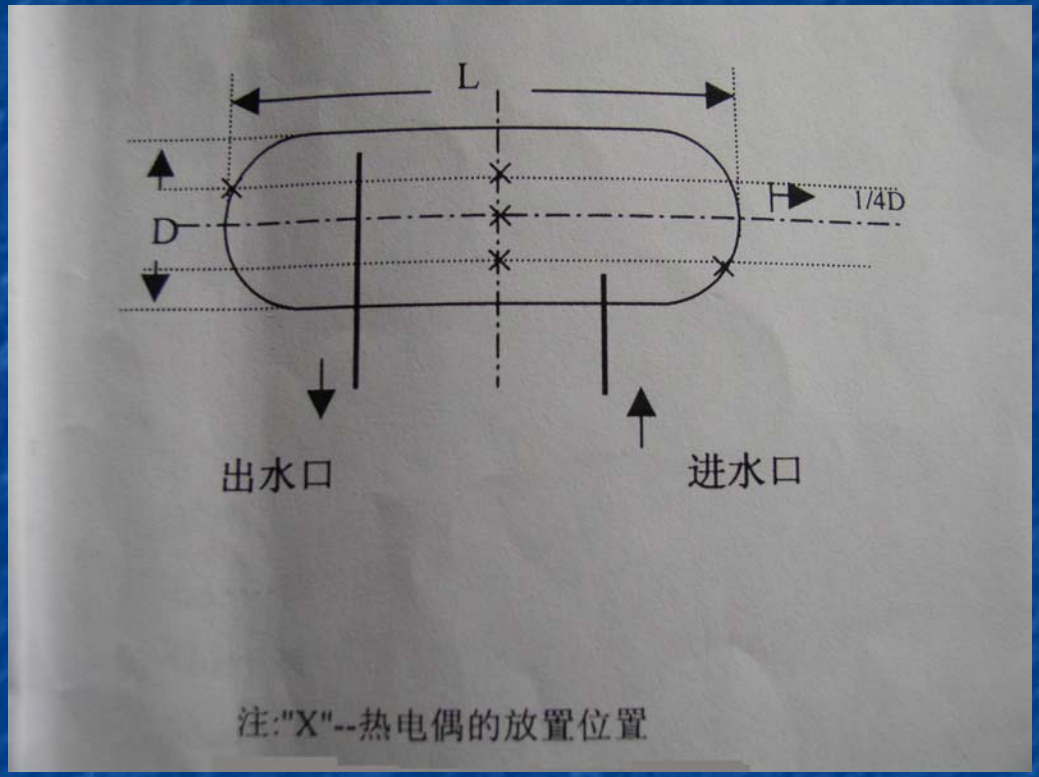
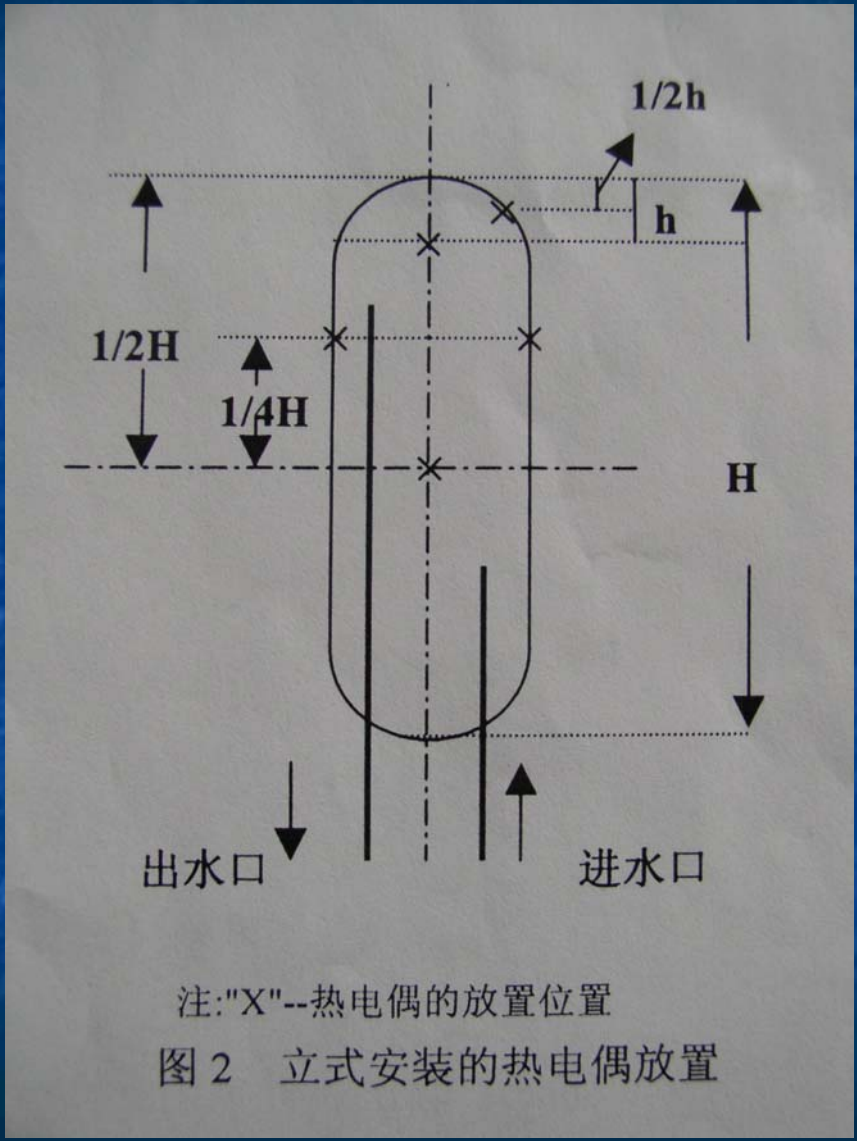


示意图2
figure2



注:"X"--热电偶的放置位置

图 2　立式安装的热电偶放置

4.2.4.2温控器断开后的某个测量点的贮水平均温度Q_A的测量

When thermostats operated, measured the average water temperature Q_A

温控器每次断开电路后某个测温点的贮水平均温度Q_A按下述公式计算：

measured the temperature Q_A by under mentioned expressions:

$$Q_A = \Sigma\ Q_{Ai}/n$$

式中：

—— Q_A温控器断开后的贮水平均温度，℃；

Q_A denote average water temperature when thermostats operated .(℃)

—— Q_{Ai}温控器某次断开后的贮水温度，℃；

Q_{Ai} denote water temperature when thermostats operated any once .(℃)

—— n测量次数。

testing number.

4.2.4.3温控器接通时的某个测量点的贮水平均温度Q_E的测量

When thermostats switched on, measured the average water temperature Q_E

温控器每次接通电路后某个测温点的贮水平均温度Q_E按下述公式计算：

measured the temperature Q_E by under mentioned expressions:

$$Q_E = \Sigma\ Q_{Ei}/n$$

式中：

—— Q_E温控器接通后的贮水平均温度，℃；

Q_E denote average water temperature when thermostats switched on.(℃)

—— Q_{Ei}温控器某次接通后的贮水温度，℃；

Q_{Ei} denote water temperature when thermostats switched on any once. (℃)

—— n测量次数。

testing number.

4.2.4.4不排水时，某个测量点的贮水平均温度Q_{Mi}的确定

Water heater do not drain, measured the average water temperature Q_{Mi}

被试电热水器容器内的水，在不排水的情况下，某个测量点贮水平均温度Q_{Mi}按下述公式计算:

measured the temperature Q_{Mi} by under mentioned expressions:

$$Q_{Mi}=(Q_A+Q_E)/n$$

式中:

—— Q_{Mi} 不排水时的某个测量点的贮水平均温度，℃;

Water heater do not drain,measured the average water temperature Q_{Mi} . (℃)

—— Q_A温控器断开后的贮水平均温度，℃;

Q_A denote average water temperature when thermostats operated .(℃)

—— Q_E温控器接通后的贮水平均温度，℃。

Q_E denote average water temperature when thermostats switched on.(℃)

最后按下述公式算出5个测量点的平均温度Q_M 作为被试电热水器不排水时的贮水平均温度

measured the temperature Q_M by under mentioned expressions , Q_M is final average water temperature.

$Q_M = \Sigma\ Q_{Mi}/5$

4.2.4.5每24h固有损耗的测定

Measured standing loss per 24 h

每24h固有损耗E_G按下述公式计算：

measured standing loss per 24 h by under mentioned expressions:

$E_G = 45/(Q_M - Q_{amb}) \times E$

式中：

—— E_G 每24h固有损耗，kWh；

E_G denote standing loss per 24 h .(kWh)

—— Q_M不排水时的贮水平均温度，℃；

Q_M denote the average water temperature

Q_{Mi} ,that water heater do not drain .(℃)

—— Q_{amb}试验时的环境温度，℃；

Q_{amb} denote environmental temperature. (℃)

—— E第24h能量损耗，kWh。

E denote the water heater's energy efficiency

in the No. twenty-fourth hour. (kWh)

4.2.4.6 电热水器每10L容积水的24h固有损耗值λ的计算

Measured water heater standing loss per 24 h (λ) every 10 l .

$\lambda = E_G$ /容积×10

$\lambda = E_G$ /cubage×10

4.2.4.7 最后通过λ和表1中的数值对比，判定合格与否。

Finally ,contrast the data between λ and table 1, decide the result is right or fault.

中国家庭中安装的电热水器
Electric water heater fixed in Chinese families

在中国家庭中安装的电热水器，一般安装在卫生间、厨房等比较潮湿的环境中。安装的房间的面积较小，一般在**4-10m²**之间。淋浴时人与热水器在同一房间中。鉴于上述使用中的实际情况，在中国销售的电热水器一般采用防溅型结构，电热管采用防干烧电热管，以确保在使用中一但出现漏电问题或因停水造成干烧漏电时，对使用者提供可靠的保护。

The water heaters in Chinese families commonly been fixed in moist circumstance, such as restrooms,kitchens which usually have 4~10 m² area.Besides,users and appliances are in the same room when they are showering. Because of the facts in using,the water heaters sold in China use water defend structure commonly , and to provide credible protect to users when there are creepage problems.

电热水器产品的市场特点

Market characteristic of electric water heaters

1.目前在中国大陆市场，电热水器品牌约290个,鱼龙混杂，水平参差不齐。

2.受水质和使用习惯的影响，电热水器保有量由北方至南方依次递减。

3.经过十几年的市场培育，消费者对电热水器的认同率较高，市场需求大，尤其是近几年，农村市场需求增长快。

4.市场上销售的电热水器以储水式封闭型电热水器为主，其它类型的电热水器为辅。简易的出口敞开式电热水器等技术水平较低的产品正逐步被淘汰。

5.随着消费者节能意识的提高，带有太阳能辅助加热功能的和节能效果好的电热水器越来越受到消费者的欢迎。

6.市场上销售的电热水器产品，以小容量电热水器为主，容积在30-80升之间。功率在2500W以下。

1.In the market of China mainland today,there are about 290 brands of water heaters, and their products' qualities are in different levels.

2.The amount of water heaters decreased successively from North to South in China, because of the different water quality and using habits.

3.The market needs is becoming bigger and bigger,especially recently,the market in the country is growing fast.

4.The main type of the products sold in the market is closed water heaters. The open-outlet water heaters which have the low technical level are being eliminated from market.

5.As the improvement of the users' energy-conserving recognition.The electric water heaters which can work by solar energy are more and more popular in consumers.

6.The capacity of products sold in today's market is commonly between 30-80L,and the power input is below 2500W.

室内加热器产品的市场特点

Characteristics of room heaters' market

1.品牌多，总体技术水平低。

2.技术不成熟，能耗大，使用成本高。

3.直热式产品市场认同率高，蓄能式产品市场认同率低。

4.受政策影响，蓄能式产品发展速度高于直热式产品。

1.There are too many brands,but whole quality in low level.

2.The skills needs to be improved,consume the products costs are too high.

3.Recognition of direct-heat products is much higher than store-energy products.

4.The tempo of store-energy products is faster than direct-heat products ,because of the policy.

在中国销售的电热水器

Electric water heaters sold in China

目前在中国大陆市场，电热水器的品牌很多。很多国际知名的公司都将自己的电热水器产品引入中国市场。例如已经在中国建厂的**A.O.SMITH**公司，**Ariston**公司，在中国引入产品销售的美国人电热水器公司，美国白浪热水器公司等。本土企业在国内的市场中也占有很大的份额，主要的电热水器生产厂如青岛海尔，广东美的等等。

At present the market of China Mainland, there are a lot of brands of the electric water heaters . Many international and known companies introduce their products into the Chinese market. For example A.O.SMITH Company, Ariston Company have set up their factory,and the Whitewave water heater company, the American electric water heaters company have introduced their products to China, etc.. Native companies occupy more share in the domestic market,such as Haier in Qingdao,and Media in Guangdong.

认证情况简介

Brief introduction of Certification

在中国销售的电热水器及室内加热器产品，按照有关规定，自2002年5月1日起，产品应符合国家对电热水器及电暖器产品的强制性标准要求，只有获得CCC标志的产品才可上市销售。

国内受理CCC标志申请的机构有中国质量认证中心和电磁兼容认证中心。作为上述两个认证中心的签约试验室，BTIHEA负责北美地区电热水器和室内加热器产品的认证检测工作。

对于美国进口中国销售的上述两类产品，由于标准上的差异，即使在美国国内获得了美国政府颁发的相关证书，在中国销售时，也需要补充进行相关的试验或对相关资料进行确认，才可获得CCC标志。

节能标准在我国不作为强制性标准，厂家可自愿选择获取节能标志，但随着市场上消费者对节能认识的提高，许多厂家已开始着手进行节能标志的认证。

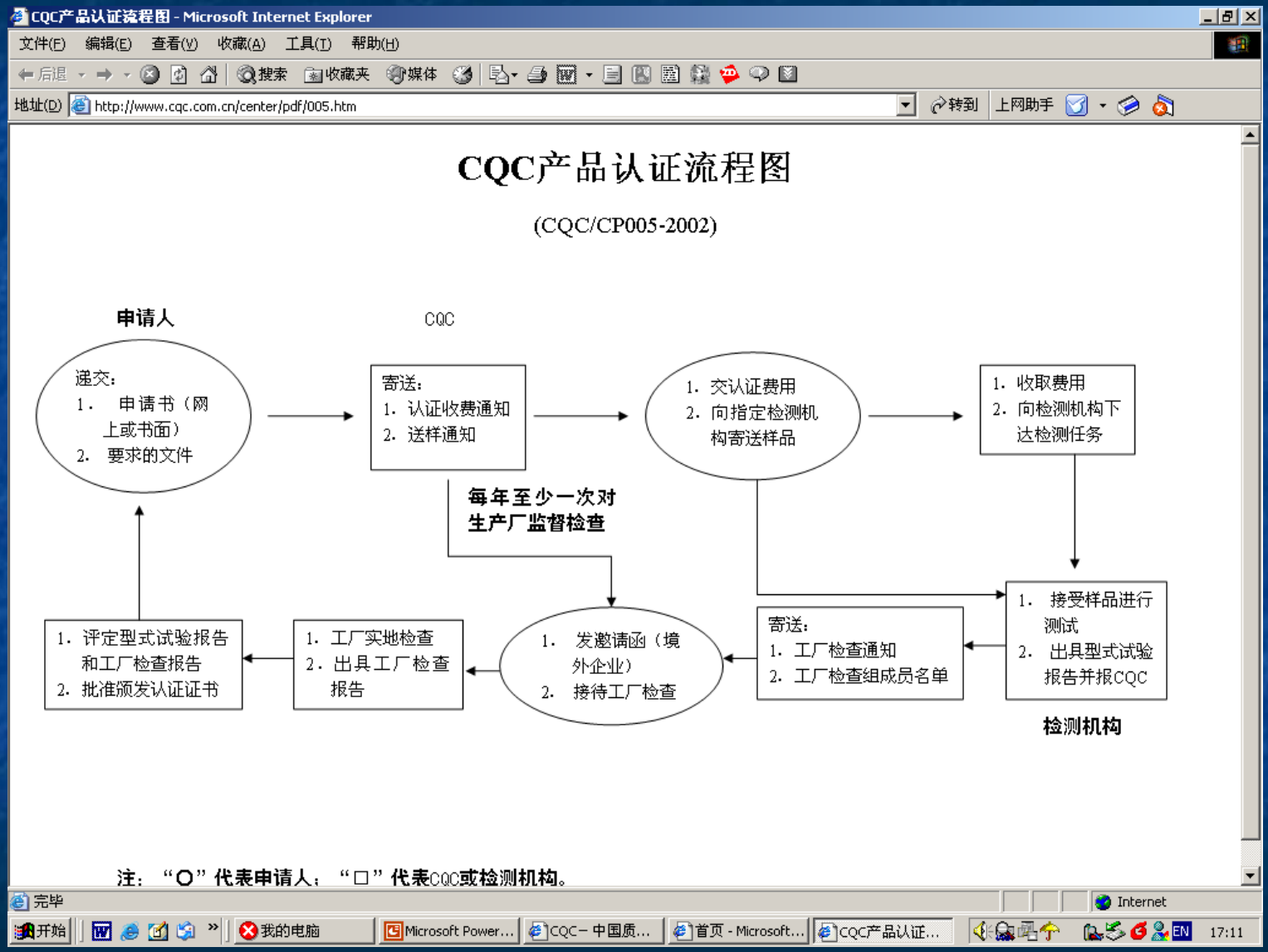
Electric water heaters and room heaters sold in China, according to relevant regulations, since May 1, 2002, the products should meet with compulsory standards for the electric heat waters and electric room heaters, they can be sold in the market only through obtaining CCC mark.

There are two centers to accept CCC organization applied :CQC and CEMC. BTIHEA as the visa lab of these two Certificated Center,is responsible for the certification of electric water heaters and room heaters in North America area .

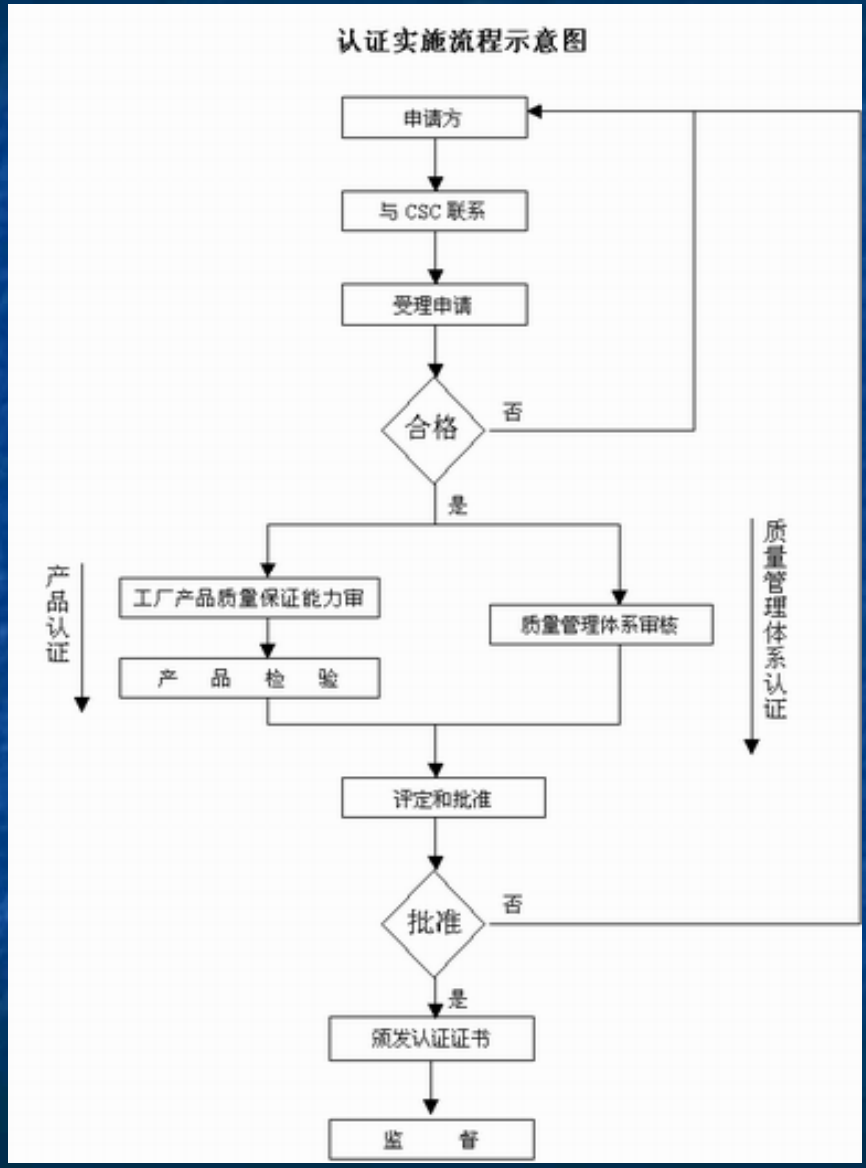
Because of the difference between the standards,those two electric appliances even got the relevant certificate awarded by U.S. government , while selling in China , still need to do some complemental testing or provide relevant documents, obtain CCC mark.

The energy-conserving standard is not regarded as the compulsory standard in our country, the companies can obtain the energy-conserving mark voluntarily , but as the improvement of consumers′ recognition for the energy-conserving, a lot of producers have already begun to set about dealing with the certification of the energy-conserving.

CQC产品认证流程图


CQC产品认证流程图 - Microsoft Internet Explorer
http://www.cqc.com.cn/center/pdf/005.htm
CQC产品认证流程图
(CQC/CP005-2002)
申请人
CQC
递交：
1． 申请书（网上或书面）
2． 要求的文件
寄送：
1．认证收费通知
2．送样通知
1．交认证费用
2．向指定检测机构寄送样品
1．收取费用
2．向检测机构下达检测任务
每年至少一次对生产厂监督检查
1． 接受样品进行测试
2． 出具型式试验报告并报CQC
检测机构
寄送：
1．工厂检查通知
2．工厂检查组成员名单
1． 发邀请函（境外企业）
2． 接待工厂检查
1．工厂实地检查
2．出具工厂检查报告
1．评定型式试验报告和工厂检查报告
2．批准颁发认证证书
注：“○”代表申请人；“□”代表CQC或检测机构。

节能产品认证流程图


认证实施流程示意图
申请方
与 CSC 联系
受理申请
合格
否
是
产品认证
工厂产品质量保证能力审
产 品 检 验
质量管理体系审核
质量管理体系认证
评定和批准
批准
否
是
颁发认证证书
监 督

相关信息网址

- http://www.cemc.org.cn
- http://www.cqc.com.cn
- http://www.cheari.com
- http://www.cecp.org.cn