U.S.–China Standards and Conformity Assessment Cooperation Program
The United States Trade and Development Agency (USTDA)
美国贸易开发署(USTDA)
中国–美国标准与合格评定合作项目(SCACP)

U.S.–China Green Building Materials and Green Lighting Certification System Workshop
中美绿色建材与绿色照明认证体系研讨会

Supporting Agencies/支持单位:
U.S. Department of Energy
美国能源部
U.S. Trade & Development Agency
美国贸易发展署
China National Development and Reform Commission
中国发展和改革委员会

Hosts/主办单位:
China Solid State Lighting Alliance
国家半导体照明工程研发及产业联盟
Pacific Northwest National Laboratory
美国太平洋西北国家实验室
China Building Material Test & Certification Group Co. LTD
中国建材检验认证集团股份有限公司
American National Standards Institute
美国国家标准化机构

2018年7月23日 北京
July 23, 2018. Beijing

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Agenda

会议议程

U.S.-China Green Building Materials and Green Lighting Certification System Workshop

July 23, 2018
Building A, 4th Floor, Meeting Room 22
China People's Palace Hotel
No.1 Zhenwumiao Road, Fuxingmen Ave, Xicheng District
Beijing, China

AGENDA

Morning: Plenary workshop
Moderator: Ma Li – U.S.-China Energy Cooperation Program (ECP)

8:30-9:00 Registration

9:00-9:30 Welcome remarks

- Zhao Huaiyong – National Development and Reform Commission (NDRC)
- Michael Yo, Deputy Director – Department of Energy (DOE)
- Steven Winkates, Director of Program Management, East Asia Region – U.S. Trade & Development Agency (USTDA)

9:30-10:05 Keynote speeches

- Analysis of China green building product standards and certification (10 min)
  Liu Yi –China Building Material Test & Certification Group Co. LTD (CTC)
- The overview of certification, policy, and development of SSL industry in China(10 min)
  Wu Ling– China Solid State Lighting Alliance(CSA)
- Roadmap to a robust national green building product certification system (15 min)
  Sha Yu – Pacific Northwest National Laboratory (PNNL)

10:05-11:10 **Panel 1 Enhancing the National System of Green Building Product Certification**

Panel discussion (50 min)

Moderator: Zhao Huaiyong – NDRC (intended) or Shi Xinyong – CTC

Panelists:

- Sun Xuliang – SAC
- MOHURD
- Wang Kun – CNCA
- Michael Yo – DOE

Discussion questions:

- Feedback about the roadmap - Would it work? What else should be included in the roadmap?

- Implementation of the roadmap - What are the roles of each agency and how can they collaborate?

Q&A and discussion (15 min)

11:10-11:30 Break + Networking

11:30-12:30 **Panel 2 Options for Pilot Projects in Product Certification**

Presentation topics (e.g. Ideas on pilot projects, Implementation steps and potential challenges):

- Verification of LED lighting products (10 min)
  Michael Yo – Department of Energy(DOE)
- Acceptance codes and green building products
  Deng Qinqin – China Academy of Building Research (CABR)(10 min)

Panel discussion (35 min)

Moderator: Sha Yu – PNNL

Panelists:

- Zhao Huaiyong – NDRC
- MOHURD
- Sun Xuliang – SAC
- Wang Kun – CNCA

Discussion questions:

- What kind of pilot projects should be prioritized?
- How can the industry participate in pilot projects?

Q&A and discussions (5 min)

12:30-13:30 Lunch + Networking

Afternoon: Two parallel breakout sessions on window glass standards (in collaboration with SAC and CTC) and LED lighting product certification (in collaboration with NDRC and CSA)

A. LED Lighting Product Certification (Building A, 4th Floor, Meeting Room 22)

13:30-14:50 **Panel 3a LED Lighting Product Certification**

Presentation topics:

- Comparison among test standards for LED lighting products (10 min)
  Qian Cheng –State Key Laboratory of Solid-State Lighting
- LED Lighting Product Certification in China (10 min)
  Zheng Xuesheng– China Quality Certification Centre (CQC)
- Recommendations for Certification Programs (10 min)
  Sha Yu – PNNL

Panel discussion (40 min)

Moderator: Li Jinmin–China Solid State Lighting Alliance

Panelists:

- Sha Yu – PNNL
- Li Zili – Guangdong Testing Institute of Product Quality Supervision
- Zheng Xuesheng – CQC
- Cao Suming – State Key Laboratory of Solid-State Lighting

Discussion questions:

- What are the challenges in product certification?
- What improvements could be made?

Q&A and discussion (10 min)

14:50-15:50 **Panel 4a Market Access of LED Lighting Products**

Presentation topics:

- Market Access for LED Lighting (10 min)
  Mark Ginsberg – U.S.Green Building Council (USGBC)
- LED Lighting Products Energy Efficiency Leader and China Energy Label
  Xia Yujuan – China National Institute of Standardization (CNIS)(10 min)

Panel discussion (35 min)

Moderator: Mark Ginsberg – USGBC

Panelists:

- Lutron
- Xia Yujuan – CNIS
- Lu Guangming – Zhejiang Shenghui Lighting Electrical Co., Ltd.

Discussion questions:

- How can product certification increase market access for LED lighting products?
- What are other practices to increase market access?

Q&A and discussion (5 min)

B. Window Glass Testing and Standards (Building A, 4th Floor, Meeting Room 23)

13:30-15:00 **Panel 3b Window Systems and Testing Standards**

Presentation topics:

- Window systems and standardization (10 min)
  Charlie Curcija – Lawrence Berkeley National Laboratory(LBNL)
- Introduction of GB/T 35604-2017 “Green Product Assessment Building Glass” (10 min)
  Wu Jie – CTC
- Standards for window film and attachment(10 min)
  Tom Barnett – National Fenestration Rating Council (NFRC)
- Application standards and energy saving requirements of super glass in buildings (10 min)
  GaoQi – NorthGlass

Panel discussion (45 min)

Moderator: Huang Jianbin – SAC/TC255

Panelists:

- Charlie Curcija – LBNL
- Tom Barnett – NFRC
- GaoQi – Northglass
- Wu Jie – CTC

Discussion questions:

- Potential areas for standard development and enhancement, such as window film and attachments, boundary conditions, and whole window standards

Q&A and discussion (5 min)

15:00-15:50 **Panel 4b Broader Implication of Testing Standards**

Presentation topics:

- U.S. Code Requirements for Windows, Doors, Skylights and Glazed Products

  Evaluation and Certification in U.S.(10 min)

  Cheng Ping – International Code Council (ICC)

Panel discussion (35 min)

Moderator: Huang Jianbin – SAC/TC255

Panelists:

- Zhang Zhemin – AOPTEK
- Cheng Ping – ICC
- Han Song – CTC

Discussion questions:

- What are the challenges in product testing by following testing standards?
- How do companies ensure the accuracy and credibility of testing results as well as compliance with acceptance codes?

Q&A and discussion (5 min)

Combined Session of Closing Remarks(Building A, 4th Floor, Meeting Room 22)

15:50-16:10 Readouts of breakout sessions of LED Lighting and Window Glass

- Li Jinmin– China Solid State Lighting Alliance (10 min)
- Huang Jianbin – SAC/TC255 (10 min)

16:10-16:40 Implications for Broader Product Certification Systems and Next Steps

- Steven Winkates – USTDA (10 min)

中美绿色建材与绿色照明认证体系研讨会

中国职工之家 A 座配楼四层第 22 会议室
北京，中国
2018 年 7 月 23 日

会议日程

时间	议题	发言人
上午会议（A 座配楼四层第 22 会议室）		
8:30-9:00	参会注册	
9:00-9:30	欢迎致辞	赵怀勇发改委（NDRC） Michael Yo 副主任 美国能源部（DOE） Steven Winkates 东亚地区项目管理主任 美国贸易发展署（USTDA）
9:30-10:05	主题演讲： ● 中国绿色建材产品标准与认证分析(10 分钟) ● 中国半导体照明产业发展及认证政策概况（10 分钟） ● 绿色建筑产品认证系路线图建议（15 分钟）	刘翼 中国建材检验认证集团股份有限公司(CTC) 吴玲国家半导体照明工程研发及产业联盟（CSA） 余莎 美国太平洋西北国家实验室(PNNL)
10:05-11:10	**座谈会 1** 加强完善国家级绿色建筑产品标准、检测、认证和标识体系	
	嘉宾讨论（50 分钟） ● 完善体系所需行动以及行动时间框架？ ● 政府部门在实施行动中所扮演的角色以及如何合作？	主持人：赵怀勇发改委（NDRC） 讨论嘉宾： 孙旭亮国标委（SAC） 住建部（MOHURD） 王昆 认监委（CNCA） Michael Yo 美国能源部（DOE）

	问答环节（15 分钟）	
11:10-11:30	茶歇	
11:30-12:30	**座谈会 2** 开展试点项目	
	演讲报告： ● LED 照明产品验证检测(10 分钟） ● 建筑节能验收和绿色产品应用（10 分钟）	Michael Yo 美国能源部（DOE） 邓琴琴 建研院（CABR）
	嘉宾讨论（35 分钟） ● 哪些试点项目应该优先进行？ ● 企业如何参与到试点项目中去？	主持人：余莎 美国太平洋西北国家实验室(PNNL) 讨论嘉宾： 赵怀勇发改委（NDRC） 住建部（MOHURD） 孙旭亮 国标委（SAC） 认监委（CNCA）
	问答环节（5 分钟）	
12:30-13:30	午餐	
下午会议		
A.LED 产品认证分会（A 座配楼四层第 22 会议室）		
13:30-14:50	**座谈会 3a** LED 照明产品认证	

	演讲报告： ● LED 照明产品检测标准对比（10 分钟） ● 中国 LED 照明产品认证(10 分钟） ● 认证项目建议（10 分钟）	钱诚 半导体照明联合创新国家重点实验室 郑雪生中国质量认证中心（CQC） 余莎 美国太平洋西北国家实验室(PNNL)
	嘉宾讨论（40 分钟） ● 产品认证遇到了什么问题和挑战? ● 针对目前现状应该如何改进?	主持人：李晋闽国家半导体照明工程研发及产业联盟（CSA） 讨论嘉宾： 余莎 美国太平洋西北国家实验室(PNNL) 李自力 广东产品质量监督检验研究院 郑雪生 中国质量认证中心（CQC） 曹苏明 半导体照明联合创新国家重点实验室
	问答环节（10 分钟）	
14:50-15:50	**座谈会 4a** LED 照明产品的市场准入	
	演讲报告： LED 照明市场准入（10 分钟） LED 照明产品能效“领跑者”和能效标识（10 分钟）	 Mark Ginsberg 美国绿色建筑委员会(USGBC) 夏玉娟 中国标准化研究院（CNIS）
	嘉宾讨论（35 分钟） ● 针对 LED 照明产品，产品认证如何提升市场准入? ● 是否存在有其他方法提升市场准入?	主持人：Mark Ginsberg 美国绿色建筑委员会（USGBC） 讨论嘉宾： 路创 夏玉娟 中国标准化研究院（CNIS） 陆光明 浙江生辉照明
	问答环节（5 分钟）	

<table>
<tr><td colspan="3">B.玻璃和窗户的认证检测分会（A 座配楼四层第 23 会议室）</td></tr>
<tr><td rowspan="4">13:30-15:00</td><td colspan="2">座谈会 3b 外窗系统与测试标准</td></tr>
<tr><td>演讲报告：
● 外窗系统和标准化（10 分钟）
● 《绿色产品评价 建筑玻璃》标准介绍（10 分钟）
● 外窗贴膜与其他附件相关标准（10 分钟）
● 超级玻璃在建筑中的应用标准及节能要求（10 分钟）</td><td>Charlie Curcija 劳伦斯伯克利国家实验室（LBNL）
吴洁 中国建材检验认证集团股份有限公司（CTC）
Tom Barnett 美国国家门窗评级委员会（NFRC）
高琦天津北玻玻璃工业技术有限公司（NG）</td></tr>
<tr><td>嘉宾讨论（45 分钟）
● 关于窗玻璃标准化的讨论，包括外窗贴膜、配件、边框条件、整窗等</td><td>主持人：黄健斌 SAC/TC255
讨论嘉宾：
Charlie Curcija 劳伦斯伯克利国家实验室（LBNL）
Tom Barnett 国家门窗评级委员会（NFRC）
高琦 天津北玻玻璃工业技术有限公司（NG）
吴洁 中国建材检验认证集团股份有限公司（CTC）</td></tr>
<tr><td colspan="2">问答环节（5 分钟）</td></tr>
<tr><td rowspan="2">15:00-15:50</td><td colspan="2">座谈会 4b 关于测试标准更加广泛的意义</td></tr>
<tr><td>演讲报告：
● 美国建筑规范对门窗，天窗及塑料透光产品的
要求,评估和认证</td><td>程平美国国际规范委员会（ICC）</td></tr>
</table>

	嘉宾讨论（35 分钟） ● 在现有产品检测（包括标准）中存在的挑战？ ● 公司如何来确保测试结果的准确性以及遵守建筑验收规范？	主持人：黄健斌 SAC/TC255 讨论嘉宾： 程平 美国国际规范委员会（ICC） 韩松 中国建材检验认证集团股份有限公司（CTC） 张喆民 北京奥博泰科技有限公司
在问答环节（5 分钟）		
总结部分（A 座配楼四层第 22 会议室）		
15:50-16:10	建筑窗玻璃与LED照明分会总结分析	李晋闽 国家半导体照明工程研发及产业联盟（CSA） 黄健斌 SAC/TC25 全国建筑用玻璃标准化技术委员会
16:10-16:40	对于更广泛的产品认证体系的影响和后续计划	Steven Winkates 美国贸易发展署(USTDA)

Hosts and Supporting Agencies Overview

主办单位介绍

U. S. Trade and Development Agency (USTDA)

The U.S. Trade and Development Agency (USTDA) has the mutually beneficial mission of linking U.S. businesses to export opportunities by funding project preparation and partnership building activities which develop sustainable infrastructure and foster economic growth in partner countries.

USTDA promotes economic growth in emerging economies by facilitating the participation of U.S. businesses in the planning and execution of priority development projects in host countries. The Agency's objectives are to help build the infrastructure for trade, match U.S. technological expertise with host country development needs, and help create lasting business partnerships between the United States and emerging economies.

USTDA's Program Activities

Project Development

Project identification and investment analysis generally involves technical assistance, feasibility studies and pilot projects which support large investments in infrastructure contributing to host country development. USTDA's program in China includes the transportation, energy, agriculture, and healthcare sectors.

Trade Capacity Building and Sector Development

Trade capacity building and sector development assistance supports the establishment of industry standards, rules and regulations, market liberalization and other policy reform. In China, USTDA has supported activities to enhance the protection of intellectual property rights, fair and transparent government procurement practices, science-based agricultural biotechnology regulations, and standards across a range of sectors.

Cooperation Programs

USTDA's success in China is due in large part to the public-private cooperation programs that the Agency supports in country. These programs provide a forum for government agencies and private companies from both countries to share technical, policy, and commercial knowledge to advance shared goals. USTDA has successfully established programs based on this model in the aviation, energy, healthcare, and agriculture and food sectors.

By adapting to the evolving needs of China's market and closely coordinating with decision-makers in both countries, these public-private partnerships have achieved long-term success, providing continued trade opportunities.

Reverse Trade Missions

Through the Agency's reverse trade missions (RTMs), USTDA has increased its support for programs designed to bring procurement officials to the United States to witness U.S. technologies, equipment, and ingenuity firsthand. These visits also facilitate new partnerships with U.S. companies needed to spur commercial cooperation. Related, USTDA also supports technology demonstrations, training, and specialized sector-specific workshops and conferences.

U.S.-China Standards and Conformity Assessment Cooperation Program

Sponsored by the U.S. Trade Development Agency (USTDA) and coordinated by the American National Standards Institute (ANSI), the U.S.-China Standards and Conformity Assessment Cooperation Program (SCCP) provides a forum through which U.S. and Chinese industry and government representatives can:

- Cooperate on issues relating to standards, conformity assessment, and technical regulations;
- Foster the relationships necessary to facilitate U.S.-China technical exchange on standards, conformity assessment, and technical regulations; and
- Exchange up-to-date information on the latest issues and developments relating to standards, conformity assessment, and technical regulations.

Over the next three years, ANSI will coordinate 20 workshops in China under Phase V of the SCCP. The workshops will cover a wide range of sectors, as proposed by interested U.S. private-sector organizations. Workshop topics will be chosen in coordination with relevant industry associations, ANSI, and USTDA.

To learn more about the U.S.-China SCCP or to express interest in sponsoring or participating in a workshop, please visit our website at:

www.standardsportal.org/us-chinasccp

FOR MORE INFORMATION

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中美标准与合格评定合作项目

由美国贸易发展署 (USTDA) 提供资助、 美国国家标准化机构 (ANSI) 负责协调的中美标准与合格评定合作项目(SCCP) 在以下几个方面 为中国和美国的相关行业和政府代表提供了一个论坛:

- 标准、合格评定以及技术法规等领域的合作;
- 为促进中美在标准、合格评定以及技术法规等领域的技术交流建立必要的联系;
- 及时交流关于标准、合格评定以及技术法规等领域的最新议题和发展情况的相关信息

未来三年，ANSI 将在中国协调举办 20 场研讨会。根据美国民间业界相关机构组织的建议，研讨会内容将覆盖不同的行业和领域。研讨会的主题将由相关行业组织、 ANSI 以及 USTDA 协调选定。 欲了解该项目的更多情况或有意赞助或参与该项目，请访问下列网站：

www.standardsportal.org/us_chinasccp

欲了解其他信息，请联系

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American National Standards Institute (ANSI)

As the voice of the U.S. standards and conformity assessment system, the American National Standards Institute (ANSI) empowers its members and constituents to strengthen the U.S. marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment.

The Institute oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more. ANSI is also actively engaged in accrediting programs that assess conformance to standards – including globally-recognized cross-sector programs such as the ISO 9000 (quality) and ISO 14000 (environmental) management systems.

ANSI has served in its capacity as administrator and coordinator of the United States private sector voluntary standardization system for the past hundred years. Founded in 1918 by five engineering societies and three government agencies, the Institute remains a private, nonprofit membership organization supported by a diverse constituency of private and public sector organizations.

Throughout its history, ANSI has maintained as its primary goal the enhancement of global competitiveness of U.S. business and the American quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems and promoting their integrity. The Institute represents the interests of more than 270,000 companies and organizations and 30 million professionals worldwide through its office in New York City, and its headquarters in Washington, D.C.

美国国家标准化机构（ANSI）

作为美国标准和合格评定体系的发言人，美国国家标准化机构授权其会员强化美国市场在全球经济中的地位，同时协助保障消费者的安全和健康以及环境保护事宜。

机构对数以千计的标准和指导方针的制定、颁布、实施进行监督，而这些标准和指导方针几乎直接影响商业的每个领域：从声呐设备到建筑设备，从乳制品及家禽产品到能源分配等等。 美国国家标准化机构也积极参与评估合格到标准的委托项目——包括诸如 ISO9000（质量）和 ISO14000（环境的）管理系统等全球认可的跨领域项目。

在过去的一个世纪中，美国国家标准化机构担任美国私营部门自愿性标准化体系的管理者及协调者。自 1918 年由五家工程师协会和三个政府部门成立以来，本机构一直是一个民间、非营利性质的会员制组织，得到来自私营和公共部门的多元化支持。

纵观历史，美国国家标准化机构的首要目标一直是强化美国商业的全球竞争力，通过推进自愿性标准及合格评定体系并对它们进行完善从而提高美国人民的生活质量。机构总部设在华盛顿特区，并在纽约设有办公地点，代表全球超过 27 万家公司及组织和三千万专家的利益。

China Solid-State Lighting Alliance (CSA)

China Solid-State Lighting Alliance (CSA) is the non-profit organization responsible for solid-state lighting industry. CSA has 623 alliance members, which cover over 70% of the industry product value and consist of 30 listed enterprises, four traditional lighting companies, local branches of the top 5 international lighting enterprises and top 10 testing institutes in China etc.

CSA has a professional team of more than 100 people, with 6 Ph. D. degrees, 12 Masters degrees and over 85% of the team has a Bachelor's degree. As a professional research organization, CSA has the adequate experience and background in the management of solid-state lighting industry research projects, technical innovation, standard research, industrial investigation and study, enterprise consulting, human resource services, exhibition promotion and market channel development amongst other things. Furthermore, CSA offers a powerful political supporting in technical innovation and policy consulting for NDRC, MOST, Ministry of housing and Urban-Rural Development of the People's Republic of China (MOHURD), Standardization Administration of the People's Republic of China (SAC) etc. For instant, CSA undertook the solid-state lighting industry development guidance and plan work which was published by NDRC and the development and application of solid-state lighting technology in the 13th Five-Year plan work which was published by MOST. In addition, CSA also formulates the strategy plan of industry and industrial zone for Guangdong, Shenzhen, Xiamen, Nanchang and other 30 local governments.

国家半导体照明工程研发及产业联盟（China Solid State Lighting Alliance，简称 CSA ）在科技部高新司指导下，成立于 2004 年 10 月，是为半导体照明等战略性新兴产业提供全方位创新服务的新型组织。自成立以来，CSA 始终秉承“合作、共赢、创新、发展”原则，致力于支撑政府决策、构建产业发展环境、促进创新资源整合，现有会员 623 家，占国内 70%以上的产业产值。上市企业 30 余家，包括传统照明前四大企业，国际前五大企业在华机构，台湾前五大企业，全国前十家检测机构等。

CSA 拥有一支百余人的专业的科研项目管理、技术研发与成果转化、标准研制、产业研究、企业咨询、金融服务、电商交易、人力资源服务、信息传播、会展促进与市场渠道拓展的服务团队。

CSA 作为专业性组织机构，参与了大量的产业政策建议咨询、产业发展规划与路线图制定、实施方案设计等工作，为国家发改委、科技部、住建部、国家标准委等相关部委和地方政府在产业布局、技术创新和策略咨询方面提供了大量决策支撑，如牵头承担国家发改委等六部委“半导体照明节能产业发展规划”(“十二五”、“十三五”)、科技部“半导体照明科技发展‘十二五’专项规划及实施方案”等国家相关规划的编制工作，并先后为广东省、深圳市、厦门市、宁波市等 30 余家地方政府编制产业发展战略与基地发展规划。

The Pacific Northwest National Laboratory

The Pacific Northwest National Laboratory (PNNL) is one of the seventeen U.S. Department of Energy (DOE) National Laboratories and has over 4,000 scientists, engineers, and professionals. PNNL's research and development programs support DOE through efforts in energy resiliency, environment protection, and national security. In particular, PNNL serves as the technical lead for DOE's Building Energy Codes Program and also plays a major role in other energy efficiency deployment programs, including building retrofits, smart grids, equipment standards, and market transformation efforts with industry and utilities.
The Joint Global Change Research Institute (JGCRI), a partnership between PNNL and the University of Maryland, is located in College Park, MD and houses an interdisciplinary team dedicated to understanding the problems of global climate change and their potential solutions. Joint Institute staff bring decades of experience and expertise to bear in science, technology, economics, and policy. JGCRI is currently working on building energy efficiency in China and partnering with several organizations and cities as part of this work. We have also worked with several Chinese cities on energy efficiency planning and market transformation mechanisms.

西北太平洋国家实验室是隶属于美国能源部的 17 个国家实验室的其中之一，有 4000 多名科学家，工程师等专业人员任职于此。西北太平洋国家实验室致力于支持美国能源部在能源弹性、环境保护、以及国家安全领域的研究和发展的任务。实验室作为美国能源部建筑能源守则项目的技术负责人，在推动能效发展方面起着重要作用。其涉及领域包括建筑节能改造、智能电网、设备标准、以及工业和公用事业的市场转型。

由西北太平洋国家实验室与马里兰大学合作的全球变化联合研究所位于美国马里兰州科利奇帕克市。该研究所有一个跨学科团队，致力于理解全球气候变化和潜在的解决方案。研究所工作人员在科学、技术、经济和政策方面有着几十年的经验和专业知识。研究所目前正在中国建筑能效开展工作，并已和各类组织以及各个城市形成合作伙伴，曾与几个中国城市进行能效规划和市场转型机制的工作。

China Building Material Test & Certification Group Co., Ltd.

Originated in the 1950s, China Building Material Test & Certification Group Co., Ltd. (hereinafter referred to as 'CTC', stock symbol 603060) has grown healthily with the development of China's building material industry. Through over sixty years of active exploration and tireless efforts, CTC has grown into the large scale integrity third-party test and certification body in China In the fields of building materials and construction engineering.

China Building Material Test & Certification Group serves building material production and circulation enterprises, construction engineering owners and contractors, solar photovoltaic production and application enterprises, carbon emission permits trade organizations, competent government authorities in terms of quality and safety production supervision as well as consumers. There are five service platforms including test, certification, safety production technical service, R&D and sales of testing instruments, equipment and standard substance (including standard samples), as well as extension service. Headquartered in Beijing, CTC has twenty-five branches including Shanghai, Tianjin, Guangdong, Shanxi, Hebei, Fujian, Jiangsu, Anhui, Zhejiang, etc., eleven national centers and fifteen industrial centers, with more than one thousand seven hundred personnel.

中国建材检验认证集团股份有限公司（中文简称国检集团，英文简称 CTC，股票代码 603060）的业务起源于二十世纪五十年代，伴随新中国经济的发展而茁壮成长。经过六十余载的积极探索和不懈努力，已经发展成为国内建筑和装饰装修材料及建设工程领域内规模最大的、综合性、第三方检验认证服务机构之一。

中国建材检验认证集团的服务对象包括建筑材料生产及流通企业、建设工程建设及施工单位、太阳能光伏产品生产及应用企业、碳排放权交易单位、各级政府质量和安全生产监督主管部门及消费者等。拥有检测、认证、安全生产技术服务、检验仪器设备研发销售及标准物质（含标准样品）研发销售、延伸服务五大业务平台。中国建材检验认证集团总部设在北京，在华北、华南、华东、西北、西南等区域设有 25 家分支机构，拥有 11 家国家级中心和 15 家行业级中心，员工总数 1700 余人。

Speaker Biographies

演讲人介绍

Michael Yo
Deputy Director for the DOE's China Office
He manages the clean energy and non-proliferation portfolios. He is responsible for coordinating and furthering DOE mission and cooperation in energy efficiency and renewable energy technology and projects. He previously worked at DOE's Energy Information Administration doing energy economics and data analysis.

Steven Winkates
Director of Program Management, East Asia Region
U.S. Trade and Development Agency (USTDA)

Steven Winkates is the Director of Program Management for the East Asia Region at USTDA, based at the U.S. Embassy in Beijing, China. He is responsible for managing USTDA's activities in China and Mongolia, directing business development efforts,coordinating with relevant stakeholders in both the region and the United States, and marketing USTDA services to potential partners in both countries.
Prior to this position, Mr. Winkates worked in Beijing for a consulting firm which specializes in developing transportation infrastructure projects. He also previously served as a Country Manager at USTDA, covering China and Southeast Asia during his tenure, and as a Policy Analyst at the U.S. Department of Commerce.
Mr. Winkates holds a Master of Public Policy from Georgetown University and a Bachelor of Arts from Rhodes College.

温凯时
美国贸易发展署东亚区项目主任

温凯时的职务是美国贸易发展署东亚区项目主任，就任于美国驻华使馆。他负责美国贸易发展署在中国和蒙古的项目，指导业务拓展，协调项目所在国相关方与美方的关系，并推动美国贸易发展署与两国潜在合作伙伴的合作。
在就任之前，温凯时在北京一家从事交通基础设施项目的美国咨询公司工作。在此之前，他担任过美国贸易发展署负责中国，东南亚项目的项目经理。还有过在美国商务部从事政策分析的经历。温凯时拥有罗德大学文学学士和乔治城大学公共政策硕士学位。

LIU Yi Senior Engineer, Associate director of Green product certification department. He has been engaged in the research on green building material assessment and certification for many years. He is responsible for many national research projects and standards/implementing rule of certifications in green building material field.

刘翼 高级工程师，中国建材检验认证集团绿色产品认证院院长助理，长期从事绿色建材评价认证研究与开发工作，承担多项绿色建材领域国家级科研项目、标准与认证实施规则制订。

WU Ling

Madam Wu Ling is currently leading expert of 3rd generation semiconductors sub-committee of China state advisory committee for advanced material industry development; founding president of International SSL Alliance (ISA); chairman of the board of State Key Laboratory of SSL; president of the Union of Beijing Innovation Alliances; president of China Advanced Semiconductor Industry Innovation Alliance (CASA); director of advanced semiconductor material program management office of China Ministry of Science and technology (MOST); secretary general of China Solid State Lighting Alliance (CSA) .

She is also member of the boards of Chinese Material Research Society and China Illuminating Engineering Society, China Industry-University-Research Institute Collaboration Association, director of cross-strait LED collaboration workgroup of China National Development and Reform Commission. From 2003 to 2016, Madam Wu served as the director of Solid State Lighting (SSL) Program Office of MOST.

吴玲，研究员，国家新材料产业发展专家咨询委员会委员。自 2003 年任科技部半导体照明工程项目管理办公室主任、国家半导体照明工程协调领导小组办公室副主任、北京半导体照明科技促进中心主任；2004 年担任国家半导体照明工程研发及产业联盟秘书长；2009 年出任发改委海峡两岸 LED 照明合作项目工作组组长，中国材料研究学会常务理事、中国照明学会常务理事、中国产学研促进会常务理事；2010 年牵头联合美、澳、韩、新西兰、印度及中国台湾地区的半导体照明产业组织成立国际半导体照明联盟，并全票当选成为第一届主席；2011 年组建了首个依托联盟成立的国家重点实验室（半导体照明联合创新国家重点实验室）并担任其理事长；2014 年被推选成为首都创新大联盟理事长；2015 年任科技部第三代半导体材料项目管理办公室主任；同年 9 月出任第三代半导体产业技术创新战略联盟理事长。

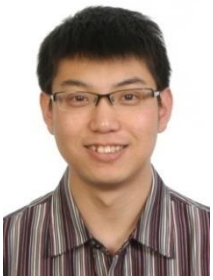
YU Sha

Scientist, Pacific Northwest National Laboratory

Dr. Sha Yu is a scientist at the Pacific Northwest National Laboratory. Her research focuses on Chinese and global energy and mitigation policy issues –emission scenarios and mitigation pathways, clean energy policies, building energy efficiency, urban energy modeling and policies, and modeling energy sectors within the Global Change Assessment Model (GCAM). She is currently leading international collaboration projects in several countries, covering integrated assessment modeling, standard development, and policy implementation.

DENG Qinqin, Ph.D., Associate Research Fellow, deputy director, Institute of building environment and energy, China Academy of building research. Work on the scientific research, consulting, testing and project management related to building energy, and participate in more than 30 national "11th Five-Year", "12th Five-Year", "13th Five-Year" science and technology projects and provincial and ministerial projects. the project leader of the intergovernmental international scientific and technological innovation cooperation, the state " In 12th Five-Year, "13th Five-Year" sub project leader and other projects.

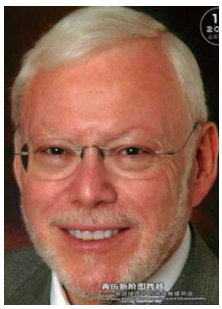
邓琴琴，博士，副研究员，中国建筑科学研究院建筑环境与节能研究院副主任。承担建筑节能相关的科研、咨询、检测和项目管理等工作；参与国家“十一五”、“十二五”、“十三五”科技课题及省部级课题等 30 多项；国家“十三五”重点研发计划政府间国际科技创新合作重点专项的项目负责人、国家“十二五”、“十三五”子课题及其他咨询项目的项目负责人等。



Dr. **CHENG Qian** is currently working as an associated professor in School of Reliability and Systems Engineering at Beihang University. He holds BS and MS degrees in Materials Science and Technology from Beijing Institute of Technology, and PhD degree in Aerospace Engineering from Delft University of Technology. And after that he persumed a postdoctoral research at Institute of Semiconductors, Chinese Academy of Sciences. He was also a program manager at State Key Laboratory of Solid State Lighting in China where he led a team working mainly on reliability researches of LED lighting products. His current work covers multiple subjects including physics of failure analysis and multi-physics simulations on electronic devices and systems, system reliability modeling, accelerating test techniques, etc. He has authored and co-authored over 40 journal/conference papers,8 patents, 3 national and international standards/specifications and 3 book chapters. Until now, he has been invloved in a number of projects funded by national and local governments, and has been active as an associate editor of IEEE Access, reviewer of many highly ranked journals such as Microelectronics Reliability, IEEE Transactions on Electron Devices, Applied Optics, IEEE Access and committee member of international conferences such as IEEE ICEPT and SSLCHINA.

钱诚，北京航空航天大学可靠性学院副研究员，博士生导师，“卓越百人计划”引进人才。本科及硕士就读于北京理工大学，博士就读于代尔夫特理工大学，博士后就读于中国科学院半导体所。曾担任半导体照明联合创新国家重点实验室可靠性项目组总监。多年从事故障物理、系统可靠性设计、可靠性与寿命评估、加速实验方法等研究工作，对功率电子器件及相关产品的失效分析、失效物理建模理论和方法有全面、深入的了解，具有丰富的多物理场仿真模拟经验以及扎实的可靠性数学理论基础。发表论文 40 余篇、授权专利 8 项、参与制订国家及国际标准、技术规范 3 项，出版英文专著 3 章。主持中国博士后科学基金第 57 批面上资助（一等）1 项，作为科研骨干参与国家重点研发计划 1 项，国家高技术研究发展计划（863 计划）1 项（担任子任务负责人和参与单位负责人）、科技部国际合作项目 2 项、北京市科委项目 1 项，常州市科技计划项目（应用基础）1 项。长期活跃于国内外半导体照明相关领域学术交流，担任 IEEEAccess 期刊副编辑，Microelectronics Reliability、IEEE Transactions on Electron Devices、AppliedOptics、IEEE Access 等期刊审稿人，IEEEICEPT、SSLCHINA 等国际会议技术技术委员会委员。

Mark Ginsberg
Principal, Ginsberg Green Strategies, LLC
Senior Fellow, USGBC



Mark Ginsberg founded Ginsberg Green Strategies to consult on Eco-Cities, energy efficiency, renewable energy and the green economy in January 2012. In the Fall 2012, the US Green Building Council designated Mark as the first USGBC Senior Fellow, where he serves as a senior policy adviser and Ambassador. Ginsberg helped develop the USGBC LEED for Cities platform, which launched in late 2016. Prior to that, he served as a senior executive at the U.S. Department of Energy for 20 years and the Arizona Energy Office for 10 years. At DOE, his portfolio included energy efficiency, renewable energy, and climate change technologies, with an emphasis on international activities, including work on Zero Energy Buildings and Communities, with primary focus on China and India. He has overseen major energy agreements between the DOE and Ministries in China, India and the UAE. He launched the research effort that lead to the goal of Zero Energy Buildings to be cost competitive by 2020 and developed early concepts for Zero Energy Communities or Eco-Cities. He granted the first funding for the USGBC's LEED and the DOE Solar Decathlon.
Mr. Ginsberg has received numerous recognitions for his work. In 2003, the US Green Building Council established a Ginsberg Sustainability Fellow to pursue his research goals and, in 2006, the Alliance to Save Energy presented its Lifetime Achievement Award to him. Ginsberg was one of 25 initial inductees into the Energy Efficiency Forum Hall of Fame in 2009. In December, 2011, Secretary of Energy Steven Chu, presented Mark with a Distinguished Career award.

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XIA Yujuan, Doctor, Associated Researcher, graduated from Shanghai Institute of Ceramics, Chinese Academy of Science, and joined in China National Institute of Standardization in 2009. She is mainly engaged in the research of energy-saving standards, energy efficiency labeling, energy-saving polices and mechanism, and related international cooperation activities, and has rich experiences in: 1) Energy-saving standardization: As the convenor of WG12 of ISO/TC 301 Energy Management and Energy Saving, led the development of ISO 50021 General Guidelines for Selecting Energy Savings Evaluators; Led or participated in the development of about 10 national energy efficiency standards and energy saving M&V (measurement and verification) standards, including those for flat-panel TV, computer display, projector, single-capped fluorescent lamps, etc., as well as 8 sector association standards for

superior performance rating of household appliances. She is familiar with the working principles, process and technical analysis approaches for energy saving standardization. 2) Energy saving policies and programs: as the key personnel, participated in the design and implementation of China Energy Labelling, National Subsidy Program for Energy Efficiency Products, Top Runner Program for End-use Products, etc., and accumulated rich experiences in the design of policy framework and implementation mode, promotion and market surveillance of efficient products, and policy impact evaluation. 3) Project research and international cooperation: Held or participated in the research of 5 national sci-tech projects including those of MOST (Ministry of Science and Technology) funded ones and National Quality Infrastructure (NQI) programs; Successively applied and carried out over 20 international cooperation programs with funding from United Nations Development Program (UNDP)/Global Environmental Facility (GEF), Asian Development Bank (ADB), China Sustainable Energy Project (CSEP) of the Energy Foundation, Collaborative Labeling and Appliance Standards Program (CLASP), including NDRC/UNDP/GEF Barrier Removal To The Cost-Effective Development And Implementation of Energy Efficiency Standards and Labelling Project (BRESL) which is led by China and with the participation of six Southeast Asia countries, ADB Promoting Energy-Efficient Products by Strengthening the Energy Labeling Scheme, etc.. She has made perspective explorations in such fields as capacity building regarding energy efficiency standards and labeling, overseas technical assistance, output of China's best practices, regional harmonization and mutual-recognition of energy efficiency standards and labeling, and successfully assisted Pakistan, Vietnam, etc. in developing and improving energy efficiency standards for electric cookers, self-ballasted fluorescent lamps, etc.. She has accumulated rich experiences in international cooperation projects and multilateral cooperation activities, won 2 ministerial level scientific awards, and published 1 book and over 10 papers.

夏玉娟，博士，副研究员，毕业于中国科学院上海硅酸盐研究所材料物理与化学专业，获得博士学位，于 2009 年加入中国标准化研究院，现任资源与环境分院综合业务部副主任。主要从事节能标准、能效标识、节能政策和制度的研究工作，具备较丰富的节能标准化和国际合作工作经验。具有国际标准化工作经历，担任 ISO/TC 301 能源管理和能源节约国际标准化技术委员会 WG12 召集人。主持或参与了近 10 项国家能效标准和节能基础标准的研制工作，涉及平板电视、计算机显示器、投影机、通风机等产品。深度参与了能效标识、节能产品惠民工程、能效领跑者政策和制度的设计实施工作，相关工作包括制度框架和实施模式设计、高效产品遴选、推广和监督、政策成效评估等。主持或参与 5 项国家科技支撑计划、国家质量基础（NQI）专项、质检公益等重大科研项目或课题，先后申请和完成联合国开发计划署（UNDP）/全球环境基金（GEF）、亚洲开发银行（ADB）、美国能源基金会中国可持续能源项目（CSEP）、国际标准标识合作组织（CLASP）等国际合作项目近 20 余项，在能效标准标识能力建设、海外技术援助、中国最佳实践经验输出、国际标准标识协调互认等方面开展了前瞻性探索，获省部级科技奖励 2 项，编写论著 1 部，论文 10 余篇。

WU Jie, Head Engineer. She worked on the test of glass optical and thermal performance at CTC. She has been engaged in the Labeling Certification of the Fenestration Energy Efficiency Performance since 2007. Her Lab acquired the LBNL authorization and became the IGDB Test Lab in 2010.

吴洁总工程师，在 CTC 长期从事玻璃光热性能检测工作，自 2007 年起同时开展建筑门窗节能性能标识测评工作。2010 年实验室获得 LBNL 授权，成为国际玻璃数据库（IGDB）检测实验室。

Tom Barnett
Senior Director of Programs
National Fenestration Rating Council
Lead the NFRC programs team under the broad direction of the CEO with responsibility for planning, organizing, directing NFRC programs and associated staff to ensure that the annual goals and objectives of NFRC's rating programs and technical activities are met. Areas of responsibility include software applications, membership communications, and program product development in support of the technical and ratings programs.

GAO Qi General Manager. He has specialized in the development of glass deep-processing product for more than 30 years. At NorthGlass, his portfolio included National Center for the Performing Arts, Beijing Daxing International Airport, Abu Dhabi International Airport, Central Bank of Kuwait, UK Bloomberg News building and Apple Stores. He also participated in the establishment of many national glass standards.

高琦总经理，致力于深加工玻璃产品的技术研发三十余年。参与了中国国家大剧院、北京新机场、阿布扎比机场、科威特国家银行、英国彭博新闻社办公大楼、苹果公司全球 80 余个苹果形象体验店等项目的玻璃应用及技术研发。参与了中国多项玻璃标准的制订。

CHENG Ping, P.E. (程平), a registered professional engineer, is a Senior Staff Engineer with ICC Evaluation Service (ICC-ES), where he has conducted the evaluation and certification of building products for code compliance close to nine years. Building products evaluated and certified include, but not limited to, Fasteners and Structural Connectors, Structural Insulated Panels (SIPs), Engineered Wood Products (EWPs), Wood Structural Panels, Wood Plastic Composite Products, Skylights, and etc. Prior to working at the ICC-ES, he has worked at one of major engineered wood product manufacturers for more than five years, doing research, testing and development of EWPs.
Cheng, Ping has a Bachelor Degree in Structural Engineering from Beijing University of Civil Engineering and Architecture (formerly Beijing Institute of Civil Engineering and Architecture) and a Master Degree in Forest Products from Oregon State University.
Cheng, Ping works at the ICC-ES Western Regional Office located in Brea, California and can be reached at +1 562 699 0541 and/or pcheng@icc-es.org.

Prof. **LI Jinmin** is the director of State Key Lab of Solid State Lighting and the executive chairman of China Solid-State Lighting Alliance. In 1993, he received his post-doctoral degree in the Institute of Semiconductors, CAS. Since then, he started his professional researches and was mainly focused on the study of novel semiconductor materials in ISCAS. In the next following years from 1995 to 2002, acting as director of material science center of ISCAS, director assistant and academic committee number of ISCAS, he was engaged in the research work on novel semiconductor materials, presiding over and accomplishing the construction of “national novel semiconductor materials research center” of “north microelectronic base” which was one of the key items in national scientific and technological projects. At present, he is responsible of the major and key programs of National High-Tech Research and Development Plan. The research work in his group leads the development of domestic Solid-state lighting technology.

李晋闽，研究员、博士生导师，曾任中国科学院半导体研究所所长、973 项目首席科学家。现任半导体照明联合创新国家重点实验室主任，国家半导体照明工程研发及产业联盟研发执行主席。2006 起担任“十一五”、“十二五”863 重大项目“半导体照明工程”总体专家组组长，“十三五”国家重点研发计划编制专家组成员。近年获国家技术发明奖、国家科技进步奖、北京市科学技术奖、中国产学研合作创新成果奖等奖项。发表 SCI 论文 200 余篇，SCI 他引 1800 余次，在国内外会议做邀请报告 19 次；出版著作 2 部、参与英文专著 1 部；授权发明专利 81 件（国际专利 3 件）。

Presentations

演讲材料

中国建材检验认证集团股份有限公司
China Building Material Test & Certification Group Co., Ltd

中国绿色建材产品标准与认证分析

Analysis of China green building product standards and certification

绿色产品认证院 刘翼

2018.7.23 北京

目 录

一、CTC简介

发展历程

1950-2005年
建材总院各实验室

2009年12月25日
中国建筑材料检验认证中心有限公司

2011年12月15日
中国建材检验认证股份有限公司

2005年9月15日
中国建筑材料检验认证中心

2012年2月22日
中国建材检验认证集团股份有限公司

一、CTC简介

发展历程

2014年5月19日
IPO首次预披露

2016年11月9日在上海证券交易所主板发行A股股票5500万股

2011年12月27日
中国建材检验认证股份有限公司创立大会暨揭牌仪式

2012年2月22日
中国建材检验认证集团股份有限公司登记注册成立

2012年10月25日
在北京证监局进行辅导备案登记

2013年3月28日
增资至1.65亿拟于上海证券交易所主板发行A股股票

2013年5月30日
中国证监会受理《首次公开发行股票核准》申请材料

一、CTC简介

绿色建材评价认证技术发源地和领跑者

十五
- 绿色建材技术及分析评价方法的研究
- 生态建材制品检验技术和评价体系的研究

十一五
- 绿色建材产品标准、评价技术和认证体系研究
- 化工产品和建筑材料关键产品生态设计技术开发

十二五
- 典型地区建筑材料全生命周期评价技术研究与应用
- 建筑材料检验认证服务平台与标准制定研究

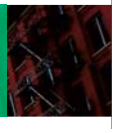
十三五
- 家居消费品绿色产品认证关键技术研究
- 功能型装饰装修材料绿色度评价与选材技术

基础方法学 | 评价体系 | 认证技术 | 数据库建设 | 标准制定 | 政府服务 | 示范工程应用

一、CTC简介

近期主要工作

CTC工作



参与国家重点研发计划
- 家居消费品绿色产品认证关键技术研究
- 功能型装饰装修材料绿色度评价与选材技术

绿色建材评价认证重要力量
- 绿色建材评价标识三星级机构，若干省市二星级机构
- 绿色产品评价国家标准化总体组成员
- 绿色产品认证建材组组长单位

编制绿色建材评价标准
- 主编6项建材类绿色产品评价的国家标准
- 主导29/100项绿色建材评价标准编制工作。

制定建材类认证实施规则
- 作为绿色产品认证建材组组长单位，牵头制定建材类的认证实施规则和细则。

二、中国绿色建材产品标准与认证

2015年9月18日，中共中央、国务院于印发《生态文明体制改革总体方案》（中发[2015]25号）。第四十六条：

建立统一的绿色产品体系。将目前分头设立的环保、节能、节水、循环、低碳、再生、有机等产品统一整合为绿色产品，建立统一的绿色产品标准、认证、标识等体系

2016年12月07日，国办发[2016]86号

二、中国绿色建材产品标准与认证

国家认监委关于发布绿色产品认证标识的公告

2018年第13号

基本标识　　变形标识

市场监管总局关于发布绿色产品评价标准清单及认证目录（第一批）的公告

包括**绝热材料、防水与密封材料、建筑玻璃、陶瓷砖、卫生陶瓷、涂料、人造板与木质地板、家具、木塑制品、纺织品、纸和纸制品、太阳能热水系统**等12类产品

二、中国绿色建材产品标准与认证

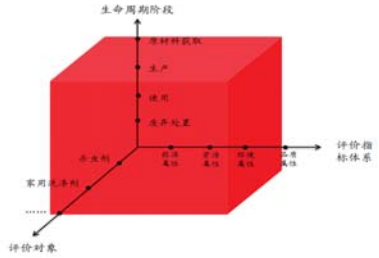
2017年12月29日，质检总局、住房城乡建设部、工业和信息化部、国家认监委、国家标准委等五部委联合印发《关于推动绿色建材产品标准、认证、标识工作的指导意见》（国质检认联〔2017〕544号）

- 五部门共同成立绿色建材评价认证工作组，评价标识**纳入认证统一管理**；
- 统一清单和目录内的**三星级证书可转化为中国绿色产品认证证书**；
- 到2020年绿色建材应用比例达到40%。

二、中国绿色建材产品标准与认证

标准基本框架

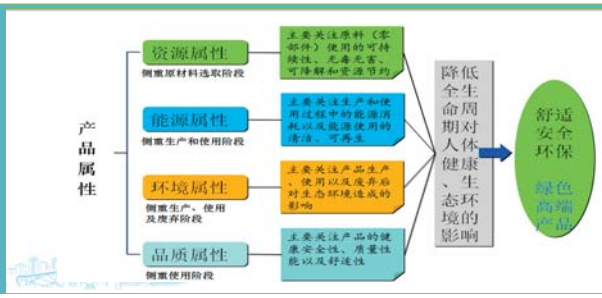
- **依据GB/T 33761《 绿色产品评价通则》**
- **基于生命周期理念；**
- **对企业和产品提出参评基本要求**
- **统筹考虑资源、能源、环境、品质四个属性**
- **符合性评价**



二、中国绿色建材产品标准与认证

标准基本框架

评价指标体系



二、中国绿色建材产品标准与认证

举例：GB/T 35603-2017《绿色产品评价 卫生陶瓷》

基本要求

企业基本要求（八大条）

污染物排放达标、安全生产标准化三级以上、配备能源和水计量器具、噪声达标、绿色供应链管理、采用清洁能源、先进工艺设备、四体系建立等。

产品基本要求

满足现行相关产品标准。

二、中国绿色建材产品标准与认证

GB/T 35603-2017《绿色产品评价 卫生陶瓷》

评价指标

一级指标	二级指标		单位	基准值	判定依据
资源属性	单位产品取水量		m^3/t	≤8.0	按附录A的计算方法进行计算，并提供相关证明材料
	生产废料回收利用	废瓷利用率	%	≥98	按附录A的计算方法进行计算，并提供相关证明材料
		废坯（含釉坯）利用率		≥98	按附录A的计算方法进行计算，并提供相关证明材料
		废釉浆回收利用率		≥98	按附录A的计算方法进行计算，并提供相关证明材料
		废污泥回收利用率		≥98	按附录A的计算方法进行计算，并提供相关证明材料

二、中国绿色建材产品标准与认证

GB/T 35603-2017《绿色产品评价 卫生陶瓷》

评价指标

一级指标	二级指标			单位	基准值	判定依据
资源属性	石膏模具使用率（每吨陶瓷产品的石膏粉用量）			t/t	≤0.2	按附录A的计算方法进行计算，并提供相关证明材料
	产品包装			—	—	依据GB/T 31268、GB/T 16716、JC/T 694检测，并提供相关证明材料
	产品轻量化	坐便器单件质量(不含配件)	连体	kg	≤45	依据GB/T 6952测试，并提供相关测试报告
			分体(不含水箱)		≤25	
		蹲便器单件质量(不含配件)			≤20	
		壁挂式小便器单件质量(不含配件)			≤15	
		洗面器			≤20	

二、中国绿色建材产品标准与认证

GB/T 35603-2017《绿色产品评价 卫生陶瓷》

评价指标

一级指标	二级指标	单位	基准值	判定依据
能源属性	单位产品综合能耗	kgce/t	≤500	依据GB/T 2589、GB 21252计算产品综合能耗，并提供能耗证明
环境属性	提供产品EPD或碳足迹报告	—	—	依据GB/T 24025测试，并提供相关检测报告

二、中国绿色建材产品标准与认证

GB/T 35603-2017《绿色产品评价 卫生陶瓷》

评价指标

一级指标	二级指标			单位	基准值	判定依据
品质属性	用水量	坐便器	双冲式 全冲最大值	L	≤5.0	依据GB/T 6952测试，并提供相关测试报告
			双冲式 平均值		≤4.0	
			单冲式 平均值		≤4.0	
		蹲便器 平均值			≤5.0	
		小便器 平均值			≤2.0	
	使用寿命	重力式冲水装置	进水阀	次	≥100000	依据GB/T 26730测试，并提供相关测试报告
			排水阀		≥100000	
		压力冲水装置			≥200000	依据GB/T 26750测试，并提供相关测试报告
		坐便器坐圈和盖	摇摆试验		≥25000	依据JC/T 764测试，并提供相关检测报告
			慢落试验		≥30000	
			强压试验		≥10000	

二、中国绿色建材产品标准与认证

绿色产品认证模式


初始评价

+


产品抽样检验

+


获证后的跟踪评价

二、中国绿色建材产品标准与认证

绿色产品认证实施规则：认证流程

认证申请 → 初始评价 → 产品抽样检验 → 认证结果评价与批准 → 获证后的跟踪评价 → 延续申请

初始评价包括资料技术评审和现场评价

三、下一步工作计划

1.建立并完善绿色建材评价标准体系

2.加快绿色建材标准研制

3.在湖州开展绿色产品认证试点

4.在雄安新区等大力引导选用绿色建材

传递信任，服务发展

感谢

中国半导体照明产业发展及认证政策概况

The Overview of Certification, Policy and Development of Solid State Lighting Industry in China

国家半导体照明工程研发及产业联盟

China Solid-State Lighting Alliance(CSA)

吴玲● 秘书长

Wu Ling ● Secretary-General

2018年7月 July, 2018

目录 Contents

半导体照明产业对中国的重要性 Importance of SSL for China

- 节能环保

Energy-saving & Environment Strategy

- 可持续发展

Sustainable Economic Growth

Upgrade traditional industries;

Lower energy consumption in full lifecycle than conventional products

- 培育战略性新兴产业

Cultivating Emerging Strategic Industries

Large scale & driving effects

High employment opportunities

半导体照明——光的革命 SSL - The lighting revolution

- 一场成功的技术革命

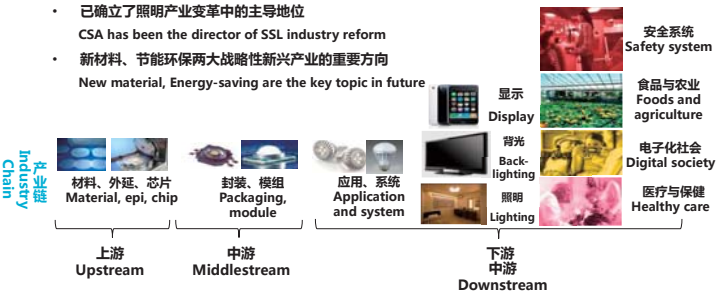
A fantastic technology revolution

- 已确立了照明产业变革中的主导地位

CSA has been the director of SSL industry reform

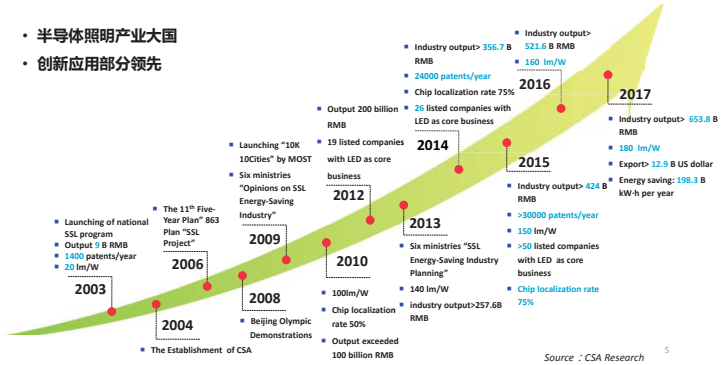
- 新材料、节能环保两大战略性新兴产业的重要方向

New material, Energy-saving are the key topic in future



中国半导体照明产业发展历程 Development of China SSL

- 半导体照明产业大国
- 创新应用部分领先



Source：CSA Research

核心技术不断突破 Key technologies breakthrough

- 高功率白光LED 180lm/W

High power white LED 180lm/W

- LED室内灯具 100lm/W

Indoor lighting products 100lm/W

- 室外灯具 130lm/W

Outdoor lighting products 120lm/W

- 功率型硅基LED芯片 150lm/W

Power Si substrate 160lm/W

- 白光OLED 130lm/W

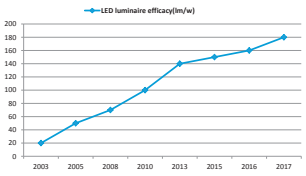
White OLED 120lm/W

- 硅基黄光LED （565nm）@20A/cm², 光电转换效率 22.8%

Si-based Yellow LED（565nm）@20A/cm², WPE 22.8%

- 硅基绿光LED（520nm）@20A/cm², 光电转换效率 40.6%

Si-based green LED （520nm）@20A/cm², WPE 40.6%



Luminous efficacy of power white LED in China(2003-2017)

Source：CSA Research

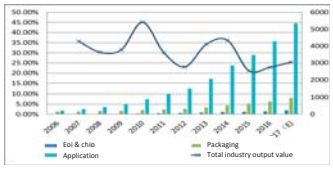
产值持续增长 Industrial output keeps growing

- 2017，产值6538亿人民币， 同比增长 25.3%；2016, 5216亿人民币；过去10年年均增长率超过30%。
- 2017，industrial output: RMB 653.8 Billion, GROSP 25.3%；2016, RMB 521.6 Billion； the past 10 years average annual growth rate exceeded 30%.

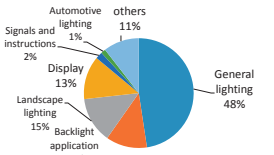
芯片：产值232亿人民币， 增长率28%　　Epi & chip: Output value 23.2 B RMB, growth rate 28%

封装：产值963亿人民币，增长率29%　　Packaging: Output value 96.3 B RMB, growth rate 29%

应用：产值5343亿人民币，增长率25%　　Applications: Output value 534.3 B RMB, growth rate 25%



2006-2017 China SSL Industry Scale with Segments



2017 Application areas of LED products (Output value)

Source：CSA Research

出口平稳增长 Export growth rate increase

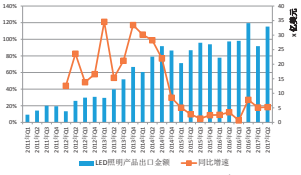
- 2016年出口超过 105亿美元，同比下降2.4%
- 2017年出口额129亿美元，同比增长14.72%
- 美国和欧盟是主要的出口市场
- 金砖国家市场的增长率为47%

Exports > USD 10.5 Billion, decrease 2.4% in 2016

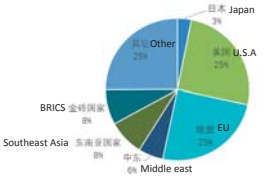
Exports > USD 12.9 Billion, increase 14.72% in 2017

USA and EU are the major export markets

Market of BRICS grows rate: 47%



2011-2017 Export growth of China LED products

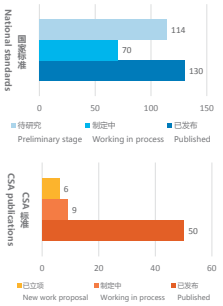


2017 China LED Export Share

Source：China Custom，CSA Research

半导体照明标准改革发展
The rapid growth for national standard of SSL in China

- 新的《中华人民共和国标准化法》重点强调国家鼓励社会团体、企业制定高于推荐性标准相关技术要求的团体标准，企业标准。
  The new version of "Standardization Law of the People's Republic of China" emphasis that government encourage organizations and enterprises to formulate the group standard and enterprise standard.
- 截止2017年底半导体照明国家标准已发布的标准130项，制定中的标准70项，待研究制定的标准114项。
  For China's SSL industry, there are 130 national standards published, 70 projects in process, and 114 proposals in preliminary stage in the end of 2017.
- CSA团体标准及技术规范已发布50项，制定中的9项，已立项6项。
  For CSA Standards and Technical reports, there are 50 published, 9 projects in process, 6 proposals in preliminary stage until now.



中国照明产品认证体系逐步完善
The certification system of SSL product in China

- 强制性认证（Mandatory certification program）
  强制性产品认证（CCC）和中国能效标识（CEL）
- 自愿性认证（Voluntary certification program）
  中国质量认证（CQC）和中国节能认证（CECC）
- 能效”领跑者”制度（Top Runner program）
- 更多的国家标准和CSA标准已作为CNAS和CMA实验室检测能力依据
  More China national standards and CSA standards have become the testing criteria of testing body, such CMA or CNAS.

中国照明产品认证体系结构图

The diagram of certification system for China's SSL industry

国际合作 Global eco-system development

中美合作
China -USA
- 标准和认证
- Standard and Conformity

中荷合作
China –Netherland
- 代尔伏特理工大学合作
- TUdelft cooperation

中德合作
China- Germany
- 全生命周期评价
- Full life recycle assessment
- 离网照明
- Off-grid lighting

照亮非洲
Lighting Africa
- 照明示范项目
- Lighting pilot program

照亮“一带一路”行动计划
Lighting one belt and one road
- 加速测试方法推广
- Accelerated test method promotion

国际半导体照明联盟
International SSL Alliance
- 标准化工作合作
- Standardization works

能源节约潜力巨大
Energy Saving in China in 2017

- 2017年LED照明产品实现节电1983亿度，实现碳排放减少1.78亿吨，节能效果相当于两个三峡。

Due to the application of SSL products, energy saving = 198.3 billion kW·h, which is two times of the power generated by three gorge dam plant;Reduction of carbon emission of nearly 178 million tons.

三峡电站2017年实现年度发电976.05亿千瓦时

Annual power generation of the three gorges dam (TGD) power plant = 97.605 billion kW·h

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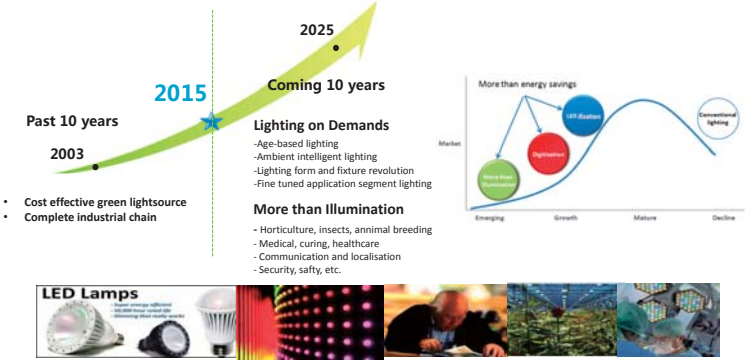
中国发展目标 China's target

2015：
- Industrial output 424BY
- Cost reduction: 50%
- Leading in innovative application
- General lighting penetration rate: 30%
- Energy saving: 100B KWh

2020： The leading SSL nation
- Industrial output >1000BY
- No. 1 in IP
- General lighting penetration rate > 70%
- Energy saving: 340B KWh
- Wide spread applications

产业发展目标 Main Targets of China LED Industry



挑战与建议 Challenges and Suggestions

质量和价格参差不齐 Disordered quality and price	产业集中度低 Low concentration of industry	产业环境有待完善 Improvable industry environment
• 需要建立开放、透明、有序的竞争环境消除伪劣残次品 • Need to create a open, transparent, orderly competition environment, to eliminate fake and inferiors	• 集成产业链，优化产品效率，提高竞争力，建立领导品牌 • Integrated supply chain, optimize the production efficiency, improve the competitiveness, build the leading brand	• 重点集中于整个LED产业系统，持续扩大专利池、标准、测试和认证 • Focus on the ecological system of the whole LED industry, continue to strengthen the patents pool, standards, testing, certification

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"十三五" 研发规划 The 13th Five-Year Plan on R&D Strategy

01 **完善创新链 Innovation Chain**
从基础研究，前沿技术，系统集成到演示系统发展
From fundamental research, frontier technology, system integration to the demonstration system deployment

02 **创新和服务平台 Platforms**
为整个产业链开放创新平台,为这个产业系统优化建立网络服务平台
Open innovation platform for the whole industry chain
A network service platform for eco-system optimization

03 **重点发展方向 Focuses**
为各种应用提供高效能，高质量和更舒适的照明
Efficient, high quality and comfort lighting sources for various applications
智慧照明系统和服务
Smart lighting systems and service
超越照明
"Beyond lighting"

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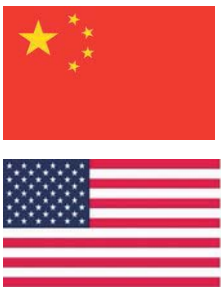
增强中美合作 More Cooperation with USA

合作建议
Advice for future cooperation
- **研发创新**
R&D
- **标准、检测和认证**
Standard、Test and Certification
- **应用示范项目**
Application Showcase
- **产业合作**
Industrial Collaboration
- **信息互通**
Information exchange



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Global opportunity
Global challenge
Global & joint effort

Thanks for your attention!

Recommendations for Roadmap

A National Green Building Product Standard, Testing, Certification, and Labeling System

路线图建议：一个国家级绿色建筑产品标准、检测、认证和标识体系

SHA YU 余莎, YUANRONG ZHOU 周圆融, MEREDYDD EVANS

Pacific Northwest National Laboratory 美国太平洋西北国家实验室

U.S.-China Green Building Materials and Green Lighting Certification System Workshop 中美绿色建材和绿色照明认证体系研讨会

July 23, 2018 Beijing, China 2018年7月23日，北京

Background 背景

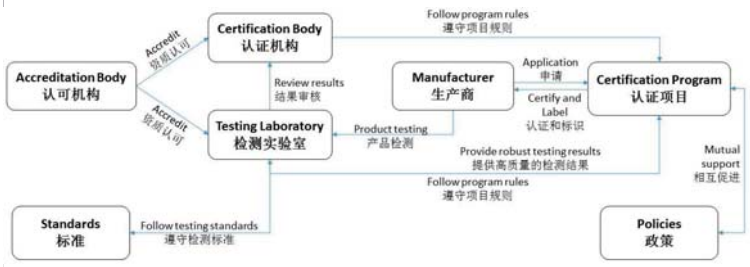
- In 2013, the National Development and Reform Commission (NDRC) and Department of Energy (DOE) launched a U.S.-China Building Energy Efficiency Initiative 中国国家发改委和美国能源部在2013年共同提出中美建筑能效倡议
- One task is to improve the standard, testing, certification, and labeling system for green building products in China 旨在改进中国绿色建筑产品的标准、测试、认证、标识体系
- Deliverables 成果:
  - A gap analysis report, published in May 2017 缺口分析和建议报告
  - A roadmap recommendation report 路线图建议报告

Collaboration with many Chinese organizations: Standardization Administration of China (SAC), Certification and Accreditation Administration (CNCA), China Building Material Test & Certification Group (CTC), China Solid State Lighting Alliance (CSA), China Quality Certification Centre (CQC), China National Institute of Standardization (CNIS), China Standards and Conformity Assessment (CSCA)
合作者包括国家标准化管理委员会、中国国家认证认可监督管理委员会、中国建材检验认证集团、中国半导体产业联盟、中国质量认证中心、中国标准化研究院、中标合信等

Green Building Product Certification 绿色建筑产品认证

- Ensures the material performs as advertised through testing, rating and labeling system 通过测试、评价和标识以确保材料性能属实
- Provides clear information to the market 向市场提供清晰的信息
- Makes high-performing materials: 为高性能建筑产品
  - Easier to identify 增加识别度
  - More widely available 增加市场
  - Lower in cost 降低成本
- Proven way to improve building energy efficiency and helps ensure that energy efficiency policies achieve objectives 提升建筑能效并有助于确保能效政策达到目标
- Can be used as a marketing tool for building owners 便于建筑业主宣传推广绿色建筑
- Many high-level government plans in China to employ certification as a fundamental tool to increase the market share of green building materials 中国正在开展统一绿色产品标准、检测、认证、标识等体系的工作

Components of a Holistic System 完整体系所涵盖的环节



A robust system requires collaboration and coordination among these components

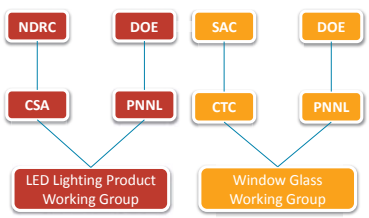
Roadmap for a Robust National System 针对建立一个完善体系的路线图建议

Goal 目标

- To provide recommendations for enhancing current system for green building products in China 为完善中国现有绿色建筑产品认证体系提供建议

Methodology 方法

- Gap analysis of testing standards (of window glass) and certification programs (of LED lighting) between the U.S. and China 中美比对：窗玻璃检测标准；LED照明产品认证
- A broader roadmap with recommendations 一个广泛的路线图建议，针对国家级绿色建筑产品标准、检测、认证和标识体系



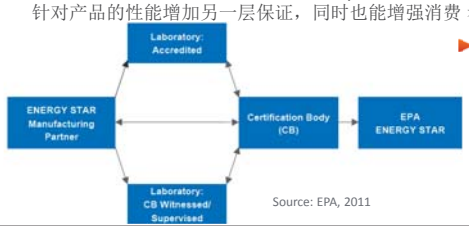
The Working Groups 工作组

Members of the working group include standard makers, accreditation bodies, certification bodies, manufacturers, and industry experts from both the U.S. and China
工作组成员包括中美标准制定者、认可机构、认证机构、制造商、行业专家

Four Key Factors
四点要素

Robust Testing and Certification
严格的检测和认证

- Accreditation of testing laboratory and certification body could ensure the integrity and quality of product testing and certification 对检测实验室和认证机构进行资质认可能够确保产品检测和认证的质量和真实性
- Verification testing could add another level of assurance in product performance and enhance consumer confidence in product label or certification 验证检测能够针对产品的性能增加另一层保证，同时也能增强消费 者对于产品认证标识的信任



Source: EPA, 2011

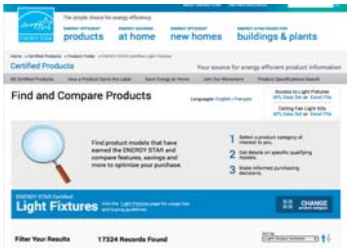
- Third-party certification could help ensure certification program integrity 由第三方认证机构进行产品认证能够确保认证的客观完整性

Greater Coordination and Alignment
更紧密的协作与衔接

- Greater alignment and consistency among testing standards could help streamline the certification process 同类产品同类性能的检测标准的统一性可以简化认证流程
- Greater coordination and linkage among different components of the system could help smooth the certification process, be more cost effective, and accelerate the overall industry development 体系中不同环节更紧密地衔接与协作可以使认证过程更顺畅、更高效益、并促进产业发展

Better Information
更好的信息

- Information transparency could help engage manufacturers in product certification, smooth the testing and certification process, and build consumer confidence 信息的透明公开能够促使企业积极参与产品认证、使检测和认证流程更加顺畅，同时也建立了消费者的信任
- Product database could be used to analyze and support the overall development of the industry 产品数据库能够应用于产品的数据分析并支撑产业发展规划



Source: Energy Star, 2018

Supporting Programs
扶持项目

- Supportive policies that could help promote product certification and the use of certified products, such as building codes and incentive schemes 扶持性政策能够推动产品认证以及已认证产品的应用和推广。相关政策包括财政补贴或将建筑规范中与建筑产品认证相连接
- Capacity building among consumers is necessary for the system to realize its true value 消费者的能力建设对于整个体系是否能够发挥真正的效果有着重要影响

Recommendations Specific to Window Glass and LED Lighting 针对窗玻璃和LED照明的具体建议

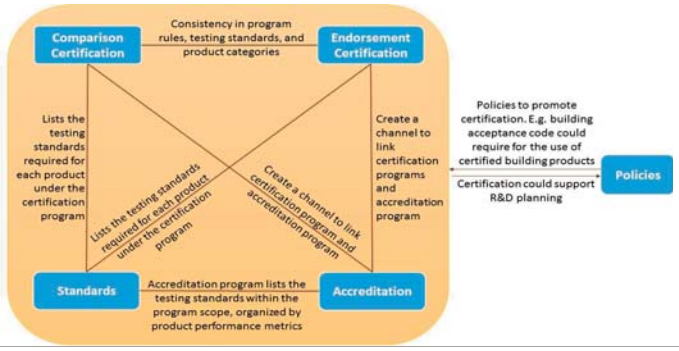
Window Glass Standards
窗玻璃标准

- Enhance consistency and alignment among existing standards 提高测试标准间的统一性和一致性
- Enhance the linkage between standards and other components 增强测试标准与体系内其它环节的衔接
- Improve the transparency of the product measurement process 提升产品检测过程的信息透明度
- Identify areas that need additional standards with input from industry 根据行业需求制定新检测标准

LED Lighting Certification
LED照明产品认证

- Strengthen accreditation requirements 增强对检测实验室和认证机构的资质认可要求
- Enhance the linkage among components in the system 增强体系内各环节的协作与衔接
- Strengthen verification testing for quality assurance 增强验证试验力度以达到质量保证
- From self-certification to third-party certification 由自我认证转化为第三方认证

Broader Recommendations
针对体系的广泛建议



Panel 1 Discussion Topics
第一座谈讨论议题

- What actions (and timeframe of the actions) could be taken to ensure standards are consistent, robust, and comprehensive? 可以采取什么行动（以及行动时间框架）来确保测试标准的统一性和健全性？
- What actions (and timeframe of the actions) could be taken to ensure robust testing and certification systems? 可以采取什么行动（以及行动时间框架）来确保严格的产品检测和认证系统？
- What actions (and timeframe of the actions) could be taken enhance the coordination between different components of the standard, testing, certification, and labeling system? 可以采取什么行动（以及行动时间框架）来确促进系内不同环节更紧密地衔接与合作？
- How to prioritize the actions? 如何决定行动的优先顺序？
- How policies and incentives can help improve the market update of green building products? 如何用政策和奖励来提高绿色建筑产品的市场占有率？

Thank you!
谢谢！

Sha Yu
Staff Scientist 科学家
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U.S. DEPARTMENT OF ENERGY
Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Verification Testing of LED Lighting Products
LED照明产品验证检测

Michael Yo
U.S. Department of Energy 美国能源部
Meredydd Evans, Sha Yu, Yuanrong Zhou
Pacific Northwest National Laboratory
美国西北太平洋国家实验室

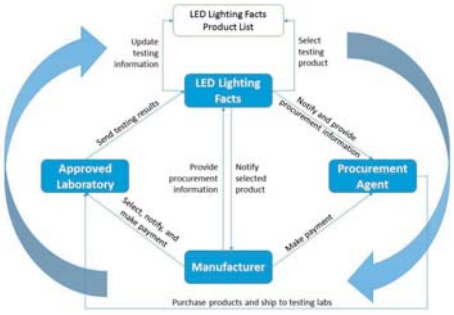
U.S.-China Green Building Materials and Green Lighting Certification System Workshop
中美绿色建材和绿色照明认证体系研讨会
July 23, 2017
Beijing, China 北京，中国

Verification Testing and Why It Is Important
验证检测的重要性

- Verification of post-market product performance through product testing 对已认证或在市场上流通的产品进行产品性能验证检测
- An effective approach for quality assurance 质量保证的有效措施
- Helps maintain consumer confidence in products on the market 提高消费者对市面上的产品信心
- Product verification could be done under either a certification program or a stand-alone verification testing program 验证检测可包含在认证项目内或建立一个独立的项目

U.S. Example A – Within Certification Program Verification Testing
美国例子A – 认证项目内的验证检测

LED Lighting Facts



U.S. Example B – Stand-alone Verification Testing Program
美国例子B – 一个独立的验证检测项目

SSL Commercially Available LED Product Evaluation and Reporting (CALiPER) Program
SSL市面上LED照明产品评价和报告项目

- Established by Department of Energy 由美国能源部建立
- Goal: provide accurate and comparable data on LED products by arranging for reliable independent testing and data reporting 目标：通过可靠的独立检测和数据报告，为消费者提供准确可比的LED产品数据
- The Pacific Northwest National Laboratory (PNNL), by operating a nationally accredited lighting test laboratory (Lighting Metrology Laboratory), leads the product testing and reporting work under the CALiPER program 太平洋西北国家实验室有国家认可的照明测试实验室，主要负责CALiPER项目下的产品检测和汇报

CALIPER

Verifiable Testing Results 可验证的测试结果

- Testing to two or more samples to account for variability in product 考虑到产品产异性，对两个或以上同类产品样品进行检测，
- Round-robin tests: same product tested by ≥ 2 testing laboratories to account for variability among laboratories 考虑到不同实验室间差异性，同类产品会在两家或以上实验室进行检测
- Testing results compared to data from U.S. certification programs 检测结果会与美国其他相关LED产品认证的产品数据进行比对

Co-Benefits 共生效益

- Inform the development and refinement of standards and protocols 为标准和协议的制定与完善提供信息
- Support R&D and market development activities 支持R&D和市场发展

Conclusions 总结

- Verification testing should be conducted at an independent accredited testing laboratory 验证检测应由独立的、获得资质认可的实验室进行产品检测
- Purchasing products directly from the market instead of from the manufacturer could better represent product quality on the market 直接从市场购买产品而不是从商家获得产品，可以更好地反映消费者所及产品质量
- Round-robin testing helps make sure testing results are verifiable and helps determine the reproducibility of a testing process 循环测试有助于确保测试结果是可验证性，并帮助判断检测过程的可重复性
- Testing results could be used to support standard development and refinement as well as R&D planning 检测结果可用于支持测试标准的制定和改进，并用于支持R&D相关计划
- A transparent program description and testing results could build consumer confidence 详细透明的项目介绍和产品检测可以建立消费者信心

中国建筑科学研究院有限公司 China Academy of Building Research

建筑节能验收及绿色产品应用

Building Energy Acceptance Code and Green Building Products

邓琴琴 博士 副研究员

China Academy of Building Research Qinqin Deng Ph.D

Beijing, July 23, 2017

中国建筑科学研究院有限公司 China Academy of Building Research

目录 Outline

- 建筑节能验收要求 Building energy acceptance code
- 绿色建筑中绿色产品应用 The application of green products in green building
- 总结与展望 Summary and prospect

中国建筑科学研究院有限公司 China Academy of Building Research

绿色建筑认证 Green building certification

协调 Coordination

绿色建材认证 Green building material certification

在实际的各项认证评价研究工作中发现，绿色建材与绿色建筑长期以来，独立发展，缺乏有效衔接，导致绿色建筑选材难和绿色建材应用难

During the actual certification and evaluation work, green building materials and green building has been development independently for a long time, the lack of effective convergence, resulting in the difficulty of green building choosing materials and application difficult of green building materials

中国建筑科学研究院有限公司 China Academy of Building Research

- 开发商、建筑师对建筑材料、特别是新材料的性能了解不够，面对绿色建筑节能、节材等定量化目标的提出，开发商、建筑师对建筑材料的选用无参考
- 建材生产者对绿色建筑的功能目标不够了解，在选择项目和产品规格上忽视了绿色建筑的需求，产品与绿色建筑的适应性和配套性存在一定差距
- 绿色建筑前端的开发商、建筑师和绿色建材生产商缺乏有效衔接

Developers, architects on the building materials, the lack of understanding of the performance of new materials, and other quantitative, developers, difficult on the selection of building materials without reference

Building materials producers do not understand the functional objectives of green buildings, often ignored the demand for green buildings when choice of projects and product specifications, products and green building adaptability and compatibility

Green building front-end developers, architects and green building materials manufacturers lack effective convergence

中国建筑科学研究院有限公司 China Academy of Building Research

国家绿色建筑评价标准

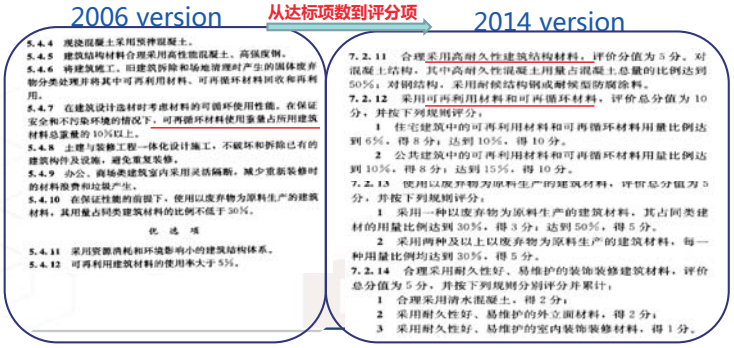
National Evaluation Standard for Green Building

修订 Revision

提出的是可再利用材料、可再循环材料概念，还没明确与绿色建材的关系

Propose recyclable materials, not clear on green building materials

2006 version 从达标项数到评分项 2014 version



5.4.4 现浇混凝土采用预拌混凝土。
5.4.5 建筑结构材料合理采用高性能混凝土、高强度钢。
5.4.6 将建筑施工、旧建筑拆除和场地清理时产生的固体废弃物分类处理并将其中可再利用材料、可再循环材料回收和再利用。
5.4.7 在建筑设计选材时考虑材料的可循环使用性能，在保证安全和不污染环境的情况下，可再循环材料使用重量占所用建筑材料总重量的10%以上。
5.4.8 土建与装修工程一体化设计施工，不破坏和拆除已有的建筑构件及设施，避免重复装修。
5.4.9 办公、商场类建筑室内采用灵活隔断，减少重新装修时的材料浪费和垃圾产生。
5.4.10 在保证性能的前提下，使用以废弃物为原料生产的建筑材料，其用量占同类建筑材料的比例不低于30%。

优 选 项

5.4.11 采用资源消耗和环境影响小的建筑结构体系。
5.4.12 可再利用建筑材料的使用率大于5%。

7.2.11 合理采用高耐久性建筑结构材料，评价分值为5分。对混凝土结构，其中高耐久性混凝土用量占混凝土总量的比例达到50%；对钢结构，采用耐候结构钢或耐候型防腐涂料。
7.2.12 采用可再利用材料和可再循环材料，评价总分值为10分，并按下列规则评分：
1 住宅建筑中的可再利用材料和可再循环材料用量比例达到6%，得8分；达到10%，得10分。
2 公共建筑中的可再利用材料和可再循环材料用量比例达到10%，得8分；达到15%，得10分。
7.2.13 使用以废弃物为原料生产的建筑材料，评价总分值为5分，并按下列规则评分：
1 采用一种以废弃物为原料生产的建筑材料，其占同类建材的用量比例达到30%，得3分；达到50%，得5分。
2 采用两种及以上以废弃物为原料生产的建筑材料，每一种用量比例均达到30%，得5分。
7.2.14 合理采用耐久性好、易维护的装饰装修建筑材料，评价总分值为5分，并按下列规则分别评分并累计：
1 合理采用清水混凝土，得2分；
2 采用耐久性好、易维护的外立面材料，得2分；
3 采用耐久性好、易维护的室内装饰装修材料，得1分。

《绿色建材评价标识管理办法》（建科[2014]75号）

Green building materials evaluation labeling management approach

2014年5月21日两部联合印发了《管理办法》

《管理办法》**首次**以国家政府官方名义给出了“绿色建材”的科学定义

Issued by MOHURD and MIIT on May 21, 2014


住房城乡建设部 文件
工业和信息化部

鼓励新建、改建、扩建的建设项目优先使用获得评价标识的绿色建材。绿色建筑、绿色生态城区、政府投资和使用财政资金的建设项目，应使用获得评价标识的绿色建材

Encourage the construction of new, expansion project priority to use the identification of green building materials. Green building, green eco-city, government investment and construction projects using financial funds , should obtain the identification of green building materials

地方绿色建筑评价标准

Local Evaluation Standard for Green Building

北京市新版《绿色建筑评价标准》DB11/T 825-2015，在标准中明确提出了绿色建材要求

Beijing Evaluation Standard for Green Building DB11/T 825-2015, clearly put forward the requirements of green building materials

使用获得**绿色建材**评价标识的建材，且用量占同类材料用量比例不小于70%，评价分值为1分（创新项）

该标准将使用获得国家**绿色建材**评价标识的产品作为创新项予以加分，**成为我国首部实现绿色建材评价与绿色建筑评价有效衔接的标准**

Become the first standard to achieve effective convergence between green building materials evaluation and green building evaluation

绿色产品评价国家标准

National Standard of Green Product Assessment

序号	标准号	标准名称
1	GB/T 33761-2017	绿色产品评价通则
2	GB/T 35601-2017	绿色产品评价 人造板和木质地板
3	GB/T 35602-2017	绿色产品评价 涂料
4	GB/T 35603-2017	绿色产品评价 卫生陶瓷
5	GB/T 35604-2017	绿色产品评价 建筑玻璃
6	GB/T 35605-2017	绿色产品评价 墙体材料
7	GB/T 35606-2017	绿色产品评价 太阳能热水系统
8	GB/T 35607-2017	绿色产品评价 家具
9	GB/T 35608-2017	绿色产品评价 绝热材料
10	GB/T 35609-2017	绿色产品评价 防水与密封材料
11	GB/T 35610-2017	绿色产品评价 陶瓷砖(板)
12	GB/T 35611-2017	绿色产品评价 纺织产品
13	GB/T 35612-2017	绿色产品评价 木塑制品
14	GB/T 35613-2017	绿色产品评价 纸和纸制品

建筑节能工程施工质量验收规范 GB50411(修订)

Code for acceptance of energy efficient building construction

建筑节能工程**宜优先**选用通过节能认证的产品或通过节能标识的产品；公共机构建筑和政府出资的建筑**应**选用通过节能认证的产品和通过节能标识的产品

Construction projects **should** select the building energy-saving product certification or energy-saving products; Public construction and government-funded construction projects **must select** the building energy-saving product certification or energy-saving labeling products

公共机构建筑是指全部或者部分使用财政性资金的国家机关、事业单位和团体组织的建筑

政府出资的建筑是指政府出资或参与投资的建筑工程

Public institution building refers to the construction of state organs, institutions and groups of all or part of the use of financial funds

Government-funded buildings are government-funded or involved in the construction of investment projects

建筑节能工程施工质量验收规范 GB50411 (修订)

Code for acceptance for energy efficient building construction

经产品认证或标识符合要求的节能材料，进场验收时，其检验数量可以减少一倍。在同一工程中，同一厂家、同一牌号、同一规格的节能材料连续三次进场检验均一次检验合适时，其后的检验数量可以减少一倍

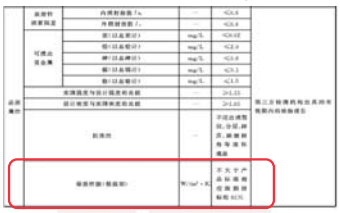
When the product is certified or identified, the testing number of energy saving materials can be reduced by half when applied. In the same project, when the energy saving materials is from the same factory, the same brand, and the same specification and have been tested for three consecutive times, the number of subsequent inspection can be reduced by half


GB
中华人民共和国国家标准
绿色产品评价 墙体材料

烧结砖和砌块Sintered brick and block
非烧结砖和砌块Non sintered brick and block
复合保温砖和砌块Composite insulation brick and block

资源属性、能源属性、环境属性、品质属性

Resource attributes, energy attributes, environmental attributes, and quality attributes



节能相关：品质属性——保温性能，要求不大于产品标准相应级别指标的95%

Thermal insulation performance, requirements are not greater than 95% of the corresponding level indicators of product standards

满足GB26969中规定，并达到能效等级1级（最高等级）

□eet the requirements of □□□□9□9 and achieve energy efficiency □rade □ □the highest level□

满足现行检测标准要求，抽样型式检验

□eet the current inspection standard requirements, sampling type inspection

绿色建材在中国的发展

Green building materials in China

《中华人民共和国节约能源法》和《民用建筑节能条例》等法律法规对绿色建材的要求

Energy Conservation Law of the People's Republic of China

Civil Building Energy Conservation Regulations

第四十条 国家鼓励在新建建筑和既有建筑节能改造中使用新型墙体材料等节能建筑材料。——节能是绿色建材的核心内涵之一

The State encourages the use of energy-saving building materials such as new wall materials in the construction of new buildings and existing building energy-saving. Energy saving is one of the core content of green building materials

绿色建材在中国的发展

Green building materials in China

Green Building Action Plan by NDRC and MOHURD

发改委、住建部提出的《绿色建筑行动方案》（国办发〔2013〕1号）

- 到2015年：新增绿色建筑面积10亿平方米以上，绿色建筑占新建建筑比重超过20%
- 既有建筑节能改造，住宅4.5亿平米，公建1.2亿平米
- **大力发展绿色建材，研究建立绿色建材认证制度，编制绿色建材产品目录**，引导规范市场消费

绿色建材在中国的发展

Green building materials in China

中共中央 国务院印发
《国家新型城镇化规划（2014—2020年）》

●按照走中国特色新型城镇化道路、全面提高城镇化质量的新要求，明确未来城镇化的发展路径、主要目标和战略任务，统筹相关领域制度和政策创新，是指导全国城镇化健康发展的宏观性、战略性、基础性规划。

●第十八章　推动新型城市建设

第一节　加快绿色城市建设

……“**大力发展绿色建材，强力推进建筑工业化。**”……

绿色建材在中国的发展

Green building materials in China

《中国制造2025》（国发〔2015〕28号）

Made in China 2025

（五）全面推行绿色制造。

- □ 加快制造业绿色改造升级
- □ 推进资源高效循环利用
- □ 积极构建绿色制造体系

支持企业开发绿色产品，推行生态设计，显著提升产品节能环保低碳水平，引导绿色生产和绿色消费。壮大绿色企业，支持企业实施绿色战略、绿色标准、绿色管理和绿色生产。强化绿色监管，健全节能环保法规、标准体系，加强节能环保监察，推行企业社会责任报告制度，开展绿色评价。

绿色建材在中国的发展

Green building materials in China

《促进绿色建材生产和应用行动方案》

Action program to promote green building materials production and application

到2018年,新建建筑中绿色建材应用比例达到30%,绿色建筑应用比例达到50%，试点示范工程应用比例达到70%,既有建筑改造应用比例提高到80%

By 2018, the proportion of green building materials in the new building reached 30%, the proportion of green building application reached 50%, the proportion of demonstration project application reached 70%, and the proportion of application of building renovation was increased to 80%

“十三五”节能减排综合工作方案

"Thirteen-Five Year" energy saving emission reduction program

开展超低能耗及近零能耗建筑建设试点，推广建筑屋顶分布式光伏发电。编制绿色建筑建设标准，开展绿色生态城区建设示范，到2020年，城镇绿色建筑面积占新建建筑面积比重提高到50%。实施绿色建筑全产业链发展计划，推行绿色施工方式，推广节能绿色建材、装配式和钢结构建筑

绿色建材在中国的发展

Green building materials in China

《关于促进绿色消费的指导意见的通知》
（发改环资〔2016〕353号）

四、积极引导居民践行绿色生活方式和消费模式

（四）鼓励绿色产品消费。……**实施绿色建材生产和应用行动计划，推广使用节能门窗、建筑垃圾再生产品等绿色建材和环保装修材料。**

八、建立健全绿色消费长效机制

（十五）健全标识认证体系。……**完善绿色建筑和绿色建材标识制度。**

The implementation of green building materials production and application of action plans to promote the use of energy-saving windows and doors, construction waste recycling products such as green building materials and environmental decoration materials

Improve the green building and green building materials identification system

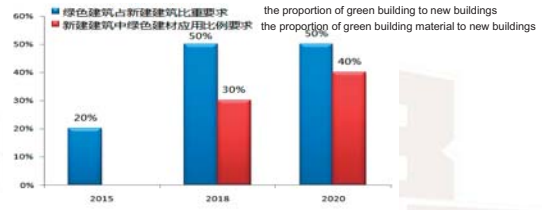
2015 年，中国建筑科学研究院获批为：
全国 “三星级绿色 建材评价机构” （首批四家之一）
2016 年5月，中国建筑科学研究院获批为：
北京市 “一星级、二星级绿色建材评价机构”

In 2015, CABR successfully get approval for one of four "three-star green building materials evaluation agency"
In May 2016, CABR successfully get approval for one of the Beijing "one star, two star green building materials evaluation agency"

- 为便于维护和管理绿色建材评价业务资质：
  2015年8月，中国建筑科学研究院成立“绿色建材评价中心”
  2016年8月，中国建筑科学研究院颁布《院绿色建材评价服务业管理暂行办法》（建院经〔2016〕22号
- In August 2015，CABR built “Evaluation center for green building”
  In August 2016，CABR issued《 Interim Measures for the Administration of Green Building Materials Evaluation Service 》（建院经〔2016〕22号

国家层面应用比例要求

Application requirements at the national level

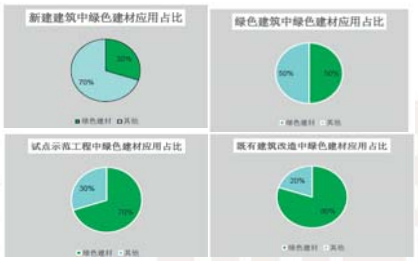


对绿色建筑、绿色建材应用比例要求逐步增大，顺应建筑发展趋势

Requirements on application of the green building and green building materials gradually increased, conform to the development trend of the building

绿色建材应用比例调研

the proportion of green building material application



试点示范工程、既有建筑改造项目中绿色建材的应用比例高于国家要求

总结与展望

Summary and Prospect

- 绿色建筑或装配式建筑在中国未来5年会发展较快，绿色建材占比越来越重，消费者对**绿色建材**的关注也会越来越多
- 全国的**绿色产品评价与绿色建筑评价**有效衔接还需要一段时间，还需要我们大家共同的努力
- The future of green buildings and even the assembly buildings in China in the next 5 years will develop faster, accounting for higher ratio, the consumer will pay more and more attention to green building materials
- Effective convergence between the national green building materials evaluation and green building evaluation also need a period of time, we also need common efforts

总结与展望 Summary and Prospect

谢 谢 thanks

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LED照明产品检测标准对比
Comparison among test standards for LED lighting products

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半导体照明联合创新国家重点实验室
State Key Laboratory of Solid State Lighting
2018-7-23

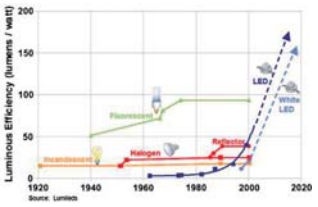
主要内容 Content

① LED照明产品加速/快速测试背景介绍
Background on accelerated/rapid test methods for LED lighting products

② 三种加速/快速测试标准对比
Comparison among 3 accelerated/rapid test methods (GB/T 33720-2017 vs. GB/T 33721-2017 vs. LM-84-2014)

1 LED照明产品加速/快速测试背景介绍
Background on accelerated/rapid test methods

- LED具有高光效、小体积、低功耗、高可靠性和长寿命等特性，已成为继白炽灯、荧光灯之后的第三代光源。
  Due to its high luminous efficacy, small size, low energy consumption, high reliability and long lifetime, LED has become the 3rd generation light source, after incandescent lamp and fluorescent lamp.
- 2017年，LED的市场总产值达到6538亿元，并向植物生长、动物养殖、可见光通信、医疗健康等超越照明领域扩展。
  In 2017, the LED market reaches a new high point of 653.8 billion RMB, and penetrates to new applications such as plant and animal cultivation, visible light communication, medical and health care, etc.



光源 Light Source	寿命 Lifetime (hrs)
白炽灯 Incandescent	750-2,000
卤钨灯 Halogen incandescent	3,000-4,000
紧凑式荧光灯 Compact fluorescent (CFL)	8,000-10,000
金卤灯 Metal halide	7,500-20,000
LED	35,000-50,000*

Source: Lifetime of White LEDs , U.S. DOE
*Depending on drive current, operating temperature, etc.

1 LED照明产品加速/快速测试背景介绍
Background on accelerated/rapid test methods

- LED照明产品的寿命较传统照明长，传统照明的可靠性测试将难以评价LED产品。
  Conventional test methods are no longer suitable for LED luminaires.
- LED发光模组与产品的寿命测试目前根据US DoE Energy Star、IES LM-79、IES LM-80、IES TM21体系、测试时间**至少6,000**小时。
  LED modules and luminaires lifetime test follows US DoE Energy Star, IES LM-79, IES LM-80, IES LM-82, IES LM-84, IES TM21, IES TM28 etc. which require a 6000hrs test duration.
- 6,000小时(**约9~10个月**)的测试时间：
  6,000hrs (around 9~10 months) test duration：
  - 检测时间过长，对于LED产业的快速发展不利。
    Influence the rapidly developing SSL industry.
  - 目前对快速评估LED照明产品寿命的呼声越来越高。
    There is a strong demand to develop rapid test methods for LED products.

CFL产品100%失效
CFL products all failed

LED 产品0失效
LED products no fail

2 三种加速/快速测试标准对比
Comparison among the 3 test methods

标准 Standard	IES LM-84-14 & TM-28-14	GB/T 33721-2017	GB/T 33720-2017
直接法测试时间 The time for direct test method	6000 小时 6000 hour	6000 小时 6000 hour	2000 小时 2000 hour
特殊测试时间 The time for test method based on specific condition	3000 小时 3000 hour 条件 Condition: 1. 样品提供 LM-80 报告 LM-80 test report provided 2. 光源的T_s温度满足LM-80报告的要求 the T_s temperature is in between those mentioned in the LM-80 report	1000 小时 1000 hour 条件 Condition: 1. 样品提供 LM-80 报告 LM-80 test report provided 2. 光源的T_s温度和其他参数满足LM-80报告的要求 the T_s temperature other additional requirements claimed by LM-80 are satisfied	1. 前500小时为老练时间，测试完毕后计算光通量初始值 The first 500h is the seasoning time, after that, the original value of the luminous maintenance is calculated. 2. 正式测试时，在900、1200和1500小时测试样品光通维持率，并与失效判据（95%）进行比较 During the accelerated test, luminous maintenances of the samples are measured at 900h、1200h and 1500h, to compare the threshold (95%);

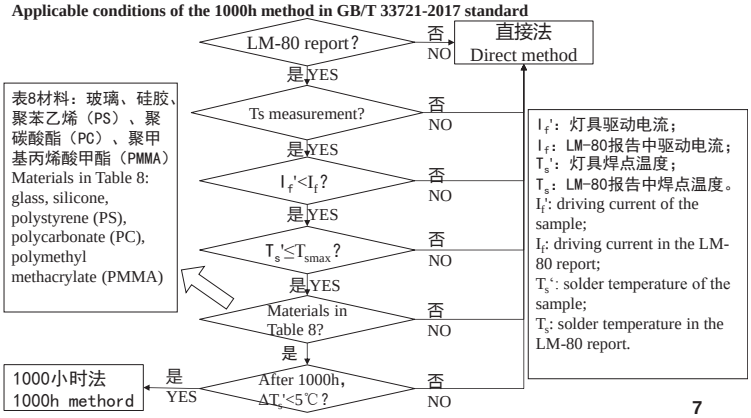
2 三种加速/快速测试标准对比
Comparison among the 3 test methods

标准 Standard	IES LM-84-14 & TM-28-14	GB/T 33721-2017	GB/T 33720-2017
测试温度 Test temperature	25℃±5℃	rated lifetimes ≤25000h 40℃ ±2℃ rated lifetimes between 25000h and 35000h 50℃ ±2℃ rated lifetimes between 35000h and 50000h 60 ℃ ±2℃	55℃ ±2℃
测试样品量 The amount of test samples	3000小时测试法样品数量不少于5个 No less than 5 samples in the 3000h method	样品数量不少于3个 No less than 3 samples	样品数量室内灯不少于12个，室外灯不少于5个 No less than 12 and 5 samples for indoor and outdoor lamps, respectively

2 三种加速/快速测试标准对比
Comparison among the 3 test methods

GB/T 33721-2017标准1000小时法适用条件

Applicable conditions of the 1000h method in GB/T 33721-2017 standard



2 三种加速/快速测试标准对比
Comparison among the 3 test methods

寿命评价对比 Comparison among the lifetime assessment methods

标准 Standard	最短测试时间 Shortest test duration	评价方法 Assessment requirement	声称寿命 Rated lifetime
IES LM-84-14 & TM-28-14	3000h	• Lifetime expectation is calculated by an exponential projection; • The first 1000h test data is discarded; • The rated lifetime is no more than N*test duration, in which N is in between 1.5 and 6, depending on the sample count.	≤18000h
GB/T 33721-2017	1000h	• The luminous maintenance after 1000h is no less than 93%; • $L_1' = exp\left\{\frac{6000}{t} ln[0.7 + \Delta L_o]\right\}, L_1' > L_1$	≤25000h
		• The luminous maintenance after 1000h is no less than 94%; • $L_1' = exp\left\{\frac{6000}{t} ln[0.7 + \Delta L_o]\right\}, L_1' > L_1$	(25000h-35000h]
		• The luminous maintenance after 1000h is no less than 95%; • $L_1' = exp\left\{\frac{9000}{t} ln[0.7 + \Delta L_o]\right\}, L_1' > L_1$	(35000h-50000h]
GB/T 33720-2017	2000h	• During the accelerated test, the averaged luminous maintenances measured at 900h, 1200h and 1500h are all no less than 95%.	25000h

2 三种加速/快速测试标准对比
Comparison among the 3 test methods

优缺点总结 Pros and cons

标准 Standards	优点 Advantages	缺点 Disadvantages
IES LM-84-14 & TM-28-14 3000小时法 3000h method	寿命评价方法理论性较强 strong theoretical background on the lifetime assessment	声称寿命较保守，对于较长的声称寿命需要大幅延长测试时间 conservative rated lifetime evaluation, require largely extending the test duration for claiming long rated lifetime.
GB/T 33721-2017 1000小时法 1000h method	测试时间短，样品数量少 short test duration, less samples	满足测试的限制条件较多 more limitations on satisfaction of the conditions to perform the 1000h method.
GB/T 33720-2017 2000小时法 2000h method	测试时间较短，测试方法简便，寿命评价理论性强 short test duration, simple operation and strong theoretical background	预期寿命只有25000小时 The lifetime can only be claimed up to 25000h.

中国LED照明产品认证
LED Lighting Product Certification in China

中国质量认证中心
China Quality Certification Centre
郑雪生
Zheng Xuesheng

CHINA QUALITY CERTIFICATION CENTRE

内容/Contents

1 LED照明产品认证概况/Brief introduction

- 认证分类/Classification
  - 按认证性质分/according to the nature
    - ❖强制性产品认证/China Compulsory Certification

第二十八条 为了保护国家安全、防止欺诈行为、保护人体健康或者安全、保护动植物生命或者健康、保护环境，国家规定相关产品必须经过认证的，应当经过认证并标注认证标志后，方可出厂、销售、进口或者在其他经营活动中使用。

——《中华人民共和国认证认可条例》

In order to protect the national security, human health or safety, life or health of animals and plants and environment, and to prevent fraud, the relevant products shall be certified in accordance with the provisions of the state. And the products shall be delivered, sold, imported or used in other business activities after being certified and marked with the certification mark.

——*Certification and Accreditation Regulations*

1 LED照明产品认证概况/Brief introduction

- 认证分类/Classification
  - 按认证性质分/according to the nature
    - ❖强制性产品认证/China Compulsory Certification
    - ❖自愿性产品认证/Voluntary Certification

1 LED照明产品认证概况/Brief introduction

- 认证分类/Classification
  - 按认证内容分类/according to the content of certification
    - ❖安全认证/safety certification
    - ❖安全和电磁兼容认证/ safety and EMC certification
    - ❖性能认证/performance certification
    - ❖节能认证/energy conservation certification
    - ❖环保认证/environmental protecting certification

1 LED照明产品认证概况/Brief introduction

- 强制性产品认证和自愿性产品认证的区别/Difference between CCC certification and voluntary certification

强制性产品认证/CCC certification

- 市场准入制度/market entry system
- 产品目录由认监委会同有关部门制定、调整/CCC catalog is issued and adjusted by the government
- 实施机构由国家认监委指定/The certification bodies and laboratories are designated by CNCA
- 认证标准为国家标准/The applicable standards are national standards
- 实施规则由国家认监委制定/The implementation rules are formulated by CNCA
- 实施细则由认证机构自行制定，报认监委备案/The detailed rules for implementation are formulated by the certification bodies , and reported to CNCA.
- 认证标志由认监委统一规定/The mark is stipulated by CNCA.
- 主要涉及产品安全和EMC/mainly aimed at the requirements of the product safety and EMC

1 LED照明产品认证概况/Brief introduction

- 强制性产品认证和自愿性产品认证的区别/Difference between CCC certification and voluntary certification

自愿性产品认证/Voluntary certification

- 自愿性的，企业根据需求提交认证申请/the enterprises may apply to the certification body when needed.
- 产品目录由认证机构自行制定/the product catalog is formulated by the certification body
- 依据标准为国家标准、行业标准或认证机构制定的认证技术规范/the applicable standards can be national standards, professional standards or technical specification formulated by the certification body.
- 实施规则由认证机构自行制定，报认监委备案/the implementation rules are formulated by the certification body, and reported to CNCA
- 实验室由认证机构确定/the testing laboratories are chosen by the certification body.
- 认证标志由认证机构自行制定/the certification mark is formulated by the certification body
- 涉及产品安全和（或）EMC、性能、能效、环保/aimed at the performance, energy conservation, environmental protecting besides safety and/or EMC

1 LED照明产品认证概况/Brief introduction

- 认证开展情况/Status of certification for LED products
  - 认证项目40多项/More than 40 businesses
    - ❖ CCC认证8项，自愿认证30多项/8 for CCC certification, more than 30 for voluntary certification
  - 实施机构/institutions engaged in CCC certification
    - ❖ CCC认证机构2家，实验室40余家/2 certification bodies, and more than 40 laboratories for CCC certification
    - ❖ 自愿认证机构5家，实验室40余家/5 certification bodies, and more than 40 laboratories for voluntary certification
  - 获证企业数量/certified enterprises
    - ❖ 3000余家/more than 3000

2 LED照明产品CCC认证/CCC certification

- 2.1 认证目录的制定/formulation of the catalog
  - 由国家认监委会同有关部门共同制定/formulated by CNCA and the relevant departments
  - 照明电器产品自2001年实施CCC认证/CCC certification for lighting products was carried out since 2001.
  - 至今调整过2次，最近一次调整是在2014年12月16日/The catalog has been updated for 2 times. The latest one was issued on Dec 16, 2014.

2 LED照明产品CCC认证/CCC certification

- 2014年认监委第45号公告/No. 45 Bulletin of 2014 issued by CNCA

近两年来，国家认监委陆续发布了有关强制性产品认证目录适用产品调整和相关标准及实施规则调整的公告。为使各相关方准确界定强制性产品认证目录范围，国家认监委修订了《强制性产品认证目录描述与界定表》，共20大类158种产品，现予发布。

国家认监委以2012年第30号公告发布的原《强制性产品认证目录描述与界定表》自即日起废止。

本公告内容由国家认监委负责解释。

附件：强制性产品认证目录描述与界定表（2014年修订）

国家认监委

2014年12月16日

2 LED照明产品CCC认证/CCC certification

《强制性产品认证目录描述与界定表》P48-54
Description and definition for CCC catalog of lighting products

十、照明电器（2种）
不包括光源产品。

产品种类及代码	对产品种类的描述	产品适用范围	对产品适用范围的描述或列举	备注
1. 灯具（1001）	能分配、透出或转变一个或多个光源发出光线的器具，并包括支承、固定和保护光源必需的所有部件（但不包括光源本身），以及必需的电路辅助装置和与电源连接的装置。	固定式通用灯具	指不为专门目的设计的固定式灯具，由于灯具的固定方式使之只能借助于工具才能拆卸，或由于灯具使用在不易接触到的地方，灯具不能轻易地从一处移到另一处。适用范围为使用电光源、电源电压高于36V和不超过1000V的固定式通用灯具，包括使用内装式变压器的固定式通用钨丝灯灯具。灯具的电源方式包括：灯具连接装置、接线端子、与插座配合的插头、连接引线、电源线、与电源导轨连接的接合器、器具插座。 1. 悬吊在天花板上的灯具，如枝形花灯，库房、商场等使用的吊灯，教室、办公室用的吊灯等； 2. 表面安装灯具，包括天花板表面安装灯具，如	适用标准： GB7000.1 GB7000.201 GB17743 GB17625.1 不包括： 1. 固定式应急照明用灯具； 2. 隧道灯具； 3. 道路和街路照明灯具； 4. 灯具总高度不低于2.5m（≥2.5m）的柱式合

2 LED照明产品CCC认证/CCC certification

- 2.2 产品认证范围/Scope
  - 7种的LED灯具，电源电压高于36V和不超过1000V)
    7 types of LED luminaires with power supply above 36V, but not exceeding 1000V
  - LED控制装置
    Electronic control gear for LED modules

2 LED照明产品CCC认证/CCC certification

- 2.2 产品认证范围/Scope

No.	产品名称/Product	国标/National Standard
1	固定式通用LED灯具/Fixed general purpose luminaries	GB7000.201-2008（IEC 60598-2-1: 1979 + A1: 1987, IDT）
2	嵌入式LED灯具/Recessed luminaires	GB7000.202-2008(IEC 60598-2-2: 1997, IDT)
3	可移式通用LED灯具/Portable general purpose luminaries	GB7000.204-2008(IEC 60598-2-4: 1997, IDT)
4	LED水族箱灯具/LED aquarium luminaires	GB7000.211-2008（IEC 60598-2-11: 2005, IDT）

2 LED照明产品CCC认证/CCC certification

- 2.2 产品认证范围/Scope

No.	产品名称/Product	国标/National Standard
5	电源插座安装的LED夜灯/Mains socket-outlet mounted nightlight	GB 7000.212-2008 (IEC 60598-2-11: 2005,IDT)
6	地面嵌入式LED灯具/Ground recessed luminaries	GB 7000.213-2008 (IEC 60598-2-13: 2006,IDT)
7	儿童用可移式LED灯具/Portable luminaires for children	GB7000.4-2007 (IEC 60598-2-10:2003,IDT)
8	LED控制装置/Electronic control gear for LED modules	GB19510.14-2009 (IEC 61347-2-13:2006,IDT)

2 LED照明产品CCC认证/CCC certification

- 2.3 认证实施规则及实施细则/The certification implementation rules and the detailed rules for implementation
  - 认证实施规则由认监委制定/The certification implementation rules are formulated by CNCA
    - ❖ CNCA-C10-01：2014 强制性产品认证实施规则 照明电器/CNCA-C10-01:2014 CCC certification implementation rules for Lighting products
  - 认证实施细则由认证机构依据实施规则制定/ The detailed certification rules for implementation are formulated by the certification bodies according to the requirements of the implementing rules
    - ❖ CQC-C1001-2014 强制性产品认证实施细则 照明电器

2 LED照明产品CCC认证/CCC certification

- 2.4 指定认证机构及实验室/certification bodies and laboratories
  - 认证机构及实验室由国家认监委指定/ The certification bodies and laboratories are designated by CNCA
    - ❖中国质量认证中心等2家机构/2 certification bodies such as CQC
    - ❖国家灯具质量监督检验中心等40多家/more than 40 laboratories such as National Center for quality supervision and inspection of luminaires.

2 LED照明产品CCC认证/CCC certification

- 2.5 对生产企业实施分类管理/manage the enterprises according to the classification results
  - 分类依据：生产企业的质量信息/The basis of the classification is the quality information of the enterprises.
    - ❖ 工厂检查结果/ the results of the factory inspection
    - ❖ 国抽、省抽、CCC专项抽查等检测结果/ Testing results of national sampling inspection, provincial sampling inspection, CCC special spot check, etc.
    - ❖ 媒体及消费者质量信息反馈等/ media exposure and feedback of consumer on quality information
  - 分为四类：A(信誉最高)，B，C，D/4 classes, A(the highest quality credit rating),B,C,D

2 LED照明产品CCC认证/CCC certification

- 2.6 认证模式/Certification mode
  - 基本模式/basic mode
    - ❖型式试验+获证后的监督/Type test +Supervision after certification
  - 质量评级较低的企业加严要求，采用型式试验+初始工厂检查+获证后的监督/For enterprises classified as C or D level, the certification bodies can adopt more complex and comprehensive certification mode , such as Type test + Initial factory inspection + Supervision after certification

2 LED照明产品CCC认证/CCC certification

- 2.7 型式试验/Type test
  - 认监委指定的第三方实验室/carried in the third party laboratories designated by CNCA
  - 可由指定实验室派出检测人员利用生产企业检测资源实施检测或目击检测/ the testing personnel from the designated laboratories make use of the testing resources of the enterprises according to the standard requirements to carry out the testing(TMP) or WMT

2 LED照明产品CCC认证/CCC certification

- 2.8 获证后的监督/ Supervision after certification
  - 跟踪检查+监督抽样检验/ Follow-up inspection+ Sampling testing
  - 结合生产企业分类情况，可以采用一种或多种方式的组合/ combined with the classification results, the supervision method after certification can be one way or combination of multiple kinds of ways
  - 对质量信誉高的企业，可以减少监督的频次或内容/ For the enterprises with high quality rating, the frequency of supervision can be reduced as well as the content of supervision.

3 LED照明产品自愿认证/Voluntary certification

- 产品认证范围/Scope
  - 灯具举例/Luminaire

产品名称/Product	依据标准/applicable standards	内容/Content
LED路灯/隧道灯 luminaires for road and street lighting	GB7000.203	安全、EMC Safety+EMC
LED投光灯 Floodlights	GB7000.7	安全、EMC Safety+EMC
36V以下固定式通用灯具 Fixed luminaires of below 36V	GB7000.201	安全 Safety
36V以下嵌入式灯具 Recessed luminaires of below 36V	GB7000.202	安全 Safety

3 LED照明产品自愿认证/Voluntary certification

- 产品认证范围/Scope
  - 灯具举例/Luminaire

产品名称/Product	依据标准/applicable standards	内容/Content
带锂离子电池或电池组的可移式灯具 Handheld and portable LED luminaires with rechargeable lithium-ion cell or battery	CQC1128	安全 Safety
读写作业台灯 Table lamps for visual task	CQC1601→GB/T 9473	性能 Performance
光伏电源供电的LED路灯 Photovoltaic supplied LED road and street lighting system	CQC1602	性能 Performance

3 LED照明产品自愿认证/Voluntary certification

- 产品认证范围/Scope
  - 光源及附件举例/Light source and accessories

产品名称/Product	依据标准/applicable standards	内容/Content
LED模块 LED modules for general lighting	GB24819	安全、EMC Safety + EMC
普通照明用自镇流LED灯 Self-ballasted LED lamps for general lighting	GB24906	安全、EMC Safety + EMC
双端LED灯管 Double-capped LED lamps	CQC1106	安全 Safety
照明用智能控制终端 Smart control terminal for lighting	GB15092.1 GB4943.1	安全 Safety

3 LED照明产品自愿认证/Voluntary certification

- 节能认证/Energy conservation certification
  - 产品范围及依据标准/Scope and applicable standards

产品名称/Product	依据标准/applicable standards	内容/Content
LED道路/隧道照明产品 LED lighting products for street and tunnel lighting	CQC3127	性能、能效 Performance + energy efficiency
LED筒灯 LED downlights	CQC3128	
反射型自镇流LED灯 Self-ballasted LED reflector lamps	CQC3129	
LED球泡灯 LED bulb lights	CQC3130→GB30255、GB/T24908	

3 LED照明产品自愿认证/Voluntary certification

- 节能认证/Energy conservation certification
  - 产品范围及依据标准(续)/Scope and applicable standards

产品名称/Product	依据标准/applicable standards	内容/Content
LED模块用交流电子控制装置 electronic control gear for LED modules	CQC3146	性能、能效 Performance + energy
LED平板灯具 LED flat panel luminaires	CQC3147	
双端LED灯管 Double-capped LED lamps	CQC3148	
中小学及幼儿园教室照明产品 Lighting products used in classroom in schools and kindergartens	CQC3155	

3 LED照明产品自愿认证/Voluntary certification

- 节能认证/Energy conservation certification
  - 实施机构/ institutions engaged in energy conservation certification
    - ❖中国质量认证中心1家认证机构/ 1 certification body
    - ❖8家实验室/8 laboratories

3 LED照明产品自愿认证/Voluntary certification

- 节能认证/Energy conservation certification
  - 基本要求/basic requirements
    - ❖安全要求为基础/meet the safety requirements
    - ❖符合产品性能要求/meet the performance requirements
  - 认证实施规则/implementation rules
    - ❖由认证机构自行制定/formulated by the certification bodies

3 LED照明产品自愿认证/Voluntary certification

- 节能认证/Energy conservation certification
  - 认证模式/Certification mode
    - ❖型式试验+初次工厂检查+获证后的监督/ Type test + Initial factory inspection + Supervision after certification
    - ❖型式试验在认证机构签约的第三方实验室进行/Type test is carried out in the third party laboratories contracted with the certification bodies

Thank You!

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Recommendations for LED Lighting Product Certification
LED照明产品认证建议

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Pacific Northwest National Laboratory 美国太平洋西北国家实验室

U.S.-China Green Building Materials and Green Lighting Certification System Workshop 中美绿色建材和绿色照明认证体系研讨会

July 23, 2018 Beijing, China 2018年7月23日，北京

Work on LED Lighting
LED照明产品相关工作

- Gap analysis between the U.S. and China 中美比对
  - Testing standards and methods 产品检测标准和方法
  - Certification programs 产品认证项目
- Inputs from the working group 业内意见
- Recommendations 建议

	U.S.	China
Standard Issuer	Illuminating Engineering Society (IES)	SAC
Electrical and photometric	LM-79-2008	GB/T 24824-2009 GB/T 29293-2012 GB/T 29295-2012
Lumen maintenance and lifetime	LM-80-2008	
	TM-21-2011	
	LM-84-2014	GB/T 33721-2017 GB/T 33720-2017
	TM-28-2014	

Two Types of Product Certification
两类产品认证

Comparison Certification 比较认证

- Rate and label product performance
  评价并标识产品性能
- Allow transparent and credible product information for product comparisons
  提供透明可靠的产品信息，可用于产品比较

Endorsement Certification 背书认证

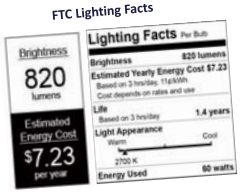
- Certify "Green" products by meeting minimum performance requirements
  认证性能达标产品为"绿色产品"
- Allow easy identification of products with superior performance
  易于识别高性能产品

Examples of Comparison Certification Programs in the U.S. and China 中美现有"比较认证"项目

	U.S. 美国	U.S. 美国	China 中国
Program Name 项目名称	Lighting Facts	LED Lighting Facts	China Energy Label (CEL) 中国能效标识
Administrator 管理单位	Federal Trade Commission (FTC) 联邦商务委员会	D&R International	China National Institute of Standardization (CNIS) 中国标准化研究院
Government-backed 政府支持	Yes 是	Yes 是	Yes 是
Mandatory/ Voluntary 强制/自愿	Mandatory 强制	Voluntary 自愿	Mandatory 强制
Post-market Verification 验证试验	No 无	Yes 有	No 无
Accreditation Requirement 资质认可要求	Yes (testing lab) 要求检测实验室资质认可	Yes (testing lab) 要求检测实验室资质认可	Testing labs not necessarily accredited 不必要，但需提供能力证明
Product Database 产品数据库	Yes 有	Yes 有	Yes 有

Examples of Comparison Certification Programs in the U.S. and China 中美现有"比较认证"项目

FTC Lighting Facts



Examples of Endorsement Certification Program in the U.S. and China 中美现有"背书认证"项目

	U.S. 美国	U.S. 美国	China 中国
Program Name 项目名称	Energy Star 能源之星	SSL Qualified Product List (QPL)	China Energy Conservation Certification (CECC) 中国节能认证
Administrator 管理单位	Environmental Protection Agency (EPA) 环境保护署	DesignLights Consortium (DLC)	China Quality Certification Centre (CQC) 中国质量认证中心
Government-backed 政府支持	Yes 是	No 否	Yes 是
Mandatory/Voluntary 强制/自愿	Voluntary 自愿	Voluntary 自愿	Voluntary 自愿
Label 标识	ENERGY STAR	DLC QPL LISTED	
Accreditation Requirement 资质认可要求	Yes (both certification body and testing lab) 要求认证机构和检测实验室资质认可	Yes (testing lab) 要求检测实验室资质认可	Not clear 不清晰
Online Certified Product Data 产品数据库	Yes 有	Yes 有	Not clear 不清晰

Key Barriers
主要障碍

- Insufficient practices to maintain the integrity and credibility of certification 缺乏保证产品认证可信度和可靠度的措施
  - Weak or unclear requirements for testing laboratories and certification bodies 对检测实验室和认证机构的要求不够严格或不够清晰
- Weak coordination and linkage among different components along the system 体系内各环节联系不紧密
- Low market uptake of green lighting products 绿色照明产品市场占有率低
  - Weak incentives for product certification 产品认证动力不足
  - Product categories covered under certification programs are relatively narrow 认证项目所覆盖的产品类别相对比较少

Recommendations for Discussion
讨论 —— 改进措施建议

Barriers 障碍	Actions 措施	Priority 优先次序	Timeline of Completion 完成时间
Integrity and credibility 可信度和可靠度	1. Change from self-certification to third-party certification 从自我认证向第三方认证转变	High priority	< 1 years
	2. Revise the program requirements and provide clear guidelines of accreditation 修改认证项目指南，明确对检测实验室和认证机构资质认可的要求	High priority	< 1 year
	3. Enhance post-market verification testing program 加强产品认证后的验证测试	High priority	1 – 2 years
Weak coordination and linkage 各环节联系不紧密	4. Different components of the system (standard, accreditation, and certification) could cross-reference each other with clearer guidelines and resources 体系中各环节和项目（标准、资质认可、产品认证）应互相参照并提供清晰的指南和资源	High priority	~ 2 years
	5. The two types of certification programs could be consistent in program requirements, product categories, and certification process 两类认证项目可覆盖统一的产品类别，提供一致的认证要求和过程	High priority	~ 2 years
Low market uptake 市场占有率	6. Establish financial incentive programs to motivate product certification 通过奖励政策激励产品认证	Medium priority 一般优先	2 – 4 years
	7. Expand product categories covered under certification programs 扩大覆盖产品类别	Medium priority 一般优先	Ongoing 持续进行

Thank you!
谢谢！

Sha Yu
Staff Scientist 科学家
Email: sha.yu@pnnl.gov

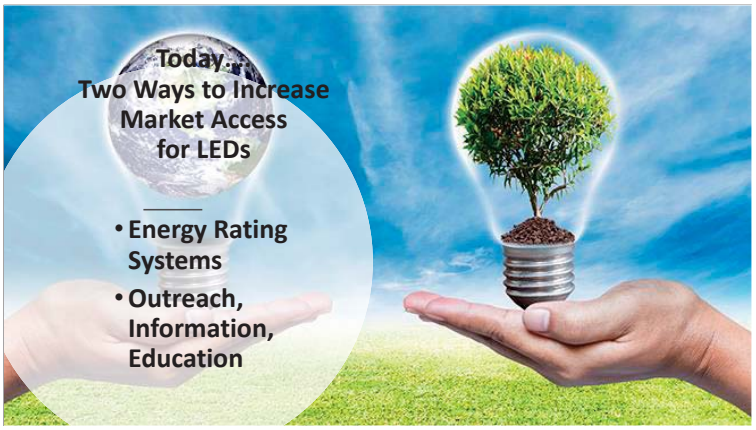
Market Access for LED Lighting
LED照明市场准入

USGBC Senior Fellow
Mark Ginsberg
美国绿色建筑委员会
资深专家
马克·金斯伯格

Buildings account for **40%** of global energy use &
one-third of global greenhouse gas emissions

建筑消耗全球40%能源并排放全球三分之一温室气体

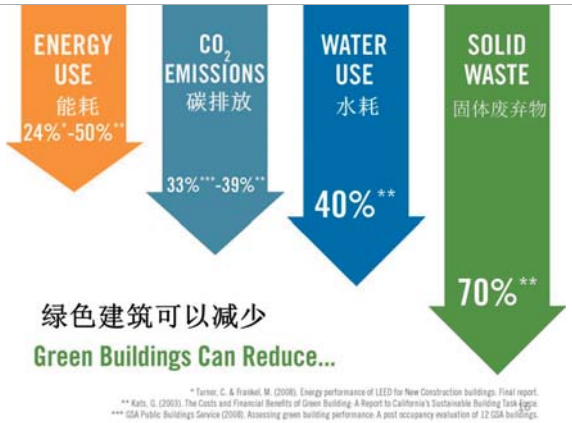
what cannot be **measured** cannot be **managed**
准确的数据有助于管理

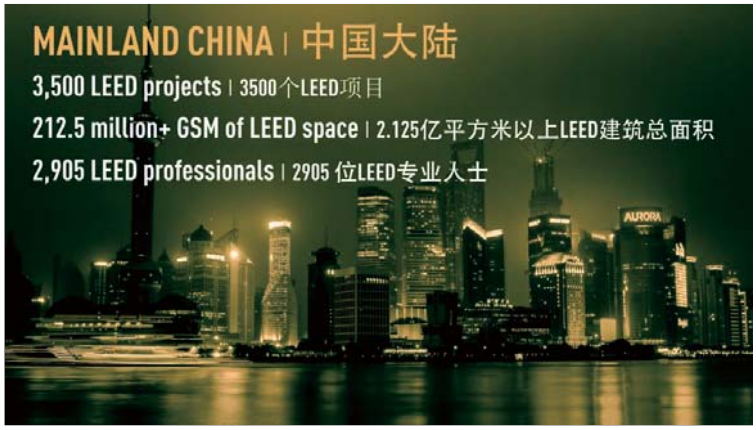


建筑评级系统的价值
Value of Green Building Rating Systems

显示效能和有效性
.体现环保责任
·推动市场转变
Indicates Efficiency and Effectiveness
Demonstrates Environmental Commitment
Promotes Market Transformation

8





Benefits of Energy Efficient Lighting

高能效照明的益处

LEED Credits Affecting Lighting
LEED得分影响照明

LEED

About 35% of the total energy used in a typical commercial building in the United States is from lighting. LEED offers credits for:

- Energy and Atmosphere
- Energy Efficiency
- Climate and Carbon Reduction
- Contributions to green power by reducing energy load
- Local Supply Chain and Recycled Materials

Interior Lighting Credits - 室内照明

LEED

Intent

- To promote occupants' productivity, comfort, and well-being by providing high-quality lighting.
- Option 1. Lighting control (1 point)
- Option 2. Lighting quality (1 point)

usgbc.org/credits/commercial-interiors-hospitality-commercial-interiors/v4/eq117

Daylighting Credits - 日光照明

LEED

Intent

- To connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight into the space.
- Option 1. Simulation: Spatial Daylight Autonomy (2–3 points, 1-2 points Healthcare)
- Option 2. Simulation: Illuminance Calculations (1–2 points)
- Option 3. Measurement (2-3 points, 1-2 points Healthcare)

www.usgbc.org/credits/healthcare/v4-draft/eqc-0

Light Pollution Reduction Credits 减少光污染

LEED

Intent

- To increase night sky access, improve nighttime visibility, and reduce the consequences of development for wildlife and people.
- Includes uplighting and light trespass
- Option 1. BUG rating method - backlight-uplight-glare (BUG) method
- Option 2. calculation method

www.usgbc.org/credits/ss8

ar et ccess or ighting
LED照明市场准入

Outreach nformation and ducation

- embership – ompanies perts overnments
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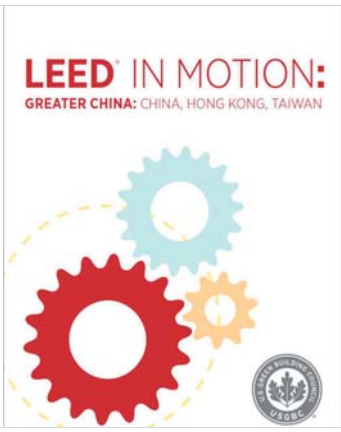
- onferences li e reenbuild hina

12,000+

USGBC members represent the best organizations from all fields. Our members are local and international, big and small, mission- and market-driven. They make an impact within their sphere of influence and collectively advance a more sustainable built environment.



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GBIG
The Green Building Information Gateway
WWW.GBIG.ORG


GREENBUILD China
For the first time ever, the world's largest and most influential green building conference in the world—Greenbuild—is coming to China.
greenbuild.usgbc.org/china


LEED
ON
LEED


Resources You Can Use
可用资源

LED照明产品能效标识和能效“领跑者”实施情况

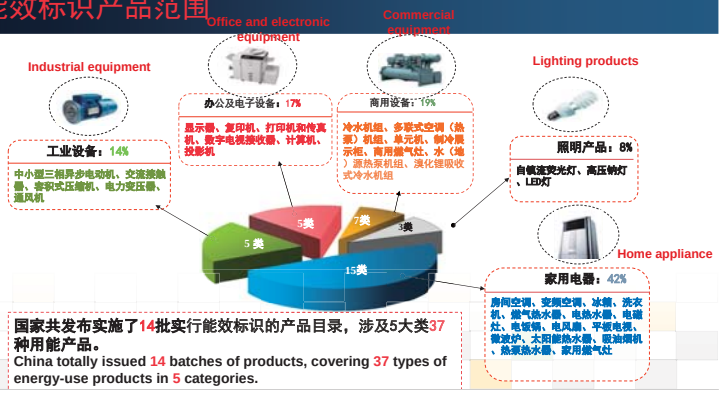
Energy Labeling and Energy Efficiency “Top Runner” Programs for Led Lighting Products

中国标准化研究院 夏玉媚

China National Institute of Standardization, Yujuan Xia

二零一八年六月

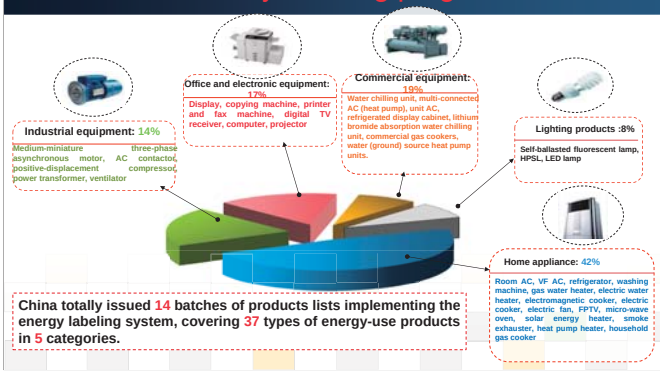
能效标识产品范围



国家共发布实施了14批实行能效标识的产品目录，涉及5大类37种用能产品。

China totally issued 14 batches of products, covering 37 types of energy-use products in 5 categories.

Products covered by labelling program



China totally issued 14 batches of products lists implementing the energy labeling system, covering 37 types of energy-use products in 5 categories.

能效标识实施要求

能效标识实施要求

◆**能效检测**：灯功率、配光类型、初始光效、一般显色指数四个项目

◆**备案单元**：LED模块的类型相同，灯壳材质相同，透光罩的材料相同，灯的外形相似，通过额定功率、色调代码和配光类型将产品划分备案单元（见表1）。相同备案单元的产品填写一份备案表，提交其中最小功率和最低色温规格型号的检测报告，其他规格型号产品可不提交检测报告。

表 1 普通照明用非定向自镇流 LED 灯备案单元划分表

色调代码	65/50/40		35/30/27/P27	
配光类型	全配光	半配光/准全配光	全配光	半配光/准全配光
额定功率 P（W）	2≤P≤5	2≤P≤5	2≤P≤5	2≤P≤5
	5<P≤25	5<P≤25	5<P≤25	5<P≤25
	25<P≤60	25<P≤60	25<P≤60	25<P≤60

能效标识备案情况

➢截至2017年底，共有备案企业151家，公告5856个型号，其中1级能效占比5. 2%，2级能效占比53. 6%，3级能效占比41. 2%。

➢2018年上半年备案企业76家，公告1801个型号，其中1级能效占比1. 2%，2级能效占比40. 8%，3级能效占比58%。

能效“领跑者”制度

◆**概念**：同类可比范围内能源利用效率领先，且保证产品资源、环境、品质等性能，具有节能示范推广意义的产品。

◆**意义**：增强全社会节能减排动力、节约能源资源、保护环境；推动产品质量提升和产业供给侧结构性改革、满足人民日益增长的美好生活需要、实现经济社会高质量发展

◆**实施模式**：**树立标杆、政策激励、提高标准**，形成推动终端用能产品能效水平不断提升的长效机制

评价标准	分值分配	备注
能效水平及节能技术	85	
其他绿色技术	5	和产品资源、环境、品质等相关的其他性能要求和技术应用情况，如**制冷剂环保性、噪声、除菌性能**等。
企业创新和推广能力	10	研发投入、创新能力、硬件保障、推广服务能力等。

能效“领跑者”制度

一、制定发布细则

2015-2017年共计发布家用电冰箱、平板电视、转速可控型房间空气调节器、电动洗衣机、LED照明产品五类实施细则

二、评选能效“领跑者”产品

通过“初评打分+能效现场检测+复核打分+公示+公告”的方式组织2016年度和2018年度能效“领跑者”产品申报评选工作。其中，2016年度遴选出三类产品共计18家企业、150个型号。2018年度能效“领跑者”目录待发布。

三、日常推广实施

组织三场大规模实施细则宣贯培训；建立开通并完善能效“领跑者”产品申报信息系统、网站和微信公众号；组织召开2016年度新闻发布会，联合央视、中国发展网、人民网、新华网等媒体机构进行跟踪报道。

2016年度能效“领跑者”产品推广近500万台，市场占比约3.3%。

LED照明产品能效“领跑者”相关要求

◆**实施时间**：2017年12月1日

◆**产品范围**：

1. 普通照明用非定向自镇流LED灯，即不具有外加光学透镜的LED球泡灯。

●光通量规格：250lm，500lm，800lm；

●配光规格：半配光，准全配光；

●色调规格：低色温(2700K，3000K，3500K)，高色温(4000K，5000K，6500K)。

性能要求：

✓GB/T 31112《普通照明用非定向自镇流LED灯规格分类》

✓GB 24906《普通照明用50V以上自镇流LED灯安全要求》、GB/T 24908《普通照明用非定向自镇流LED灯性能要求》

✓IEC/TR 62778《IEC 62471在光源和照明蓝光危害评价方面的应用》规定的蓝光危害要求

LED照明产品能效“领跑者”相关要求

◆**产品范围**：

2. LED道路照明产品、LED隧道照明产品。

●光通量规格：3000lm，5400lm，9000lm，14000lm；

●色温规格：低色温(CCT≤3500K)，中色温(3500K＜CCT≤5000K)

性能要求：

✓GB 7000.1《灯具 第1部分：一般要求与试验》、GB 7000.203《灯具 第2-3部分：特殊要求 道路与街路照明灯具》；

✓GB/T 24827《道路与街路照明灯具性能要求》

能效标识实施要求

◆**评价标准：**

评分因素	分值分配
1. 产品能效水平	70
2. 产品主要技术	15
3. 企业创新和推广能力	15
总分	100

1. 产品能效水平

序号	评分因素	考核要求	考核方式/评判依据	分值（70分）
1	能效水平	产品能效标称值从高到低排序，第一名得70分，每降一名减0.5分。	提供相关材料以及送样检测复核	70

能效标识实施要求

2. 主

a.

序号	评价因素	考核要求		分值（15分）
1	初始光通量(lm)	实测初始光通量/额定光通量×100%，	[95%，110%]，2分；[90%，95%)或(110%，120%]，1分；其他，0分	2
2	功率因数	250 lm 500 lm	≥0.7，2分；[0.5，0.7)，1分；其他，0分	2
		800 lm	≥0.9，2分；[0.7，0.9)，1分；其他，0分	
3	初始显色指数(R9>0)	≥90，4分；[85，90)，2分；[80，85)，1分；其他，0分		4
4	初始色品容差	≤2，3分；(2，5]，1分；其他，0分		3
5	初始颜色不均匀度	≤0.002，3分；(0.002，0.005]，1分；其他，0分		2
6	蓝光危害	RG0，2分；RG1，1分；其他，0分。		2

能效标识实施要求

2. 主要技术

b. LED道

序号	评分因素	考核要求		分值（15分）
1	初始光通量(lm)	|实测初始光通量/额定光通量|×100%	[95%，110%]，5分； [90%，95%)或(110%，120%]，2分； 其他，0分	5
2	初始功率	|实测初始功率/额定功率|×100%	≤100%，4分； (100%，110%]，2分； 其他，0分	4
3	初始相关色温	|初始相关色温-额定相关色温T|	≤100K，2分； (100K，300K]，1分； 其他，0分	2
4	显色指数	≥70，1分； 其他，0分		1
5	功率因数	≥0.97，3分； [0.96, 0.97)，2分； [0.95, 0.96)，1分； 其他，0分		3

敬请批评指正

谢谢！

Window System and Standardization

D. Charlie Curcija
Lawrence Berkeley National Laboratory

July 23, 2018

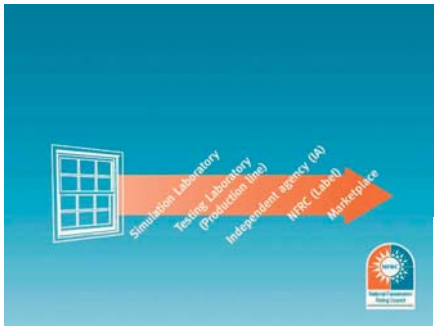
Window & Window Attachments Certification in USA





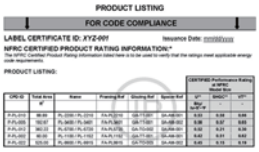



NFRC Window Certification

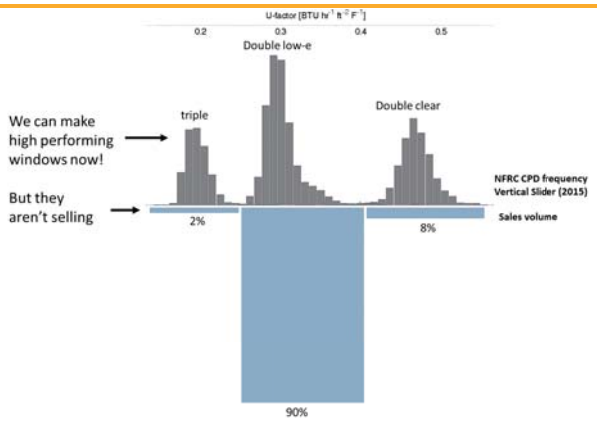


Residential Label

Commercial Label Certificate



Current Market



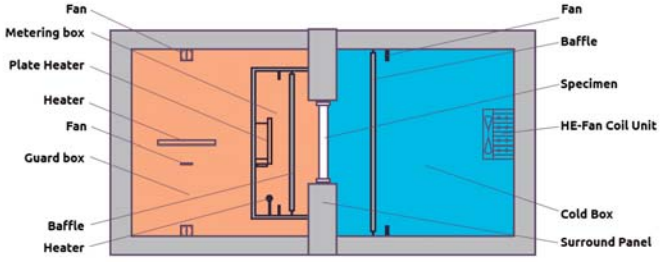
Standards

ISO 15099 –Calculation Standard

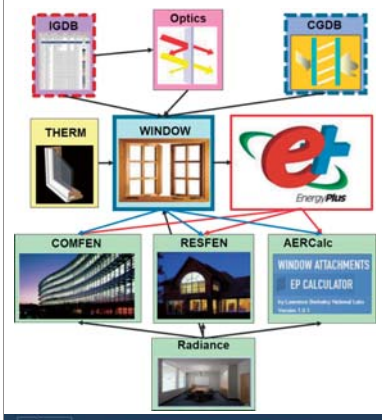
NFRC 100 – Simulation Standard

NFRC 102 – Testing Standard

Physical Testing – Hot Box



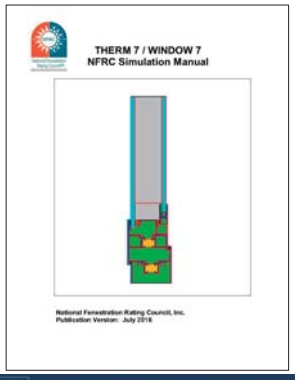
Fenestration Software Tools Ecosystem



IGDB: specular glazing database
CGDB: complex glazing & shading database
Optics: virtual glass lab
Angular SHGC/U/VT: design
THERM: window frame heat transfer
WINDOW: glazing, shading, whole-window
Radiance: detailed lighting/daylighting
EnergyPlus: whole-building energy
COMFEN: commercial fenestration design
RESFEN: residential fenestration design
AERCalc: attachment energy indices

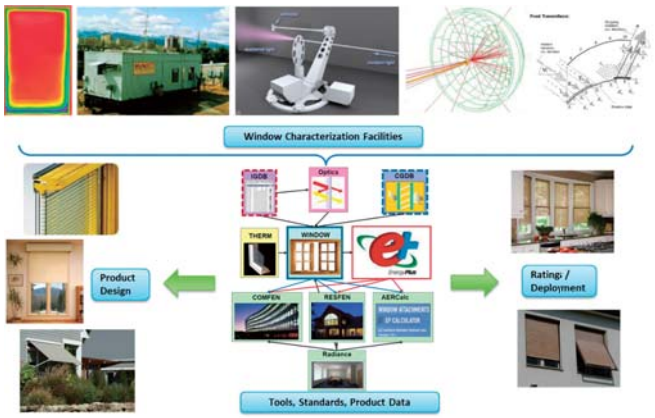
Software Tools Documentation

NFRC Simulation Manual



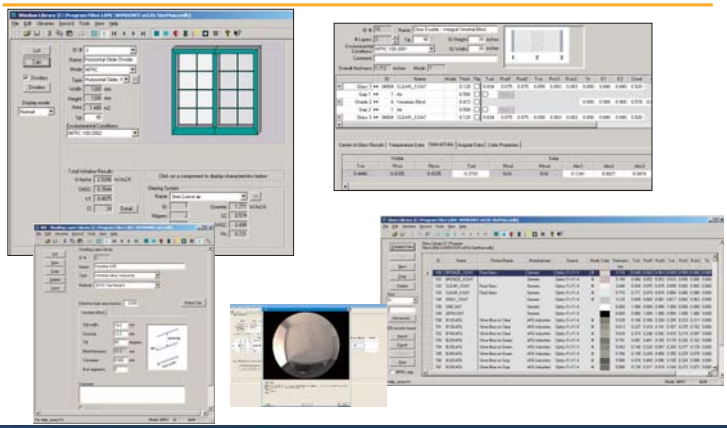
LBNL Technical Documentation

Workflow For Credible Product Characterization

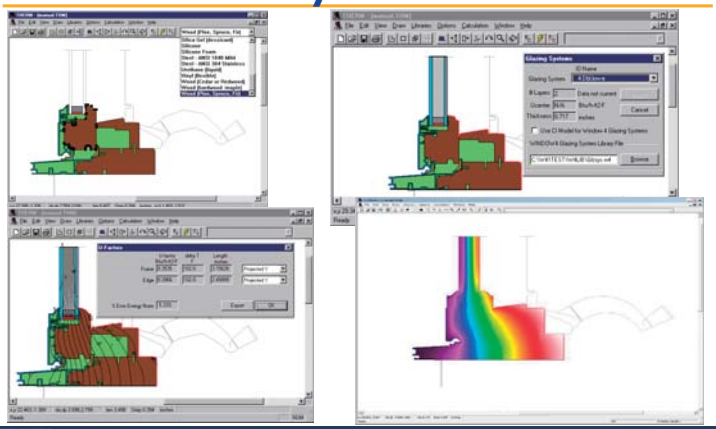


LBNL Facilities for Validating Glazing, Shading, Window Simulation Tools

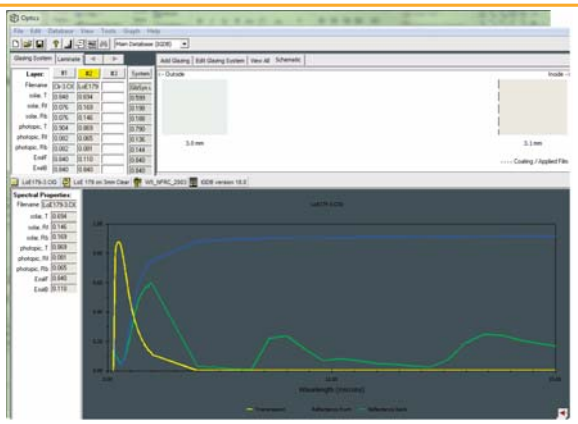
WINDOW: Glazing System & Whole Product



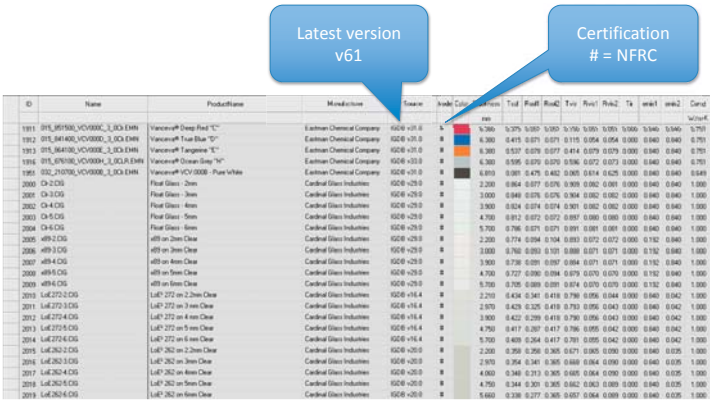
THERM: 2-D Heat Transfer Modeling System



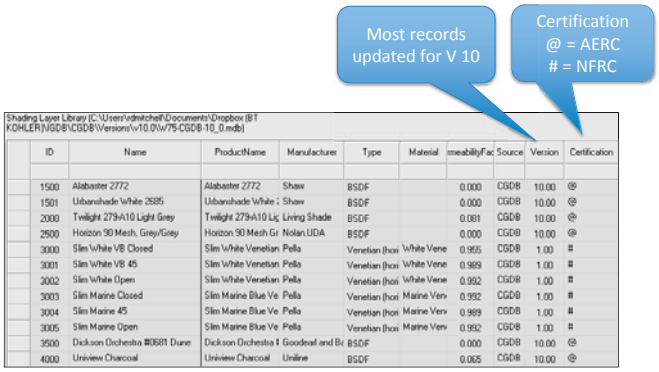
OPTICS: Virtual Glass Laboratory



IGDB – International Glazing Database



CGDB – Complex Glazing and Shading Database

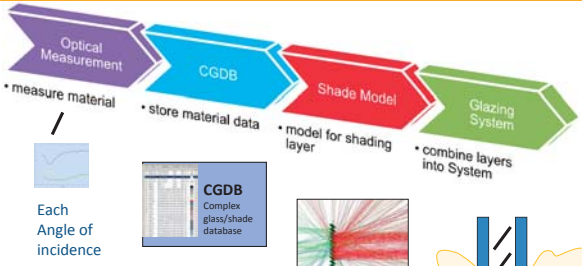


IGDB and CGDB Current State

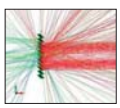
Type	Product Records	Material Records	Total
AERC @	185	34	219
NFRC #	102	20	122
Generic	27	17	44
Legacy	2		2
Total	**316**	**71**	**387**

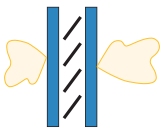
Type	Product Records	Material Records	Total
NFRC #	3859	125	3984
Generic	7	15	22
Blank	1985		1985
Total	**5832**	**140**	**5872**

IGDB/CGDB Flow



Each Angle of incidence

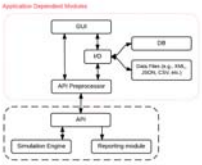


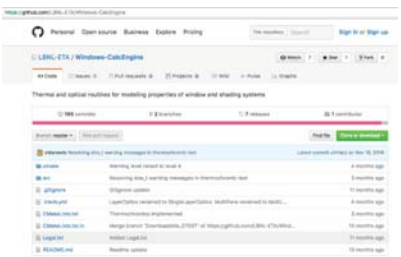


- **Current and future work:**
  - Transition to Cloud-based unified IGDB/CGDB database
  - API for data access
  - Regional Data Aggregation (RDA) model to accomplish decentralized management and support of IGDB/CGDB

Open-Source

- WinCalc engine
  - Refactored simulation engine for Berkeley Lab WINDOW
  - C++ programming language (was a mix of FORTRAN and Visual Basic)
  - Integration with E+
- WINDOW and THERM transition to open source model
  - Public vs proprietary code
  - Licensing

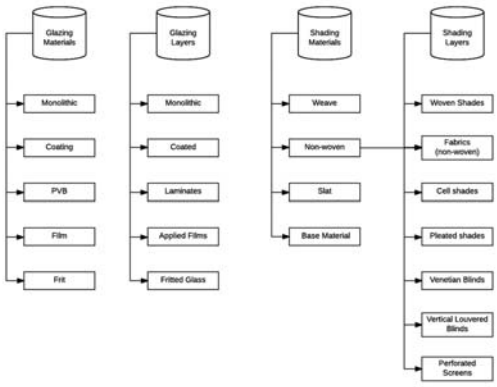




New Data Formats for Glazing & Shading Database IGSDB

- Measured data to be stored without further processing
  - Direct-direct and direct-diffuse measurements (Spectrophotometer with integrating sphere).
  - Angular tubes measurements for fabrics. Direct-direct and direct-diffuse for several incidence angles
  - Goniophotometer measurements stored in full measurement resolution.
    - Full spectral measurements
    - 3 Colors + NIR
    - May utilize various syemtries
- Postprocessing done in calculation tools
  - For example if WINDOW software tool needs BSDF, while measured data are in direct-direct/direct-diffuse format, BSDF is formed in WINDOW prior to calculation of glazing system performance
- Data formats support
  - Text file (ES-SDA)
  - XML and JSON structured formats

IGSDB Structure Outline



Regional Glazing & Shading Data Aggregators (RDA)

- White paper: Curcija, D.C.; and Selkowitz, S.E. 2016. “Establishment of Regional Glazing and Shading Data Aggregator Centers (RDA).” June 20, 2016.
- Implementation Plan:
  - Phase 1: RDA collects measured data and submits to LBNL for peer review and processing. In this phase RDA serves simply as qualified data submitter.
  - Phase 2: RDAs collects data, manages data submission and peer review, runs visual inspection and data checker and generates block of records for inclusion in IGSDB
  - Phase 3: Cloud-based IGSDB operational and accessible via web services
  - Phase 4: RDAs start posting their glazing and shading data into the IGSDB
- Timeline
  - Phase 1: Completed. NFRC/LBNL – Glazing RDA; AERC/LBNL – Attachment RDA
  - Phase 2: 9/30/2018
  - Phase 3: 6/30/2019
  - Phase 4: 9/30/2020

New IGSDB and RDA Web Tool

- Cloud-based International Glazing and Shading Database (IGSDB)
- New submission and data checking tool
  - Web-based tool: https://Checkertool-staging.herokuapp.com
  - Accommodate multiple classes of users
  - Documented API for structured access
- XML-based data submission format
- Schedule:
  - 2/2018 Alpha version with limited functionality
  - 6/2018 Beta version with essential functionality
  - 10/2018: Version 1 with essential functionality
- RDA Phase II will start with the release of version 1 of the tool
- RDA Phase 1 has already started with contract in place for CGDB (currently CGDB and IGDB are 2 separate databases)

User classes for the New RDA Tool

User Roles

User	Symbol	Description
Public	P	Public users who want to browse/search published products.
Data Submitter : Manufacturer	DS:M	A manufacturer who wants to submit data for their products.
Data Submitter	DS:C	A consultant or other third party who wants to submit data for one or more manufacturers.
Regional Data Administrator : Business	RDA:B	A manufacturer who has agreed to act as a regional administrator and facilitate part of the submission process.
Regional Data Administrator : Technical	RDA:T	A community member who has agreed to act as a regional administrator and facilitate part of the submission process.
Superuser	S	LBNL user(s) who administer the users and features of the CT.

RDA Tool Process

Submission Status

1. Review by Submitter
2. Submitted to RDA
3. Passed RDA Review
4. Submitted to Peer Review
5. Passed Peer Review
6. Approved

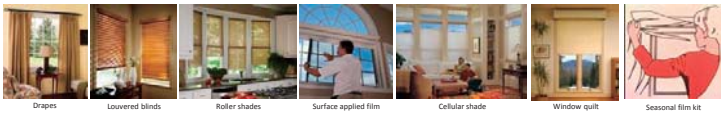
Submission Groups and User Roles

Status	Action	DS:M	DS	RDA:B	RDA	S
0	**Add products** This is the initial product import wizard, which creates the SG.	Y	Y	N	N	Y
1	Update SG metadata	Y	Y	N	N	Y
	Delete SG	Y	Y	N	N	Y
	Add product	Y	Y	N	N	Y
	Update product	Y	Y	N	N	Y
	Remove product	Y	Y	N	N	Y
	Add notes to SG	Y	Y	Y	Y	Y
	Submit to RDA	Y	Y	N	N	Y
2	Update SG metadata	Y	Y	N	N	Y
	Delete SG	Y	Y	N	N	Y
	Add product	Y	Y	N	N	Y
	Update product	Y	Y	N	N	Y
	Remove product	Y	Y	N	N	Y

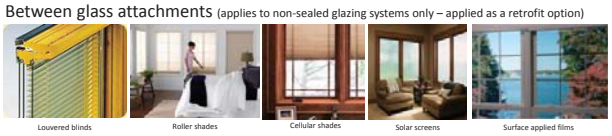
WINDOW ATTACHMENTS

Exterior attachments

Interior attachments



Between glass attachments (applies to non-sealed glazing systems only – applied as a retrofit option)



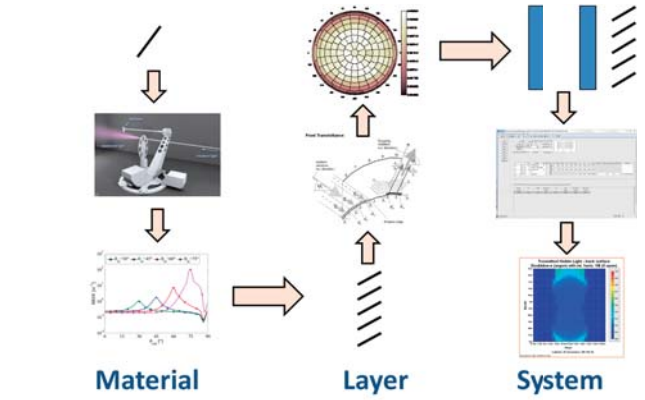
Window Attachments Classification and Research Status

Phase	No.	Product Type		Test Procedure IN T	IN S	IN O	OUT T	OUT S	OUT O	BG T	BG S	BG O	Simulation - U; SHGC; VT IN T	IN S	OUT T	OUT S	BG T	BG S	Simulation - EP IN	OUT	BG
Phase 1	1	Cellular Shade	Research																		
			Deployable																		
	2	Slat Shade	Research																		
			Deployable																		
	3	Roller Shade	Research																		
			Deployable																		
	4	Window Panel	Research																		
			Deployable																		
Phase 1 - Ext	5	Pleated Shade	Research																		
			Deployable																		
	6	Solar Screen	Research																		
			Deployable																		
	7	Surface Applied Films	Research																		
			Deployable																		
Phase 2	8	Window Quilts	Research	08/18	08/18								08/18	08/18					09/18		
			Deployable	09/18	09/18								09/18	09/18					09/18		
	9	Roller Shutter	Research				06/18	06/18							06/18	06/18				09/18	
			Deployable				09/18	09/18							09/18	09/18				12/18	
	10	Awnings	Research					09/18							09/18	09/18				09/18	
			Deployable					12/18							12/18	12/18				12/18	
Phase 3	11	Louvered Shutter	Research																		
			Deployable																		
	12	Roman Shade	Research																		
			Deployable																		
	13	Drapes	Research																		
			Deployable																		
	14	Sheer Shade	Research																		
			Deployable																		

Currently Available
Under development
Development not started

IN: Indoor mounted; **OUT:** Outdoor mounted; **BG:** Between glazing
T: Thermal; **S:** Solar Heat Gain; **O:** Optical

MODELING – FROM COMPONENTS TO SYSTEMS



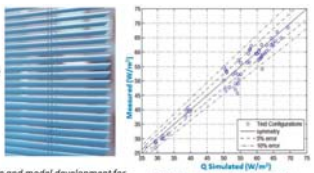
EXAMPLE – CELLULAR (HONEYCOMB) SHADES

Device Type	Optical Characterization & Calculation	Thermal Calculation
Material types: • Polymer Optical types: • Opaque base material • Translucent base material Geometry types: • Single cell • Cell-in-cell • Multiple cell-in-cell • Double cell • Triple and multiple cell	Material Characterization • Spectrophotometer measurements of fabric coupons Layer Characterization • Raytracing of actual geometry from fabric properties in WINDOW (Geometry generated in THERM) – resulting BSDF Software Implementation • Implemented	Conduction Heat Transfer: • Conductivity of the film either measured or generic value Convection Heat Transfer: • Gap: Extension of ISO 15099 model for air gap between glazing and shade • Cells: Frame cavity like modeling • Air flow: Permeability to be determined from openness. New LBNL permeability model. Software Implementation • Implemented

Air Flow Model

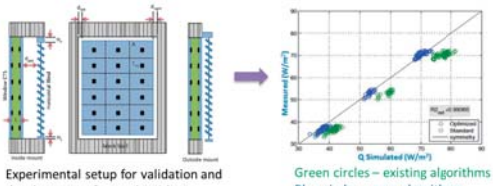
Air flow around shading systems
- Edge gaps, top and bottom gaps
- Validated existing algorithms → no change

Air flow through venetian blinds
- Developed new algorithms
- Implemented in WINDOW



Validation of airflow around attachments

Hart, R.G.; Goudey, H; and Curcija, D.C. 2017. Experimental validation and model development for thermal transmittances of porous window screens and horizontal louvred blind systems. Journal of Building Performance Simulation. DOI: 10.1080/19401493.2017.1323010

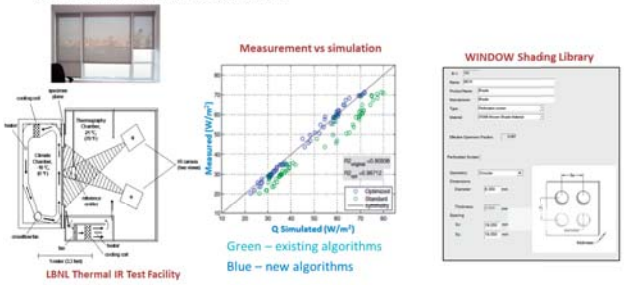


Experimental setup for validation and development of new algorithms

Green circles – existing algorithms
Blue circles – new algorithms

Window Shading Permeability Model

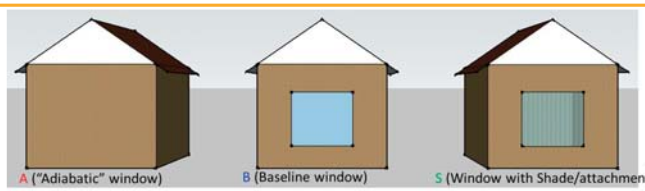
Heat transfer effects from fabrics and perforated shading devices
- New Permeability Factor (PF) $PF = \left(\frac{K}{3.44x10^{-5}}\right)^{1/1.6}$
- New heat transfer equations based on PF
- PF is used in calculating velocity in a cavity between the attachment and window, which in turn is used in heat transfer correlation



LBNL Thermal IR Test Facility

Green – existing algorithms
Blue – new algorithms

Annual Energy Performance



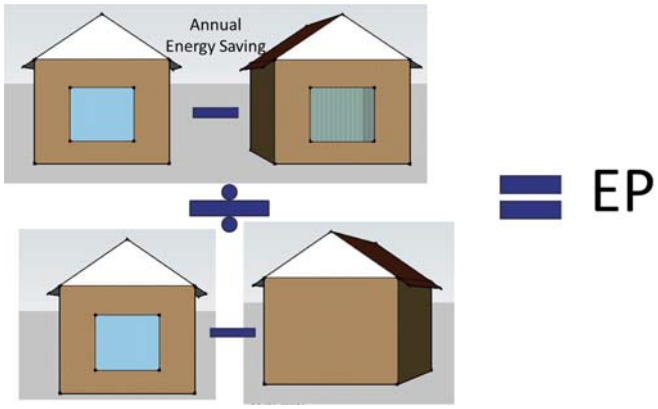
Definitions:

E_A: Annual cooling or heating energy **use** of the building with **"adiabatic"** window
E_B: Annual cooling or heating energy **use** of the building with **baseline** window only
E_S: Annual cooling or heating energy **use** of the building with **window attachments** on baseline windows

$E_{B-A} = E_B - E_A$, Annual energy **use** by the **baseline** window
$E_{S-A} = E_S - E_A$, Annual energy **use** by the baseline window **with attachment**
$E_{B-S} = E_B - E_S$, Annual energy **savings** by the window attachment vs. baseline window

$$\frac{E_{B-S}}{E_{B-A}} = EP$$

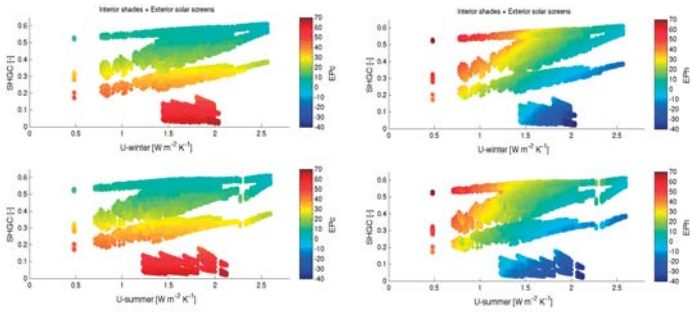
Visual Definition of EP



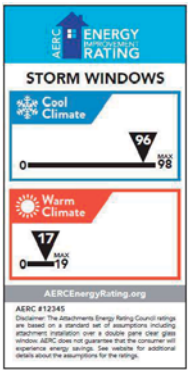
Ranges of Performance

(1) EP < 0 means the attachment has negative impact on the energy performance of window ($E_S > E_B$)
(2) EP = 0, means the attachment does not have any impact on the energy performance of window ($E_S = E_B$)
(3) 0 < EP < 1, means the attachment has positive impact on the energy performance of window and saves portion of energy ($E_S < E_B$); most of attachments would be in this case.
(4) EP = 1, means the attachment makes the window system a zero net energy window ($E_S = E_A$); in other words, window system has NO energy impact on the house.
(5) EP > 1, means the attachment makes the window system a net energy-producer window ($E_S > E_A$)

EP vs U vs SHGC from Sensitivity Analysis

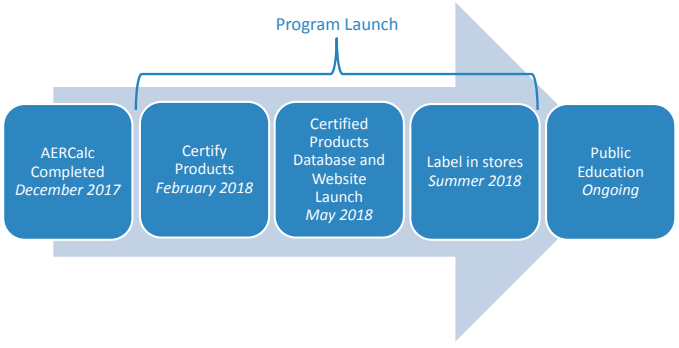


AERC Label



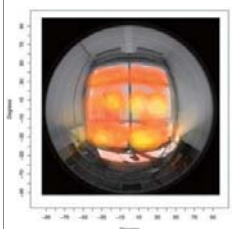
AERC

Launch Timeline

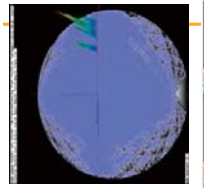


Commercial Window Attachments

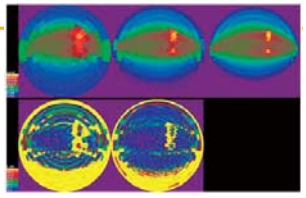
High-resolution BSDF input data



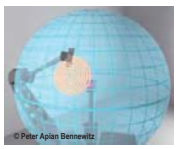
1 time-lapsed field measurements of glare



2 "peaky" bidirectional transmission data from goniophotometer

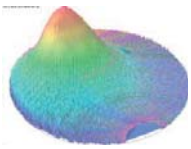


3 resolution of glare source for 1x, 2x, 4x klems basis (upper) and difference in luminance (lower); 4x captures peaks

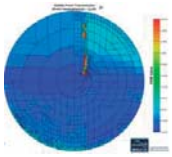


4 peak sampling with goniophotometer

5 interpolation models using gaussian lobes



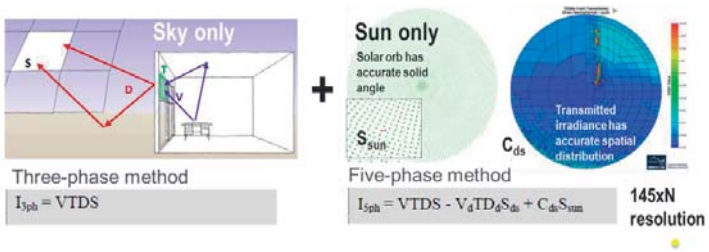
6 measured and fitted data (pink overlay)



7 variable resolution BSDF for light-redirecting system

Which Radiance method?

Five-phase method
Separate sun and sky contributions

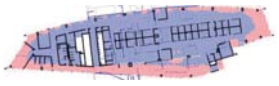


Metrics

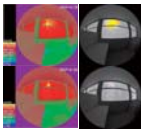
- Daylight quality [LEED/ IESNA LM-83]
  - $sDA_{300,50\%}$ = 0-100% of floor area
  - $ASE_{>1000\ lux,\ 250h}$ < 10% of daylit area

sDA: % of year that workplane illuminance ≥ 300 lux

ASE: workplane illuminance is greater than 1000 lux for more than 250 hours in a year

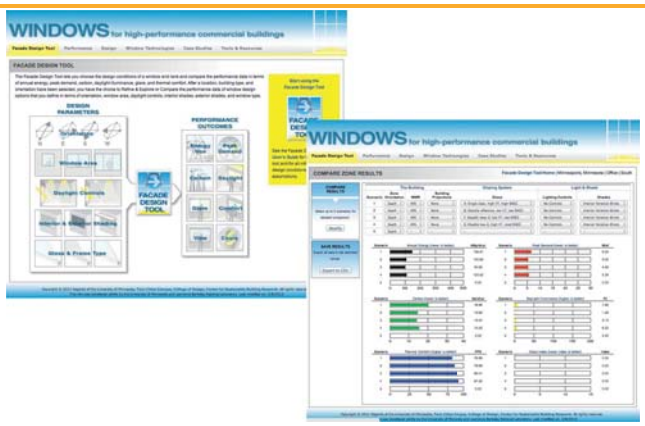


- Visual comfort: DGP Class
  - Class A-D based on degree of discomfort at 95 percentile



Residential Efficient Windows Collaborative

Commercial Windows Website



EFFICIENT WINDOW COVERINGS WEBSITE

中国建材检验认证集团股份有限公司
China Building Material Test & Certification Group Co., Ltd

国检集团

《绿色产品评价 建筑玻璃》 GB/T 35604-2017 介绍

Introduction of *Green product assessment-Building glass*

吴洁 Jie Wu
中国建材检验认证集团股份有限公司（CTC）
2018-07-23

目录 Content

《绿色产品评价 建筑玻璃》 GB/T 35604-2017 介绍
Introduce china national standard GB/T 35604-2007
Green product assessment - building glass

1 • 标准制定背景Background
2 • 标准主要内容Main points

标准制定背景 Background

政策背景 Policy background

自2015年起 政府提出积极推动建立绿色产品统一市场和统一标准。
Uniform market and standard for green product.

标准制定背景 Background

政策背景 Policy background

2016年11月3日
国家标准化管理委员会成立
国家绿色产品评价标准化总体组（简称总体组）
——负责拟订绿色产品标准化发展战略和推进措施，制订绿色产品评价标准体系框架……

标准制定背景 Background

政策背景 Policy background

2016年11月22日
国务院办公厅发文国办发〔2016〕86号——
提出建立统一的绿色产品标准、认证、标识体系

基于全生命周期理念，在资源获取、生产、销售、使用、处置等产品生命周期各阶段中，绿色产品内涵应兼顾资源能源消耗少、污染物排放低、低毒少害、易回收处理和再利用、健康安全和质量品质高等特征。
Full life cycle→Connotation of green product

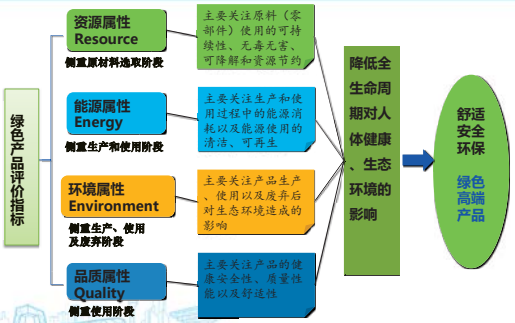
标准制定背景 Background

政策背景 Policy background

总体组根据国务院文件制定了《绿色产品评价通则》GB/T 33761-2017 于2017年5月12日发布并实施，是制定所有绿色产品评价标准的纲领。

GB/T 33761-2017 *General principle for green product assessment* was published and implemented on May 12th 2017.

标准制定背景 Background



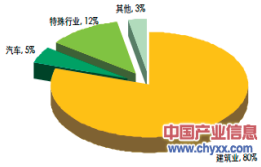
标准制定背景 Background

行业背景 Industry background

建筑玻璃广泛应用于建筑门窗、幕墙、家居装饰，是继水泥和钢材之后的第三大建筑材料。

Building glass is the third largest building materials in china.

玻璃
应用领域分布：
Glass application of distribution



标准制定背景 Background

行业背景 Industry background

产品类别 Product category	企业数量（家） Enterprise quantity	产量（亿平方米/年） Output($\times10^8 m^2$/year)
平板玻璃（原材料） Float glass(Resource)	约80	约30（折合成5mm）
钢化玻璃 Tempered glass	约4000	约5.7
夹层玻璃 Laminated glass	约1500	约1.2
中空玻璃 Insulated glass	约3000	约4.5

注：企业数量是每种产品单独统计的，同家企业可能生产多种产品

标准制定背景 Background

行业背景 Industry background

综合特点：建筑玻璃量大面广，生产过程中高耗能、高污染，使用过程中玻璃能耗约占建筑能耗的40%-50%。

因此，提出将建筑玻璃列入绿色产品评价对象。

Building glass was proposed as an object of green product assessment.

标准制定背景 Background

行业背景 Industry background

评价原则Assessment principle：

1. 高端引领，引导行业向高端发展，促进高品质、低能耗建筑玻璃的使用。
2. 总体5%原则，个项指标10%原则。即：控制符合所有指标的领先产品不超过同类可比产品5%，符合每个单项指标的产品不超过10%。

标准主要内容 Main points

《绿色产品评价 建筑玻璃》
Green product assessment - building glass
GB/T 35604-2017
2017-12-08发布
2018-07-01实施

标准主要内容 Main points

1 范围 Scope	本标准适用于建筑用钢化玻璃、夹层玻璃、中空玻璃的评价。Include tempered glass, laminated glass, insulated glass.
4 评价要求 Assessment requirements	4.1 基本要求 Basic requirements 4.2 绿色产品评价指标要求 Green product assessment specification
5 评价方法 Assessment method	标准采用指标符合性评价的方法，同时满足基本要求和评价指标要求的建筑玻璃产品称为绿色产品。Conformity assessment Green product must meet all assessment requirements

标准主要内容 Main points

4.1 基本要求 Basic requirements

对以下方面提出要求：

- 污染物排放状况、污染物总量控制 Pollutants
- 厂界环境噪声排放 Noise
- 环境管理体系和质量管理体系 EMS & QMS
- 技术工艺 Technology
- 产品质量水平 Quality

标准主要内容 Main points

4.2 绿色产品评价指标要求
Green product assessment specification

表1 钢化玻璃绿色产品评价指标要求
Table 1 Specification for tempered glass

表2 夹层玻璃绿色产品评价指标要求
Table 2 Specification for laminated glass

表3 中空玻璃绿色产品评价指标要求
Table 3 Specification for insulated glass

标准主要内容 Main points

表1 钢化玻璃绿色产品评价指标要求 Tempered glass

一级指标	二级指标		要求	判定依据
资源属性 Resource attribute	平板玻璃 Float glass	外观质量	应满足GB 11614中最高等级的技术要求	GB 11614
		单位产品能耗	应符合表A.1要求	GB 21340
	水资源 Water	用水定额	≤0.01 m^3/m^2	附录B
	包装材料 Packing material	可循环材料利用率	≥90%	附录B
	原片综合利用率 Comprehensive utilization ratio of float glass		≥85%	附录B

标准主要内容 Main points

表1 钢化玻璃绿色产品评价指标要求 Tempered glass

一级指标	二级指标		要求	判定依据
能源属性 Energy attribute	单位产品生产能耗 Energy consumption per unit of product	平面普通钢化玻璃	≤3.22 kW•h /m^2	附录B
		平面低辐射镀膜钢化玻璃	≤3.99 kW•h /m^2	
		曲面普通钢化玻璃	≤4.22 kW•h /m^2	
		曲面低辐射镀膜钢化玻璃	≤5.22 kW•h /m^2	
环境属性 Environment attribute	水资源重复利用率 Water reuse rate		≥90%	附录B
品质属性 Quality attribute	安全性及耐久性 Safety and durability	表面应力及均匀性	表面应力≥90MPa，表面应力均匀性≤10MPa	附录C
		波形弯曲度	0.12mm / 300mm	GB 15763.2

标准主要内容 Main points

表2 夹层玻璃绿色产品评价指标要求 Laminated glass

一级指标	二级指标		要求	判定依据
资源属性 Resource attribute	平板玻璃 Float glass	外观质量	应满足GB 11614中最高等级的技术要求	GB 11614
		单位产品能耗	应符合表A.1要求	GB 21340
	水资源 Water	用水定额	≤0.01 m^3/m^2	附录B
	包装材料 Packing material	可循环材料利用率	≥90%	附录B
	原片综合利用率 Comprehensive utilization ratio of float glass		≥85%	附录B
	钢化玻璃 Tempered glass		应满足表1要求	-
	夹层玻璃用胶片 PVB		厚度应不小于公称厚度	JC/T 2166

标准主要内容 Main points

表2 夹层玻璃绿色产品评价指标要求 Laminated glass

一级指标	二级指标		要求	判定依据
能源属性 Energy attribute	单位产品生产能耗 Energy consumption per unit of product		≤4.0 kW•h /m²	附录B
环境属性 Environment attribute	水资源重复利用率 Water reuse rate		≥90%	附录B
品质属性 Quality attribute	安全性及耐久性 Safety and durability	烘焙实验 Baking test	无气泡	附录D

标准主要内容 Main points

表3 中空玻璃绿色产品评价指标要求 Insulated glass

一级指标	二级指标		要求	判定依据
资源属性 Resource attribute	平板玻璃 Float glass	外观质量	应满足GB 11614中最高等级的技术要求	GB 11614
		单位产品能耗	应符合表A.1要求	GB 21340
	水资源 Water	用水定额	≤0.01 m³/m²	附录B
	包装材料 Packing material	可循环材料利用率	≥90%	附录B
	3A分子筛 3A Molecular sieve		应满足GB/T 10504中最高等级的技术要求	GB/T 10504
	原片综合利用率 Comprehensive utilization ratio of float glass		≥85%	附录B
	钢化玻璃 Tempered glass		满足表1要求	-
	夹层玻璃 Laminated glass		满足表2要求	-

标准主要内容 Main points

表3 中空玻璃绿色产品评价指标要求 Insulated glass

一级指标	二级指标		要求	判定依据
能源属性 Energy attribute	建筑节能 Building energy saving	相对节能率 *SEC*	≥65%	附录E
环境属性 Environment attribute	水资源重复利用率 Water reuse rate		≥90%	附录B
品质属性 Quality attribute	光热性能 Optical-thermal performance		见附录F	附录F
	色差 ΔE_{ab}^{*}		≤1.5	GB/T 18915.1
	安全性及耐久性 Safety and durability	水气密封耐久性能	水分渗透指数：I≤0.10 平均值I_{av}≤0.05	GB/T 11944-2012

标准主要内容 Main points

表3 中空玻璃绿色产品评价指标要求 Insulated glass

相对节能率 *SEC*

采用模拟计算的方法，以公用建筑为基础，计算夏季制冷、冬季制热所耗费的能量，同时与3mm普通玻璃相比，得到相对节能率。

$$RHG = |RHG_W| + |RHG_S| = |U \times \Delta T + (I \times g)/4|_{冬季} + |U \times \Delta T + (I \times g)/4|_{夏季}$$

式中： *RHG*——相对热增益，分为冬季RHGw和夏季RHGs。
U——传热系数，W/m²•K，按JGJ/T151 进行检验。
ΔT——室内外温差℃,室外温度-室内温度,见表E.1。
I——太阳辐射照度，见表E.1。
g——太阳能总透射比，按JGJ/T151 进行检验。

标准主要内容 Main points

表3 中空玻璃绿色产品评价指标要求 Insulated glass

相对节能率 *SEC*

$$SEC = \frac{|RHG_{3mm}| - |RHG|}{|RHG_{3mm}|} \times 100\%$$

标准主要内容 Main points

表3 中空玻璃绿色产品评价指标要求 Insulated glass

光热性能 Optical-thermal performance

气候区 Climate zones	光热比 *LSG*	传热系数 *U*	可见光透射比 *Tv*	可见光反射比（室外） *Rv*(outside)
严寒地区 Severe cold zone	≥1.2	≤1.0	≥40.0%	<20.0%
寒冷地区 Cold zone	≥1.4	≤1.1		
夏热冬冷地区 Hot summer and cold winter zone	≥1.6	≤1.1		
夏热冬暖地区 Hot summer and warm winter zone	≥1.6	≤1.3		
温和地区 Warm zone	≥1.2	≤1.8		


ctc
国检集团
感谢聆听！
Thanks!

National Fenestration Rating Council: NFRC

Testing/Standards for Window Film and/or Attachments

Agenda

- NFRC History
- Applied Films
- Attachments/Dynamic Glazing Products

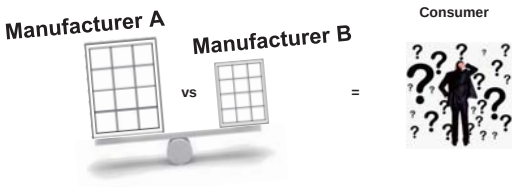
NFRC's History

- How did NFRC start?
- NFRC Certification Program
- Collaboration

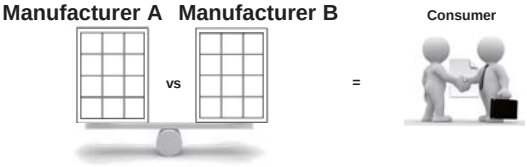
NFRC's Benefits

- Programs creates an independent, fair, accurate, and credible level playing field.
- Product Certification Program works like a three-legged stool

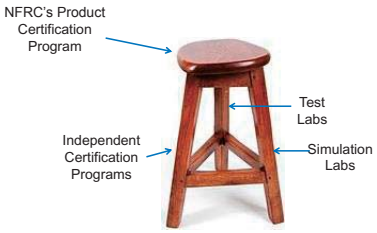
Prior to NFRC



After NFRC



NFRC's Certification Program



Collaboration

- Industry
  - EnergyStar of US
  - National Resources of Canada
  - International Energy Conservation Code
  - State & Municipal Codes
- International
  - Australia (AFRC)
  - South Africa (AAAMSCA)
  - Korea (KAFA)

What is an Applied Film?

Products that consist of a flexible adhesive-backed polymer film which may be applied to the interior or exterior surface of an existing glazing system in an installed fenestration product (i.e., as a retrofit, 'field-installed,' or 'daylight-installed')

Optical Property Standards

- NFRC 300 – Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems
- NFRC 301 – Standard Test Method for Emittance of Glazing Products (October 2017)
- NFRC 302 – Verification Program for Optical Spectral Data (October 2017)
- NFRC 304 – Creating an Applied Film Layer in Optics for NFRC Certification

Simulation Standards

- ANSI / NFRC 100 – Procedure for Determining Fenestration Product U-factors
- ANSI / NFRC 200 – Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
- NFRC Simulation Manual

Applied Film Ratings

- Ratings uses two referenced product types:
  - aluminum fixed
  - aluminum window-wall
- Ratings uses six referenced glazing options:
  - Single 3 mm (1/8 in) Clear;
  - Double 3 mm (1/8 in) Clear/3 mm (1/8 in) Clear: 7 mm (1/4 in) air gap;
  - Single 6 mm (1/4 in) Clear;
  - Single 6 mm (1/4 in) Grey;
  - Double 6mm (1/4 in) Clear/ 6 mm (1/4 in) Clear: 12.7 mm (1/2 in) air gap; and
  - Double 6 mm (1/4 in) Grey/ 6mm (1/4 in) Clear: 12.7 mm (1/2 in) air gap

Referenced Applied Film Ratings

Operator Type	Default Glazing Reference	SHGC No Film	SHGC with Film	VT No Film	VT with Film
Fixed	3 mm (1/8in.) clear	0.72		0.74	
Fixed	3 mm (1/8in.) clear 3 mm (1/8in.) clear	0.64		0.67	
Window Wall	6 mm (1/4in.) clear	0.73		0.78	
Window Wall	6 mm (1/4in.) grey	0.52		0.39	
Window Wall	6 mm (1/4in.) clear 6 mm (1/4in.) clear	0.63		0.69	
Window Wall	6 mm (1/4in.) grey 6 mm (1/4in.) clear	0.41		0.35	

Certified Applied Film Ratings

Operator Type	Default Glazing Reference	SHGC No Film	SHGC with Film	VT No Film	VT with Film	U-Factor
Fixed	3 mm (1/8in.) clear	0.71	0.46	0.74	0.44	1.081
Fixed	3 mm (1/8in.) clear 3 mm (1/8in.) clear	0.63	0.50	0.67	0.40	0.700
Window Wall	6 mm (1/4in.) clear	0.73	0.49	0.78	0.46	1.021
Window Wall	6 mm (1/4in.) grey	0.52	0.40	0.39	0.23	1.021
Window Wall	6 mm (1/4in.) clear 6 mm (1/4in.) clear	0.63	0.52	0.69	0.41	0.588
Window Wall	6 mm (1/4in.) grey 6 mm (1/4in.) clear	0.41	0.36	0.35	0.21	0.588

Applied Films Participants

Manufacturer	# of Product Lines
3M	35
Changzhou Sanyou Dissan Protective Materials MFG Co., Ltd.	3
Eastman Chemical Company	75
Erickson International LLC	21
Hanita Coatings RCA Ltd	40
Johnson Laminating & Coating, Inc.	51
Madico, Inc.	53
Saint-Gobain Solar Gard LLC	50
Scorpion Protective Coatings Inc	17
XPEL Technologies Corp	19

What is an “Attachment”?

Any fenestration product that has the fully reversible ability to change its performance properties, including U-factor, solar heat gain coefficient (SHGC), or visible transmittance (VT). This includes (but is not limited to) shading systems between the glazing layers and electronic or electrochemical switchable glass coatings or construction.

Attachment Types

- Blinds, Shades, etc.
- Dynamic Attachments for Swinging Doors
- Dynamic Glass
  - Electrochromic
  - Environmentally Controlled.

NFRC Standards

- Dynamic products utilize the same standards as applied films
- Dynamic products can also use the Complex Glazing Database (CGDB)
- Use NFRC Simulation Manual

Blinds, Shades

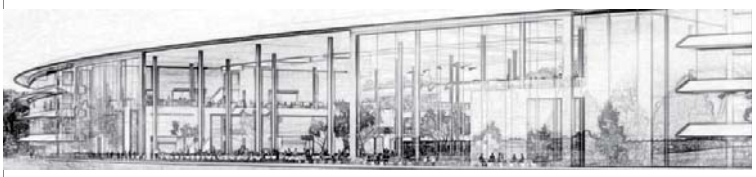
		U-factor		SHGC/VT	
Glazing / Shading Type	**Shade Position**	**Vertical**	**Tilted**	**Vertical**	**Tilted**
Venetian Blinds	Between Glass (See Sections 8.14.3 & 8.16)	Y	N	Y	Y
Venetian Blinds	Indoor (See Section 8.15)	N	N	Y	Y
Woven Shades	Indoor (See Section 8.15)	N	N	Y	Y
Woven Shades	Outdoor (See Sections 8.14.3 and 8.17)	Y	Y	Y	Y
Fritted or Etched Glass (See Section 8.18)	n/a	Y	Y	Y	Y

Thank you

Website: www.nfrc.org

Make view looks Wide, Clear and Great

Paul Gao

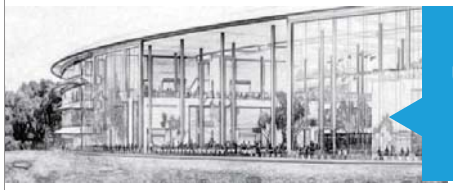


PART 1 Ultra High Curved Temped Glass

PART 2 Curved Tempered Glass with Ultra Long Arc Length

PART 3 Concave Curved Tempered Glass

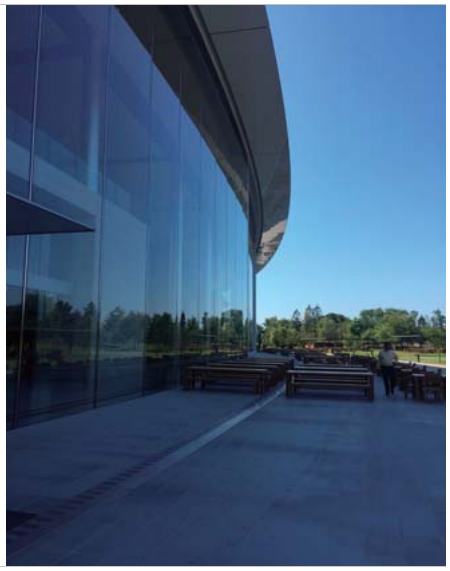
PART 4 3D Curved Glass



Ultra High

Curved Tempered Glass

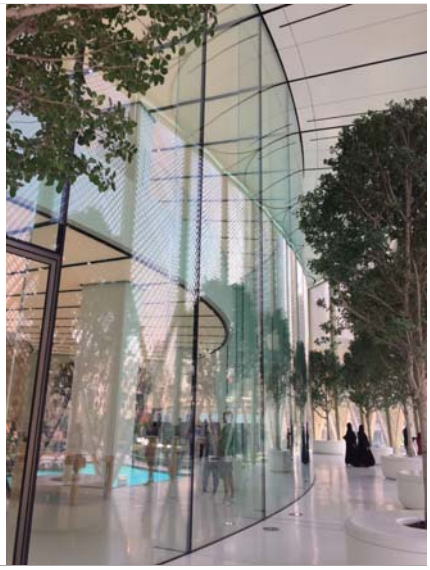
Apple Headquarter, US



Apple Store, Nanjing

Apple Store, Dubai

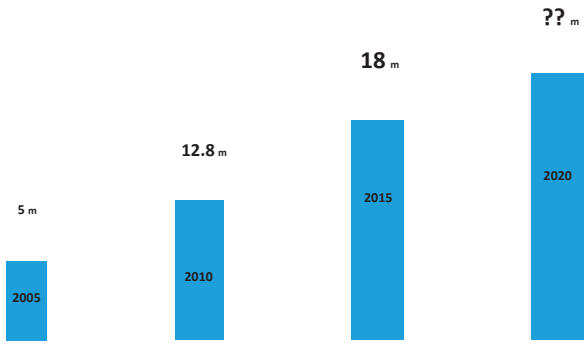
Apple Store, Dubai

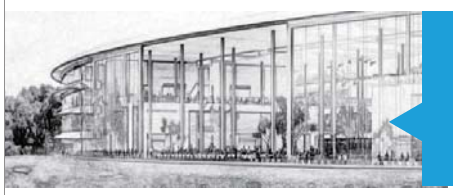


Manchester City Hall, UK

Ultra High Curved Tempered Glass with Small Radius - Apple Store, Taiwan

Ultra High Curved Tempered Glass





Curved Temped Glass
with Ultra Long Arc Length

View with Separated Windows

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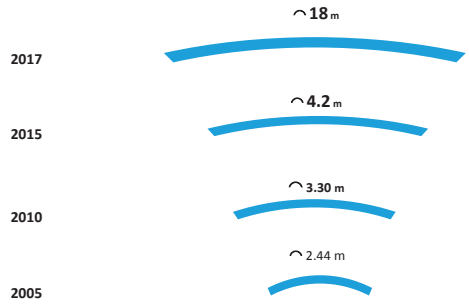
Curved Tempered Glass with Ultra Long Arc Length

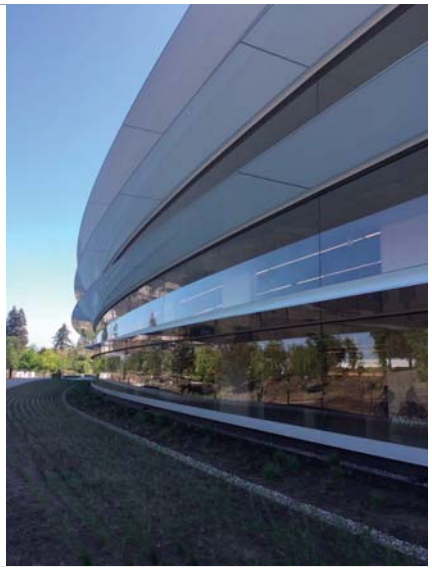
Curved Tempered Glass with Ultra Long Arc Length

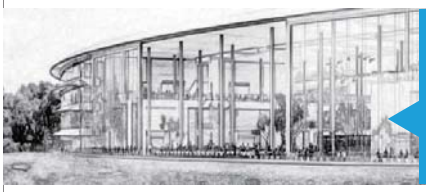


Cold Bending – Apple HQ, US

Cold Bending

Apple Headquarter, US

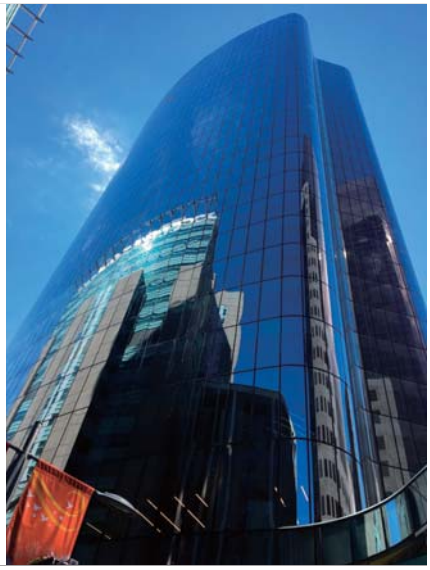




Concave

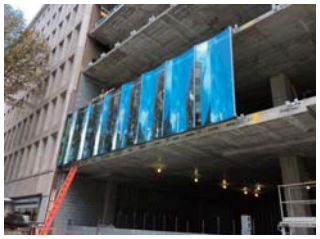
Curved Tempered Glass

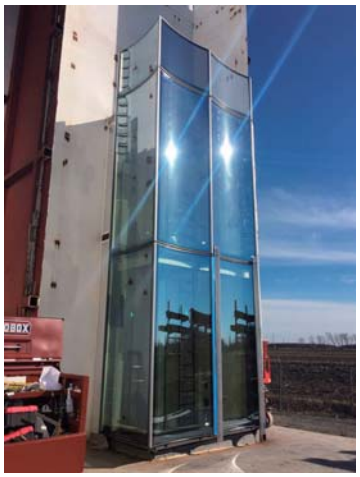
Manulife Office Building , Canada

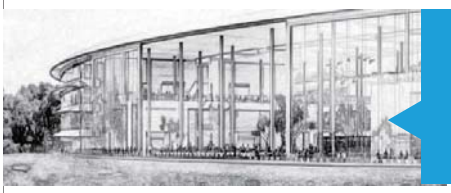


Washington Office Building, US

Washington Office Building, US

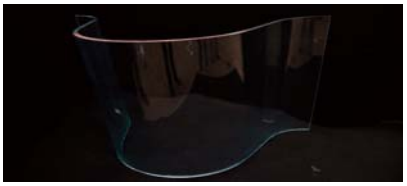


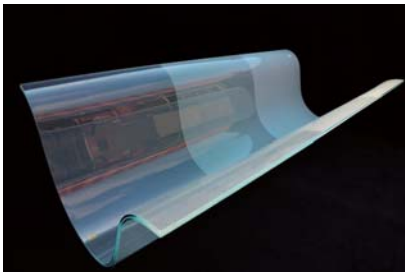




3D Curved Glass

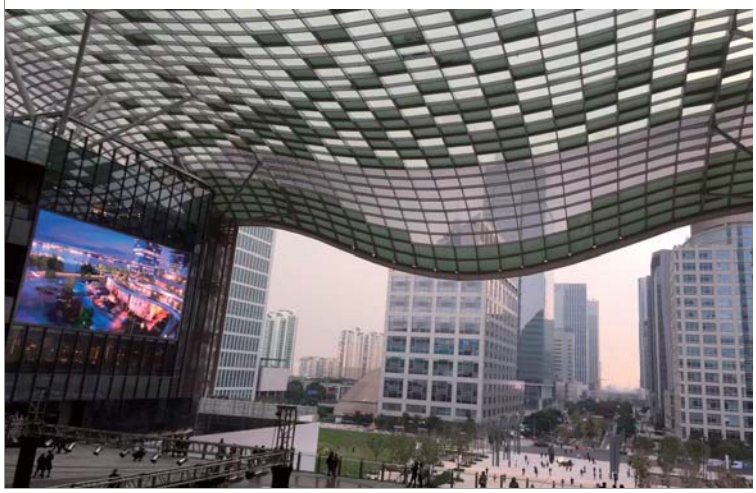
3D Laminated Glass



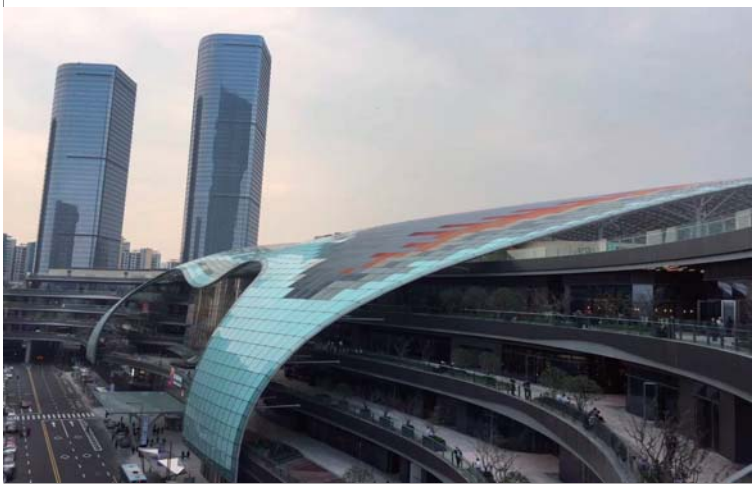


Suzhou Centre Tower

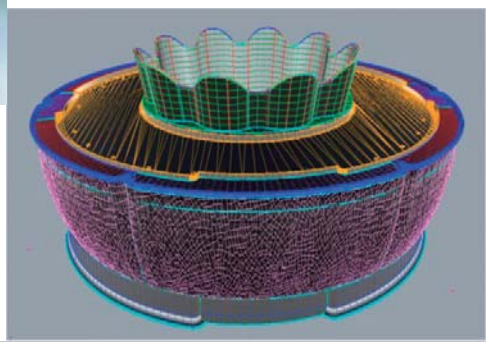
Suzhou Centre Tower



Suzhou Centre Tower



Ru Porcelain Museum, He Nan



Ru Porcelain Museum, He Nan

Nike Flagship Store

Iphone with Bézier Curve


Thanks

ICC Evaluation Service

美国建筑规范对门窗, 天窗及塑料透光产品的要求,评估和认证

U.S. Code Requirements for Windows, Doors, Skylights and Glazed Products Evaluation and Certification in U.S.

Cheng, Ping (程平)
Senior Staff Engineer
ICC Evaluation Service

July 23, 2018
Beijing, China (中国, 北京)

Look for the Marks of Conformity!

ICC Evaluation Service

What is ICC-ES?

使用规范和标准做产品认证的机构

ICC-ES evaluates products using codes and standards for the built environment

美国国家标准协会 (ANSI) 认可, 符合ISO/IEC 17065要求的产品认证机构

Accredited by the American National Standard Institute (ANSI) to the requirements of ISO/IEC 17065

加拿大标准委员会 (SCC) 认可的产品认证机构

Accredited by the Standards Council of Canada (SCC)

墨西哥EMA认可, 可使用墨西哥NOMS做水暖, 卫浴产品认证的机构

Accredited by EMA to conduct Plumbing Product listing to the Mexican NOMs

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What is ICC-ES?

国际规范委员会的子公司

A subsidiary of the International Code Council

拥有各类专职技术人员的产品认证机构

注册职业工程师, 建筑师
评估专业人员

An organization with a dedicated staff of:
Licensed Professional Engineers
Evaluation Specialists

制定和解释ICC-ES创新产品认证标准 (ACs)的唯一专属机构

Experts in developing and interpreting ICC-ES Acceptance Criteria (ACs) for innovative products

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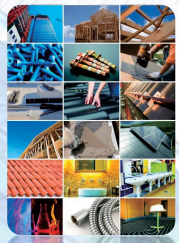

ICC-ES Programs

传统建筑产品评估项目(ESR): 通过评估报告(ESR)的形式为创新建筑构建产品, 组件, 方法和材料提供满足规范要求的依据

Traditional Building Product Evaluation Program (ESR): Allowing innovation through the issuance of Evaluation Reports (ESRs) as evidence that building products, components, methods, and materials meet code requirements

管道, 机械和气体产品评估项目(PMG): 依据I-Codes, UPC, UMC,加拿大国家管道规范标准以及墨西哥NOMs评估和认证管道, 机械和气体产品

Plumbing, Mechanical and Gas (PMG) Listings: Use I-Codes as well as the UPC, UMC, National Plumbing Code of Canada, and Mexican NOMs to evaluate and certify PMG products

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ICC-ES Programs

产品列名项目(ESL)

Product Listing (ESL)

环保(绿色)评估项目(VAR)

Environmental Programs (VAR)

太阳能热量等级和列名项目(SRCC)

Solar Thermal Ratings and Listings (SRCC)

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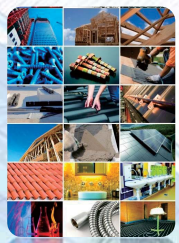

What is Product Certification?

依据国标, ACs或规范的要求审查产品, 以确保产品的持续合规性

Review of products against a standard, a criteria, or a code to ensure continuous compliance of products

认证步骤包括产品审查, 由ISO / IEC 17020认可的检验机构做工厂定期检查, 依据新的或修订的标准对提交的信息做定期审查

Certification steps include review of products, periodic inspection of plants (by an ISO/IEC 17020 accredited inspection agency), periodic review of submitted information against new or revised standards

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Codes and Standards ICC-ES Evaluates Products to:

- **Building:**
  - International Building Code® (IBC)
  - International Residential Code® (IRC)
  - Abu Dhabi International Building Code (ADIBC)
  - Acceptance Criteria (ICC-ES)
  - ASME, ASTM, ASSE, UL, ASHRAE and many other standards
  - National Building Code of Canada (NBC)
  - Local Codes (CBC, CRC, FBC, LABC)
- **Environmental (Green):**
  - International Green Construction Code® (IgCC)
  - International Energy Conservation Code (IECC)
  - California Green Building Standards Code (CALGreen)
  - NAHB/ICC's National Green Building Standard (ICC 700-2008)
  - U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED)

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Codes and Standards ICC-ES Evaluates Products to:

- **Solar:**
  - Uniform Solar Energy Code
  - International Solar Energy Provisions
  - ICC901/ICC-SRCC™ 100
  - ICC900/ICC-SRCC™ 300
  - ICC902/ICC-SRCC™ 400
  - Acceptance Criteria (ICC-ES)
- **Plumbing, Mechanical, Gas:**
  - International Plumbing Code (IPC)
  - Uniform Plumbing Code (UPC)
  - Mechanical Codes (IMC, UMC), Fuel Gas Code (IFGC)
  - National Plumbing Code of Canada (NPC)
  - Listing Criteria (ICC-ES)

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Codes and Standards ICC-ES Evaluates Products to:

What's an Acceptance Criteria:

- Document developed by the ICC-ES Technical Staff in consultation with a report applicant and with input from interested parties.
- Document addresses products or applications not defined or contained in codes
- New criteria and changes to an existing criteria are vetted in a public input process and are approved by an Evaluation Panel made up of code officials.

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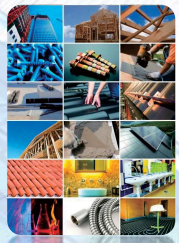

Evaluation of Skylights

Types of Skylights

Open Skylights
Fixed Unit Skylights
Operable Skylights
Retractable Skylights
Tubular Skylights
Sloped Glazing

Materials of Skylights

Glass Glazing
Plastic Glazing

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Evaluation of Skylights

Code Requirements

IBC:

Section 104.11
Section 2405
Section 2610

IRC:

R104.11
R308.6

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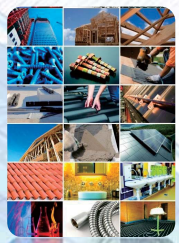

Performance Requirements for Skylights

- Sequential Testing
  - Operating Force
  - Air Infiltration
  - Water Penetration
  - Uniform Load Testing
    - Uniform Load Deflection Test
    - Uniform Load Structural Test
- Additional Uniform Load Testing
- Additional Air Infiltration Testing

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Performance Requirements for Skylights

- Skylights With Excessive Dome Deflection
  - Uniform Load Testing
  - Cyclic Load Testing
- Distributed Load Testing
- Adhesive
- Weathering and Strength Testing of Plastic Materials
- Self-ignition Temperature, Smoke-developed Index and Plastic Combustibility Classification
- Deformation/Creep Testing
- Class B Burning-brand Testing
- Labeling

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Protocols for Evaluation of Skylights

- AAMA 101
- ASTM Standards
  - E84 Test Method for Surface Burning Characteristics of Building Materials
  - E108 Test Methods for Fire Tests of Roof Covering
  - E283 Test Method for Determining Rate of Air leakage
  - E330 Test Method for Structural Performance
  - E331 Test Method for Water Penetration
  - E1966 Test Method for Impact Performance
  - E1996 Specification for Impact Performance
  - D635 Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
  - D1929 Test Method for Determining Ignition Temperature of Plastics
- ICC-ES AC16 Acceptance Criteria for Plastic Glazed Skylights
- ICC-ES AC17 Acceptance Criteria for Glass Glazed Unit Skylights and Sloped Glass

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Product Certification Process

Initial contact and estimation of capabilities and cost

⌄

Manufacturer submits an application along with supporting documentation

⌄

Products tested at an accredited testing laboratory

⌄

Initial inspection of manufacturing process

⌄

Successful evaluation and issuance of an ICC-ES report

⌄

Continuous Compliance: Inspections to verify products are manufactured consistent with originally certified product

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What is an Evaluation Report?

- …document that…presents the findings, conclusions, and recommendations from a particular evaluation… (Center for Disease Control, Developing an Effective Evaluation Report)
- "Evaluation reports…verify that new and innovative building products comply with code requirements.
- [P]rovide information about what code requirements or acceptance criteria were used to evaluate the product, how the product should be installed…how to identify the product, and much more." (www.icc-es.org)

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ICC Evaluation Service

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