



UNEP-*lites.asia* Laboratory Training Workshop

Beijing, China

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Centre

UNEP Collaborating Centre for Energy Efficient Lighting



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International Lighting Standard development and trend

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Global Efficient Lighting Centre

April 24th, 2015



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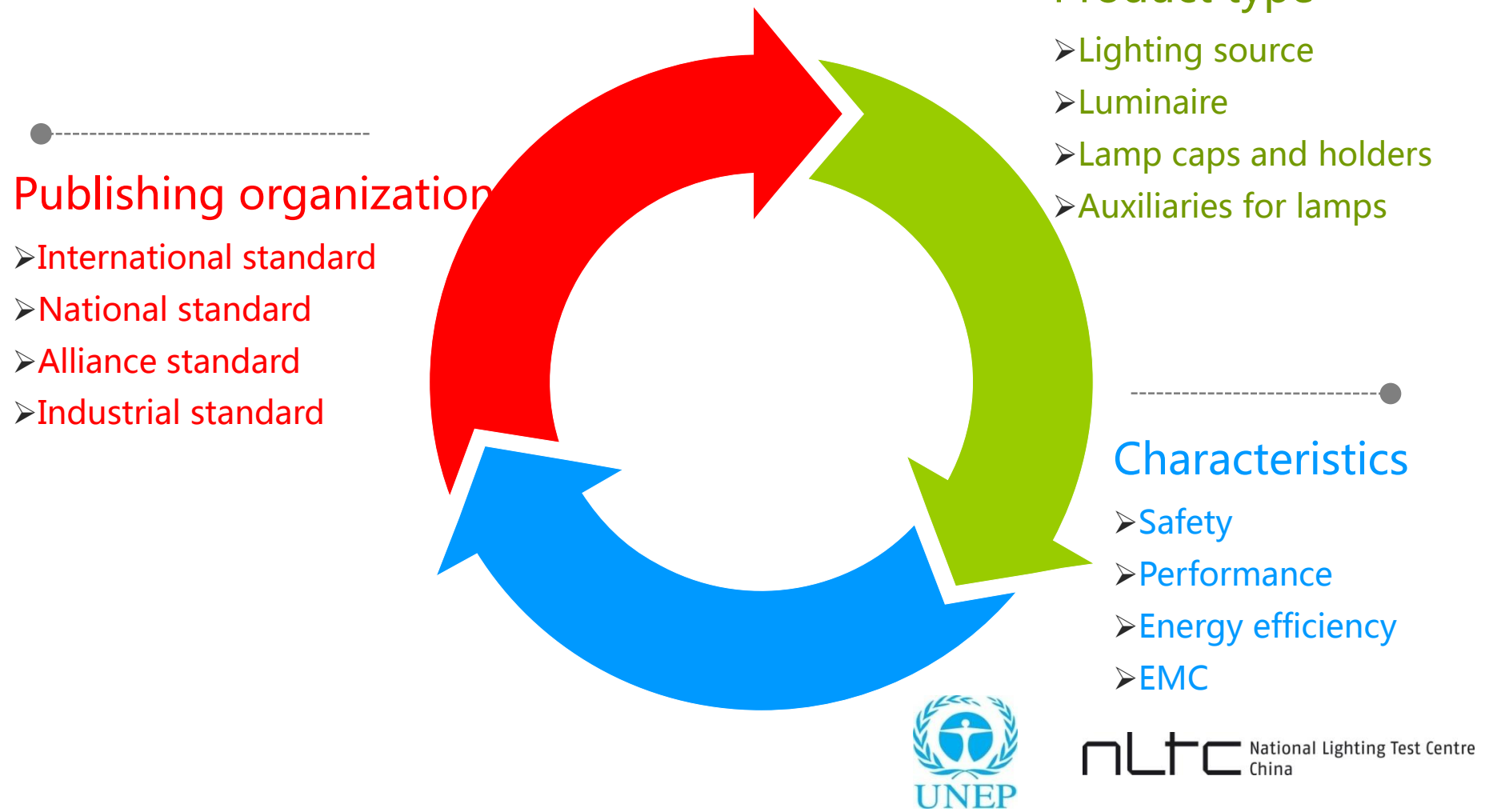
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1. *Classification of lighting standard*





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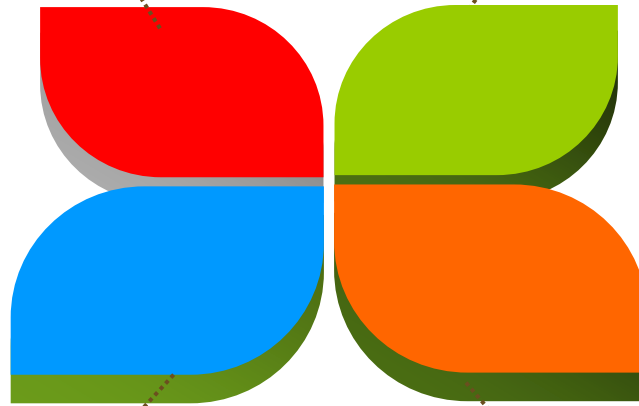
1. *Classification of lighting standard*

Product standard

Testing standard

Technical
requirement

Efficiency
regulation



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Classification of lighting standard



International Standard Organisations



Summary of testing standards



Trend of International standards



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2. *International Standard Organisations*

International Standard Organisations

- IEC TC34
- CIE
- ISO TC 274 (Light and lighting)

National Standard Organisations

- CN (GB)
- US (IESNA/ANSI/Energy Star/ ASSIST)
- EU

➤ International
adaptability

➤ Uniqueness

➤ Refer to International
Standard



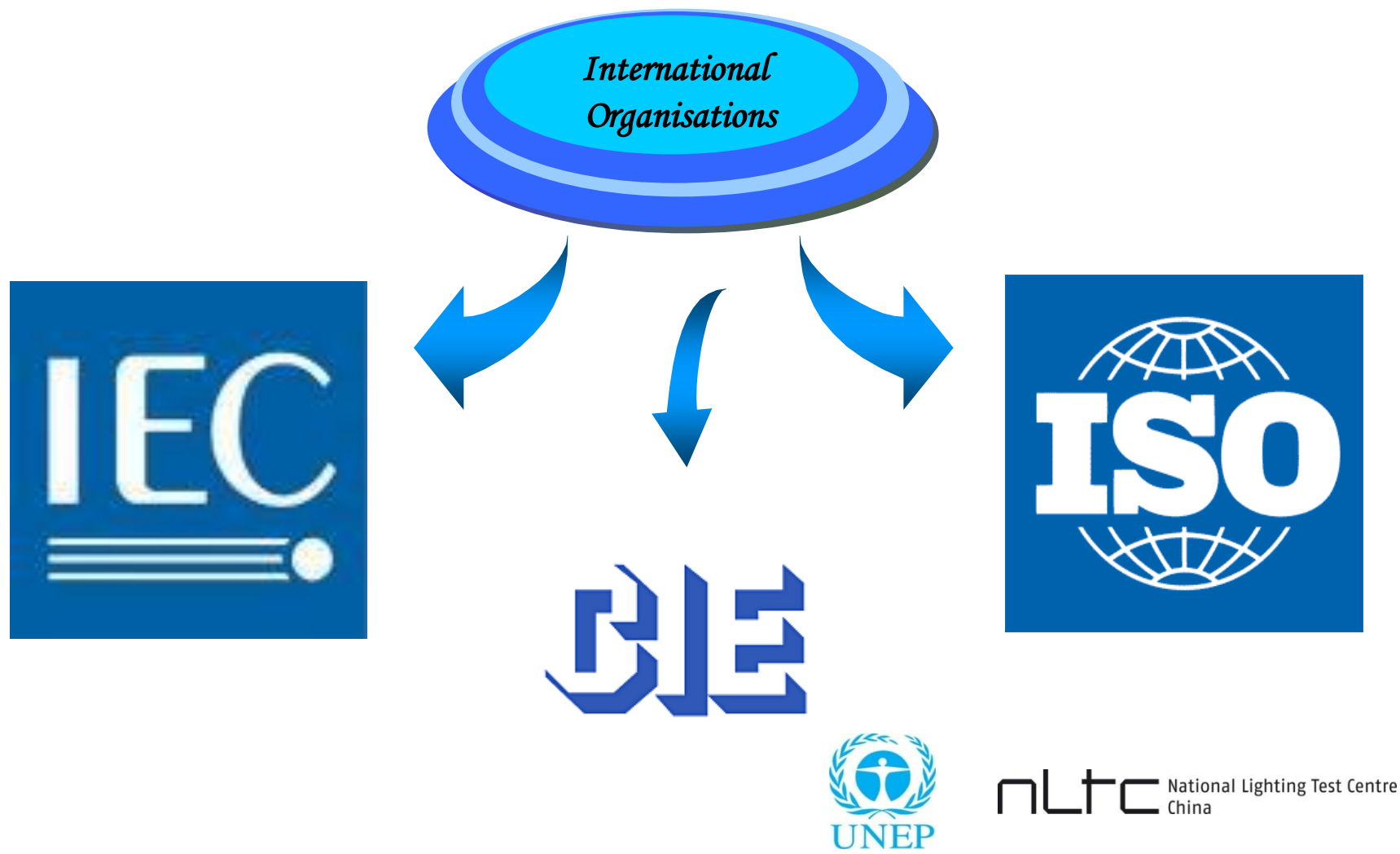
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2. *International Standard Organisations*





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2. *International Standard Organisations*

International Electrotechnical
Commission (IEC) , 1906

- ✓ Scope : International Standards for all electrical, electronic and related technologies
- ✓ TC 34 : Lamps and related equipment



**Secretariat of
IEC/TC34 in China**

**IEC 62612 ed.1
IEC 60050-845
IEC 62504**



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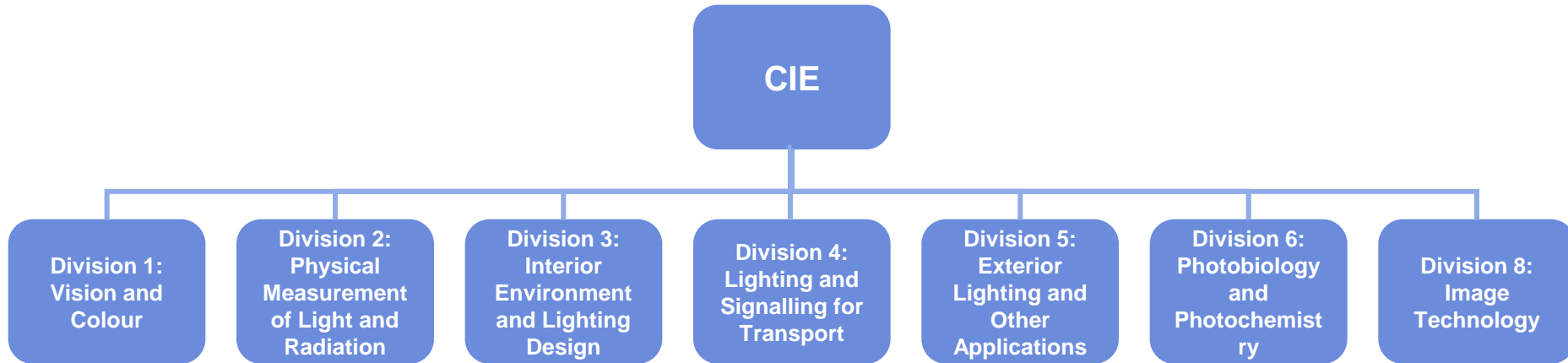
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2. *International Standard Organisations*

International Commission on Illumination (CIE)



- ✓ Scope: the science and art of light and lighting, colour and vision, photobiology and image technology.



Tips : NLTC is the mirror standardization secretary for fundamental lighting standards (corresponding to CIE Divisions)



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2. *International Standard Organisations*

International Organization for Standardization (ISO)

Scope: covering almost every industry, from technology, to food safety, to agriculture and healthcare.

ISO TC 274 Light and lighting

NLTC : Co-Group leader of TC/274 in China
Business plan



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2. *International Standard Organisations*



Chracteristics of Products



Fundamental, including testing



Application



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CONTENT



Classification of lighting standard



International Standard Organisations



Summary of testing standards



Trend of International standards



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3. *Summary of testing standards*

Standard relate to LED lamp

Standard relate to CFL lamp

LED
CFL



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3. *Summary of testing standards*

Summary of testing standards

Type	Lamp testing standard
Solid -state lighting	CIE DIS025 IES LM-79 GB 29294
Compact fluorescent lamp	IES LM65 IES LM66

Type	Relative standard	
Others	IES LM-20	IEC 60901
	IES LM-58	IEC 60081
	CIE 13.3:1995	IEC 60969
	CIE 15-2004	IEC 62471
	CIE 43:1979	IEC 62722-2-1
	CIE 63:1984	IEC 62612
	CIE 84:1989	IEC 62717
	CIE 121-1996	IEC 61341
	CIE 127-2007	IEC 62031
	CIE 177-2007	IEC 62560



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3. *Summary of testing standards*

A1

【LED lamp】

Requirements <Ambient conditions>	IEC 34D/1147/FDIS 62722-2-1 Ed. 1 Performance of LED luminaire Annex A	IEC 62612 self ballasted LED lamp Annex A	IEC 62717 LED modules Annex A
Ambient Temperature	25 degree ± 1	25 degree ± 1	25 degree ± 1
For products specified for ambient temperature other than 25° C	a correction factor will need to be established to correct the measured luminous flux value at 25 ° C to the luminous flux value at the declared ambient. This shall be done using relevant photometry in a temperature controlled cabinet.	not Specified	not Specified
Humidity	less than 65 %	less than 65 %	less than 65 %
Air flow / Air movement	shall be made in a draught free room - see CIE 121, section 4.3.2	shall be made in a draught free room - see CIE 121, section 4.3.2	shall be made in a draught free room - see CIE 121, section 4.3.2



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3. *Summary of testing standards*

A1

[LED lamp]

Requirements <Electrical conditions>	IEC 34D/1147/FDIS 62722-2-1 Ed. 1 Performance of LED luminaire Annex A	IEC 62612 self ballasted LED lamp Annex A	IEC 62717 LED modules Annex A
Test voltage (AC and DC)	Rated voltage, current, or power with tolerance 0.2 %	Rated voltage, current, or power with tolerance 0.2 %	Rated voltage, current, or power with tolerance 0.2 %
AC power supply THD	$\leq 3\%$	$\leq 3\%$	$\leq 3\%$
AC power supply voltage regulation	$\leq 0.2\%$	$\leq 0.2\%$	$\leq 0.2\%$
DC power supply voltage regulation	$\leq 0.2\%$	$\leq 0.2\%$	$\leq 0.2\%$



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3. *Summary of testing standards*

A1

【LED lamp】

Requirements <Test procedures>	IEC 34D/1147/FDIS 62722-2-1 Ed. 1 Performance of LED luminaire Annex A	IEC 62612 self ballasted LED lamp Annex A	IEC 62717 LED modules Annex A
Ageing/Seasoning	not required (but manufacturer can define aging period)	not required (but manufacturer can define aging period up to 500 h)	not required (but manufacturer can define aging period)
Stabilization of test device	light output within 0.5 % in 15 min and V, A, W within 1 %.	light output within 0.5 % in 15 min and power within 1 %.	light output within 0.5 % in 15 min and V, A, W within 1 %.
Monitoring stabilization	monitor light output every 1 min.	monitor light output every 1 min.	monitor light output every 1 min.
If it takes very long time	Max 45 min for module, lamp Max 150 min for luminaire	Max 45 min	Max 45 min for module, lamp; Max 150 min for luminaire
Operating orientation/operating position		"vertical position, cap-up, unless otherwise specified by the manufacturer or responsible vendor.	
If a number of same type of products are measured	shorter time allowed with 1.05 method	shorter time allowed with 1.05 method.	shorter time allowed with 1.05 method.



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3. *Summary of testing standards*

A2

【CFL】

Requirements <Ambient conditions>	IES LM-66(electrical and photometric measurements of single -ended compact fluorescent lamps	IEC 60969(Self-ballasted lamps for general lighting services -Performance requirements)2001
Ambient Temperature	25 degree ± 1	25 degree ± 1 for life and lumen maintenance (15-40 degree)
Measurement point	no more than 1m from the lamp	not Specified
For products specified for ambient temperature other than 25° C	should be noted in the test report	not Specified
Humidity	not Specified	$\leq 65\%$
Air flow / Air movement	recommended that air flow not exceed 5metre/min	not Specified



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3. *Summary of testing standards*

A2

【CFL】

Requirements <Electrical conditions>	IES LM-66 (electrical and photometric measurements of single -ended compact fluorescent lamps)	IEC 60969 (Self-ballasted lamps for general lighting services -Performance requirements) 2001
Test voltage/wattage (AC and DC)	$\leq \pm 0.5\%$ voltage $\leq \pm 0.75\%$ wattage	$\leq \pm 0.5\%$
AC power supply THD	not Specified	$\leq 3\%$
AC power supply voltage regulation	$\leq 0.2\%$	not Specified
DC power supply voltage regulation	$\leq 0.2\%$	not Specified
impedance limitations	voltage inputs $\geq 1\text{m}\Omega$ current inputs $\leq 10\text{ m}\Omega$	not Specified



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3. *Summary of testing standards*

A2

【CFL】

Requirements <Test procedures>	IES LM-66 (electrical and photometric measurements of single -ended compact fluorescent lamps)	IEC 60969 (Self-ballasted lamps for general lighting services - Performance requirements) 2001
Ageing/Seasoning	new lamp shall be seasoned	100h
preburn	at rated voltage+/-5%, preburn time 5-16 hours;	not Specified
Stabilization of test device	within 1% (max-min)/average(6 times test)	state by manufacture or responsible vendor
Monitoring stabilization	1 min (total 5 minutes)	not Specified
orientation	seasoning ,preburning and photometric measurement shall be done with the lamp in the same orientation	not Specified



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3. *Summary of testing standards*

A2

【CFL】

Requirements <Integrating sphere>	IES LM-66(electrical and photometric measurements of single -ended compact fluorescent lamps	IEC 60969(Self-ballasted lamps for general lighting services - Performance requirements)2001
Calibration of int. sphere for luminous flux	Calibration by total luminous flux or total spectral radiant flux standards traceable to NMI is required (LM-78 9.1.6)	not Specified
Self-absorption measurement for sphere system	Required	not Specified
f1' of sphere photometer	<=3 %	not Specified
f2 of photometer head of sphere system	<=15%	not Specified



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CONTENT



Classification of lighting standard



International Standard Organisations



Summary of testing standards

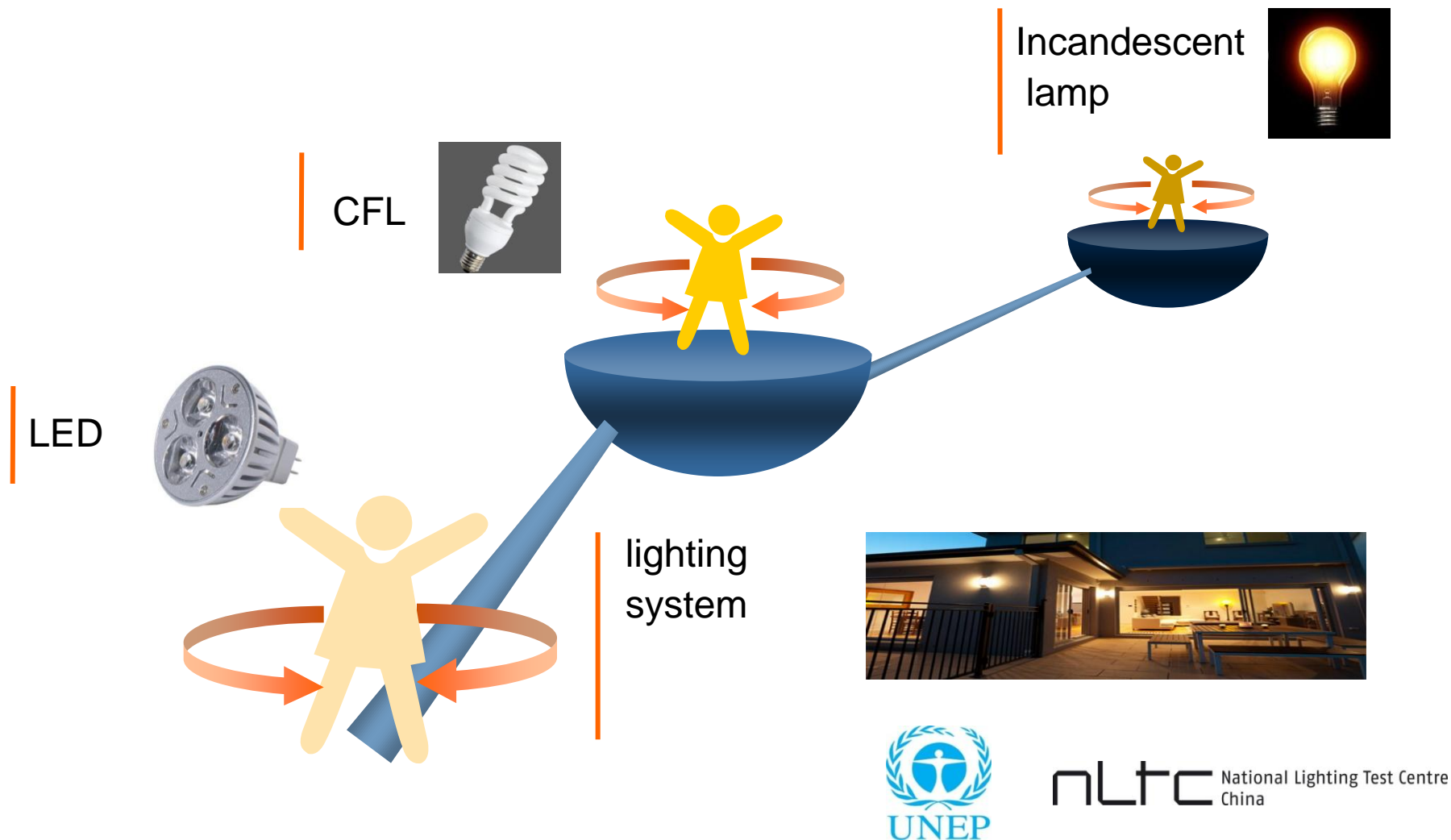


Trend of International standards



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4. *Trend of International standards*





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4. *Trend of International standards*



**smart
lighting**



**intelligent
lighting**



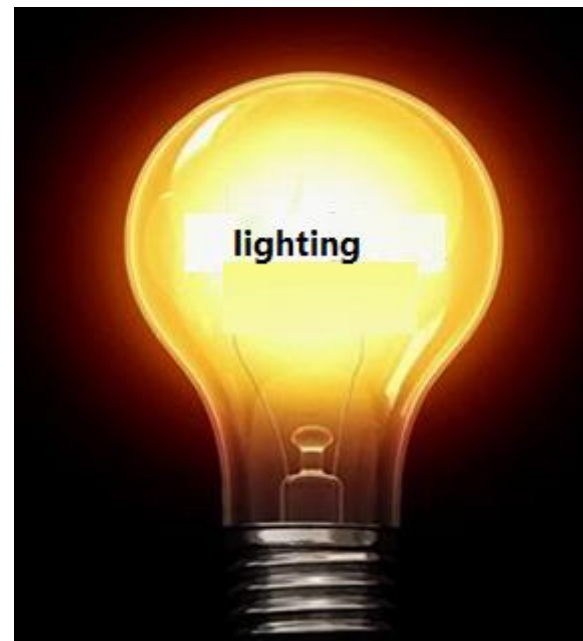
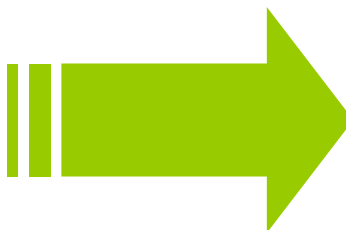
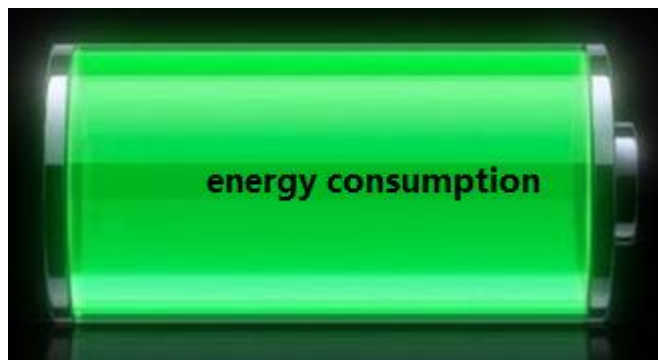
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lighting**



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4. *Trend of International standards*

W classification Im



4. *Trend of International standards*

classification

LED products



LED Bulb lamp



LED directional lamp



LED road lamp



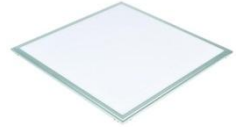
LED Downlight lamp



LED tunnel lamp



LED tube



LED panel lamp

Classification Self-ballast LED lamp

150 lm

250 lm

500 lm

800 lm

1000 lm

1500 lm

2000 lm

3000 lm

➤ IEC 62612 Ed.1 CDV

➤ GB/T 31112 2014



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4. Trend of International standards



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 **Thank you** 



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