ENERGY STAR® Lighting Webinar Series

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Imagination at work

Dimming compatibility in the past made people feel like they don't get it…but there's hope

Not all Lamps/Dimmers created equally…

Each Dimmer/Lamp has different design considerations

Each Dimmer/Lamp manufacturer had different set of Pass/Fail criteria

Each Dimmer/Lamp manufacturer had different testing practices or procedure

Dimmer and Lamp manufacturer would publish conflicting information

Inconsistency in compatibility criteria/testing of LED lamp(s) and dimmer(s) lead to customer complaint's/ dissatisfaction

Dimmable products…What Does the consumer expect?

Consumers expect that when something is marked "dimmable" that it will "work" with what they have currently installed at home.

Allot of time and effort has been spent on determining minimum level of performance from the "eyes" of the consumer by industry and partners

There is no "magic" design to make a LED lamp work with every dimmer ever manufactured

Energy Star Specification for dimming:

Designed and focused on key consumer dissatisfiers regarding lighting in the home:

12.1. Maximum Light Output:

Lamp Type	ENERGY STAR Requirements	Methods of Measurement and/or Reference Documents	Supplemental Testing Guidance
All Lamps Marketed As Dimmable	Lamp light output on the maximum setting of a dimmer/control shall not fall below the lamp's baseline light output when operated without a dimmer by more than 20%. 80% of tested lamp/dimmer combinations must meet the requirement.	Measurement: ENERGY STAR Recommended Practice - Light Output on a Dimmer	Sample Size: 1 lamp per dimmer and 4 lamps per dimmer. See Section 8 of the Recommended Practice - Light Output on a Dimmer, for reporting information.

12.2. Minimum Light Output:

Lamp Type	ENERGY STAR Requirements	Methods of Measurement and/or Reference Documents	Supplemental Testing Guidance
All Lamps Marketed As Dimmable	Lamp light output on a dimmer/control shall be no more than 20% of the maximum light output of the lamp on each tested dimmer/control. 80% of tested lamp/dimmer combinations must meet the requirement.	Measurement: ENERGY STAR Recommended Practice - Light Output on a Dimmer	Sample Size: 1 lamp per dimmer and 4 lamps per dimmer. See Section 8 of the Recommended Practice - Light Output on a Dimmer, for reporting information.

12.3. Flicker:

Lamp Type	ENERGY STAR Requirements	Methods of Measurement and/or Reference Documents	Supplemental Testing Guidance
All Lamps Marketed As Dimmable	Lamp average light output periodic frequency, highest percent flicker, and highest flicker index shall be reported.	Measurement: ENERGY STAR Recommended Practice - Light Source Flicker	Sample Size: 1 lamp per dimmer and 4 lamps per dimmer See Section 8 of the Recommended Practice - Light Source Flicker, for reporting information.

12.4. Audible Noise:

Lamp Type	ENERGY STAR Requirements	Methods of Measurement and/or Reference Documents	Supplemental Testing Guidance
All Lamps Marketed as Dimmable	Lamp shall not emit noise above 24dBA at 1 meter or less. 80% of tested lamp/dimmer combinations must meet the requirement.	Measurement: ENERGY STAR Recommended Practice - Noise Reference: ISO 7574-4:1985, B.2.1 ANSI S12.55-2006/ISO3745:2003	Sample Size: 1 lamp per dimmer and 4 lamps per dimmer Measurement shall be on a single lamp. See Section 8 of the Recommended Practice – Noise, for reporting information. The reported sound level value shall be the loudest measurement of all lamp/dimmer combinations.

Consolidated testing procedure(s) that every manufacturer can complete without large testing cost implication(s) (SSL7A)

Spec has also created a path for new technologies (i.e. wireless) to be used/tested as well

What affect does this have on Manufacturers?

- Overall test sample size reduced…most manufacturers will test more that the minimum amount and place additional information on website

- Predefined test procedures have reduced overall test times and provide repeatable results manufacturer to manufacturer

- Predefined Pass/Fail criteria define minimum requirements but allow for lamp manufacturers to differentiate on performance..(ie if a manufacturer wants to go 1% light output they can)

- Predefined testing has reduced overall call rate regards to dimming performance

What affect is there On consumers?

- Lamps on the shelf today are dimmable and achieve similar performance

- LED lamp packaging provides avenue for consumers where to find the most up to date information regarding a product

★★★★★ Color and brightness consistent with incandescent. No buzzing w/ standard dimmer!
By kmperham on January 6, 2016

★★★★★ Great incandescent bulb replacement
By EddieB on June 26, 2016

★★★★★ Excellent dimmable LED bulbs
By Der Angler on July 23, 2016

★★★★★ Excellent Dimmable LED Bulb - 800 lumens / 9.5 Watts

★★★★★ Great bulbs, great packaging and shipping
By Ms. High Standards Consumer on July 20, 2016

**Taken from Amazon.com ratings of multiple products

Next Generation Dimming Performance

- New technologies continue to give expanded performance (light and control control) and access to new interfaces (ie voice)

- Connected vs. Smart – not all connected things are "smart"…need to ensure that the consumer understands the difference

- Lighting, as a whole, is being upgraded to a digital tool in the home automation space

- Newer technologies add complexities that the consumer may not understand and could lead to dissatisfaction similar to early dimming performance:

    Commissioning – initial install and setup

    Protocol definition/access – Current market is very fragmented…no   single champion in sight

"Room for improvement"

- Need to better quantify items like Flicker from testing and pass/fail criteria point of view

- Non-visible flicker…now that we are in the age of camera's everywhere how does this impact the consumer?

- Packaging – how to use items like SSL7A compliance to better assist the consumer into picking the intended product.