



## How Will New Legislation Affect Lighting Options?

### Key Points

- No technologies have been banned outright by the 2000 DOE Ballast Rule or the Energy Independence and Security Act of 2007 (EISA).
- After July 1, 2010, ballast manufacturers cannot manufacture replacement ballasts that do not pass the new requirements.
- The incandescent requirements for EISA 2007 are phased in over two years, between January 1, 2012 and 2014.

There has been significant legislation in the last 10 years that will affect lighting technology into the next decade. The DOE published a final rule on Fluorescent Lamp Ballasts dated September 19, 2000. The Energy Independence and Security Act of 2007 (EISA) was passed by Congress and signed into law by the President on December 19, 2007. It is important to understand that the 2000 DOE Ballast Rule and EISA 2007 were not "design" standards, but rather were "performance" standards. While a design standard may have been prescriptive about what technologies should be banned, a performance standard focuses on the service of the product. In these cases, the legislation established minimum requirements around the amount of light delivered per unit of energy consumed (lumens per watt or lpw). No technologies have been banned outright by the 2000 DOE Ballast Rule or EISA. The following is a discussion of how EISA and other legislation impacts lighting in this decade.

### Incandescents

EISA only applies to >2.25" diameter incandescent bulbs with a medium screw base (E26) and halogen reflector lamps with a rated wattage of 40-watts or higher. The incandescent requirements for EISA 2007 are phased in over two years, between January 1, 2012 and 2014. For the same lumen output, the minimum requirements represent a reduction of 25% over the incandescent technology in use in 2007. The table below summarizes the maximum wattage permissible for several lumen output ranges. However, it is not clear if the maximum wattage applies only to the high end of the range. For the lowest lumen output range, if the 310 lumen output cannot exceed 29 watts, then the efficacy is only 9 lpw (310/29). For the high end of that range, the efficacy would be 26 lpw (749/29), which seems more reasonable. A typical incandescent bulb outputs 10 to 17 lpw compared to the 20+ lpw minimum required by EISA legislation.



EISA Requirements for General Service Incandescent Lamps

Rated Lumens	Max Rated Wattage	Min Rated Lifetime	Effective Date
1490–2600	72	1,000 hrs	1/1/2012
1050–1489	53	1,000 hrs	1/1/2013
750–1049	43	1,000 hrs	1/1/2014
310–749	29	1,000 hrs	1/1/2014

Reflector lamps addressed by EISA include Parabolic Aluminized Reflector (PAR#), Bulged (BR#), and Ellipsoidal (ER#) reflector lamps. EISA basically applies the performance standards established in 1992 for R and PAR lamps >2.75" (22/8) in diameter to a wider range of reflector lamps. The # equates to the diameter of the widest part of the lamp in eighths of an inch (R20 = 20/8 = 2.5" diameter)

So, BR30, BR40, ER30, and ER40 lamps apply, but there is an exception for less than 50-watt lamps for those specific sizes. The 65-watt BR30, BR40, and ER40 lamps are exempt. Lamps designed for "vibration service" or "rough" applications are also exempt. The most popular lamps being eliminated include 50-watt and 75-watt R20 and 85-watt BR30 lamps.

A typical 65BR30 incandescent reflector lamp outputs 595 lumens at 65 watts. That is only a 9 lpw efficacy, the reason why EISA was enacted. The minimum reflector lamp efficacy performance requirements range from 10.5 lumens per watt (40 to 50 watt range) to 15 lumens per watt (156 to 205 watt range) or they cannot be manufactured after June 16, 2008.

## Existing Reflector Lamps

## Recommended Replacements

All wattages K19

Halogen PAR16 or PAR20

50 W R20 lamps

New 45 W R20 or any wattage Halogen PAR20

BR40 lamps &gt; 65 W and &lt; 205 W

65 W BR40 or Halogen PAR38

## Fluorescent Lamp Ballasts

The 2000 DOE Ballast Rule is directed at magnetic ballasts, which are the primary ballast for the T12 fluorescent lamp. It establishes performance standards like EISA, but they will be virtually impossible or uneconomical to meet using magnetic ballast technology. The Energy Policy Act (EPA) Act) legislation of 2005 expanded on the 2000 rule to include systems using energy-saving T12 fluorescent lamps. However, there are still situations that are not impacted by this rule.

The following table contains the two timetables governing the phased withdrawal of ballasts that do not meet the new ballast efficiency factor (BEF) standards:

Action	2005 BEF Standards for Full-Wattage T12 Lamps	2009 BEF Standards for Energy-Saving T12 Lamps
Ballast manufacturers can no longer make ballasts that do not pass the new requirements for use in new fixtures.	April 1, 2005	July 1, 2009
Ballast manufacturers cannot sell ballasts that do not pass the new requirements to U.S. fixture manufacturers.	July 1, 2005	October 1, 2009
Fixture manufacturers cannot sell fixtures that include ballasts that do not pass the new requirements.	April 1, 2006	July 1, 2010
Ballast manufacturers cannot manufacture replacement ballasts that do not pass the new requirements.	July 1, 2010	July 1, 2010

Both ballast rules exempt ballasts that meet the following criteria:

- Are designed for dimming to 50% or less of their maximum light output
- Are designed for use with two F96T12HO lamps at ambient temperatures of -20°F and for use in outdoor signs
- Have a power factor of less than 0.90 and are designed and labeled for use only in residential applications

Replacement ballasts will continue to be manufactured and sold until July 1, 2010. These ballasts will feature output leads shorter than the length of the lamp they operate, may be shipped in packages limited to 10 or fewer units, and will be marked, for replacement only.

## Metal Halides

According to Sec. 324 of EISA, which relates to Metal Halide Lamp Fixtures, there are new efficiency standards and labeling rules that go into effect starting January 1, 2009. There are several manufacturers that have published guidance documents on EISA and its impact on metal halide ballasts, including Cooper Lighting, Hubbell Lighting, and Acuity Brands (see, in particular, their FAQ document). There are also several manufacturers that are providing lists of their metal halide ballast products that are EISA compliant, including Philips and Cooper Lighting.

Lighting fixtures manufactured for operation of metal halide lamps that are > or equal to 150 W and < or equal to 500 W must contain the following:

Metal Halide Ballast Type	EISA Minimum Ballast Efficiency
Pulse-start metal halide ballast	88%

Magnetic probe-start ballast	94%
Electronic ballast (not pulse-start)	90% if <250 W 92% if >250 W

Exemptions: The standards do not apply to the following:

- Fixtures with regulated lag ballasts.
- Fixtures that use electronic ballasts that operate at 480V.
- Fixtures rated only for 150 W lamps, for use in wet locations, and that contain a ballast rated to operate at ambient air temperatures above 50°C.

Compliance: A review of metal halide ballasts suggests that probe-start metal halide magnetic ballasts will be virtually eliminated from new lighting fixtures after January 1, 2009. Electronic ballasts comply and so do many pulse-start magnetic ballasts. Be sure to look for ballasts that are certified to comply with the new regulation after it takes effect.

Just the fixture, not the ballast: *This provision covers only newly manufactured fixtures featuring metal halide ballasts, not the ballasts themselves.* Nor does it appear to prohibit sale of existing inventories. The replacement market is, therefore, not covered by this law, so owners will not be required to retrofit existing fixtures, but instead will be able to continue purchasing probe-start magnetic metal halide ballasts with lower efficiencies after the enactment of this provision.

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