

Guide to the DOE Fluorescent Ballast Rule of 2000 and EPCIA 2005 Ballast Legislation

On September 19, 2000, the U.S. Department of Energy (DOE) published a revised rule covering the efficiency of certain fluorescent lamp and ballast systems. The 2000 rule covered systems using full wattage T12 fluorescent lamps. The Energy Policy Act (EPCIA) legislation of 2005 expanded on the 2000 rule to include systems using energy saving T12 fluorescent lamps.

The 2000 DOE rule and the EPCIA 2005 legislation are the result of agreements among lighting manufacturers represented by the National Electrical Manufacturers Association (NEMA); the energy policy advocates including the American Council for an Energy Efficient Economy (ACEEE), the Alliance to Save Energy (ASE) and the Natural Resources Defense Council (NRDC); the State energy offices, represented by Oregon; and the DOE.

Both the 2000 rule and the EPCIA 2005 legislation raise the minimum Ballast Efficacy Factors (BEF)¹ for T12 fluorescent ballasts used in non-residential installations to a level that eliminates magnetic ballasts and requires the use of hybrid or electronic ballasts. Because compliant T12 ballasts are typically more costly than T8 electronic ballasts and have lower system efficacy than T8 lamp/electronic ballast systems, the effect of the rule and legislation is to drive the use of the more energy efficient T8 lamp/electronic ballast systems and T5 lamp/electronic ballast systems (new fixtures required for T5 systems).

T8 and T5 ballasts are unaffected by either measure. Users are free to choose between T8 instant start, rapid start or programmed start and T5 ballast systems, either fixed light output or dimming models, to find the most cost-effective, efficient system for their applications. For those few applications that may be sensitive to IR, or have electromagnetic compatibility (EMC or EMI) issues, users may continue to specify T8 magnetic ballasts. However, since these ballasts comprise a very small fraction of a shrinking fluorescent magnetic ballast market, they will likely carry a significant cost premium, are less efficient, and are only available in one or two-lamp, rapid start or instant start models.

¹ Ballast Efficacy Factor (BEF) = Ballast factor ÷ Input Power

The following summarizes the 2000 ballast rule and the modifications to that rule as enacted by EAct 2005 legislation.

The associated T12 lamp types are full-wattage and energy saving types

- 40 and 34/35-watt, 2-foot, bi-pin, rapid start U-lamps
- 40 and 34-watt, 4-foot, bi-pin, rapid start lamps
- 75 and 60-watt, 8-foot, single-pin, instant start lamps
- 110 and 95-watt, 8-foot, recessed double contact, high output (HO), rapid start lamps

Ballasts for Full Wattage Fluorescent Lamps

Operation of	Ballast Input Voltage	Total Nominal Lamp Watts	Minimum Ballast Efficacy Factor
One F40 T12 Lamp	120	40	1.805
	277	40	1.805
Two F40 T12 Lamps	120	80	1.060
	277	80	1.050
Two F96 T12 Lamps	120	150	0.570
	277	150	0.570
Two F96T12 HO Lamps	120	220	0.390
	277	220	0.390

Ballast for Energy Saving (E.S.) Fluorescent Lamps

Operation of	Ballast Input Voltage	Total Nominal Lamp Watts	Minimum Ballast Efficacy Factor
One F34 (or 35) T12 E.S. Lamp	120	34	2.61
	277	34	2.61
Two F34 (or 35) T12 E.S. Lamps	120	68	1.35
	277	68	1.35
Two F96 T12 E.S. Lamps	120	120	0.77
	277	120	0.77
Two F96T12 HO E.S. Lamps	120	190	0.42
	277	190	0.42

Ballast Power Factor (PF) must be greater than or equal to .90.

No other linear fluorescent lamps, compact fluorescent lamps (CFLs) or HID lamps are covered by the 2000 rule or the EAct 2005 legislation. Magnetic ballasts will continue to be available for these lamp types.

Both the 2000 rule and the EPAAct 2005 legislation provide for a phase-out approach to elimination of non-compliant ballasts.

Action	<u>Per 2000 Ballast Rule: BEF Standards for Operation of Full-Wattage T12 Lamps</u>	<u>Per EPAAct 2005: BEF Standards for Operation of Energy-Saving T12 Lamps</u>
Ballast manufacturers can no longer make ballasts that do not comply for use in new fixtures	April 1, 2005	July 1, 2009
Ballast manufacturers cannot sell ballasts that do not comply to U.S. fixture requirements	July 1, 2005	October 1, 2009
Fixture manufacturers cannot sell fixtures that include ballasts that do not comply	April 1, 2006	July 1, 2010
Ballast manufacturers cannot manufacture replacement ballasts that do not comply	July 1, 2010	July 1, 2010

Exception and Exemptions

- T12 ballasts for replacement purposes in existing installations
These ballasts can be manufactured until June 30, 2010, but must be marked "For Replacement Use Only", have leads shorter than the length of lamps intended to be operated, be contained in packages of 10 ballasts or less, and must meet the 1991 T12 magnetic BEF criteria.
- T12 dimming ballasts that dim to 50% or less of its maximum light output
- 2-Lamp F96T12 HO ballasts designed for -20°F operation and used in outdoor signs
- Magnetic ballasts with power factors less than 0.90, designed and labeled for use only in residential applications

There is an implied warning to all fluorescent lamp users that if they have not converted to T8 or T5 (requires new fixtures) by June 20, 2010, they will have to use T8 lamps and ballasts for spot replacement in their existing T12 magnetic ballast installations. This could result in maintenance problems if the maintenance personnel are not conscientious about installing T12 lamps with the remaining T12 ballasts and T8 lamps with T8 ballasts. T12 lamps operated by T8 ballasts will be under driven and T8 lamps operated by T12 ballasts will be over driven. The end result will be the same: significantly reduced lamp life.

Although magnetic ballasts will not be available for the covered T12 lamps after 2010, lamp manufacturers will continue to make T12 lamps so long as there is sufficient market demand and future DOE rule makings or legislation do not eliminate them.

The text of the 2000 DOE rule making can be found in the Federal Register, September 19, 2000, Volume 65, Number 182 (Rules and Regulations), pages 56739-56749. The text can be found at the following website:

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2000_register&docid=00-24004-filed

The Energy Policy Act of 2005 was passed by the 109th congress and became Public Law 109-58. The text of the EPAct 2005 legislation can be found at the following website:

http://frwebgate.access.gpo.gov/cgi-bin/useftp.cgi?IPaddress=162.140.64.183&filename=publ058.109&directory=/diska/wais/data/109_cong_public_laws

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