RADIONIC
INDUSTRIES, INC.

# Radionic Industries, Inc. Comments on ENERGY STAR Program Requirements for Residential Light Fixtures Draft 1 Eligibility Criteria – Version 4.0

Re: EPS Energy Star Residential Light Fixture Program, Draft v 4.0

The following are comments to Draft 1 v. 4.0 of Energy Star qualified Residential Light Fixtures Eligibility Criteria:

Page 3: Indoor Fixtures, Qualifying Products

Allow magnetic ballasts in low power lights (up to 15 W of nominal lamp power)

Rationale: excluding magnetic ballasts in all classes of light fixtures does not accomplish significant energy savings, nor cost savings for the end user. For example, for 1 x F15T8 fixture, employing a typical electronic ballast, the savings of energy cost per year amounts to about $0.22 #. The initial cost of electronic vs. magnetic ballast will exceed the savings. It will take 10-20 years for a payback of increased fixture price vs. energy savings.

This rationale would apply to categories such as 15 watt under cabinet lights, desk lamps, closet lights, etc. Many of these types of lights are only used for a few hours per day (a closet light might only be used for a few minutes per day). Consideration should be given to the total cost to the end user (price of the fixture plus energy cost for a period of years) and these two factors need to be weighed and balanced. *Also, consideration needs to be given to the fact that magnetic ballasts often last 20-30 years while electronic ballasts are likely to last only 5-10 ** years even if they are of very high quality.* A typical 15 watt under cabinet light or closet light would cost approximately $7.00 at

Home Depot with a magnetic ballast and will probably cost at least $15.00 with an electronic ballast. (Calculation: a one lamp 15 watt electronic ballast would cost about $4.00 more than the magnetic ballast and, at retail, this $4.00 difference is likely to double to $8.00). Even if this type of fixture is used 8 hours per day, it would take many years for a payback to be realized. If it is only used 2 house per day, there would never be a payback. The cost of a replacement electronic ballast at retail in 5-7 years, will almost certainly be more than the cost of a new fixture, before even considering the cost of labor.

While Energy Star is an optional program, does it make sense to try to "encourage" a home owner to spend $15.00 for a fixture that might have a useful life of 5-10 ** years rather than buying a $7.00 fixture that will last 20-30 years? Is the consumer being considered?

# Based on $0.08 / kWh and 2 hr / day usage

See attached chart showing energy savings for 2hr/day and 8hr/day operation.

Page 5: Lamp Start Time

(i) This requirement should be relocated to the page 7-8, Electronic Fluorescent Ballast Requirements.

Rationale: Lamp start time depends solely on ballast construction.

(ii) Lamp start up time should be relaxed to 1.5sec.

Rationale: to allow programmed start ballasts in the Program.
Performance of programmed start ballasts is superior to any other ballast type. We feel the advantage of using it outweighs the nuisance of a delayed start. Consumers should have the option of selecting excellent performance over 1.5 s time delay. Programmed start ballasts greatly reduce damage to lamps, extending their life span.

Page 8, New Construction Details

Manufacturers should be allowed to self-certify if they have proper equipment and instrumentation to perform the required tests; otherwise an accredited lab should be employed.

Page 8: End of Life Protection

This requirement should be deleted.

Rationale: Energy Star Program should not address safety issues, particularly new ones. It creates confusion as to whose guidelines to follow (UL, ANSI or Energy Star). Perhaps simply incorporate by reference that the ballast must be UL approved.

Page 19, Reference Standards; Input Power, Lamp Start Time
Page 24, Reference Standards; Lamp Current Crest Factor

Allow ballast manufacturer to provide this data instead of requiring results from accredited laboratory.

Rationale: Measurement of these parameters are simple and do not require special instrumentation or skills. This outside lab requirement is an unnecessary burden and expense to ballast manufacturers.

More comments on ballast reliability and testing

1. The main factor contributing to ballast failures is heat, both generated by the ballast and by the surrounding environment. Heat causes degradation of ballast

components and also stresses mechanical board assemblies. Both effects may cause failures. Required ballast reliability in the context of heat related effects may be achieved by careful component selection and adequate testing.

Since the most heat sensitive components in virtually all electronic ballasts are electrolytic capacitor/s, it is important that its ratings are adequate to the ballasts expected temperature and application. See above Page 8, New Construction Details.

2. Another good way of ensuring ballast reliability is accelerated life testing. During that test a ballast is exposed to a series of thermal cycles in a thermal/environmental chamber while operating a nominal load. Although the mapping of test cycles to real life is far from precise, failures which occur during this test may reveal the weakest circuit spots, manufacturing problem or defective material or component.

3. If Energy Star accepts some of these recommendations as to assuring high quality and long lasting electronic ballasts, and that it will increase the cost of fixtures using electronic ballasts, *then consideration must also be given to the fact that if, for example an under cabinet fixture, is priced too high it might have the reverse effect intended by the Energy Star program; that is, it might encourage people to simply leave an incandescent light bulb in place rather than replacing the fixture with a fluorescent model.*

Residential Only?

We suggest that it be made clear that Energy Star is a residential program (assuming this is correct) to avoid confusion in the ballast and lighting fixture industry on whether commercial /industrial fixtures need to comply with these new guidelines in November, 2005 and avoid conflict with the new DOE ballast requirements in May, 2005.

Landfills

Has consideration been given to the fact that fixtures with electronic ballasts are going to last 5-10 ** years if very high quality electronic ballasts are employed and only a couple of years if cheap electronic ballasts are used? The PC boards in electronic ballasts contain lead. Chances are that in many cases it will be cheaper to buy new fixtures than to replace the ballast (particularly in cheaper fixtures under 20 watts) and hence these fixtures will go into landfills which would not have occurred if magnetic ballasts which last 20-30 years were used.

We are submitting these suggestions with the hope they will be carefully considered by Energy Star. We would be glad to participate in further discussions and provide more detailed information. By way of background, Radionic Industries, Inc. was founded in 1939 and is the oldest ballast manufacturing company in the USA. (Please see our web site for further information about Radionic at www.Radionic.net). We manufacture both magnetic and electronic ballasts so we have no particular ax to grind one way or the other,

but would encourage a common sense approach based on both the best interests of the American consumer and national energy saving goals.

Respectfully submitted – 10/15/04

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** No definitive research has yet been done that conclusively shows the likely life expectancy of an electronic ballast. Ballast life will be greatly affected by ambient temperatures, hours of use per day, lamp quality and other factors. Electronic ballasts have been around for many years (in some cases with very poor quality and lifetime results) but have only been used in massive quantities starting 3-4 years ago. We are not claiming scientific evidence for ballast life and in referring to expected life we are *talking about industry wide brands, not Radionic specifically*. Based on logic and experience, we believe some ballasts (in higher ambient environments and/or with poor quality lamps) will last approximately 5 years and that under ideal conditions, others will last 10 years. Based on what we have seen over the past few years from various manufacturers, poor quality ballasts may only last 1-2 years.

| Electronic Ballast WH 2 Fulham 1 x F15T8 | | | | | | Relative Light Output | | Magnetic Ballast CUSP 452 1 x F15T8 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Irms [mA] | THD [%] | PW [W] | Pf [%] | Vin [V] | Fin [Hz] | Lx | Lx | Irms [mA] | THD [%] | PW [W] | Pf [%] | Vin [V] | Fin [Hz] |
| 100.4 | 31.8 | 11.4 | 94.4 | 120.0 | 60 | 3380 | 3750 | 255.7 | 11.3 | 16.2 | 52.8 | 120.0 | 60 |

## Energy Cost Per Year (based on $ 0.08/kWh) 2HR a day & 8HR a day

| | | | | | NORMALIZED FOR THE SAME LIGHT OUTPUT | | |
|---|---|---|---|---|---|---|---|
| 0.08 /kWh | Magnetic [kWh] | Electronic [kWh] | Δ [kWh] | $ savings with electronic | Electronic [kWh] | Δ [kWh] | $ savings with electronic |
| 730 hours | 11.8 | 8.3 | 3.5 | $0.28 | 9.1 | 2.7 | $0.22 |
| 2920 hours | 47.3 | 33.2 | 14.2 | $1.13 | 36.5 | 10.9 | $0.87 |