

Bonneville Power Administration
Conservation Augmentation: Extended Standard Offer (ESO)
Lighting Rebate Specifications

General Equipment Requirements

- A. All equipment shall be new.
- B. All ballasts and luminaires shall be UL rated.
- C. Ballast Warranty: All electronic ballasts shall be warranted against defects in material and workmanship for a minimum of 3 years. The warranty shall include either a \$10.00 replacement labor allowance or complete replacement including labor by an agent of the manufacturer.
- D. Lamp Warranty: Lamps shall be warranted against defects in material and workmanship for at least two years. The warranty shall provide for replacement lamps at a minimum.
- E. Compact Fluorescent Warranty: CFLs shall be warranted for at least one year, or for the stated life of the CFL.
- F. Starting Temperatures: All ballasts shall be capable of starting the lamps at the appropriate ambient (surrounding) temperatures. Examples include: indoor heated vs. indoor non-heated vs. normal outdoor vs. cold climate outdoor.

Rebate Item Requirements

A. High Performance T8 Fluorescent Lamps and Electronic Ballasts

- 1. Includes fixture retrofits and new fixtures.
- 2. This category is primarily intended for 4' T8 lamps, but includes T8 and T5 linear fluorescent lamps, 2' to 8' length, with ballast input watts from 15 to 114 watts, that meet the 95 lumens/watt requirement.
- 3. Lamps shall have a Color Rendering Index = 85, lumen maintenance = 95 percent, and lamp life = 24,000 hours (@ 40 percent of rated life, 3-hours per start). Four-foot F32T8 lamps shall have initial output = 3,100 lumens.
- 4. Ballasts shall meet the requirements of the Lighting Design Lab T8 & T5 Fluorescent Lamp Electronic Ballast Specifications current at the time of installation.
- 5. Lamp/ballast combination shall have an efficacy of equal to or greater than 95 lumens per watt:

$$\text{Lamp/Ballast Efficacy} = \frac{\text{Initial Lamp Lumens} \times \text{No. of Lamps} \times \text{Ballast Factor}}{\text{Ballast Input Watts}}$$

- 6. For this "High Performance" rebate, the application must include either the manufactures specification sheet documenting initial lamp lumens, lamp lumen maintenance, ballast factor and ballast input watts, or list manufacturer's model numbers and performance.
- 7. Alternate Compliance Method: In lieu of lamp/ballast efficacy documentation, lamps and ballast may qualify separately as follows:

Ballast Type			
Lamp Type	Instant Start	Programmed Rapid Start	Lamp Lumens
1-lamp F32T8	----	BEF ≥ 2.75	≥ 3,100
2-lamp F32T8	BEF ≥ 1.6	BEF ≥ 1.47	≥ 3,100
3-lamp F32T8	BEF ≥ 1.06	BEF ≥ 0.97	≥ 3,100
4-lamp F32T8	BEF ≥ 0.81	BEF ≥ 0.75	≥ 3,100
<i>Ballast Efficacy Factor (BEF) = Ballast Factor x 100 / Ballast Input Watts</i>			

B. T8 or T5 Fluorescent Lamps and Electronic Ballast

- 1. Includes fixture retrofits and new fixtures. This rebate category is intended only for applications where the requirements of category A above cannot be achieved.
- 2. Includes T8 and T5 linear fluorescent lamps, 2' to 8' length, with ballast input watts from 15 to 114 watts.
- 3. Lamps shall have a CRI = 80, lumen maintenance = 90 percent, and lamp life = 18,000 hours (@ 40 percent of rated life, 3-hours per start). Four-foot F32T8 lamps shall have initial output = 2,900 lumens. Lamp/ballast combination shall have an efficacy = 80 lumens per watt.
- 4. Ballasts shall meet the requirements of the current Lighting Design Lab T8 & T5 Fluorescent Lamp Electronic Ballast Specifications.

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C. Hardwired Compact Fluorescent

1. Includes new hardwired compact fluorescent fixtures and fixture retrofits, 15 to 99 watts (nominal).
2. Must replace existing incandescent or mercury vapor lighting.
3. Hardwire retrofits must remove screw-in lamp socket. Recessed fixtures must include a reflector designed for the new lamp.
4. Lamps shall have a CRI = 80, lumen maintenance = 80 percent, and lamp life = 10,000 hours (@ 40 percent of rated life, 3-hours per start).
5. Ballast shall have a power factor = 90 percent, THD = 33 percent, Lamp Current Crest Factor = 1.7, Class A sound rated, and provide end of life protection.
6. Lamp/ballast combination shall have a minimum efficacy of 46 lumens/watt for lamps under 30 watts, and 60 lumens/watt for lamps 30 watts or greater.

D. Ceramic Metal Halide

1. Includes new hardwired fixtures and fixture retrofits, 39 to 250 watts (nominal).
2. Must replace existing incandescent lighting.
3. Lamps shall have CRI = 80, lumen maintenance = 80 percent, and maximum color shift over life of lamp = 200K.

E. Screw-in Compact Fluorescent Lamps

1. Includes one-piece or modular screw-in compact fluorescent, 3 to 150 watts (nominal).
2. Must replace existing incandescent lighting.
3. Installation in recessed fixtures is not recommended. Lamps in recessed fixtures must include a reflector designed for the lamp.
4. Screw-in compact fluorescents must bear the ENERGY STAR label and meet the ENERGY STAR specifications for energy efficiency.
Exception: Where ENERGY STAR specifications do not apply, substitutions may be allowed with prior approval from BPA.

F. LED or Cold Cathode Exit Signs

1. Applies to new LED or Cold Cathode exit signs.
2. Must retrofit or replace existing incandescent exit signs.
3. Exit signs must meet the ENERGY STAR specifications for energy efficiency. Input power must be less than 5 watts per face.

G. Induction Lamp Luminaire

1. Includes new induction lighting systems.
2. Must replace existing incandescent or mercury vapor lighting.

H. High Output Fluorescent Luminaire

1. Includes T8, T5, standard or HO, 4' and 8' lamps, 85 to 600 input watts.
2. Must replace T12 fluorescent/magnetic ballasts, mercury vapor, probe-start metal halide, or incandescent.
3. Lamps shall have a CRI = 80, lumen maintenance = 90 percent, and lamp life = 18,000 hours (@ 40 percent of rated life, 3-hours per start).
4. Lamp/ballast combination shall have an efficacy of greater than 80 lumens per watt.
5. Ballasts shall meet the requirements of the current Lighting Design Lab T8 & T5 Fluorescent Lamp Electronic Ballast Specifications.

I. Pulse Start Metal Halide

1. Includes new pulse-start lighting systems. Where possible, high output fluorescents are recommended over metal halide.
2. Lamps shall have a CRI = 65, lumen maintenance = 75 percent, and lamp life = 20,000 hours (@ 40 percent of rated life, 3-hours per start).
4. Lamp/ballast combination shall have an efficacy equal to or greater than 89 lumens per watt.

J. Occupancy Sensors

1. Includes infrared, ultrasonic, and dual-technology sensors. Wall, ceiling and fixture mount.
2. Occupancy sensor must be compatible with the controlled lighting equipment and rated for the controlled wattage.
3. Infrared sensors require an unobstructed view of targeted motion.
4. All sensors shall be tuned after installation for proper coverage, sensitivity, and time delay.