

High Performance T8 (HPT8) systems reduce energy costs compared to older T12 or standard T8 systems. The systems produce similar or more light output than standard T8s, with the same high quality light, but use less energy.

Definitions:

Ballast Factor (BF) – The ratio of lamp lumens produced when lamp(s) are operated by a given ballast to the lamp lumens produced when the lamp(s) are operated on a reference ballast.

Ballast Efficacy Factor (BEF) – The ratio of ballast factor (BF) to the total supply power times 100.

HPT8 Systems

HPT8 Systems consist of fixtures that use two qualified components: four-foot, 32 Watt high-lumen T8 lamps and high-efficiency electronic ballasts.

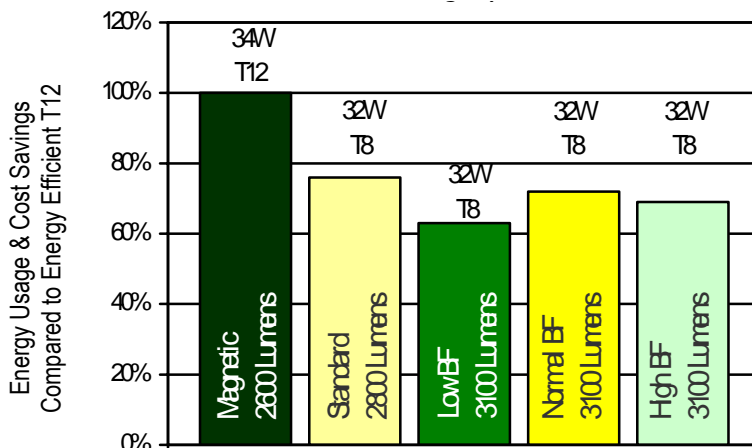
Lamps - high lumen (≥ 2900 Mean Lumens compared to 2,600 for standard T8),
long life ($\geq 24,000$ hours compared to 20,000 for standard T8),
high color rendering index (CRI ≥ 81 compared to 75 for standard T8)

Ballasts - low-power (<0.85 ballast factor compared to 0.88 for standard ballasts). HPT8 ballasts also must meet specific ballast efficacy criteria as follows:

Ballast Efficacy Factor (BEF) BEF = [Ballast Factor (BF) x 100] / Ballast Input Watts		
Number of Lamps	Instant-Start Ballast	Programmed Rapid-Start Ballast
	Low BF ≤ 0.85	
1	≥ 3.08	≥ 2.84
2	≥ 1.60	≥ 1.48
3	≥ 1.04	≥ 0.97
4	≥ 0.79	≥ 0.76

Note: HPT8 high-efficiency ballasts with normal and high ballast factors are also available and will provide higher lumens. Consider lighting design lay-outs that use fewer lamps per fixture or fewer fixtures when using normal or high BF ballasts. For your reference, an HPT8 project comparison chart is on the back of this document. Different BEFs are used to qualify normal and high BF ballasts.

HPT8 Systems Energy Use and Cost



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This table compares the use of alternative luminaires in a lighting layout for a 3,000 square foot retail space with eight foot ceilings, using 2X4, three-lamp recessed luminaires. The main function of this sample space is general merchandising and the average target light level is 75 footcandles. Each column represents a specific lighting system and provides detailed information about the system performance. In this example, the High Performance T8 Systems with low ballast factor and high lumen T8 lamps are the smartest, most energy-efficient solution. In other applications, designing with HPT8 fixtures using normal or high ballast factor ballasts and high lumen lamps may allow for fewer fixtures and a more energy-efficient design. Note that different DFTs are used to qualify normal and high BF ballasts.

Fixture Description	Energy-Efficient T12 34W T12 @ 2650 Lumens	Standard T8 32W T8 @ 2800 Lumens	Low BF HPT8 32W HPT8 @ 3100 Lumens	Normal BF HPT8 32W HPT8 @ 3100 Lumens	High BF HPT8 32W HPT8 @ 3100 Lumens
Ballast Factor (BF)	0.9	0.88	0.77	0.88	1.18
Ballast Efficacy Factor (BEF)	0.78	1.00	1.05	1.06	1.06
BEF HPT8 Qualified?	No	No	Yes	Yes	Yes
Mean Lumens	2300	2660	2950	2950	2950
Initial Lamp Lumens	2650	2800	3100	3100	3100
Lamp HPT8 Qualified?	No	No	Yes	Yes	Yes
Mean System Efficacy*	53.81	79.80	93.35	93.83	94.08
Mean System Efficacy Qualified?	No	No	Yes	Yes	Yes
# Rows	7	7	7	7	5
# Columns	5	5	5	5	5
Total number of fixtures	35	35	35	35	25
Watts (W) per Fixture	115.4	88	73	83	111
Total Wattage	4039	3080	2555	2905	2775
Total Kilo-Watt (kW)	4.039	3.08	2.555	2.905	2.775
Total Annual Kilo-Watt Hour (kWh)	12602	9610	7972	9064	8658
Total Annual Energy Cost	\$1,890	\$1,441	\$1,196	\$1,360	\$1,299
W/Square Foot	1.35	1.03	0.85	0.97	0.93
Average Light Level (Foot Candle)	60.02	78.31	76.3	86.7	82.98

* Efficacy is defined as Lumens Per Watt (LPW); CEE minimum for instant start ballasts is > 90 Mean Lumens per Watt (MLPW)
 Note: Annual energy consumption and cost based on 3,120 operating hours per year at 15¢ per kWh