

SMART



LIGHTING

# **Reduced Wattage Technology Overview**

Facilitator

Afroz Khan, CEE

Presenter

James Benya, **Benya Lighting Design**

SMART



LIGHTING

Thanks to

**OSRAM SYLVANIA**

For their support of Mr. Benya's  
participation

## T8 Core Lamp Technologies

SMART



LIGHTING

### BASIC OPTIONS INCLUDE

- Standard lamp (20,000 hours)
- Premium Long Life lamp (+50 lumens, +4,000 hours)
- Low mercury TCLP compliant lamp
- Premium Long Life Low Mercury lamp

## T8 Core Lamp Technologies

SMART



LIGHTING

### PHOSPHOR OPTIONS INCLUDE

- Standard 75 CRI (7xx) 2800 lumens
- New 78-82 CRI (7xx) 2850 lumens
- Standard 82-85 CRI (8xx) 2950-3000 lumens
- High lumen 86 CRI (8xx) 3100-3200 lumens

## T8 Core Lamp Technologies

SMART



LIGHTING

### BARRIER COAT OPTIONS INCLUDE

- Standard 7xx 90% lumen maintenance at 8000 hours
- Premium 7xx 95% lumen maintenance at 9600 hours
- Standard 8xx 92% lumen maintenance at 8000 hours
- Premium 8xx 95% lumen maintenance at 9600 hours

## T8 Core Ballast Technologies

SMART



LIGHTING

Input power for 2 F32T8 lamps at 0.88 BF

- Magnetic (70 watts)
- Standard Electronic Instant Start (59 watts)
- Efficient Electronic Instant Start (53 watts)
- Standard Electronic Program Start (60 watts)
- Efficient Electronic Program Start (56 watts)

## T8 Core Ballast Technologies

SMART



LIGHTING

Input power for 2 F32T8 lamps, efficient electronic instant start ballast

- Normal light output, 0.88 BF (53 watts)
- High light output, 1.15 (72 watts)
- Low light output, 0.78 (48 watts)
- For comparison, a rapid start dimming ballast, 0.05 to 0.88 (64 watts)

## T8 Core Ballast Technologies

SMART



LIGHTING

Input Voltage

- Fixed (120, 277, 347, etc) about 1-2% more efficient
- Universal (100-300), easier to stock

Power Quality

- <20% THD
- <10% THD

# The T8 is a System

SMART



LIGHTING

- Choices of Lamp
  - Basic Type (generic, premium, "super")
  - Quality (lumen maintenance and life)
  - Color temperature
  - Mercury content
- Range of lamp watts
  - 32 standard
  - 30, 28, 25
- Standard, efficient or dimming electronic ballast
- Normal, high or low ballast factor ballast



Range of 2 lamp system (non dimming)

Worst 3930 L 52w

Best 6986 L 72w

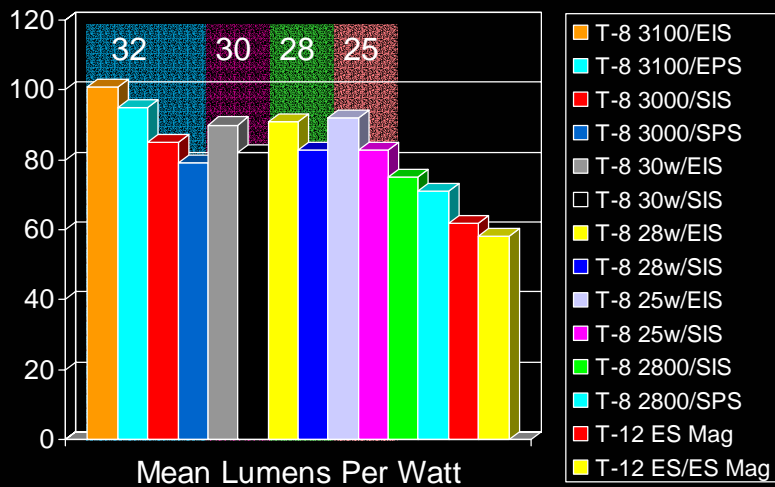
Less lamp power, same maintained output

# Lamp/Ballast Systems

SMART



LIGHTING



## Lamp/Ballast Compatibility

SMART



LIGHTING

Lamp Type	32 watt lamp	30 watt lamp	28 watt lamp
Instant Start Ballast	YES	YES	YES
Rapid Start Ballast	YES	NO	NO
Program Start Ballast	YES	NO	NO
Dimming Ballast	YES	NO	NO

## Applications

SMART



LIGHTING





### Direct Lighting (40-60 MEAN fc)

Typical Layout: 3 lamp troffers on 8' x 10' centers

- (3) Standard T8, standard IS normal BF ballast provides 58 fc at 1.12 w/sf
- (3) "super" T8, efficient IS ballast low BF ballast provides 62 fc @ 0.90 w/sf
- (3) F30T8 and a standard IS normal BF ballast provides 62 fc @ 1.05 w/sf
- (3) F28T5 and an efficient IS low BF ballast provides 53fc @ 0.85 w/sf
- (3) F25T8 and an efficient IS low BF ballast provides 51fc @ 0.81 w/sf

SMART





LIGHTING

## My Conclusions

- Low wattage T8 systems are not as efficacious as standard F32T8 systems
- Low wattage T8 systems are not fully compatible with all types of ballasts
- Use of efficient electronic ballasts is a more durable way to ensure long term savings
- Nonetheless, low wattage T-8 lamps can save energy most easily

SMART



LIGHTING

## Low wattage T8 lamps

James R. Benya, PE, FIES, IALD. LC  
BENYA LIGHTING DESIGN

This will be posted within 1 week at  
[www.benyalighting.com](http://www.benyalighting.com)