

*California  
Energy Commission*



# **California 2005 Residential Lighting Energy Efficiency Standards**



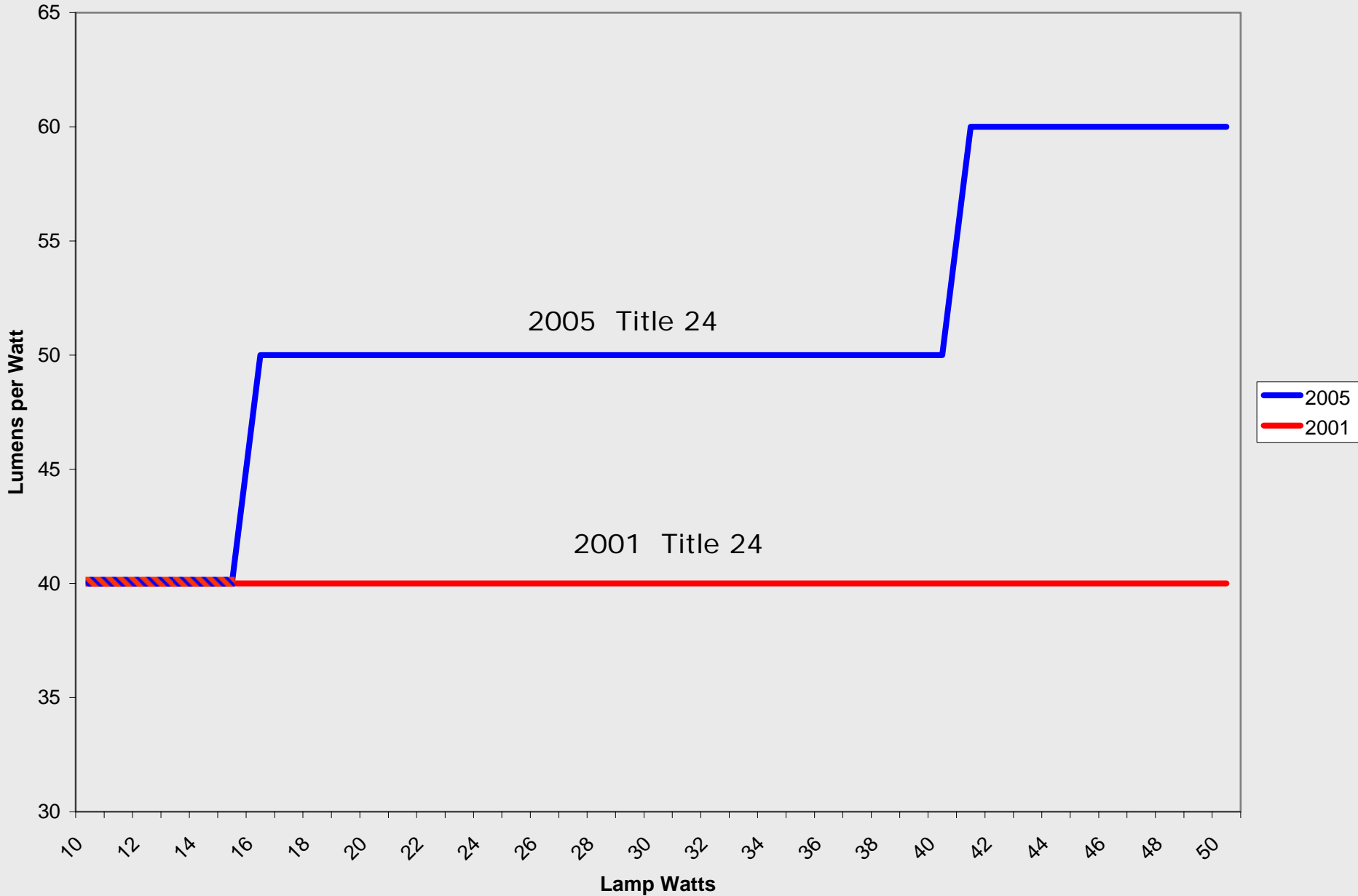
# California Title 24 Residential Lighting Standards

## Comparison of 2001 to 2005 Standards

Applicable provisions will also apply to interior lighting in

- ✓ High-rise residential living quarters
- ✓ Hotel/motel guest rooms

# Definition of High Efficacy Lighting





# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Ballast Requirements

<b>2001 Standards</b>	<b>2005 Standards</b>
	<p>Ballasts for lamps rated 13 Watts or greater shall be electronic and shall have an output frequency of no less than 20 kHz.</p>



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## How to determine WATTAGE

The label on the luminaire showing the maximum relamping rated wattage must be permanently installed on the luminaire at the factory. Field installed labels are not allowed.



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## How to determine wattage

Luminaires with modular components that allow conversion between screw-based and pin-based sockets without changing the luminaire housing or wiring are considered low efficacy.

It must be assumed that the maximum relamping or system wattage rated for that platform will be used.



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## How to determine wattage

CFL luminaires with permanently installed ballasts that are capable of operating a range of lamp wattages, the highest operating input wattage of the rated lamp/ballast combination must be used for determining the luminaire wattage.



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Switching Requirements

2001 Standards	2005 Standards
<p>High efficacy lighting system must be operated on separate switch from any incandescent or other low efficacy lighting system.</p>	



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Recessed luminaires in insulated ceilings

2001 Standards	2005 Standards
Must be approved for zero-clearance insulation cover (IC)	
	<p style="text-align: center;"><b>AND</b> must be certified airtight</p> 
	<p style="text-align: center;">© Progress Lighting, used by permission</p>



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Recessed Luminaire Inspection Protocol

### Primary Intent

To install a certified airtight luminaire so that it is sufficiently airtight to prevent the flow of heated or cooled air between conditioned and unconditioned spaces

- ✓ All air leak paths through luminaire assembly or ceiling opening must be sealed.
- ✓ Leak paths in the installation assembly that are not part of the ASTM E283 testing must be sealed with either a gasket or caulk



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Recessed Luminaire Inspection Protocol

**Inspected prior to installation of the ceiling when rough-in electrical work is visible:**

- ✓ Gasket attached to bottom of housing – gasket continuous, compressed contact with ceiling, & housing securely attached

**Inspected after installation of ceiling:**

- ✓ Gasket applied after ceiling installed
- ✓ Caulk applied after ceiling installed
- ✓ Certified airtight trim kit (include gasket)



# California Title 24 Residential Lighting Standards

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## Recessed Luminaire Inspection Protocol

- ✓ Luminaire must include a label certifying airtight

### **Submit on plans:**

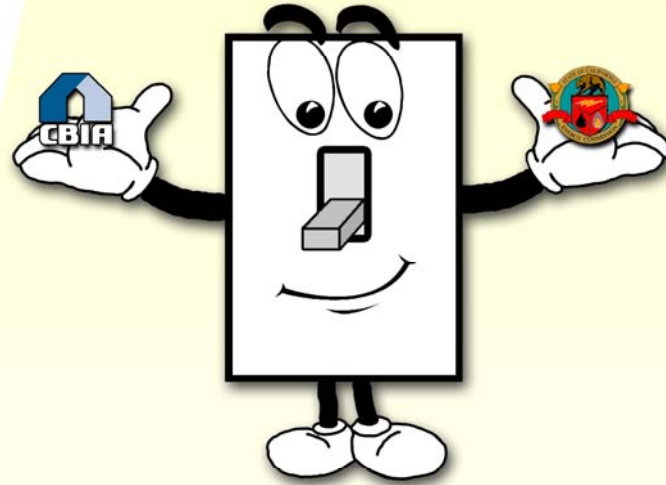
- ✓ Manufacturer specifications "cut sheet"
- ✓ Manufacturers installation instructions explaining entire assembly required -how gasket attached, type of caulk.

# Summary Table of 2005 Residential Lighting Standards

<b>Kitchen</b>	Electronic Ballasts for all lamps rated 13 Watts or greater	All Hardwired Lighting Must be High Efficacy	Alternate option: Up to 50% of relamping rated WATTAGE can be other than high efficacy
<b>Bathroom</b> <b>Garage</b> <b>Laundry Room</b> <b>Utility Room</b>			Alternate option: Manual-on occupant sensor
<b>All other interior rooms (i.e.: Hallway, Dining Room, Bedroom)</b>	Recessed luminaires in all insulated ceilings approved for zero-clearance insulation cover (IC) and certified airtight		Alternate options: Manual-on occupant sensor, or dimmer
<b>Outdoor lighting attached to buildings</b>	Switch all high efficacy lighting separate from low efficacy lighting		Alternate option: Motion sensor plus photo control
<b>Common Areas of low-rise residential buildings with 4 or more dwelling units</b>			Alternate option: Occupant sensor
<b>Residential parking lots and garages for 8 or more vehicles</b>	Must meet 2005 Nonresidential Building Standards		

# SWITCH!

To the  
2005 Residential Lighting Requirements



# NOW!

For  
Early Adopter  
Lighting Credits



## Early Compliance Credit

# Limited Term Compliance Option

- ✓ Approved May 5, 2004
- ✓ Available until October 1, 2005  
(when 2005 Building Energy Standards take effect )



## Early Compliance Credit

# Limited Term Compliance Option

- ✓ Responds to comments received from several individuals and groups.
- ✓ Initiate a credit to encourage early compliance with the 2005 residential lighting Standards.
- ✓ Designed to be energy neutral.



## Early Compliance Credit

### Eligibility Criteria Includes...

- ✓ Building permit application before October 1, 2005.
- ✓ Single family buildings.
- ✓ Multi-family buildings where single dwelling units are modeled individually for showing compliance using the multiple orientation approach.



## Early Compliance Credit

# Eligibility Criteria Includes...

- ✓ Field verification by a certified HERS Rater
- ✓ Supplement to Form CF-4R signed and dated by the HERS Rater.



# Energy Star

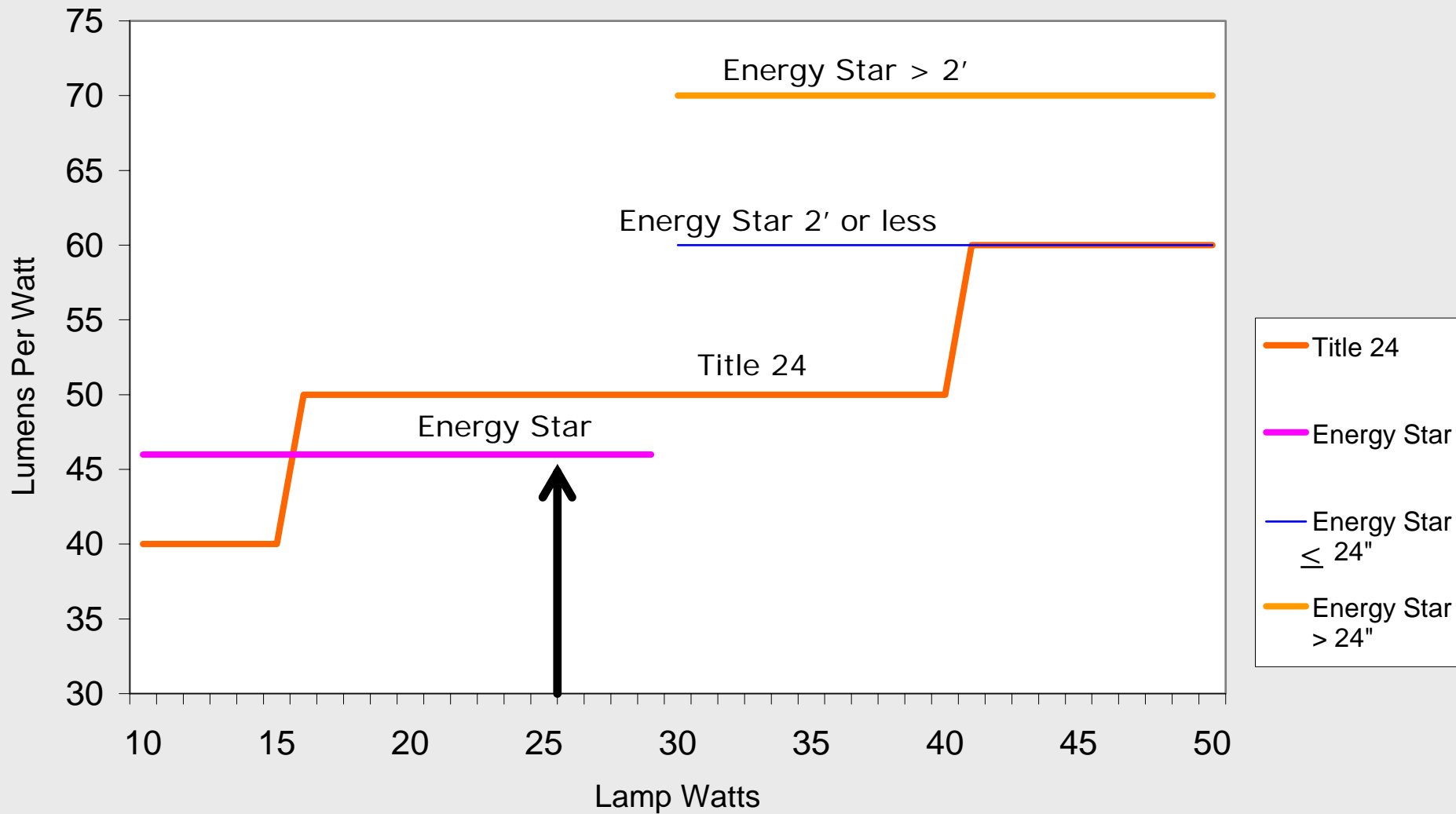
## California 2005 Title 24

Electronic ballasts for lamps rated 13  
Watts or greater

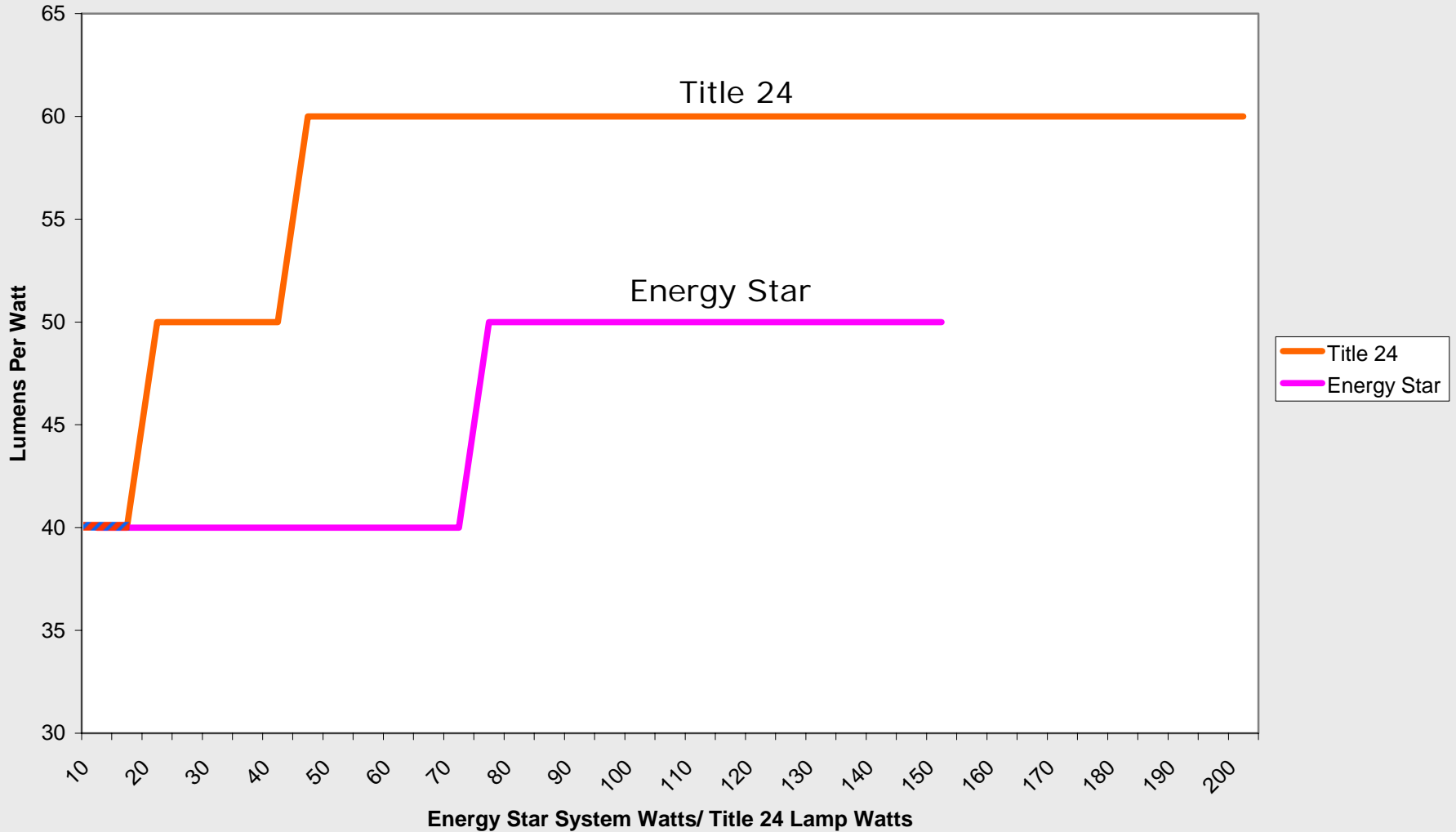
### Energy Star

No requirement at this time for  
electronic ballast. Proposed to be  
electronic ballast by October 1, 2005

# Minimum Efficacy – Indoor Lights



# Minimum Efficacy – Outdoor Lights





# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Future Standards ?

- Mandatory % High Efficacy in other Rooms
  - Market transformation more luminaires
  - Safety/security
- Exception for LEDs / Wattage threshold
  - But not 5 W xenon ?
- ASTM E283 (Air tight)
- Landscape Lighting



# California Title 24 Residential Lighting Standards

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## Future Standards ?

### Controls

- Smart Controls
- Load Compatibility
  - Screw-in CFL on dimmer
  - Minimum load requirements
  - 3-way circuit



# California Title 24 Residential Lighting Standards

Comparison of 2001 to 2005 Standards

## Future Standards ?

### Lighting Quality

- Luminaire Labor Warranty
  - Discourage Knock-offs
  - Increase acceptance
- Best Practices, Recommended Specifications