

Project		Catalog #		Type	
Prepared by		Notes		Date	



# Metalux

## Cruze ST 24CZ2

2' x 4' LED Specification Grade Troffer

### Typical Applications

Office • Education • Healthcare • Hospitality • Retail

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- Product Warranty

### Product Certification



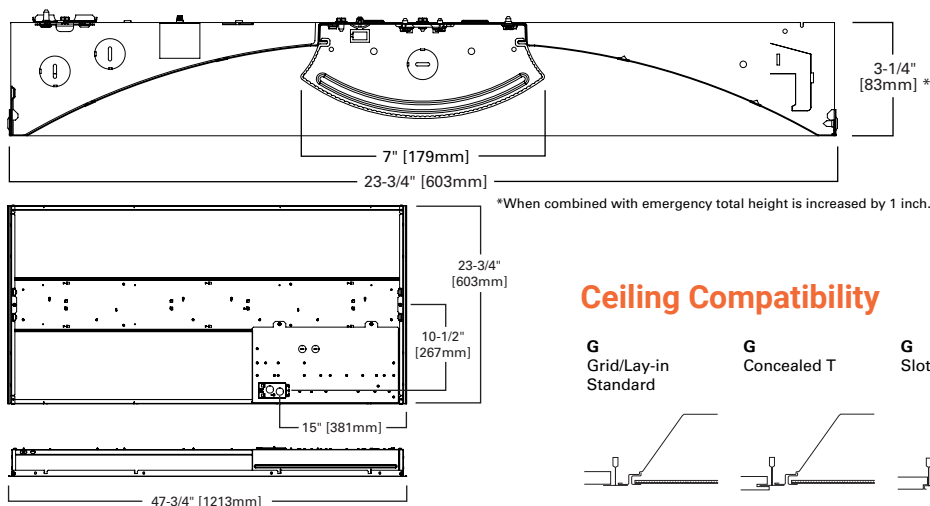
### Product Features



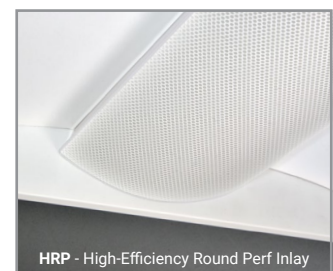
### Top Product Features

- Latch-less design provides clean architectural look
- VividTune CCT tuning options from 3000K-5000K or 2700K-6500K
- Designers delight - ribbed, smooth and round perforated lens options
- High performance efficacy up to 138 lm/W
- Integrated sensor systems - occupancy, daylight and IoT connectivity

### Dimensional and Mounting Details

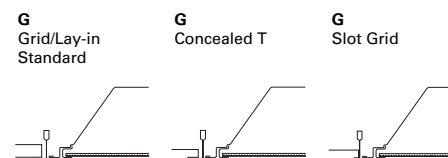


### Shielding



See ordering information for more shielding options.

### Ceiling Compatibility



Ceiling Type	Trim Type
Exposed Grid	Standard
Concealed T	Standard
Slot Grid	Standard
Flange	*

\*See Drywall Frame Kit Accessory in Ordering Information Section

## Order Information

SAMPLE ORDER NUMBER: **24CZ2-45HE-UNV-L835-CD1-U**

Rating	Series	Lumen Output		Shielding	Voltage	Options	Emergency Options
[Blank]=Standard ATW-SW4= Chicago Rated	24CZ2=2x4 Cruze ST	<b>High Efficacy</b> 30HE=3000 Lumens 35HE=3500 Lumens 40HE=4000 Lumens 45HE=4500 Lumens 50HE=5000 Lumens 55HE=5500 Lumens 60HE=6000 Lumens 65HE=6500 Lumens 70HE=7000 Lumens 75HE=7500 Lumens <sup>(9), (11)</sup>	<b>Standard Efficacy</b> 30=3000 Lumens 35=3500 Lumens 40=4000 Lumens 45=4500 Lumens 50=5000 Lumens 55=5500 Lumens <sup>(8)</sup> 60=6000 Lumens <sup>(8)</sup> 65=6500 Lumens <sup>(8), (11)</sup> <sup>(9), (11)</sup>	[Blank]=Ribbed Frosted Acrylic Lens (standard) S=Smooth Frosted Acrylic Lens RDP=Smooth Lens with Round Pattern Insert HRP=High- Efficiency Round Perf Inlay	UNV=Universal Voltage 120-277 347V=347 Volt <sup>(5)</sup> 48V=48 Volt Low- voltage (Class 2) <sup>(3)</sup>	GL=Single Element Fuse GM=Double Element Fuse	[Blank]=No emergency EL7W=7-watt, 120V-277V emergency battery pack installed <sup>(3)</sup> EL14W=14-watt 120V-277V emergency battery pack installed <sup>(3)</sup> ELV7W=7-watt, DLVP-compatible low voltage emergency battery pack installed <sup>(3)</sup> ELV14W=14-watt DLVP-compatible low voltage emergency battery pack installed <sup>(3)</sup> GTR2=Generator Transfer Relay <sup>(6)</sup> ETRD=Emergency Transfer Relay with dimming control <sup>(6)</sup>
		<b>Notes</b> (8) White tuning not available with this model. (9) Two drivers are required for the following packages: 65 347V CD, 75HE 347V CD. When combined with emergency total height is increased by 1 inch. (11) Not compatible with WN driver.			<b>Notes</b> (2) Products also available in non-US voltages and frequencies for international markets. (5) 347 versions 6000 lumens and below are available with emergency options, 5LTHD and step-dim options or sensors are not available. (C) Consult DLVP system pages for additional details and compatibility.		<b>Notes</b> (3) With integral test switch/indicator/laser test. For approximate delivered lumens multiply the lumens per watt of the desired fixture by the wattage of the emergency battery pack (100 lm/W x 7=700 lumens). IES-format photometry for luminaire under emergency operation available. Battery option increases total height by 1 inch. (6) Used to bypass local control during outage. Must be used in conjunction with UL 1008 device (provided by others). GTR2 option includes 2 relays on fixtures with dimming drivers. ETRD option only requires one relay when used on a dimming fixture. Must specify voltage as 120V or 277V when ordering these devices. 347 not available. (C) Consult DLVP system pages for additional details and compatibility.

CRI/CCT	Flex	Driver Type	Number of Drivers
L830=80CRI, 3000K L835=80CRI, 3500K L840=80CRI, 4000K L850=80CRI, 5000K L930=90CRI, 3000K L935=90CRI, 3500K L940=90CRI, 4000K L950=90CRI, 5000K L83050=80CRI 3000K-5000K White Tuning <sup>(7)</sup> L93050=90CRI 3000K-5000K White Tuning <sup>(7)</sup> L82765=80CRI 2700K-6500K White Tuning <sup>(7)</sup> L92765=90CRI 2700K-6500K White Tuning <sup>(7)</sup>	[Blank]=No Flex A3/8-4/18GDIM=3/8" Flex with 0-10V Dimming Leads A3/8-2/18G=3/8" Flex with line and common A3/8-5/18GDIM=Flex with 0-10V Dimming leads and Blue for alternate wiring. See below for details.	CD=0-10V Dimming Driver (1%-100% Dimming) SR=Sensor-ready Dimming Driver for LWIPD1 option (1%-100% Dimming) <sup>(8)</sup> 5LTD=Fifth Light DALI Driver (5%-100% Dimming) <sup>(E)</sup> 5LTHD=Fifth Light Dimming Driver (1%-100% Dimming) <sup>(E)</sup> LV=DLVP Dimming Driver (0%-100% Dimming) <sup>(G)</sup> SD=Step Dimming Driver (50%-100% Dimming) LH=Lutron HiLume (LDE1 series) 1%-100% EcoSystem Driver with Soft-on Fade to Black dimming <sup>(F)</sup> L5=Lutron 5 Series (LDE5-Series) 5%-100% EcoSystem Driver <sup>(F)</sup> W2A = White Tuning, 2 ch, Analog 0-10V Intensity and CCT Control <sup>(7)</sup> WN=WaveLinX Wireless Fixture, No Sensor. (A), (G), (H)	1=1 Driver 2=2 Drivers <sup>(9)</sup>
<b>Notes</b> (7) White tuning provides correlated color temperatures (CCT) between 3000K (warm) to 5000K (cool) or 2700K (warm) to 6500K (cool). Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity. Not compatible with other control or sensor options.	<b>Flexible Metal Conduit Options</b> Flex options available for 0-10V dimming control, DALI dimming control, emergency and night light functions. 72-inch factory-installed and pre-wired to driver, fitted to luminaire housing access plate with 90° enclosed FMC connector. Not all options may be combined and installation ratings vary by type. A3/8-4/18GDIM series notes: Factory installed dimming option 3/8" flexible metal conduit with 2-#18 power and ground wires and 2-#18 UL-listed jacketed 0-10V +/- control wires. Meets UL 66, 83, 1479, 1569, 1581, 2556. NEC® 250.118, 300.22(C), 392, 396, 330, 501, 502, 503, 530, 504, 505, 518, 520, 530, 645, 72; Federal Specification A-A-59544 (formerly J-C-308); all applicable OSHA and HUD Requirements. UL Classified 1-, 2-, and 3-hour through penetration with applicable fire stop product (not included). May be surface mounted, fished and/or embedded in plaster. Cable tray and approved raceway rated, install per NEC®, Environmental Air-Handling Space Installation per NEC® 300.22(C).	<b>Notes</b> (7) White tuning provides correlated color temperatures (CCT) between 3000K (warm) to 5000K (cool) or 2700K (warm) to 6500K (cool). Must be used in conjunction with W2A driver only. Must be used with two (2) 10V dimming control channels, 1 color, 1 intensity. Not compatible with other control or sensor options. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (A) Consult WaveLinX system pages for additional details and compatibility. (B) Consult LumaWatt Pro system pages for additional details and compatibility. (C) Consult DLVP system pages for additional details and compatibility. (E) Consult Fifth Light system pages for additional details and compatibility. (F) Consult Marketplace Options - Lutron system pages for additional details and compatibility. Compatible only with driver series shown, and may require two or more drivers. Requires field commissioning to operate or dim. Contact Lutron at www.lutron.com. (G) Not compatible with emergency or integrated sensor options. (H) Available with UNV voltage only.	<b>Notes</b> (9) Two drivers are required for the following packages: 65 347V CD, 75HE 347V CD. When combined with emergency total height is increased by 1 inch.

### Integrated Sensing Systems

### Packaging

### Accessories

Integrated Sensing Systems	Packaging	Accessories (order separately)
[Blank]=No Sensor SWPD1=WaveLinX Wireless Integrated Sensor <sup>(A)</sup> SDWPD1=WaveLinX Wireless Integrated Sensor Dual Band <sup>(A), (4)</sup> LWIPD1=LumaWatt Pro Wireless Integrated Sensor <sup>(B)</sup> LDWIPD1=LumaWatt Pro Wireless Integrated Sensor Dual Band <sup>(B), (4)</sup> LWTPD1=LumaWatt Pro Wireless Tile-mount Sensor <sup>(B)</sup> SLVDP1=DLVP Low-voltage Integrated Sensor <sup>(C)</sup> SDLVDP1=DLVP Low-voltage Integrated Sensor Dual Band <sup>(C), (4)</sup> SVPD1=0-10V Stand-alone Integrated Sensor <sup>(D)</sup> SDVDP1=0-10V Stand-alone Integrated Sensor Dual Band <sup>(D), (4)</sup>	U=Unit Pack PAL=Job Pack, out of carton PALC=Job Pack, in carton	CZ2-EQCLIP-U-PK=Cruze Plus "CZ2" Earthquake Clip Kit (4 clips per bag kit) <sup>(1)</sup> DF-24-W=2' x 4' Drywall Frame Kit SK-24-WS=2' x 4' Shallow Surface Mount Kit SK-24-WT=2' x 4' Tall Surface Mount Kit ISHH-01=Programming Remote for Integrated Sensor <sup>(D)</sup> ISHH-02=Personal Control Remote for Integrated Sensor <sup>(D)</sup>
<b>Notes</b> (4) Required for use with sensors and emergency options. Provides blank band on opposite side from sensor band to provide symmetric appearance. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (A) Consult WaveLinX system pages for additional details and compatibility. (B) Consult LumaWatt Pro system pages for additional details and compatibility. (C) Consult DLVP system pages for additional details and compatibility. (D) Consult SVPD series system pages for additional details and compatibility.		<b>Notes</b> (1) An EQ Grid Clip is recommended for all 9/16" ceiling systems. Four required per fixture. Integrated options must be used in conjunction with the associated system and may not be compatible with other options or accessories. Please refer to the following: (D) Consult SVPD series system pages for additional details and compatibility.

## Product Specifications

### Construction

- Die formed of code gauge prime cold rolled steel with full length die-formed stiffeners
- Unibody endplates attached with interlocking tabs and screws
- Hemmed side flanges
- Four auxiliary fixture end suspension points
- Integral Grid-lock feature for endplates for added safety
- Optional earthquake clips available

### Integrated Controls

- 0-10V dimming to 1% standard
- WaveLinX wireless fixture for sensor-less wireless control
- WaveLinX sensor compatible for IoT capability
- LumaWatt Pro sensor compatible for IoT capability
- SVPD sensor compatible for out of the box functionality
- DLVP sensor and driver compatible for low voltage applications
- DALI 2.0, Lutron, and step-dimming available

### LED and Light Engine

- LED's available in 3000K, 3500K, 4000K, or 5000K at 80 CRI minimum and 90 CRI minimum
- TM21 life at 60,000 hours up to L94 and calculated L70 exceeds 290,000 hrs.
- Drivers available in 120-277V and 347V
- Color Tuning options available with Eaton's VividTune

### Emergency Battery Options

- Optional 120-277V emergency battery available in 7W or 14W
- 90-minute backup period for code compliance
- Test switch with laser pointer and testing from floor feature for ease of use
- EZ Key feature prevents accidental discharge during construction
- Generator transfer options available

### Finish

- Multistage, iron phosphate pretreatment
- 90% reflective, matte white enamel finish
- Full fixture housing painted after fabrication

### Shielding

- Ribbed acrylic frosted lens standard
- Optional smooth acrylic frosted lens (S)
- Optional metal perforated acrylic lens (RDP)
- Optional High-Efficiency Round Perf Inlay (HRP)

### Compliance

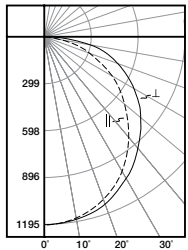
- IC rated for insulation contact
- cULus listed for damp locations
- RoHS compliant
- Tested to IESNA LM-79 and LM-80
- Stated life tested to TM21 standards
- Can be used for State of California Title 24 high efficacy luminaire

### Warranty

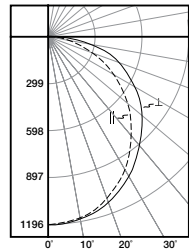
- Five year warranty standard.

## Photometric Data

[View IES files](#)



**24CZ2-35-UNV-L830-CD1-U**  
 Dimming Driver  
 Linear LED 3000K  
 Spacing criterion: (II) 1.22 x mounting height,  
 (⊥) 1.28 x mounting height  
 Lumens: 3618  
 Input Watts: 30.1W  
 Efficacy: 120.2 LPW  
 Test Report: 24CZ2-35-UNV-L830-CD1-U.IES



**24CZ2-35HE-UNV-L830-CD1-U**  
 Dimming Driver  
 Linear LED 3000K  
 Spacing criterion: (II) 1.21 x mounting height,  
 (⊥) 1.27 x mounting height  
 Lumens: 3562  
 Input Watts: 26.9W  
 Efficacy: 132.4 LPW  
 Test Report: 24CZ2-35HE-UNV-L830-CD1-U.IES

## Energy and Performance Data

### Standard Efficacy Versions – Single Row of LEDs

Catalog Number	Lumens	Watts	lm/W
24CZ2-30-UNV-L835-CD1-U	3032	24.2	125
24CZ2-35-UNV-L835-CD1-U	3638	30.1	121
24CZ2-40-UNV-L835-CD1-U	4196	36.2	116
24CZ2-45-UNV-L835-CD1-U	4618	42.9	108
24CZ2-50-UNV-L835-CD1-U	5015	48.6	103
24CZ2-55-UNV-L835-CD1-U	5571	50.5	110
24CZ2-60-UNV-L835-CD1-U	6042	55.6	109
24CZ2-65-UNV-L835-CD1-U	6572	62.8	105

### High Efficacy Versions – Two Rows of LEDs

Catalog Number	Lumens	Watts	lm/W
24CZ2-30HE-UNV-L835-CD1-U	3014	22.4	135
24CZ2-35HE-UNV-L835-CD1-U	3583	26.9	133
24CZ2-40HE-UNV-L835-CD1-U	4029	30.6	132
24CZ2-45HE-UNV-L835-CD1-U	4582	35.3	130
24CZ2-50HE-UNV-L835-CD1-U	5021	38.6	130
24CZ2-55HE-UNV-L835-CD1-U	5564	43.5	128
24CZ2-60HE-UNV-L835-CD1-U	6011	44.1	136
24CZ2-65HE-UNV-L835-CD1-U	6590	48.9	135
24CZ2-70HE-UNV-L835-CD1-U	7018	51.0	138
24CZ2-75HE-UNV-L835-CD1-U	7572	55.4	137

### Shielding

Lumen Adjustment Factors		
S	RDP	HRP
1.05	0.67	0.81

### Lumen Calculator

CCT Multiplier	80 CRI	90 CRI
3000K	0.994	0.830
3500K	1.00	0.845
4000K	1.00	0.854
5000K	1.065	0.852

### Example of Lumen Adjustment Calculation

24CZ2-40-UNV-L835-CD1-U at 90CRI at 3500K

Lumen Adjustment Factor = 0.845

Total Light Output =

$4,196 \text{ lm} \times 0.845 = 3,546 \text{ lm}$

Efficacy =  $\frac{3,546 \text{ lm}}{36.2 \text{ W}} = 98 \text{ lm/W}$

### Lumen Maintenance

Version	TM-21 Lumen Maintenance (60,000 hours)	Theoretical L70 (hours)
Standard	> 87%	> 162,000
High Efficiency	> 94%	> 290,000

### Load Data (Stock Product)

Thd	6%
Power Factor	0.99
Weight (lbs.)	16
Low Temp. Start	-20°C

### Shipping Data

Catalog No.	Wt.	Pallet 49' L x 52' W x 46' H
2' x 4'	20.4 lbs.	28

## Control Systems

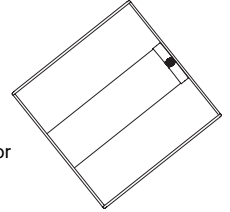
- WaveLinx
- DLVP
- LumaWatt Pro
- iLumin Plus
- VividTune

The Cruze ST with Integrated Sensor technology provides automatic energy savings without sacrificing performance. Traditionally, these types of energy savings required coordination between the luminaire and a lighting control system. The Cruze ST delivers superior lighting with integrated occupancy and daylighting controls.


Capture the benefits of traditional lighting controls, without complicated coverage planning or special wiring. Ideal for new construction or retrofit, the Cruze ST delivers automatic ON to an energy saving light level, while ensuring lighting is turned OFF when the space is unoccupied.

The integral daylight sensor reduces the need for special daylight zone planning. Each luminaire will automatically adjust the light level based on reflected light beneath the sensor in a closed loop method.


The integral sensor can be offered in both standalone (SVPD1) and networked (SWPD1, LWIPD1, and SLVPD1) for application versatility.




## We make connections work




**EATON POWER**  
Unparalleled knowledge of electrical power management



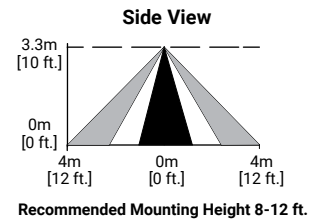
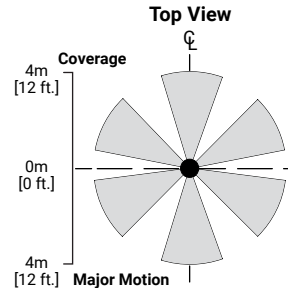
**LIGHTING**  
Advanced LED fixtures



**CONNECTIVITY**  
Communications & sensing technology  
Physical devices & controllers



**APPS**  
Software applications  
Data accumulation & analysis



Installation of integrated sensors within 3-ft (1m) of HVAC air vents is not recommended.

## Systems comparison chart

Eaton provides many lighting system solutions designed to satisfy code requirements and meet the unique needs of any project.

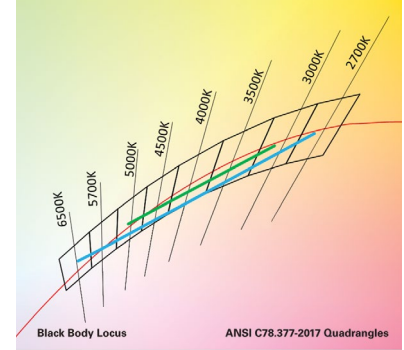


	Distributed Low-Voltage Power System	WaveLinx	LumaWatt Pro
Space type	Interior	Interior/Outdoor	Any
Stand-alone or Network	Stand-alone	Both	Network
Need-based feature progression			
Basic compliance only	●	●	●
Occupancy sensing	●	●	●
Daylight harvesting	●	●	●
Zone control	●	●	●
Scheduling	●	●	●
0-10V dimming	●	●	●
Individual fixture control	●	●	●
Retrofit+Building Integration	●	●	●
Total wireless connectivity		●	●
A/V integration		●	●
BMS integration		●	●
UI options (touchscreen, apps, etc.)		●	●
Enterprise level building integration		●	●
Facility management & tools		●	●
Floor plan & reporting tools		●	●
Value-added services			●
Asset tracking			●
API integration		●	●
Analytics/higher problem solving			●



**24 Cruze ST LED with VividTune Tunable White**

VividTune tunable white luminaires from Eaton deliver high-quality light in a broad range of continuously variable color temperatures and intensities. Create a dynamic environment by adjusting the ambient light warmer or cooler to influence mood, support the task at hand, or create a dramatic ambience. The ability to control correlated color temperature and intensity separately using simple controls is the next evolution of LED lighting for the commercial, educational, healthcare and hospitality space. The unparalleled flexibility and number of available lighting environments enable users to find the right light with tunable white.



3000K - 5000K  
2700K - 6500K

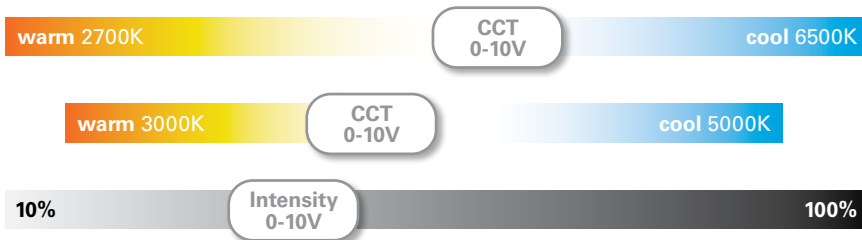
**Performance Data\***

Tunable White - Lumen Adjustment Factors				
CCT	3000K-5000K		2700K-6500K	
	80 CRI	90 CRI	80 CRI	90 CRI
2700K	-	-	0.878	0.750
3000K	0.904	0.744	0.903	0.779
3500K	0.956	0.813	0.934	0.819
4000K	1.004	0.878	0.954	0.844
4500K	1.014	0.893	0.972	0.866
5000K	1.014	0.893	0.985	0.884
6500K	-	-	0.999	0.908

2' x 4' Cruze ST LED - Example of Approximate Lumen Calculation			
	Standard Catalog #	VividTune 80 CRI Catalog #	VividTune 90 CRI Catalog #
<b>CCT Setting</b>	<b>24CZ2-40HE-UNV-L835-CD1-U</b>	<b>24CZ2-40HE-UNV-L83050-W2A1-U</b>	<b>24CZ2-40HE-UNV-L93050-W2A1-U</b>
3000K	-	3641	2998
3500K	4029	3853	3275
4000K	-	4046	3537
4500K	-	4084	3599
5000K	-	4084	3599

**Controlling VividTune Tunable White**

VividTune luminaires make tunable white more accessible by using simple and familiar controls. From wall dimmers to wireless controls, VividTune tunable white luminaires are compatible with industry standard 0-10V dimming controls. A single 0-10V dimming input is used to control intensity (brightness) while a second 0-10V dimming input is used to adjust CCT. For suggested control configurations, go to [www.eaton.com/lighting](http://www.eaton.com/lighting) for tunable white application guides.



**Example of Lumen Adjustment Calculation**

24CZ2-40HE-UNV-L83050-W2A1-U at 80 CRI tuned to 3500K

Adjusted Lumen = published lm x adjusted lm factor

Adjusted Lumen = 4029 x 0.956

Adjusted Lumen = 3853 lm

*\* Lumen adjustment factors are for reference and may be different for each product selected. Refer to IES files for actual performance data on each.*