

# New Energy LED Modules (NELM) Family

Versatile Lighting Modules

# Data Sheet

Version 2.0



- NELM Light Source with Flat Lens



- NELM Light Source with Dome Lens

## Product Description

New Energy LED modules (NELM) provide lighting designers and manufacturers with simple, easy-to-adopt LED lighting solutions that reduce luminaire development time and speed time-to-market. New Energy modules are the ideal choice for enabling rapid luminaire development where bright, beautiful, long-life lighting is required. The versatile NELM series enables the luminaire designer to jump start the design process. The high-performance quality of the NELM modules are ideally suited for architectural specification grade recessed down lights, wall sconces and pendants. NELM-enabled products are ideal for cutting-edge applications including retail, museums, high end residential and studios.

## Features

- Industry-leading light-source efficacy (steady state) of up to 136 lm/W.
- 850-4000 lumens available in 2700K, 3000K, 3500K and 4000K.
- > 90 CRI for all color temperatures (CCTs).
- Designed to last 50,000 hours at L70.
- Easy mounting - designed for quick mounting to a housing or bracket.
- RoHS compliant.
- ETL Recognized for wet locations.

## Custom Options (Consult factory for pricing and lead times.)

- Private label or design changes are available.
- Additional CCTs and CRIs are available.

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# PRODUCT SPECIFICATION TABLE

Characteristics	Unit	Minimum	Typical	Maximum
Viewing angle (FWHM) - Standard flat lens	degrees		86	
Viewing angle (FWHM) - Standard dome lens	degrees		102	
Viewing angle (FWHM) - Performance flat lens	degrees		82	
Viewing angle (FWHM) - Performance dome lens	degrees		102	
DC forward current - Standard 850 lm	mA	180	190	200
DC forward current - Standard 1250 lm	mA	280	300	320
DC forward current - Standard 2000 lm	mA	490	530	560
DC forward current - Performance 3000 lm	mA	680	710	750
DC forward current - Performance 4000 lm	mA	960	1040	1100
Forward voltage - Standard 850 lm	V		33.4	33.5
Forward voltage - Standard 1250 lm	V		34.4	34.6
Forward voltage - Standard 2000 lm	V		36.2	36.4
Forward voltage - Performance 3000 lm	V		33.7	33.8
Forward voltage - Performance 4000 lm	V		34.6	34.8
Luminous flux - Standard dome lens 850 lm	lm	860	865	869
Luminous flux - Standard dome lens 1250 lm	lm	1274	1292	1324
Luminous flux - Standard dome lens 2000 lm	lm	1997	2031	2079
Luminous flux - Performance dome lens 3000 lm	lm	2996	3012	3025
Luminous flux - Performance dome lens 4000 lm	lm	3972	4008	4031
LED module case temperature (T <sub>c</sub> )	°C		55	85
CRI - 90 CRI	100-point scale	90	92	
CRI - 95 CRI	100-point scale	95	98	

## NOTES:

- NELM modules are not designed for reverse bias operation.
- New Energy maintains a tolerance of  $\pm 7\%$  on flux measurements,  $\pm 10\%$  on power measurements,  $\pm 0.005$  on chromaticity (CC<sub>x</sub>, CC<sub>y</sub>) measurements and a tolerance of  $\pm 2$  on CRI measurements.
- 55 °C measured at case temperature (T<sub>c</sub>) point shown on page 11.
- Luminous flux values for the flat lens NELM LED module can be up to 3% lower.

## RoHS COMPLIANCE:

The levels of RoHS restricted materials in this product are below the minimum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented January 2, 2013. RoHS Declarations for this product can be obtained from a New Energy, LLC representative.

## CAUTION:

Users should be cautioned not to stare at the light of this LED product. The bright light can damage the eye.

# ORDER CODES

Product Family	Typical Luminous Flux (lm)	CCT (K)	CRI	Order Code	
				Flat	Dome
NELM	XX/XX/XX	XX	XX	F	D
NELM	850/1250/2000	2700	90	NELM-85/12/20-27-90-F	NELM-85/12/20-27-90-D
NELM	850/1250/2000	3000	90	NELM-85/12/20-30-90-F	NELM-85/12/20-30-90-D
NELM	850/1250/2000	3500	90	NELM-85/12/20-35-90-F	NELM-85/12/20-35-90-D
NELM	850/1250/2000	4000	90	NELM-85/12/20-40-90-F	NELM-85/12/20-40-90-D
NELM	850/1250/2000	2700	95	NELM-85/12/20-27-91-F	NELM-85/12/20-27-91-D
NELM	850/1250/2000	3000	95	NELM-85/12/20-30-91-F	NELM-85/12/20-30-91-D
NELM	850/1250/2000	3500	95	NELM-85/12/20-30-91-F	NELM-85/12/20-30-91-D
NELM	850/1250/2000	4000	95	NELM-85/12/20-30-91-F	NELM-85/12/20-30-91-D
NELM	3000/4000	2700	90	NELM-30/40/00-27-90-F	NELM-30/40/00-27-90-D
NELM	3000/4000	3000	90	NELM-30/40/00-30-90-F	NELM-30/40/00-30-90-D
NELM	3000/4000	3500	90	NELM-30/40/00-35-90-F	NELM-30/40/00-35-90-D
NELM	3000/4000	4000	90	NELM-30/40/00-40-90-F	NELM-30/40/00-40-90-D
NELM	3000/4000	2700	95	NELM-30/40/00-27-91-F	NELM-30/40/00-27-91-D
NELM	3000/4000	3000	95	NELM-30/40/00-30-91-F	NELM-30/40/00-30-91-D
NELM	3000/4000	3500	95	NELM-30/40/00-35-91-F	NELM-30/40/00-35-91-D
NELM	3000/4000	4000	95	NELM-30/40/00-40-91-F	NELM-30/40/00-40-91-D

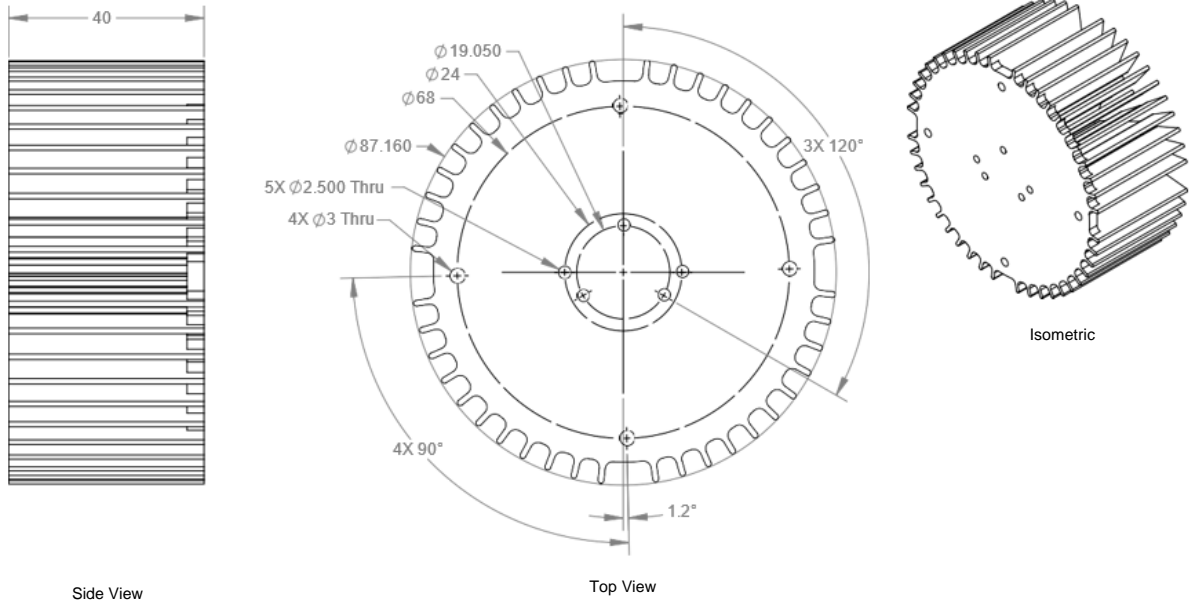
# THERMAL MANAGEMENT GUIDELINES

**CAUTION: Customer is responsible for proper thermal management.**

The NELM is designed to perform in a variety of environments without the need for active cooling. To achieve lifetime and performance estimates, the final luminaire design cannot allow the Tc point shown on page 10 to exceed 85 °C for the light source when the luminaire is at thermal equilibrium. The optional heat sinks shown below are available from New Energy.

## Option 1

NEHS-LM-30-XX Suitable for Standard Modules



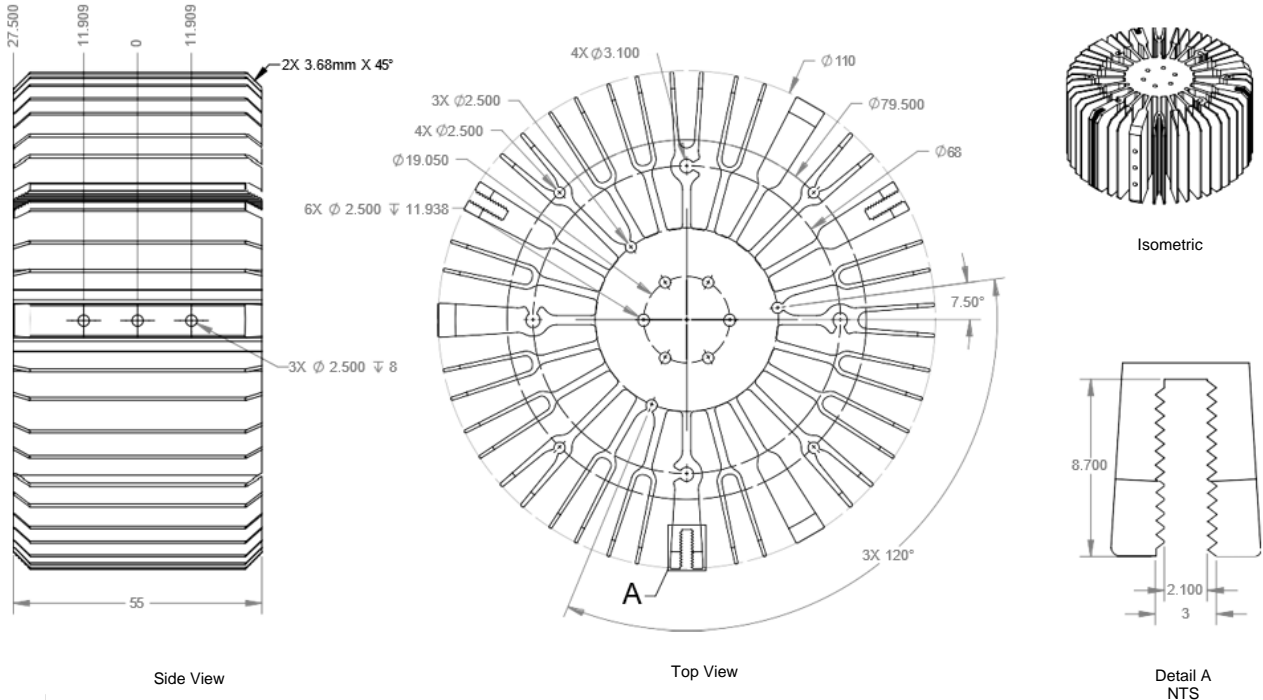
Side View

Top View

Note: Dimensions in Millimeters

## Option 2

NEHS-LM-40-XX Suitable for Performance Modules



Side View

Top View

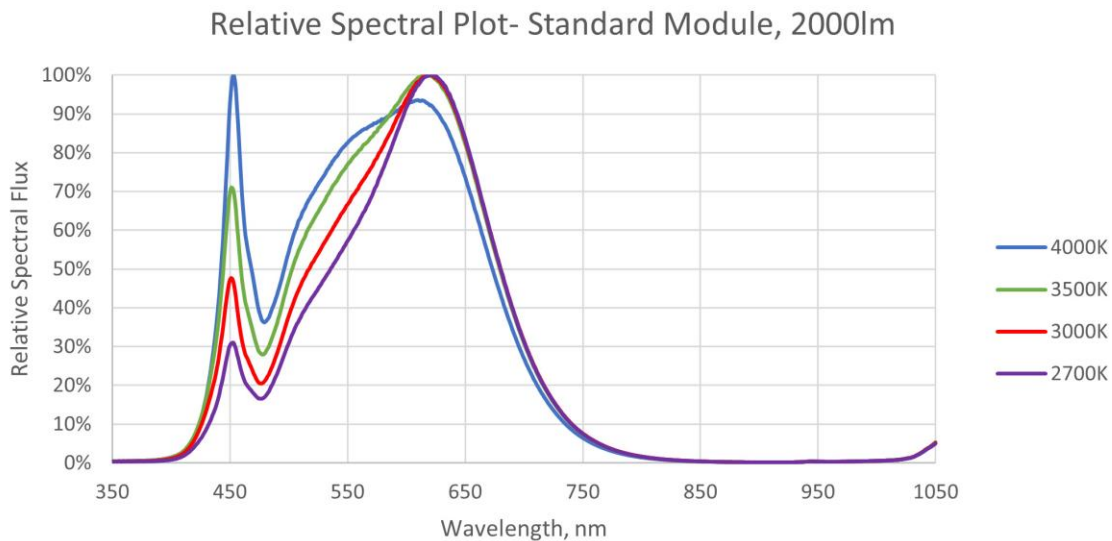
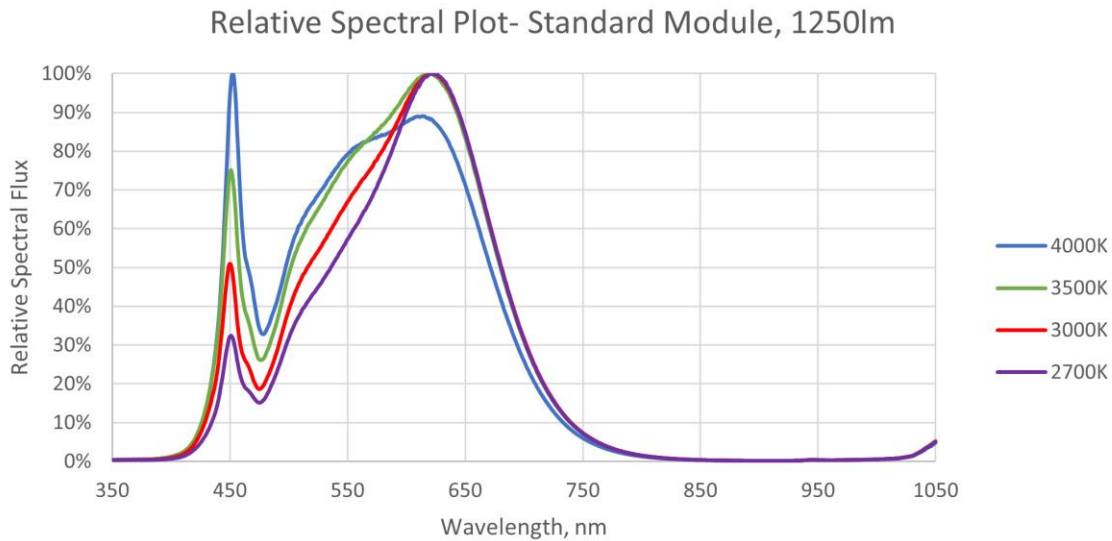
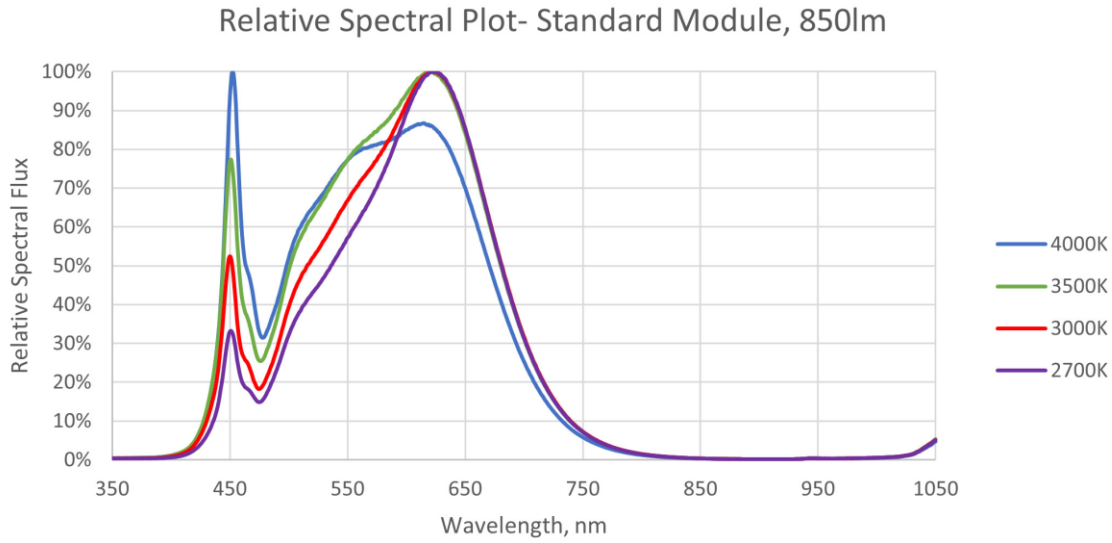
Isometric

Detail A  
NTS

Note: Dimensions in Millimeters

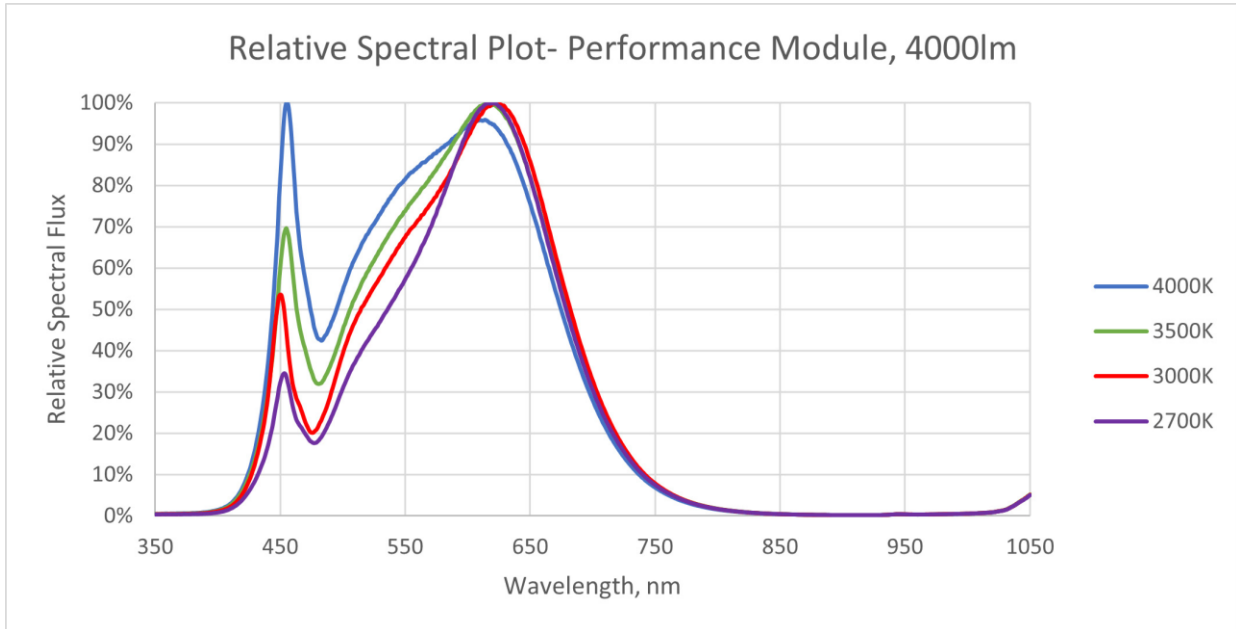
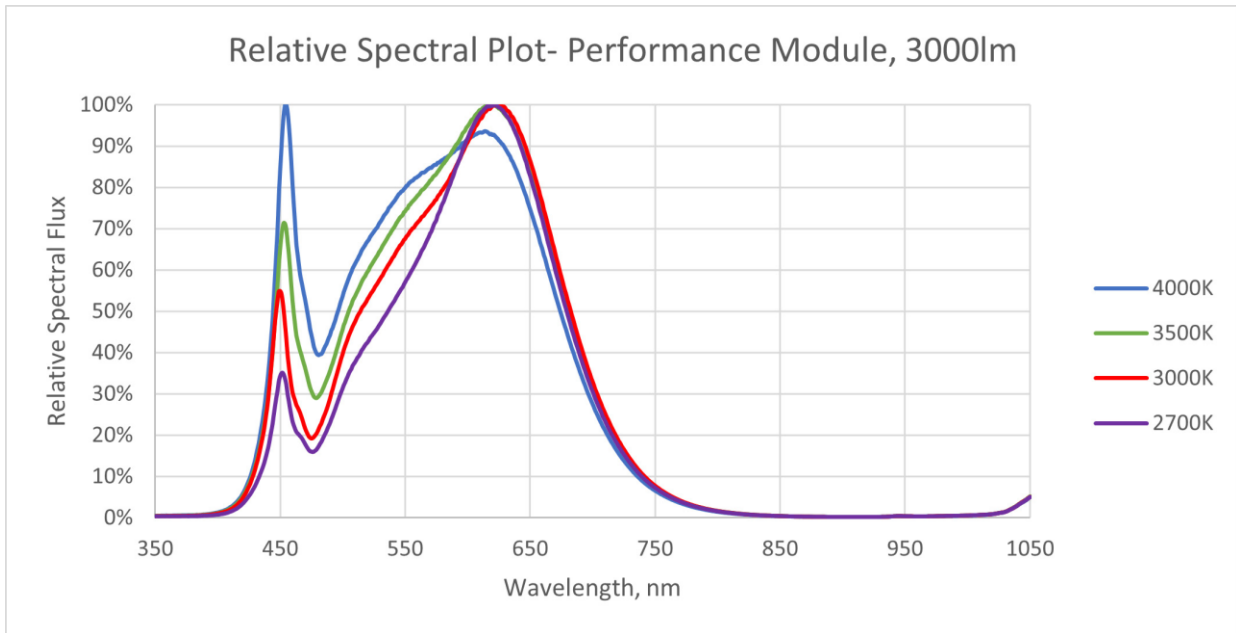
# SPECTRAL DISTRIBUTION

## Standard Module Spectral Plot



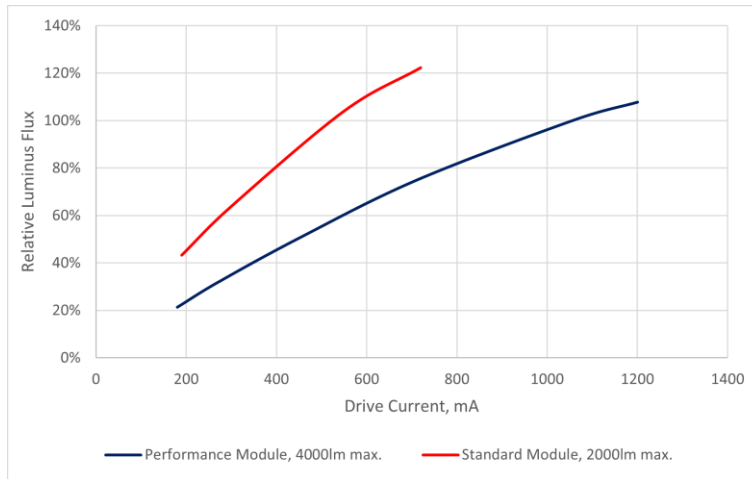
# SPECTRAL DISTRIBUTION

## Performance Module Spectral Plot

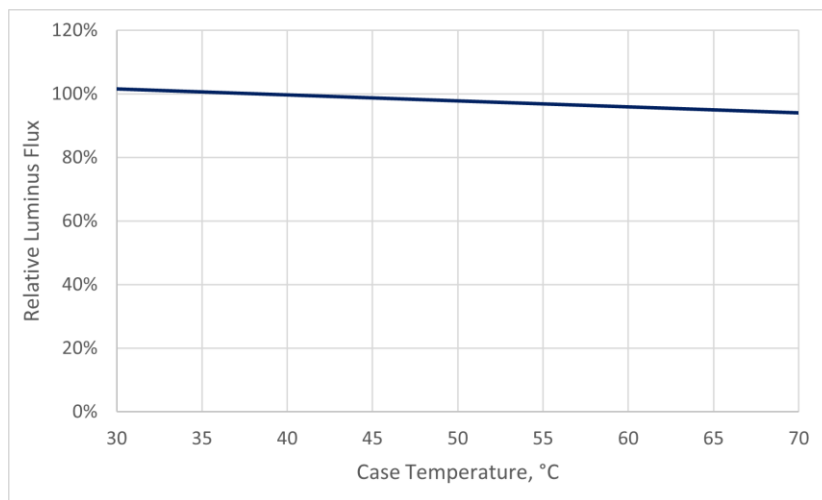


# PERFORMANCE CHARACTERISTICS

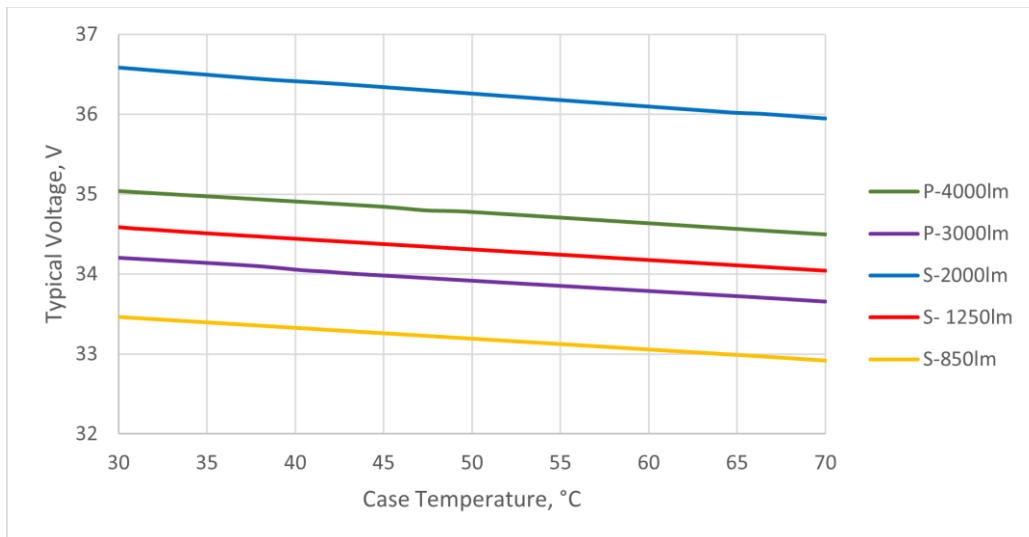
## Relative Luminous Flux vs. Drive Current



## Relative Luminous Flux vs. Case Temperature



## Typical Voltage vs. Case Temperature

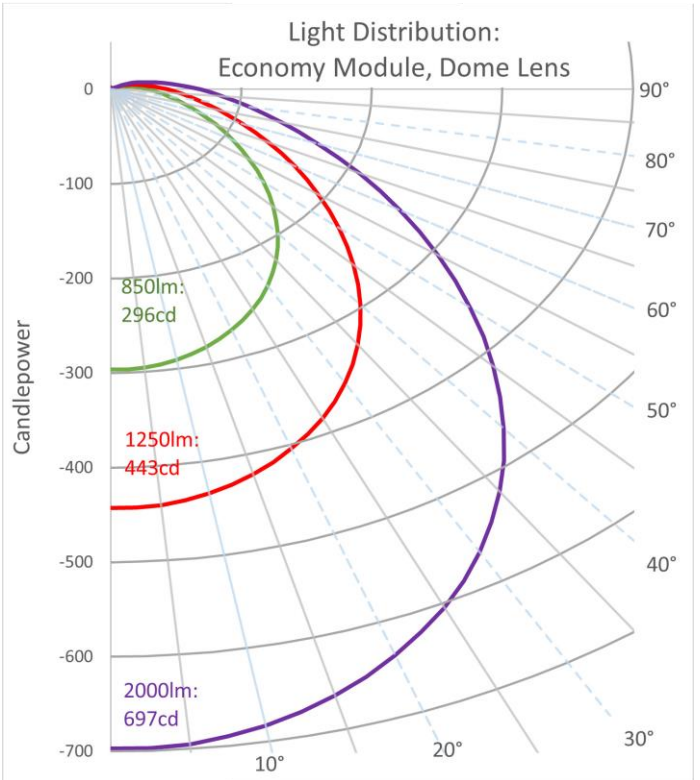


# PHOTOMETRIC DISTRIBUTIONS

## Standard Module

### Dome Lens

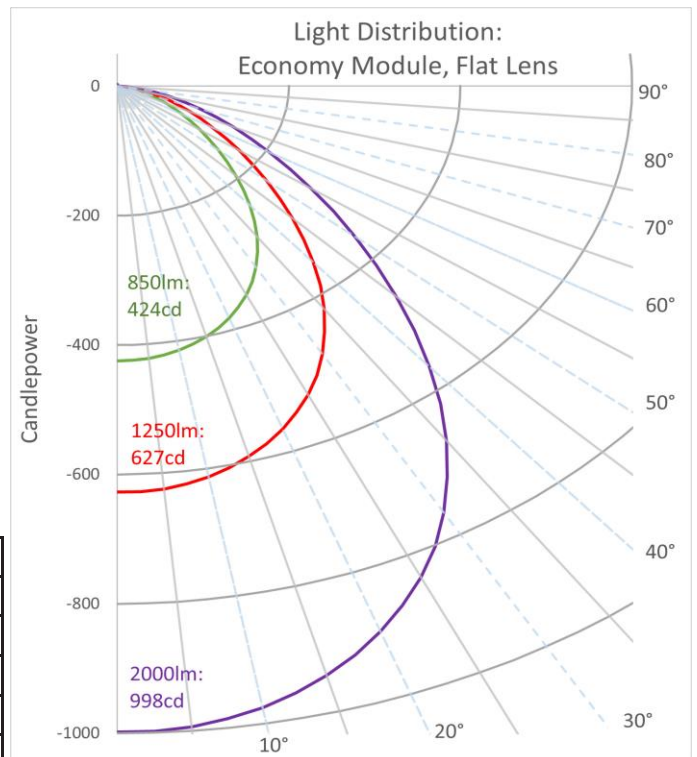
Angle	Intensity (Candlepower)		
	850lm	1250lm	2000lm
0	296	443	697
5	296	442	695
15	282	421	664
25	257	384	605
35	221	330	519
45	176	263	415
55	130	194	306
65	89	134	210
75	58	86	136
85	37	55	86
90	29	43	68



Zonal Lumens				
Zone	Lumens/ 850	Lumens/ 1250	Lumens/ 2000	% Luminaire
0-30	224	330	528	26
0-40	361	531	850	43
0-60	612	900	1440	72
0-90	802	1180	1888	94
0-180	850	1250	2000	100

### Flat Lens

Angle	Intensity (Candlepower)		
	850lm	1250lm	2000lm
0	424	628	998
5	423	625	994
15	401	593	943
25	356	527	838
35	284	420	669
45	196	289	460
55	118	174	277
65	64	94	150
75	28	42	66
85	5	7	11
90	0	0	0



Zonal Lumens				
Zone	Lumens/ 850	Lumens/ 1250	Lumens/ 2000	% Luminaire
0-30	315	463	740	37
0-40	490	721	1154	58
0-60	747	1099	1758	88
0-90	848	1248	1996	100
0-180	850	1250	2000	100



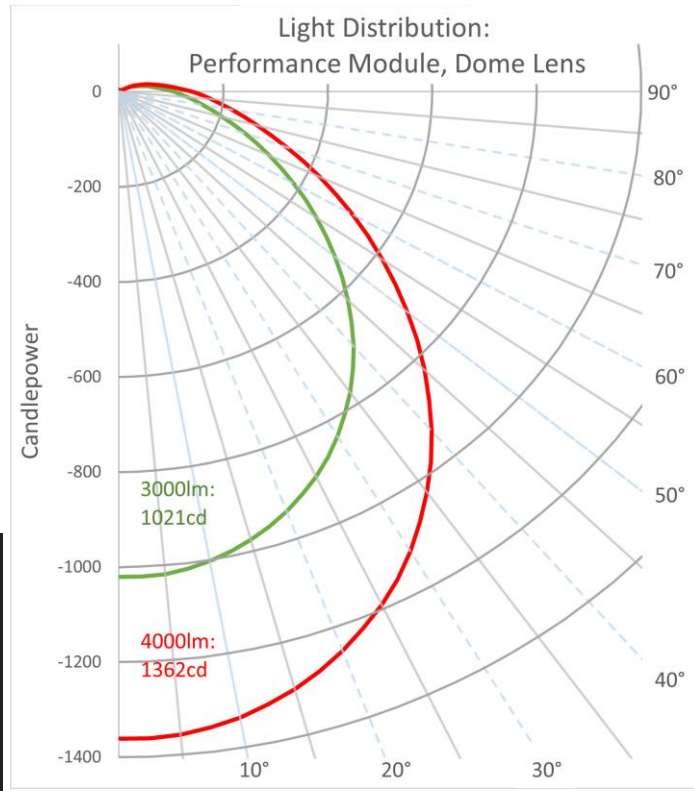
# PHOTOMETRIC DISTRIBUTIONS

## Performance Module

### Dome Lens

Intensity (Candlepower)		
Angle	3000lm	4000lm
0	1021	1362
5	1019	1358
15	976	1301
25	894	1191
35	771	1029
45	621	828
55	462	616
65	319	425
75	206	275
85	133	177
90	105	140

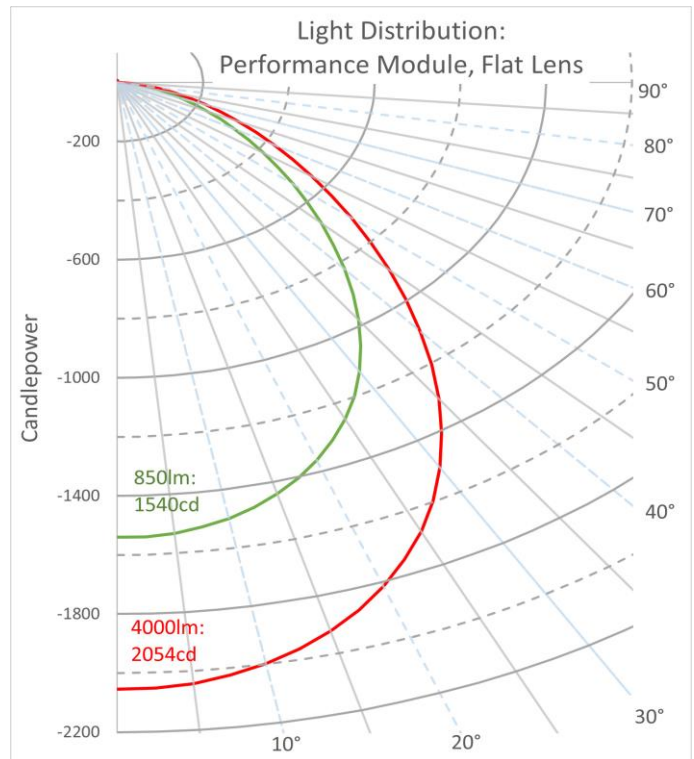
Zonal Lumens			
Zone	Lumens/3000	Lumens/4000	% Luminaire
0-30	780	1040	26
0-40	1260	1680	42
0-60	2148	2864	72
0-90	2829	3772	94
0-180	3000	4000	100



### Flat Lens

Intensity (Candlepower)		
Angle	3000lm	4000lm
0	1540	2054
5	1533	2044
15	1442	1923
25	1258	1677
35	981	1308
45	672	896
55	415	554
65	234	311
75	105	141
85	18	24
90	0	0

Zonal Lumens			
Zone	Lumens/3000	Lumens/4000	% Luminaire
0-30	1122	1496	37
0-40	1731	2308	58
0-60	2622	3496	87
0-90	2994	3992	100
0-180	3000	4000	100



# CHROMATICITY

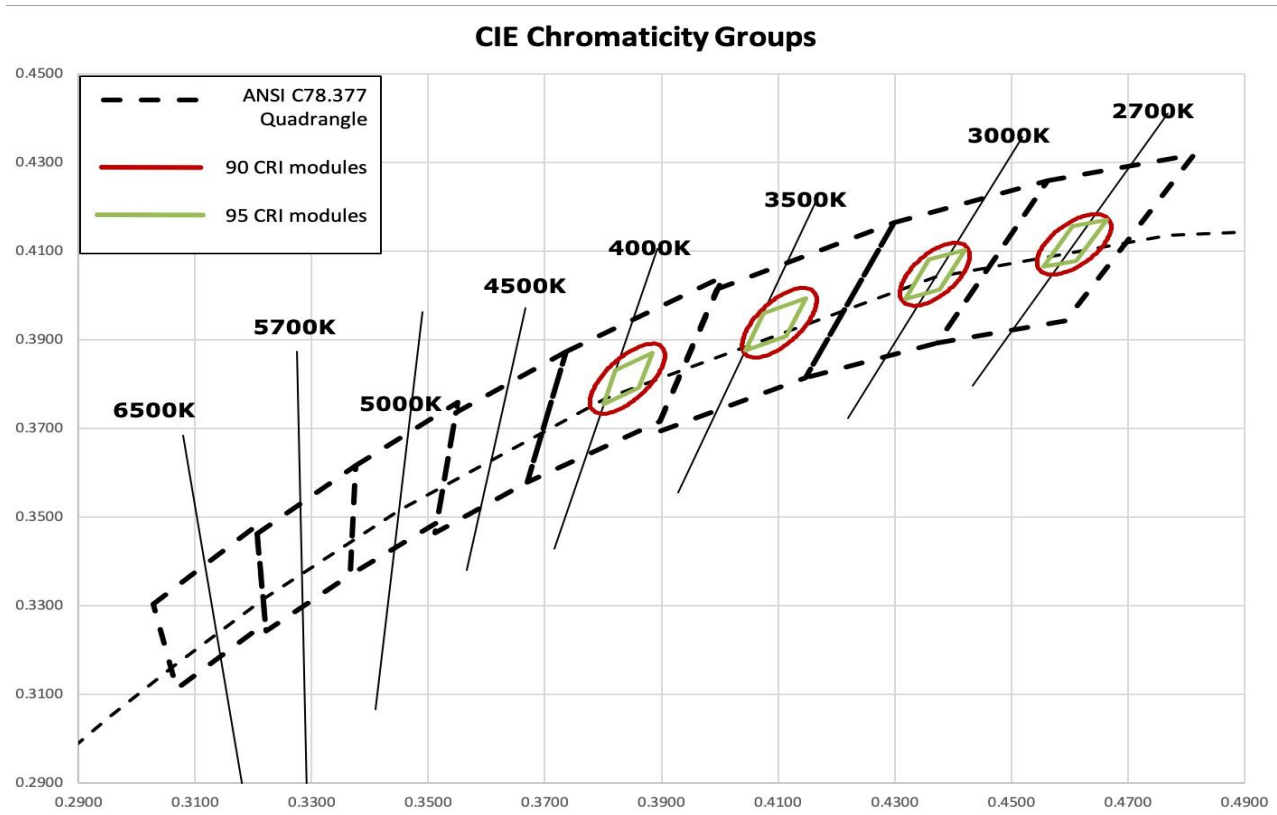
## NELM Chromaticity Group 90

Code	CCT	Center Point		Major Axis	Minor Axis	Rotation Angle
		x	y	a	b	
27	2700K	0.4607	0.4115	0.0083	0.0042	49
30	3000K	0.4368	0.4048	0.0083	0.0040	53
35	3500K	0.4102	0.3939	0.0092	0.0041	54
40	4000K	0.3841	0.3812	0.0093	0.0040	54

## NELM Chromaticity Group 95

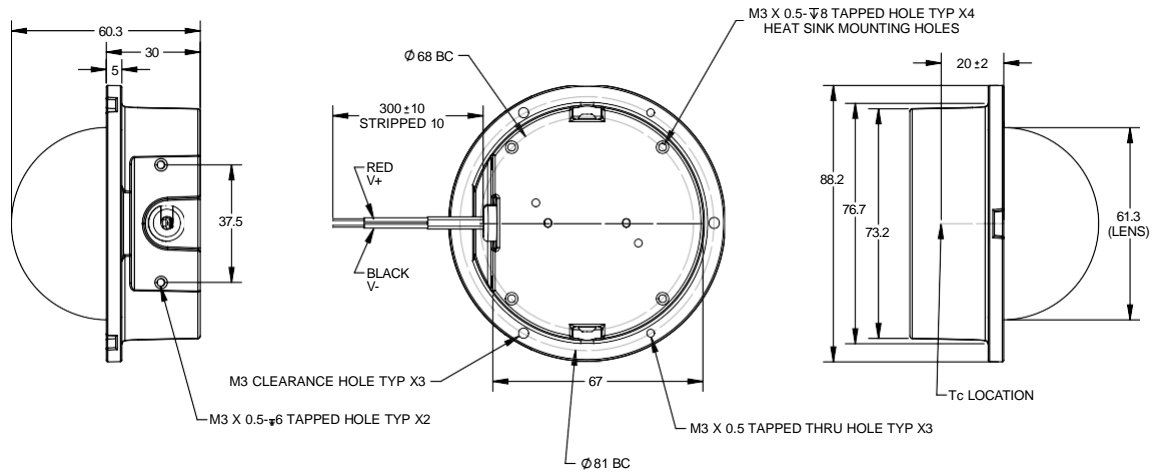
Code	CCT	CCx	CCy	Code	CCT	CCx	CCy
27	2700K	0.4554	0.4064	35	3500K	0.4044	0.3875
		0.4604	0.4156			0.4075	0.3959
		0.4663	0.4170			0.4147	0.3994
		0.4611	0.4078			0.4113	0.3908
30	3000K	0.4317	0.3993	40	4000K	0.3800	0.3754
		0.4358	0.4082			0.3820	0.3831
		0.4420	0.4104			0.3884	0.3870
		0.4377	0.4014			0.3861	0.3792

## ANSI Binning Curve

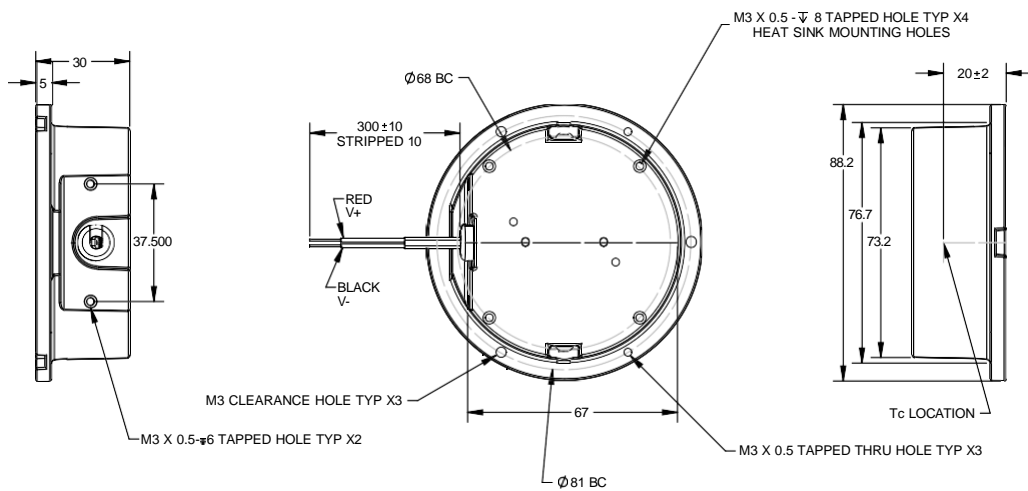


# MECHANICAL DIMENSIONS

## Dome Lens Module



## Flat Lens Module



Dimensions in mm

# PACKAGING

NELM light sources are packaged in boxes of 10, which are then combined in cartons of 5 boxes, or 50 NELM light sources. Box and carton sizes are as follows.

Box of 10 NELM light sources: 320 x 280 x 115 mm

Carton of 5 NELM boxes: 600 x 300 x 350 mm

Optional heat sinks are packaged in boxes of 10. Each box also includes 40 screws. Boxes are combined in cartons as shown below. Box and carton sizes are as follows.

Heat Sink	Order Code	Box Size (mm)	Carton Size (mm)
Optional Heat Sink 1	NEHS-LM-30-XX	450 x 95 x 95	Carton of 5 boxes, or 50 heat sinks: 500 x 460 x 115
Optional Heat Sink 2	NEHS-LM-40-XX	600 x 120 x 120	Carton of 2 boxes, or 20 heat sinks: 620 x 260 x 150

**Disclaimer: Customer is responsible for proper thermal management.**