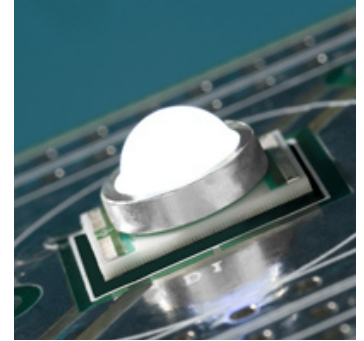


# Cree® XLamp® XR-E and XR-C LED Binning and Labeling

## Introduction

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This document describes the product nomenclature required to select and order Cree's XLamp XR-E and XR-C LEDs. XLamp XR-E and XR-C LEDs are tested and sorted into bins which are then combined into orderable kits identified by an order code.



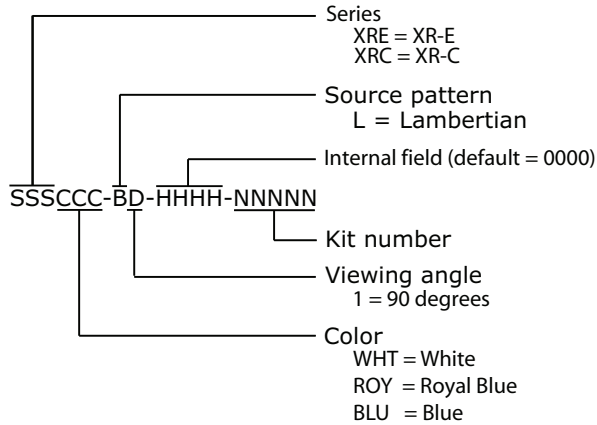
All XLamp LEDs are tested and sorted by color and brightness into a unique bin. Each bin contains LEDs from only one color and brightness group and is uniquely identified by a bin code. White XLamp LEDs are sorted by chromaticity (color) and luminous flux (brightness). Color XLamp LEDs are sorted by dominant wavelength (color) and luminous flux (brightness), or in the case of royal blue, radiant flux (brightness). LEDs are shipped on reels containing LEDs from one bin and are always labeled with the appropriate bin code.

Kits contain LEDs from a number of similar bins and are fully defined by their order codes. A full explanation of the order codes for each family, as well as a list of standard order codes, is provided in this document.

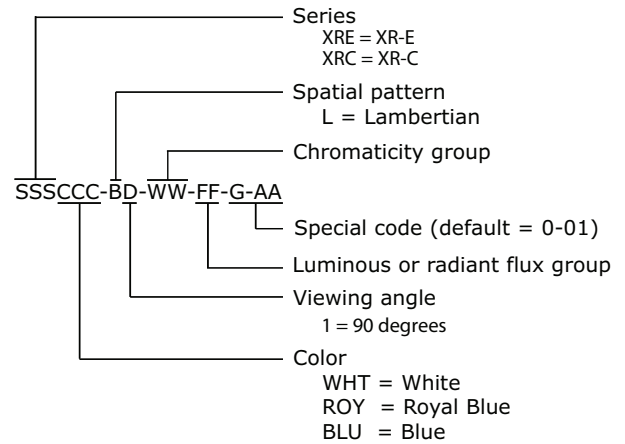
## Bin- and Order-Code Format

Bin codes and order codes are configured in the following manner:

### Order Code



### Bin Code



## Performance Groups – Brightness

White XLamp LEDs are tested for luminous flux and placed into one of the following luminous-flux groups:

Group Code	Min. Luminous Flux @ 350 mA (lm)	Max. Luminous Flux @ 350 mA (lm)
M2	39.8	45.7
M3	45.7	51.7
N2	51.7	56.8
N3	56.8	62.0
N4	62.0	67.2
P2	67.2	73.9
P3	73.9	80.6
P4	80.6	87.4
Q2	87.4	93.9
Q3	93.9	100
Q4	100	107
Q5	107	114

Color XLamp LEDs are tested for luminous flux and placed into one of the following luminous-flux groups:

Group	Min. Luminous Flux @ 350 mA (lm)	Max. Luminous Flux @ 350 mA (lm)
G0	13.9	18.1
H0	18.1	23.5
J0	23.5	30.6
K0	30.6	39.8
M0	39.8	51.7

Royal-blue XLamp LEDs are tested for radiant flux and placed into one of the following radiant-flux groups:

Group	Min. Radiant Flux (mW) @ 350 mA	Max. Radiant Flux (mW) @ 350 mA
12	250	300
13	300	350
14	350	425
15	425	500
16	500	600

## Performance Groups – Chromaticity

White XLamp LEDs are tested for chromaticity and placed into one of the regions defined by the bounding coordinates below.

White Chromaticity Region Bounding Coordinates

Region	x	y	Region	x	y
WK	.283	.284	WF	.314	.355
	.295	.297		.316	.332
	.298	.288		.306	.322
	.287	.276		.301	.342
WA	.292	.306	WP	.317	.319
	.295	.297		.329	.330
	.283	.284		.329	.318
	.279	.291		.318	.308
WM	.295	.297	WD	.329	.345
	.308	.311		.329	.330
	.310	.300		.317	.319
	.298	.288		.316	.332
WB	.306	.322	WG	.329	.369
	.308	.311		.329	.345
	.295	.297		.316	.332
	.292	.306		.314	.355
WE	.301	.342	WJ	.329	.330
	.306	.322		.329	.345
	.292	.306		.346	.359
	.287	.321		.344	.342
WN	.308	.311	WH	.348	.384
	.317	.319		.346	.359
	.318	.308		.329	.345
	.310	.300		.329	.369
WC	.316	.332			
	.317	.319			
	.308	.311			
	.306	.322			

## Performance Groups – Chromaticity (continued)

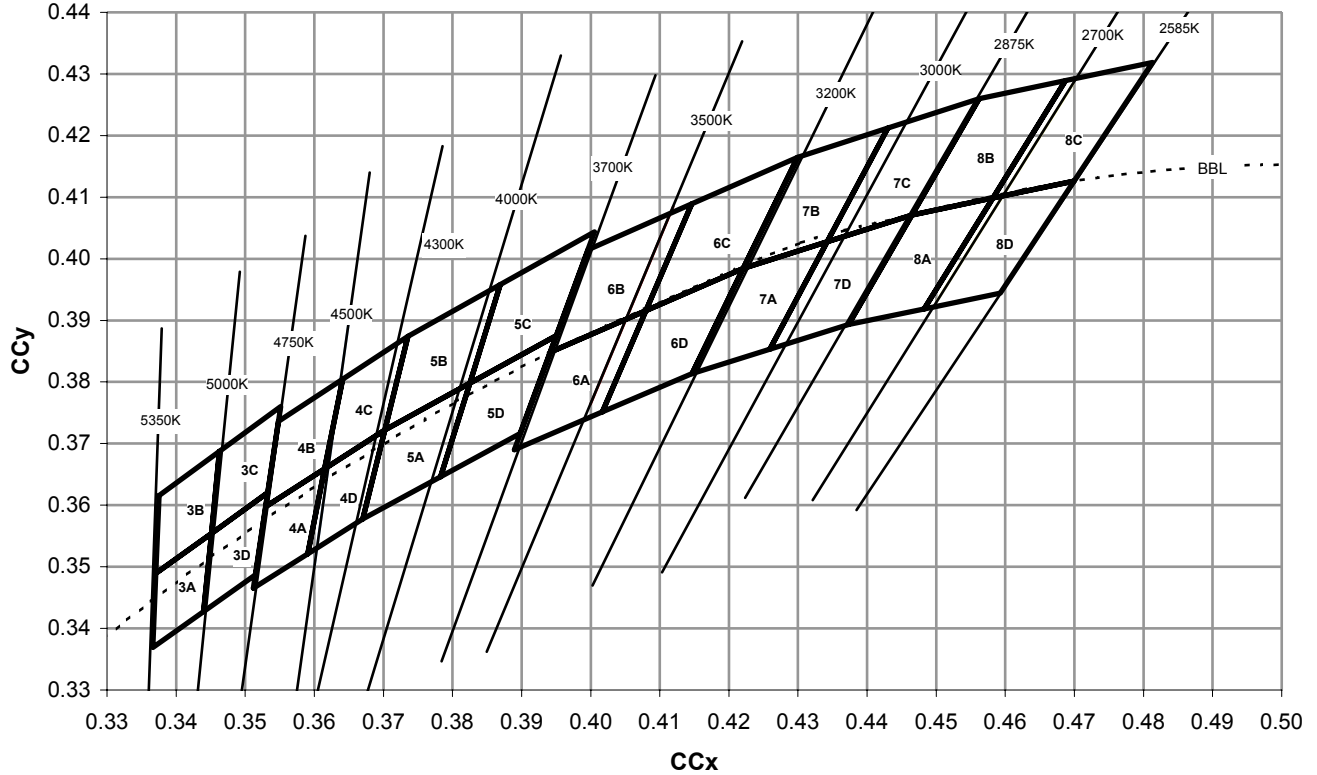
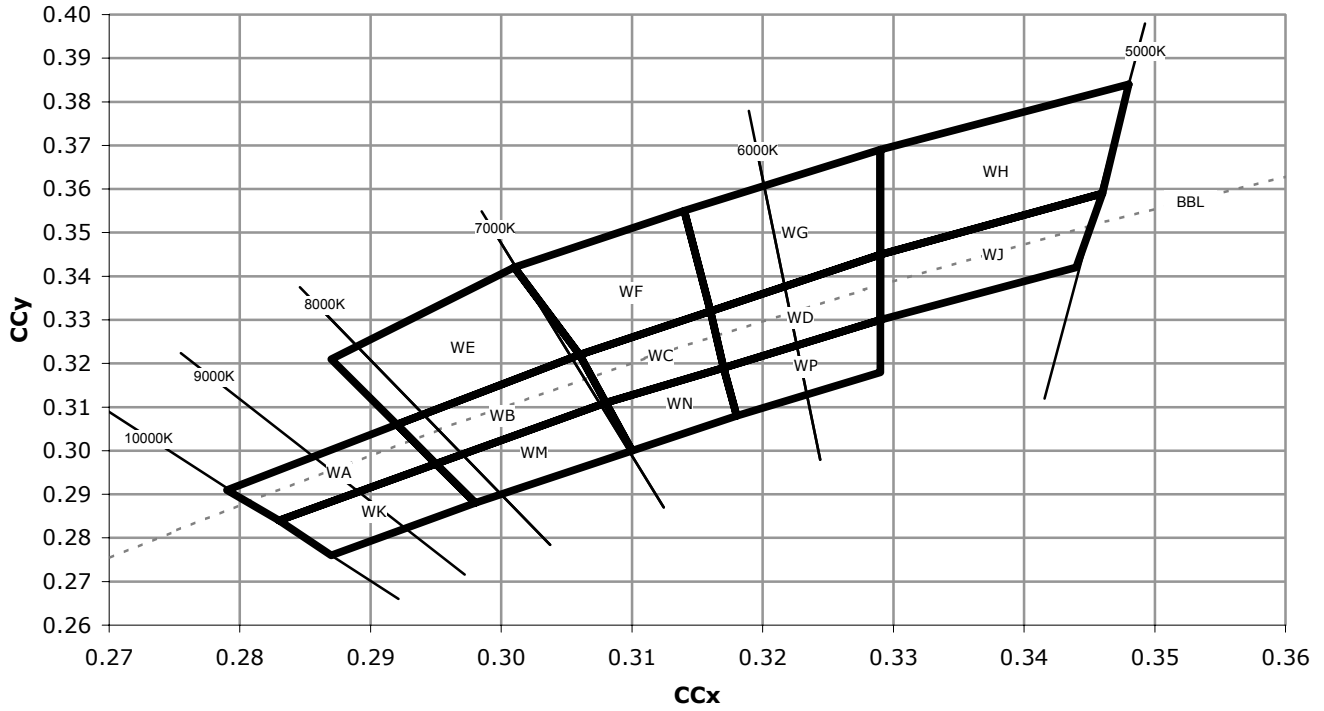
Region	x	y	Region	x	y	Region	x	y	Region	x	y
3A	.3371	.3490	3B	.3376	.3616	3C	.3463	.3687	3D	.3451	.3554
	.3451	.3554		.3463	.3687		.3551	.3760		.3533	.3620
	.3440	.3428		.3451	.3554		.3533	.3620		.3515	.3487
	.3366	.3369		.3371	.3490		.3451	.3554		.3440	.3428
4A	.3512	.3465	4B	.3529	.3597	4C	.3615	.3659	4D	.3590	.3521
	.3529	.3597		.3548	.3736		.3641	.3804		.3615	.3659
	.3615	.3659		.3641	.3804		.3736	.3874		.3702	.3722
	.3590	.3521		.3615	.3659		.3702	.3722		.3670	.3578
5A	.3670	.3578	5B	.3702	.3722	5C	.3825	.3798	5D	.3783	.3646
	.3702	.3722		.3736	.3874		.3869	.3958		.3825	.3798
	.3825	.3798		.3869	.3958		.4006	.4044		.3950	.3875
	.3783	.3646		.3825	.3798		.3950	.3875		.3898	.3716
6A	.3889	.3690	6B	.3941	.3848	6C	.4080	.3916	6D	.4017	.3751
	.3941	.3848		.3996	.4015		.4146	.4089		.4080	.3916
	.4080	.3916		.4146	.4089		.4299	.4165		.4221	.3984
	.4017	.3751		.4080	.3916		.4221	.3984		.4147	.3814
7A	.4147	.3814	7B	.4221	.3984	7C	.4342	.4028	7D	.4259	.3853
	.4221	.3984		.4299	.4165		.4430	.4212		.4342	.4028
	.4342	.4028		.4430	.4212		.4562	.4260		.4465	.4071
	.4259	.3853		.4342	.4028		.4465	.4071		.4373	.3893
8A	.4373	.3893	8B	.4465	.4071	8C	.4582	.4099	8D	.4483	.3919
	.4465	.4071		.4562	.4260		.4687	.4289		.4582	.4099
	.4582	.4099		.4687	.4289		.4813	.4319		.4700	.4126
	.4483	.3919		.4582	.4099		.4700	.4126		.4593	.3944

## Performance Groups – Dominant Wavelength

Royal blue and blue XLamp LEDs are tested for dominant wavelength (DWL) and placed into one of the DWL groups defined below.

Color	DWL Group	Min. DWL (nm) @ 350 mA	Max. DWL (nm) @ 350 mA
Royal Blue	D3	450	455
	D4	455	460
	D5	460	465
Blue	B3	465	470
	B4	470	475
	B5	475	480
	B6	480	485

**Cree's Standard Chromaticity Regions Plotted on the 1931 CIE Curve**



## Standard Order Codes and Bins (XR-C Cool White)

The following tables list standard kit numbers and performance bins. Kit numbers completely describe an order code's chromaticity regions and luminous flux range.

XLamp XR-C LED Standard Order Codes - White			
Min. Luminous Flux (lm) @ 350 mA		Chromaticity Regions	Kit Number
Group	Flux (lm)		
Cool White (5000 K - 10,000 K)			
M3	45.7	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00301
		WC, WD, WF, WG	00302
		WC, WD, WF, WG, WH, WJ, WN, WP	00303
N2	51.7	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00401
		WC, WD, WF, WG	00402
		WC, WD, WF, WG, WH, WJ, WN, WP	00403
N3	56.8	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00501
		WC, WD, WF, WG	00502
		WC, WD, WF, WG, WH, WJ, WN, WP	00503

For other flux and chromaticity combinations, contact Cree or an authorized distributor.

## Standard Order Codes and Bins (XR-C Neutral and Warm White)

The following tables list standard kit numbers and performance bins. Kit numbers completely describe an order code's chromaticity regions and luminous flux range.

XLamp XR-C LED Standard Order Codes - White			
Min Luminous Flux (lm) @ 350 mA		Chromaticity Regions	Kit Number
Group	Flux (lm)		
Neutral White (3700 K – 5000 K)			
M3	45.7	3A, 3B, 3C, 3D	003E3
		3C, 3D, 4A, 4B	003F4
		4A, 4B, 4C, 4D	003E4
		4C, 4D, 5A, 5B	003F5
		5A, 5B, 5C, 5D	003E5
		5C, 5D, 6A, 6B	003F6
N2	51.7	3A, 3B, 3C, 3D	004E3
		3C, 3D, 4A, 4B	004F4
		4A, 4B, 4C, 4D	004E4
		4C, 4D, 5A, 5B	004F5
		5A, 5B, 5C, 5D	004E5
		5C, 5D, 6A, 6B	004F6
N3	56.8	3A, 3B, 3C, 3D	005E3
		3C, 3D, 4A, 4B	005F4
		4A, 4B, 4C, 4D	005E4
		4C, 4D, 5A, 5B	005F5
		5A, 5B, 5C, 5D	005E5
		5C, 5D, 6A, 6B	005F6
Warm White (2600 K – 3700 K)			
M2	39.8	6A, 6B, 6C, 6D	002E6
		6C, 6D, 7A, 7B	002F7
		7A, 7B, 7C, 7D	002E7
		7C, 7D, 8A, 8B	002F8
		8A, 8B, 8C, 8D	002E8
M3	45.7	6A, 6B, 6C, 6D	003E6
		6C, 6D, 7A, 7B	003F7
		7A, 7B, 7C, 7D	003E7
		7C, 7D, 8A, 8B	003F8
		8A, 8B, 8C, 8D	003E8
N2	51.7	6A, 6B, 6C, 6D	004E6
		6C, 6D, 7A, 7B	004F7
		7A, 7B, 7C, 7D	004E7
		7C, 7D, 8A, 8B	004F8
		8A, 8B, 8C, 8D	004E8

For other flux and chromaticity combinations, contact Cree or an authorized distributor.



## Standard Order Codes and Bins (XR-E Cool White)

The following tables list standard kit numbers and performance bins. Kit numbers completely describe an order code's chromaticity regions and luminous flux range.

XLamp XR-E LED Standard Order Codes - White			
Min. Luminous Flux (lm) @ 350 mA		Chromaticity Regions	Kit Number
Group	Flux (lm)		
Cool White (5000 K - 10,000 K)			
N4	62.0	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00601
		WC, WD, WF, WG	00602
		WC, WD, WF, WG, WH, WJ, WN, WP	00603
P2	67.2	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00701
		WC, WD, WF, WG	00702
		WC, WD, WF, WG, WH, WJ, WN, WP	00703
P3	73.9	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00801
		WC, WD, WF, WG	00802
		WC, WD, WF, WG, WH, WJ, WN, WP	00803
P4	80.6	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00901
		WC, WD, WF, WG	00902
		WC, WD, WF, WG, WH, WJ, WN, WP	00903
Q2	87.4	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00A01
		WC, WD, WF, WG	00A02
		WC, WD, WF, WG, WH, WJ, WN, WP	00A03
Q3	93.9	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00B01
		WC, WD, WF, WG	00B02
		WC, WD, WF, WG, WH, WJ, WN, WP	00B03
Q4	100	WA, WB, WC, WD, WE, WF, WG, WH, WJ, WK, WM, WN, WP	00C01
		WC, WD, WF, WG	00C02
		WC, WD, WF, WG, WH, WJ, WN, WP	00C03

For other flux and chromaticity combinations, contact Cree or an authorized distributor.

## Standard Order Codes and Bins (XR-E Neutral and Warm White)

The following tables list standard kit numbers and performance bins. Kit numbers completely describe an order code's chromaticity regions and luminous flux range.

XLamp XR-E LED Standard Order Codes - White			
Minimum Luminous Flux (lm) @ 350 mA		Chromaticity Regions	Kit Number
Group	Flux (lm)		
Neutral White (3700 K – 5000 K)			
N4	62.0	3A, 3B, 3C, 3D	006E3
		3C, 3D, 4A, 4B	006F4
		4A, 4B, 4C, 4D	006E4
		4C, 4D, 5A, 5B	006F5
		5A, 5B, 5C, 5D	006E5
		5C, 5D, 6A, 6B	006F6
P2	67.2	3A, 3B, 3C, 3D	007E3
		3C, 3D, 4A, 4B	007F4
		4A, 4B, 4C, 4D	007E4
		4C, 4D, 5A, 5B	007F5
		5A, 5B, 5C, 5D	007E5
		5C, 5D, 6A, 6B	007F6
P3	73.9	3A, 3B, 3C, 3D	008E3
		3C, 3D, 4A, 4B	008F4
		4A, 4B, 4C, 4D	008E4
		4C, 4D, 5A, 5B	008F5
		5A, 5B, 5C, 5D	008E5
		5C, 5D, 6A, 6B	008F6
Warm White (2600 K – 3700 K)			
N3	56.8	6A, 6B, 6C, 6D	005E6
		6C, 6D, 7A, 7B	005F7
		7A, 7B, 7C, 7D	005E7
		7C, 7D, 8A, 8B	005F8
		8A, 8B, 8C, 8D	005E8
N4	62.0	6A, 6B, 6C, 6D	006E6
		6C, 6D, 7A, 7B	006F7
		7A, 7B, 7C, 7D	006E7
		7C, 7D, 8A, 8B	006F8
		8A, 8B, 8C, 8D	006E8

For other flux and chromaticity combinations, contact Cree or an authorized distributor.

## Standard Order Codes and Bins (Blue)

The following tables list standard kit numbers and performance bins. Kit numbers completely describe an order code's dominant-wavelength range and luminous- or radiant-flux range.

XLamp XR-E LED Standard Order Codes – Blue						
Min. Luminous Flux (lm) @ 350 mA		Dominant Wavelength (nm)				Kit Number
		Min.		Max.		
Group	Flux (lm)	Group	DWL (nm)	Group	DWL (nm)	
H0	18.1	B3	465	B4	475	00H02
H0	18.1	B4	470	B5	480	00H03
J0	23.5	B4	470	B5	480	00J03

XLamp XR-E LED Standard Order Codes – Royal Blue						
Min. Radiant Flux (mW) @ 350 mA		Dominant Wavelength (nm)				Kit Number
		Min.		Max.		
Group	Flux (mW)	Group	DWL (nm)	Group	DWL (nm)	
12	250	D3	450	D5	465	00701
13	300	D3	450	D5	465	00801

For other flux and dominant wavelength combinations, contact Cree or an authorized distributor.