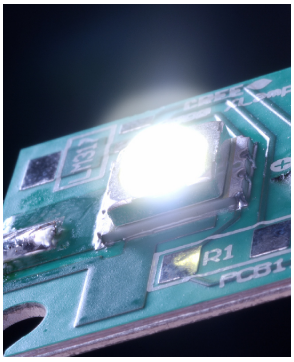
Cree® XLamp® 3 7090 LED
Binning and Labeling



Cree XLamp 3 7090 LEDs combine the brightness of power LED chips with a rugged package capable of operating in excess of three watts. XLamp LEDs lead the solid-state lighting industry in brightness while providing a reflow-solderable design that is optimized for ease-of-use and thermal management. Lighting applications featuring XLamp LEDs maximize light output and increase design flexibility, while minimizing environmental impact.

This application note describes Cree's procedures for sorting XLamp 3 7090 LEDs by color (dominant wavelength or chromaticity) and brightness (flux) and then lists the order codes encompassing these color and brightness groups for easy reference.

Nomenclature

XLamp LEDs are tested and sorted into performance bins. A bin is specified by ranges of dominant wavelength and brightness. Sorted XLamp LEDs are packaged on reels. A reel contains lamps from one bin and is labeled with its bin code. For more information on packaging see the XLamp 3 7090 Data Sheet.

XLamp LEDs are sold by order codes in combinations of bins called kits. Kits include a minimum of two dominant wavelength groups and two brightness groups. Order codes are configured in the following manner:

Family	Color	Spatial Pattern	Viewing Angle (degrees)	Kit # Combination of bins
3XL7090	RY	L – Lambertian	100	0001-9999
	BL	G- Global*		
	CN			
	GR			
	AM			
	RO			
	RD			
	CW			

*Global—is an alternative white product that has higher efficacy with slightly lower color uniformity.

XLamp LED order codes specify package family, color, optical configuration (spatial pattern and viewing angle) and kit number (combination of bins).

Kit number 0001 is always the order code encompassing the broadest range of color and brightness groups.

Performance Groups – Brightness

XLamp LEDs that are tested for luminous flux are placed into one of the following groups:

Group	Minimum Luminous Flux (lm) @ 700mA	Maximum Luminous Flux (lm) @ 700mA
H	18.1	23.5
J	23.5	30.6
K	30.6	39.8
M	39.8	51.7
N	51.7	67.2
P	67.2	87.4
Q	87.4	113.6
R	113.6	

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

Group	Minimum Radiant Flux (mW) @ 700mA	Maximum Radiant Flux (mW) @ 700mA
13	300	350
14	350	425
15	425	500
16	500	600

Performance Groups – Dominant Wavelength (DWL)

Monochromatic XLamp LEDs are tested for dominant wavelength and placed into one of the following groups.

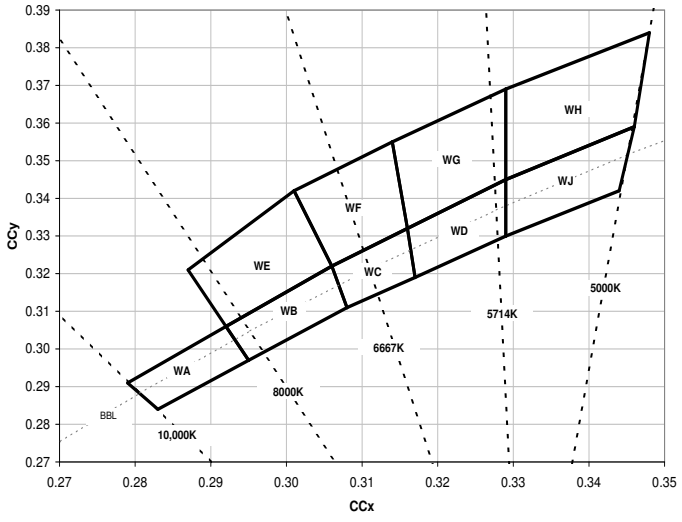
Color	DWL Group	Min. DWL (nm) @ 700mA	Max. DWL (nm) @ 700mA
Royal Blue	D4	455	460
	D5	460	465
Blue	B3	465	470
	B4	470	475
Cyan	C2	500	505
	C3	505	510
Green	G2	520	525
	G3	525	530
	G4	530	535
Amber	A2	585	590
	A3	590	595
Red-Orange	O3	610	615
	O4	615	620
Red	R2	620	625
	R3	625	630
	R4	630	635

Performance Groups – Chromaticity

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

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

Cree's standard chromaticity regions plotted on the 1931 CIE Curve.



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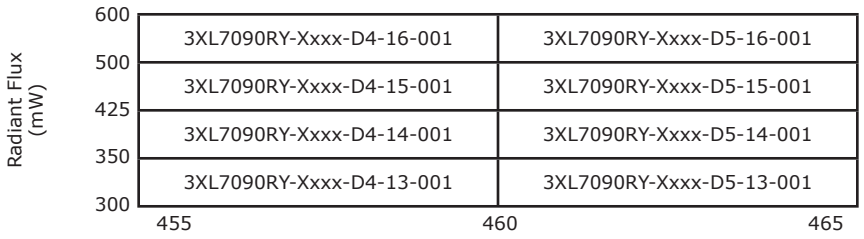
Standard Order Codes and Bins

The following tables list standard order code configurations and performance bins. Contact Cree Lighting at +1 919.313.5300 if custom order codes are required.

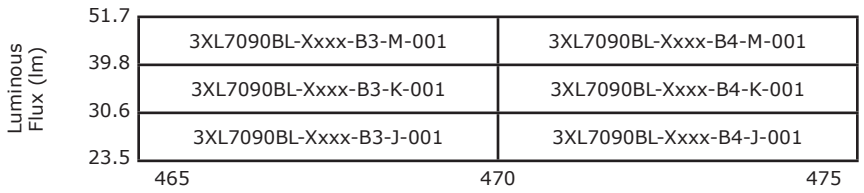
Standard Order Codes – Royal Blue					
Order Code	Bins	DWL (nm)		Radiant Flux (mW)	
		Min.	Max.	Min.	Max.
3XL7090RY-L100-0001	ALL	455	465	ALL	

Standard Bins – Royal Blue



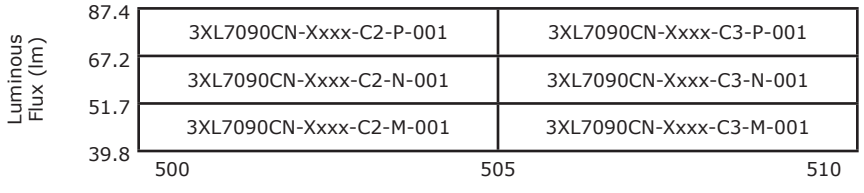
Standard Order Codes – Blue					
Order Code	Bins	DWL (nm)		Luminous Flux (lm)	
		Min.	Max.	Min.	Max.
3XL7090BL-L100-0001	ALL	465	475	ALL	

Standard Bins – Blue



Standard Order Codes – Cyan					
Order Code	Bins	DWL (nm)		Luminous Flux (lm)	
		Min.	Max.	Min.	Max.
3XL7090CN-L100-0001	ALL	500	510	ALL	

Standard Bins – Cyan



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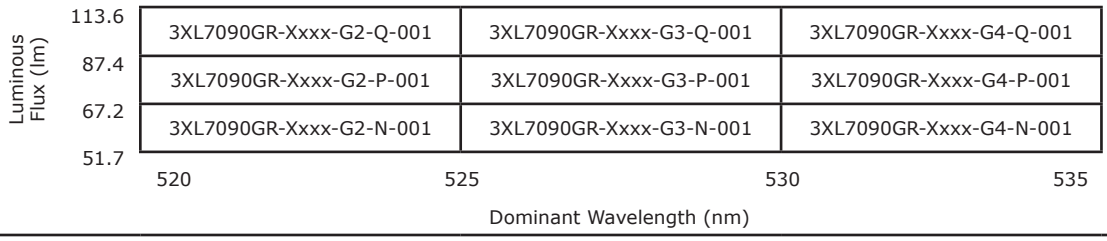
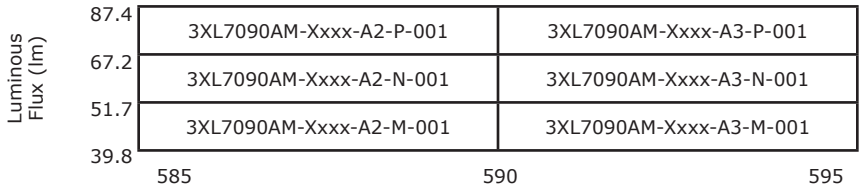
Standard Order Codes – Green					
Order Code	Bins	DWL (nm)		Luminous Flux (lm)	
		Min.	Max.	Min.	Max.
3XL7090GR-L100-0001	ALL	520	535	ALL	

Standard Bins – Green



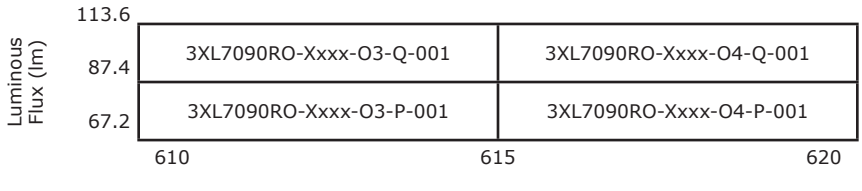
Standard Order Codes – Amber					
Order Code	Bins	DWL (nm)		Luminous Flux (lm)	
		Min.	Max.	Min.	Max.
3XL7090AM-L100-0001	ALL	585	595	ALL	

Standard Bins – Amber



Standard Order Codes – Red-Orange					
Order Code	Bins	DWL (nm)		Luminous Flux (lm)	
		Min.	Max.	Min.	Max.
3XL7090RO-L100-0001	ALL	610	620	ALL	

Standard Bins – Red-Orange



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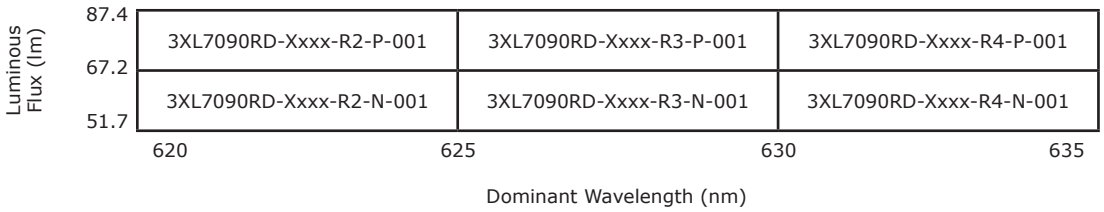
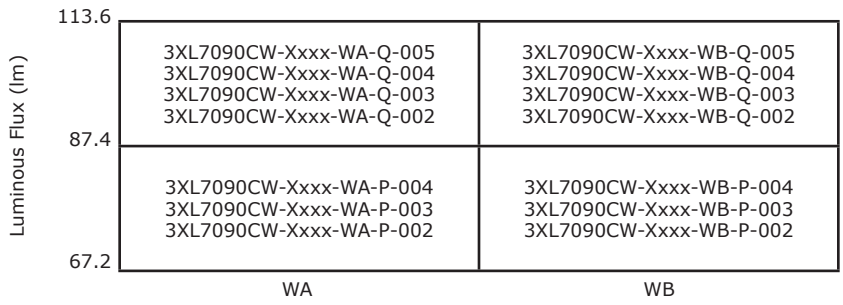
Standard Order Codes – Red					
Order Code	Bins	DWL (nm)		Luminous Flux (lm)	
		Min.	Max.	Min.	Max.
3XL7090RD-L100-0001	ALL	620	635	ALL	

Standard Bins – Red

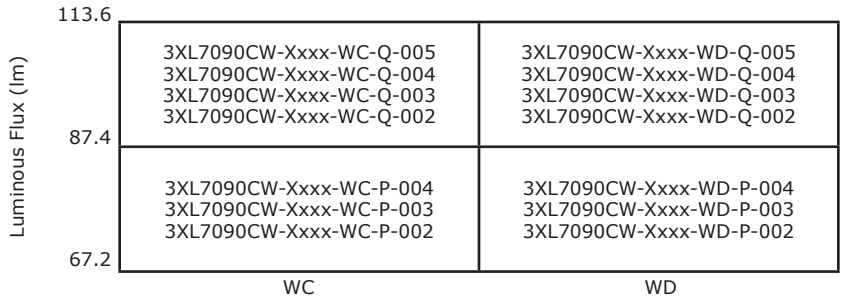


Standard Order Codes – White										
Order Code	WA	WB	WC	WD	WE	WF	WG	WH	WJ	Lum. Flux (lm)
3XL7090CW-L100-0001	X	X	X	X	X	X	X	X	X	ALL
3XL7090CW-L100-0010			X	X		X	X			
3XL7090CW-G100-0001	X	X	X	X	X	X	X	X	X	ALL

Standard Bins – White



Standard Bins – White



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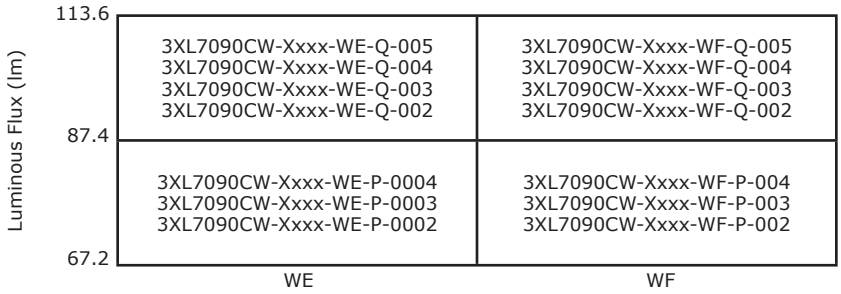
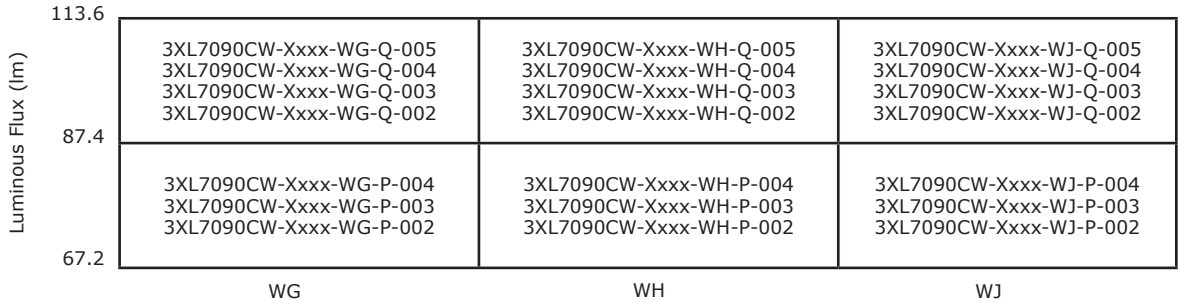
Standard Bins – White



Standard Bins – White



In order to minimize the perceived luminous flux variation among white lamps from the same reel, Cree bins to tighter luminous flux sub-groups. These sub-groups are defined below. Cree does not take orders for specific sub-groups.

Group Code	Minimum Luminous Flux (lm)	Maximum Luminous Flux (lm)
P-002	67.2	73.9
P-003	73.9	80.6
P-004	80.6	87.4
Q-002	87.4	93.9
Q-003	93.9	100.4
Q-004	100.4	107.0
Q-005*	107.0	113.6

* not yet available

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