

# Cree® XLamp® ML-E LED

## Binning and Labeling



### Introduction

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This document describes the product nomenclature required to select and order Cree’s XLamp ML-E LEDs. XLamp ML-E 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). 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 XLamp ML-E LEDs, as well as a list of standard order codes, is provided in this document.

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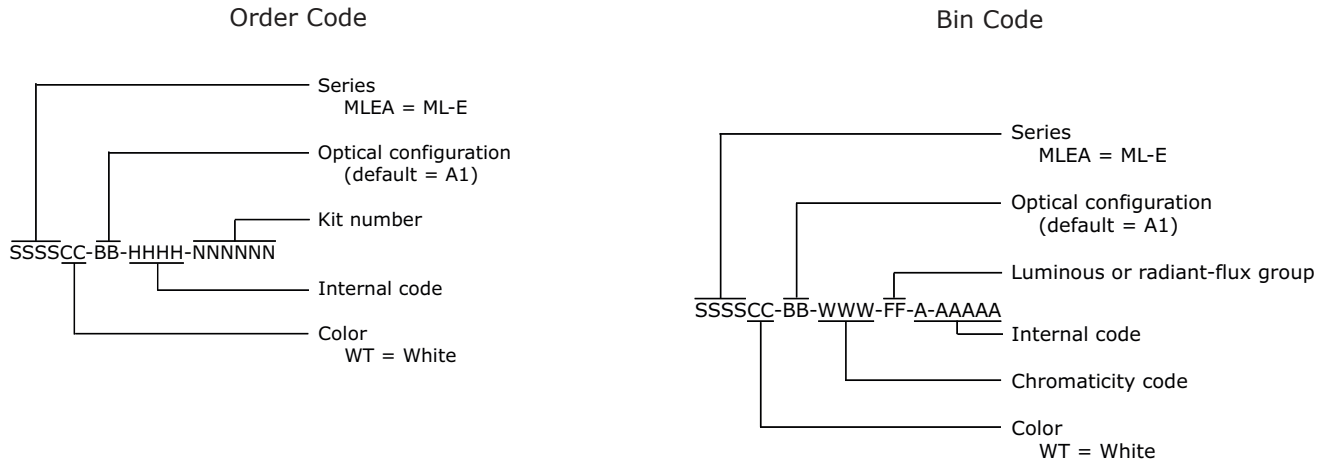
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## Bin and Order-Code Format

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



## Performance Groups – Brightness

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

Group Code	Min. Luminous Flux @ 150 mA (lm)	Max. Luminous Flux @ 150 mA (lm)
K2	30.6	35.2
K3	35.2	39.8
M2	39.8	45.7
M3	45.7	51.7
N2	51.7	56.8
N3	56.8	62



## Performance Groups – Chromaticity

Region	x	y	Region	x	y	Region	x	y	Region	x	y
0A	0.2950	0.2970	0B	0.2920	0.3060	0C	0.2984	0.3133	0D	0.2984	0.3133
	0.2920	0.3060		0.2895	0.3135		0.2962	0.3220		0.3048	0.3207
	0.2984	0.3133		0.2962	0.3220		0.3028	0.3304		0.3068	0.3113
	0.3009	0.3042		0.2984	0.3133		0.3048	0.3207		0.3009	0.3042
0R	0.2980	0.2880	0S	0.2895	0.3135	0T	0.2962	0.3220	0U	0.3037	0.2937
	0.2950	0.2970		0.2870	0.3210		0.2937	0.3312		0.3009	0.3042
	0.3009	0.3042		0.2937	0.3312		0.3005	0.3415		0.3068	0.3113
	0.3037	0.2937		0.2962	0.3220		0.3028	0.3304		0.3093	0.2993
1A	0.3048	0.3207	1B	0.3028	0.3304	1C	0.3115	0.3391	1D	0.3130	0.3290
	0.3130	0.3290		0.3115	0.3391		0.3205	0.3481		0.3213	0.3373
	0.3144	0.3186		0.3130	0.3290		0.3213	0.3373		0.3221	0.3261
	0.3068	0.3113		0.3048	0.3207		0.3130	0.3290		0.3144	0.3186
1R	0.3068	0.3113	1S	0.3005	0.3415	1T	0.3099	0.3509	1U	0.3144	0.3186
	0.3144	0.3186		0.3099	0.3509		0.3196	0.3602		0.3221	0.3261
	0.3161	0.3059		0.3115	0.3391		0.3205	0.3481		0.3231	0.3120
	0.3093	0.2993		0.3028	0.3304		0.3115	0.3391		0.3161	0.3059
2A	0.3215	0.3350	2B	0.3207	0.3462	2C	0.3290	0.3538	2D	0.3290	0.3417
	0.3290	0.3417		0.3290	0.3538		0.3376	0.3616		0.3371	0.3490
	0.3290	0.3300		0.3290	0.3417		0.3371	0.3490		0.3366	0.3369
	0.3222	0.3243		0.3215	0.3350		0.3290	0.3417		0.3290	0.3300
2R	0.3222	0.3243	2S	0.3196	0.3602	2T	0.3290	0.3690	2U	0.3290	0.3300
	0.3290	0.3300		0.3290	0.3690		0.3381	0.3762		0.3366	0.3369
	0.3290	0.3180		0.3290	0.3538		0.3376	0.3616		0.3361	0.3245
	0.3231	0.3120		0.3207	0.3462		0.3290	0.3538		0.3290	0.3180
3A	0.3371	0.3490	3B	0.3376	0.3616	3C	0.3463	0.3687	3D	0.3451	0.3554
	0.3451	0.3554		0.3463	0.3687		0.3551	0.3760		0.3533	0.3620
	0.3440	0.3427		0.3451	0.3554		0.3533	0.3620		0.3515	0.3487
	0.3366	0.3369		0.3371	0.3490		0.3451	0.3554		0.3440	0.3427
3R	0.3366	0.3369	3S	0.3381	0.3762	3T	0.3480	0.3840	3U	0.3440	0.3428
	0.3440	0.3428		0.3480	0.3840		0.3571	0.3907		0.3515	0.3487
	0.3429	0.3307		0.3463	0.3687		0.3551	0.3760		0.3495	0.3339
	0.3361	0.3245		0.3376	0.3616		0.3463	0.3687		0.3429	0.3307
4A	0.3530	0.3597	4B	0.3548	0.3736	4C	0.3641	0.3804	4D	0.3615	0.3659
	0.3615	0.3659		0.3641	0.3804		0.3736	0.3874		0.3702	0.3722
	0.3590	0.3521		0.3615	0.3659		0.3702	0.3722		0.3670	0.3578
	0.3512	0.3465		0.3530	0.3597		0.3615	0.3659		0.3590	0.3521
4R	0.3512	0.3465	4S	0.3571	0.3907	4T	0.3668	0.3957	4U	0.3590	0.3521
	0.3590	0.3521		0.3668	0.3957		0.3771	0.4034		0.3670	0.3578
	0.3567	0.3389		0.3641	0.3804		0.3736	0.3874		0.3640	0.3440
	0.3495	0.3339		0.3548	0.3736		0.3641	0.3804		0.3567	0.3389

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## Performance Groups – Chromaticity (continued)

Region	x	y	Region	x	y	Region	x	y	Region	x	y
5A1	0.3670	0.3578	5A2	0.3686	0.3649	5A3	0.3744	0.3685	5A4	0.3726	0.3612
	0.3686	0.3649		0.3702	0.3722		0.3763	0.3760		0.3744	0.3685
	0.3744	0.3685		0.3763	0.3760		0.3825	0.3798		0.3804	0.3721
	0.3726	0.3612		0.3744	0.3685		0.3804	0.3721		0.3783	0.3646
5B1	0.3702	0.3722	5B2	0.3719	0.3797	5B3	0.3782	0.3837	5B4	0.3763	0.3760
	0.3719	0.3797		0.3736	0.3874		0.3802	0.3916		0.3782	0.3837
	0.3782	0.3837		0.3802	0.3916		0.3869	0.3958		0.3847	0.3877
	0.3763	0.3760		0.3782	0.3837		0.3847	0.3877		0.3825	0.3798
5C1	0.3825	0.3798	5C2	0.3847	0.3877	5C3	0.3912	0.3917	5C4	0.3887	0.3836
	0.3847	0.3877		0.3869	0.3958		0.3937	0.4001		0.3912	0.3917
	0.3912	0.3917		0.3937	0.4001		0.4006	0.4044		0.3978	0.3958
	0.3887	0.3836		0.3912	0.3917		0.3978	0.3958		0.3950	0.3875
5D1	0.3783	0.3646	5D2	0.3804	0.3721	5D3	0.3863	0.3758	5D4	0.3840	0.3681
	0.3804	0.3721		0.3825	0.3798		0.3887	0.3836		0.3863	0.3758
	0.3863	0.3758		0.3887	0.3836		0.3950	0.3875		0.3924	0.3794
	0.3840	0.3681		0.3863	0.3758		0.3924	0.3794		0.3898	0.3716
6A1	0.3889	0.3690	6A2	0.3915	0.3768	6A3	0.3981	0.3800	6A4	0.3953	0.3720
	0.3915	0.3768		0.3941	0.3848		0.4010	0.3882		0.3981	0.3800
	0.3981	0.3800		0.4010	0.3882		0.4080	0.3916		0.4048	0.3832
	0.3953	0.3720		0.3981	0.3800		0.4048	0.3832		0.4017	0.3751
6B1	0.3941	0.3848	6B2	0.3968	0.3930	6B3	0.4040	0.3966	6B4	0.4010	0.3882
	0.3968	0.3930		0.3996	0.4015		0.4071	0.4052		0.4040	0.3966
	0.4040	0.3966		0.4071	0.4052		0.4146	0.4089		0.4113	0.4001
	0.4010	0.3882		0.4040	0.3966		0.4113	0.4001		0.4080	0.3916
6C1	0.4080	0.3916	6C2	0.4113	0.4001	6C3	0.4186	0.4037	6C4	0.4150	0.3950
	0.4113	0.4001		0.4146	0.4089		0.4222	0.4127		0.4186	0.4037
	0.4186	0.4037		0.4222	0.4127		0.4299	0.4165		0.4259	0.4073
	0.4150	0.3950		0.4186	0.4037		0.4259	0.4073		0.4221	0.3984
6D1	0.4017	0.3751	6D2	0.4048	0.3832	6D3	0.4116	0.3865	6D4	0.4082	0.3782
	0.4048	0.3832		0.4080	0.3916		0.4150	0.3950		0.4116	0.3865
	0.4116	0.3865		0.4150	0.3950		0.4221	0.3984		0.4183	0.3898
	0.4082	0.3782		0.4116	0.3865		0.4183	0.3898		0.4147	0.3814
7A1	0.4147	0.3814	7A2	0.4183	0.3898	7A3	0.4242	0.3919	7A4	0.4203	0.3833
	0.4183	0.3898		0.4221	0.3984		0.4281	0.4006		0.4242	0.3919
	0.4242	0.3919		0.4281	0.4006		0.4342	0.4028		0.4300	0.3939
	0.4203	0.3833		0.4242	0.3919		0.4300	0.3939		0.4259	0.3853

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## Performance Groups – Chromaticity (continued)

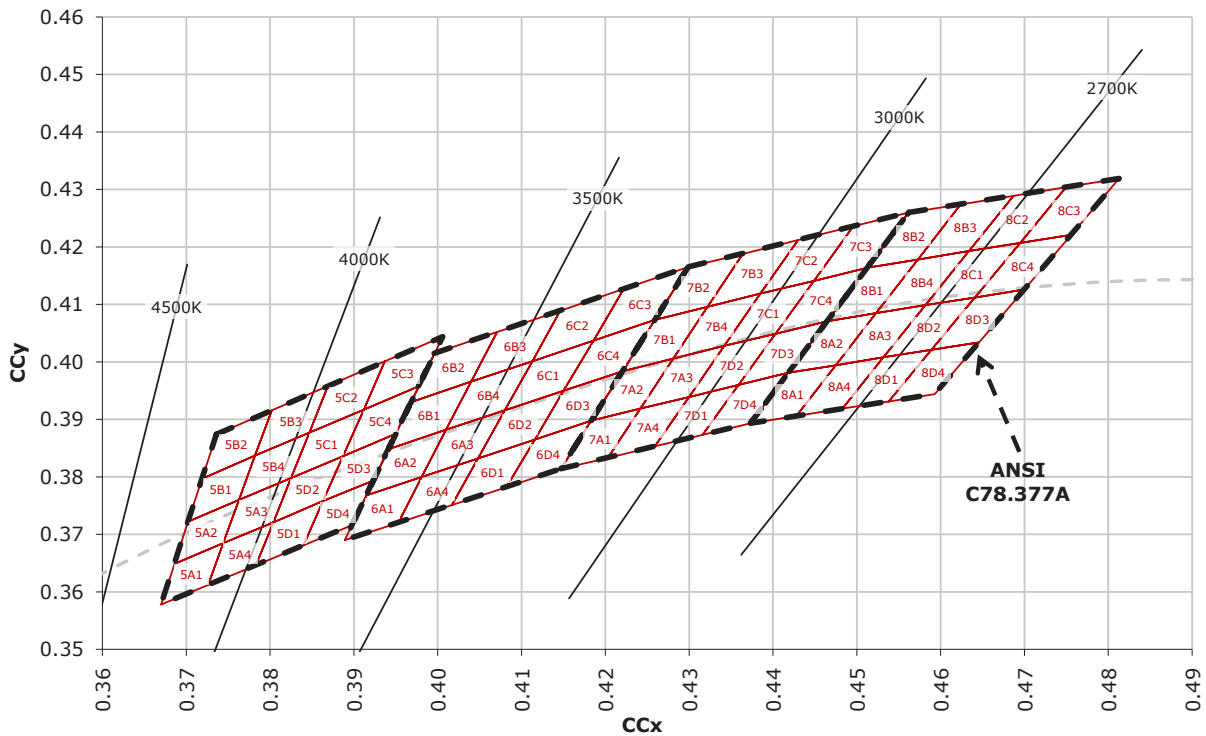
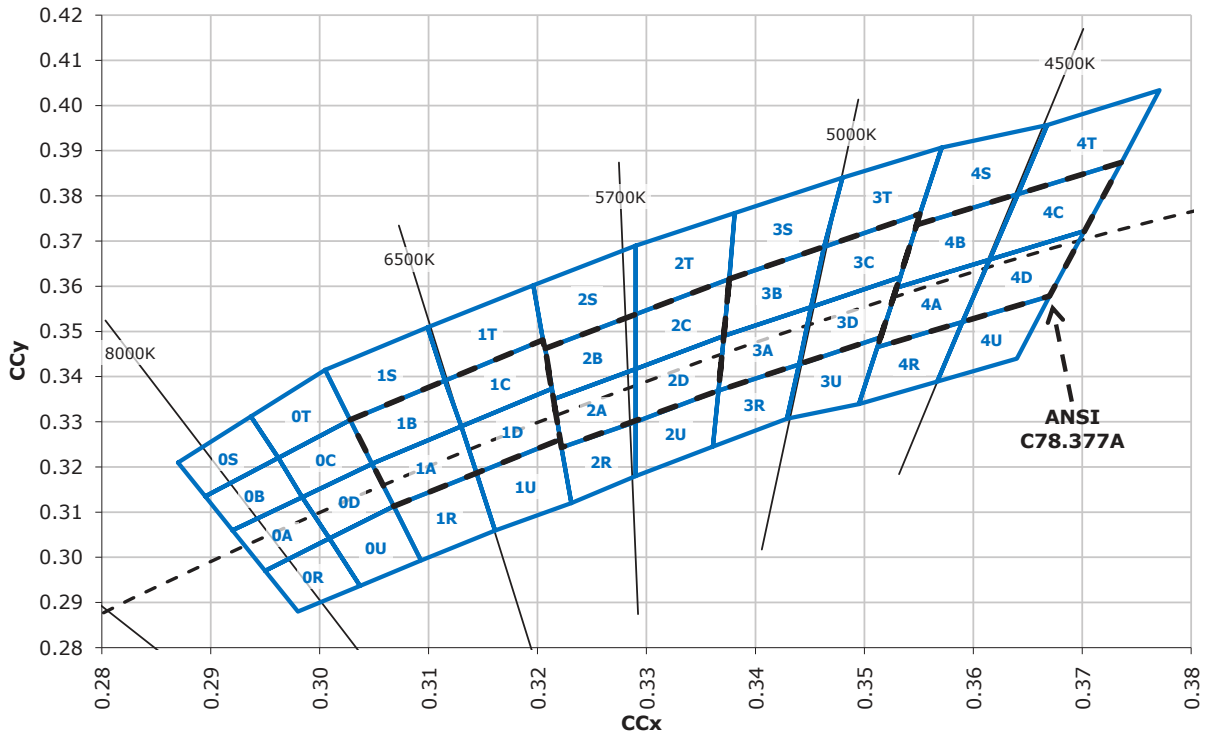
Region	x	y	Region	x	y	Region	x	y	Region	x	y
7B1	0.4221	0.3984	7B2	0.4259	0.4073	7B3	0.4322	0.4096	7B4	0.4281	0.4006
	0.4259	0.4073		0.4299	0.4165		0.4364	0.4188		0.4322	0.4096
	0.4322	0.4096		0.4364	0.4188		0.4430	0.4212		0.4385	0.4119
	0.4281	0.4006		0.4322	0.4096		0.4385	0.4119		0.4342	0.4028
7C1	0.4342	0.4028	7C2	0.4385	0.4119	7C3	0.4449	0.4141	7C4	0.4403	0.4049
	0.4385	0.4119		0.4430	0.4212		0.4496	0.4236		0.4449	0.4141
	0.4449	0.4141		0.4496	0.4236		0.4562	0.4260		0.4513	0.4164
	0.4403	0.4049		0.4449	0.4141		0.4513	0.4164		0.4465	0.4071
7D1	0.4259	0.3853	7D2	0.4300	0.3939	7D3	0.4359	0.3960	7D4	0.4316	0.3873
	0.4300	0.3939		0.4342	0.4028		0.4403	0.4049		0.4359	0.3960
	0.4359	0.3960		0.4403	0.4049		0.4465	0.4071		0.4418	0.3981
	0.4316	0.3873		0.4359	0.3960		0.4418	0.3981		0.4373	0.3893
8A1	0.4373	0.3893	8A2	0.4418	0.3981	8A3	0.4475	0.3994	8A4	0.4428	0.3906
	0.4418	0.3981		0.4465	0.4071		0.4523	0.4085		0.4475	0.3994
	0.4475	0.3994		0.4523	0.4085		0.4582	0.4099		0.4532	0.4008
	0.4428	0.3906		0.4475	0.3994		0.4532	0.4008		0.4483	0.3919
8B1	0.4465	0.4071	8B2	0.4513	0.4164	8B3	0.4573	0.4178	8B4	0.4523	0.4085
	0.4513	0.4164		0.4562	0.4260		0.4624	0.4274		0.4573	0.4178
	0.4573	0.4178		0.4624	0.4274		0.4687	0.4289		0.4634	0.4193
	0.4523	0.4085		0.4573	0.4178		0.4634	0.4193		0.4582	0.4099
8C1	0.4582	0.4099	8C2	0.4634	0.4193	8C3	0.4695	0.4207	8C4	0.4641	0.4112
	0.4634	0.4193		0.4687	0.4289		0.4750	0.4304		0.4695	0.4207
	0.4695	0.4207		0.4750	0.4304		0.4813	0.4319		0.4756	0.4221
	0.4641	0.4112		0.4695	0.4207		0.4756	0.4221		0.4700	0.4126
8D1	0.4483	0.3919	8D2	0.4532	0.4008	8D3	0.4589	0.4021	8D4	0.4538	0.3931
	0.4532	0.4008		0.4582	0.4099		0.4641	0.4112		0.4589	0.4021
	0.4589	0.4021		0.4641	0.4112		0.4700	0.4126		0.4646	0.4034
	0.4538	0.3931		0.4589	0.4021		0.4646	0.4034		0.4593	0.3944

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



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## Standard Order Codes and Bins (ML-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 ML-E LED Standard Order Codes - Cool White				
Min. Luminous Flux (lm) @ 150 mA*		Chromaticity Regions	Kit Number	CCT
Group	Flux (lm)			
Cool White (4,300 K – 8,300 K)				
M2	39.8	0A,0B,0C,0D,0R,0S,0T,0U,1A,1B,1C,1D,1R,1S,1T,1U,2A,2B,2C,2D,2R,2S,2T,2U,3A,3B,3R,3S	000251	6500K
		1A,1B,1C,1D,2A,2B,2C,2D	000250	6000K
		3C,3D,4A,4B,4C,4D	0002A2	4750K
		3A,3B,3C,3D	0002E3	5000K
		3C,3D,4A,4B	0002F4	4750K
		4A,4B,4C,4D	0002E4	4500K
M3	45.7	0A,0B,0C,0D,0R,0S,0T,0U,1A,1B,1C,1D,1R,1S,1T,1U,2A,2B,2C,2D,2R,2S,2T,2U,3A,3B,3R,3S	000351	6500K
		2C,2D,2T,2U,3A,3B,3R,3S,3C,3D,3T,3U,4A,4B,4R,4S	0003DZ	5000K
		3A,3B,3C,3D,4A,4B,4C,4D	0003B1	4750K
		2A,2B,2C,2D	0003E2	5750K
		3A,3B,3C,3D	0003E3	5000K
		3C,3D,4A,4B	0003F4	4750K
N2	51.7	0A,0B,0C,0D,0R,0S,0T,0U,1A,1B,1C,1D,1R,1S,1T,1U,2A,2B,2C,2D,2R,2S,2T,2U,3A,3B,3R,3S	000451	6500K
		2C,2D,2T,2U,3A,3B,3R,3S,3C,3D,3T,3U,4A,4B,4R,4S	0004DZ	5000K
		1A,1B,1C,1D,2A,2B,2C,2D	000450	6000K
		3A,3B,3C,3D,4A,4B,4C,4D	0004B1	4750K
		1A,1B,1C,1D	0004E1	6500K
		2A,2B,2C,2D	0004E2	5750K
		3A,3B,3C,3D	0004E3	5000K
		3C,3D,4A,4B	0004F4	4750K
N3	56.8	0A,0B,0C,0D,0R,0S,0T,0U,1A,1B,1C,1D,1R,1S,1T,1U,2A,2B,2C,2D,2R,2S,2T,2U,3A,3B,3R,3S	000551	6500K
		0A,0B,0C,0D,0R,0S,0T,0U,1A,1B,1C,1D,1R,1S,1T,1U	0005DT	7000K
		1A,1B,1C,1D,1R,1S,1T,1U,2A,2B,2C,2D,2R,2S,2T,2U	0005DV	6000K

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

\* Cree XLamp ML-E order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity or DWL bin restrictions specified by the order code



## Standard Order Codes and Bins (ML-E 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 ML-E LED Standard Order Codes - Warm White				
Min. Luminous Flux (lm) @ 150 mA*		Chromaticity Regions	Kit Number	CCT
Group	Flux (lm)			
Warm White (2,600 K – 4,300 K)				
K2	30.6	6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4	0000F7	3200K
		7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4	0000E7	3000K
		7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4	0000F8	2850K
		8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4	0000E8	2700K
K3	35.2	5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4	0001F6	3750K
		6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4	0001E6	3500K
		6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4	0001F7	3200K
		7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4	0001E7	3000K
		7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4	0001F8	2850K
M2	39.8	8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4	0001E8	2700K
		4C1,4C2,4C3,4C4,4D1,4D2,4D3,4D4,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4	0002F5	4250K
		5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4	0002E5	4000K
		5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4	0002F6	3750K
		6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4	0002E6	3500K
		6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4,7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4	0002F7	3200K
		7A1,7A2,7A3,7A4,7B1,7B2,7B3,7B4,7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4	0002E7	3000K
7C1,7C2,7C3,7C4,7D1,7D2,7D3,7D4,8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4	0002F8	2850K		
M3	45.7	8A1,8A2,8A3,8A4,8B1,8B2,8B3,8B4,8C1,8C2,8C3,8C4,8D1,8D2,8D3,8D4	0002E8	2700K
		4C1,4C2,4C3,4C4,4D1,4D2,4D3,4D4,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4	0003F5	4250K
		5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4	0003E5	4000K
		5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4,6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4	0003F6	3750K
N2	51.7	6A1,6A2,6A3,6A4,6B1,6B2,6B3,6B4,6C1,6C2,6C3,6C4,6D1,6D2,6D3,6D4	0003E6	3500K
		4C1,4C2,4C3,4C4,4D1,4D2,4D3,4D4,5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4	0004F5	4250K
		5A1,5A2,5A3,5A4,5B1,5B2,5B3,5B4,5C1,5C2,5C3,5C4,5D1,5D2,5D3,5D4	0004E5	4000K

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

\* Cree XLamp ML-E order codes specify only a minimum flux bin and not a maximum. Cree may ship reels in flux bins higher than the minimum specified by the order code without advance notice. Shipments will always adhere to the chromaticity or DWL bin restrictions specified by the order code.