## LIGHTOLIER

by (s) ignify

Calculite LED 6" gen 3

**Downlighting** 

**C6STW** Square Tunable White



Calculite LED 6" generation 3 features industry leading visual comfort, excellent uniform illumination over time, and patented installation flexibility.

Complete luminaire = Frame + Engine + Trim + Accessories (optional)

Project:	
Location:	
Cat.No:	
Туре:	
Lamps:	Qty:
Notes:	

**Frame** example: C6SN

Series		Aperture	Installation	Voltage/Options		
6		S				
<b>6</b> 6" Non-IC* <b>S</b> S		<b>S</b> Square	N New Construction R Remodeler	<ul> <li>Universal 120 V/277 V</li> <li>3 347 V</li> <li>EM Emergency 1.2</li> <li>LC Chicago Plenum 1</li> </ul>		
			A Airseal IC	- Universal 120 V/277 V		

**Engine** example: C6L10865MDUTW

Series	Lumens	CRI	ССТ	Beam	Dimming	Voltage	Options
C6L							TW
<b>C6L</b> Calculite LED 6" aperture	10 1000 lm 15 1500 lm 20 2000 lm 25 2500 lm	<b>8</b> 80 CRI	<b>65</b> 6500-2700K	M Medium (56°) <sup>3</sup> W Wide (76°)	<b>D</b> Dali	<b>U</b> Universal 120 V/277 V/347 V	<b>TW</b> Tunable White
	<b>15</b> 1500lm <b>20</b> 2000lm	<b>8</b> 80 CRI	<b>65</b> 6500-2700K	<b>M</b> Medium (56°) <sup>3</sup> <b>W</b> Wide (76°)	P Power over Ethernet <sup>4</sup>	E Ethernet 48 V DC	<b>TW</b> Tunable White

**Trim** example: C6SDLNMCCP

Series Aperture S		Styl	e	Beam³		
	Calculite LED 6" aperture	S Square D		Downlight	NM W	Narrow & Medium Wide
			LW	Lensed Wall Wash <sup>3</sup>	<b>–</b> b	olank

Finis	sh	Fla	ange
cc	Specular clear Comfort clear Comfort clear diffuse	I -	White (matte) Polished Flangeless
WH	White (matte)	- F	White (matte) Flangeless

#### **Beam options**

	Med engine	Wide engine
6"	56°	78°
reflector	(0.8 s.c.)	(1.2 s.c.)

#### Mixing chambers

	Med engine	Wide engine
6" cone	0.8 s.c.	1.1 s.c.
	(56°)	(78)

#### **Accessories**

- 1. Emergency (EM) and Chicago Plenum (LC) options are only available with New construction (N) installations. Not compatible with PoE light engine.
- 2. Emergency (EM) frame comes with emergency battery pack and ceiling mountable test switch. Reflector mounted test switch requires above ceiling access and is only available with the downlight option. For reflector mounted test switch, order emergency frame and add "EM" suffix to reflector (example: C6SDLNMCCEM). 3. Medium (M) beam is ideal for lensed wall washing.
- 4. Power over Ethernet (PoE) option compatible with 6SN and 6SR frames only.

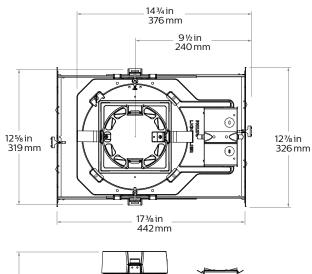


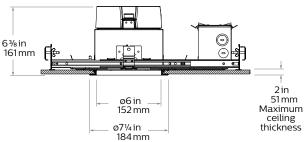




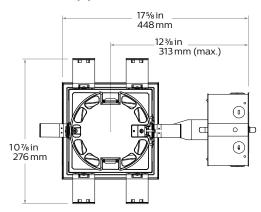
## Square Tunable White

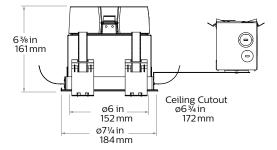
#### **New Construction (N)**



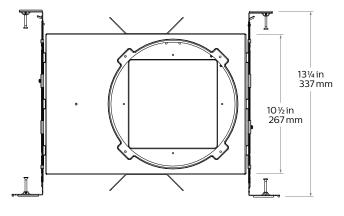


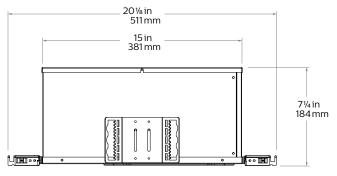
#### Remodeler (R)



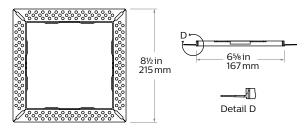


### Chicago Plenum (LC)





### Flangeless mud-in ring (CA6SFT) accessory



## Square Tunable White

#### **Disclaimers/Recommendations**

For best performance, we recommend using Lightolier Dynalite products when designing your controls system.

CCT targeting table is for guidance only. Lightolier cannot guarantee color targeting precision, accuracy, or general performance with third party controls.

Lightolier cannot provide post sales configuration or commissioning support when using control systems that are not in the Lightolier product offering. Please contact your controls manufacturer for support.

Lightolier cannot provide guidance on programming dynamic show behaviors (circadian rhythm, daylight mimicry, etc.).

Any configuration, commissioning, or support is solely owned by the sales agent/rep/specifier.

#### Objective

Provide an application note to reps/agents/ trade channel partners that provides information for integration of Lightolier tunable white luminaires with third party controllers.

All Lightolier tunable white luminaires leave the factory with the following settings:

Cool white CCT: 6500K
Warm white CCT: 2700K

When either channel is at 100% brightness

Warm white lumen output = Cool white lumen output

Communication protocol:

DALI 2.0 (Device Type 6) Power over Ethernet 48V

### **CCT** targeting guidance

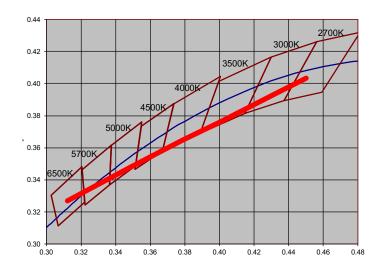
Target CCT	ww%	cw%
2700K	100	0
3000K	82	18
3500K	66	34
4000K	49	51
5000K	24	76
6500K	0	100

#### Color information (Dali)

6" 2000lm	2700K	3000К	3500K	4000K	5000К	6500K
Flux (lms)	1927	1856	1863	1937	1848	1790
Power (W)	19.21	18.12	17.62	17.93	17.14	16.84
Efficacy (lm/W)	100.3	102.4	105.7	108.0	107.8	106.3
ССТ	2785	3008	3499	3936	4818	6549
CRI	86	87	88	89	88	84
R9	20	26	33	36	33	15
x	0.4501	0.4311	0.3999	0.3794	0.3495	0.3122
у	0.4033	0.393	0.376	0.3649	0.3484	0.3269
Duv	-0.0018	-0.0037	-0.0054	-0.0054	-0.0034	0.0024

#### Lifetime (TM-21) data

Lumens Narrow beam		Medium/Wide beam*		
500lm 1000lm 1500lm	L90 @ 60,000hrs.	L90 @ 60,000hrs.		
2000lm 2500lm	L90 @ 60,000hrs.	L85 @ 60,000hrs.		



#### Color information (PoE)

Flux (lm)	1300	1275	1284	1279	1266	1248	1221	1223
Power (W)	11.62	11.55	11.16	11	10.92	10.9	10.98	10.85
Efficacy (lm/W)	111.9	110.4	115.1	116.2	115.9	114.5	111.2	112.7
ССТ	2729	2987	3508	4019	4536	5076	5869	6480
CRI	85	86	88	88	87	86	85	83
Color Rendering Index (R9)	16.5	23.1	31	33.9	33	28.6	22.3	14.1
х	0.4564	0.4336	0.3998	0.3762	0.3579	0.3425	0.3245	0.3132
У	0.4084	0.396	0.3773	0.3639	0.3535	0.3446	0.3342	0.3276
Duv	-0.0005	-0.0028	-0.0048	-0.0049	-0.0040	-0.0025	0.0001	0.0023
TM30 Rf	86	86	87	87	86	85	84	84
TM30 Rg	98	100	100	100	100	100	99	98

### Square Tunable White

#### Reflector



Specular clear (CL): Most specular and most efficient finish, delivers maximum photometric performance but can produce a mirror image effect of the interior space.



Comfort clear (CC): Semi-specular finish that softens the light at the source of the reflector and creates a subtle, even luminance from the reflector cone.



Comfort clear diffuse (CD): Slightly diffuse clear finish, that eliminates iridescence and reduces the mirror image effect inherent with specular finishes.



White (WH): (matte) Brightest illuminated aperture and provides the smoothest transition to most ceilings when off (white is only available with a white flange).

#### **Flange**



White (–): (matte) Provides the smoothest transition to ceilings when off.



Polished (P): (matches aperture) Produces a continuous look throughout the reflector (aperture matching).



Flangeless (F): (flush-mount) Creates a flush, virtually seamless transition from aperture to ceiling.

#### Frame-in-kits

#### **New Construction**

Galvanized stamped steel for dry or plaster ceilings. Preinstalled telescoping mounting bars from 13" to 24". For 4' distances, use 1/2" EMT, 1-1/2" x 1/2" U or C channel.

#### Max ceiling thickness is 2".

#### **AirSea**

Black painted steel housing for dry or plaster ceilings. Pre-installed telescoping mounting bars from 13" to 24".

#### **Patented install Mounting frame**

With no driver attached, this versatile frame is independent of driver accommodating a wide range of lumen packages, driver types and CCTs, including 120V and 277V inputs.

Close-cut aperture design eliminates possibility of gap between ceiling opening & reflector flange.

Separate wiring compartment for wiring frame to building allows inspection prior to light engine install.

Simple plug-and-play connection between frame and light engine from below ceiling eliminates need for wiring between frame and LED driver, and also saves time during installation and future replacements/upgrades. Plug-and-play receptacle accommodates technology upgrade of light engines and replacements for the life of the building.

#### **Drivers**

- EldoLED ECOdrive Dali 1% Dimming

#### Rated life

60,0000 hrs at 70% lumen maintenance based on IES LM-80-08 and TM-21-11.

#### **Power over Ethernet**

Powered via Lightolier PoE lighting controller: Complies with FCC rules per Title 47 part 15 (Class A) for EMI / RFI (conducted & radiated). PoE lighting controller accessible from below ceiling.

#### Rated life

60,0000 hrs at 70% lumen maintenance based on IES LM-80-08 and TM-21-11.

#### **Optical systems**

#### Comfort throughout the space:

Patented optical system combines primary and secondary optics to provide a true 50° physical cutoff and 45° reflected cutoff virtually eliminating the view of the light source and bright spots in the reflector. A new reflector curve reduces reflector brightness by up to 50% compared to existing products, allowing for the use of higher lumen packages in smaller apertures without creating bright spots in the ceiling.

#### **Light Engine**

Quick connect power pack comprised of light source and driver allow for easy installation and replacement from below ceiling with no need for additional wiring. This allows for

- Frame and ceiling installation to be performed while still finalizing details such as lumen packages, CCT and control type.
- Easy replacement of electronics at end of life with minimal wasted material and labor required.
- Ease and upgradability of technology.

#### **Options and Accessories**

**Flangeless mud-in ring:** Use **CA6SFT** for use with flangless installations.

**Sloped ceilings:** Compatible with sloped ceiling adapters (see **SCA** spec sheet).

#### Labels and Listings

- cULus listed for wet locations
- RoHS certified

#### Warranty

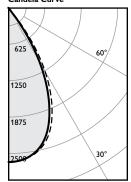


5 year limited warranty Visit Signify.com/warranties

for more information on Signify's standard 5-year limited warranty on complete luminaire systems.

## Square Tunable White (with Dali driver)

#### Medium beam, 2500lm Engine, 101.6 lm/w



Frame: C6SN or 6SN Engine: C6L25835MZ10U Trim: C6SDLNMCL

 $CCT^1$ 3500K Output lumens: Input watts: 21.3 W (±5%) 80 min CRI: Spacing Crit.: Beam Angle:

#### Zonal summary

Angle

Zone	Lumens	%Luminaire
0-30	1647	76.1%
0-40	2058	95.1%
0-60	2162	99.9%
0-90	2164	100.0%

0	2647	2647	
5	2624	2620	247
10	2539	2530	
15	2382	2348	654
20	2088	2101	
25	1615	1730	745
30	1058	1222	
35	563	723	411
40	249	326	
45	88	133	97
50	16	43	
55	3	9	7
60	2	1	
65	1	1	1
70	1	1	
75	1	0	1
80	1	0	
85	1	1	1
90	0	0	

#### Single unit data

Height to lighted plane	Initial center beam foot-candles	Beam diameter (ft)*
5'	106	4.5'
6'	74	5.4'
7'	54	6.3'
8'	41	7.2'
9'	33	8.1′

\* Beam diameter is where foot-candles drop to 50% of maximum.

#### Multiple unit data - RCR 2

Spacing on center	Initial center beam foot-candles	Watts per sq. ft.
5' 6'	99.1 65.0	0.94 0.62
7'	46.5	0.44
8'	38.7	0.37
9'	31.0	0.30

38' x 38' x 10' Room, Workplane 2.5' above floor, 80/50/20% Reflectances

Efficacy: 101.6 lm/w Report<sup>2</sup>: F37167

#### Adjustment factors

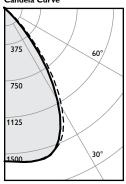
CL = 100% 80CRI 4000K = 102% 6000lm = 240% CCL = 95% 80CRI 3500K = 100% 4800lm = 192% CCZ = 63% 80CRI 3700K = 87% 3500lm = 140% 2500lm = 100% WH = 87% 90CRI 3000K = 77% 2000lm = 80% BK = 57% 90CRI 2700K = 73% 1500lm = 60% 1000lm = 40%	Finish	CCT	Lumens
	CCL = 95% CCD = 87% CCZ = 63% WH = 87%	80CRI 3500K = 100% 80CRI 3000K = 97% 80CRI 2700K = 87% 90CRI 3000K = 77%	4800lm = 192% 3500lm = 140% 2500lm = 100% 2000lm = 80% 1500lm = 60%

#### **Coefficients of utilization**

Ceiling		80	)%		70	)%	50	)%	30	)%	0%
Wall	70	50	30	10	50	10	50	10	50	10	0
RCR	Zo	nal c	avity r	netho	d - Ef	fectiv	e floc	r refle	ectan	ce = 20	Э%
Room Cavity Ratio 0 6 8 2 9 5 7 8 2 5 1 0	119 114 108 103 98 94 89 85 81 77	119 111 104 97 91 86 81 76 72 68 64	119 109 100 92 86 80 75 70 66 62 59	119 107 97 89 82 76 71 66 62 58	116 109 102 96 90 85 80 75 71 67 64	116 105 96 88 81 75 70 66 62 58 55	111 105 99 93 88 83 78 74 70 66 63	111 102 93 86 80 75 70 66 62 58 55	106 101 96 91 86 81 77 73 69 66 62	106 99 91 85 79 74 69 65 61 58	100 94 88 82 77 72 68 64 60 56

#### Wide beam, 2500lm Engine, 90.0 lm/w

#### Candela Curve



#### Frame: C6SN or 6SN Engine: C6L25835MZ10U Trim: C6SDLWCL

CCT:	3500K
Output lumens:	1917 lms
Input watts:	21.3 W (±5%
CRI:	80 min
Spacing Crit.:	1.1
Poam Angle	680

#### **Zonal summary**

Zone	Lumens	%Lu	minaire	
0-30 0-40 0-60	1225 1726 1914	9	63.9% 90.1% 99.9%	
0-90		1917 100.0%		
Angle	0.	45°	Lms	

0	1573	1573	
5	1584	1581	151
10	1602	1603	
15	1601	1592	447
20	1538	1544	
25	1368	1428	627
30	1095	1190	
35	771	883	502
40	419	531	
45	165	266	176
50	23	96	
55	4	15	12
60	2	2	
65	1	1	1
70	1	1	
75	1	1	1
80	1	0	
85	1	1	1
90	0	0	
	•		1

#### Single unit data

Height to lighted plane	Initial center beam foot-candles	Beam diameter (ft)*
5'	63	5.5'
6'	44	6.6'
7'	32	7.7'
8'	25	8.8'
9'	19	9.9'

Beam diameter is where foot-candles drop to 50% of maximum.

#### Multiple unit data - RCR 2

Spacing on center	Initial center beam foot-candles	Watts per sq. ft.
5'	86.6	0.94
6'	56.8	0.62
7'	40.6	0.44
8'	33.8	0.37
9'	27.1	0.30

38' x 38' x 10' Room, Workplane 2.5' above floor, 80/50/20% Reflectances

Efficacy: 90.0 lm/w F37139 Report2:

#### Adjustment factors

Finish	CCT	Lumens
CL = 100% CCL = 95% CCD = 87% CCZ = 63% WH = 87% BK = 57%	80CRI 4000K = 102% 80CRI 3500K = 100% 80CRI 3000K = 97% 80CRI 2700K = 87% 90CRI 3000K = 77% 90CRI 2700K = 73%	6000lm = 240% 4800lm = 192% 3500lm = 140% 2500lm = 100% 2000lm = 80% 1500lm = 60% 1000lm = 40%

#### Coefficients of utilization

Ceiling	80%			70%		50%		30%		0%	
Wall	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal cavity method - Effective floor reflectance = 20%										
Room Cavity Ratio 0 6 8 2 9 5 7 8 8 7 1 0	119 113 107 102 96 91 86 81 77 73 69	119 110 102 95 88 82 76 71 67 63 59	119 108 98 90 82 76 70 65 61 56	119 106 95 86 78 71 66 61 56 52 49	116 108 101 93 87 81 76 71 66 62 58	116 104 94 85 77 71 65 60 56 52 49	111 104 97 91 85 79 74 69 65 61 58		106 100 94 88 83 78 73 68 64 60 57	106 98 89 82 76 70 65 60 56 52 48	100 93 86 79 73 68 63 58 54 50 47

- 1. Correlated Color Temperature within specs as defined in ANSI\_NEMA\_ANSLG C78.377-2008: Specifications for the Chromaticity of Solid State Lighting Products.
- 2. Tested using absolute photometry as specified in LM79: IESNA Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products.

The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.

