

PHILIPS LIGHTOLIER

Downlighting

Calculite LED gen 3 4" round downlight

500 – 3000lm



Project: _____
 Location: _____
 Cat.No: _____
 Type: _____
 Lamps: _____ Qty: _____
 Notes: _____

Calculite LED 4" generation 3 features industry leading visual comfort, excellent uniform illumination over time, and patented installation flexibility.

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

Frame

example: C4RN

Series	Aperture	Installation	Voltage / Options
C4	R		
C4 Calculite LED 4" aperture	R Round	N New construction ¹ R Remodeler	— Universal 120V/277V (specify for Power Over Ethernet configurations) 3 347V (not compatible with ELV dimming) EM Emergency ^{1,2} LC Chicago Plenum ¹

Engine

example: C4L15835NZ10U

Series	Lumens	CRI	CCT	Beam	Dimming / Driver	Voltage
C4L						
C4L Calculite LED 4" aperture	05 500lm ³ 10 1000lm 15 1500lm 20 2000lm ⁴ 25 2500lm ⁴ 30 3000lm ⁴	8 80CRI 9 90CRI	27 2700K 30 3000K 35 3500K 40 4000K	N Narrow (43°) M Medium (56°) W Wide (76°)	Z10 0-10V 1% ³ SOL EldoLED Solo 0-10V 0.1% D Dali L Lutron LDE1 EcoSystem (fade-to-black) E ELV (120V dimming only) ⁵ P Power over Ethernet Only compatible with 1000 (10) to 2500 (25) lumen configurations.	U Universal 120V/277V/347V 1 Universal 120V/277V E Ethernet 48V DC

Trim

example: C4RDLCCP

Series	Aperture	Style	Finish	Flange
C4	R	DL		
C4 Calculite LED 4" aperture	R Round	DL Downlight	BK Black (matte) CL Specular clear WH White (matte) CC Comfort clear CD Comfort clear diffuse CZ Champagne bronze	— White (matte) P Polished F Flangeless — White (matte) F Flangeless

Accessories (ordered with a flangeless trim)

CA4RFT	Mud-in ring for use with flangeless installations
CAEM	Field installable EM pack (not compatible with Power over Ethernet configurations)
C4RVPWH	IP65 rated vandal proof matte white accessory that mounts onto a flangeless trim
AMS	ActiLume multi-sensor (optional accessory for Power Over Ethernet configurations)

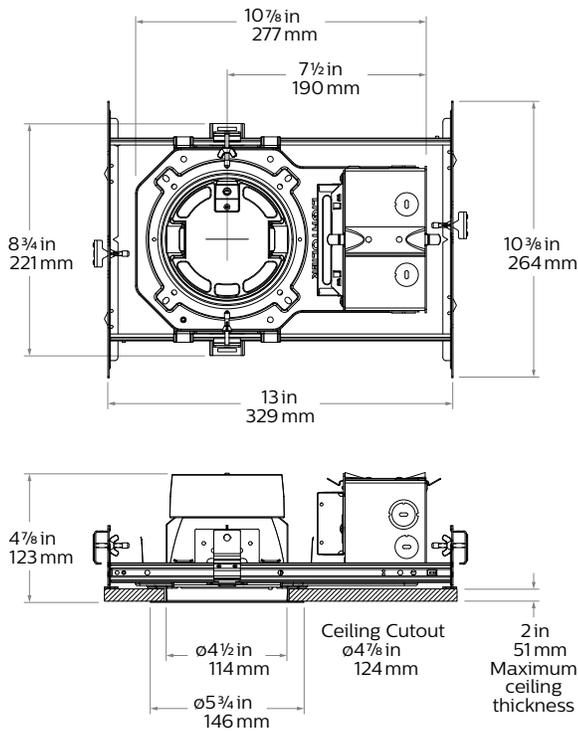
- Emergency (EM) and Chicago Plenum (LC) options are only available with New construction (N) installations.
- Emergency (EM) frame comes with emergency battery pack and ceiling mountable test switch. Reflector mounted test switch requires above ceiling access. For reflector mounted test switch, order emergency frame and add "EM" suffix to reflector (example: C4RDLCCEM).
- The 500lm (05) option is only compatible with 0-10V (Z10) dimming.
- The 2000lm (20), 2500lm (25), and 3000lm (30) packages have marked spacing requirements (see page 3).
- ELV (E) dimming is only compatible with up to 2000lm (20) configurations.



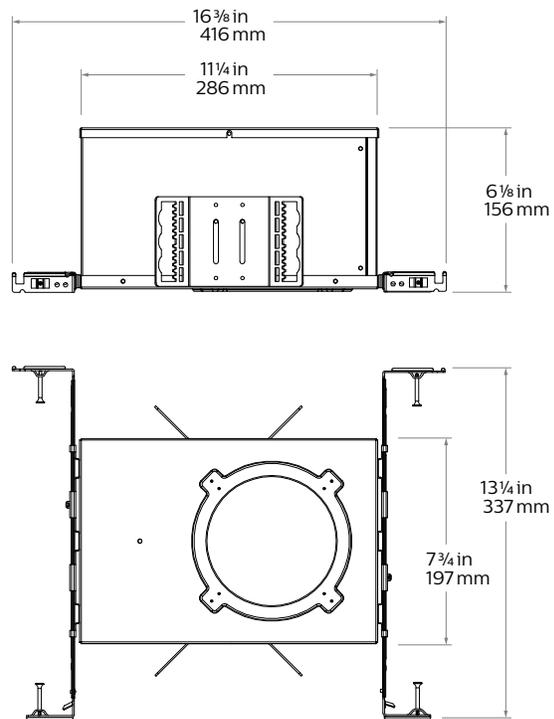
C4RDL Calculite LED generation 3

4" round downlight

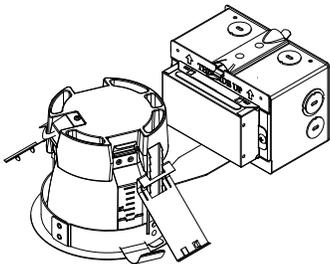
New Construction (N)



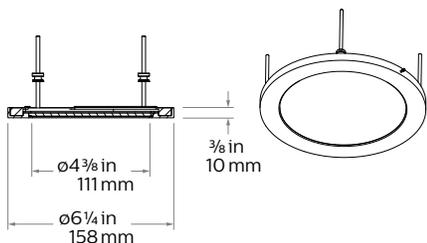
Chicago Plenum (LC)



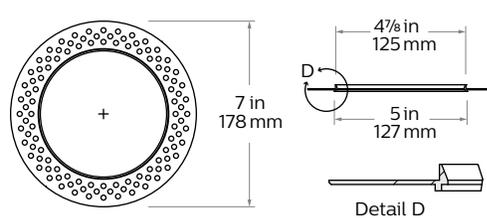
Remodeler (R)



Vandal Proof (VP) accessory



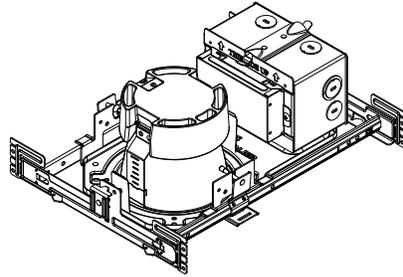
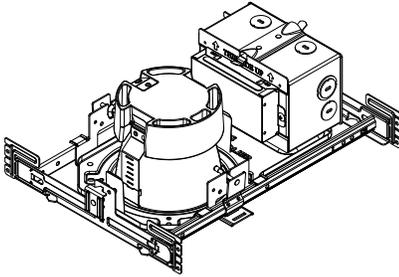
Flangeless mud-in ring (CA4RFT) accessory



Consult factory for wood installation instructions.

C4RDL Calculite LED generation 3

4" round downlight



Narrow

Light engine	Input volts	Input freq	Input current	Drive current	Input power	THD power	Power factor
C4L05_NZ10U	120V	50/60Hz	0.05	110 mA	6W	<20%	>0.95
	277V		0.03			<20%	>0.90
C4L10_NZ10U	120V	50/60Hz	0.08	230 mA	11W	<15%	>0.95
	277V		0.04			<20%	>0.95
C4L15_NZ10U	120V	50/60Hz	0.12	360 mA	16W	<10%	>0.95
	277V		0.06			<15%	>0.95
C4L20_NZ10U	120V	50/60Hz	0.17	490 mA	21W	<10%	>0.95
	277V		0.08			<15%	>0.95
C4L25_NZ10U	120V	50/60Hz	0.22	640 mA	27W	<10%	>0.95
	277V		0.10			<15%	>0.95
C4L30_NZ10U	120V	50/60Hz	0.27	790 mA	33W	<10%	>0.95
	277V		0.13			<15%	>0.95

Medium/Wide

Light engine	Input volts	Input freq	Input current	Drive current	Input power	THD power	Power factor
C4L05_MZ10U	120V	50/60Hz	0.05	110 mA	6W	<20%	>0.95
	277V		0.03			<20%	>0.90
C4L10_MZ10U	120V	50/60Hz	0.08	230 mA	11W	<15%	>0.95
	277V		0.04			<20%	>0.95
C4L15_MZ10U	120V	50/60Hz	0.12	350 mA	16W	<10%	>0.95
	277V		0.06			<15%	>0.95
C4L20_MZ10U	120V	50/60Hz	0.16	470 mA	21W	<10%	>0.95
	277V		0.08			<15%	>0.95
C4L25_MZ10U	120V	50/60Hz	0.21	610 mA	25W	<10%	>0.95
	277V		0.09			<15%	>0.95
C4L30_MZ10U	120V	50/60Hz	0.26	770 mA	31W	<10%	>0.95
	277V		0.12			<15%	>0.95

Narrow (Power over Ethernet)

Light engine	Input				
	Volts ¹	Voltage ²	Freq	Current	Power
C4L10__NPE	53V	51-54V	DC	160 mA	8.9 W
C4L15__NPE	53V	51-54V	DC	250 mA	13.6 W
C4L20__NPE	53V	51-54V	DC	340 mA	18.5 W
C4L25__NPE	53V	51-54V	DC	460 mA	24.6 W

Medium (Power over Ethernet)

Light engine	Input				
	Volts ¹	Voltage ²	Freq	Current	Power
C4L10__MPE	53V	51-54V	DC	160 mA	8.8 W
C4L15__MPE	53V	51-54V	DC	250 mA	13.4 W
C4L20__MPE	53V	51-54V	DC	320 mA	17.6 W
C4L25__MPE	53V	51-54V	DC	430 mA	23.2 W

Wide (Power over Ethernet)

Light engine	Input				
	Volts ¹	Voltage ²	Freq	Current	Power
C4L10__WPE	53V	51-54V	DC	160 mA	8.8 W
C4L15__WPE	53V	51-54V	DC	250 mA	13.4 W
C4L20__WPE	53V	51-54V	DC	320 mA	17.6 W
C4L25__WPE	53V	51-54V	DC	430 mA	23.2 W

- Nominal input volts.
- Preferred volt range.

Marked spacing applications

Light engine	2500lm	3000lm
C4L_Z10U series	—	X
C4L_LU series	X	X
C4L_DU series	—	X

Modules marked with an X require marked spacing:
 - Center-to-center of adjacent luminaires: 24" (610mm)
 - Luminaire center to side building member: 12" (305mm)

Lifetime (TM-21) data

Lumens	Narrow beam	Medium/Wide beam*
500lm 1000lm 1500lm	L90 @ 60,000hrs.	L90 @ 60,000hrs.
2000lm 2500lm 3000lm*	L90 @ 60,000hrs.	L85 @ 60,000hrs.

* Lutron 3000lm with Medium/Wide beam is L80 @ 60,000hrs.

C4RDL Calculite LED generation 3

4" round downlight

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" (51 mm).
Including PoE frame 4.88" (124 mm).**

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.

Pre-installed mounting bars allow for fast and tool-less installation into T-grid and hat channel ceilings.

Close-cut aperture design eliminates the possibility of undesired gap between ceiling opening and reflector flange.

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

Simple plug-and-play connection between the frame and light engine from below the ceiling eliminates the 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.

Dimming

- Advance 0-10V 1% dimming
- Lutron Hi-lume EcoSystem H Series 1% dimming
- EldoLED ECOdrive Dali 1% dimming
- EldoLED SOLOdrive 0-10V 0.1% dimming
- ELV dimming

Power over Ethernet

Powered via Philips 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: 60,000 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.

Quality of light: 2 SDCM ensures color consistency from fixture to fixture and over the luminaire's long lifetime. Proprietary optical grade silicone lens with patterned surface provides soft, even beam diffusion without hotspots or dark rings.

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 **CA4RFT** for use with flangeless plaster installations.

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

Vandal Proof: Use **C4RVPWH** for an IP65 rated vandal proof matte white accessory. Must be ordered with a flangeless trim.

ENERGY STAR® exceptions

Dali configurations

500lm configurations

90 CRI configurations

Champagne Bronze and Black finishes

347V and Emergency configurations

ELV & EldoLED Solo dimming

Power over Ethernet driver

Labels and Listings

cULus listed for wet location

ENERGY STAR®

CCEA (frames with *LC suffix)

IP65 rated with vandal proof accessory

IBEW Union made (light engines & reflectors)

RoHS compliant

Warranty

5 year warranty on complete system.

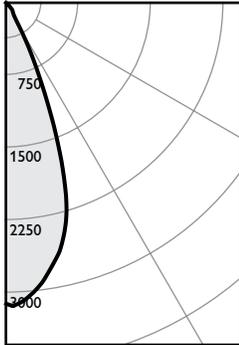
Complete warranty available at: http://images.philips.com/is/content/PhilipsConsumer/PDFDownloads/United%20States/ODL120150930_003-UPD-en_US-Philips-warranty-indoor-PLS-us.pdf

C4RDL Calculite LED generation 3

4" round downlight

Narrow beam, 1500lm Engine, 103.8 lm/W at 14.7W or 112.2 lm/W at 13.6W (Power over Ethernet)

Candela Curve



Frame: **C4RN**
 Engine: **C4L15835NZ10U**
 Trim: **C4RDLCL**

Output lumens: 1526 lms
 Input watts: 14.7 W
 CRI: 80 min
 CCT¹: 3500K
 Spacing Crit.: 0.6
 Beam Angle: 43°

Zonal summary

Zone	Lumens	%Luminaire
0-30	1354	88.7%
0-40	1469	96.3%
0-60	1526	100.0%
0-90	1526	100.0%

Angle	Mean CP	Lumens
0	3112	282
5	3044	
10	2785	
15	2410	
20	1672	
25	837	420
30	324	
35	163	
40	128	115
45	77	
50	0	
55	0	0
60	0	
65	0	
70	0	0
75	0	
80	0	
85	0	0
90	0	

Single unit data

Height to lighted plane	Initial center beam foot-candles	Beam diameter (ft)*
5'	124	3.0'
6'	86	3.6'
7'	64	4.2'
8'	49	4.8'
9'	38	5.4'

* 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'	71.3	0.65
6'	46.8	0.43
7'	33.4	0.31
8'	27.8	0.25
9'	22.3	0.20

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

Efficacy: 103.8 lm/w
 Report#: T20161390

Adjustment factors

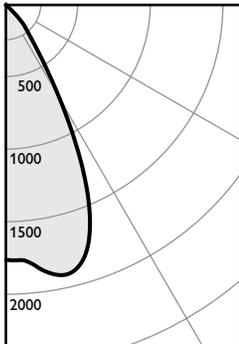
Finish	CCT	Lumens
CL = 100%	80CRI 4000K = 107%	3000lm = 200%
CC = 95%	80CRI 3500K = 100%	2500lm = 167%
CD = 87%	80CRI 3000K = 99%	2000lm = 133%
CZ = 63%	80CRI 2700K = 93%	1500lm = 100%
WH = 87%	90CRI 3000K = 87%	1000lm = 67%
BK = 57%	90CRI 2700K = 81%	500lm = 33%

Coefficients of utilization

Ceiling	80%					70%					50%					30%					0%
	70	50	30	10	50	10	50	10	50	10	50	10	50	10	50	10	0				
Wall	0																				
RCR	Zonal cavity method - Effective floor reflectance = 20%																				
Room Cavity Ratio	0	119	119	119	119	116	116	111	111	106	106	106	106	106	106	106	100				
1	114	112	110	108	110	106	106	103	103	102	100	99	98	98	98	98	95				
2	110	106	102	99	104	98	101	96	96	96	94	91	88	88	88	88	86				
3	105	100	96	92	99	92	96	90	94	89	86	82	82	82	82	82	82				
4	101	95	90	87	94	86	92	85	90	84	82	82	82	82	82	82	82				
5	97	90	85	82	89	81	88	81	88	81	86	80	78	78	78	78	78				
6	93	86	81	77	85	77	84	77	83	76	74	74	74	74	74	74	74				
7	90	82	77	74	81	73	80	73	79	73	71	71	71	71	71	71	71				
8	86	79	74	70	78	70	77	70	76	69	68	68	68	68	68	68	68				
9	83	75	70	67	75	67	74	67	73	66	65	65	65	65	65	65	65				
10	80	72	67	64	72	64	71	64	70	64	62	62	62	62	62	62	62				

Medium beam, 1500lm Engine, 114.6 lm/W at 14.2W or 121.4 lm/W at 13.4W (Power over Ethernet)

Candela Curve



Frame: **C4RN**
 Engine: **C4L15835MZ10U**
 Trim: **C4RDLCL**

Output lumens: 1627 lms
 Input watts: 14.2 W
 CRI: 80 min
 CCT¹: 3500K
 Spacing Crit.: 0.9
 Beam Angle: 56°

Zonal summary

Zone	Lumens	%Luminaire
0-30	1269	78.0%
0-40	1537	94.5%
0-60	1627	100.0%
0-90	1627	100.0%

Angle	Mean CP	Lumens
0	1760	174
5	1783	
10	1886	
15	1887	
20	1702	
25	1283	572
30	762	
35	406	
40	236	268
45	116	
50	14	
55	0	1
60	0	
65	0	
70	0	0
75	0	
80	0	
85	0	0
90	0	

Single unit data

Height to lighted plane	Initial center beam foot-candles	Beam diameter (ft)*
5'	70	4.5'
6'	49	5.4'
7'	36	6.3'
8'	28	7.2'
9'	22	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'	74.8	0.63
6'	49.1	0.41
7'	35.0	0.30
8'	29.2	0.25
9'	23.4	0.20

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

Efficacy: 114.6 lm/w
 Report#: T20161397

Adjustment factors

Finish	CCT	Lumens
CL = 100%	80CRI 4000K = 102%	3000lm = 200%
CC = 95%	80CRI 3500K = 100%	2500lm = 167%
CD = 87%	80CRI 3000K = 97%	2000lm = 133%
CZ = 63%	80CRI 2700K = 87%	1500lm = 100%
WH = 87%	90CRI 3000K = 77%	1000lm = 67%
BK = 57%	90CRI 2700K = 73%	500lm = 33%

Coefficients of utilization

Ceiling	80%					70%					50%					30%					0%
	70	50	30	10	50	10	50	10	50	10	50	10	50	10	50	10	0				
Wall	0																				
RCR	Zonal cavity method - Effective floor reflectance = 20%																				
Room Cavity Ratio	0	119	119	119	119	116	116	111	111	106	106	106	106	106	106	106	100				
1	114	111	109	107	109	105	105	102	102	101	99	94	96	92	88	88	88				
2	108	104	100	97	102	96	99	94	96	92	88	82	82	82	82	82	82				
3	103	97	93	89	96	88	93	87	91	85	82	82	82	82	82	82	82				
4	98	91	86	82	90	81	88	81	86	80	77	77	77	77	77	77	77				
5	94	86	80	76	85	76	83	75	81	74	72	72	72	72	72	72	72				
6	89	81	75	71	80	71	79	70	77	70	68	68	68	68	68	68	68				
7	85	76	70	66	76	66	74	66	73	66	64	64	64	64	64	64	64				
8	81	72	66	62	71	62	70	62	69	62	60	60	60	60	60	60	60				
9	77	68	63	59	68	59	67	58	66	58	57	57	57	57	57	57	57				
10	74	65	59	55	64	55	63	55	63	55	54	54	54	54	54	54	54				

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.

