LIGHTOLIER
by signify

Downlighting

Calculite LED 4" gen 3

C4RDL Round Downlight

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

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

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

Frame

example: C4RN

Series	Aperture	Installation	Voltage / Options	
	R			
C4 Calculite LED 4" **4** 4" Non-IC *	**R** Round	**N** New construction[1] **R** Remodeler	**—** Universal 120 V/277 V (specify for Power Over Ethernet) **EM** Emergency[1,2] **LC** Chicago Plenum[1]	**3** 347 V (not ELV dimming compatible) **3IP** 347V with Interact Pro (not ELV dimming compatible)[1,3] **IP** Interact Pro[1,3]

Engine

example: C4L15835NZ10U

Series	Lumens	CRI	CCT	Beam	Dimming / Driver	Voltage
C4L						
C4L Calculite LED 4"	**05** 500 lm[4] **10** 1000 lm **15** 1500 lm **20** 2000 lm[5] **25** 2500 lm[5] **30** 3000 lm[5]	**8** 80 CRI **9** 90 CRI	**27** 2700 K **30** 3000 K **35** 3500 K **40** 4000 K	**N** Narrow (43°) **M** Medium (56°) **W** Wide (76°)	**Z10** 0-10 V 1%[4] **SOL** EldoLED Solo 0-10 V 0.1% **D** Dali **L** Lutron LDE1 EcoSystem (fade-to-black) **DMX** Digital Multiplexing	**U** Universal 120 V/277 V/347 V
					E ELV (120V dimming only)[6]	**1** Universal 120 V/277 V
					P Power over Ethernet (PoE)	**E** Ethernet 48 V DC
					Only compatible with 1000 (10) to 2500 (25) lumen configurations.	

Trim

example: C4RDLCCP

Series	Aperture	Style	Finish	Flange
C4	R	DL		
C4 Calculite LED 4"	**R** Round	**DL** Downlight	**BK** Black (matte) **CL** Specular clear **CC** Comfort clear **CD** Comfort clear diffuse **CZ** Champagne bronze	**–** White (matte) **P** Polished **F** Flangeless
			WH White (matte)	**–** White (matte) **F** Flangeless
		SL Shower light (non-conductive)[7]	**WH** White (matte)	**–** Not applicable

1. Interact Pro (IP), Emergency (EM) and Chicago Plenum (LC) options are only available with New construction (N) installations.
2. Emergency (EM) frame comes with emergency battery pack and ceiling mountable test switch (see page 5).
3. Integral Interact Pro RF sensor, enables network lighting control; to be specified with 0-10V light engines only.
4. The 500lm (05) package is only compatible with 0-10V (Z10) dimming.
5. The 2000lm (20), 2500lm (25), and 3000lm (30) packages have marked spacing requirements (see page 2).
6. ELV (E) dimming is only compatible with up to 2000lm (20) configurations.
7. Non-conductive flush mount lens with pre-installed gasket (matte white non-conductive flange with diffuse lens that is flush with the flange).

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C4RDL Calculite LED 4" gen 3

Round Downlight

Accessories

CA4RFT	Mud-in ring for use with flangeless installations (ordered with a flangeless trim)
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)
SWZDT	SpaceWise wireless controller with dwell time functionality (compatible with all 0-10V - see "SWZDT" spec sheet)

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)

	Input				
Light engine	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)

	Input				
Light engine	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)

	Input				
Light engine	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

1. Nominal input volts.
2. Preferred volt range.

Marked spacing applications

Light engine	2500 lm	3000 lm
C4L_Z10U series	—	X
C4L_LU series	X	X
C4L_DU series	—	X
C4L_DMXU 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.

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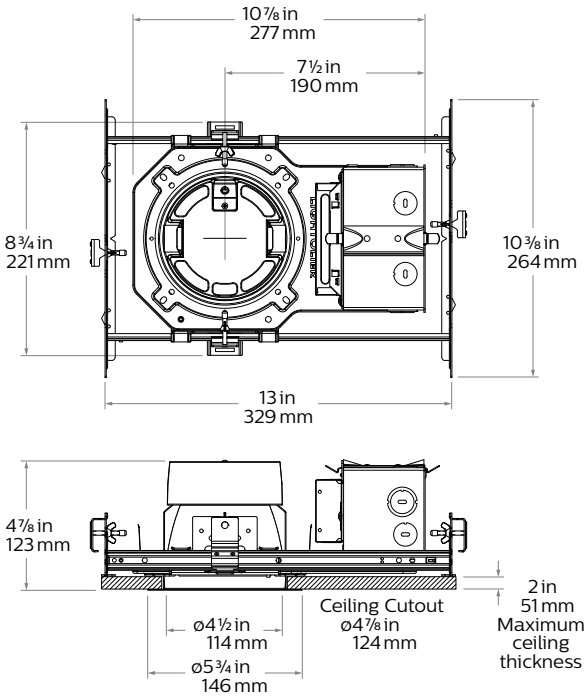
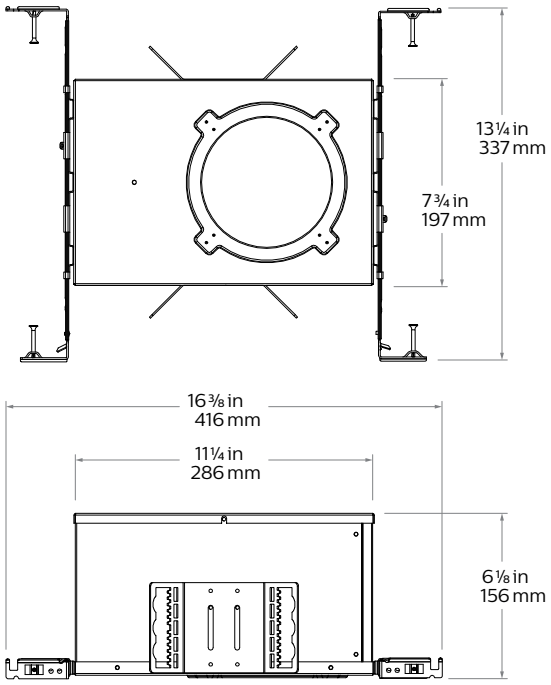
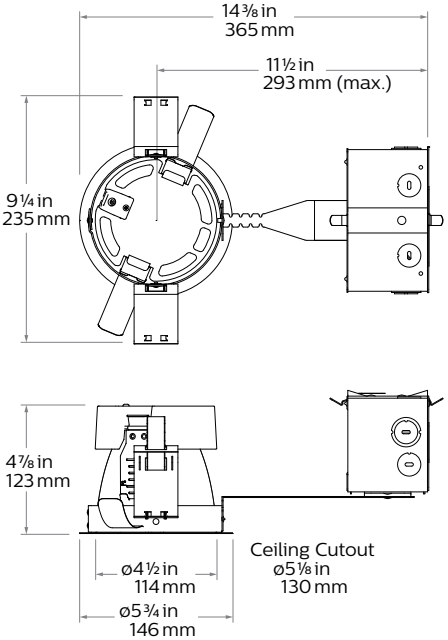
New Construction (N)



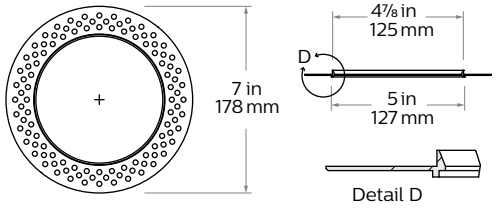
Chicago Plenum (LC)



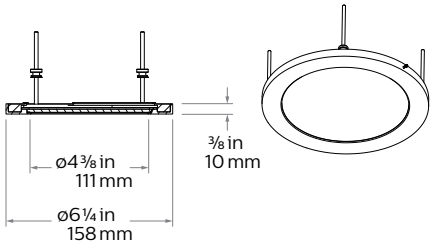
Remodeler (R)



Flangeless mud-in ring (CA4RFT) accessory



Vandal Proof (VP) accessory



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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.

Champagne bronze (CZ): Semi-specular finish that softens light at the source of the reflector while providing a warmer reflector appearance (slightly warmer).

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.

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

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

Black (BK): (matte) Specular finish that provides the lowest aperture brightness possible and significantly reduces source identification in a ceiling.

Shower light (SL): Wet location rated shower light applicable in any installation requiring dead front trims, interior or exterior non-corrosive applications, or where a diffused lens at the ceiling is required (non-conductive).

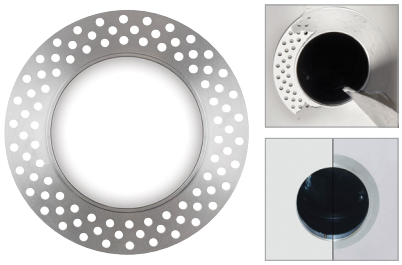
Vandal proof (VP): Provides an elegant solution for vandal resistant needs. One piece machined aluminum ring with impact resistant clear lens. Flangeless (F) flange must be ordered. Provides the luminaire with an IK10 impact and IP65 rating.

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.



Mud-in ring (FT): Low profile, machined aluminum mud-in ring provides a raised rib to plaster up to and a 3/16" flange thickness. The ring is attached to the ceiling material as opposed to the frame-in kit to avoid conduction of heat and vibration which can cause yellowing or cracking of the plaster.

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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).

Emergency

Reflector mounted test switch requires above ceiling access. For reflector mounted test switch, order emergency frame and add "EM" suffix to reflector (example: C4RDLCCEM).

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 for fast and tool-less installs into T-grid & hat channel ceilings.

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.

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 and DMX dimming

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.

Interact Pro (IAP)

- Interact Pro brings the power of connected lighting to small and medium businesses without the complexity usually associated with connected lighting.
- Interact Pro includes an app, a portal and a broad portfolio of wireless Luminaires, lamps and retrofit kits all working on the same system.
- Commissioning via Interact Pro App (Android or iPhone)
- Prepare commissioning remotely via Interact Pro portal
- Requires compatible Interact Pro Gateway and internet connectivity for commissioning
- Compatible with UID8451/10 ZigBee Greenpower wireless dimmer switch
- Compatible with wireless Occ sensor (OCC SENSOR IA CM IP42 WH 10/1) or wireless Day/Occ sensor (OCC MULTI SENSOR IA CM WH 10/1)
- For more information on Interact Pro visit: www.interact-lighting.com/pro
- For more information on Interact Ready visit: www.philips.com/interactready

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 flangless 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

- 500lm & 90 CRI configurations
- Champagne Bronze & Black finishes
- 347V & Emergency voltage/options
- Dali, EldoLED Solo & PoE drivers

Title 24 exceptions

- 1000lm configurations
- Champagne Bronze & Black finishes

Labels and Listings

- cULus listed for wet locations
- ENERGY STAR® certified
- RoHS certified
- CEC Title 24 JA8 certified
- CCEA (frames with *LC suffix)
- IP65 rated with vandal proof accessory
- IBEW Union made (light engines & reflectors)

Warranty

5 year warranty on complete system.

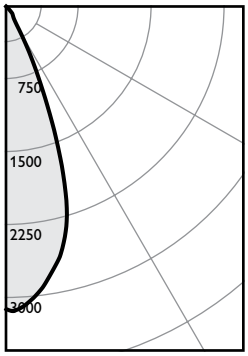
Complete warranty available at: http://images.philips.com/is/content/PhilipsConsumer/PDFDownloads/United%20States/ODLI20150930_003-UPD-en_US-Philips-warranty-indoor-PLS-us.pdf

C4RDL Calculite LED 4" gen 3

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 or 4RN**
Engine: **C4L15835NZ10U**
Trim: **C4RDLCL**

Output lumens:	1526 lms
Input watts:	14.7 W
CRI:	80 min
CCT[1]:	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	
5	3044	282
10	2785	
15	2410	652
20	1672	
25	837	420
30	324	
35	163	115
40	128	
45	77	57
50	0	
55	0	0
60	0	
65	0	0
70	0	
75	0	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[2]: 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%

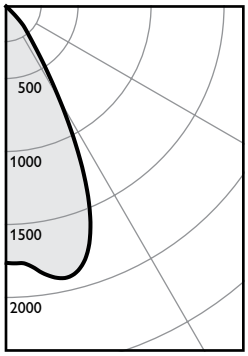
Coefficients of utilization

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

Room Cavity Ratio

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 or 4RN**
Engine: **C4L15835MZ10U**
Trim: **C4RDLCL**

Output lumens:	1627 lms
Input watts:	14.2 W
CRI:	80 min
CCT[1]:	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	
5	1783	174
10	1886	
15	1887	524
20	1702	
25	1283	572
30	762	
35	406	268
40	236	
45	116	89
50	14	
55	0	1
60	0	
65	0	0
70	0	
75	0	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[2]: 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%
Wall	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal cavity method - Effective floor reflectance = 20%										
0	119	119	119	119	116	116	111	111	106	106	100
1	114	111	109	107	109	105	105	102	101	99	94
2	108	104	100	97	102	96	99	94	96	92	88
3	103	97	93	89	96	88	93	87	91	85	82
4	98	91	86	82	90	81	88	81	86	80	77
5	94	86	80	76	85	76	83	75	81	74	72
6	89	81	75	71	80	71	79	70	77	70	68
7	85	76	70	66	76	66	74	66	73	66	64
8	81	72	66	62	71	62	70	62	69	62	60
9	77	68	63	59	68	59	67	58	66	58	57
10	74	65	59	55	64	55	63	55	63	55	54

Room Cavity Ratio

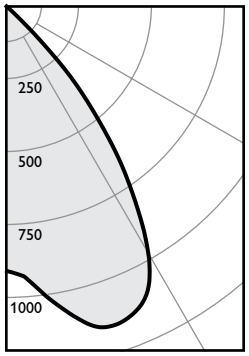
1. Correlated Color Temperature within specs as defined in ANSI_NEMA_ANSLG C78.377-2008: Specifications for the Chromaticity of Solid State Lighting Products.
2. Tested using absolute photometry as specified in LM79: IESNA Approved Method for the Electrical and Photometric Measurements of Solid-State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

C4RDL Calculite LED 4" gen 3

Round Downlight

Wide beam, 1500lm Engine, 106.6 lm/W at 14.2W or 113.2 lm/W at 13.4W (Power over Ethernet)

Candela Curve



Frame: **C4RN or 4RN**
Engine: **C4L15835WZ10U**
Trim: **C4RDLCL**

Output lumens:	1517 lms
Input watts:	14.2 W
CRI:	80 min
CCT[1]:	3500K
Spacing Crit.:	1.2
Beam Angle:	76°

Zonal summary

Zone	Lumens	%Luminaire
0-30	918	60.5%
0-40	1368	90.2%
0-60	1517	100.0%
0-90	1517	100.0%

Angle	Mean CP	Lumens
0	906	
5	945	93
10	1040	
15	1128	318
20	1153	
25	1114	506
30	978	
35	732	450
40	460	
45	175	148
50	18	
55	0	2
60	0	
65	0	0
70	0	
75	0	0
80	0	
85	0	0
90	0	

Single unit data

Height to lighted plane	Initial center beam foot-candles	Beam diameter (ft)*
5'	36	6.0'
6'	25	7.2'
7'	18	8.4'
8'	14	9.6'
9'	11	10.8'

* 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'	68.5	0.63
6'	45.0	0.41
7'	32.1	0.30
8'	26.8	0.25
9'	21.4	0.20

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

Efficacy: 106.6 lm/w
Report[2]: T20161406

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%
Wall	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal cavity method - Effective floor reflectance = 20%										
0	119	119	119	119	116	116	111	111	106	106	100
1	113	110	108	105	108	104	104	100	100	97	93
2	107	102	98	94	100	93	97	91	94	89	86
3	101	94	89	85	93	84	90	83	88	81	79
4	96	87	82	77	86	77	84	76	82	75	72
5	90	81	75	70	80	70	78	69	77	69	66
6	85	75	69	64	75	64	73	64	72	63	61
7	80	70	64	59	69	59	68	59	67	58	56
8	76	65	59	55	65	54	64	54	63	54	52
9	72	61	55	50	61	50	60	50	59	50	48
10	68	57	51	47	57	47	56	47	55	46	45

Room Cavity Ratio

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.

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