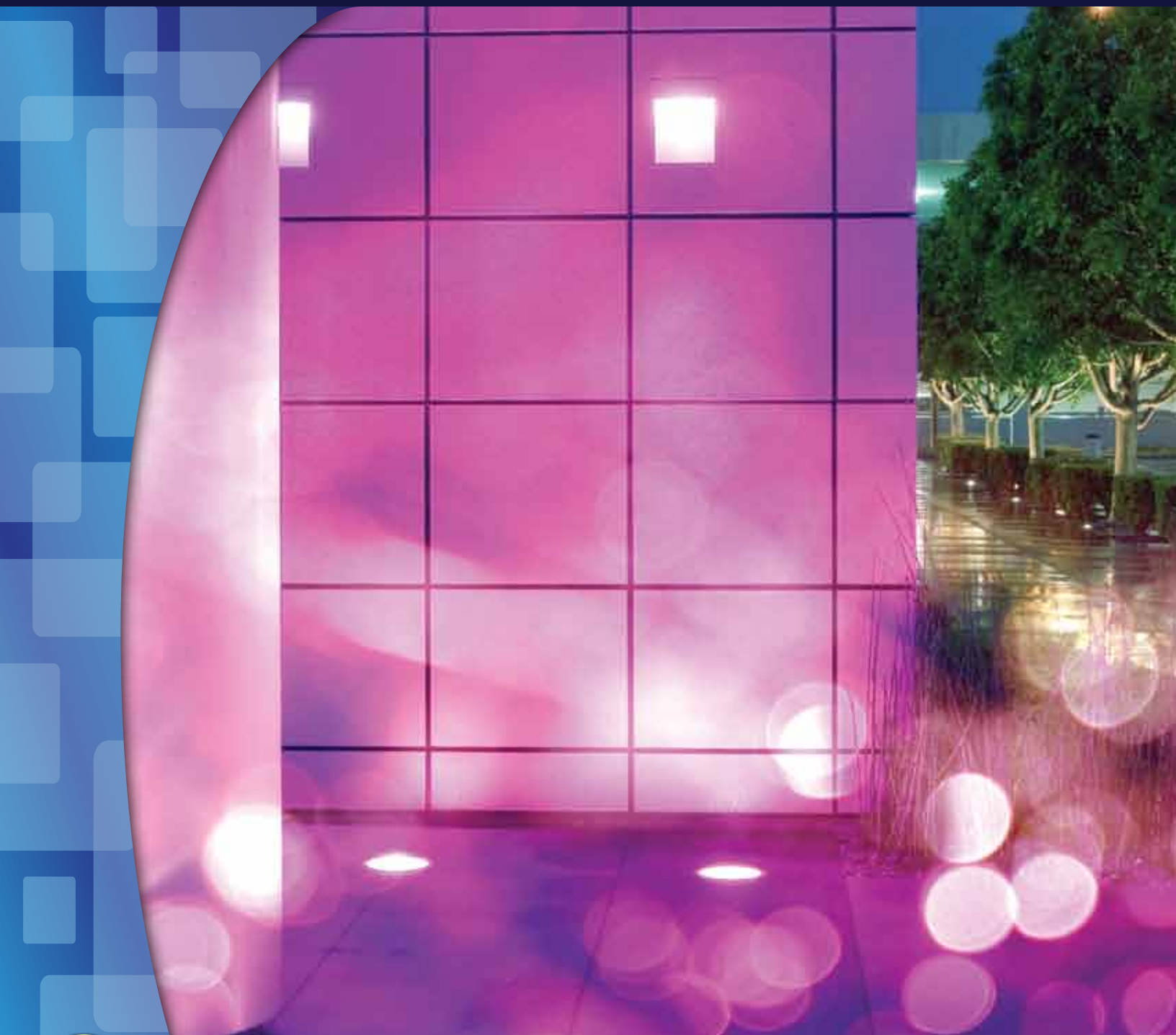


SERVICE GUIDE

LL-QA-14 062215R26

8165 E. Kaiser Blvd, Anaheim, CA 92808



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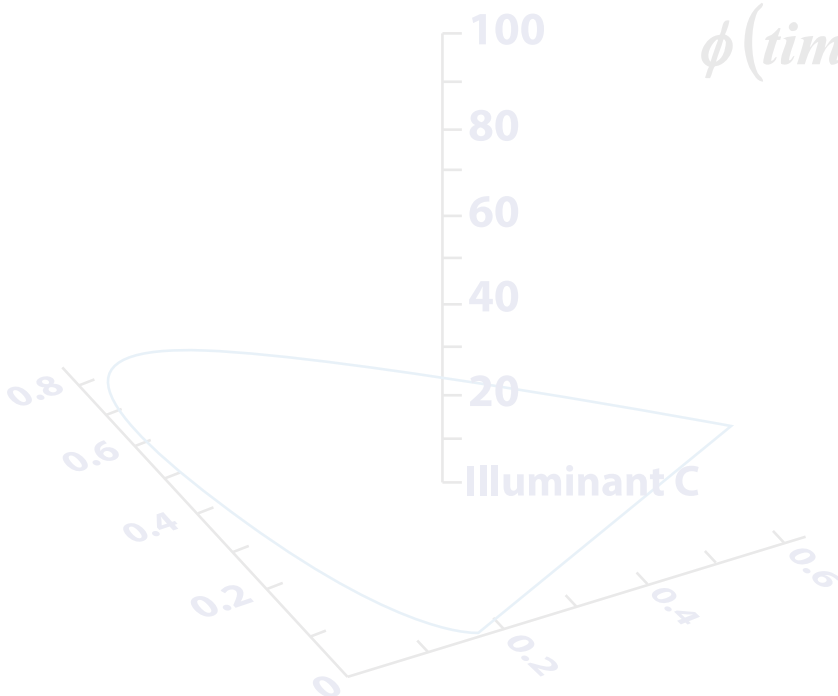
Sphere Testing..... 12

Additional Services..... 13-15

EPA limit LM (25,000) = exp[-(1.467 e - 5)(6,000)] = 0.918

$\phi(\text{time}) = \exp(-\text{alpha time})$

$\text{alpha} = -\frac{\ln(0.7)}{\text{time}}$



Indoor Photometry (Conventional)



SKU	Product Name	Service Description
101	Relative Indoor Photometry	<p>Indoor Relative Photometry Report: Luminaire Lumens, Lumens per Lamp, Efficiency, Spacing Criterion, Luminance Data, Candela Tabulation, Zonal Lumen, Coefficients of Utilization, Polar Graph, Lamp Lumen Measurement IES file</p> <p>Electrical Measurement at Testing Voltage or Current</p>
102	Absolute Indoor Photometry	<p>Indoor Absolute Photometry Report: Luminaire Lumens, Efficacy, Spacing Criterion, Luminance Data, Candela Tabulation, Zonal Lumen, Coefficients of Utilization, Polar Graph IES file</p> <p>Electrical Measurement at Testing Voltage or Current</p>
103	Relative Indoor Photometry: <i>Distribution Test</i>	<p>IES file</p> <p>Electrical Measurement at Testing Voltage or Current</p>
104	Absolute Indoor Photometry: <i>Distribution Test</i>	<p>IES File</p> <p>Electrical Measurement at Testing Voltage or Current</p>
105	Absolute Indoor Photometry - Plasma Light Source	<p>Indoor Absolute Photometry Report: Luminaire Lumens, Efficacy, Spacing Criterion, Luminance Data, Candela Tabulation, Zonal Lumen, Coefficients of Utilization, Polar Graph IES file</p> <p>Electrical Measurement at Testing Voltage or Current</p>
106	Absolute Indoor Photometry: <i>Distribution Test- Plasma Light Source</i>	<p>IES file</p> <p>Electrical Measurement at Testing Voltage or Current</p>



Roadway Photometry (Conventional)

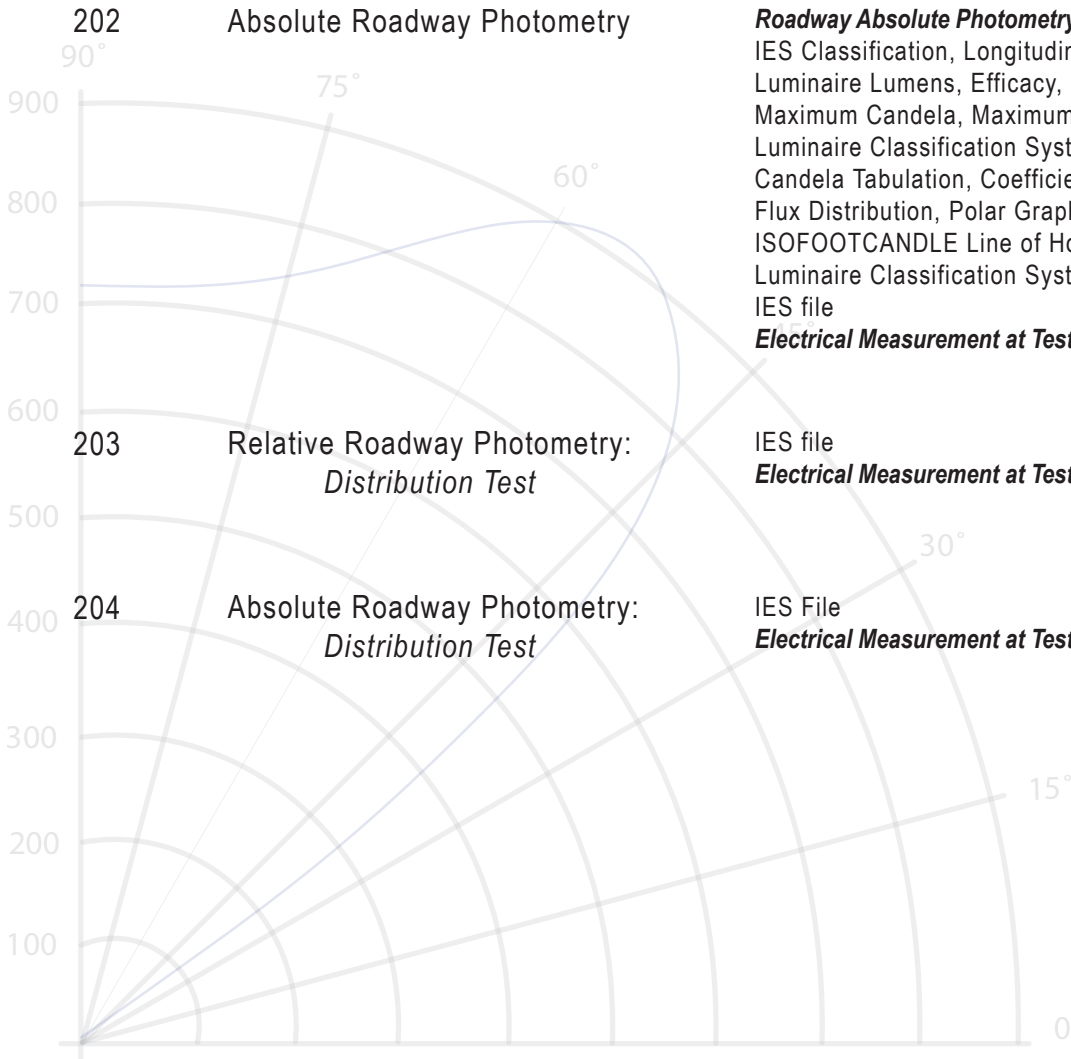
SKU	Product Name	Service Description
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201	Relative Roadway Photometry	<p>Roadway Relative Photometry Report: IES Classification, Longitudinal Classification, Lumen per Lamps, Luminaire Lumens, Efficiency, Maximum Candela, Maximum Candela Angle, Luminaire Classification System, BUG Rating, Candela Tabulation, Coefficients of Utilization, Flux Distribution, Polar Graph, ISOFOOTCANDLE Line of Horizontal Illuminance, Luminaire Classification System (LCS) Graph Lamp Lumen Measurement IES file Electrical Measurement at Testing Voltage or Current</p>
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202	Absolute Roadway Photometry	<p>Roadway Absolute Photometry Report: IES Classification, Longitudinal Classification, Luminaire Lumens, Efficacy, Maximum Candela, Maximum Candela Angle, Luminaire Classification System, BUG Rating, Candela Tabulation, Coefficients of Utilization, Flux Distribution, Polar Graph, ISOFOOTCANDLE Line of Horizontal Illuminance, Luminaire Classification System (LCS) Graph IES file Electrical Measurement at Testing Voltage or Current</p>
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203	Relative Roadway Photometry: Distribution Test	<p>IES file Electrical Measurement at Testing Voltage or Current</p>
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204	Absolute Roadway Photometry: Distribution Test	<p>IES File Electrical Measurement at Testing Voltage or Current</p>
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Roadway Photometry (Conventional)

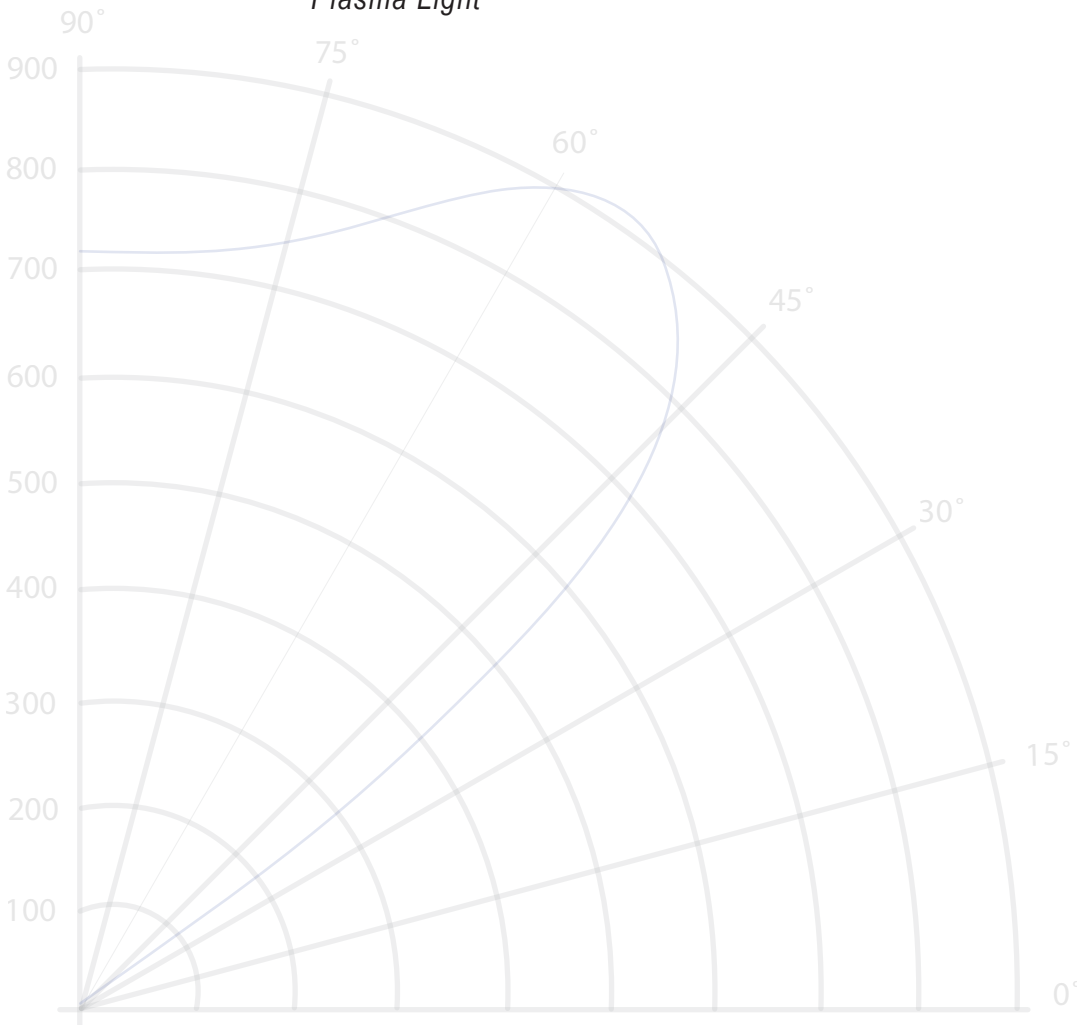
SKU	Product Name	Service Description
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205 Absolute Roadway Photometry
- Plasma Light

Roadway Absolute Photometry Report:
 IES Classification, Longitudinal Classification, Luminaire Lumens, Efficacy, Maximum Candela, Maximum Candela Angle, Luminaire Classification System, BUG Rating, Candela Tabulation, Coefficients of Utilization, Flux Distribution, Polar Graph, ISOFOOTCANDLE Line of Horizontal Illuminance, Luminaire Classification System (LCS) Graph
 IES file
Electrical Measurement at Testing Voltage or Current

206 Absolute Roadway Photometry
Distribution Test Only - Plasma Light

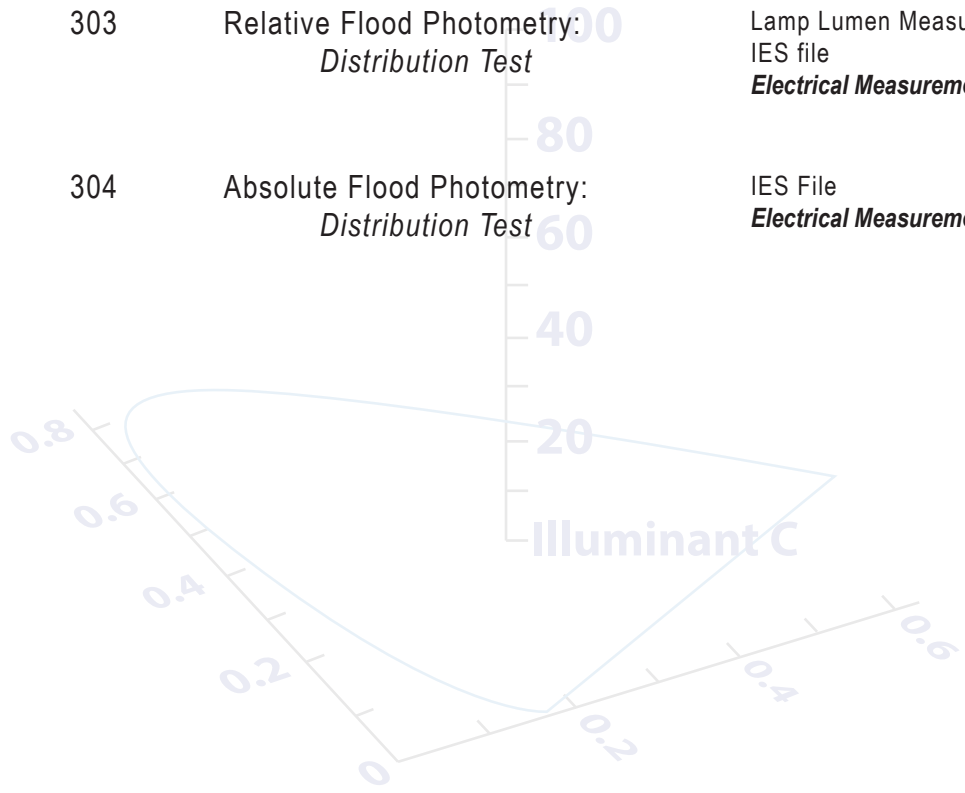
IES file
Electrical Measurement at Testing Voltage or Current





Flood Photometry (Conventional)

SKU	Product Name	Service Description
301	Relative Flood Photometry	<p>Flood Relative Photometry Report: NEMA Type, Maximum Candela, Maximum Candela Angle, Horizontal Beam Angle, Vertical Beam Angle, Lamp Lumens, Beam Lumens, Field Lumens, Spill Lumens, Efficiency, AXIAL Candela, Axial Candela Display, Isocandela Curves Lamp Lumen Measurement IES file Electrical Measurement at Testing Voltage or Current</p>
302	Absolute Flood Photometry	<p>Flood Absolute Photometry Report: NEMA Type, Maximum Candela, Maximum Candela Angle, Horizontal Beam Angle, Vertical Beam Angle, Beam Lumens, Field Lumens, Spill Lumens, Efficacy, AXIAL Candela, Axial Candela Display, Isocandela Curves IES file Electrical Measurement at Testing Voltage or Current</p>
303	Relative Flood Photometry: <i>Distribution Test</i>	<p>Lamp Lumen Measurement IES file Electrical Measurement at Testing Voltage or Current</p>
304	Absolute Flood Photometry: <i>Distribution Test</i>	<p>IES File Electrical Measurement at Testing Voltage or Current</p>





Flood Photometry (Conventional)

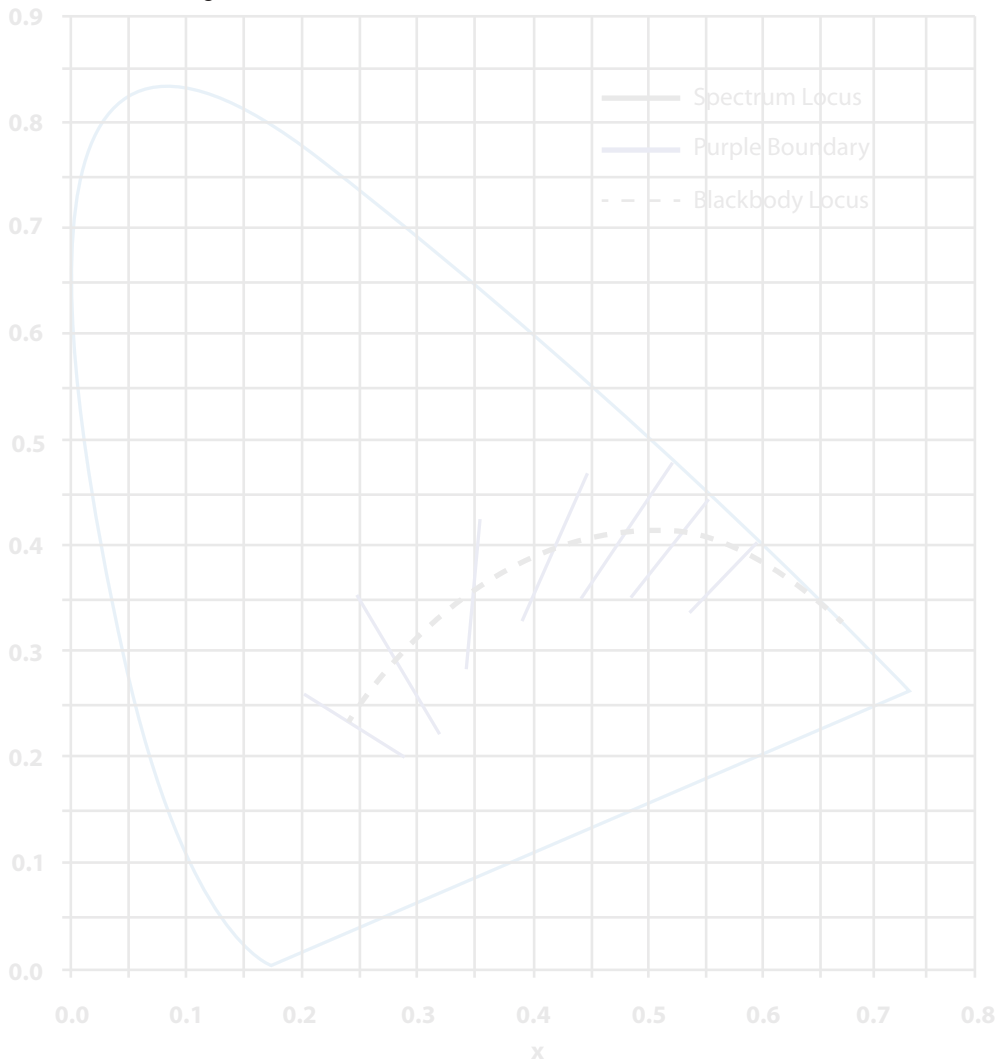
SKU	Product Name	Service Description
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305 Absolute Flood Photometry - Plasma Light Source

Flood Absolute Photometry Report:
 NEMA Type, Maximum Candela, Maximum Candela Angle, Horizontal Beam Angle, Vertical Beam Angle, Beam Lumens, Field Lumens, Spill Lumens, Efficacy, AXIAL Candela, Axial Candela Display, Isocandela Curves
 IES file
Electrical Measurement at Testing Voltage or Current

306 Absolute Flood Photometry - Distribution Test - Plasma Light Source

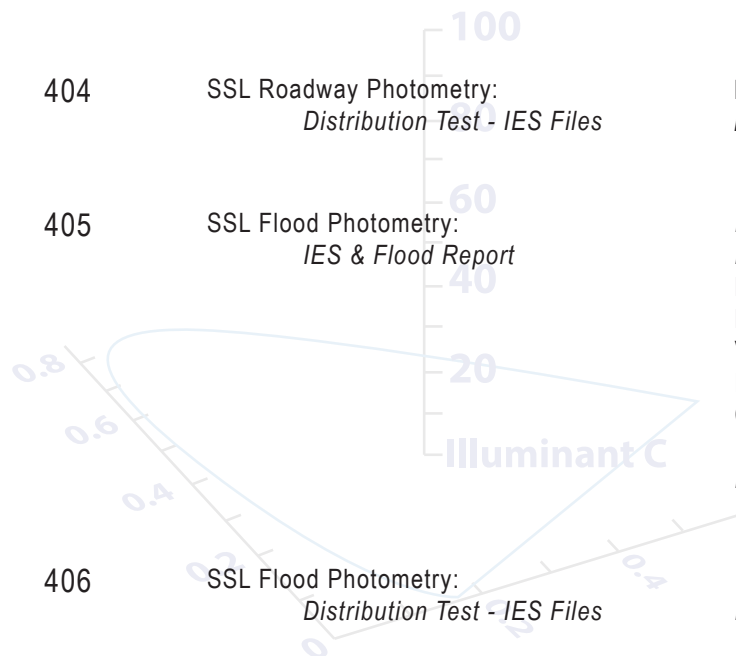
IES file
Electrical Measurement at Testing Voltage or Current



SSL Photometry (LED)



SKU	Product Name	Service Description
401	SSL Indoor Photometry: <i>IES & Indoor Report</i>	LM-79 Sec. 10 Luminous Intensity; Indoor Absolute Photometry Report : Luminaire Lumens, Efficacy, Spacing Criterion, Luminance Data, Candela Tabulation, Zonal Lumen, Coefficients of Utilization, Polar Graph IES file Electrical Measurement at Testing Voltage or Current
402	SSL Indoor Photometry: <i>Distribution Test - IES Files</i>	IES file Electrical Measurement at Testing Voltage or Current
403	SSL Roadway Photometry: <i>IES & Roadway Report</i>	LM-79 Sec. 10 Luminous Intensity; Roadway Absolute Photometry Report: IES Classification, Longitudinal Classification, Luminaire Lumens, Efficacy, Maximum Candela, Maximum Candela Angle, Luminaire Classification System, BUG Rating, Candela Tabulation, Coefficients of Utilization, Flux Distribution, Polar Graph, ISOFOOTCANDLE Line of Horizontal Illuminance, Luminaire Classification System (LCS) Graph IES file Electrical Measurement at Testing Voltage or Current
404	SSL Roadway Photometry: <i>Distribution Test - IES Files</i>	IES File Electrical Measurement at Testing Voltage or Current
405	SSL Flood Photometry: <i>IES & Flood Report</i>	LM-79 Sec. 10 Luminous Intensity; Flood Absolute Photometry Report: NEMA Type, Maximum Candela, Maximum Candela Angle, Horizontal Beam Angle, Vertical Beam Angle, Beam Lumens, Field Lumens, Spill Lumens, Efficacy, AXIAL Candela, Axial Candela Display, Isocandela Curves IES file Electrical Measurement at Testing Voltage or Current
406	SSL Flood Photometry: <i>Distribution Test - IES Files</i>	IES file Electrical Measurement at Testing Voltage or Current

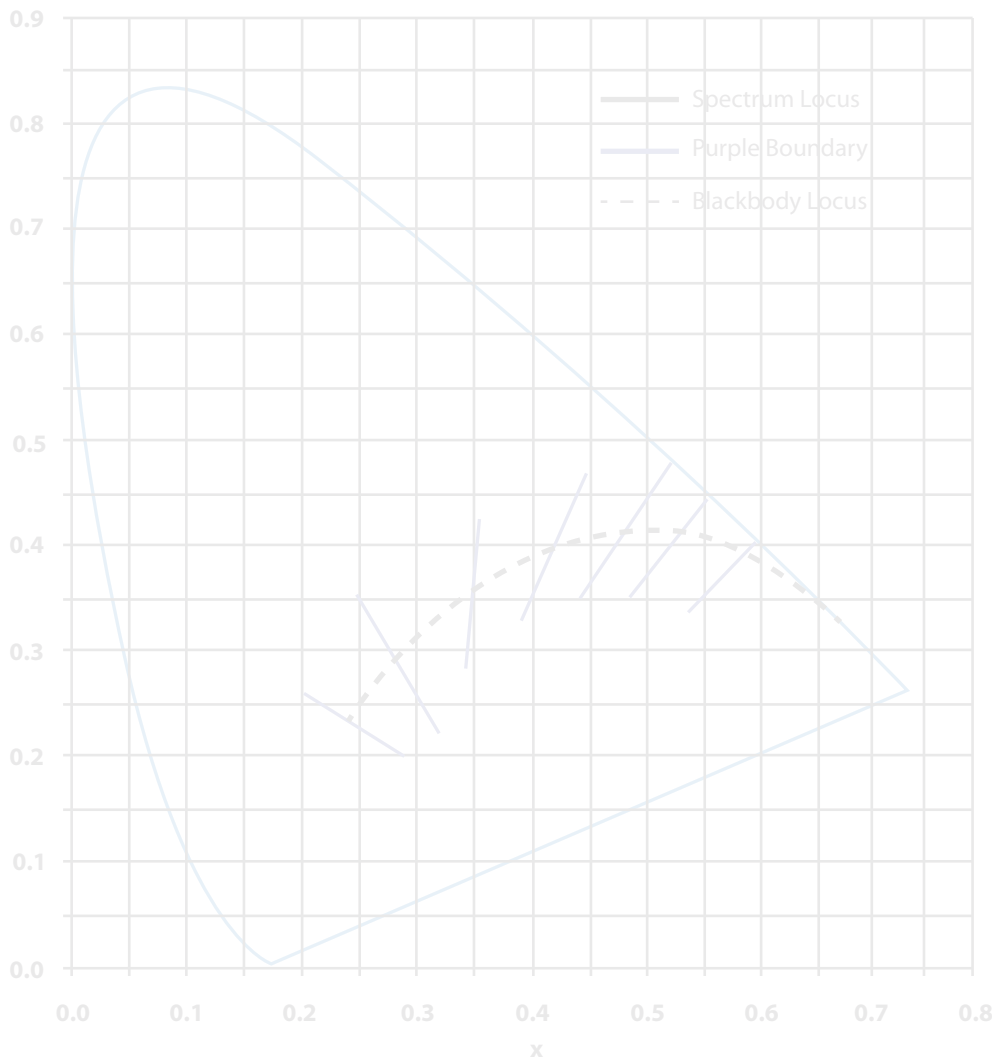




SSL Photometry (LED)

SKU	Product Name	Service Description
451	SSL Color Angular Uniformity for Energy Star: <i>Directional Indoor Luminaires</i>	Vertical angular 1 degree color scanning on the 0 to 90 degree vertical plane.
452	SSL Color Angular Uniformity for Energy Star: <i>Directional Lamps</i>	Vertical angular color scanning on two planes separately by 90 degrees. Each 2 degrees for beam angles less than 15 degrees and 5 degrees for beam angles 15 degrees or greater.

$$alpha(25,000\ hour) = -\frac{\ln(0.7)}{25,000} = 1.4267e - 5$$



SSL Photometry (LED)



SKU	Product Name	Service Description
501	SSL LM-79 Indoor Photometry and Colorimetry	401 SSL Photometry: <i>IES and Indoor Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i>
502	SSL LM-79 Indoor Photometry and Colorimetry and Add-On Electrical Measurement	401 SSL Photometry: <i>IES and Indoor Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement
503	SSL LM-79 Roadway Photometry and Colorimetry	403 SSL Photometry: <i>IES and Roadway Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i>
504	SSL LM-79 Roadway Photometry, Colorimetry and Add-on Electrical Measurement	403 SSL Photometry: <i>IES and Roadway Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement
505	SSL LM-79 Flood Photometry and Colorimetry	405 SSL Photometry: <i>IES and Flood Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i>
506	SSL LM-79 Flood Photometry, Colorimetry and Add-on Electrical Measurement	405 SSL Photometry: <i>IES and Flood Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement
507	SSL LM-79 Retrofit Linear Panel Photometry and Colorimetry for Tube Style	401 SSL Photometry: <i>IES and Indoor Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i>
508	Retrofit Linear Panel Photometry For Tube Style: <i>IES and Indoor Report</i>	401 SSL Photometry: <i>IES and Indoor Report</i>
509	Retrofit Linear Panel Photometry for Tube Style: <i>Distribution Test</i>	402 SSL Photometry: <i>IES file</i>
510	Retrofit Kit Photometry: <i>Distribution Test</i>	402 SSL Photometry: <i>IES file</i>
511	Retrofit Kit Photometry: <i>IES and Photometry Report</i>	401 SSL Photometry: <i>IES and Photometry Report</i>
512	SSSL LM-79 Retrofit Kit Photometry: <i>IES, Photometry Report and Colorimetry</i>	401 SSL Photometry: <i>IES and Photometry Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i>
513	SSSL LM-79 Retrofit Kit Photometry: <i>IES, Report, Colorimetry Add-on Electrical Measurement</i>	401 SSL Photometry: <i>IES and Photometry Report</i> 602 Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement

SSL Photometry (LED)

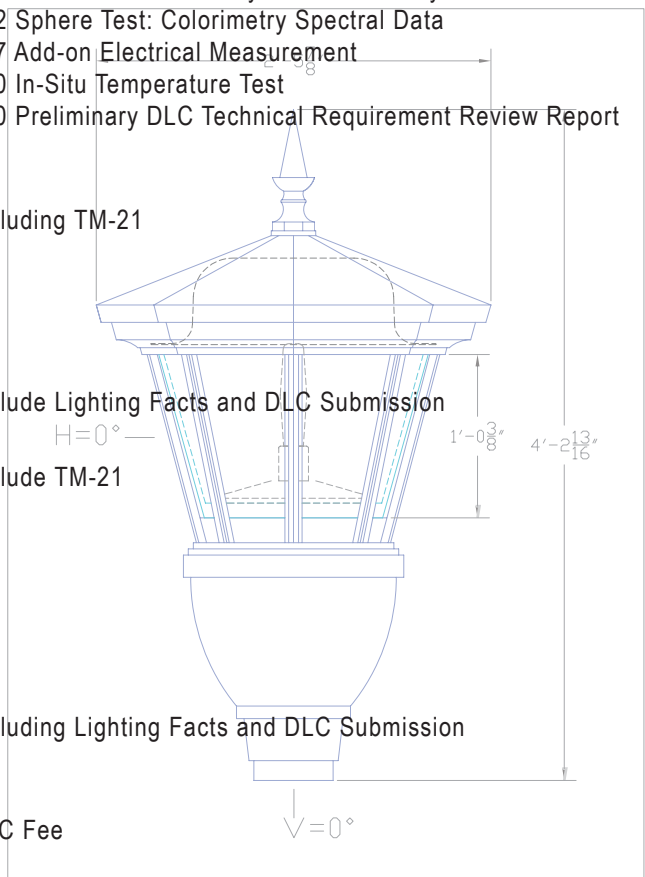


SKU	Product Name	Service Description
801	Indoor DLC Test Package	754 Electrical Pre-Test 501 SSL Photometry: <i>IES and Indoor Report</i> Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement 750 In-Situ Test 810 Preliminary DLC Testing Requirement Review Report
802	Roadway DLC Test Package	754 Electrical Pre-Test 503 SSL Photometry: <i>IES and Roadway Report</i> Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement 750 In-Situ Test 810 Preliminary DLC Testing Requirement Review Report
803	Flood DLC Test Package	754 Electrical Pre-Test 505 SSL Photometry: <i>IES and Flood Report</i> Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement 750 In-Situ Test 810 Preliminary DLC Testing Requirement Review Report
804	Refrigerated Case DLC Test Package	754 Electrical Pre-Test 501 SSL Photometry: <i>IES and Indoor Report</i> Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement 750 In-Situ Test 728 System Electrical Measurement (PF,THD) & Pro Ration (W, Current) 810 Preliminary DLC Testing Requirement Review Report
805	Linear Replacement DLC Test Package <i>Excludes Bare Lamp Test</i>	754 Electrical Pre-Test 501 SSL Photometry: <i>IES and Indoor Report</i> Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement 750 In-Situ Test 810 Preliminary DLC Testing Requirement Review Report
806	Linear Replacement DLC Test Package <i>Includes Bare Lamp Test</i>	754 Electrical Pre-Test 401 SSL Photometry: <i>IES and Indoor Report-Troffer</i> 501 SSL LM79 Indoor Photometry and Colorimetry 727 Add-on Electrical Measurement 750 In-Situ Test 810 Preliminary DLC Testing Requirement Review Report

SSL Photometry (LED)



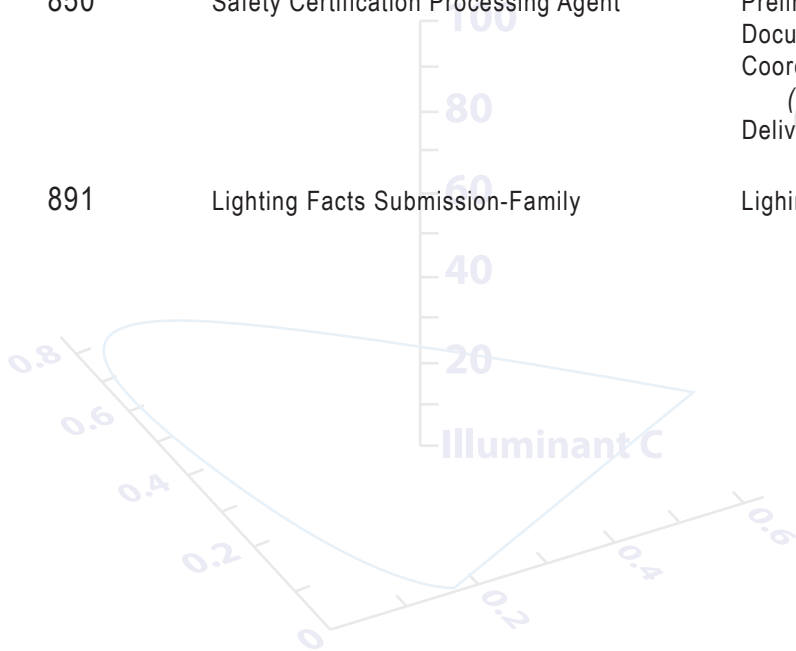
SKU	Product Name	Service Description
807	Linear Ambient DLC Te Package <i>For Indirect/Direct</i>	754 Electrical Pre-Test 501 SSL Photometry: <i>IES and Indoor Report</i> Sphere Test: <i>Colorimetry Spectral Data</i> 727 Add-on Electrical Measurement 750 In-Situ Test 703 Add-on Direct/Indirect 810 Preliminary DLC Testing Requirement Review Report
808	Lighting Facts Verification Testing Process Fee	
809	Off Road SSL Flood Light Test	405 SSL Photometry: <i>IES and Flood Report</i> Off Road Beam Report
810	Preliminary DLC Technical Requirement Review Report	Prelim-Check report for LM-79 Test report
811	Retrofit Kit DLC Test Package	754 Electrical Pre-Test 501 SSL LM79 Photometry and Colorimetry 602 Sphere Test: Colorimetry Spectral Data 727 Add-on Electrical Measurement 750 In-Situ Temperature Test 810 Preliminary DLC Technical Requirement Review Report
821	TM-21 Report Preparation	
822	DLC DOC Preparation for Single Product - Preparation	Including TM-21
823	DLC DOC Re-preparation for Single	
824	DLC Submission for Single Product	Include Lighting Facts and DLC Submission H=0°
825	DLC DOC Preparation for Family Group - Preparation	Include TM-21
826	DLC DOC Re-preparation for Family	
827	DLC Submission for Family Group	
828	International DLC DOC Preparation and Submission	Including Lighting Facts and DLC Submission
829	DLC Application Fee - Single product/Report review	DLC Fee V=0°



SSL Photometry (LED)



SKU	Product Name	Service Description
830	DLC Application Fee - Additional Family	DLC Fee
831	Lighting Facts Submission	
832	DLC Private Labeling/Multiple Listing- Single	DLC Private Labeling/Multiple Listing Doc Prep and Submission
833	DLC Private Labeling/Multiple Listing- Family	DLC Private Labeling/Multiple Listing Doc Prep and Submission
840	LDL DOC Preparation	Lighting Design Lab Doc Preparation
841	LDL Submission	Lighting Design Lab Submission
842	Title-24 DOC preparation	
843	Title-24 Submission	
844	Test Report review Single Product - 3rd Party	Test Report Review - Per Project
845	Test Report review fee Family Product - 3rd Party	Test Report Review - Per Project
850	Safety Certification Processing Agent	Preliminary Design Review Document review and completion Coordinate Safety Project with vendor choice (UL, ETL, CSA, TUV, etc.) Delivery of Certification and Report to customer
891	Lighting Facts Submission-Family	Lighting Facts Submission-Family



$$\ln(0.7) = \frac{\text{time}}{\text{time}}$$

Sphere Testing (Conventional & LED)



SKU	Product Name	Service Description
601	Sphere Test: Total Lumens & Spectral Data	<p>LM-79 Sec. 9 Total Flux and Sec. 12 Color Measurement; Total Lumens, THD & PF@Testing Voltage or Current, Efficacy, Color Rendering Index (CRI), Correlated Color Temperature (K), Chromaticity Coordinate x, R Values Chromaticity Coordinate y, Off State Power (W), Spectral Power Graph and Tabulation</p> <p>Electrical Measurement at Test Voltage or Current</p>
602	Sphere Test: Colorimetry Spectral Data	<p>LM-79 Sec. 12 Color Measurement; THD & PF@Testing Voltage or Current, Color Rendering Index(CRI), Correlated Color Temperature (K), Chromaticity Coordinate x, R Values Chromaticity Coordinate y, Off State Power (W), Spectral Power Graph and Tabulation</p> <p>Electrical Measurement at Test Voltage or Current</p>
603	Sphere Test: Total Lumens	<p>LM-79 Sec. 9 Total Flux; Total Lumens, Efficacy</p> <p>Electrical Measurement at Testing Voltage or Current</p>

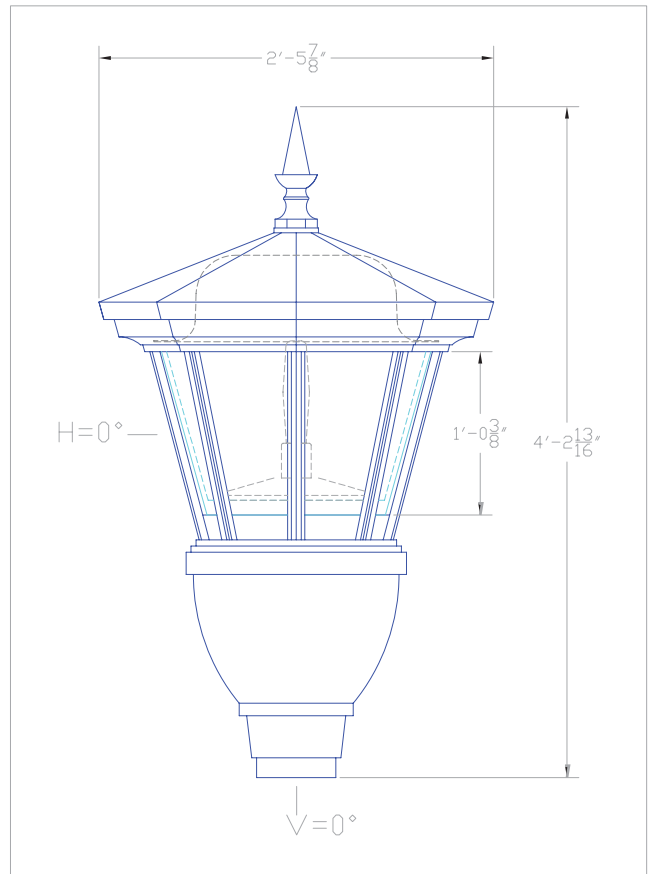
$$\phi(\text{time}) = \exp(-\text{alpha time})$$

$$\text{alpha}(25,000 \text{ hour}) = -\frac{\ln(0.7)}{25,000} = 1.4267 e - 5$$

Add-on Services



SKU	Product Name	Service Description
701	Add-on Lamps for Linear Fluorescent Set of 2	
702	Add-on Compact Fluorescent Lamp	
703	Add-on Direct/Indirect	0-90 Light Distribution & 90-180 Light Distribution
704	Single Point Measurement	Single Point Candela Measurement
705	ISO-Foot Candle Plot	ISO foot candle lines of Horizontal illumination plot based on the mounting height
706	Illuminance, Cone of Light	Illuminance at a Distance show Certen Beam Foot-candle and field width(ft) by distance
707	Add-on S/P Ratio (Scotopic/Photopic)	
710	Report Conversion (Prorated Lumens, Electrical data, Tilt, Meter, Lux)	
712	Report Correction (Company Name, Model no, Description)	
713	Report Generation for different Report Type	
714	Report Generation for Private Label	
715	IES File Conversion	
720	3 Business Day Expedite Service (3 days for Photometry, 5 Days In-Situ)	
721	One Business Day Expedite Service (1 Day for Photometry, 2 Days for In-Situ)	
722	Add-on Weight Over 50lb	
723	Add-on HID Lamp	



Add-on Services



SKU	Product Name	Service Description
724	Add-on Incandescent Lamp	
725	Lab Hour	
726	Electrical Measurement Only	Wattage, Current, Voltage, THD & PDF
727	Add-on Electrical Measurement	Wattage, Current, Voltage, THD & PF
728	System Electrical Measurement	System Electrical Measurement, Prorate the unit Electrical Data
730	Lamp Seasoning Set up	100hr Lamp Seasoning
731	Lamp Seasoning fee per lamp less than 50W	Per Lamp
732	Lamp Seasoning fee per lamp over 50W	Per Lamp
740	Custom Test	
741	Custom Test Setup	
742	Custom Report	
750	In-Situ Test	UL 1598 In-Situ Test Report (1 LED Tc) Electrical Measurement at Testing Voltage or Current
751	Add-on In-Situ for Additional LED	
752	Add-on In-Situ for Additional Driver	
753	LED Current Measurement	
754	Electrical Pre-Test	
755	Lens Change	
756	Drive Change	
757	Dimming Set-up	

Add-on Services



SKU	Product Name	Service Description
758	Reflector Change	
759	Rewiring	
760	RGB Setting	
761	Insitu Test with LED forward Current	UL 1598 In-Situ Test Report (1LED Tc) LED Forward Current Electrical Measurement at Test Voltage or Current
762	Junction Temperature Measurement	Junction Temperature Measurement per chip (Die) or average of multiple chip
770	Thermal Imaging Report	Luminaire Thermal Imaging
780	PAR (Photosynthetic Active Radiation)	Total PPF (photosynthetic photon flux)