Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2017

Prepared For

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1.0 Test Summary

DLC Technical Requirements v5.1

Indoor - Troffer - 2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category	**Test Method**	**Requirements**		**Test value**
Luminaire Description:	T34FA2X2 / 20W / 3500K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		2282
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	126.9
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		18.0
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	8.23%
		20.00%	277V	8.89%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.990
		0.9	277V	0.904
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3366
		4 step	3465±124	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		81
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		-1
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-13%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.95%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		18.8
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.24
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.072
(Goniophotometer - Section 4.2)		Non-Worst Case		0.140
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		18.0
(Goniophotometer - Section 4.2)		Non-Worst Case		16.7

Luminaire Description:	T34FA2X2 / 20W / 4000K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		2341
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	134.1
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		17.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	7.88%
		20.00%	277V	9.07%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.991
		0.9	277V	0.899
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	3995
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		10
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		92
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.95%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		18.9
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.24
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.070
(Goniophotometer - Section 4.2)		Non-Worst Case		0.140
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		17.5
(Goniophotometer - Section 4.2)		Non-Worst Case		16.7
Luminaire Description:	T34FA2X2 / 20W / 5000K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		2279
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	127.2
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		17.9

Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	8.19%
		20.00%	277V	8.96%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.990
		0.9	277V	0.903
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	4810
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		9
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.96%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		18.6
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.26
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.072
(Goniophotometer - Section 4.2)		Non-Worst Case		0.140
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		17.9
(Goniophotometer - Section 4.2)		Non-Worst Case		16.7
Luminaire Description:	T34FA2X2 / 30W / 3500K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		3259
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	120.3
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		27.1
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.39%
		20.00%	277V	8.83%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
		0.9	277V	0.950
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3372
		4 step	3465±124	

Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		81
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		-3
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-13%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.91%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		19.7
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.26
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.103
(Goniophotometer - Section 4.2)		Non-Worst Case		0.221
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		27.1
(Goniophotometer - Section 4.2)		Non-Worst Case		26.5
Luminaire Description:	T34FA2X2 / 30W / 4000K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		3411
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	133.2
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		25.6
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.44%
		20.00%	277V	8.25%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
		0.9	277V	0.950
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	4001
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		9
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83

Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		92
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.94%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		20.2
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.24
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.098
(Goniophotometer - Section 4.2)		Non-Worst Case		0.202
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		25.6
(Goniophotometer - Section 4.2)		Non-Worst Case		24.1
Luminaire Description:	T34FA2X2 / 30W / 5000K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		3271
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	123.4
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		26.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.34%
		20.00%	277V	8.78%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
		0.9	277V	0.954
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	4816
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		83
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		8
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		84
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-13%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.95%

Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		19.8
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.26
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.101
(Goniophotometer - Section 4.2)		Non-Worst Case		0.212
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		26.5
(Goniophotometer - Section 4.2)		Non-Worst Case		25.3
Luminaire Description:	T34FA2X2 / 40W / 3500K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		4089
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	118.8
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		34.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	6.89%
		20.00%	277V	7.36%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
		0.9	277V	0.978
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3377
		4 step	3465±124	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		82
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		-1
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-13%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.84%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		20.6
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.26
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28

Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.127
(Goniophotometer - Section 4.2)		Non-Worst Case		0.278
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		34.4
(Goniophotometer - Section 4.2)		Non-Worst Case		33.2
Luminaire Description:	T34FA2X2 / 40W / 4000K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		4328
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	131.1
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		33.0
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	6.77%
		20.00%	277V	6.99%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
		0.9	277V	0.975
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3985±275	4003
		4 step	3985±154	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		83
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		8
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		93
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.87%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		21.0
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.24
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.30
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.122
(Goniophotometer - Section 4.2)		Non-Worst Case		0.263
Power (Input Wattage - W)				

(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		33.0
(Goniophotometer - Section 4.2)		Non-Worst Case		31.5
Luminaire Description:	T34FA2X2 / 40W / 5000K			
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	3000		4100
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 110	Premium 125	119.2
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		34.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	6.44%
		20.00%	277V	7.37%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
		0.9	277V	0.977
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	4822
		4 step	5029±220	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾80		83
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	⩾0		7
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾70		84
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	⩾89		94
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%⩽IES Rcs,h1⩽+23%		-13%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾75%		77.89%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	＜22		20.6
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.26
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	1.0-2.0		1.28
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		277
(Goniophotometer - Section 4.2)		Non-Worst Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.127
(Goniophotometer - Section 4.2)		Non-Worst Case		0.265
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		34.4
(Goniophotometer - Section 4.2)		Non-Worst Case		31.7

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/11/3	T34FA2X2	A1
2	Goniophotometer Test	2021/11/3	T34FA2X2	A1
3	THD and PF Test	2021/11/3	T34FA2X2	A1

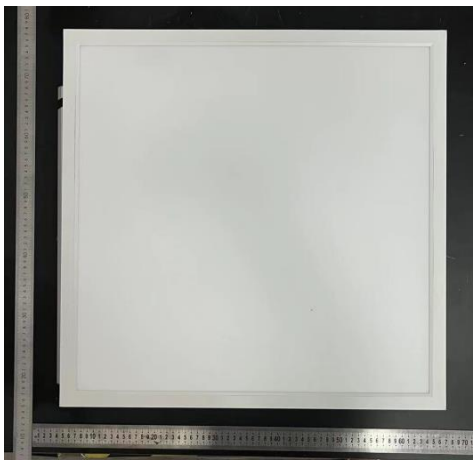
Remark(If any)
1、This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

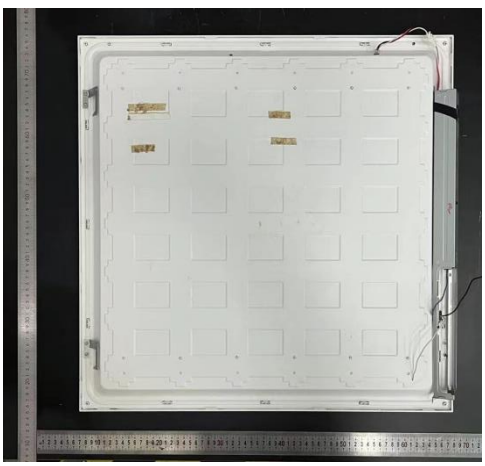
3.0 Production Description

Luminaire Description: T34FA2X2

Electrical Specification: 120V-277V,50/60HZ

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 20W / 3500K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.01	60	0.138	16.4	0.990
276.95	60	0.072	18.1	0.904

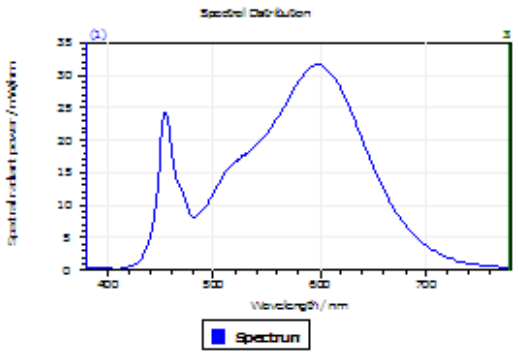
Test Result

CCT (K)	CRI	R9	Duv
3366	81	-1	0.0016

Rf	Rg	IES Rcs,h1
83	93	-13%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	580.75 nm
Purity	0.443
PeakWavelength	598.13 nm
Radiant Power	4.829 W
Width50%:	

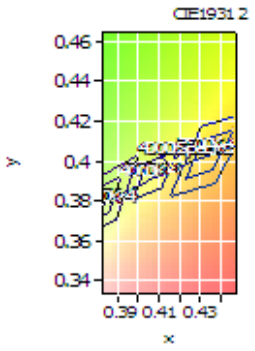
Color Coordinates

Correlated Color Temperat 3366 K

x:	0.4149	u:	0.2385	u':	0.2385
y:	0.3991	v:	0.3441	v':	0.5161

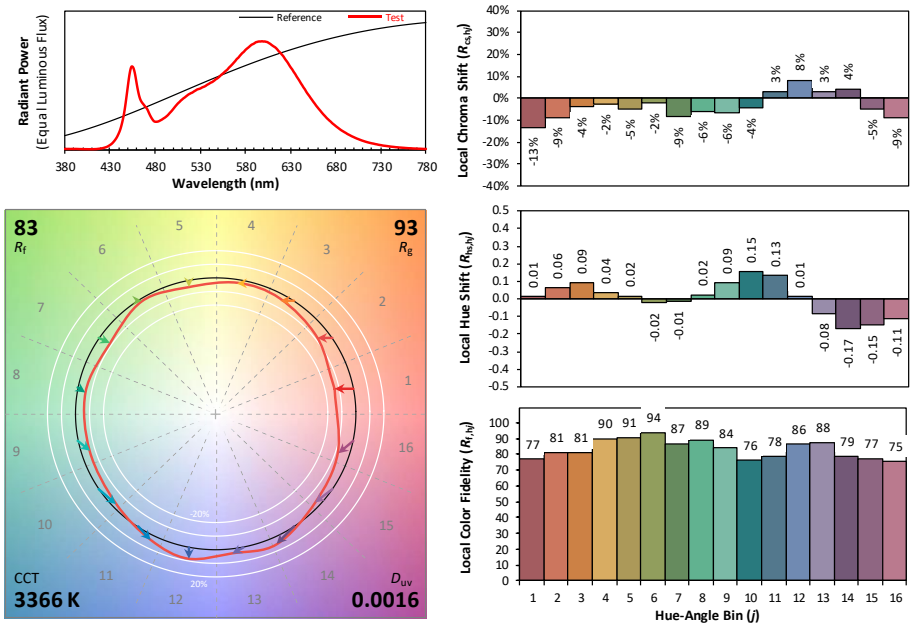
CRI01	80.0	CRI09	-1.1
CRI02	91.5	CRI10	80.3
CRI03	94.7	CRI11	76.8
CRI04	77.7	CRI12	64.7
CRI05	79.7	CRI13	83.1
CRI06	88.8	CRI14	97.6
CRI07	81.7	CRI15	71.6
CRI08	56.7	CRI16	67.9

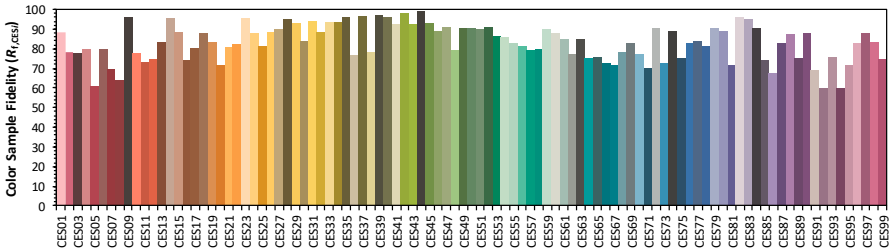
ResultsCRI 81.4



PlanckDistance 1.6E-003

4.1 Integrating Sphere Test





Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4149
y	0.3991
u'	0.2385
v'	0.5161

CIE 13.3-1995 (CRI)

R_a	82
R_9	0

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4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 20W / 4000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.00	60	0.132	15.7	0.991
276.96	60	0.070	17.4	0.899

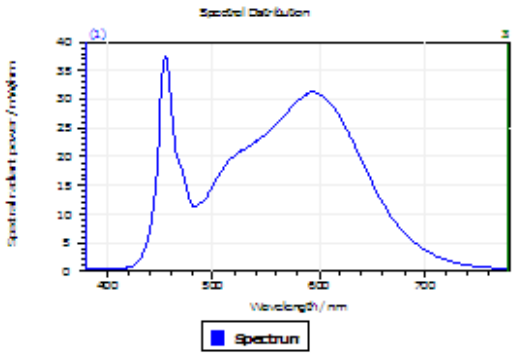
Test Result

CCT (K)	CRI	R9	Duv
3995	84	10	0.0013

Rf	Rg	IES Rcs,h1
83	92	-12%

4.1 Integrating Sphere Test

Results



Spectral Distribution

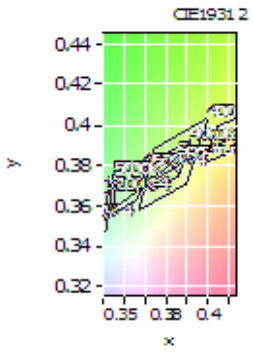
Spectral values

DominantWavelength	578.39 nm
Purity	0.287
PeakWavelength	455.27 nm
Radiant Power	5.359 W
Width50%:	

Color Coordinates

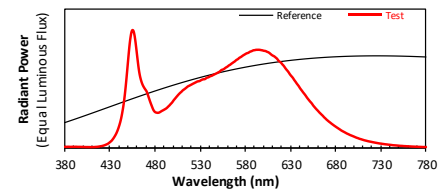
Correlated Color Temperat		3995 K			
x:	0.3816	u:	0.2244	u':	0.2244
y:	0.3803	v:	0.3355	v':	0.5033

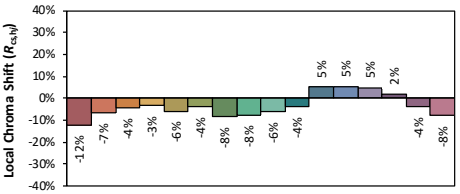
CRI01	82.8	CRI09	9.8
CRI02	92.7	CRI10	82.0
CRI03	95.6	CRI11	79.5
CRI04	80.1	CRI12	60.7
CRI05	82.2	CRI13	85.8
CRI06	89.0	CRI14	98.3
CRI07	84.2	CRI15	75.9
CRI08	63.4	CRI16	71.3
ResultsCRI	83.8		

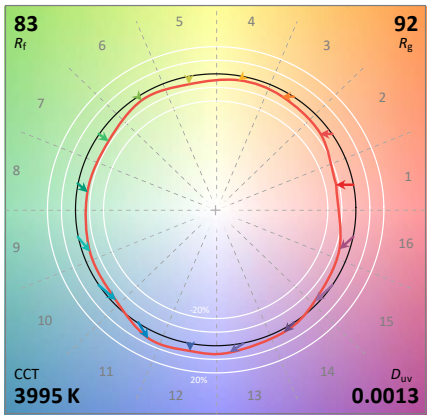


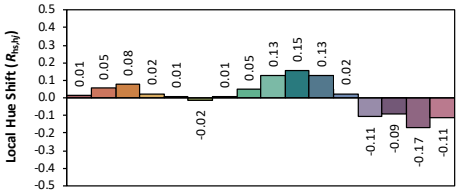
PlanckDistance 1.3E-003

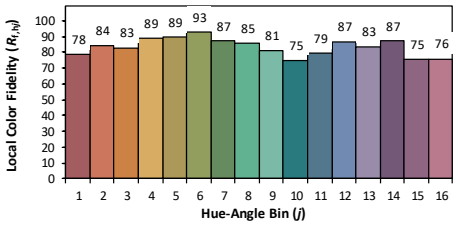
4.1 Integrating Sphere Test

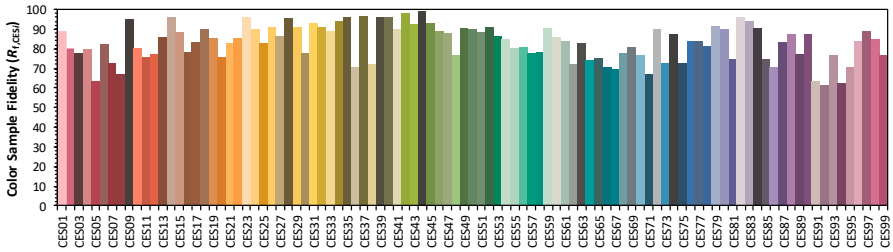












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3816
y	0.3803
u'	0.2244
v'	0.5033

CIE 13.3-1995 (CRI)

R_a	84
R_9	9

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 20W / 5000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.09	60	0.139	16.5	0.990
276.99	60	0.072	18.0	0.903

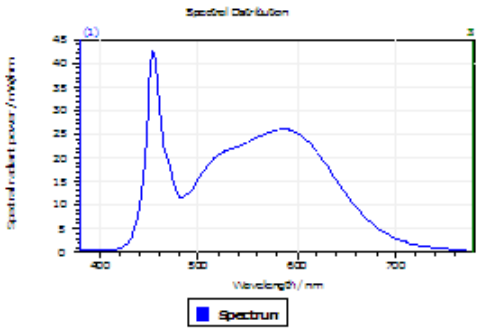
Test Result

CCT (K)	CRI	R9	Duv
4810	84	9	0.0038

Rf	Rg	IES Rcs,h1
83	93	-12%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

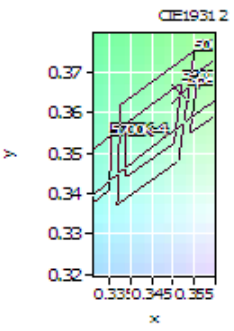
DominantWavelength	571.78 nm
Purity	0.150
PeakWavelength	454.34 nm
Radiant Power	4.983 W
Width50%:	

Color Coordinates

Correlated Color Temperat		4810 K			
x:	0.3517	u:	0.2109	u':	0.2109
y:	0.3646	v:	0.3279	v':	0.4918

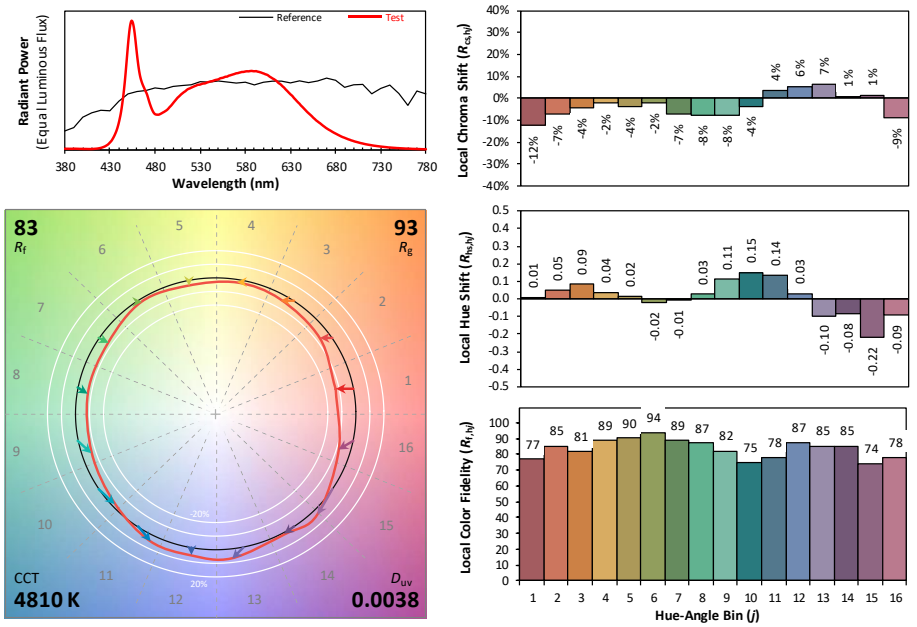
CRI01	81.8	CRI09	9.1
CRI02	91.3	CRI10	78.5
CRI03	95.6	CRI11	78.8
CRI04	79.6	CRI12	55.3
CRI05	81.1	CRI13	84.8
CRI06	86.6	CRI14	98.0
CRI07	86.1	CRI15	75.2
CRI08	65.8	CRI16	70.1

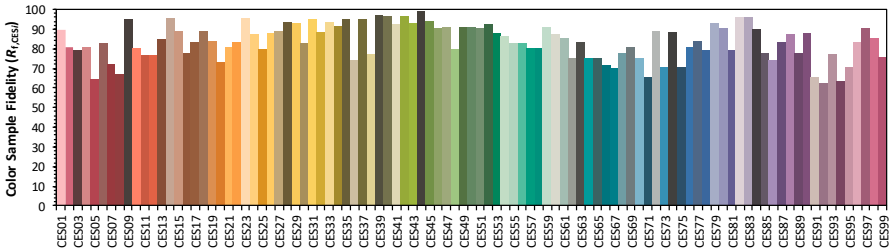
ResultsCRI 83.5



PlanckDistance 3.8E-003

4.1 Integrating Sphere Test





Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3517
y	0.3646
u'	0.2109
v'	0.4918

CIE 13.3-1995 (CRI)

R_a	84
R_9	9

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4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 30W / 3500K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.98	60	0.212	25.3	0.997
276.96	60	0.102	26.8	0.950

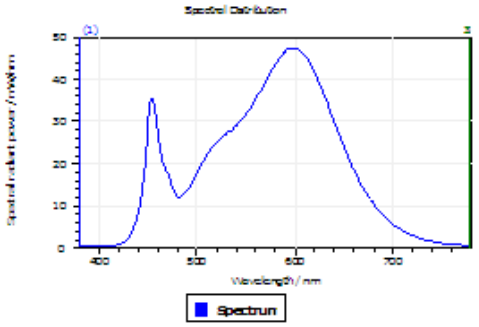
Test Result

CCT (K)	CRI	R9	Duv
3372	81	-3	0.0017

Rf	Rg	IES Rcs,h1
83	93	-13%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	580.67 nm
Purity	0.443
PeakWavelength	597.84 nm
Radiant Power	7.267 W
Width50%:	

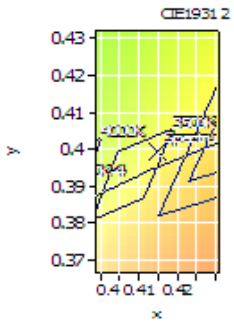
Color Coordinates

Correlated Color Temperat 3372 K

x:	0.4147	u:	0.2383	u':	0.2383
y:	0.3993	v:	0.3441	v':	0.5162

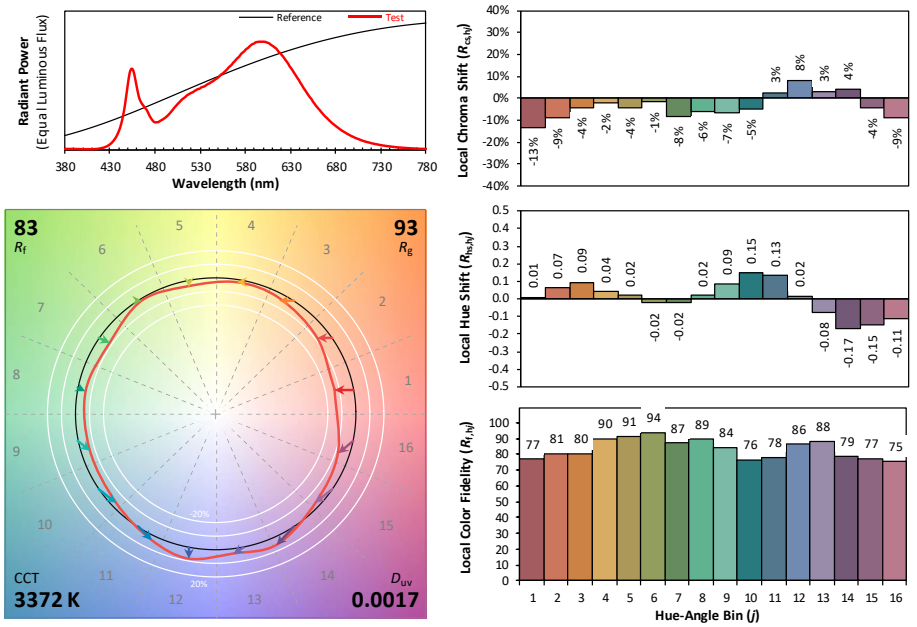
CRI01	79.4	CRI09	-2.5
CRI02	91.1	CRI10	79.3
CRI03	95.0	CRI11	76.5
CRI04	77.5	CRI12	64.5
CRI05	79.2	CRI13	82.6
CRI06	88.2	CRI14	97.7
CRI07	81.7	CRI15	71.0
CRI08	56.3	CRI16	67.6

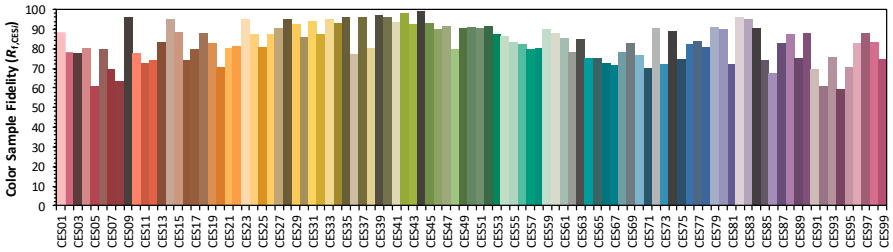
ResultsCRI 81.0



PlanckDistance 1.7E-003

4.1 Integrating Sphere Test





Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4147
y	0.3993
u'	0.2383
v'	0.5162

CIE 13.3-1995 (CRI)

R_a	81
R_9	-1

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4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 30W / 4000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.98	60	0.200	23.9	0.997
276.96	60	0.098	25.7	0.950

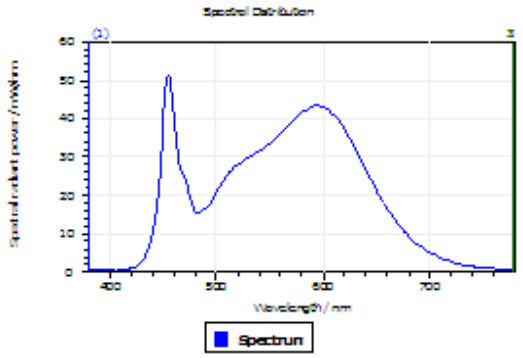
Test Result

CCT (K)	CRI	R9	Duv
4001	84	9	0.0014

Rf	Rg	IES Rcs,h1
83	92	-12%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

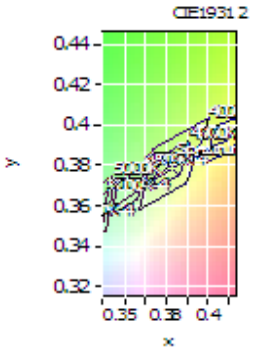
DominantWavelength	578.31 nm
Purity	0.287
PeakWavelength	454.94 nm
Radiant Power	7.44 W
Width50%:	

Color Coordinates

Correlated Color Temperat		4001 K			
x:	0.3814	u:	0.2243	u':	0.2243
y:	0.3805	v:	0.3356	v':	0.5034

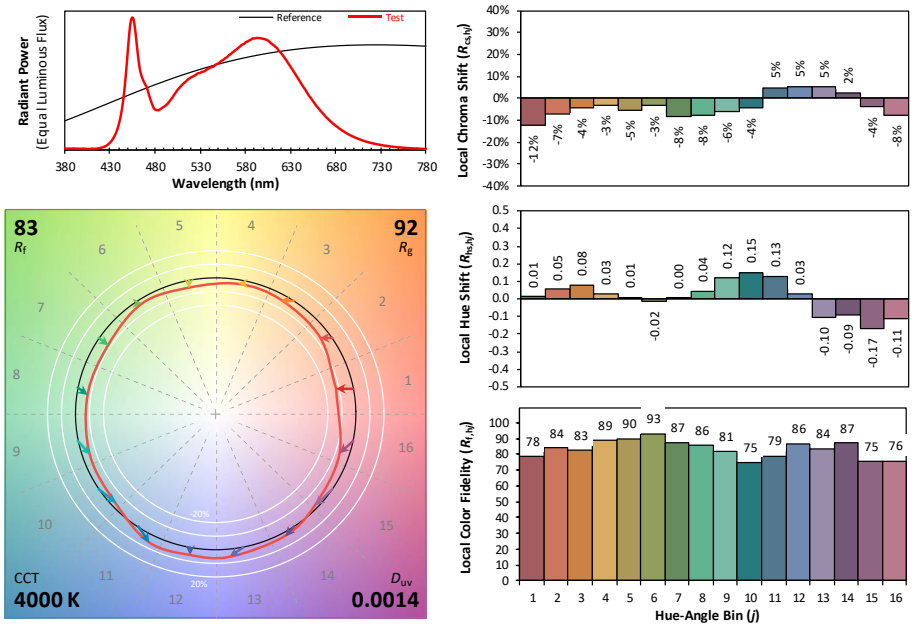
CRI01	82.4	CRI09	8.8
CRI02	92.3	CRI10	81.2
CRI03	95.7	CRI11	79.4
CRI04	80.1	CRI12	60.7
CRI05	81.9	CRI13	85.4
CRI06	88.6	CRI14	98.3
CRI07	84.4	CRI15	75.5
CRI08	63.1	CRI16	71.2

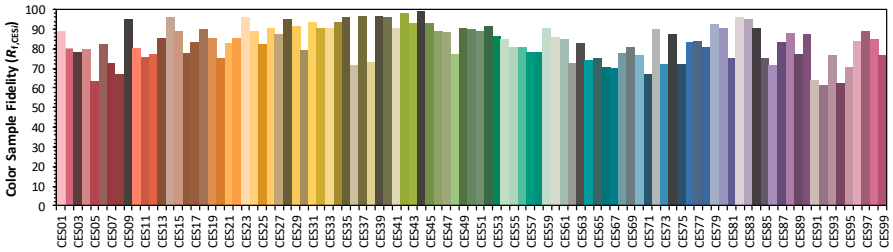
ResultsCRI 83.6



PlanckDistance 1.4E-003

4.1 Integrating Sphere Test





Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3814
y	0.3805
u'	0.2243
v'	0.5034

CIE 13.3-1995 (CRI)

R_a	84
R_9	9

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4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 30W / 5000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.93	60	0.211	25.2	0.997
277.00	60	0.101	26.8	0.954

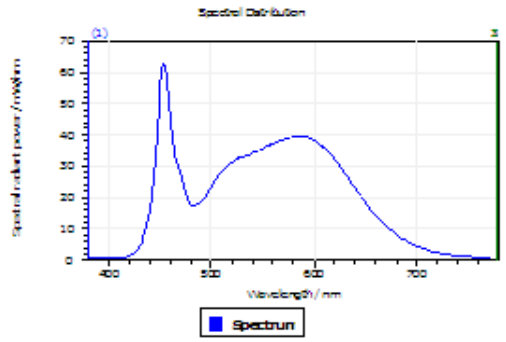
Test Result

CCT (K)	CRI	R9	Duv
4816	83	8	0.0039

Rf	Rg	IES Rcs,h1
84	93	-13%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	571.68 nm
Purity	0.149
PeakWavelength	453.85 nm
Radiant Power	7.573 W
Width50%:	

Color Coordinates

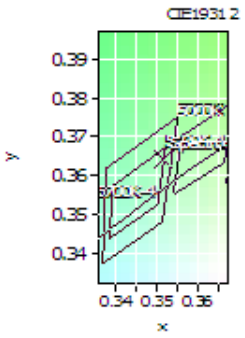
Correlated Color Temperat 4816 K

x: 0.3516 u: 0.2108 u': 0.2108

y: 0.3646 v: 0.3279 v': 0.4918

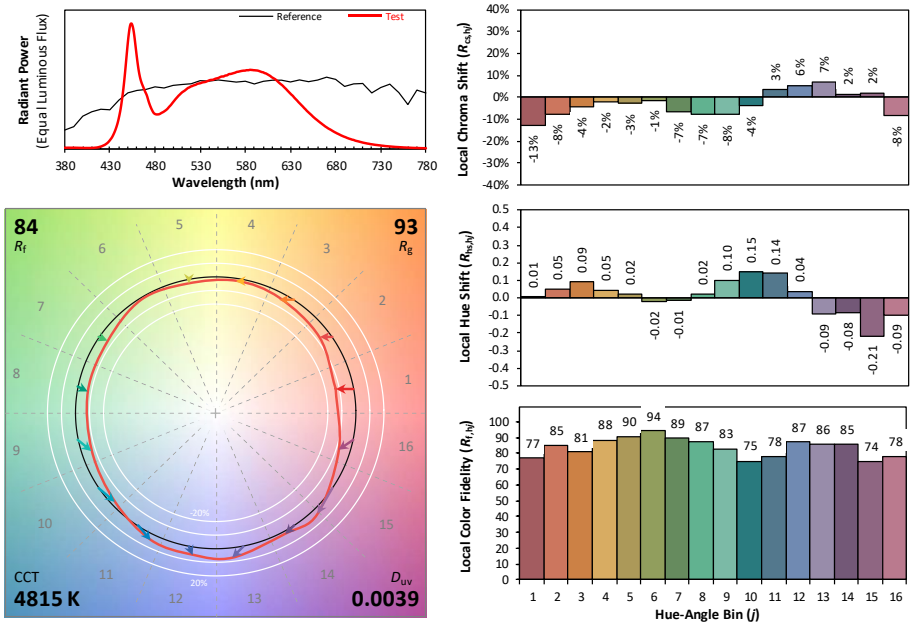
CRI01	81.3	CRI09	7.5
CRI02	90.6	CRI10	77.1
CRI03	95.5	CRI11	78.8
CRI04	79.7	CRI12	55.5
CRI05	80.8	CRI13	84.1
CRI06	85.9	CRI14	97.9
CRI07	86.4	CRI15	74.6
CRI08	65.5	CRI16	70.0

ResultsCRI 83.2



PlanckDistance 3.9E-003

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3516
y	0.3646
u'	0.2108
v'	0.4918

CIE 13.3-1995 (CRI)	
R_a	83
R_9	8

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 40W / 3500K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.04	60	0.278	33.3	0.996
277.00	60	0.128	34.7	0.978

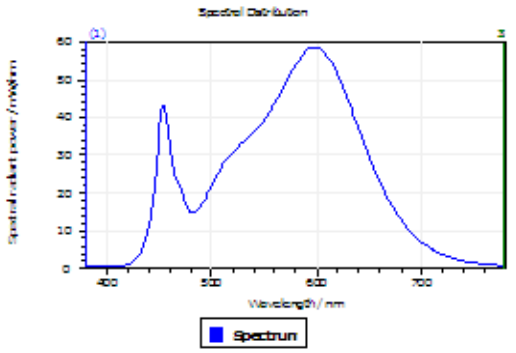
Test Result

CCT (K)	CRI	R9	Duv
3377	82	-1	0.0018

Rf	Rg	IES Rcs,h1
83	93	-13%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	580.62 nm
Purity	0.443
PeakWavelength	597.60 nm
Radiant Power	8.954 W
Width50%:	

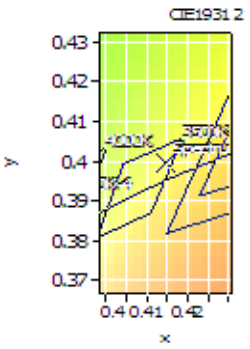
Color Coordinates

Correlated Color Temperat 3377 K

x:	0.4145	u:	0.2381	u':	0.2381
y:	0.3995	v:	0.3441	v':	0.5162

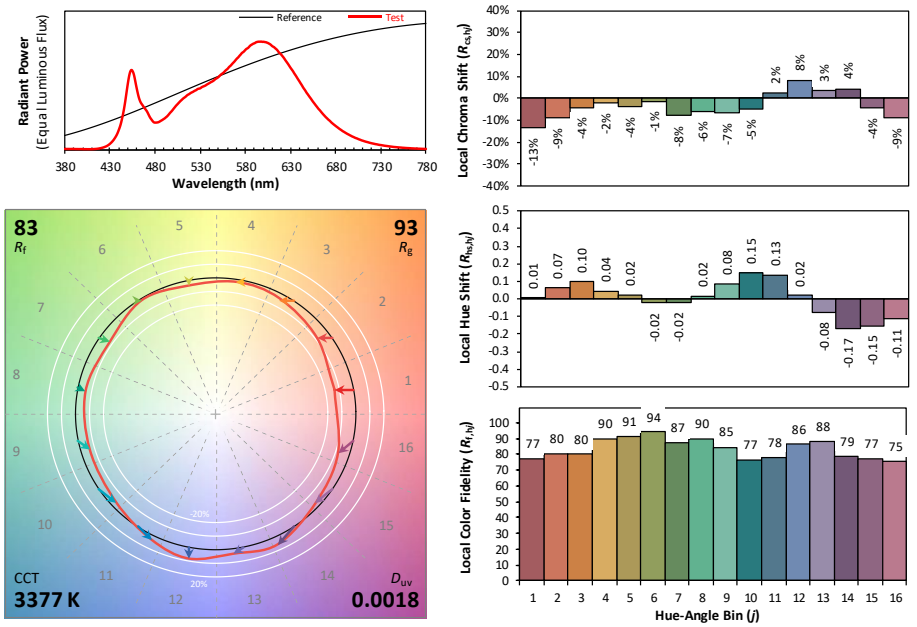
CRI01	79.5	CRI09	-0.6
CRI02	90.3	CRI10	77.5
CRI03	96.4	CRI11	77.7
CRI04	78.9	CRI12	63.3
CRI05	79.8	CRI13	82.2
CRI06	87.6	CRI14	98.6
CRI07	82.8	CRI15	71.7
CRI08	57.8	CRI16	68.4

ResultsCRI 81.6



PlanckDistance 1.8E-003

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4145
y	0.3995
u'	0.2381
v'	0.5162

CIE 13.3-1995 (CRI)

R_a	81
R_9	-2

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4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 40W / 4000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.00	60	0.263	31.4	0.996
276.95	60	0.122	32.8	0.975

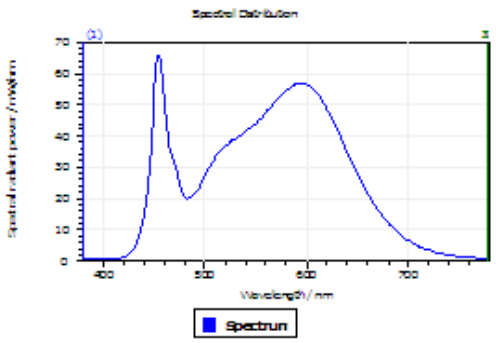
Test Result

CCT (K)	CRI	R9	Duv
4003	83	8	0.0015

Rf	Rg	IES Rcs,h1
83	93	-12%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	578.27 nm
Purity	0.287
PeakWavelength	454.65 nm
Radiant Power	9.773 W
Width50%:	

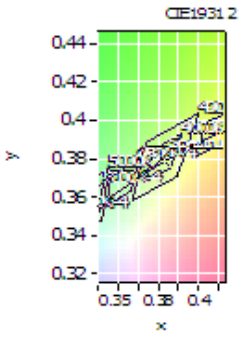
Color Coordinates

Correlated Color Temperat 4003 K

x:	0.3814	u:	0.2242	u':	0.2242
y:	0.3806	v:	0.3356	v':	0.5034

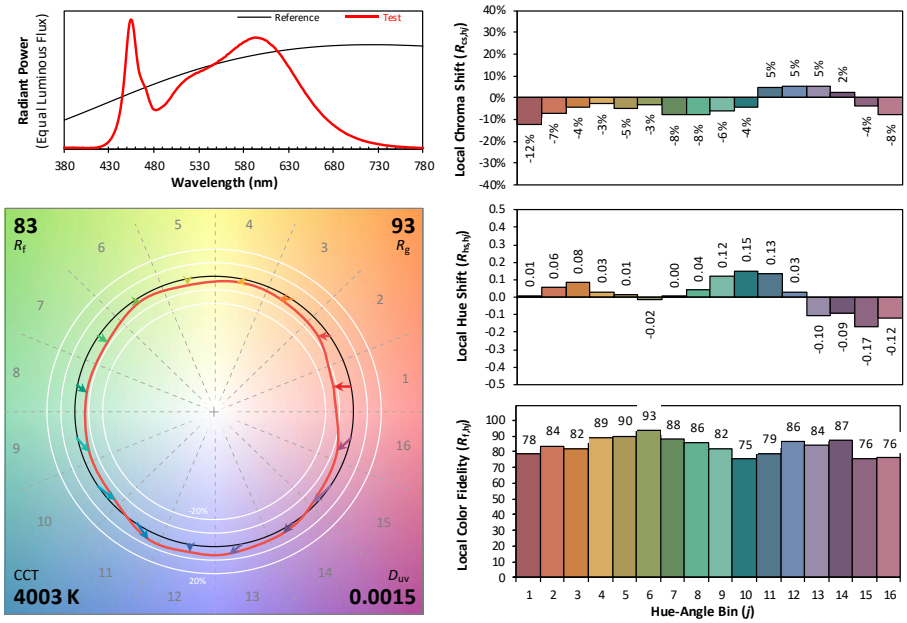
CRI01	82.1	CRI09	7.8
CRI02	92.0	CRI10	80.5
CRI03	95.8	CRI11	79.3
CRI04	80.0	CRI12	60.7
CRI05	81.7	CRI13	85.0
CRI06	88.2	CRI14	98.3
CRI07	84.4	CRI15	75.1
CRI08	62.9	CRI16	71.0

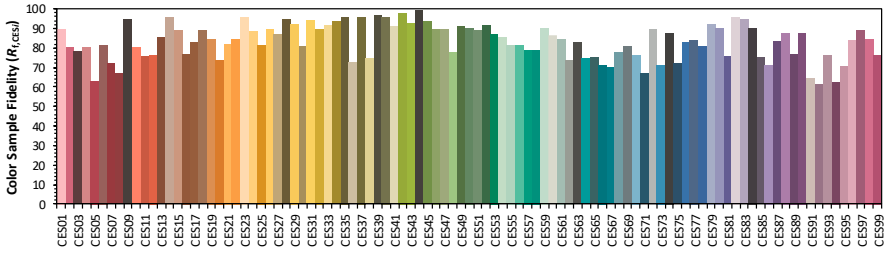
ResultsCRI 83.4



PlanckDistance 1.5E-003

4.1 Integrating Sphere Test





Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3814
y	0.3806
u'	0.2242
v'	0.5034

CIE 13.3-1995 (CRI)

R_a	83
R_9	8

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34FA2X2 / 40W / 5000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C.
The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.
The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.07	60	0.275	32.9	0.997
277.05	60	0.127	34.3	0.977

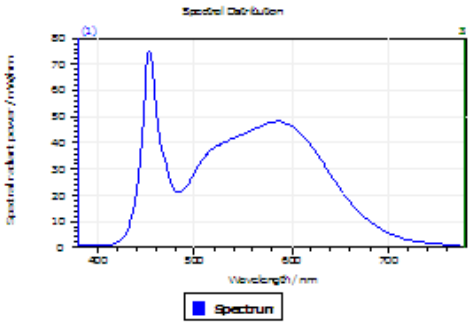
Test Result

CCT (K)	CRI	R9	Duv
4822	83	7	0.0038

Rf	Rg	IES Rcs,h1
84	94	-13%

4.1 Integrating Sphere Test

Results



Spectral Distribution

Spectral values

DominantWavelength	571.68 nm
Purity	0.147
PeakWavelength	453.67 nm
Radiant Power	9.211 W
Width50%:	

Color Coordinates

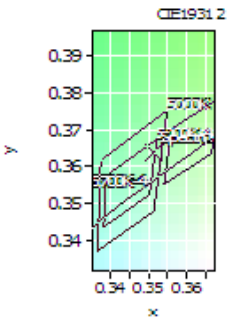
Correlated Color Temperat 4822 K

x: 0.3514 u: 0.2108 u': 0.2108

y: 0.3642 v: 0.3277 v': 0.4916

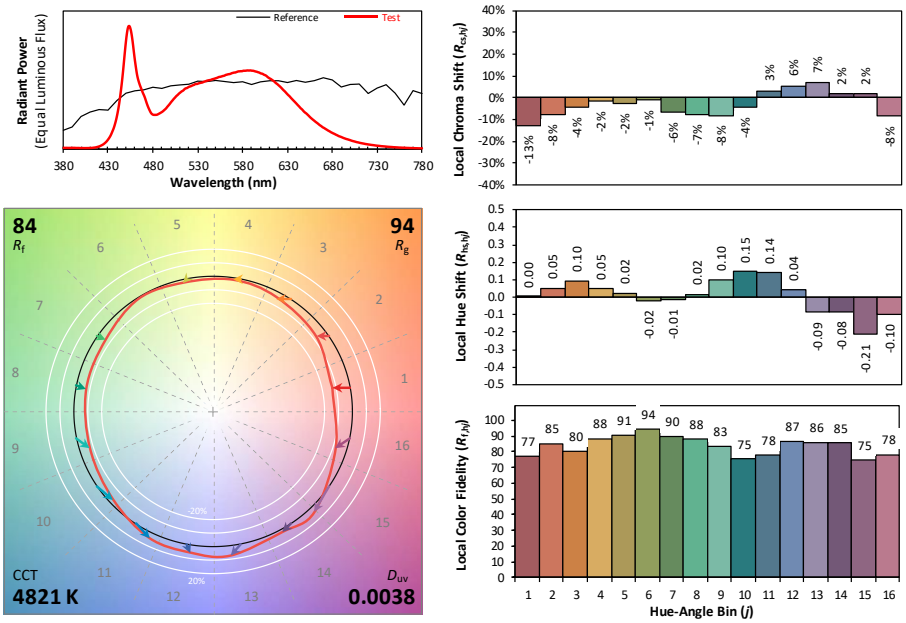
CRI01	81.1	CRI09	6.8
CRI02	90.4	CRI10	76.5
CRI03	95.4	CRI11	78.7
CRI04	79.7	CRI12	55.8
CRI05	80.7	CRI13	83.9
CRI06	85.6	CRI14	97.8
CRI07	86.4	CRI15	74.4
CRI08	65.4	CRI16	70.0

ResultsCRI 83.1



PlanckDistance 3.8E-003

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3514
y	0.3642
u'	0.2108
v'	0.4916

CIE 13.3-1995 (CRI)

R_a	83
R_9	7

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 20W / 3500K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.03	60	0.072	18.0	0.899
NON-WORST CASE	120.04	60	0.140	16.7	0.990

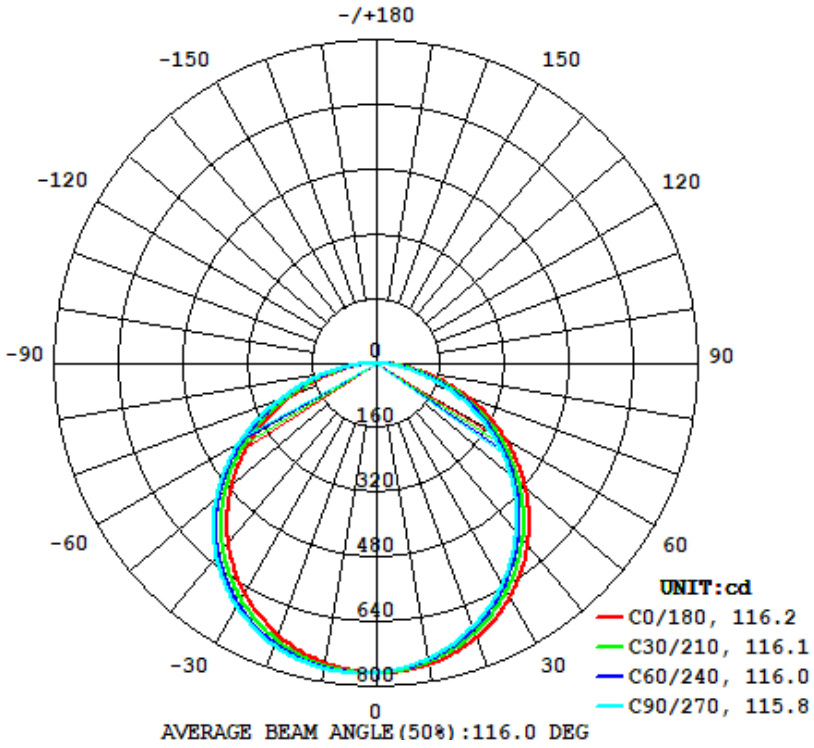
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2282	163.3	162.1	116.2	115.8	126.9

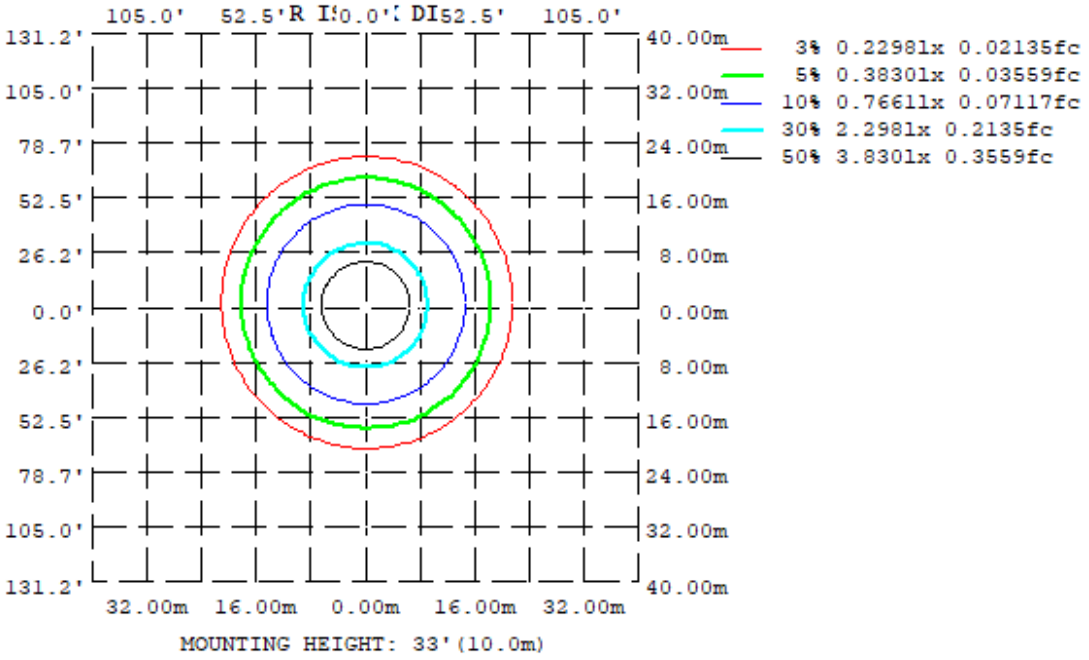
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.95%	18.8	1.24	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	755.1	745.9	741.4	743.4	752.4	762.1	766.4	763.7
20	721.7	703.9	695.1	700.1	716.2	734.6	743.5	737.8
30	665.8	641.8	628.6	633.9	655.8	681.6	695.1	687.6
40	586.9	558.3	543.2	548.7	574.3	604.4	620.6	614.1
50	487.2	456.8	440.2	444.6	470.4	503.9	520.9	514.9
60	368.6	339.3	321.8	325.4	349.2	380.8	397.5	393.5
70	237.1	212.3	195.5	196.2	215.9	241.3	255.7	255.7
80	106.6	88.45	72.05	73.95	86.50	102.3	110.3	116.3
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.1	15.7	14.4	16.0	16.4	14.6	16.2	14.9	16.5	16.9
	3H	15.8	17.3	16.2	17.6	18.0	16.4	17.9	16.7	18.2	18.6
	4H	16.4	17.8	16.8	18.2	18.6	17.0	18.4	17.4	18.8	19.2
	6H	16.8	18.1	17.2	18.5	18.9	17.5	18.8	17.9	19.2	19.6
	8H	16.9	18.2	17.3	18.6	19.0	17.6	18.9	18.0	19.3	19.7
	12H	17.0	18.2	17.4	18.5	19.0	17.7	18.9	18.1	19.3	19.7
4H	2H	14.7	16.2	15.1	16.5	16.9	15.2	16.7	15.6	17.0	17.4
	3H	16.7	17.9	17.1	18.3	18.7	17.3	18.4	17.7	18.8	19.2
	4H	17.4	18.5	17.8	18.9	19.3	18.0	19.1	18.5	19.5	19.9
	6H	17.9	18.9	18.4	19.3	19.8	18.6	19.5	19.0	20.0	20.4
	8H	18.0	18.9	18.5	19.4	19.8	18.8	19.7	19.2	20.1	20.6
	12H	18.1	18.9	18.6	19.4	19.9	18.9	19.7	19.4	20.2	20.6
8H	4H	17.7	18.6	18.2	19.1	19.5	18.3	19.2	18.8	19.7	20.1
	6H	18.3	19.1	18.8	19.6	20.1	19.0	19.8	19.5	20.3	20.7
	8H	18.5	19.2	19.0	19.7	20.2	19.3	19.9	19.8	20.4	20.9
	12H	18.7	19.2	19.2	19.7	20.3	19.4	20.0	19.9	20.5	21.1
12H	4H	17.8	18.6	18.3	19.1	19.5	18.4	19.2	18.9	19.7	20.1
	6H	18.4	19.1	18.9	19.6	20.1	19.1	19.8	19.6	20.2	20.8
	8H	18.7	19.2	19.2	19.7	20.3	19.4	20.0	19.9	20.5	21.0

Maximum UGR = 21.1

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

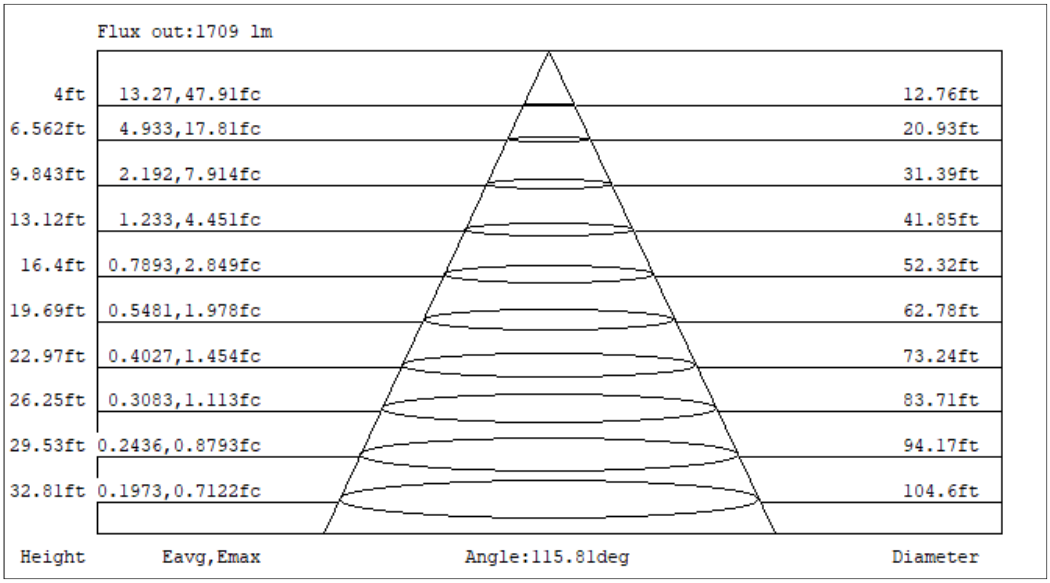
	Zonal (lm)		Total (lm)	Percent
0-10	72.51	0 - 10	72.51	3.18%
10-20	208.76	0 - 20	281.27	12.32%
20-30	319.51	0 - 30	600.78	26.33%
30-40	390.32	0 - 40	991.10	43.43%
40-50	411.02	0 - 50	1402.12	61.44%
50-60	376.75	0 - 60	1778.87	77.95%
60-70	290.48	0 - 70	2069.35	90.68%
70-80	167.99	0 - 80	2237.34	98.04%
80-90	44.77	0 - 90	2282.11	100.00%
90-100	0.00	0 - 100	2282.11	100.00%
100-110	0.00	0 - 110	2282.11	100.00%
110-120	0.00	0 - 120	2282.11	100.00%
120-130	0.00	0 - 130	2282.11	100.00%
130-140	0.00	0 - 140	2282.11	100.00%
140-150	0.00	0 - 150	2282.11	100.00%
150-160	0.00	0 - 160	2282.11	100.00%
160-170	0.00	0 - 170	2282.11	100.00%
170-180	0.00	0 - 180	2282.11	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	75	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	33
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	41	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 20W / 4000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	276.94	60	0.070	17.5	0.899
NON-WORST CASE	120.04	60	0.140	16.7	0.991

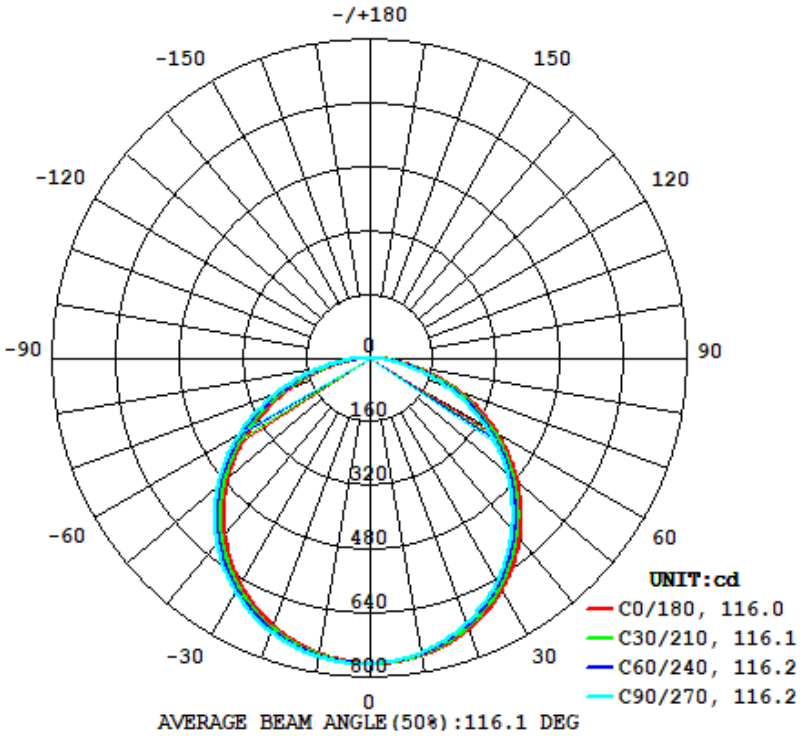
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2341	162.7	162.9	116.0	116.2	134.1

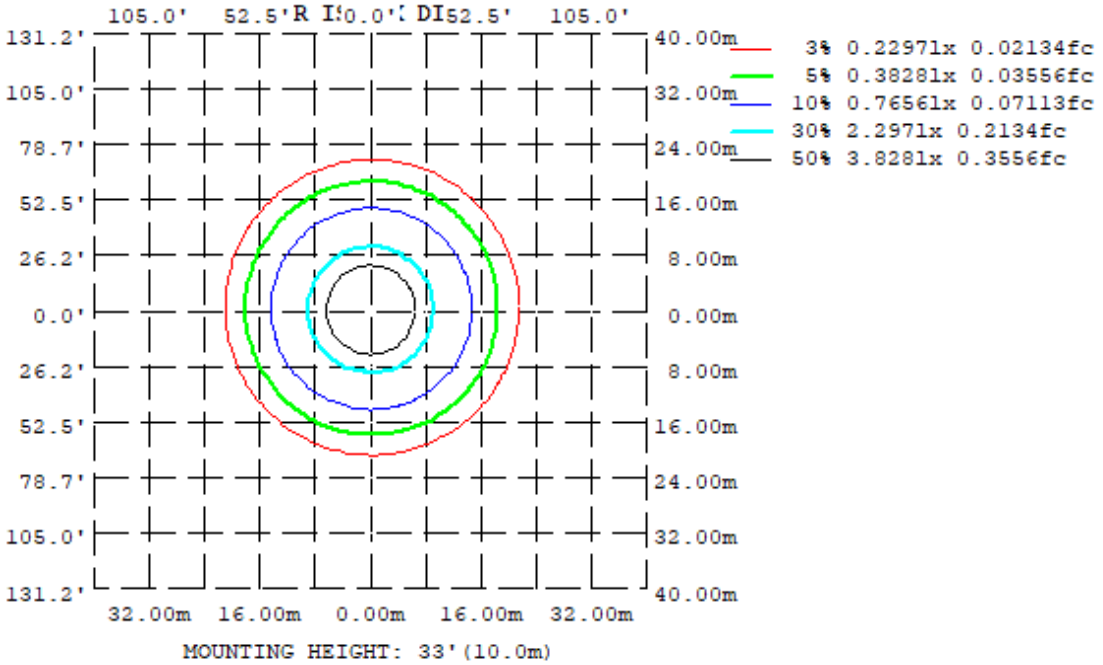
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.95%	18.9	1.24	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	756.4	750.7	747.7	748.0	751.8	756.2	759.9	759.9
20	723.6	713.9	707.4	707.3	713.7	723.7	730.7	730.6
30	667.7	654.4	644.0	643.7	654.0	667.5	677.2	677.9
40	588.7	572.8	560.0	558.4	570.7	587.6	601.2	601.6
50	489.4	470.3	456.0	453.7	468.2	488.0	503.3	504.1
60	369.5	350.0	334.5	331.5	346.6	367.7	384.2	385.7
70	235.9	218.1	203.4	199.1	212.3	233.2	250.5	251.8
80	103.6	90.51	76.39	73.86	82.18	100.2	113.3	117.2
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.1	15.8	14.5	16.1	16.4	14.7	16.3	15.0	16.6	16.9
	3H	15.9	17.4	16.3	17.7	18.1	16.5	18.0	16.8	18.3	18.6
	4H	16.5	17.9	16.9	18.3	18.6	17.1	18.5	17.5	18.9	19.3
	6H	16.9	18.2	17.3	18.6	19.0	17.6	18.9	18.0	19.2	19.6
	8H	17.0	18.2	17.4	18.6	19.0	17.7	19.0	18.1	19.3	19.7
	12H	17.0	18.2	17.4	18.6	19.0	17.8	19.0	18.2	19.4	19.8
4H	2H	14.8	16.2	15.2	16.6	17.0	15.3	16.7	15.7	17.1	17.5
	3H	16.8	18.0	17.2	18.3	18.7	17.3	18.5	17.7	18.9	19.3
	4H	17.5	18.6	17.9	19.0	19.4	18.1	19.2	18.5	19.6	20.0
	6H	18.0	18.9	18.4	19.4	19.8	18.7	19.6	19.1	20.1	20.5
	8H	18.1	19.0	18.6	19.4	19.9	18.9	19.7	19.3	20.2	20.7
	12H	18.2	19.0	18.7	19.5	19.9	19.0	19.8	19.5	20.2	20.7
8H	4H	17.8	18.7	18.3	19.1	19.6	18.4	19.3	18.9	19.8	20.2
	6H	18.4	19.2	18.9	19.6	20.1	19.1	19.9	19.6	20.3	20.8
	8H	18.6	19.3	19.1	19.8	20.3	19.4	20.0	19.9	20.5	21.0
	12H	18.7	19.3	19.2	19.8	20.4	19.5	20.1	20.0	20.6	21.2
12H	4H	17.9	18.6	18.3	19.1	19.6	18.5	19.3	19.0	19.7	20.2
	6H	18.5	19.2	19.0	19.6	20.2	19.2	19.9	19.7	20.3	20.9
	8H	18.7	19.3	19.2	19.8	20.4	19.5	20.1	20.0	20.5	21.1

Maximum UGR = 21.2

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

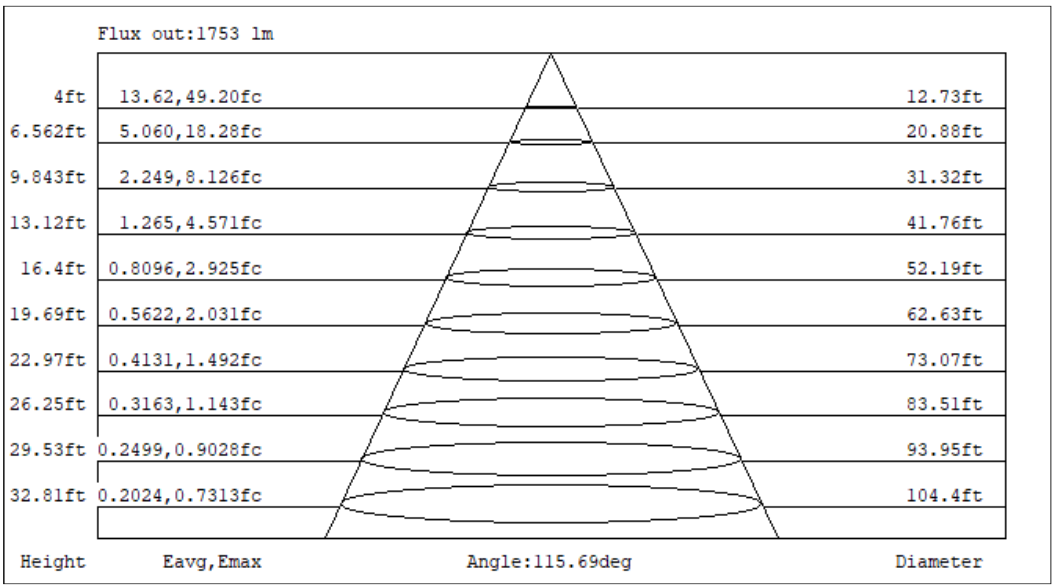
	Zonal (lm)		Total (lm)	Percent
0-10	74.39	0 - 10	74.39	3.18%
10-20	214.17	0 - 20	288.56	12.33%
20-30	327.76	0 - 30	616.32	26.33%
30-40	400.40	0 - 40	1016.72	43.44%
40-50	421.60	0 - 50	1438.32	61.45%
50-60	386.35	0 - 60	1824.67	77.95%
60-70	297.76	0 - 70	2122.43	90.67%
70-80	172.24	0 - 80	2294.67	98.03%
80-90	46.10	0 - 90	2340.77	100.00%
90-100	0.00	0 - 100	2340.77	100.00%
100-110	0.00	0 - 110	2340.77	100.00%
110-120	0.00	0 - 120	2340.77	100.00%
120-130	0.00	0 - 130	2340.77	100.00%
130-140	0.00	0 - 140	2340.77	100.00%
140-150	0.00	0 - 150	2340.77	100.00%
150-160	0.00	0 - 160	2340.77	100.00%
160-170	0.00	0 - 170	2340.77	100.00%
170-180	0.00	0 - 180	2340.77	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	33
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	41	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 20W / 5000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	276.94	60	0.072	17.9	0.899
NON-WORST CASE	119.97	60	0.140	16.7	0.995

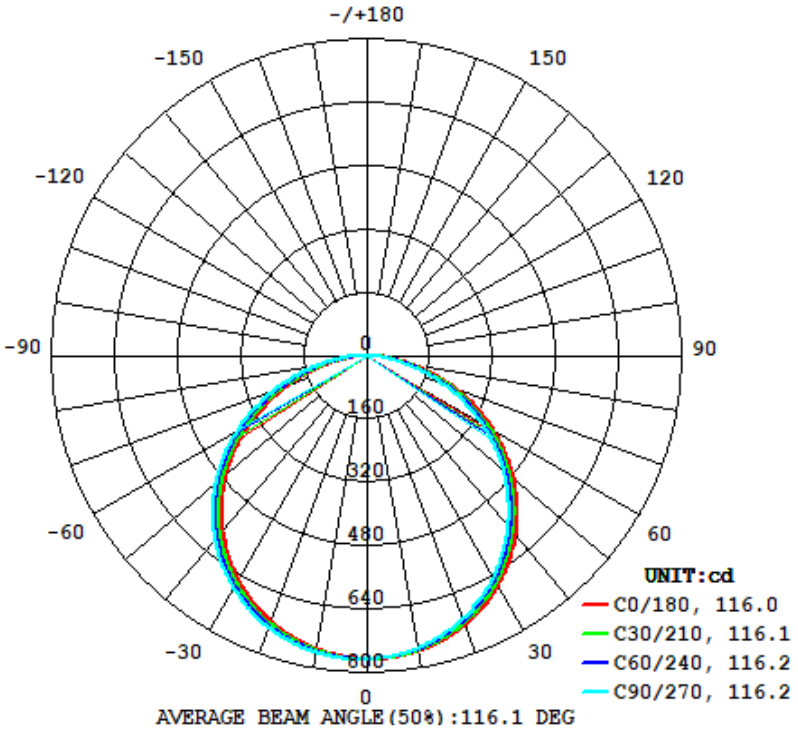
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2279	162.7	162.9	116.0	116.2	127.2

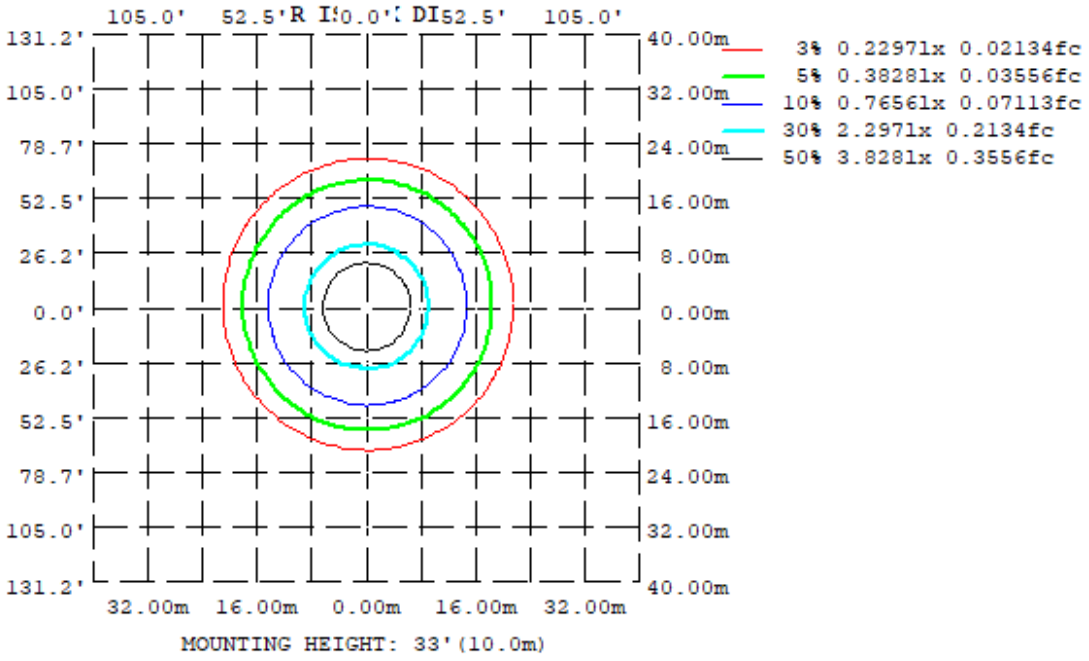
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.96%	18.6	1.26	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	756.4	750.7	747.7	748.0	751.8	756.2	759.9	759.9
20	723.6	713.9	707.4	707.3	713.7	723.7	730.7	730.6
30	667.7	654.4	644.0	643.7	654.0	667.5	677.2	677.9
40	588.7	572.8	560.0	558.4	570.7	587.6	601.2	601.6
50	489.4	470.3	456.0	453.7	468.2	488.0	503.3	504.1
60	369.5	350.0	334.5	331.5	346.6	367.7	384.2	385.7
70	235.9	218.1	203.4	199.1	212.3	233.2	250.5	251.8
80	103.6	90.51	76.39	73.86	82.18	100.2	113.3	117.2
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.3	16.0	14.7	16.3	16.6	14.5	16.2	14.9	16.5	16.8
	3H	16.1	17.6	16.4	17.9	18.3	16.3	17.8	16.7	18.1	18.5
	4H	16.7	18.1	17.1	18.5	18.8	16.9	18.3	17.3	18.7	19.1
	6H	17.1	18.4	17.5	18.8	19.2	17.4	18.7	17.8	19.0	19.4
	8H	17.2	18.5	17.6	18.9	19.3	17.5	18.7	17.9	19.1	19.5
	12H	17.3	18.5	17.7	18.8	19.3	17.5	18.7	18.0	19.1	19.6
4H	2H	15.0	16.4	15.4	16.7	17.1	15.2	16.6	15.6	16.9	17.3
	3H	16.9	18.1	17.3	18.5	18.9	17.2	18.4	17.6	18.8	19.2
	4H	17.7	18.8	18.1	19.2	19.6	17.9	19.0	18.4	19.4	19.8
	6H	18.2	19.1	18.7	19.6	20.0	18.5	19.4	18.9	19.9	20.3
	8H	18.3	19.2	18.8	19.7	20.1	18.6	19.5	19.1	19.9	20.4
	12H	18.4	19.2	18.9	19.7	20.2	18.7	19.5	19.2	20.0	20.5
8H	4H	18.0	18.9	18.4	19.3	19.8	18.2	19.1	18.7	19.6	20.0
	6H	18.6	19.4	19.1	19.8	20.3	18.9	19.6	19.4	20.1	20.6
	8H	18.8	19.5	19.3	20.0	20.5	19.1	19.8	19.6	20.3	20.8
	12H	18.9	19.5	19.4	20.0	20.6	19.3	19.8	19.8	20.3	20.9
12H	4H	18.0	18.8	18.5	19.3	19.8	18.3	19.1	18.8	19.5	20.0
	6H	18.7	19.4	19.2	19.8	20.3	19.0	19.6	19.5	20.1	20.6
	8H	18.9	19.5	19.4	20.0	20.5	19.2	19.8	19.7	20.3	20.9

Maximum UGR = 20.9

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

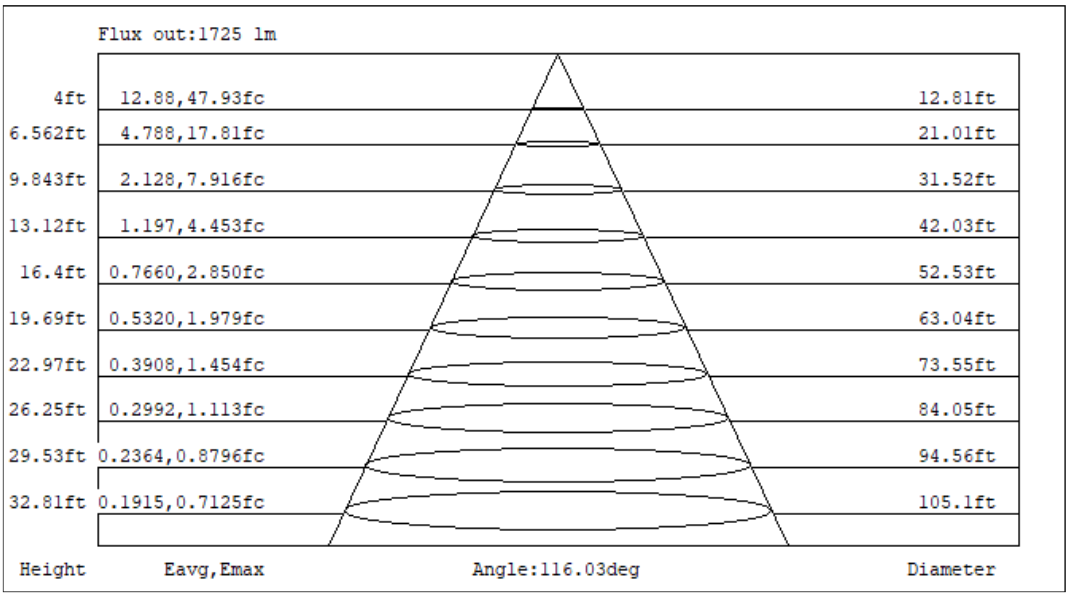
	Zonal (lm)		Total (lm)	Percent
0-10	72.52	0 - 10	72.52	3.18%
10-20	208.73	0 - 20	281.25	12.34%
20-30	319.30	0 - 30	600.55	26.35%
30-40	389.86	0 - 40	990.41	43.46%
40-50	410.32	0 - 50	1400.73	61.46%
50-60	375.87	0 - 60	1776.60	77.96%
60-70	289.66	0 - 70	2066.26	90.67%
70-80	167.69	0 - 80	2233.95	98.02%
80-90	45.05	0 - 90	2279.00	100.00%
90-100	0.00	0 - 100	2279.00	100.00%
100-110	0.00	0 - 110	2279.00	100.00%
110-120	0.00	0 - 120	2279.00	100.00%
120-130	0.00	0 - 130	2279.00	100.00%
130-140	0.00	0 - 140	2279.00	100.00%
140-150	0.00	0 - 150	2279.00	100.00%
150-160	0.00	0 - 160	2279.00	100.00%
160-170	0.00	0 - 170	2279.00	100.00%
170-180	0.00	0 - 180	2279.00	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	75	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	33
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	41	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	37	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 30W / 3500K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	276.97	60	0.103	27.1	0.952
NON-WORST CASE	120.05	60	0.221	26.5	0.997

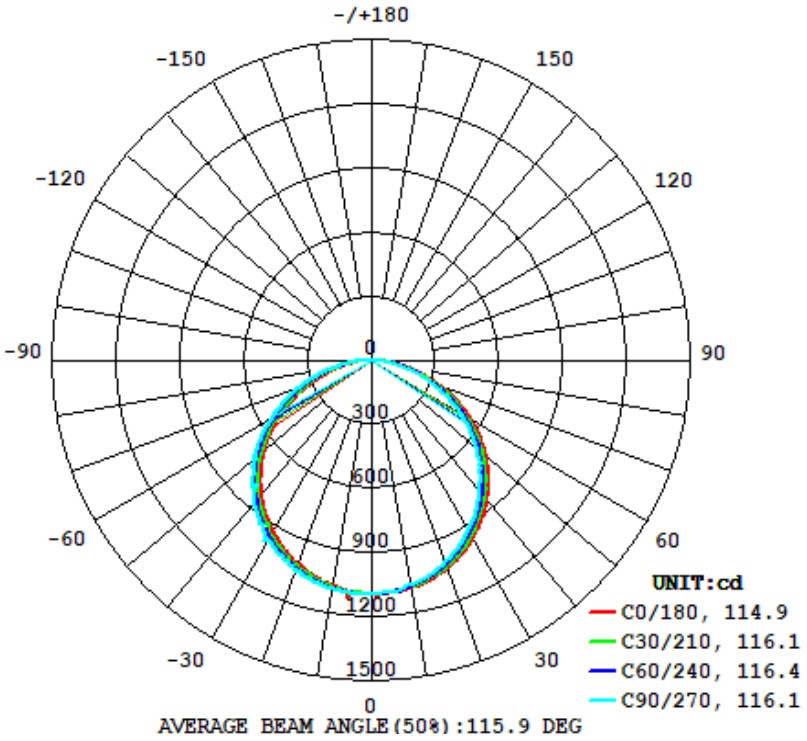
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
3259	162.6	162.9	114.9	116.1	120.3

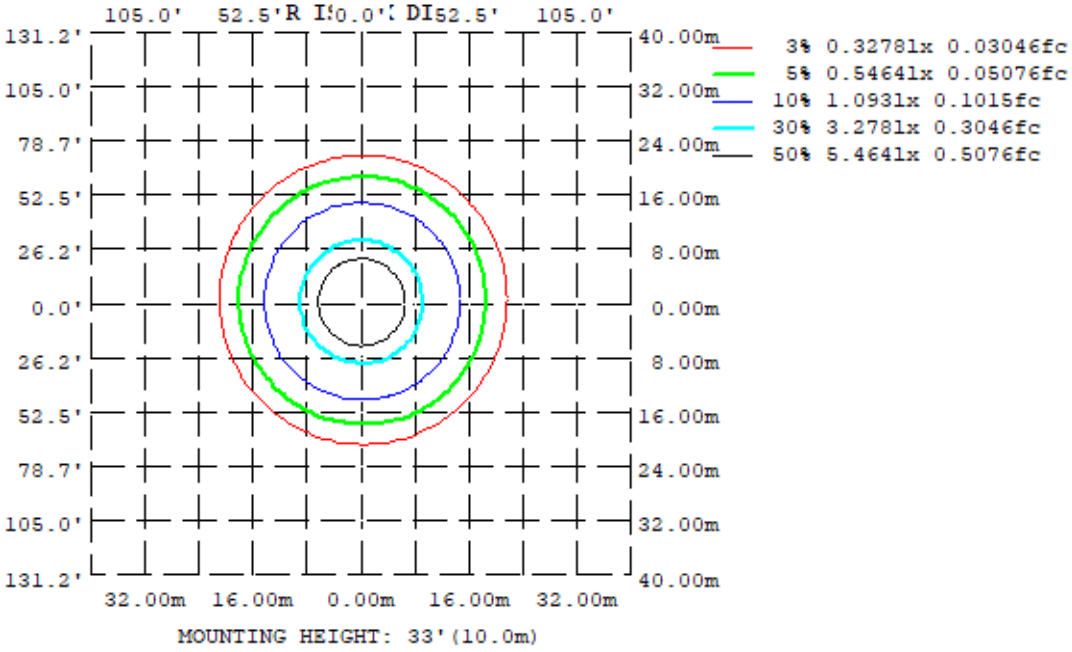
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.91%	19.7	1.26	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1081	1076	1069	1068	1070	1081	1080	1087
20	1035	1024	1007	1003	1017	1034	1046	1043
30	957.9	938.8	916.9	909.5	929.1	951.5	972.9	972.6
40	842.8	823.0	796.3	791.6	809.5	838.5	863.0	866.8
50	706.5	677.2	649.2	639.7	664.9	694.2	715.8	729.1
60	535.7	503.3	477.7	469.1	493.8	521.4	549.7	557.3
70	343.5	316.4	292.2	279.9	299.0	330.7	358.2	367.3
80	151.6	132.0	108.9	104.1	116.2	141.5	163.6	170.7
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	15.5	17.1	15.8	17.5	17.8	15.6	17.3	16.0	17.6	17.9
	3H	17.2	18.7	17.6	19.1	19.4	17.4	18.9	17.8	19.3	19.6
	4H	17.9	19.3	18.3	19.6	20.0	18.0	19.5	18.4	19.8	20.2
	6H	18.3	19.6	18.7	20.0	20.3	18.5	19.8	18.9	20.2	20.6
	8H	18.4	19.6	18.8	20.0	20.4	18.6	19.9	19.0	20.3	20.7
	12H	18.4	19.6	18.9	20.0	20.4	18.7	19.9	19.1	20.3	20.7
4H	2H	16.1	17.6	16.5	17.9	18.3	16.3	17.7	16.7	18.1	18.4
	3H	18.1	19.3	18.5	19.7	20.1	18.3	19.5	18.7	19.9	20.3
	4H	18.9	19.9	19.3	20.4	20.8	19.0	20.1	19.5	20.5	21.0
	6H	19.4	20.3	19.8	20.8	21.2	19.6	20.5	20.0	21.0	21.4
	8H	19.5	20.4	20.0	20.8	21.3	19.7	20.6	20.2	21.1	21.5
	12H	19.6	20.4	20.1	20.9	21.3	19.9	20.6	20.3	21.1	21.6
8H	4H	19.2	20.1	19.6	20.5	21.0	19.4	20.2	19.8	20.7	21.1
	6H	19.8	20.5	20.3	21.0	21.5	20.0	20.8	20.5	21.2	21.7
	8H	20.0	20.7	20.5	21.2	21.6	20.2	20.9	20.7	21.4	21.9
	12H	20.1	20.7	20.6	21.2	21.7	20.4	21.0	20.9	21.5	22.0
12H	4H	19.2	20.0	19.7	20.5	21.0	19.4	20.2	19.9	20.7	21.1
	6H	19.9	20.5	20.4	21.0	21.5	20.1	20.8	20.6	21.2	21.8
	8H	20.1	20.7	20.6	21.2	21.7	20.4	20.9	20.9	21.4	22.0

Maximum UGR = 22.0

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

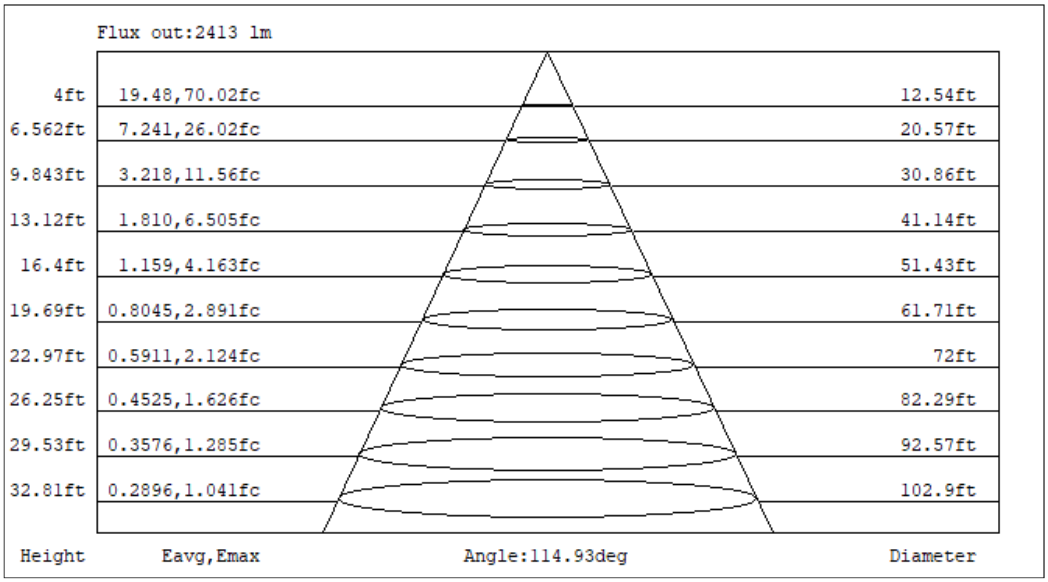
	Zonal (lm)		Total (lm)	Percent
0-10	103.52	0 - 10	103.52	3.18%
10-20	298.00	0 - 20	401.52	12.32%
20-30	455.91	0 - 30	857.43	26.31%
30-40	557.04	0 - 40	1414.47	43.41%
40-50	586.59	0 - 50	2001.06	61.41%
50-60	537.75	0 - 60	2538.81	77.91%
60-70	414.74	0 - 70	2953.55	90.64%
70-80	240.50	0 - 80	3194.05	98.02%
80-90	64.66	0 - 90	3258.71	100.00%
90-100	0.00	0 - 100	3258.71	100.00%
100-110	0.00	0 - 110	3258.71	100.00%
110-120	0.00	0 - 120	3258.71	100.00%
120-130	0.00	0 - 130	3258.71	100.00%
130-140	0.00	0 - 140	3258.71	100.00%
140-150	0.00	0 - 150	3258.71	100.00%
150-160	0.00	0 - 160	3258.71	100.00%
160-170	0.00	0 - 170	3258.71	100.00%
170-180	0.00	0 - 180	3258.71	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	32
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 30W / 4000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.08	60	0.098	25.6	0.947
NON-WORST CASE	120.05	60	0.202	24.1	0.995

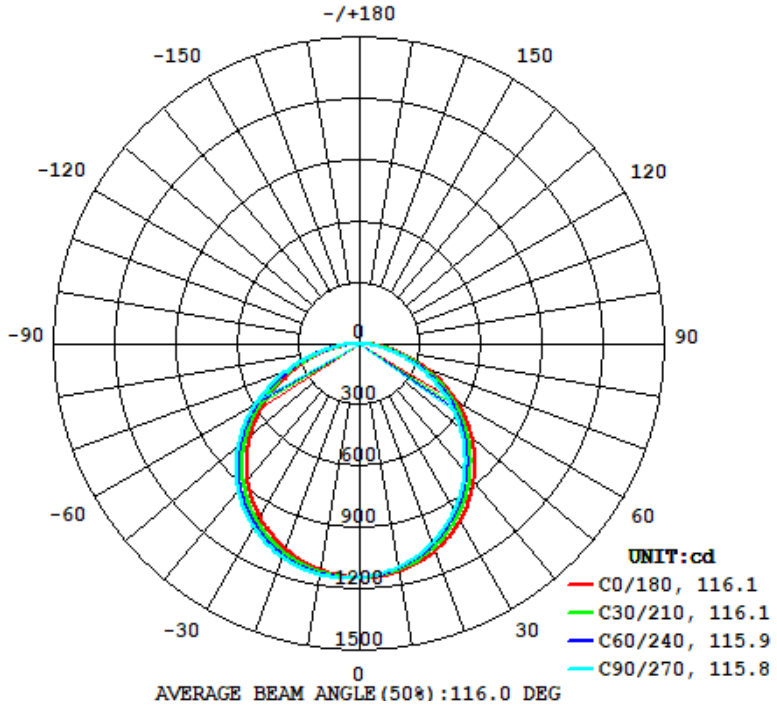
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
3411	163.3	162.1	116.1	115.8	133.2

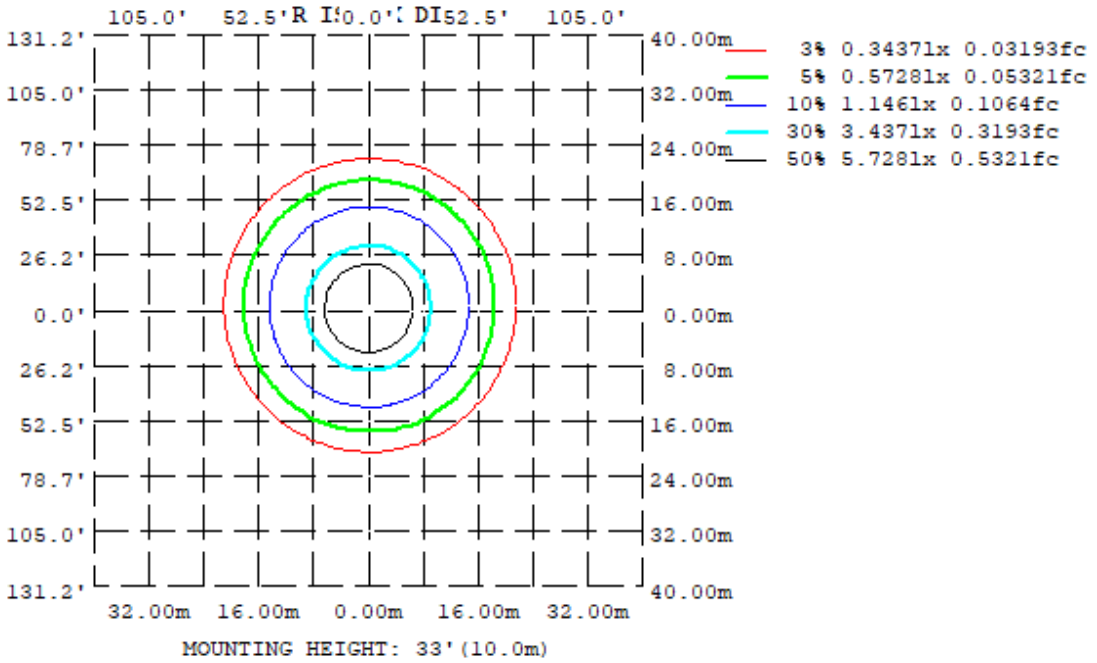
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.94%	20.2	1.24	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1130	1114	1108	1111	1126	1139	1146	1143
20	1079	1053	1037	1046	1069	1098	1111	1105
30	995.2	959.4	938.7	948.0	979.6	1018	1039	1031
40	876.9	833.7	810.2	818.4	857.3	905.0	927.8	919.5
50	728.3	681.9	657.1	662.9	704.3	753.6	779.9	770.6
60	549.4	506.8	480.4	484.2	522.2	569.3	596.0	591.3
70	353.7	315.7	290.5	291.9	323.0	361.1	382.4	384.2
80	158.5	131.3	106.8	109.5	129.8	154.4	166.6	175.6
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	15.4	17.1	15.8	17.4	17.7	15.9	17.6	16.3	17.9	18.2
	3H	17.2	18.7	17.6	19.0	19.4	17.7	19.3	18.1	19.6	19.9
	4H	17.8	19.2	18.2	19.5	19.9	18.4	19.8	18.8	20.2	20.5
	6H	18.2	19.5	18.6	19.9	20.2	18.9	20.2	19.3	20.6	20.9
	8H	18.3	19.5	18.7	19.9	20.3	19.0	20.3	19.4	20.6	21.0
	12H	18.3	19.5	18.7	19.9	20.3	19.1	20.3	19.5	20.7	21.1
4H	2H	16.1	17.5	16.5	17.9	18.3	16.6	18.0	17.0	18.4	18.8
	3H	18.1	19.3	18.5	19.6	20.0	18.6	19.8	19.0	20.2	20.6
	4H	18.8	19.9	19.2	20.3	20.7	19.4	20.5	19.8	20.9	21.3
	6H	19.3	20.2	19.7	20.7	21.1	20.0	20.9	20.4	21.4	21.8
	8H	19.4	20.3	19.9	20.7	21.2	20.2	21.0	20.6	21.5	22.0
	12H	19.5	20.3	20.0	20.8	21.2	20.3	21.1	20.8	21.5	22.0
8H	4H	19.1	20.0	19.6	20.4	20.9	19.7	20.6	20.2	21.1	21.5
	6H	19.7	20.5	20.2	20.9	21.4	20.4	21.2	20.9	21.6	22.1
	8H	19.9	20.6	20.4	21.1	21.6	20.7	21.3	21.2	21.8	22.3
	12H	20.0	20.6	20.5	21.1	21.7	20.8	21.4	21.3	21.9	22.5
12H	4H	19.2	19.9	19.6	20.4	20.9	19.8	20.6	20.3	21.0	21.5
	6H	19.8	20.5	20.3	20.9	21.5	20.5	21.2	21.0	21.6	22.2
	8H	20.0	20.6	20.5	21.1	21.6	20.8	21.4	21.3	21.8	22.4

Maximum UGR = 22.5

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

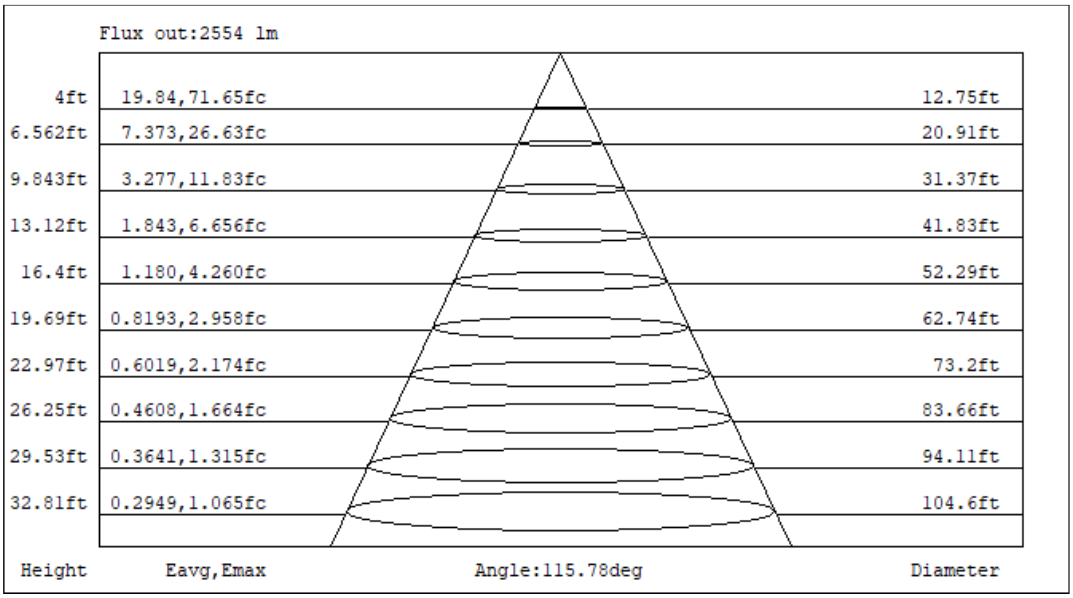
	Zonal (lm)		Total (lm)	Percent
0-10	108.42	0 - 10	108.42	3.18%
10-20	312.09	0 - 20	420.51	12.33%
20-30	477.62	0 - 30	898.13	26.33%
30-40	583.43	0 - 40	1481.56	43.43%
40-50	614.30	0 - 50	2095.86	61.44%
50-60	562.96	0 - 60	2658.82	77.94%
60-70	434.02	0 - 70	3092.84	90.66%
70-80	251.14	0 - 80	3343.98	98.03%
80-90	67.32	0 - 90	3411.30	100.00%
90-100	0.00	0 - 100	3411.30	100.00%
100-110	0.00	0 - 110	3411.30	100.00%
110-120	0.00	0 - 120	3411.30	100.00%
120-130	0.00	0 - 130	3411.30	100.00%
130-140	0.00	0 - 140	3411.30	100.00%
140-150	0.00	0 - 150	3411.30	100.00%
150-160	0.00	0 - 160	3411.30	100.00%
160-170	0.00	0 - 170	3411.30	100.00%
170-180	0.00	0 - 180	3411.30	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	75	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	33
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	41	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 30W / 5000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.04	60	0.101	26.5	0.950
NON-WORST CASE	120.02	60	0.212	25.3	0.993

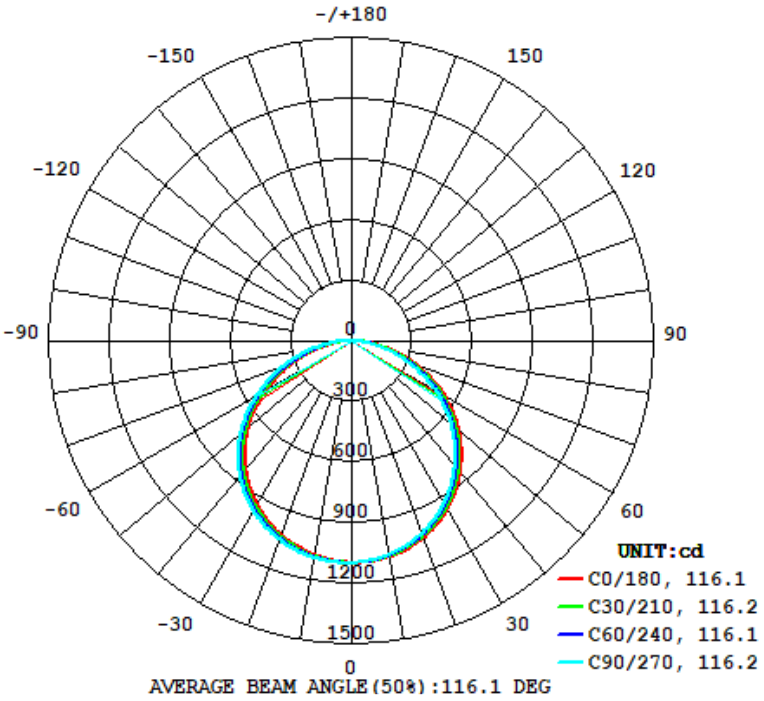
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
3271	162.7	162.9	116.1	116.2	123.4

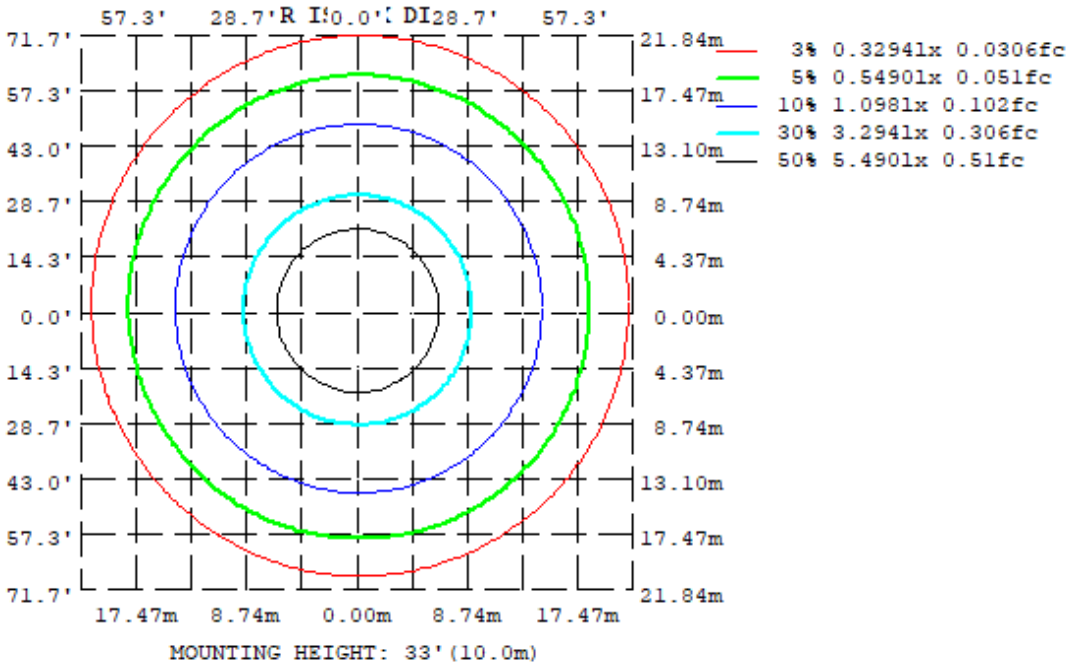
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.95%	19.8	1.26	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1085	1078	1074	1073	1078	1086	1090	1090
20	1038	1024	1015	1015	1024	1038	1048	1049
30	957.7	939.0	923.9	923.2	937.3	957.8	972.4	973.5
40	844.7	821.4	803.2	801.9	819.3	845.0	862.9	864.7
50	701.1	674.5	653.4	650.8	671.7	699.9	721.7	724.1
60	529.6	502.1	479.5	475.6	497.1	527.3	551.5	554.1
70	338.3	312.8	291.5	285.5	305.0	335.1	359.9	362.4
80	148.3	129.5	109.1	105.5	118.4	144.7	163.8	169.2
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	15.5	17.2	15.9	17.5	17.8	15.7	17.4	16.1	17.7	18.0
	3H	17.3	18.8	17.6	19.1	19.4	17.5	19.0	17.9	19.3	19.7
	4H	17.9	19.3	18.3	19.7	20.0	18.1	19.5	18.5	19.9	20.3
	6H	18.3	19.6	18.7	20.0	20.4	18.6	19.9	19.0	20.2	20.6
	8H	18.4	19.7	18.8	20.0	20.4	18.7	19.9	19.1	20.3	20.7
	12H	18.4	19.6	18.9	20.0	20.5	18.7	19.9	19.2	20.3	20.8
4H	2H	16.2	17.6	16.6	17.9	18.3	16.4	17.8	16.8	18.1	18.5
	3H	18.1	19.3	18.5	19.7	20.1	18.4	19.6	18.8	20.0	20.4
	4H	18.9	19.9	19.3	20.4	20.8	19.1	20.2	19.6	20.6	21.0
	6H	19.4	20.3	19.8	20.8	21.2	19.7	20.6	20.1	21.1	21.5
	8H	19.5	20.4	20.0	20.9	21.3	19.8	20.7	20.3	21.2	21.6
	12H	19.6	20.4	20.1	20.9	21.3	19.9	20.7	20.4	21.2	21.7
8H	4H	19.2	20.1	19.6	20.5	21.0	19.4	20.3	19.9	20.8	21.2
	6H	19.8	20.5	20.3	21.0	21.5	20.1	20.8	20.6	21.3	21.8
	8H	20.0	20.7	20.5	21.2	21.7	20.3	21.0	20.8	21.5	22.0
	12H	20.1	20.7	20.6	21.2	21.7	20.5	21.1	21.0	21.5	22.1
12H	4H	19.2	20.0	19.7	20.5	21.0	19.5	20.3	20.0	20.8	21.2
	6H	19.9	20.5	20.4	21.0	21.5	20.2	20.8	20.7	21.3	21.8
	8H	20.1	20.7	20.6	21.2	21.7	20.4	21.0	20.9	21.5	22.1

Maximum UGR = 22.1

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	104.07	0 - 10	104.07	3.18%
10-20	299.55	0 - 20	403.62	12.34%
20-30	458.22	0 - 30	861.84	26.35%
30-40	559.53	0 - 40	1421.37	43.46%
40-50	588.84	0 - 50	2010.21	61.46%
50-60	539.37	0 - 60	2549.58	77.95%
60-70	415.73	0 - 70	2965.31	90.66%
70-80	240.80	0 - 80	3206.11	98.02%
80-90	64.64	0 - 90	3270.75	100.00%
90-100	0.00	0 - 100	3270.75	100.00%
100-110	0.00	0 - 110	3270.75	100.00%
110-120	0.00	0 - 120	3270.75	100.00%
120-130	0.00	0 - 130	3270.75	100.00%
130-140	0.00	0 - 140	3270.75	100.00%
140-150	0.00	0 - 150	3270.75	100.00%
150-160	0.00	0 - 160	3270.75	100.00%
160-170	0.00	0 - 170	3270.75	100.00%
170-180	0.00	0 - 180	3270.75	100.00%

4.2 Goniophotometer Test

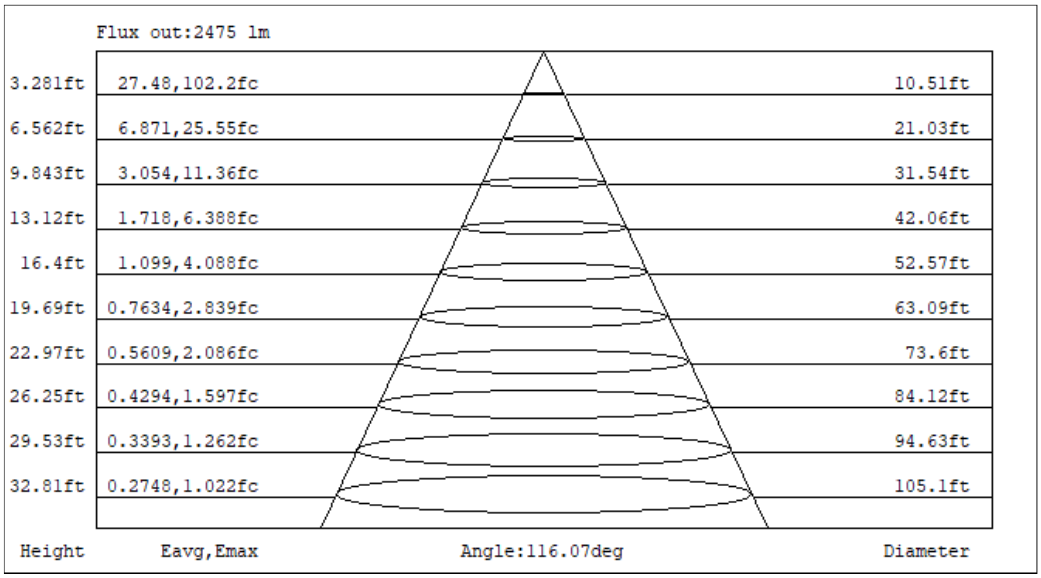
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	33
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	41	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 40W / 3500K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	276.99	60	0.127	34.4	0.975
NON-WORST CASE	120.01	60	0.278	33.2	0.996

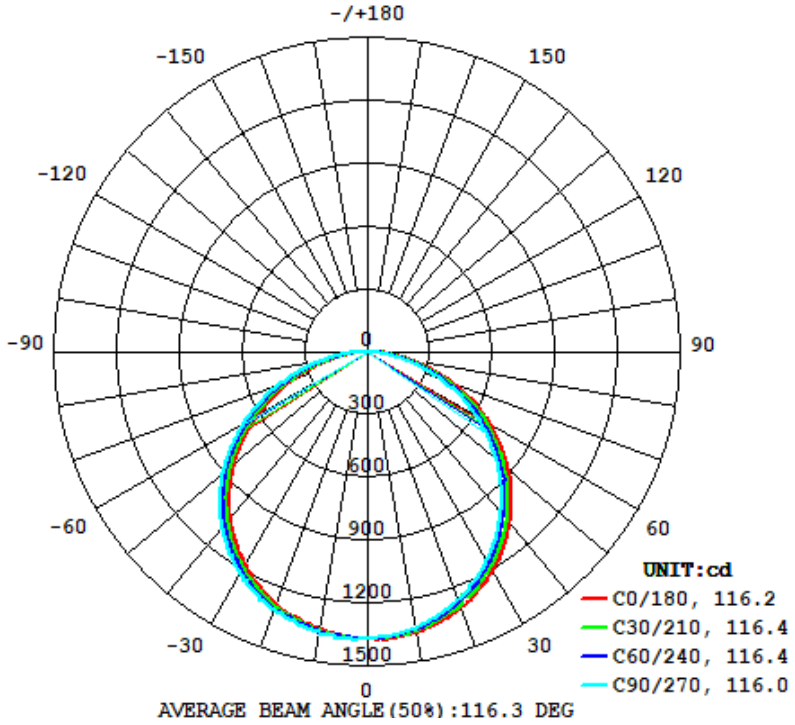
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
4089	162.9	162.9	116.2	116.0	118.8

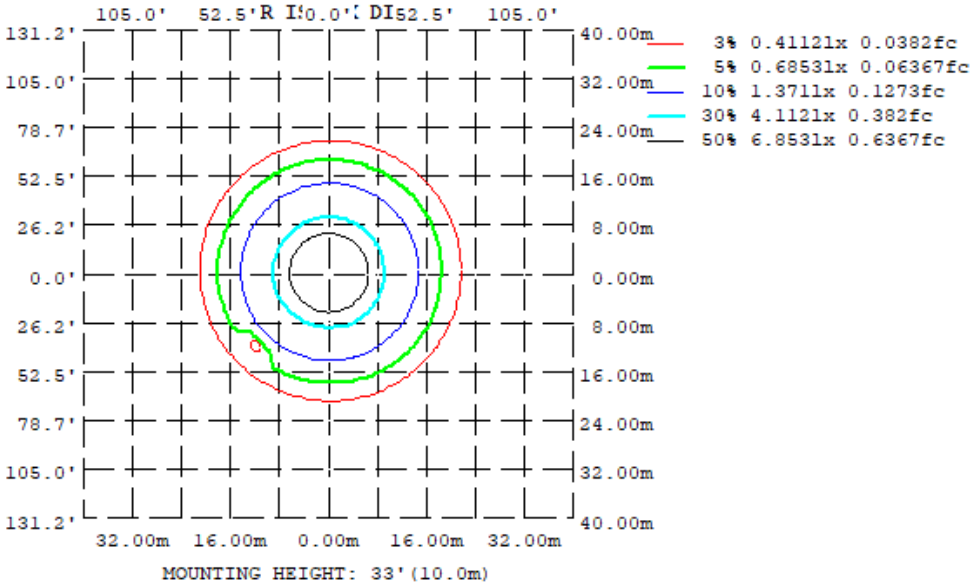
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.84%	20.6	1.26	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1358	1345	1334	1334	1343	1352	1355	1362
20	1302	1279	1258	1254	1284	1301	1312	1310
30	1204	1173	1145	1148	1174	1199	1221	1225
40	1064	1027	999.2	996.8	1024	1057	1085	1090
50	885.9	846.4	812.3	806.1	838.0	877.2	906.6	914.6
60	673.2	633.1	601.4	293.4	618.1	657.5	689.8	702.5
70	434.8	397.9	367.9	357.7	377.2	415.2	449.9	458.1
80	192.2	166.6	137.8	132.6	147.1	178.5	204.5	213.8
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	16.3	17.9	16.6	18.3	18.6	16.5	18.2	16.9	18.5	18.8
	3H	18.1	19.6	18.4	19.9	20.2	18.2	19.8	18.6	20.1	20.4
	4H	18.7	20.1	19.1	20.4	20.8	18.9	20.3	19.3	20.6	21.0
	6H	19.1	20.4	19.5	20.8	21.2	19.3	20.6	19.7	21.0	21.4
	8H	19.2	20.5	19.6	20.9	21.2	19.4	20.7	19.9	21.1	21.5
	12H	19.3	20.5	19.7	20.8	21.3	19.5	20.7	19.9	21.1	21.5
4H	2H	16.9	18.4	17.3	18.7	19.1	17.1	18.6	17.5	18.9	19.3
	3H	18.9	20.1	19.4	20.5	20.9	19.1	20.3	19.5	20.7	21.1
	4H	19.7	20.8	20.1	21.2	21.6	19.9	21.0	20.3	21.4	21.8
	6H	20.2	21.2	20.7	21.6	22.1	20.4	21.4	20.9	21.8	22.3
	8H	20.3	21.2	20.8	21.7	22.1	20.6	21.5	21.0	21.9	22.4
	12H	20.4	21.2	20.9	21.7	22.2	20.7	21.5	21.2	22.0	22.4
8H	4H	20.0	20.9	20.5	21.3	21.8	20.2	21.1	20.6	21.5	22.0
	6H	20.6	21.4	21.1	21.9	22.3	20.8	21.6	21.3	22.1	22.6
	8H	20.8	21.5	21.3	22.0	22.5	21.1	21.7	21.6	22.2	22.7
	12H	21.0	21.5	21.5	22.0	22.6	21.2	21.8	21.7	22.3	22.9
12H	4H	20.1	20.8	20.5	21.3	21.8	20.2	21.0	20.7	21.5	22.0
	6H	20.7	21.4	21.2	21.8	22.4	20.9	21.6	21.4	22.1	22.6
	8H	20.9	21.5	21.4	22.0	22.6	21.2	21.8	21.7	22.3	22.8

Maximum UGR = 22.9

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

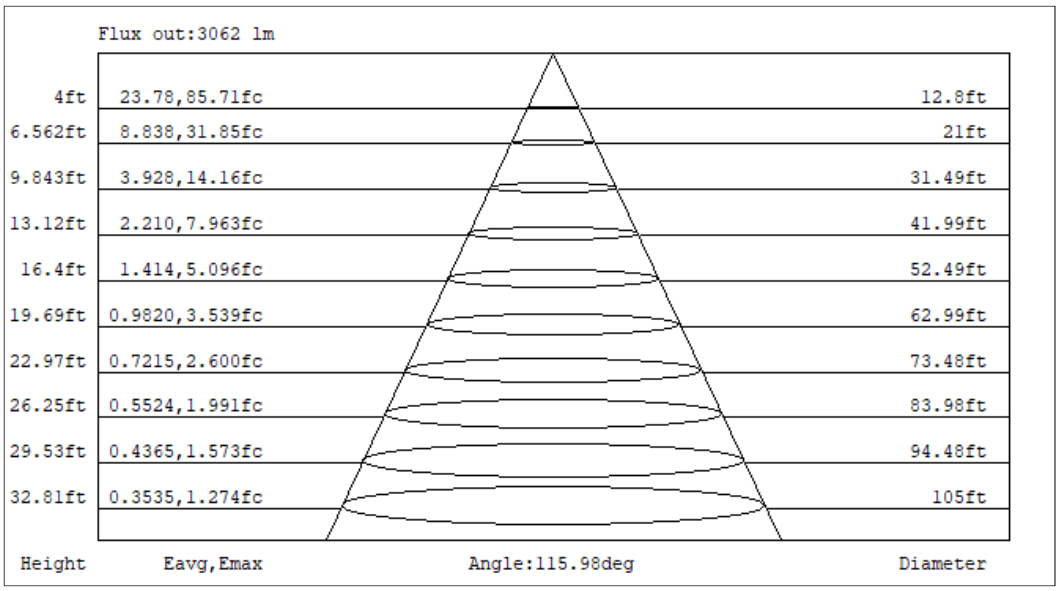
	Zonal (lm)		Total (lm)	Percent
0-10	129.59	0 - 10	129.59	3.17%
10-20	373.29	0 - 20	502.88	12.30%
20-30	572.78	0 - 30	1075.66	26.30%
30-40	699.78	0 - 40	1775.44	43.42%
40-50	736.92	0 - 50	2512.36	61.44%
50-60	671.05	0 - 60	3183.41	77.84%
60-70	521.35	0 - 70	3704.76	90.59%
70-80	303.18	0 - 80	4007.94	98.01%
80-90	81.51	0 - 90	4089.45	100.00%
90-100	0.00	0 - 100	4089.45	100.00%
100-110	0.00	0 - 110	4089.45	100.00%
110-120	0.00	0 - 120	4089.45	100.00%
120-130	0.00	0 - 130	4089.45	100.00%
130-140	0.00	0 - 140	4089.45	100.00%
140-150	0.00	0 - 150	4089.45	100.00%
150-160	0.00	0 - 160	4089.45	100.00%
160-170	0.00	0 - 170	4089.45	100.00%
170-180	0.00	0 - 180	4089.45	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	70	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	35	32
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 40W / 4000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.08	60	0.122	33.0	0.973
NON-WORST CASE	120.04	60	0.263	31.5	0.996

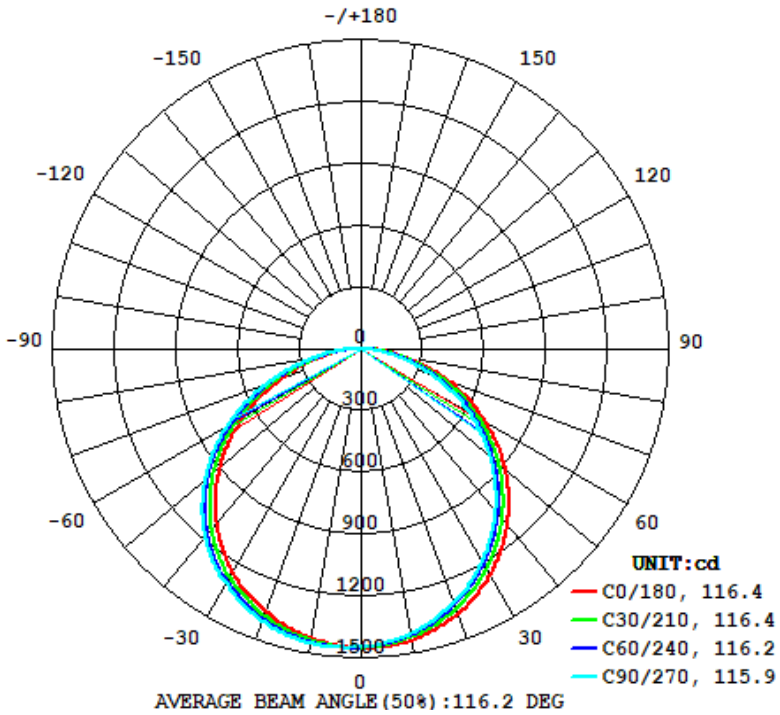
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
4328	163.4	162.2	116.4	115.9	131.1

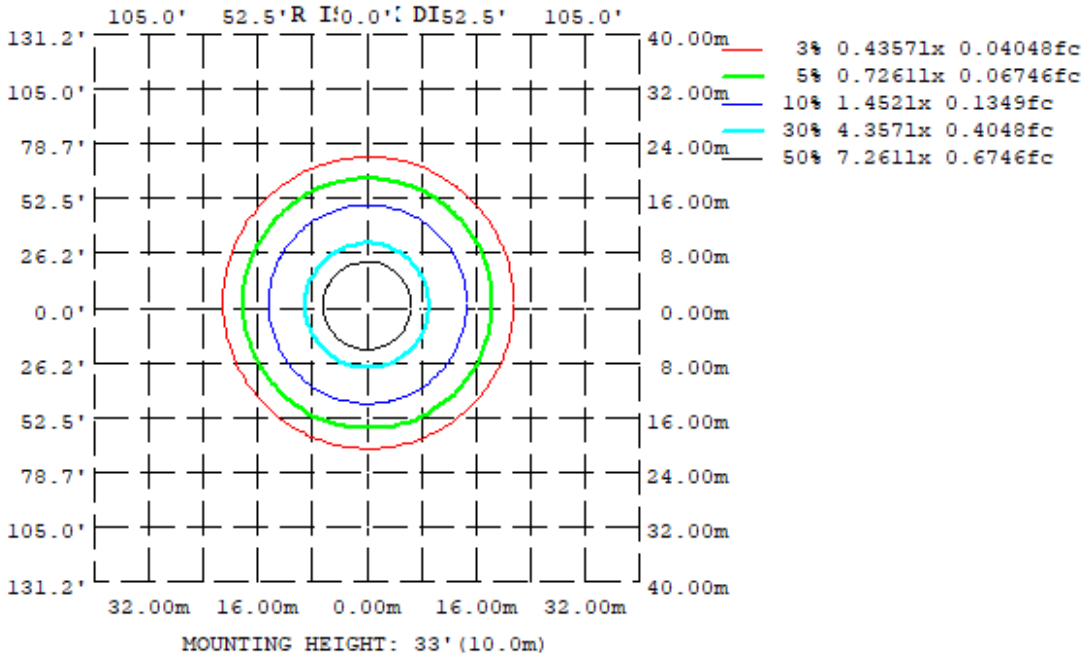
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.87%	21.0	1.24	1.30

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1433	1413	1401	1404	1426	1440	1449	1443
20	1369	1333	1313	1319	1356	1388	1406	1395
30	1263	1212	1186	1194	1252	1294	1316	1303
40	1112	1054	1024	1034	1094	1151	1181	1169
50	922.8	863.8	830.4	837.1	898.2	959.5	992.2	980.0
60	698.3	641.8	608.9	616.9	666.3	724.1	757.8	750.4
70	452.2	403.0	369.9	371.4	412.2	459.0	487.3	487.9
80	202.8	167.6	136.4	139.3	166.1	195.8	211.6	223.2
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	16.2	17.9	16.6	18.2	18.5	16.8	18.4	17.1	18.7	19.1
	3H	18.0	19.5	18.3	19.8	20.2	18.6	20.1	18.9	20.4	20.8
	4H	18.6	20.0	19.0	20.3	20.7	19.2	20.6	19.6	21.0	21.4
	6H	19.0	20.3	19.4	20.7	21.1	19.7	21.0	20.1	21.4	21.8
	8H	19.1	20.3	19.5	20.7	21.1	19.8	21.1	20.2	21.5	21.9
	12H	19.1	20.3	19.6	20.7	21.1	19.9	21.1	20.3	21.5	21.9
4H	2H	16.9	18.3	17.3	18.7	19.0	17.4	18.8	17.8	19.2	19.6
	3H	18.9	20.1	19.3	20.5	20.9	19.5	20.6	19.9	21.0	21.4
	4H	19.6	20.7	20.0	21.1	21.5	20.2	21.3	20.7	21.7	22.2
	6H	20.1	21.0	20.6	21.5	21.9	20.8	21.8	21.3	22.2	22.7
	8H	20.2	21.1	20.7	21.6	22.0	21.0	21.9	21.4	22.3	22.8
	12H	20.3	21.1	20.8	21.6	22.1	21.1	21.9	21.6	22.4	22.8
8H	4H	19.9	20.8	20.4	21.2	21.7	20.5	21.4	21.0	21.9	22.3
	6H	20.5	21.3	21.0	21.8	22.2	21.2	22.0	21.7	22.5	22.9
	8H	20.7	21.4	21.2	21.9	22.4	21.5	22.1	22.0	22.7	23.1
	12H	20.8	21.4	21.3	21.9	22.5	21.7	22.2	22.2	22.7	23.3
12H	4H	20.0	20.8	20.5	21.2	21.7	20.6	21.4	21.1	21.9	22.3
	6H	20.6	21.3	21.1	21.7	22.3	21.3	22.0	21.8	22.4	23.0
	8H	20.8	21.4	21.3	21.9	22.5	21.6	22.2	22.1	22.7	23.2

Maximum UGR = 23.3

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

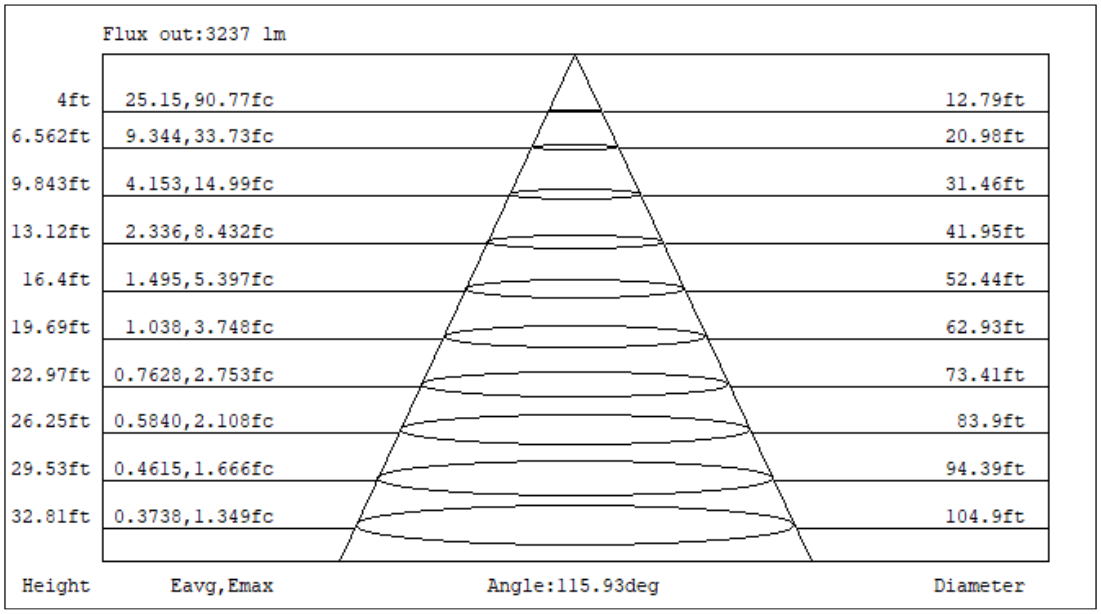
	Zonal (lm)		Total (lm)	Percent
0-10	137.06	0 - 10	137.06	3.17%
10-20	394.59	0 - 20	531.65	12.29%
20-30	604.05	0 - 30	1135.70	26.24%
30-40	740.16	0 - 40	1875.86	43.35%
40-50	779.53	0 - 50	2655.39	61.36%
50-60	714.49	0 - 60	3369.88	77.87%
60-70	552.27	0 - 70	3922.15	90.63%
70-80	319.74	0 - 80	4241.89	98.02%
80-90	85.68	0 - 90	4327.57	100.00%
90-100	0.00	0 - 100	4327.57	100.00%
100-110	0.00	0 - 110	4327.57	100.00%
110-120	0.00	0 - 120	4327.57	100.00%
120-130	0.00	0 - 130	4327.57	100.00%
130-140	0.00	0 - 140	4327.57	100.00%
140-150	0.00	0 - 150	4327.57	100.00%
150-160	0.00	0 - 160	4327.57	100.00%
160-170	0.00	0 - 170	4327.57	100.00%
170-180	0.00	0 - 180	4327.57	100.00%

4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	70	64	87	77	69	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	53	66	58	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	44	39	50	44	39	37
7	64	51	42	35	62	50	41	35	48	41	35	47	40	35	45	39	34	32
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34FA2X2 / 40W / 5000K	Sample ID.	A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	277.04	60	0.127	34.4	0.975
NON-WORST CASE	120.02	60	0.265	31.7	0.995

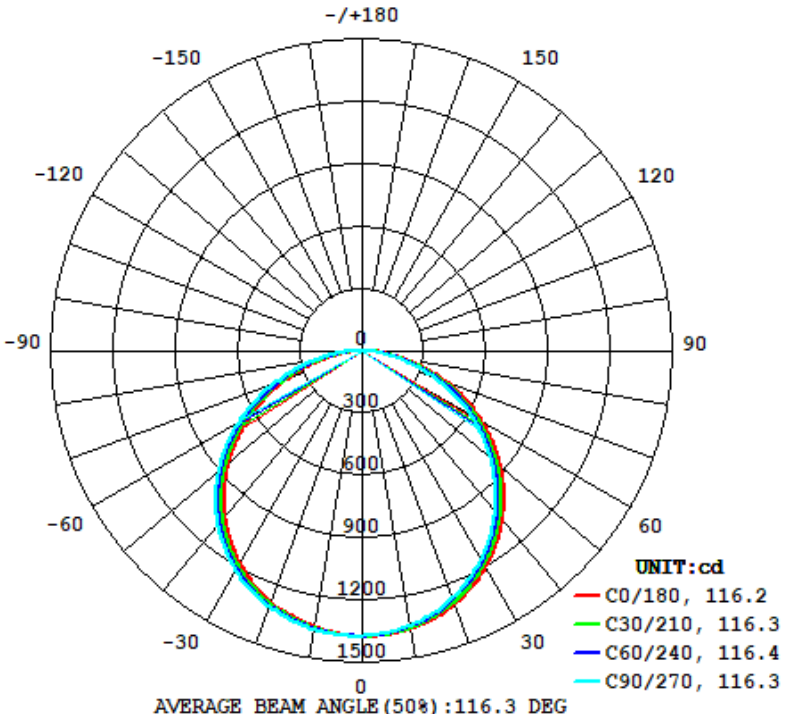
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
4100	162.9	163.0	116.2	116.3	119.2

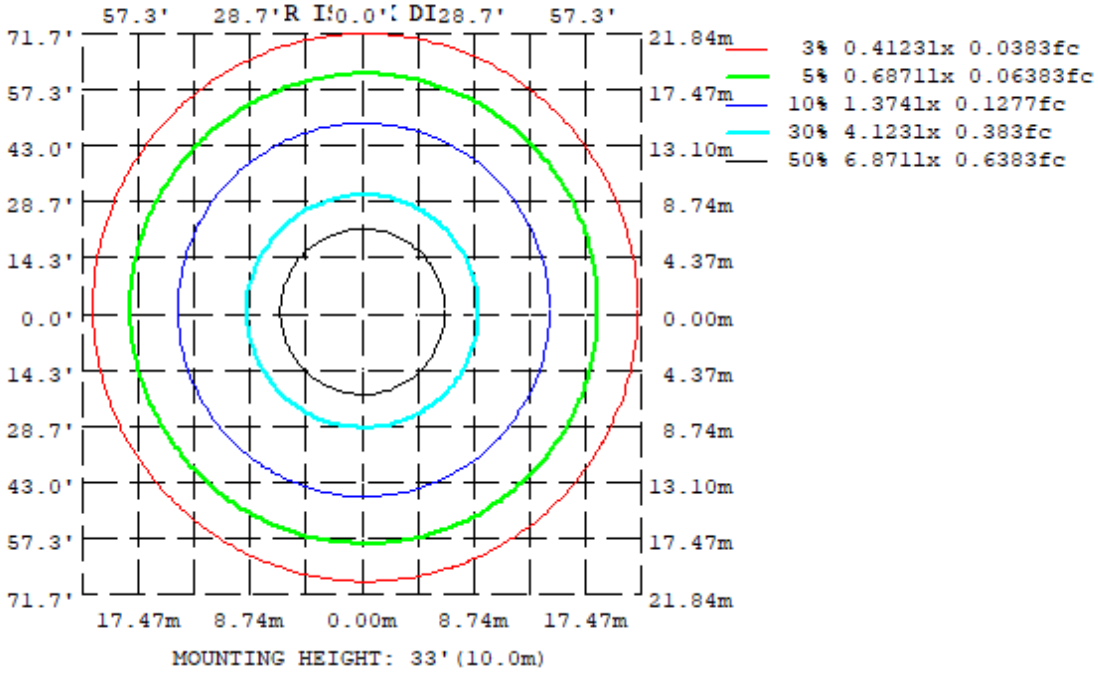
Zonal Lumen Requirement (0°-60°)	UGR (X=4H, Y=8H, 70/50/20%)	SC: 0-180°	SC: 90-270°
77.89%	20.6	1.26	1.28

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1357	1347	1341	1339	1348	1356	1361	1361
20	1298	1281	1268	1267	1287	1306	1311	1312
30	1198	1174	1155	1153	1181	1204	1221	1221
40	1058	1028	1004	1002	1031	1062	1083	1084
50	878.7	844.3	818.2	813.8	844.8	879.8	905.8	907.5
60	664.7	630.3	604.2	599.4	624.4	662.2	691.5	694.1
70	427.8	395.1	368.4	360.6	381.7	419.8	450.1	453.1
80	188.5	164.4	139.0	134.6	148.4	180.7	203.8	210.6
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	16.3	18.0	16.7	18.3	18.6	16.5	18.2	16.9	18.5	18.8
	3H	18.1	19.6	18.5	19.9	20.3	18.3	19.8	18.7	20.1	20.5
	4H	18.7	20.1	19.1	20.5	20.9	18.9	20.4	19.3	20.7	21.1
	6H	19.1	20.5	19.5	20.8	21.2	19.4	20.7	19.8	21.1	21.4
	8H	19.3	20.5	19.7	20.9	21.3	19.5	20.8	19.9	21.1	21.5
	12H	19.3	20.5	19.7	20.9	21.3	19.6	20.8	20.0	21.1	21.6
4H	2H	17.0	18.4	17.4	18.7	19.1	17.2	18.6	17.6	19.0	19.3
	3H	19.0	20.2	19.4	20.6	21.0	19.2	20.4	19.6	20.8	21.2
	4H	19.7	20.8	20.2	21.2	21.6	19.9	21.0	20.4	21.4	21.9
	6H	20.3	21.2	20.7	21.6	22.1	20.5	21.4	20.9	21.9	22.3
	8H	20.4	21.3	20.8	21.7	22.2	20.6	21.5	21.1	22.0	22.4
	12H	20.5	21.3	20.9	21.7	22.2	20.7	21.5	21.2	22.0	22.5
8H	4H	20.0	20.9	20.5	21.4	21.8	20.3	21.1	20.7	21.6	22.1
	6H	20.7	21.4	21.2	21.9	22.4	20.9	21.7	21.4	22.2	22.6
	8H	20.9	21.5	21.4	22.0	22.5	21.1	21.8	21.6	22.3	22.8
	12H	21.0	21.6	21.5	22.1	22.6	21.3	21.9	21.8	22.4	22.9
12H	4H	20.1	20.9	20.5	21.3	21.8	20.3	21.1	20.8	21.6	22.0
	6H	20.7	21.4	21.3	21.9	22.4	21.0	21.7	21.5	22.1	22.7
	8H	21.0	21.6	21.5	22.0	22.6	21.3	21.8	21.8	22.3	22.9

Maximum UGR = 22.9

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	129.96	0 - 10	129.96	3.17%
10-20	374.26	0 - 20	504.22	12.30%
20-30	574.18	0 - 30	1078.40	26.30%
30-40	701.25	0 - 40	1779.65	43.40%
40-50	738.01	0 - 50	2517.66	61.40%
50-60	676.15	0 - 60	3193.81	77.89%
60-70	522.61	0 - 70	3716.42	90.63%
70-80	302.75	0 - 80	4019.17	98.02%
80-90	81.31	0 - 90	4100.48	100.00%
90-100	0.00	0 - 100	4100.48	100.00%
100-110	0.00	0 - 110	4100.48	100.00%
110-120	0.00	0 - 120	4100.48	100.00%
120-130	0.00	0 - 130	4100.48	100.00%
130-140	0.00	0 - 140	4100.48	100.00%
140-150	0.00	0 - 150	4100.48	100.00%
150-160	0.00	0 - 160	4100.48	100.00%
160-170	0.00	0 - 170	4100.48	100.00%
170-180	0.00	0 - 180	4100.48	100.00%

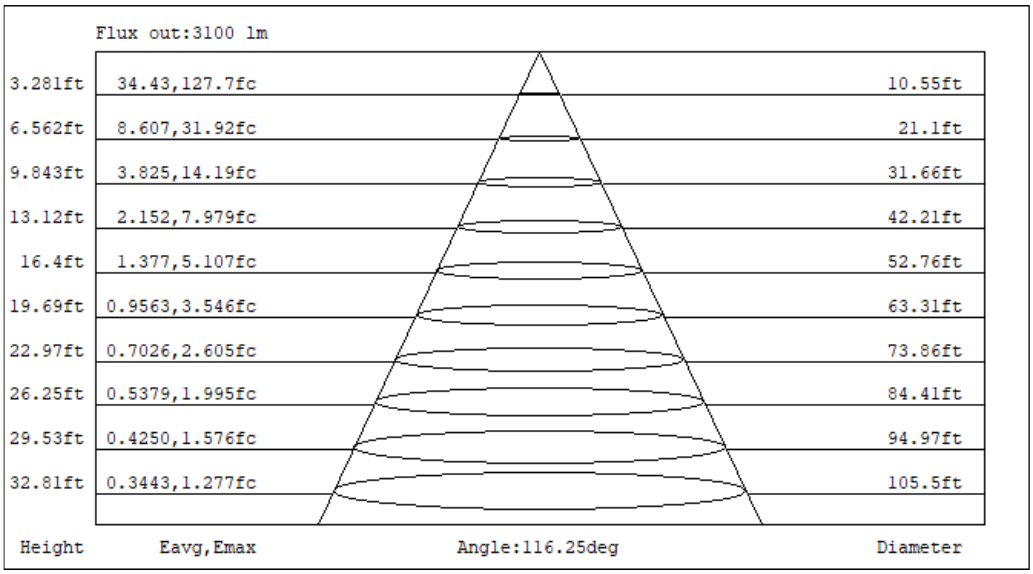
4.2 Goniophotometer Test

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	90	88	90	87	85	83
2	98	90	83	77	96	88	82	76	85	79	74	81	77	73	78	74	71	69
3	90	79	71	64	87	77	70	63	74	68	62	71	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	52	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	45	39	50	44	39	37
7	64	51	42	35	63	50	41	35	48	41	35	47	40	35	45	39	34	32
8	60	46	37	32	58	45	37	31	44	37	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 20W / 3500K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.01	60	0.138	16.4	0.990	8.23%
276.95	60	0.072	18.1	0.904	8.89%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 20W / 4000K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.00	60	0.132	15.7	0.991	7.88%
276.96	60	0.070	17.4	0.899	9.07%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 20W / 5000K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.09	60	0.139	16.5	0.990	8.19%
276.99	60	0.072	18.0	0.903	8.96%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 30W / 3500K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.98	60	0.212	25.3	0.997	5.39%
276.96	60	0.102	26.8	0.950	8.83%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 30W / 4000K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.98	60	0.200	23.9	0.997	5.44%
276.96	60	0.098	25.7	0.950	8.25%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 30W / 5000K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
119.93	60	0.211	25.2	0.997	5.34%
277.00	60	0.101	26.8	0.954	8.78%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 40W / 3500K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.04	60	0.278	33.3	0.996	6.89%
277.00	60	0.128	34.7	0.978	7.36%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 40W / 4000K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.00	60	0.263	31.4	0.996	6.77%
276.95	60	0.122	32.8	0.975	6.99%

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34FA2X2 / 40W / 5000K	Sample ID.	A1
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results					
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.07	60	0.275	32.9	0.997	6.44%
277.05	60	0.127	34.3	0.977	7.37%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

********** End of Test Report**********