







TEST REPORT

Of IES LM-79-08

Kunde: <i>Client:</i>	Shenzhen Penel Optoelectronics Technology Co.,Ltd
Adresse: <i>Address:</i>	The 1st Building ,Xi'en Industrial District, No.227, Xiangshan Avenue, Yanluo Street, Bao'an District, Shenzhen, China
Hersteller: <i>Manufacturer:</i>	Shenzhen Penel Optoelectronics Technology Co.,Ltd
Adresse: <i>Address:</i>	The 1st Building ,Xi'en Industrial District, No.227, Xiangshan Avenue, Yanluo Street, Bao'an District, Shenzhen, China
Name der Marke: <i>Brand Name:</i>	
Beschreibung des Produkts: <i>Product Description:</i>	LED FLOOD LIGHT
Modelle: <i>Models:</i>	FL-NS05-400
Bewertung: <i>Rating:</i>	AC100-240V, 50/60Hz, 400W, 4000K
Verfahren: <i>Method:</i>	IES LM-79-08: Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products
Prüfergebnis*: <i>Test result*:</i>	N/A

Datum der Prüfung: <i>Date of Test:</i>	Datum der Emission: <i>Date of Issue:</i>	Klassifizierung: <i>Classification:</i>	Gegenstand der Prüfung: <i>Test item:</i>
2021-01-20-2021-01-25	2021-01-26	Commission Test	IES LM-79-08

Prüflabor (Testlabor) / Testing Laboratory:
Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Test von/Test by:  Sharon Su/ Project Engineer	Check von/Check by:  Ian Luo/ Director	Genehmigt von/Approved by:  Jesse Liu/ Manager
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Table of Contents

1. Test Method.....	3
2. Product Information.....	4
3. Test equipment list.....	4
4. Integrating Sphere Test Results.....	5
4.1 Test Data.....	5
4.2 Spectrum.....	5
5. Goniophotometer Test results.....	6
5.1 Test Data.....	6
5.2 Luminous Intensity Distribution Diagram and C0 Plane Isolux Diagram (Unit : lx).....	6
5.3 Zonal Flux Diagram.....	7
5.4 Isocandela Diagram.....	8
5.5 Luminous Distribution Intensity Data.....	9
6. Photo of sample.....	10



1. Test Method

Test Item.....:	Integrating Sphere Test
Ambient Condition	25.1°C
Stabilization time(h):	0.5h
Orientation(burning position) of SSL product during test	down
Test Method	<p>The sample was tested according to the IES LM-79-2008.</p> <p>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 sample was 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.</p>
Test Item.....:	Goniophotometer Test
Ambient Condition.....:	25.1°C
Total operated time of the product for measurements including stabilization..... (h):	1.0h
Orientation(burning position) of SSL product during test	down
Test Method.....:	<p>The sample was tested according to the IES LM-79-2008.</p> <p>Photometric parameters were measured using a type C goniophotometer and software. The sample reference plane was located at the center of the sample goniometer at a test distance of 26m from the detectors. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, Luminous efficacy, zonal flux were calculated from the software taken at 1 ° vertical intervals and 22.5 ° horizontal intervals.</p>



2. Product Information

Product description.....:	LED FLOOD LIGHT
Model Number.....:	FL-NSO5-400
Rated Inputs.....:	AC100-240V, 50/60Hz
Rated Power.....:	400W
Declared CCT.....:	4000K
LED Manufacturer.....:	CREE
LED Model.....:	3030LEDs
Forward current of the LED chip.....:	400mA
Date of Receipt Samples.....:	January 19, 2021
Quantity of Receipt Samples.....:	1 unit

3. Test equipment list

Manufacturer	Description	Equipment ID	Model	Calibration Date	Calibration Due Date
EVERFINE	Full-field Speed Goniophotometer	SLCS-S-112	GO-R5000	2020/07/02	2021/07/01
EVERFINE	Digital Power Meter	SLCS-S-103	PF2010	2020/06/24	2021/06/23
EVERFINE	AC Testing Power Source	SLCS-S-115	DPS1060	2020/06/24	2021/06/23
EVERFINE	Total Spectral Radiant Flux Standard Lamp	SLCS-S-143	D908S	2020/07/02	2021/07/01
SENSING	2 Meter Integrating Sphere	SLCS-S-038	SPR-3000	2020/07/02	2021/07/01
YOKOGAWA	Digital Power Meter	SLCS-S-058	WT310	2020/06/24	2021/06/23
ALL POWER ELECTRONIC	AC Testing Power Source	SLCS-S-111	APW-105N	2020/06/24	2021/06/23
SENSING	Standard Lamp	SLCS-S-118	S11010017	2020/07/02	2021/07/01



4. Integrating Sphere Test Results

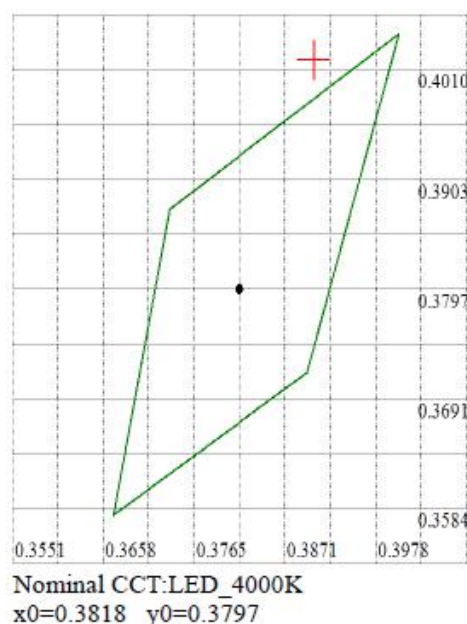
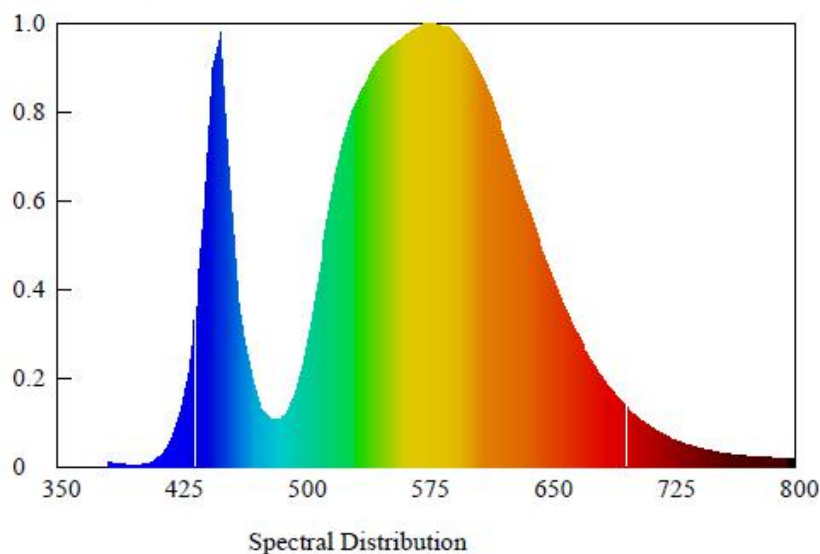
4.1 Test Data

Test type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	229.88	50.01	1.7732	0.9810	399.87

Test type	CCT (K)	CRI	Duv	Luminous flux (lm)	Luminous efficacy(lm/W)
Output	3921	70.1	+0.00849	56422.64	141.1

4.2 Spectrum

Spectroradiometric Parameters



Chromaticity Coordinates: $x=0.3906$ $y=0.4019$ $u'=0.2219$ $v'=0.5137$

Correlated Color Temperature: 3921 K

Colour Fidelity Index: $R_f=71$

Luminous Flux: 56422.64 lm

Chromaticity Difference: +0.00849Duv

Color Ratio: $K_r=36.0\%$ $K_g=57.8\%$ $K_b=6.2\%$

Bandwidth: 137nm

Photosynthetically Active Radiation(PAR): 136.75W

Rendering Index: $R_a=70.1$

Dominant Wavelength: 574.0 nm(E)

Gamut Index: $R_g=93$

Purity: 0.3774

Peak Wavelength: 580.0 nm

Radiant Flux: 140.605 W

Photosynthetic Photon Flux(PPF):647.39 μ mol/s

$R_1=67$ $R_2=75$ $R_3=82$ $R_4=71$ $R_5=65$ $R_6=64$ $R_7=83$ $R_8=54$

$R_9=-30$ $R_{10}=41$ $R_{11}=65$ $R_{12}=32$ $R_{13}=69$ $R_{14}=89$ $R_{15}=61$ $R_e=59$



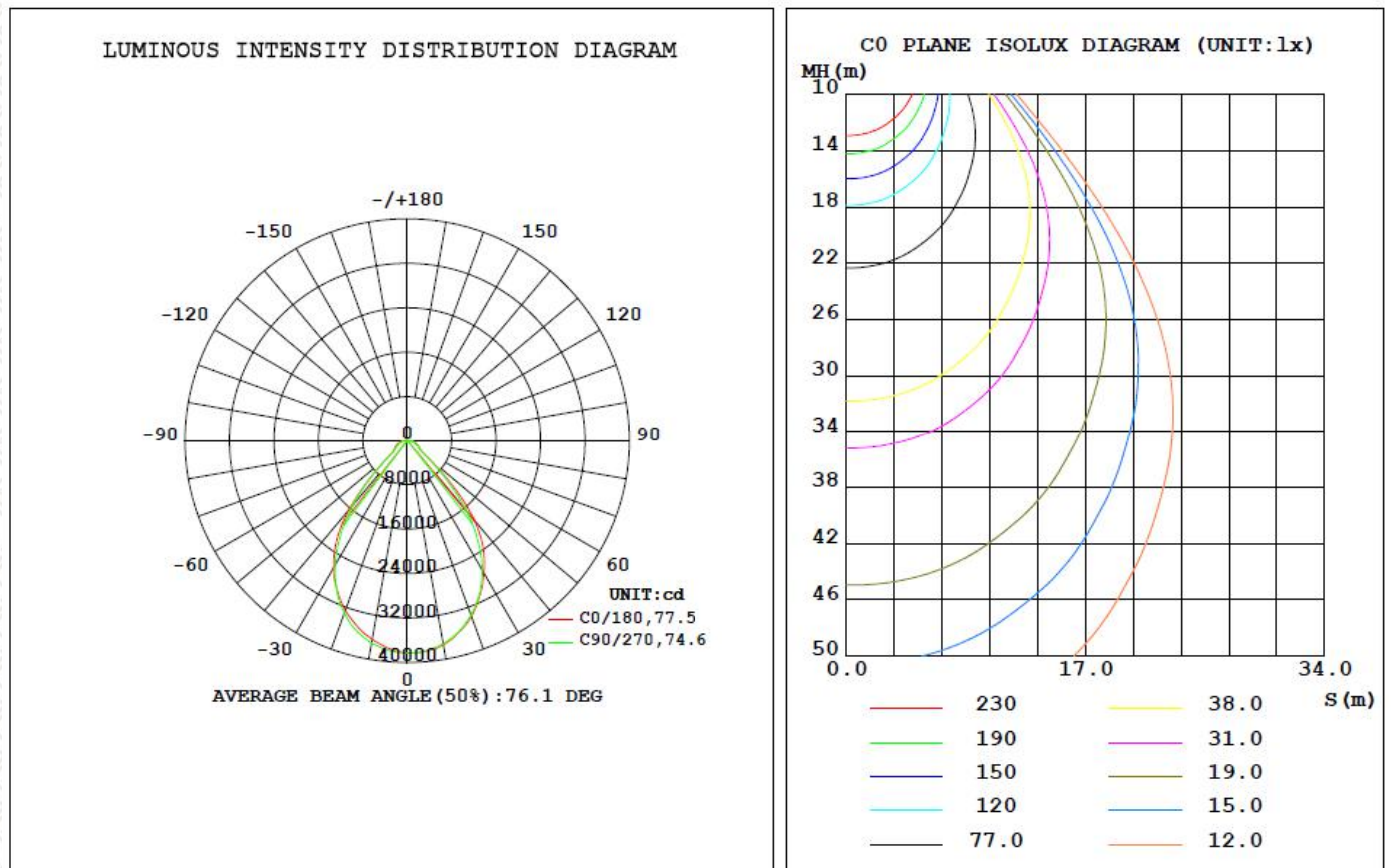
5. Goniophotometer Test results

5.1 Test Data

Test type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	230.2	50.01	1.773	0.9798	399.8

Test type	Total Flux (lm)	Luminous efficacy(lm/W)	Imax (cd)	Spacing Criteria (0~180°)	Spacing Criteria (90~270°)
Output	56386.9	141.04	38314	1.07	1.06

5.2 Luminous Intensity Distribution Diagram and C0 Plane Isolux Diagram (Unit : lx)



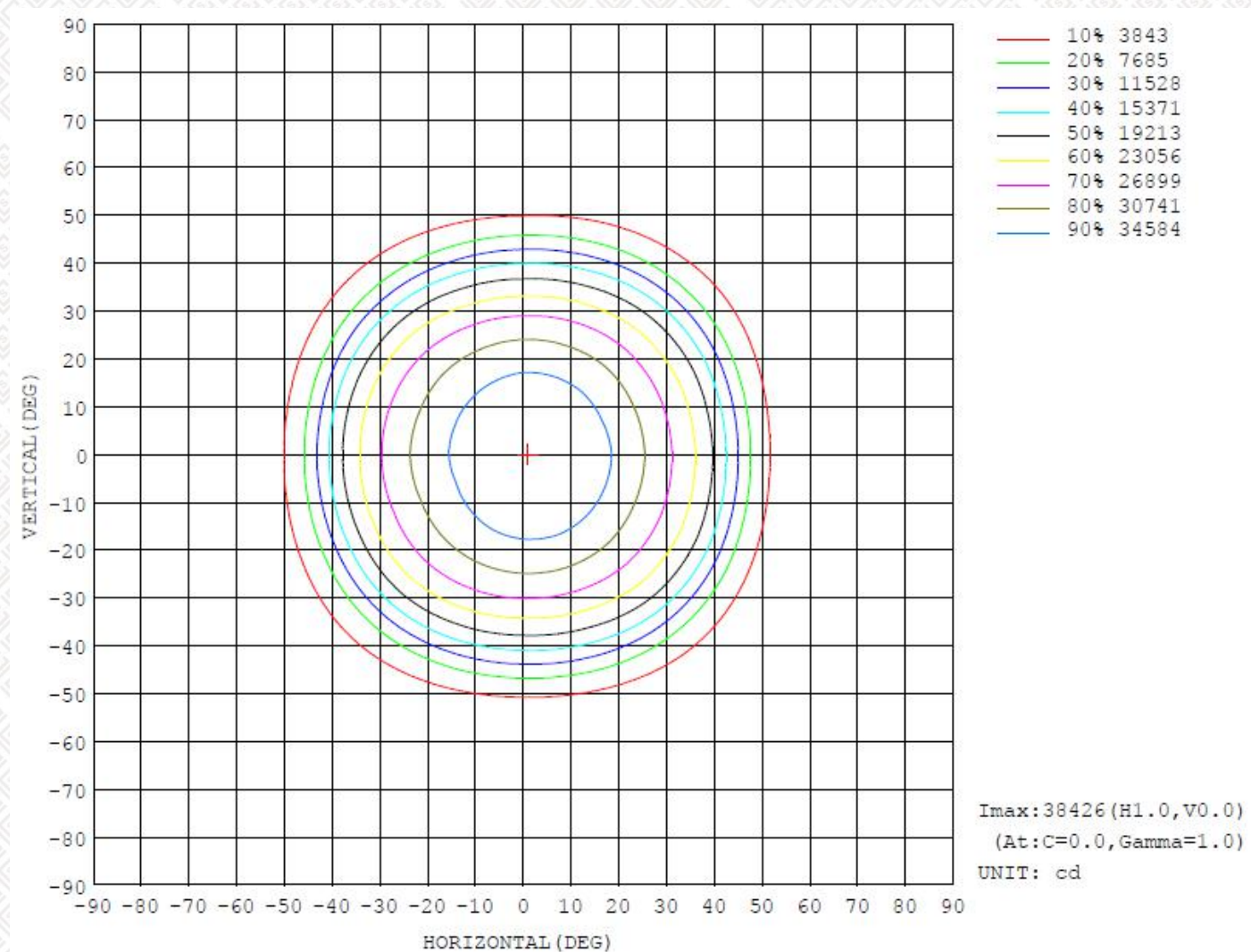


5.3 Zonal Flux Diagram

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	3739	3736	3717	3667	3640	3653	3706	3726	0- 10	3591	3591	6.5, 6.5
20	3378	3377	3351	3292	3260	3264	3313	3364	10- 20	9951	13542	24.5, 24.5
30	2760	2764	2699	2686	2658	2630	2599	2716	20- 30	13922	27464	49.7, 49.7
40	1876	1837	1659	1642	1629	1539	1525	1713	30- 40	13866	41330	74.8, 74.8
50	500.6	487.3	431.2	414.2	387.8	370.8	373.2	464.1	40- 50	7596	48926	88.5, 88.5
60	245.7	241.8	217.1	250.8	256.1	246.9	211.1	245.8	50- 60	2625	51551	93.2, 93.2
70	168.7	167.1	139.1	172.9	177.6	169.8	136.0	166.4	60- 70	1999	53551	96.9, 96.9
80	76.04	70.64	77.95	69.27	75.57	64.95	73.28	69.51	70- 80	1245	54795	99.1, 99.1
90	0.6727	1.129	1.101	0.5816	0.5715	0.4705	0.5215	0.9603	80- 90	333.0	55128	99.7, 99.7
100	0.4024	0.3594	0.3235	0.3454	0.4248	0.3596	0.3385	0.4204	90-100	4.586	55133	99.7, 99.7
110	0.4024	0.3593	0.3159	0.3378	0.5968	0.4942	0.4514	0.5709	100-110	4.203	55137	99.7, 99.7
120	1.012	0.6138	0.4420	0.6606	1.580	0.9740	0.7297	1.248	110-120	6.049	55143	99.7, 99.7
130	2.580	2.033	1.660	2.077	3.279	1.972	1.343	2.478	120-130	13.25	55157	99.8, 99.8
140	4.672	4.190	3.976	4.359	5.623	3.573	3.239	4.727	130-140	24.28	55181	99.8, 99.8
150	6.839	7.172	6.992	7.374	7.744	6.057	5.619	7.102	140-150	34.42	55215	99.9, 99.9
160	8.016	8.383	8.069	8.025	9.920	9.145	7.750	9.393	150-160	35.46	55251	99.9, 99.9
170	10.19	9.878	10.29	10.69	10.37	10.47	9.192	10.30	160-170	25.95	55277	100, 100
180	11.92	11.39	10.72	11.16	11.80	11.36	10.70	11.50	170-180	10.19	55287	100, 100
DEG	LUMINOUS INTENSITY: *10cd									UNIT: lm		



5.4 Isocandela Diagram





5.5 Luminous Distribution Intensity Data

Table--1 UNIT: ×10cd

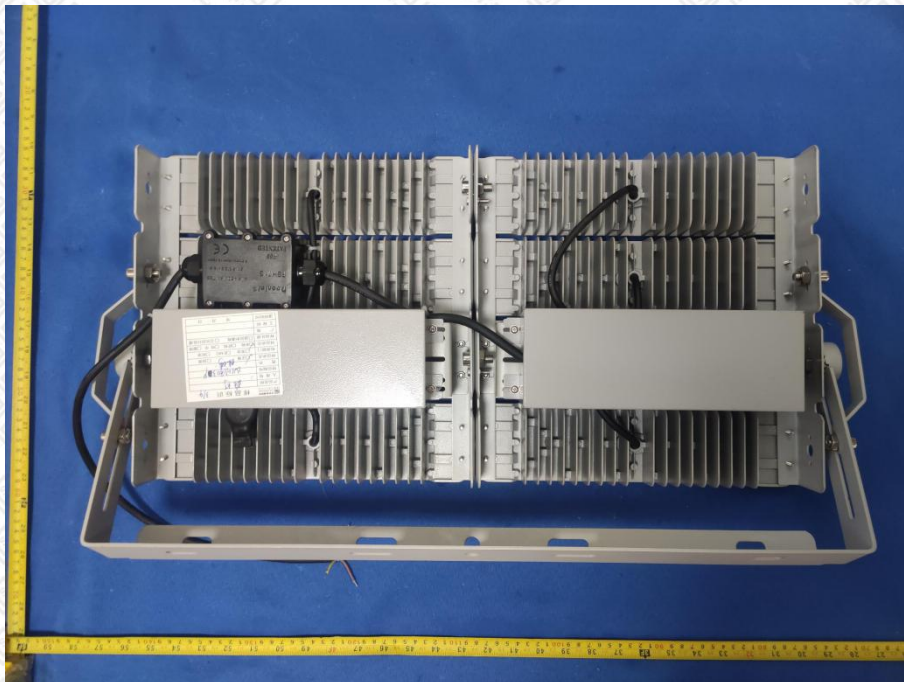
C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828	3828			
5	3815	3814	3814	3809	3802	3792	3778	3768	3765	3763	3775	3786	3794	3804	3809	3818			
10	3739	3734	3736	3730	3717	3695	3667	3642	3640	3637	3653	3682	3706	3717	3726	3738			
15	3581	3587	3590	3586	3569	3535	3503	3478	3471	3471	3488	3514	3547	3563	3582	3587			
20	3378	3375	3377	3372	3351	3323	3292	3258	3260	3250	3264	3288	3313	3337	3364	3371			
25	3090	3090	3099	3088	3067	3041	3018	2990	2984	2975	2982	2986	3006	3035	3076	3090			
30	2760	2768	2764	2727	2699	2687	2686	2660	2658	2645	2630	2591	2599	2651	2716	2751			
35	2392	2402	2371	2281	2225	2226	2251	2230	2230	2209	2171	2108	2105	2174	2282	2362			
40	1876	1895	1837	1727	1659	1642	1642	1620	1629	1596	1539	1507	1525	1600	1713	1826			
45	1150	1167	1111	1053	999	958	915	881	882	850	815	827	873	932	1004	1104			
50	501	509	487	464	431	425	414	398	388	378	371	368	373	426	464	504			
55	286	287	283	269	262	269	286	291	287	285	280	264	253	264	283	291			
60	246	245	242	228	217	232	251	258	256	252	247	228	211	226	246	251			
65	210	209	205	190	174	195	212	223	221	218	209	191	169	187	208	214			
70	169	171	167	151	139	155	173	181	178	178	170	152	136	148	166	174			
75	116	127	123	108	108	110	126	133	118	130	122	106	107	105	122	130			
80	76.0	77.3	70.6	67.5	77.9	68.0	69.3	76.1	75.6	74.5	64.9	62.8	73.3	62.9	69.5	78.5			
85	33.6	31.0	30.1	29.7	32.2	28.0	26.9	26.2	32.7	25.3	23.4	23.0	25.7	24.7	26.9	31.4			
90	0.67	0.88	1.13	1.50	1.10	0.79	0.58	0.61	0.57	0.53	0.47	0.48	0.52	0.68	0.96	0.94			
95	0.43	0.43	0.41	0.38	0.36	0.35	0.38	0.41	0.42	0.39	0.35	0.32	0.33	0.36	0.41	0.45			
100	0.40	0.39	0.36	0.34	0.32	0.32	0.35	0.38	0.42	0.41	0.36	0.33	0.34	0.37	0.42	0.46			
105	0.39	0.39	0.36	0.32	0.32	0.31	0.34	0.37	0.49	0.46	0.40	0.35	0.37	0.41	0.47	0.52			
110	0.40	0.39	0.36	0.32	0.32	0.31	0.34	0.39	0.60	0.56	0.49	0.44	0.45	0.49	0.57	0.62			
115	0.59	0.53	0.41	0.36	0.35	0.34	0.41	0.58	0.94	0.85	0.65	0.55	0.54	0.62	0.75	0.84			
120	1.01	0.92	0.61	0.47	0.44	0.46	0.66	0.99	1.58	1.43	0.97	0.71	0.73	0.92	1.25	1.40			
125	1.72	1.61	1.22	0.98	0.95	0.96	1.33	1.72	2.37	2.14	1.37	0.89	1.00	1.12	1.78	2.17			
130	2.58	2.39	2.03	1.78	1.66	1.69	2.08	2.72	3.28	2.98	1.97	1.34	1.34	1.93	2.48	3.08			
135	3.43	2.99	2.97	2.75	2.56	2.66	2.96	3.60	4.39	3.79	2.65	2.22	2.34	2.86	3.52	4.12			
140	4.67	4.07	4.19	3.97	3.98	4.28	4.36	4.80	5.62	4.61	3.57	3.26	3.24	4.18	4.73	5.19			
145	5.73	5.30	5.57	5.42	5.55	5.80	5.85	5.86	6.66	5.45	4.75	4.48	4.43	5.06	6.02	6.37			
150	6.84	6.54	7.17	6.85	6.99	6.99	7.37	6.98	7.74	6.42	6.06	5.75	5.62	6.15	7.10	7.64			
155	7.58	7.34	7.97	7.65	7.48	7.62	7.97	7.53	8.92	7.95	7.68	6.97	6.82	7.41	8.42	9.06			
160	8.02	7.75	8.38	8.00	8.07	8.21	8.02	7.88	9.92	9.13	9.15	8.07	7.75	7.90	9.39	9.64			
165	9.07	8.68	8.94	8.85	8.82	9.12	9.14	9.35	10.3	10.0	9.99	8.84	8.43	8.64	9.51	9.96			
170	10.2	9.87	9.88	10.0	10.3	10.7	10.7	10.6	10.4	10.4	10.5	9.58	9.19	9.28	10.3	10.5			
175	11.4	10.9	10.9	11.0	11.0	11.7	11.5	11.5	11.3	11.2	10.9	10.4	10.1	10.0	10.8	11.0			
180	11.9	11.4	11.4	10.7	10.7	11.6	11.2	11.6	11.8	11.8	11.4	11.3	10.7	10.7	11.5	11.4			



6. Photo of sample

Photo document

Photos of FL-NSO5-400



----- End of test report -----