



Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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TEST REPORT

Applicant:	Radomir Klabal Komenskeho 446, Bilovice nad Svitavou, Czech Republic	Number:	HK09020062-6
		Date:	28 Jan 2011

Sample Description

Product	:	Compact Fluorescent Lamp
Model No.	:	CFL20T2S27E27
Brand Name	:	Divetta
Electrical Rating	:	220-240V, 50Hz/60Hz
No. of Submitted Samples	:	25 pieces
Date Received	:	03 Feb 2009
Date Test Conducted	:	04 Feb 2009 to 30 Dec 2010
Test Requested	:	EN 60969: 1993 +A1: 1993 +A2: 2000
		1. Lumen Output
		2. Energy Efficiency Ratio
		3. Colour Temperature
		4. Colour Rendering Index
		5. Total Harmonic Distortion
		6. Physical weight and dimension
		8. SDCM
		9. 2000, 6000 & 10000 Hours Lumen Maintenance
		10. 15000 Hours Life Test
Test Method	:	See the attached sheets.
Test Result	:	The submitted samples complied with the above standard / requirement. The remarks in page 10 shall be noted. Measurement uncertainty for applicable tests has been established.

***** End of Page *****

Prepared and checked by:

Lam Chi Keung
Manager

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
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TEST REPORT

Test Result:

Number: HK09020062-6

Description : Compact Fluorescent Lamp

Design : Bare Design

Test Sample Size : 20 pieces

1. **Measuring Method**

1.1 Lamp Pre-Conditioning

The lamps were pre-conditioned for 100 hours (mounted in base-up position), before the initial lumen measurement.

1.2 Light Output Measurements

Total light output (luminous flux) was measured using a Labsphere 65 inches integrating sphere spectral lamp measurement system SLMS-6521. Temperature was measured at a position inside the sphere shielded from direct light. Relative humidity of 65% was measured at a position in the testing laboratory.

Spectral radiant flux measurements were made using the Labsphere model DAS-1100 Diode Array spectrometer attached to the detector port of the integrating sphere. Each lamp was operated at 240V AC 50Hz in the base up orientation. Each lamp was allowed to stabilise before measurements were made. The calibration of the integrating sphere spectrometer system is by the reference/standard lamps which are traceable to NIST national standards in US. Lamp efficacy (lumens per watt) for each lamp model was then computed based on the luminous flux result. Electrical measurements including voltage, power and power factor were measured using the Voltech Instrument Ltd., model PM100 digital power meter.

1.3 Run-up Times from switch-on for self ballasted CFLs

Prior to run-up testing a sample of 20 lamps, which have been operated for 100 hours, shall be started under normal conditions at Rated Supply Voltage (240V). The light output at both 2 seconds after switch-on and 60 seconds after switch-on shall be recorded and logged as a percentage of the final light output for each lamp.

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Test Result:

Number: HK09020062-6

1. Measuring Method

1.4 Run-up Times at 60% of the initial stable lumen

Prior to run-up testing a sample of 20 lamps, which have been operated for 100 hours, shall be started under normal conditions at Rated Supply Voltage (240V). The light output at 60% of initial stable lumen will be recorded and logged.

1.5 Lumen Maintenance

The lamps were placed on the life racks in their designated positions for an elapsed period of specified hours. Each lamp was on a 2-hours-45-minutes-on/15-minutes-off cycle at 240 volts AC 50Hz. The lamps were then re-measured for lumens and divided by the initial value of the luminous flux of the lamp and expressed as a percentage.

1.6 Average Rated Life Test

The rated voltage of the lamp type was 240 volts. The lamps were operated at 240 volts AC 50Hz during the life test. All lamps were on a 2-hours-45-minutes-on/15-minutes-off cycle. The lamps were visually inspected at regular intervals throughout the life test. The life test was discontinued after 50% of the lamps failed to reignite. The time and date of failure of each lamp was recorded. The actual elapsed time to failure for each lamp was in hours. Any lamp still operating at the end of the life tests was so noted. The measured average rated lamp life was determined from the life test results.

1.7 Equipment List

Model	Description	Manufacturer
SLMS-6521	SLMS spectral lamp measurement system	Labsphere
LMS-650	65 inches Integrating Sphere unit	Labsphere
DAS-1100	Diode array spectrometer	Labsphere
SCL-1400	Calibrated lamp standard	Labsphere
6810	AC Power Supply	Extech
PM100	Digital Power Meter	Voltech Instrument Ltd

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TEST REPORT

Test Result:

Number: HK09020062-6

2. Performance Test Result

Performance test per each saving lamp: 20mins

100 hours initial lumen measurement

Model No.	Sample No.	Voltage (V)	Current (mA)	Power (Watt)	Power Factor	THD (%)	Luminous Flux (lm)	Efficacy Lumen Per Watt)	Ambient Temp (°C)
CFL20T2S27E27	1/20	240.0	142.0	19.2	0.565	123.7	1262.2	65.7	24.7
	2/20	240.0	141.9	19.1	0.560	126.1	1293.0	67.7	25.0
	3/20	240.0	142.1	19.2	0.565	124.6	1308.0	68.1	24.6
	4/20	240.0	139.9	18.8	0.559	127.4	1263.0	67.2	25.0
	5/20	240.0	139.4	18.7	0.560	126.5	1236.5	66.1	24.7
	6/20	240.0	138.3	18.5	0.557	127.8	1207.3	65.3	25.0
	7/20	240.0	139.2	18.7	0.560	127.2	1269.2	67.9	24.5
	8/20	240.0	137.7	18.4	0.557	127.3	1282.5	69.7	24.6
	9/20	240.0	142.6	19.2	0.562	124.9	1209.2	63.0	24.7
	10/20	240.0	141.8	19.2	0.563	124.6	1291.1	67.2	24.6
	11/20	240.0	141.5	19.1	0.563	125.0	1278.4	66.9	24.7
	12/20	240.0	139.5	18.8	0.561	126.2	1247.4	66.4	24.8
	13/20	240.0	143.1	19.2	0.560	126.2	1299.2	67.7	24.6
	14/20	240.0	141.1	19.0	0.561	127.1	1301.4	68.5	24.7
	15/20	240.0	140.2	18.9	0.562	125.6	1261.0	66.7	24.8
	16/20	240.0	138.4	18.7	0.563	125.2	1201.4	64.2	24.9
	17/20	240.0	142.3	19.1	0.561	126.0	1313.0	68.7	25.0
	18/20	240.0	143.6	19.3	0.561	125.4	1319.8	68.4	25.0
	19/20	240.0	142.5	19.2	0.561	125.8	1298.1	67.6	24.9
	20/20	240.0	141.7	19.2	0.564	124.5	1269.1	66.1	25.0
Average value	-----	240.0	140.9	19.0	0.561	125.9	1270.5	67.0	-----

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TEST REPORT

Test Result:

Number: HK09020062-6

2. Performance Test Result

Run-up Times from switch-on for self ballasted CFLs

Model No.	Sample No.	Voltage (V)	100 hours Stabilised Lumen output (lm)	Lumen at 2 sec (Sec)	Lumen at 60 sec (Sec)	Percentage of Lumen output at 2 sec (%)	Percentage of Lumen output at 60 sec (%)	60 % Run-time of initial stable lumen (Sec)
CFL20T2S27E27	1/20	240.0	1238.0	557.1	1151.5	45.00	93.01	45.78
	2/20	240.0	1265.2	574.7	1197.6	45.42	94.66	16.42
	3/20	240.0	1281.5	585.7	1198.2	45.70	93.50	17.86
	4/20	240.0	1235.1	567.8	1160.6	45.97	93.97	16.41
	5/20	240.0	1210.0	553.8	1188.6	45.77	98.23	16.85
	6/20	240.0	1137.5	551.6	1055.9	48.49	92.83	17.33
	7/20	240.0	1241.6	656.4	1142.1	52.87	91.99	21.00
	8/20	240.0	1244.6	596.0	1151.8	47.89	92.55	14.59
	9/20	240.0	1282.3	587.8	1200.1	45.84	93.59	16.69
	10/20	240.0	1266.6	577.3	1161.9	45.58	91.73	48.58
	11/20	240.0	1262.9	688.0	1164.3	54.48	92.19	42.03
	12/20	240.0	1219.1	607.1	1203.5	49.80	98.72	34.00
	13/20	240.0	1273.0	546.8	1190.1	42.95	93.49	46.12
	14/20	240.0	1275.7	610.3	1124.8	47.84	88.17	32.11
	15/20	240.0	1243.4	626.1	1243.1	50.35	99.97	40.00
	16/20	240.0	1179.5	564.7	1165.9	47.88	98.84	38.82
	17/20	240.0	1286.4	577.2	1195.3	44.87	92.92	36.40
	18/20	240.0	1293.4	566.2	1161.3	43.78	89.78	42.33
	19/20	240.0	1268.9	585.7	1151.5	46.16	90.74	44.88
	20/20	240.0	1246.0	575.5	1187.7	46.19	95.32	36.09
Average value	-----	240.0	1247.5	587.8	1169.8	47.14	93.81	31.21

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TEST REPORT

Test Result:

Number: HK09020062-6

2. Performance Test Result

Physical weights and dimensions for lamps & colour performance

Model No.	Sample No.	Sample Weight (g)	Sample Height (mm)	Sample Diameter (mm)	Colour temp. -CCT (K)	Colour Rendering Index (%)	Chromaticity Coordinate x	Chromaticity Coordinate y	SDCM
CFL20T2S27E27	1/20	72	106.89	53.43	2715	80.6	0.4598	0.4127	3
	2/20	73	107.64	53.02	2707	80.9	0.4611	0.4138	3
	3/20	74	108.78	54.27	2655	81.4	0.4667	0.4170	4
	4/20	71	108.64	52.74	2759	80.1	0.4565	0.4122	4
	5/20	72	107.93	53.93	2703	80.6	0.4609	0.4130	3
	6/20	72	108.28	53.35	2745	80.1	0.4578	0.4129	3
	7/20	73	107.45	52.62	2760	80.1	0.4567	0.4128	4
	8/20	71	107.58	53.22	2720	80.7	0.4592	0.4122	3
	9/20	73	105.80	54.39	2662	81.2	0.4652	0.4154	3
	10/20	72	109.64	53.15	2729	80.1	0.4595	0.4138	3
	11/20	71	108.60	54.06	2671	81.1	0.4652	0.4165	3
	12/20	71	107.44	52.88	2768	79.9	0.4558	0.4121	4
	13/20	72	108.22	53.55	2702	81.0	0.4614	0.4138	3
	14/20	72	108.39	52.72	2710	80.9	0.4606	0.4133	3
	15/20	73	108.82	53.03	2732	80.6	0.4589	0.4132	3
	16/20	73	109.65	52.92	2769	79.9	0.4557	0.4121	4
	17/20	74	106.80	53.23	2716	80.8	0.4599	0.4129	3
	18/20	75	106.60	53.48	2684	81.3	0.4626	0.4135	3
	19/20	71	108.86	52.92	2722	80.6	0.4593	0.4127	3
	20/20	71	107.56	53.46	2750	80.4	0.4574	0.4128	4
Average value	-----	72	107.98	53.32	2719	80.6	0.4600	0.4134	3

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Test Result:

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2. Performance Test Result

2000 hours Lumen Maintenance Test:

Model No.	Sample No.	Luminous Flux (lm)	Initial Lumen (lm)	Lumen Maintenance (%)
CFL20T2S27E27	1/20	1109.7	1262.2	87.9
	2/20	1123.9	1293.0	86.9
	3/20	1234.8	1308.0	94.4
	4/20	1112.2	1263.0	88.1
	5/20	1130.3	1236.5	91.4
	6/20	1186.1	1207.3	98.2
	7/20	1210.9	1269.2	95.4
	8/20	1215.1	1282.5	94.7
	9/20	1139.6	1209.2	94.2
	10/20	1204.3	1291.1	93.3
	11/20	1237.2	1278.4	96.8
	12/20	1174.2	1247.4	94.1
	13/20	1221.1	1299.2	94.0
	14/20	1192.8	1301.4	91.7
	15/20	1147.0	1261.0	91.0
	16/20	1183.7	1201.4	98.5
	17/20	1214.5	1313.0	92.5
	18/20	1233.2	1319.8	93.4
	19/20	1189.9	1298.1	91.7
	20/20	1167.6	1269.1	92.0
Average value	-----	1181.4	1270.5	93.0

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Test Result:

Number: HK09020062-6

2. Performance Test Result

6000 hours Lumen Maintenance Test:

Model No.	Sample No.	Luminous Flux (lm)	Initial Lumen (lm)	Lumen Maintenance (%)	Life Status (Hours)
CFL20T2S27E27	1/20	1014.9	1262.2	80.4	>6000
	2/20	1075.9	1293.0	83.2	>6000
	3/20	1108.8	1308.0	84.8	>6000
	4/20	1063.1	1263.0	84.2	>6000
	5/20	1017.5	1236.5	82.3	>6000
	6/20	1043.1	1207.3	86.4	>6000
	7/20	1094.3	1269.2	86.2	>6000
	8/20	1077.0	1282.5	84.0	>6000
	9/20	1078.6	1209.2	89.2	>6000
	10/20	1111.7	1291.1	86.1	>6000
	11/20	1059.3	1278.4	82.9	>6000
	12/20	1029.2	1247.4	82.5	>6000
	13/20	1043.3	1299.2	80.3	>6000
	14/20	1075.5	1301.4	82.6	>6000
	15/20	1053.7	1261.0	83.6	>6000
	16/20	1054.4	1201.4	87.8	>6000
	17/20	1096.4	1313.0	83.5	>6000
	18/20	1092.4	1319.8	82.8	>6000
	19/20	1045.8	1298.1	80.6	>6000
	20/20	1049.1	1269.1	82.7	>6000
Average value	-----	1064.2	1270.5	83.8	Pass

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TEST REPORT

Test Result:

Number: HK09020062-6

2. Performance Test Result

10000 hours Lumen Maintenance Test:

Model No.	Sample No.	Luminous Flux (lm)	Initial Lumen (lm)	Lumen intenance (%)	Life Status (Hours)
CFL20T2S27E27	1/20	989.6	1262.2	78.4	>10000
	2/20	1040.9	1293.0	80.5	>10000
	3/20	1038.6	1308.0	79.4	>10000
	4/20	980.1	1263.0	77.6	>10000
	5/20	966.9	1236.5	78.2	>10000
	6/20	981.5	1207.3	81.3	>10000
	7/20	1063.6	1269.2	83.8	>10000
	8/20	1052.9	1282.5	82.1	>10000
	9/20	Sample burnt out			8078
	10/20	1071.6	1291.1	83.0	>10000
	11/20	1036.8	1278.4	81.1	>10000
	12/20	1006.7	1247.4	80.7	>10000
	13/20	990.0	1299.2	76.2	>10000
	14/20	1032.0	1301.4	79.3	>10000
	15/20	1011.3	1261.0	80.2	>10000
	16/20	1002.0	1201.4	83.4	>10000
	17/20	Sample burnt out			7972
	18/20	Sample burnt out			8188
	19/20	1029.4	1298.1	79.3	>10000
	20/20	983.6	1269.1	77.5	>10000
	Average value	-----	1016.3	1268.8	80.1

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Number: HK09020062-6

2. Performance Test Result

15000 Hours Life Test Status

Model No.	Sample No.	Life Status (Hours)
CFL20T2S27E27	1/20	14524
	2/20	14392
	3/20	>15000
	4/20	12126
	5/20	>15000
	6/20	>15000
	7/20	>15000
	8/20	>15000
	9/20	8078
	10/20	14590
	11/20	>15000
	12/20	>15000
	13/20	>15000
	14/20	11708
	15/20	14700
	16/20	>15000
	17/20	7972
	18/20	8188
	19/20	12038
	20/20	>15000
Average value	-----	Pass

Remarks:

- 1) The lamps were pre-conditioned for 100 hours (mounted in base-up position).
- 2) The rated input voltage of 240V was used and the line frequency is 50Hz.
- 3) The test was performed with the lamp in base-up position.
- 4) Sample #1, #2, #4, #9, #10, #14, #15, #17, #18 & #19 burnt out during 15000 hours Life Test.

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TEST REPORT

Appendix A:

Number: HK09020062-6

Product Photo



Model No.: CFL20T2S27E27

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