



Report No.: GZE160558-C

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

HOCAN GROUP CO LTD

(Brand Name: N/A)

Rm 1902, Easet cinn Bldg 253-261 Hennessy Rd Wanchai, HongKong

Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires

Model name(s): HC-WPB-100

Representative (Tested) Model: HC-WPB-100 (3000K)
HC-WPB-100 (5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Jun.16,2016

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

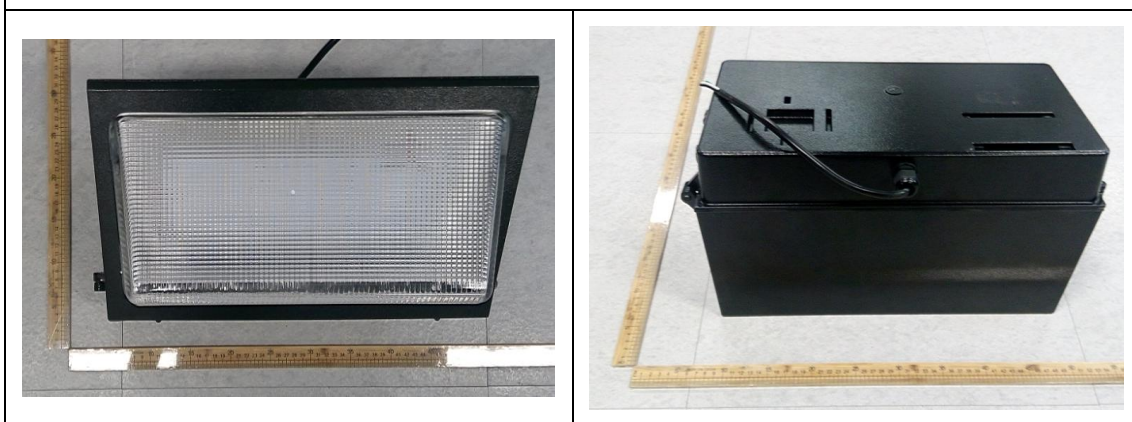
Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

1.1 Product Information:

Organization Name	HOCAN GROUP CO LTD	
Brand Name	N/A	
Model Number	HC-WPB-100	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	100W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,5700K	
LED Manufacturer	Nichia Corporation	
LED Model	NF2L757DR	
Sample Number	GZE160558-C1(3000K), C2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


1.2 Test Specifications:

Date of Receipt	Jun.15,2016
Date of Test	Jun.16,2016
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.</p>
<p>3) Electrical Measurements:</p> <p>Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.</p>

2.1 Electrical, Photometric and Chromaticity Measurements
 (Refer to Work Instruction QD25)

Test date	2016-06-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HC-WPB-100(3000K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160558-	120.0	60	0.8184	98.00	0.9979	3.79
C1	277.0	60	0.3579	95.60	0.9644	9.02
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

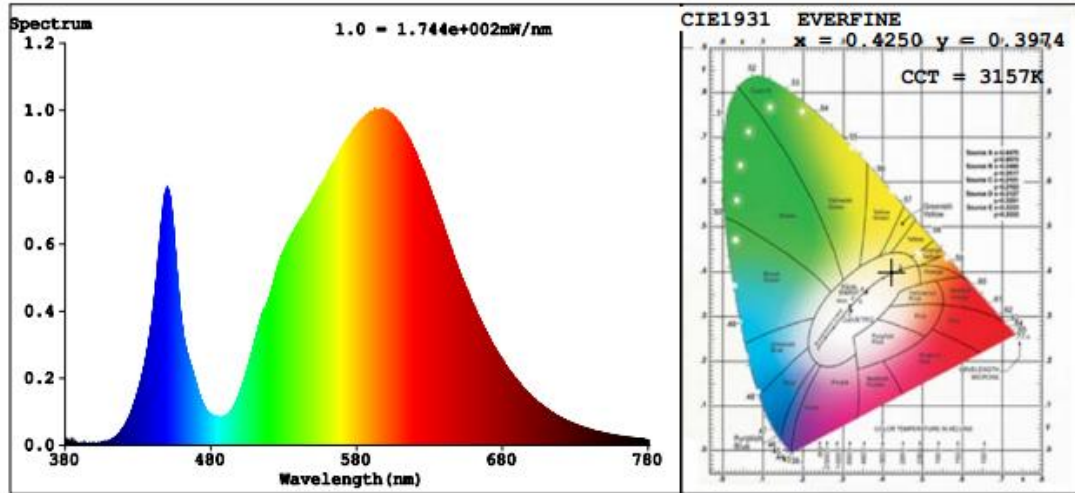
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	71	R9	0
Frequency (Hz)	60	R2	81	R10	54
CCT (K)	3157	R3	88	R11	64
Duv	-0.0009	R4	70	R12	43
Chromaticity (x, y)	x=0.4250 y=0.3974	R5	69	R13	72
Chromaticity (u', v')	u'=0.2457 v'=0.5169	R6	72	R14	93
Color Rendering Index (CRI)	72.9	R7	81	R15	65
R9	0	R8	52	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	14692	14556	--	
Luminous Efficacy (lm/W)	149.92	152.26	--	
Total Luminous (lm) (0°-90° zone)	11507	11404	>=10000 (-10%)	
Luminous Efficacy (lm/W) (0°-90° zone)	117.42	119.29	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 80-90° zone (%) (0-90° zone)	12.9	--	<=10(+3)	
Beam Angle (°)	101.9	--	--	
Center Beam Candle Power (cd)	2750	--	--	

Spectral Power Distribution & Chromaticity Diagram

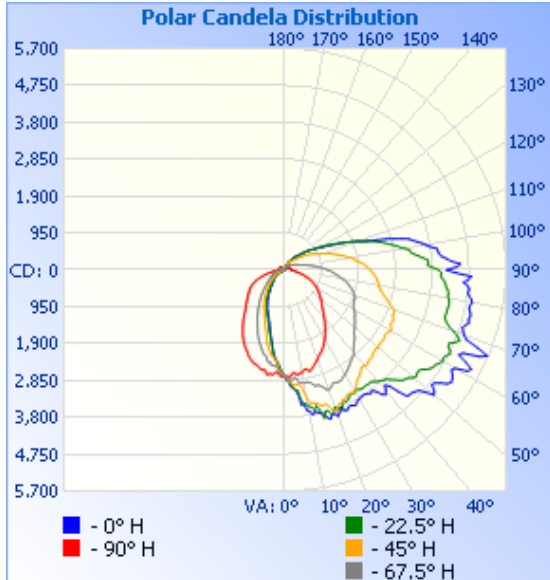


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,134.4	14.5%
0-40	3,461.7	23.6%
0-60	6,620.5	45.1%
60-90	4,886.0	33.3%
70-100	4,358.9	29.7%
90-120	2,636.1	17.9%
0-90	11,506.5	78.3%
90-180	3,185.1	21.7%
0-180	14,691.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	260.7	1.8%	90-100	1,233.1	8.4%
10-20	753.4	5.1%	100-110	882.7	6%
20-30	1,120.3	7.6%	110-120	520.3	3.5%
30-40	1,327.3	9.0%	120-130	286.0	1.9%
40-50	1,494.1	10.2%	130-140	149.8	1%
50-60	1,664.7	11.3%	140-150	75.0	0.5%
60-70	1,760.2	12.0%	150-160	30.6	0.2%
70-80	1,639.1	11.2%	160-170	6.9	0%
80-90	1,486.7	10.1%	170-180	0.7	0%

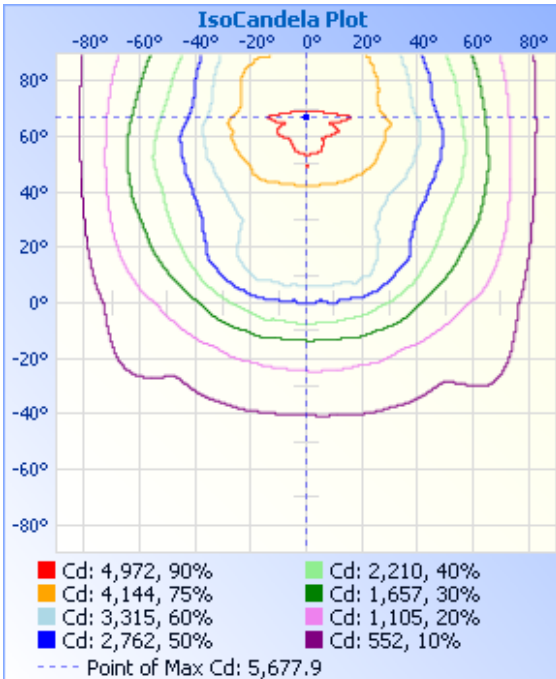
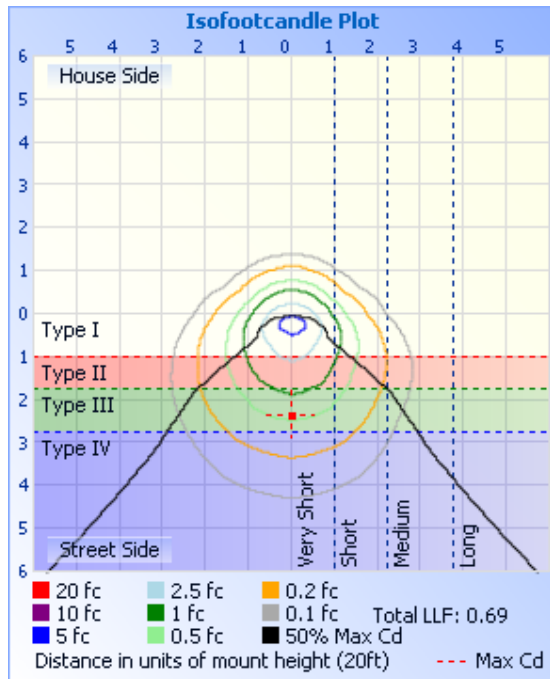
Photometric Data



Illuminance at a Distance

Distance (ft)	Center Beam fc	Beam Width
17.0ft	9.52 fc	45.7 ft 33.8 ft
34.0ft	2.38 fc	91.3 ft 67.6 ft
51.0ft	1.06 fc	137.0 ft 101.5 ft
68.0ft	0.59 fc	182.7 ft 135.3 ft
85.0ft	0.38 fc	228.3 ft 169.1 ft
102.0ft	0.26 fc	274.0 ft 202.9 ft

■ Vert. Spread: 106.7°
■ Horiz. Spread: 89.7°



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C (DEG) y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750	2750
5	2642	2761	2944	3113	3109	3114	2981	2784	2647	2518	2446	2391	2374	2391	2408	2492
10	2731	3028	3523	3535	3713	3567	3397	2952	2666	2377	2162	1985	1916	1961	2179	2424
15	2594	3094	3702	3864	3845	3952	3626	3092	2647	2229	1770	1551	1514	1575	1813	2198
20	2494	3332	3738	3833	4010	3762	3891	3286	2446	1884	1501	1265	1245	1290	1497	1943
25	2315	3327	3617	3817	3897	3740	3673	3195	2270	1603	1231	1093	1081	1122	1249	1665
30	2129	3169	3548	3753	3845	3618	3600	3100	2046	1351	1040	914	882	936	1075	1412
35	1903	2954	3389	3629	3873	3640	3339	2922	1809	1136	864	735	701	756	906	1190
40	1669	2832	3297	3754	4049	3750	3221	2761	1573	942	704	580	551	593	742	989
45	1444	2559	3220	4046	4552	4008	3179	2542	1369	763	562	459	433	478	596	815
50	1288	2372	3213	4301	5012	4322	3124	2350	1218	603	441	366	379	374	473	657
55	1164	2208	3311	4542	5114	4464	3109	2199	1086	490	339	309	278	313	374	536
60	1058	2077	3347	4596	5069	4691	3149	2068	962	411	261	215	195	228	290	441
65	942	2017	3334	4634	5065	4648	3087	1965	821	352	209	133	92.4	145	227	375
70	783	1920	3271	4611	4923	4634	3003	1907	663	301	159	78.0	54.4	85.1	172	324
75	593	1790	2990	4402	4903	4311	2679	1764	490	255	100	19.9	11.1	25.7	118	276
80	398	1581	2780	4369	4902	4286	2465	1563	329	208	51.7	9.91	10.8	11.2	64.9	226
85	251	1376	2686	4247	4739	4159	2368	1324	231	164	40.6	11.4	7.13	11.2	50.8	176
90	179	1175	2478	4066	4168	3971	2201	1107	181	145	32.8	11.8	13.3	11.2	41.2	150
95	161	976	2264	3665	4060	3577	2006	869	167	130	28.6	11.8	13.4	11.3	35.3	131
100	159	789	1974	3293	3700	3163	1756	668	162	109	24.3	11.2	12.9	10.7	30.1	111
105	156	616	1643	2809	3126	2676	1472	505	152	87.5	21.0	10.6	12.8	10.5	26.0	91.9
110	145	476	1357	2280	2174	2145	1229	392	141	66.8	17.6	9.71	12.1	9.57	22.1	74.1
115	128	387	1083	1737	1672	1657	991	322	126	51.8	14.5	8.91	11.2	8.91	18.7	59.0
120	106	318	884	1302	1225	1279	828	268	102	40.5	12.0	8.11	10.4	8.10	15.6	47.3
125	82.9	263	683	984	943	980	651	223	75.8	31.4	9.66	6.91	9.01	6.89	12.8	37.6
130	62.0	224	531	736	767	750	524	192	55.0	24.1	7.89	6.54	7.55	6.78	10.5	29.4
135	45.8	193	420	547	583	548	401	160	40.2	18.6	6.89	6.46	7.20	6.67	8.61	23.0
140	34.2	156	339	426	471	431	320	127	29.4	14.4	6.90	6.39	7.16	6.56	7.41	17.5
145	25.3	116	289	324	371	319	279	91.6	21.3	11.8	7.05	7.12	7.12	6.97	6.86	13.0
150	18.5	75.7	214	237	271	247	218	56.2	15.1	10.1	6.90	7.18	7.04	6.96	6.77	9.62
155	12.9	39.1	149	189	217	201	147	29.5	10.00	7.80	6.22	6.11	6.68	6.83	6.20	6.44
160	8.77	11.6	81.1	129	154	135	73.1	9.39	6.44	5.96	6.00	5.85	6.25	6.39	5.95	5.99
165	6.26	6.49	32.5	66.7	83.8	66.0	27.6	6.12	5.53	5.63	5.97	5.86	6.22	6.23	5.94	5.92
170	6.78	6.81	6.70	19.0	24.0	17.3	6.28	6.45	6.67	6.94	7.87	8.65	8.21	7.37	7.94	8.11
175	6.88	7.48	7.29	7.16	5.91	6.31	6.81	7.05	6.70	6.88	8.22	8.78	7.93	7.36	7.48	7.98
180	6.85	7.61	7.89	6.85	5.94	6.43	6.87	7.18	6.65	6.82	7.62	7.85	6.80	5.95	6.46	6.84

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-06-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HC-WPB-100(5700K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160558-C2	120.0	60	0.7977	95.64	0.9991	4.92
	277.0	60	0.3488	93.30	0.9657	10.51
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method :

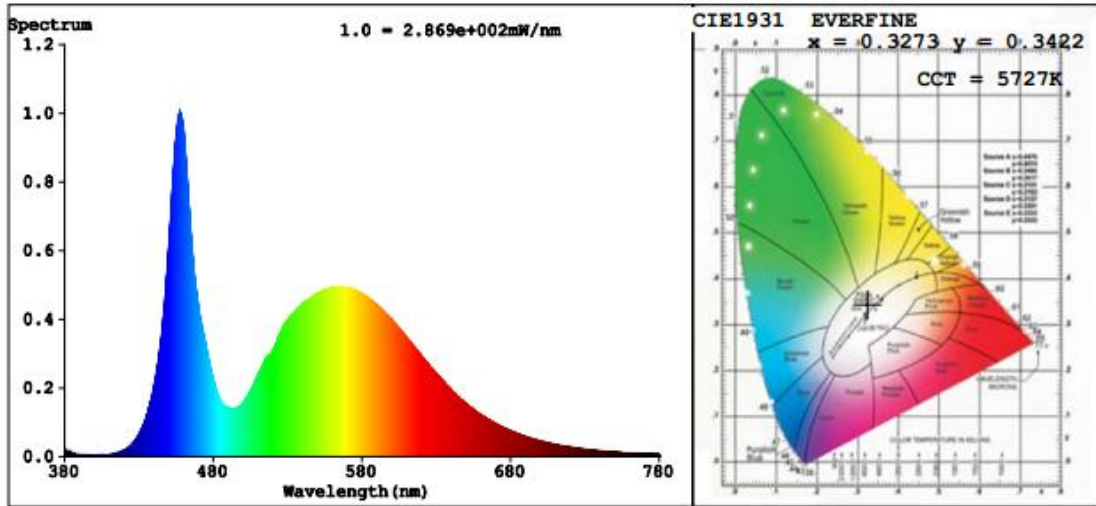
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	84	R10	57
CCT (K)	5727	R3	88	R11	60
Duv	0.0029	R4	67	R12	41
Chromaticity (x, y)	x=0.3273 y=0.3422	R5	70	R13	74
Chromaticity (u', v')	u'=0.2029 v'=0.4774	R6	74	R14	93
Color Rendering Index (CRI)	73.8	R7	82	R15	67
R9	0	R8	56	--	--

Photometric Measurement – Sphere-Spectroradiometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	14975	14836	--	
Luminous Efficacy (lm/W)	156.58	159.01	--	
Total Luminous (lm) (0°-90° zone)	11725	11617	>=10000(-10%)	
Luminous Efficacy (lm/W) (0°-90° zone)	122.60	124.51	Standard: >= 100(-3%)	Premium: >= 120(-3%)

* These values are calculated assuming ZLD of 0°-90° zone is 78.3% (see “Zonal Lumen Tabulation” on page 5).

Spectral Power Distribution & Chromaticity Diagram



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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF REPORT *******