

# Certificate

**Certificate No: 50501/2**

**Issue No: 1**

**Date of issue 19 June 2007:**

This is to certify that

**BSRIA Limited (Notified Body 0480)**

have tested samples of the products described below in accordance with the test methods contained within BSEN 442-1 Annex ZA and have determined the items met the requirements of the EU Construction Products Directive (89/106/CEE). For further details see page 2- 4 of this certificate

<b>Manufacturer/Agent</b>	ALUMINA TRIMEX JSC. 4300 Karlovo 32, Gen. Zaimov blvrd. Bulgaria
<b>Product</b>	Alumina Trimex aluminium radiators
<b>Trade mark and model</b>	Sunny and Ray ranges
<b>Date of test</b>	18 April 2007 to 4 June 2007
<b>Test Engineers</b>	P Stonard, A Russell
<b>Quality Approved</b>	GREG KING Group Manager MicroClimate, Test & Refrigeration

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**PRODUCT DETAILS****Individual Thermal Performance Data for tested product**

Product reference	Output at 50 $\Delta T$ (W)	Individual equations of Output	
		Constant 'k <sub>M</sub> '	Exponent 'n'
Sunny 200	717	4.8698	1.27761
Sunny 500	1144	7.1424	1.2975
Sunny 1000	1164	6.7066	1.3181
Ray 200	729	4.7530	1.2866
Ray 500	1028	6.3648	1.2998
Ray 1000	1041	6.2134	1.3091
Ray 1800	1637	8.8331	1.3349

**Mechanical and range data for tested product**

Reference	Nominal overall size L x H (mm)	Weight (kg)	Water content (kg)	Other designs or models of generic group
Sunny 200	950 x 270	10.5	1.7	None
500	790 x 570	12.9	2.6	
1000	470 x 1070	11.7	2.5	
Ray 200	1100 x 250	11.0	1.8	None
500	790 x 550	11.5	2.5	
1000	470 x 1050	10.5	2.3	
1800	470 x 1850	16.4	3.8	

**‘Ray’ linear regression fit data**

Output  $\dot{Q}_L$ (W/m)= constant K\*height<sup>b</sup>\*temp diff<sup>c<sub>o</sub></sup>\*temp diff<sup>c<sub>1</sub></sup>H

constant for this family of radiators (K)	12.7760
first coefficient (b)	0.8578
second coefficient (c <sub>o</sub> )	1.3187
third coefficient(c <sub>1</sub> )	-0.0111

**Heat Output in relation to temperature difference for 1m length**

Length(m)	DT(oC)	Height (m)										
		0.249	0.349	0.399	0.549	0.649	0.899	0.949	1.049	1.249	1.549	1.849
		Output (Watts)										
1.000	20	200	266	298	390	450	595	623	679	789	949	1104
1.000	30	341	453	507	663	766	1013	1061	1156	1343	1615	1880
1.000	40	497	662	741	968	1117	1477	1548	1687	1959	2356	2743
1.000	50	667	887	993	1297	1497	1980	2074	2260	2626	3158	3676
1.000	60	848	1127	1262	1648	1902	2516	2635	2872	3335	4012	4670
1.000	70	1038	1381	1545	2017	2329	3080	3226	3516	4083	4911	5717

**Heat Output per section in relation to height of emitter at 50DT**

Length (m)	DT (oC)	Height (m)										
		0.249	0.349	0.399	0.549	0.649	0.899	0.949	1.049	1.249	1.549	1.849
0.080	50	53.4	71.0	79.4	103.8	119.3	156.0	163.1	176.9	203.7	241.9	277.9
exponent	n	1.3159	1.3148	1.3142	1.3126	1.3114	1.3087	1.3081	1.3070	1.3048	1.3014	1.2981

**‘Sunny’ linear regression fit data**

$$\text{Output } \varnothing_L(\text{W/m}) = \text{constant } K * \text{height}^b * \text{temp diff}^{c_0} * \text{temp diff}^{c_1} H$$

constant for this family of radiators (K)	14.5469
first coefficient (b)	0.8639
second coefficient (c <sub>0</sub> )	1.2972
third coefficient(c <sub>1</sub> )	0.0045

**Heat Output in relation to temperature difference for 1m long**

Length(m)	DT (oC)	Height (m)							
		0.270	0.370	0.420	0.570	0.670	0.920	0.970	1.070
1.000	20	229	302	337	439	506	668	699	762
1.000	30	389	511	570	744	857	1132	1199	1292
1.000	40	564	742	829	1082	1246	1645	1744	1880
1.000	<b>50</b>	754	992	1108	1446	1665	2200	2305	2513
1.000	60	956	1257	1404	1832	2111	2789	2922	3187
1.000	70	1167	1535	1715	2239	2579	3409	3571	3895

**Heat Output per section in relation to height of emitter at 50DT**

Length(m)	DT (oC)	Height (m)							
		0.270	0.370	0.420	0.570	0.670	0.920	0.970	1.070
0.080	50	60.3	79.3	88.6	115.7	133.2	176.0	184.4	201.1
exponent	n	1.2984	1.2989	1.2991	1.2998	1.3002	1.3013	1.3016	1.3020