

TEST REPORT

Powerzon
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Page : 1 of 7
Date : 2010-09-16

TESTING TO SANS 6211-1:2003

SUMMARY

A full specification test was performed on the Indirect Powerzon 300 litre WE storage tank and 2 x (1.94m²) collector system submitted. The system submitted passed. Refer clause 9 for a summary of the results.

1 DESCRIPTION OF SAMPLE

The following Indirect Powerzon 300 litre WE storage tank and 2 x (1.94m²) collector system was submitted by Mr Theunis v Aardt on behalf of the company Powerzon.

<u>Sample No.</u>	<u>Quantity</u>	<u>Sample Description</u>
010S170	1	Indirect Powerzon 300 litre WE storage tank and 2 x (1.94m ²) black coated flat plate collector thermosiphon system.



2 REPORT CONDITIONS

The contents of this test report refers to the sample/s detailed above and does not infer that the above samples (or any other similar samples) are SABS approved for quality and/or performance.

In the instance where this report is used to verify compliance with the JASWIC or Eskom Acceptance Scheme, the validity of the test reports shall not exceed a period of one (1) year.

Report No. 010S170 b

3 SAMPLE SUBMITTED

The Indirect Powerzon 300 litre WE storage tank and 2 x (1.94m²) collector system was received in good condition and suitable for testing.

Date sample received : 2010-08-17
Test start date : 2010-09-07
Test completion date : 2010-09-15

4 TEST REQUESTED

To test the Indirect Powerzon 300 litre WE storage tank and 2 x (1.94m²) collector system submitted for testing with the full requirements of SANS 6211-1:2003.

5 METHODS OF TESTING

Methods used according to SANS 6211-1:2003.

6 CONDITIONING AND TEST ENVIRONMENT

Not applicable

7 LABORATORIES

All tests were performed by SABS laboratories.

This test was performed by SABS Commercial (Pty) Ltd, an affiliate of the SABS.
This report relates only to the specific sample(s) tested as identified herein. It does not imply SABS approval of the quality and/or performance of the item(s) in question and the test results do not apply to any similar item that has not been tested. (Refer also to the complete conditions printed on the back of official test reports.)

8 TEST DATA

8.1 DAILY RESULTS

When the advanced 6 day thermal performance of the sample was tested as described in the standard, the following data were collected for the various test days.

Measured					Calculated
Q	H	T _a	T _c	Delta T	Q
26.027	15.336	26.065	27.395	-1.33	23.481
18.798	10.667	27.926	27.416	0.51	18.590
21.478	10.179	30.087	17.055	13.032	22.487
32.069	17.702	27.609	17.091	10.59	30.553
37.14	25.167	31.029	27.812	3.217	36.788
24.129	18.459	31.752	31.543	0.209	27.748

8.2 Energy output of the system

The test data collected were used to perform a regression in order to determine the following formula that can be used to determine the amount of energy that the system will collect depending on the atmospheric conditions of the day:

$$Q = \alpha_1 H + \alpha_2 (T_a - T_c) + \alpha_3$$

	Values	Units	Description
α_3	5.733	unit less	Intercept Value
α_1	1.188	unit less	Irradiance Coefficient
α_2	0.357	unit less	Temperature Coefficient

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8.3 Energy input and output. Graphs

The following graphs provide a visual representation of the performance that can be expected from the sample. These graphs were compiled by using the formula printed above for a range of general ambient conditions.

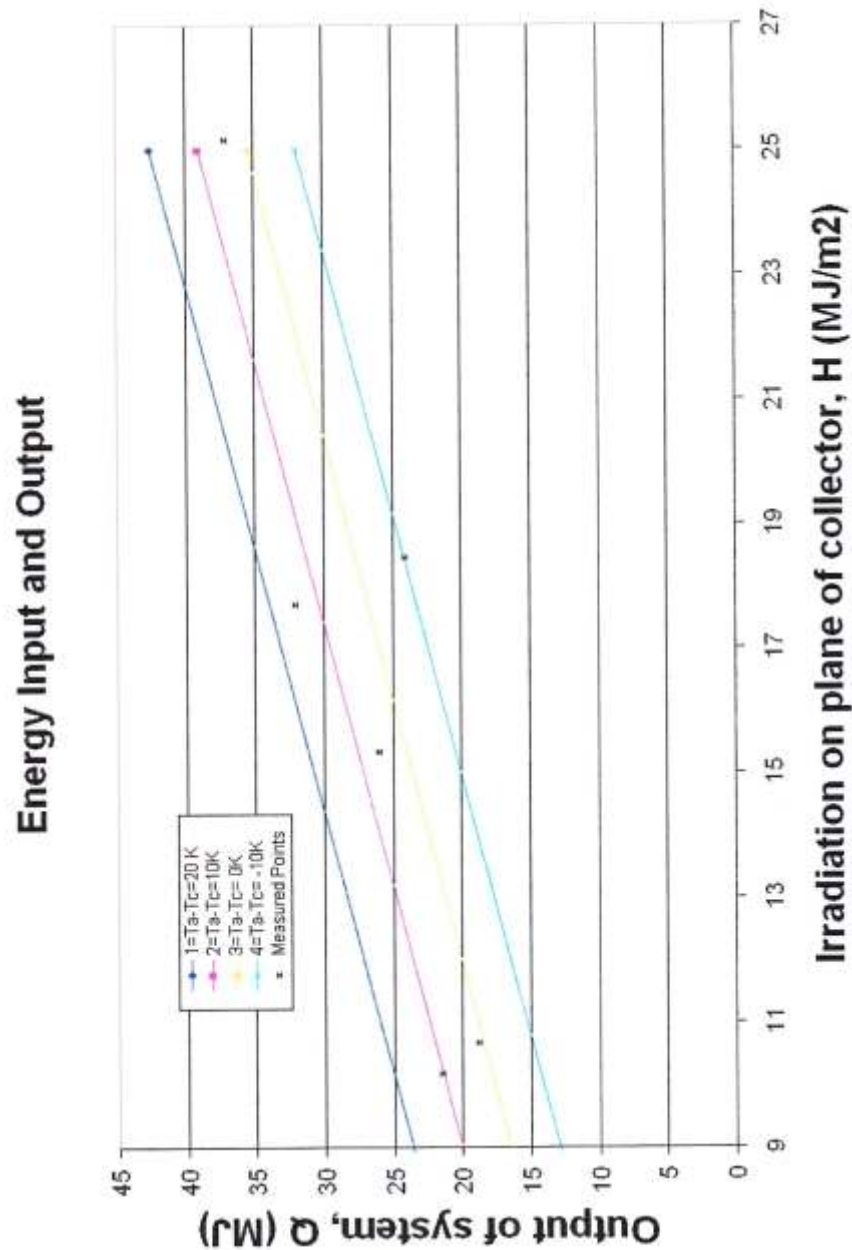


figure 3: energy input/output graph

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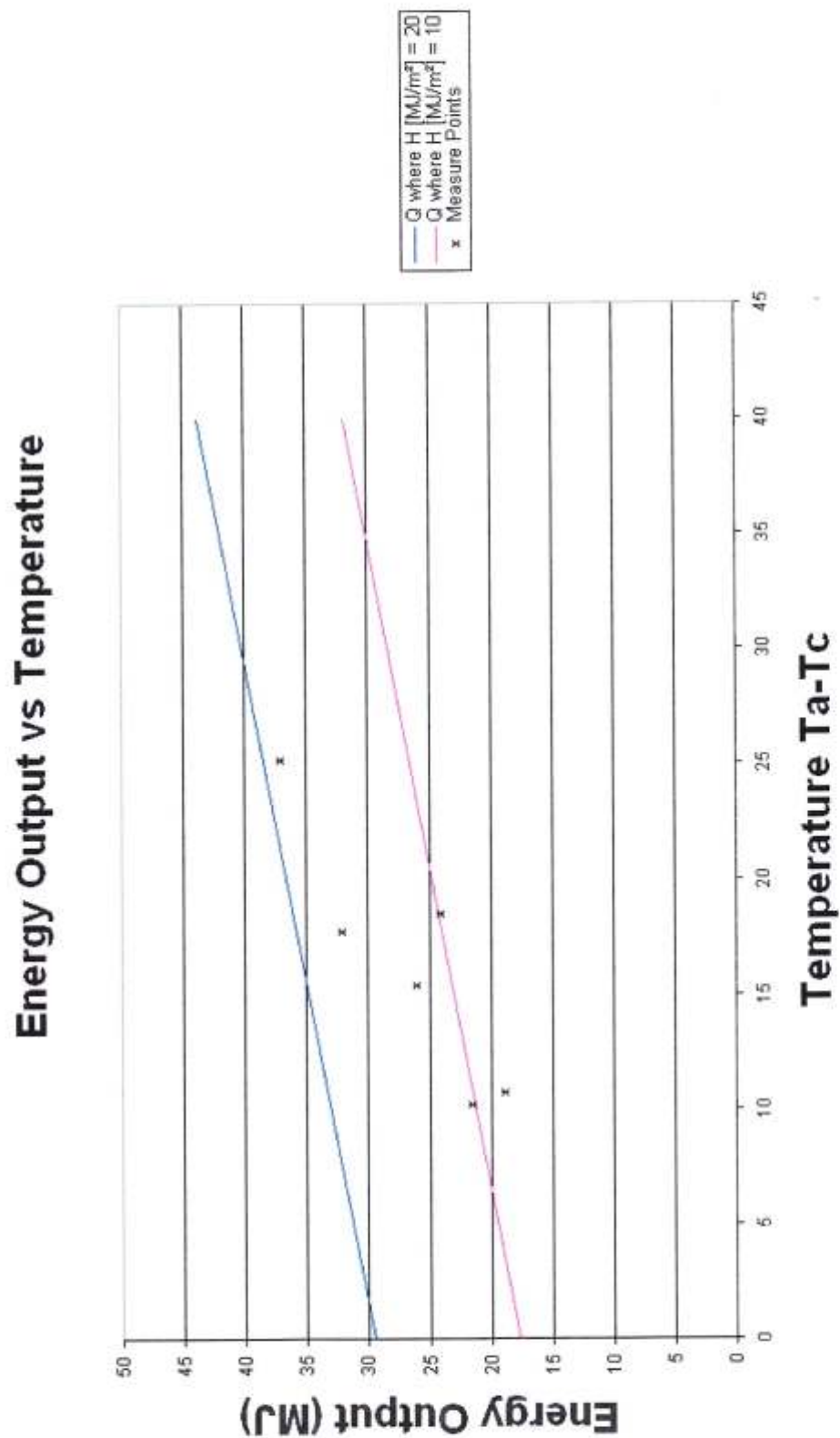
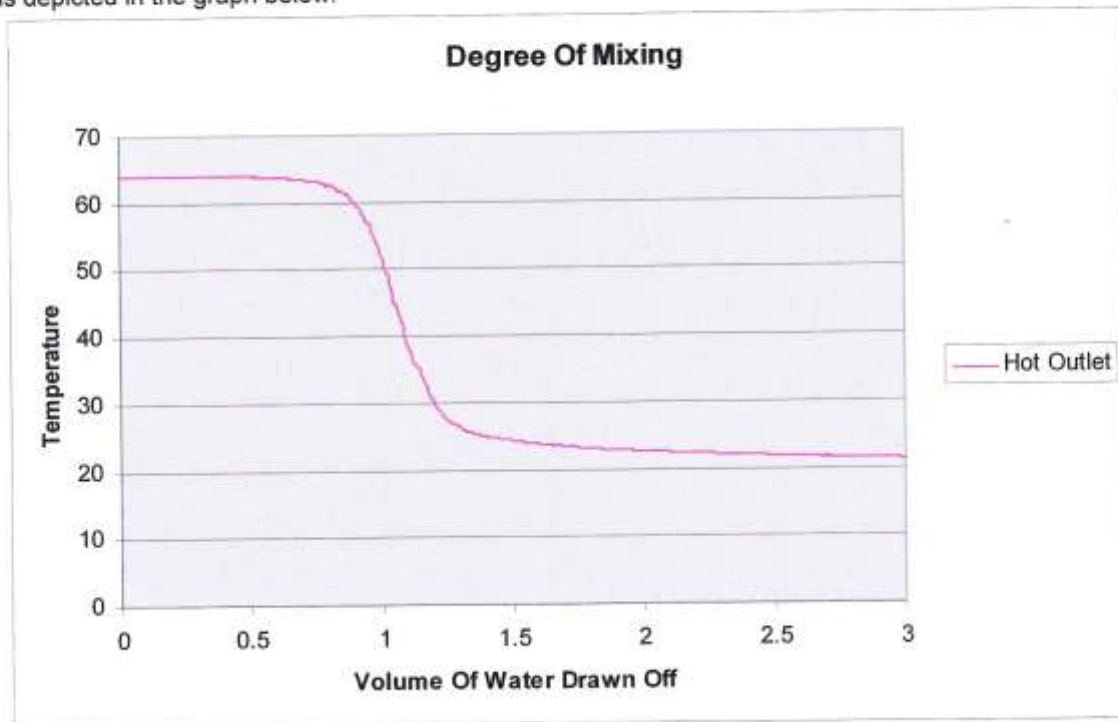


Figure 4: energy output/temperature graph

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8.4 Degree of mixing

The data collected when the degree of mixing of the sample was tested as described in the standard, is depicted in the graph below.



Degree Of Mixing

Results: Required minimum temperature 50°C: Measured 64°C.

8.5 Over night heat loss coefficient

When the 8.5 Over night heat loss coefficient of the sample was tested as described in the standard, the following data were collected.

Time (t)	Initial Temp. (Ti)	Average ambient Temp. (T _{a(night)})	Final Temp. (T _f)	Density of water	Heat capacity J/(kg K)	Heat capacity (J/K)	Volume (m ³)	Heat loss coefficient (W/K)
44110	64.030	15.869	58.798	980.72	4185.34	1231394	0.3	3.210
Sec	°C	°C	°C	kg/m ³	C _p	C _s	m ³	U _s

Results: No Pass or Fail Criteria.

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