

TEST REPORT

SABS

Powerzon
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Our ref : 11S157 c
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Page : 1 of 7
Date : 2011-08-23

TESTING TO SANS 6211-1:2003

SUMMARY

A full specification test was performed on the indirect Powerzon 150 litre Kwiksol storage tank and (1.94m²) flat plate collector system submitted. The system submitted passed. Refer clause 9 for a summary of the results of submitted system.

1 DESCRIPTION OF SAMPLE

The following indirect Powerzon 150 litre Kwiksol storage tank and (1.94m²) flat plate collector system was submitted by Mr. T. van Aardt on behalf of the company Powerzon.

<u>Sample No.</u>	<u>Quantity</u>	<u>Sample Description</u>
11S157	1	Indirect Powerzon 150 litre Kwiksol storage tank and (1.94m ²) black coated flat plate collector thermosiphon solar water heater 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.

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The test work relating to this report was performed by SABS Commercial (Pty) Ltd. This report and its test results relate only to the specific sample(s) identified herein. They do 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 conditions of test printed on the back of this page.) This report may not be reproduced except in full. The authenticity of this report and its contents can be confirmed by contacting the person who signed it.



Lab accreditation number: T0196

3 SAMPLE SUBMITTED

The indirect Powerzon 150 litre Kwiksol storage tank and (1.94m²) flat plate collector system was received in good condition and suitable for testing.

Date sample received : 2011-08-01
Test start date : 2011-08-13
Test completion date : 2011-08-22

4 TEST REQUESTED

To test the indirect Powerzon 150 litre Kwiksol storage tank and (1.94m²) flat plate 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

When applicable all tests will be performed by the solar technology laboratory of the SABS.

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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 was collected for the various test days.

Measured					Calculated
Q	H	T _a	T _c	Delta T	Q
15.6	18.6	25.2	16	9.2	14.9
8.2	8.5	24.2	15	9.2	8.9
12.8	18.5	16.4	18	-1.6	13.4
10.3	11.4	17.7	18.5	-0.8	9.3
11.1	14.7	20	20.2	-0.2	11.3
16.4	23.6	25.5	25.2	0.3	16.6

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	2.7	unit less	Intercept Value
α_1	0.6	unit less	Irradiance Coefficient
α_2	0.1	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.

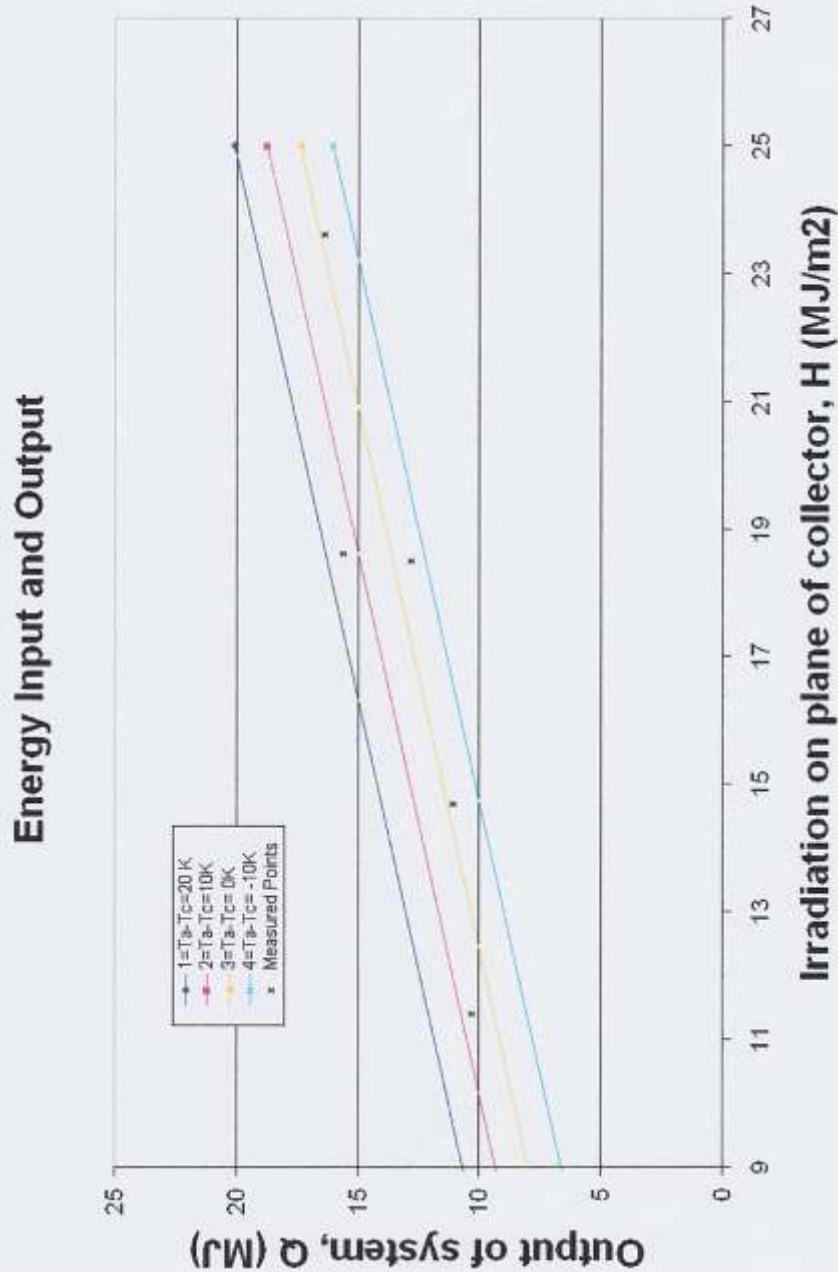


figure 3: energy input/output graph

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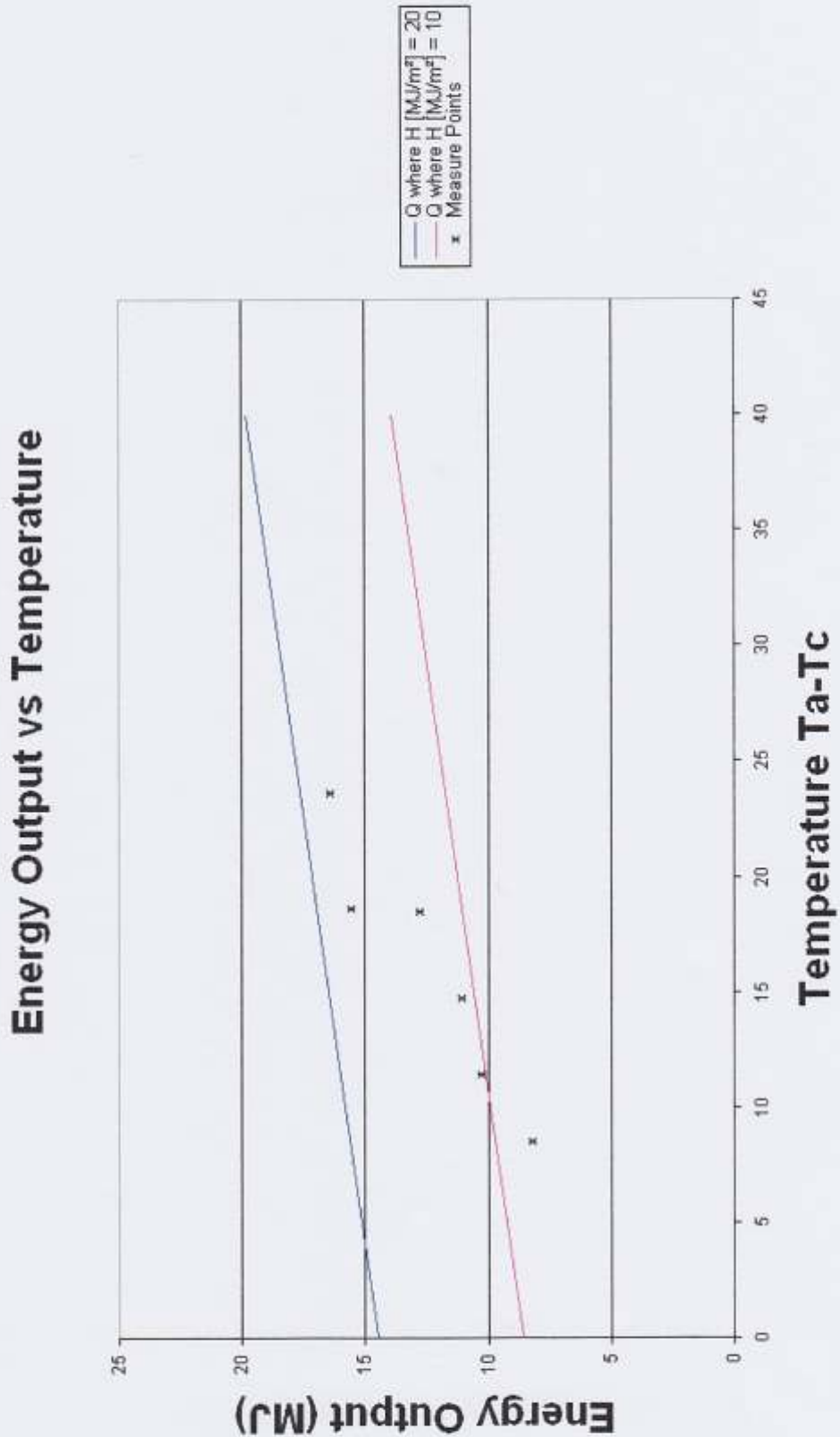
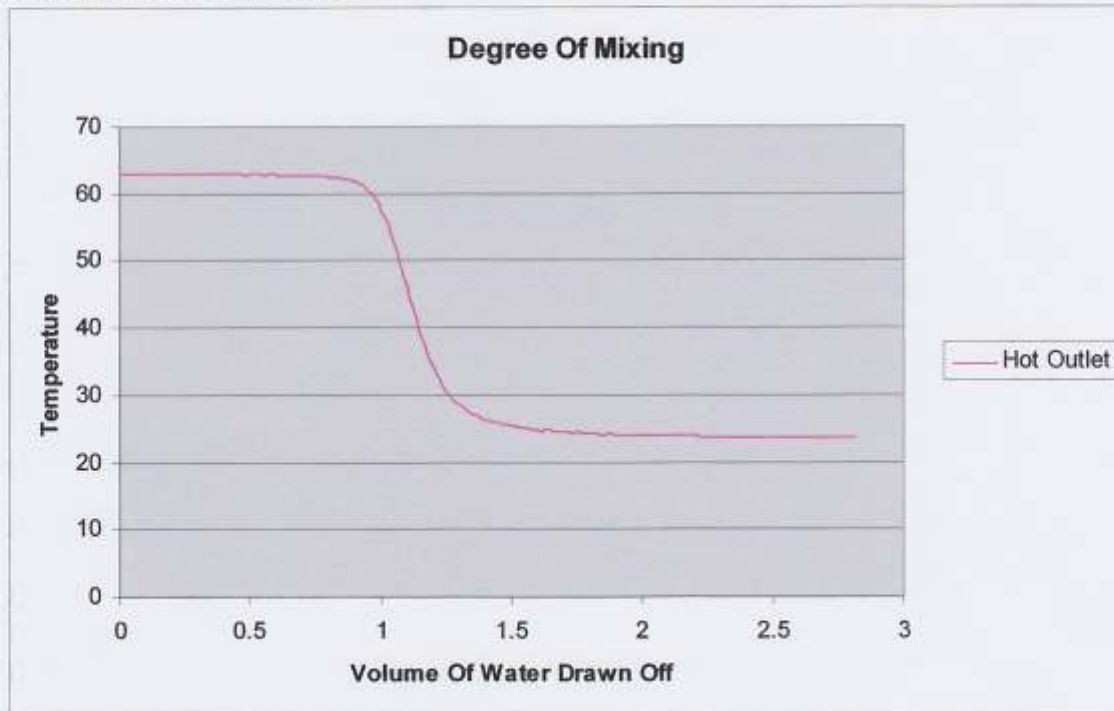


Figure 4: energy output/temperature graph

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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)
44560	59.717	6.454	52.047	980.72	4185.34	615697	0.15	2.148
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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9 GENERAL

The Indirect Powerzon 150 litre Kwiksol storage tank and (1.94m²) black coated flat plate collector thermosiphon solar water heater system was tested and complied with the full requirements of SANS 6211-1:2003.

Note that at 16 MJ from the sun at a temperature difference of 10°C, the system's output will be 13.452MJ.

Note that all the performance tests were done at an inclination angle of latitude plus 10°. (35°)

All test samples will be disposed of if not collected within 1 month from date of this report.



C.R. Tshitlho
Test Officer
Solar Technology Laboratory



K.F.C. Deist
Technical Specialist
Solar Technology Laboratory

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