

APPENDIX 3A

Baseline System Technical Specification

Capacity: 80 – 150 Litre SWH Systems

*Freeze Resistant **OR** Non-Freeze Resistant*

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1 INTRODUCTION

The Department of Energy (DoE) has centralised and re-conceptualised the implementation of the national solar water heater (SWH) programme with a re-focus on the following main objectives:

- Energy (load reduction)
- Industrialisation (local manufacturing capacity)
- Socio-economic (jobs & access to hot water)

DoE is currently in a process of procuring the below specified Baseline Systems as outlined in the Supply Request for Bids (RFB). This document defines the technical requirements for the Baseline Systems to be supplied pursuant to the Supply Agreement.

2 PURPOSE

The purpose of this document is to specify the minimum technical requirements for Baseline Systems to be supplied under the Social Programme.

3 APPLICABILITY

This document applies to all Baseline Systems that have the following attributes:

- SABS Mark Approval certification. A specific requirement is the *exclusion* of a back-up element for supplementary heating
- Resistant to freezing **OR** not resistant to freezing (which ever the Bidder is capable of supplying)
- 70% local production and content for tanks
- 70% local production and content for collectors

4 SUPPORTING DOCUMENTS/EVIDENCE

To support the attributes/ Baseline System requirements listed in **3** above, the submission of copies of the following documents, as they pertain to the required product, is **mandatory**:

- SBD 6.2 for the tank, with supporting schedules (Annexure C, D & E), duly signed by

an authorised person and self-declaring compliance with the above stipulated local production and content thresholds;

- SBD 6.2 for the collector, with supporting schedules (Annexure C, D & E), duly signed by an authorised person and self-declaring compliance with the above stipulated local production and content thresholds;
- SABS Mark Approval certificate for the Baseline System; and
- Specification Test Report for the Baseline System confirming full compliance with the requirements of SANS 1307 and which is not older than 18 months.

5 NORMATIVE/INFORMATIVE REFERENCES

The product to be supplied must demonstrate compliance with the most recent edition of the documents listed in the following paragraphs.

5.1 NORMATIVE

[1]	SANS 151	Fixed Electric Storage Water Heaters
[2]	SANS 198	Functional-Control Valves and Safety Valves for Domestic Hot and Cold Water Supply
[3]	SANS 241-1	Drinking water Part 1: Microbiological, physical, aesthetic and chemical determinants
[4]	SANS 752	Float valves
[5]	SANS 1307	Domestic solar water heaters
[6]	SANS 6210	Domestic Solar Water Heaters - Mechanical Qualification Tests
[7]	SANS 6211-1	Domestic solar water heaters Part 1: Thermal performance using an outdoor test method
[8]	SANS 6509	Corrosion of metals and alloys - Determination of dezincification resistance of brass
[9]	SANS 10400 (SABS 0400)	The application of the National Building Regulations – Particularly Part A, B, L, XA

- [10] SANS 10106 The Installation, Maintenance, Repair and Replacement of Domestic Solar Water Heating Systems
- [11] SANS 60335-2-21 Safety of household and similar electrical appliances Part 2-21: Particular requirements for storage water heaters
- [12] SATS 1286 Local Goods, Services and Works measurement and Verification of Local Content
- [13] OHS Act Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
- [14] WSA Water Services Act, 1977 (Act No. 108 of 1977)
- [15] CPA Consumer Protection Act, 2008 (Act No 68 of 2008) – particularly clauses 49, 55, and 61 – 66
- [16] Local Government, Municipal Systems Act, 2000 (Act No. 32 of 2000) – particularly the local water By-Laws

NOTE: Copies of SANS standards are available from SABS, as amended from time to time. The latest versions of the above mentioned standard shall apply,

5.2 INFORMATIVE

- [17] ISO 9001 Quality Management Systems – Requirements
- [18] ISO 10005 Quality Management Systems - Guidelines for Quality Plans

6 SCOPE

6.1 Supply the quantities of Baseline Systems, including complete installation kits for each Baseline System, as specified in the Supply Agreement.

- 6.2 The kit shall be put together such that no additional components, parts or installation material have to be procured after delivery of the SWH and complete installation kit by the Supplier. However, under unforeseen site conditions, additional material may be required.
- 6.3 The Supplier should supply DoE with a list of all the components contained in the Baseline System together with full colour photos of each component making up the installation kit and clearly showing the product markings.
- 6.4 The Supplier shall provide a minimum 5 year warrantee for the Baseline Systems. For submission purposes, the warrantee clauses must be clearly stated.

7 GENERAL REQUIREMENTS

7.1 LOCAL SYSTEMS

The SWH Industry is a designated sector in terms of the Preferential Procurement Policy Framework Act (PPPFA) 2000 (Act No 05 of 2000), and the stipulated minimum threshold for local production and content for major SWH components is 70% for the tank and 70% for the collector.

8 TECHNICAL REQUIREMENTS

8.1 SYSTEM REQUIREMENTS

- 8.1.1 Only SABS Mark approved systems are eligible. A complete copy (inclusive of all schedules) of the mark approved document to be submitted for evaluation.
- 8.1.2 The minimum daily heat output will be 9 Megajoules (MJ) and above per 100 litres at 16MJ/m² (average for the country). If the Baseline System does not comply with the above mentioned minimum thermal performance requirements, the Baseline System will be disqualified.
- 8.1.3 The Baseline System must be supplied in a manner that enables its installation to comply with SANS 10254, SANS 10252-1 and SANS 10106, among other installation requirements.
- 8.1.4 The warranty on the tank, collector, installation materials, pipework and fittings shall be 5 years. Evidence of how the warranty will be maintained over the five years (e.g.

Warranty management plan, or evidence of insurance) shall be provided to DoE. The evidence/plan shall clearly indicate the responsibilities of the Supplier.

8.1.5 The Baseline Systems shall be either freeze resistant (to enable its compatibility with frost-prone areas) or non-freeze resistant. Submit SABS proof of compliance.

Frost areas are classified as:

- a) any area where the air temperature drops below 4 degree Celsius at any time
- b) any area above the escarpment (non-coastal areas)
- c) any area that is prone to frost spells

8.1.6 Suppliers must use the same freeze protection mechanisms as Baseline Systems were tested and passed for.

8.1.7 Customers must be informed in writing of the risks and maintenance issues around these Baseline Systems and their mechanisms failing (e.g. Instruction booklet). This is as per the SANS 1307 requirements and per the Consumer Protection Act. Suppliers are required to leave the customers with their contact details in case of Baseline System failure, faults and installation issues.

8.1.8 If Baseline Systems are damaged by frost/freezing (under the certified frost conditions tested by SABS) within the five year warrantee period then the Supplier is liable for any damages and shall be required to repair such related damages. This must be provided for in the warranty.

8.2 BASELINE SYSTEM MOUNTING STRUCTURES

8.2.1 The mounting structures shall be designed to enable mounting the SWH system securely at the required horizontal angle of tilt and oriented to true north with a maximum deviation of 45° to north east or north west with the lowest edge of the collector 50 mm above the roof cover material and bolted to the roof support structure.

8.2.2 The mounting structures shall be designed to prevent any build-up of debris behind the solar collector.

8.2.3 The mounting structures shall be made from, at least, mild steel which has been hot dip galvanised in accordance with national code of standard SABS 763, or of

materials with known superior corrosion protection.

8.2.4 With respect to mounting practices Suppliers' Baseline Systems should enable compliance of the Baseline Systems with the latest SANS 10106 specification.

8.3 HEATING CIRCUIT AND CONNECTING PIPE WORK

8.3.1 The interconnecting collector loop pipe work shall be of sufficient diameter to allow optimal circulation by thermo-siphoning (where applicable), with a minimum diameter of 22 mm.

8.3.2 All connections shall be compression-type connections to facilitate maintenance as soldering is not allowed.

8.3.3 Allowance shall be made for thermal expansion of the piping Baseline System and the absorber.

8.3.4 The piping insulation shall have an R-value (insulation rating) of no less than 1.0 and if the insulation is materially damaged within a period of 6 months after installation the participating Supplier must replace it at his own cost.

8.3.5 Roof penetration flashing material shall be provided with UV and weather protection, if the flashing is not entirely of corrosion resistant metal.

8.3.6 Unless galvanic action is unlikely to occur, or unless effective measures are taken to prevent such deterioration, supply of metal pipes and components of different materials shall, as far as possible, be avoided.

8.3.7 No plastic or composite pipes may be used outside of the houses.

8.4 DRIP TRAYS HP

8.4.1 Split units will require drip trays, where these are not already installed.

8.4.2 Drip trays shall comply with SANS 1848 and shall be installed in compliance with SANS 10254.

8.5 NON-RETURN VALVES

8.5.1 As balanced pressure systems are required, no non-return valves are required on the hot water outlet.

8.5.2 The non-return valves shall be of the light weight spring-type and shall comply with SANS 1808-10.

8.6 PRESSURE CONTROL VALVES

8.6.1 Pressure control valves shall be required to regulate the supply to the Baseline System for operating at the pressures prescribed in SANS 151.

8.6.2 The pressure control valves shall comply with SANS 198.

8.7 HOT WATER STORAGE TANK

8.7.1 The hot water storage tank shall comply with SANS 1307 and SANS 151.

8.7.2 The drain cocks shall comply with SANS 1808-53.

8.8 TEMPERING VALVES

8.8.1 A tempering valve that complies with SANS 1299 must be supplied for every installation.

8.9 BASELINE SYSTEM DOCUMENTATION AND USER INSTRUCTION BOOKLET

8.9.1 For each batch of Baseline Systems supplied, the following documentation shall be supplied in English to DoE:

- a) Equipment test certificates from SABS **AND** SABS mark approval.
- b) Equipment drawings or diagrams, clearly demonstrating the operating principles (may be included in the User Instruction Booklet).
- c) Documentation of safety reviews (if any).
- d) SABS approved installation manuals (User Instruction Booklet) to be provided.
- e) Functional description of the equipment (how it works). This may be included in the

User Instruction Booklet.

8.9.2 For each Baseline System and installation kit supplied, the following documentation shall be supplied in English to DoE as part of the installation kit:

- a) User Instruction Booklet for safe use of the equipment to be supplied with each Baseline System.
- b) Maintenance manuals describing the maintenance requirements (may be included in the User Instruction Booklet)
- c) List of recommended replacement parts (i.e. wear parts) (may be included in the User Instruction Booklet).

8.9.3 User instruction booklet requirements

- a) The last page of the User Instruction Booklet shall be perforated for ease of removal.
- b) The last 2 pages shall contain the same information (one to remain with the user, one to be removed by the Installer as record of hand-over), namely:
 - i. The Supplier's contact details
 - ii. The contact details of the person signing off the installation
 - iii. Contact details for customer complaints or queries
 - iv. Space for sign-off by the Installer confirming that the Baseline System has been successfully installed
 - v. Space for the User to sign that he/she has received the Baseline System and that, it has been demonstrated to be in working order, and that he/she has received basic training in the use and maintenance of the Baseline System.

8.10 APPLICABLE CODES AND REGULATIONS

8.10.1 The applicable SABS Standard and Codes of Practice or the relevant BS or IEC Standards or Codes of Practice where no SABS Standards or Codes of Practice exists and the listed codes, standards and regulations are applicable.