

## Regulations regarding solar water heating systems

**Solar water heating (SWH)** is a simple, cost-effective and pollution-free technique for heating water. Solar water heating is a simple mature technology that can make a substantial contribution to energy savings in South Africa. Product standards are intended to control the safety, durability and performance of products in the market place. Standards set the technical guidelines for performance and durability while testing confirms whether the products meet the guidelines. The testing of such conformance is done according to a test standard. Testing for compliance in solar water heating is typically either component tests or systems tests. Component tests are defined as a test performed on the individual components of a system whereas systems tests are defined as testing on a complete factory made system. Prior to installing any solar water heater. It is important to make sure the system complies with regulations. This document gives an overview of the various SANS documents which you need to take into consideration before installing a solar water heater.

1. **SANS 151: Fixed electric storage water heaters:** Specifies the characteristics of thermostatically controlled fixed electric storage water heaters intended for indoor and outdoor domestic use and for operation on ac supplies at voltages not exceeding 250 V for single-phase and 480 V for other appliances.
2. **SANS 181: Thermostats for electric storage water heaters:** Covers requirements, testing and characteristics of thermostats and thermal cut-outs for use in electric storage water heaters.
3. **SANS 198: Functional-control valves and safety valves for domestic hot and cold water supply:** Specifies the characteristics of functional-control valves and safety valves of size not exceeding 25 mm for use in conjunction with domestic hot and cold water supply systems and suitable for static inlet pressures of up to 2 000 kPa and nominal working pressures of up to 600 kPa.
4. **SANS 514: Immersion heaters for electric storage water heaters:** Specifies requirements for withdrawable and non-withdrawable types of electric immersion heater for use in thermostatically controlled storage water heaters. Is intended for electric immersion heaters used in single-phase a.c. circuits, the voltage of which does not exceed 250 V phase to neutral and that have a load rating not exceeding 10 kW.
5. **SANS 893-2: Legionnaires disease – Part 2 (The control of Legionella in water systems):** Recommended temperature for storage of water is 60° C and be maintained at a minimum of 55° C to prevent the conditions that could allow for the development of the bacterium Legionella Pneumophila.
6. **SANS 1299: Tempering valves for storage hot water systems:** Covers the requirements for tempering valves for storage hot water systems particularly in domestic situations, where hot water poses a hazard.
7. **SANS 1307: Domestic solar water heating systems:** A solar water heating system shall be one of the following:

- Collector/Storage Combinations: integral (the hot water storage tank is incorporated integrally with the collector and is stored in the body of the collector), close-coupled (hot water is stored in a separate but close-coupled water storage tank), split system (hot water is stored in a water storage tank that is separate from the collector) or a pre-heater system (a solar water heater does not contain a means of supplementary heating and is installed to preheat the cold potable water supply prior to its entry into any other type of household water heater)
- Heat transfer method: direct indirect direct indirect
- Circulation method: thermosiphon or pumped

A solar water heater shall be designed for a working pressure of zero (open type system), 100 kPa, 200 kPa, 300 kPa 400 kPa or 600 kpa, as required. The heating system shall be with or without supplementary energy sources as required, not applicable to solar water heaters for swimming pools or to industrial and commercial solar water heaters, or to push-through type domestic solar water heaters

#### 8. SANS 10106: The installation, maintenance, repair and replacement of domestic solar water heating systems:

##### Requirements

- General: Solar water heaters consist basically of an absorber unit that collects the incident solar radiation during the day, and a storage tank to contain the heated water
- Assembly: All components used in an assembly shall be of an approved type
- Operation of system: All the components of the system shall be installed in accordance with the manufacturer's instructions

##### Installation

- Freeze protection
- Solar Collectors
- Storage tank
- Safety devices and controls
- Pipework
- Pumps

##### Operation and maintenance

- On completion of the installation, the installer shall furnish the owner with an operation manual that contains
- The maintenance of the system shall include cleaning of the solar collector glazing, cleaning of components, and recommended maintenance intervals

##### Repair

- Repair of a solar water heating system shall ensure that the system is restored to full and effective operational readiness and that it complies with the requirements of the original manufacturer

9. **SANS 10252-1: Water supply and drainage for buildings – Part 1:** Water supply installations for buildings: Establishes general principles for the design, installation and testing of water installations for buildings, not applicable to water installations related to air-conditioning systems, industrial processes, high temperature (exceeding 80 °C) water heating systems and automatic sprinkler installations. **SANS 10254: The installation, maintenance, replacement and repair of fixed electric storage water heating systems:** Covers the safe installation of new and replacement fixed electric storage water heaters, complete with all the relevant and applicable safety and hydraulic control units. It also covers the maintenance of storage water heating systems.

#### 10. SANS 10400 (SABS 0400): The application of the National Building Regulations

- **SANS10400-A:** The application of the National Building Regulations – Part A: General principals and requirements
- **SANS 10400-L:** The application of the National Building Regulations – Part L: Roofs: An assessment of the roof structure that will support the anticipated loads, wind and rain to be carried out by a competent person

- **SANS 10400-XA:** The application of the National Building Regulations – Part XA: Energy usage in buildings specifies that at least 50% by volume of the annual average hot water heating requirement shall be provided by means other than electrical resistance heating, including – but not limited to – solar heating, heat pumps, heat recovery from other systems or processes and renewable combustible fuel.

**11. SANS 60335-2-21/IEC 60335-2-21:** Safety of household and similar electrical applications – Safety – Part 2-21: Particular requirements for storage water heaters: Deals with the safety of electric storage water heaters for household and similar purposes and intended for heating water below boiling temperature, their rated voltage being not more than 250 V for single-phase appliances and 480 V for other appliances

## Regulations regarding solar water heating systems

**SANS (South African National Standards):** refers to a standard that specifies the performance requirements of a specific product

The following SANS requirements applies when installing, retrofitting, maintenance, repair and replacement of a solar water heating system for residential use.

