

رقم الاصدار: 2	الشركة السعودية للفحص والاختبار	
تاريخ الاصدار: 2020/10/01	SAUDI INSPECTION & TESTING CO. (SAITCO)	
رقم المراجعة: 1	ملحق 7 - أ: ملاحق متطلبات العملية - نتائج الاختبارات - مختبر الكهرباء	
تاريخ المراجعة: 2020/10/01	Appendix 7-A: LAB process REQ. TEST RESULTS ELECTRICAL Lab	



رمز المنتج بالمختبر: C-138



Laboratory name	Saudi Inspection and Testing Company
Address	First Industrial Area – Street No 4,5,6,7–Riyadh
Country	Saudi Arabia

Date or period of tests	18 - 22/ 12 / 2022
Date of report issue	25/01/2023
Laboratory test report number	E-230029
Client Reference No.	اتفاقية رقم 0020100E/23 بتاريخ 2023/01/08
Client Name & address	Sahary AL- Qaseem Factory P.O.BOX 5003 Qaseem - Buriada Ind .Burida Onaza Road
Manufacturer Name & address	Sahary AL- Qaseem Factory P.O.BOX 5003 Qaseem - Buriada Ind .Burida Onaza Road

Product description	Electric Storage Water Heater
Brand name or trademark	SAHARE
Model No.	S-H. 50 L
Country of origin	SAUDI ARABIA

Product category	Water Heaters - Energy Performance Requirements and Labeling
Standard	SASO 2884:2017 / EN 50440
Conformity to articles tested	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Test case verdicts	
Test case does not apply to the test object	: N (.A.)
Test item does meet the requirement	: P(ass)
Test item does not meet the requirement	: F(ail)

Note: The result recorded in this document only related to the item tested.

ملاحظة : النتائج المدونة في تقرير التحكم في النتائج لا تمثل إلا العينة المختبرة




**ELECTRICAL LAB  
TECHNICAL Dep**



F 07-08-02 A  
By: GM

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Issued By: QGM - Approved

SAITCO ,First Industrial City area ,Riyadh Station area beside dry customs St.4,5,6,7 Building No.2433 , Riyadh 11427, PO 27711 ,  
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الشركة السعودية للفحص والاختبار - الرياض - المدينة الصناعية الأولى ، منطقة محطة القطار بجوار جمر ك الرياض الجاف ش

SASO 2884: 2017			
Clause	Requirement – Test	Result - Remark	Verdict

<b>4</b>	<b>Criteria for applying the Minimum Energy Performance Standard (MEPS)</b>		
<b>4.1</b>	<b>Declaration of rated values</b>	-	-
	The declaration of the rated capacity shall be expressed only in terms of liters (l) according to the following rules	-	P
	- rated capacity lower or equal to 14 liters as multiples of 1 liter	-	N
	- rated capacity from 15 liters as multiples of 5 liters	50L	P
	The declaration of the rated power shall be expressed only in terms of watt (W) as multiples of 50 W.	1200W	P
	The rated annual energy as a multiple of 5 kWh	1560kWh	P

4.2	Determining the Minimum Performance																																											
4.2.1	General						-		-																																			
	Minimum energy performance are based on the Water Heating Energy Efficiency						-		P																																			
4.2.2	Declaration of the Load Profile						-		-																																			
	Declared a load profile as described in Annex A						-		N																																			
	Declared load profiles of 3XS, XXS, XS and S						-		N																																			
	3XS shall not exceed 7 litres in capacity						-		N																																			
	XXS and XS shall not exceed 15 litres in capacity						-		N																																			
	S shall not exceed 36 litres in capacity						50L		N																																			
AMD 4	For storage water heaters with declared load profile M,L,XL,XXL,3XL and 4XL, the requirements of mixed water At 40 °C shall be as illustrated in table below						-		-																																			
Declared Load Profile		M	L	XL	XXL	3XL		4XL		P																																		
Mixed Water at 40 °C		65 L	130 L	210 L	300 L	520 L		1040 L																																				
4.2.3	Minimum Energy Performance Standard (MEPS) for Water Heaters										-																																	
	The water heater MEPS values are presented in Table 1.					-					-																																	
	<table><tr><th colspan="11">Table 1 – MINIMUM ENERGY EFFICIENCY (<math>\eta_{wh}</math>) in %</th></tr><tr><th>Declared load profile</th><th>3XS</th><th>2XS</th><th>XS</th><th>S</th><th>M</th><th>L</th><th>XL</th><th>2XL</th><th>3XL</th><th>4XL</th></tr><tr><td>Water heaters energy efficiency (with or without smart controls)</td><td>53</td><td>55</td><td>63</td><td>63</td><td>73</td><td>73</td><td>79</td><td>79</td><td>79</td><td>79</td></tr></table>										Table 1 – MINIMUM ENERGY EFFICIENCY ( $\eta_{wh}$ ) in %											Declared load profile	3XS	2XS	XS	S	M	L	XL	2XL	3XL	4XL	Water heaters energy efficiency (with or without smart controls)	53	55	63	63	73	73	79	79	79	79	-
Table 1 – MINIMUM ENERGY EFFICIENCY ( $\eta_{wh}$ ) in %																																												
Declared load profile	3XS	2XS	XS	S	M	L	XL	2XL	3XL	4XL																																		
Water heaters energy efficiency (with or without smart controls)	53	55	63	63	73	73	79	79	79	79																																		
4.2.4	Minimum Energy Performance Standard (MEPS) for Hot Water Storage Tanks										-																																	
	Minimum energy performance standard (MEPS) requirements for hot water storage tanks with capacities higher or equal to 25 liters are based on the daily thermal losses QPR.						-				N																																	
	The limit values for QPR are expressed in table 2, rounded to 2 decimal places.						-				N																																	
4.2.5	Test Voltage						-				-																																	
AMD 4	The products shall be tested at 230V for single-phase, and shall be at 400V for three phase.						Applied 230V				P																																	
4.3	Acceptance Criteria for Labelling and Market Surveillance										-																																	




SASO 2884: 2017			
Clause	Requirement – Test	Result - Remark	Verdict

	<i>The energy label shall be accepted as valid when a sample unit(s) tested meets the following criteria:</i>					-
	<b>TABLE: Acceptance Criteria for Labelling and Market Surveillance</b>					-
	Measured Point	Acceptance Criteria	Rated	Limit	Measured Value	Verdict
	a.) Tested Power (W)	$\geq 0.90 \times \text{rated power}$	1200W	1080W	1199W	P
	b) Tested Power (W)	$\leq 1.05 \times \text{rated power}$		1260W		
	c) Tested thermal losses (QPR)	$\leq 1.05 \text{ rated QPR, rated}$	-	-	-	N
	d) Tested Standing loss power (S)	$\leq 1.05 \text{ rated S}$	-	-	-	N
AMD 3	e.) Capacity (L)	$\geq 0.95 \times \text{rated Capacity}$	50L	$\geq 47.5L$	48L	P
	f.) Mixed quantity of water ( $V_{40}$ )	$\geq 0.97 \times \text{rated } V_{40}$	65L	$\geq 63.05L$	68.52L	P
	g.) Tested Energy (any type)	$\leq 1.05 \times \text{rated annual energy}$	1560kWh	$\leq 1638kWh$	1560kWh	P
	h) Tested Collector Aperture ( $m^2$ )	$\geq 0.98 \times \text{rated value}$	-	-	-	N
	i) Tested Standby Power $P_{sol;stby}$	$\leq 1.03 \text{ rated } P_{sol;stby}$	-	-	-	N
	j) Tested Pump power consumption $P_{sol;pump}$	$\leq 1.03 \text{ rated } P_{sol;pump}$	-	-	-	N
	<b>Qelec</b>	-	-	-	7.32kWh	-

5	<b>Label and classification</b>		
5.1	<b>Determining the energy efficiency class</b>	-	-
	Energy efficiency for the maximum load profile shall be used to determine the classification as outlined in table 3 and 4.	No energy efficiency label provided	N
5.2	<b>Design and placement of the label</b>	-	-
AMD 4	The label shall be printed as illustrated in Figure 1.	-	N
	The label shall be visible and fixed on the most prominent part the of the product	-	N
	Another label shall be fixed and non-removable on the product packaging	-	N
	Energy efficiency classes shall be represented with a visible letter and color-coded bars as outlined in Table 3 and illustrated in Figure 1	-	N
	The label dimensions shall be 100 mm wide and 170 mm high.	-	N




SASO 2884: 2017			
Clause	Requirement – Test	Result - Remark	Verdict



	In case of instantaneous type, the label dimensions shall be 45 mm wide and 75 mm high	-	N
5.3	<b>Information and values contained on the label</b>	-	-
	The fields (a) to (k) shall comply with the following requirements:	-	-
	a) SASO Logo	-	N
	b) energy efficiency class	-	N
AMD 1	c) this field identifies the annual energy consumption of all types of water heaters	-	N
	d) water heating function, including declared load profile	-	N
	e) electric power of the water heater in kW	-	N
	f) capacity of the water heater (or hot water storage) in liters	-	N
	g) specific product information	-	N
	h) QR code	-	N
	i) general product information:	-	N
	- Brand name	-	N
	- Country of origin	-	N
	- Model number	-	N
AMD 2	j) this field identifies the SASO standard applicable and registration number	-	N
	k) legal statement	-	N
6	<b>Marking and instructions</b>		
6.1	General information	-	-
	The following information <b>shall be marked on the nameplate</b> of the water-heater in English or Arabic and English	English / Arabic	P
	The marking shall not be on a detachable part of the unit and shall be indelible, durable and easily legible	-	P
	Any information related to <b>energy performance</b> added on any part of the water heater unit or packaging shall not have any ambiguity or lead to misunderstanding of the performance of the unit	-	P
6.2	<b>Nameplate information</b>	-	-
	The nameplate information <b>shall include</b> , for conformity to this standard the following information:	-	-
	• Manufacturer's name and/or trademark	SAHARE	P
	• Country of origin	SAUDI ARABIA	P
	• Manufacturer's model or type reference and serial number of the unit	S-H. 50 L	P
	• Rated voltage or rated voltage range in volts (V)	220V	P
	• Rated frequency in hertz (Hz)	50/60Hz	P
	• Rated power input in Watt (W) or kiloWatts (kW)	1200W	P
	• Rated Capacity	50L	P




SASO 2884: 2017			
Clause	Requirement – Test	Result - Remark	Verdict

	<ul style="list-style-type: none"> <li>Annual standby losses (kWh/year) or daily standby losses (kWh/24h), when applicable</li> </ul>	-	N
6.3	<b>Instruction sheet</b>	-	-
	An instruction sheet or manual in both Arabic and English shall be delivered with each water heater	Arabic and English	P
	Tables, drawings and circuit diagrams may be depicted in English only	See instruction manual	P
	The instruction sheet or manual shall include the following information as a minimum:	-	-
	a) Supplier's name or trade mark	SAHARE	P
	b) Supplier's model number	S-H. 50 L	P
	c) Declared load profile	M	P
	d) Energy Efficiency Class of the model	E	P
	e) Water heating energy efficiency in %	83.74%	P
	f) Annual electricity consumption in kWh under average climatic condition for Saudi Arabia	1560kWh	P
	g) If applicable, other load profiles for which the water heater is suitable to use and the corresponding water heating energy efficiency and annual electricity consumption as set out in points (e) and (f)	-	N
	h) Thermostat temperature setting	75°C	P
	i) specific precautions that shall be taken when the water heater is assembled, installed or maintained	See instruction manual	P
	j) Where Smart Control Compliance is declared as being enabled	-	N
	k) annual electricity consumption in kWh (or mass of butane equivalent when applicable)	-	N
	l) ) Collector aperture area in m <sup>2</sup>	-	N
	m) zero-loss efficiency	-	N
	n) First-order coefficient (W/(m <sup>2</sup> . K <sup>2</sup> ))	-	N
	o) Second-order coefficient (W/(m <sup>2</sup> . K <sup>2</sup> ))	-	N
	p) Incidence angle modifier (I <sub>am</sub> )	-	N
	q) Storage Capacity in Liters	50L	P
	r) pump power consumption in W	-	N
	s) standby power consumption in W,	-	N
	t) Annual non-solar heat contribution Q <sub>nonsol</sub> in kWh	-	N
	u) Annual auxiliary electricity consumption Q <sub>aux</sub>		
	In addition, for solar water heaters, the instruction sheet or manual shall include the following:	Electric storage water heater	-
	• The information specified in clause 6.2 and Table 6	-	N
	• Dimensions of the unit	-	N
	• Instruction for mounting and connection to the pipes	-	N
	• Instruction for connection to the electrical installation	-	N

Clause	Requirement – Test	Result - Remark	Verdict
	<ul style="list-style-type: none"> <li>Instructions necessary for the correct operation of the unit and any special precautions to be observed to ensure its safe use and maintenance</li> </ul>	-	N
	<ul style="list-style-type: none"> <li>Instruction for packing and unpacking the unit</li> </ul>	-	N
	<ul style="list-style-type: none"> <li>Instructions on unit handling and rigging</li> </ul>	-	N
	<ul style="list-style-type: none"> <li>Net weight of the unit (empty)</li> </ul>	-	N

AMD 4	<b>Design and Dimension of Energy Efficiency Label</b>			-
	<b>Monitored point</b>	<b>Limit (mm)</b>	<b>Measured (mm)</b>	-
	<b>Hot Storage Tank Water Heater</b>	(A)	170	N
		(B)	100	N
	<b>Instantaneous Water Heater</b>	(C)	75	N
		(D)	45	N
	<b>Hot Storage Tank Water Heater</b>		<b>Instantaneous Water Heater</b>	
				

ANNEX C	<b>Calculation of the Energy Efficiency</b>					
C.3	<b>Calculation of the Energy Efficiency Coefficient <math>\eta_{wh}</math></b>					
C3.1	<b>Conventional Water Heaters and HeatPump Water Heaters</b>					
$\eta_{wh} = \frac{Q_{ref}}{(Q_{fuel} + CC \cdot Q_{elec})(1 - SCF \cdot smart) + Q_{cor}}$		$Q_{ref}$	$Q_{fuel}$	CC	$Q_{elec}$	SCF.smart
		5.85	0	1.00	7.32	0
		$\eta_{wh} = 83.74\%$				
		$Q_{cor}$				
		-0.34				

C.5	<b>Determination of the Ambient Correction Term <math>Q_{cor}</math></b>					
(a) for conventional water heaters using	$Q_{elec}$	$Q_{fuel}$	$Q_{ref}$	SCF	CC	k




SASO 2884: 2017			
Clause	Requirement – Test	Result - Remark	Verdict

electricity:				smart		
$Q_{cor} = -k \cdot (CC \cdot (Q_{elec} \cdot (1 - SCF \cdot smart) - Q_{ref}))$	7.32	0	5.85	0	1.00	0.23
<b><math>Q_{cor} = -0.34</math></b>						
Where the k values are given in Table C1 for each load profile				M		-

C.6	Determination of the mixed quantity of water V40				
$V_{40} = V_{40;exp} \times \frac{(\theta_p - 15)}{(40 - 15)}$		The normalized value of the average temperature $\theta_p$	63.21°C		
		Corresponds to the quantity of water delivered at least 40°C during test. $V_{40;exp}$	35.53L		
		V40 = 68.52L			

ANNEX D	Calculation of the Annual Energy Consumption				
D.1	<b>Principle for Calculation of the Annual Energy Consumption (AEC<sub>WH</sub>)</b>			-	
	The annual energy is based on the energy efficiency ratio <b>AEC<sub>WH</sub></b> used for Classification and the reference energy Q <sub>ref</sub> used to characterize the water heaters.			1560kWh/Y	
D.2	<b>Weather Data for Saudi Arabia</b>			-	
	the following data are applied, in addition to the data used for test of the water heaters and water storage tanks (tables D1 and D2)			See table	
D.3	<b>Calculation and Presentation of the Annual Energy Consumption (AEC<sub>WH</sub>)</b>			-	
D.3.1	<b>For Conventional Water Heaters</b>			-	
<b>AEC<sub>WH</sub> = 220 x Q<sub>ref</sub>/η<sub>wh</sub>;KSA</b>		<b>Q<sub>ref</sub></b>		<b>η<sub>wh</sub>;KSA</b>	-
		5.85		82.44%	-
		<b>AEC<sub>WH</sub> = 1560kWh/y</b>			-
<b>η<sub>WH</sub>;KSA = <math>\frac{1}{1 + \left(\frac{1 - \eta_{WH}}{\eta_{WH}}\right) \times \left(\frac{65 - \vartheta_{amb;test}}{65 - \vartheta_{amb;KSA}}\right)}</math></b>		<b>η<sub>wh</sub></b>	<b>ϑ<sub>amb;test</sub></b>	<b>ϑ<sub>amb;KSA</sub></b>	-
		83.74%	20°C	24°C	-
		<b>η<sub>wh</sub>;KSA = 82.44%</b>			-
	Ambient temperature for test: ϑ <sub>amb;test</sub> =20 °C			-	
	Ambient temperature for label: ϑ <sub>amb;KSA</sub> = 24 °C			-	

**Remarks:****NOTE:**

- No energy efficiency label provided.




Clause	Requirement – Test	Result - Remark	Verdict
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Photo No. 1 (Marking)

**SAHARE AL QASSIM**

Water Heater Fact.  
Buraidah Saudi Arabia  
Tel. : 3220206 - Fax : 3220563  
Exh : 3232102 - Riyadh : 4466501 - 4465814



Manufacturer's Name	Sahare	اقرأ التعليمات قبل التركيب Read Instruction Before installation
Model	S-H. 50 L	
Type	Vertical	
Rated Voltage ( V )	220V	١ - يثبت السخان على الحائط لثبوتها جيداً .
Rated Frequency ( Hz )	50/60Hz	٢ - يوصل الماء البارد الداخل إلى السخان عن طريق صمام الامان بالعلامة الزرقاء .
Rated Power	1200 W	٣ - التأكد من خروج الماء عن العلامة الحمراء قبل التشغيل .
Rated Capacity ( L )	50 L	٤ - يركب سلك لا يقل عن ١ سم في الفتحة التي مع التأكد من ان التيار الكهربائي مطابق .
Pressure	0.6-0.8 MPa	٥ - يوصل التيار الكهربائي للتشغيل .
Thermostat	75 °C	٦ - تنظيف ماء السخان الداخلي وإزالة ما قد يتسبب داخله من الصدأ ( دورياً )
Degree of Water Protecction	IPX1	٧ - فصل التيار الكهربائي فوراً عن السخان عند ملاحظة تسرب الماء او عند حدوث صدمة كهربائية
Rated Annual Energy declared load Profile	1560 KWh/year M	
Protection Against Electric Shock	CLASS 1	
Country of Origin	SAUDI ARABIA	
ملاحظة : نفي أن الضمان ضد عيوب الصناعة ولا يشمل الاعطال الناتجة عن سوء الاستخدام		

Clause	Requirement – Test	Result - Remark	Verdict
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Photo no.2 (General view / External package)



Clause	Requirement – Test	Result - Remark	Verdict
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Photo no.3 (Energy efficiency test report)

Storage Water Heater Test Data:

Applicable Standard(s)		SASO-2884:2017, BS EN 50440-2015							
Manufacturer		Country of Origin		Model		Type		Sub Type	
SAHARE		SAUDI ARABIA		S.H.50.L		Electric		Storage	
Test Start Date		Testing Stop Date		Load Profile		Rated Power		Actual Power	
1/19/2023		1/20/2023		M		W 1200		W 1199	
Actual Capacity		Rated Capacity		T3	T5	Ambient		Smart	SCF
Litres		Litres		°C	°C	°C		0	1
48.00		50.00		70.41	70.68	18.95			
Q <sub>relelec</sub>		Q <sub>ref</sub>		Q <sub>H2O</sub>		Q <sub>elec</sub>		Q <sub>cor</sub>	
kWh		kWh		kWh		kWh		kWh	
8.07		5.85		6.43		7.32		-0.34	
V <sub>full-drawing water</sub>		CC		η <sub>elecwh</sub>		η <sub>wh</sub>		MEPS MIN. η <sub>wh</sub>	
Litres		Coefficient		%		%		%	
113.25		1.00		79.87		83.74		73.00	
η <sub>wh,KSA</sub>		Rated AEC		Actual AEC		Actual AEC <sub>WH</sub>		Efficiency Class	
%		kWh/y		kWh/y		kWh/y		E	
82.44				1533		1560			
Tset		θc		θ'p		θ <sub>p</sub>			
70.90		15.70		63.31		63.21			
FlowMeter Start		FlowMeter Stop		V40exp		V40			
329.30		364.83		35.53		68.52			

Clause	Requirement – Test	Result - Remark	Verdict
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## Photo No.4 (Classification as per declared load profile)

Table 3 – ENERGY EFFICIENCY CLASSIFICATION as per DECLARED LOAD PROFILE												
Energy Efficiency in %							83.74					
Bar Color	Energy Class		LOAD PROFILE									
			3XS	2XS	XS	S	M	L	XL	2XL	3XL	4XL
Dark Green	أ	A	95	100	105	105	210	300	300	300	300	300
Green	ب	B	87	89	97	97	140	160	160	160	160	180
Light Green	ج	C	77	79	87	87	93	95	98	110	110	110
Yellow	د	D	69	71	79	79	87	87	92	93	93	93
Orange	هـ	E	61	63	71	71	80	80	86	86	86	86
Red	و	F	53	55	63	63	73	73	79	79	79	79
Dark Red	ز	G	45	47	55	55	65	65	71	71	71	71

Inspected by

Sign  
Date**REMARK :****\*SOFT COPY OF THE CONTROL TEST RESULTS SHEET AUDITING BY LAB SUPER VISOR.**

&lt;&lt;End of control of test result sheet&gt;&gt;

