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رمز المنتج بالمختبر :C-138

الاعتماد السعودي Saudi Accreditation Testing N-T-00047 Testing N-T-00065 Testing N-T-00075

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 – 26 / 02 / 2023
Date of report issue	26 / 02 / 2023
Laboratory test report number	E-230115-1
Client Reference No.	01102003E/23
Client \ factory \ Manufacturer Name & address	Saudi Ceramics Company PO Box 3893 Riyadh 11481, Kingdom of Saudi Arabia

Product description	Electric Storage Water Heater
Brand name or trademark	SAUDI CERAMICS
Model No.	EWH-V50
Country of origin	Saudi Arabia

Product category	Water Heaters - Energy Performance Requirements and Labeling
Standard	SASO 2884:2017 / EN 50440
Conformity to articles tested	☑Yes ☐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

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Clause	Requirement – Test	Result - Remark	Verdict

4	**Criteria for applying the Minimum Energy Performance Standard (MEPS)**		
4.1	**Declaration of rated values**	-	-
	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	1530kWh	P

4.2	**DeterminingtheMinimumPerformance**		
4.2.1	***General***	-	-
	Minimum energy performance are based on the Water Heating Energy Efficiency	-	P
4.2.2	***DeclarationoftheLoadProfile***	-	-
	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
AMD4	For storage water heaters with declared load profile M,L,XL,XXL,3XL and 4XL, therequirements of mixed water At 40 ºC shall be as illustrated in table below	-	-

Declared Load Profile	M	L	XL	XXL	3XL	4XL	P
Mixed Water at 40 ºC	65 L	130 L	210 L	300 L	520 L	1040 L	

4.2.3	***MinimumEnergyPerformanceStandard(MEPS)forWaterHeaters***		-
	The water heater MEPS values are presented in Table 1.	-	P

Table 1 – MINIMUM ENERGY EFFICIENCY (η_{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

Measured η_{wh} 83.90%

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**	-	-
AMD4	The products shall be tested at 230V for single-phase, and shall be at 400V for three phase.	Applied 230V	P

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4.3	***Acceptance Criteria for Labelling and Market Surveillance***					-
	The energy label shall be accepted as valid when a sample unit(s) tested meets the following criteria:					-
	TABLE***: Acceptance Criteria for Labelling and Market Surveillance***					-
	Measured Point	***Acceptance Criteria***	**Rated**	**Limit**	**Measured Value**	**Verdict**
	a.)Tested Power (W)	≥ 0.90 x rated power	1200W	1080W	1106W	P
	b) Tested Power (W)	≤1.05 x rated power		1260W		
	c) Tested thermal losses (QPR)	≤ 1.05 rated QPR, rated	-	-	-	N
	d) Tested Standing loss power (S)	≤ 1.05 rated S	-	-	-	N
AMD 3	e.) Capacity (L)	≥0.95 x rated Capacity	50L	≥47.5L	50L	P
	f.) Mixed quantity of water (V_{40})	≥0.97 x rated V_{40}	74L	≥71.78L	81.20L	P
	g.) Tested Energy (any type)	≤1.05 x rated annual energy	1530kWh	≤1606.5kWh	1557kWh	P
	h) Tested Collector Aperture (m2)	≥ 0.98 x rated value	-	-	-	N
	i) Tested Standby Power Psol;stby	≤1.03 rated Psol;stby	-	-	-	N
	j) Tested Pump power consumption Psol;pump	≤1.03 rated Psol;pump	-	-	-	N
	Qelec	-	7.161	-	7.30kWh	-

6	**Marking and instructions**		
6.1	General information	-	-
	The following information **shall bemarked on the nameplate** of the water-heater in English or Arabic and English	English	P
	The marking shall not be on a detachable part of the unit and shall be indelible, durable and easily legible	Durable	P
	Any information related to **energy performance** 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	**Nameplate information**	-	-
	The nameplate information **shall include**, for conformity to this standard the following information:	-	-
	• Manufacturer's name and/or trademark	SAUDI CERAMICS	P
	• Country of origin	Saudi Arabia	P
	• Manufacturer's model or type reference and serial number of the unit	EWH-V50	P
	• Rated voltage or rated voltage range in volts (V)	220-240V	P
	• Rated frequency in hertz (Hz)	50/60Hz	P

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	• Rated power input in Watt (W) or kiloWatts (kW)	1200W	P
	• Rated Capacity	50L	P
	• Annual standby losses (kWh/year) or daily standby losses (kWh/24h), when applicable	-	N
6.3	**Instruction sheet**	-	-
	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	SAUDI CERAMICS	P
	b) Supplier's model number	EWH-V50	P
	c) Declared load profile	M	P
	d) Energy Efficiency Class of the model	E	P
	e) Water heating energy efficiency in %	85.2%	P
	f) Annual electricity consumption in kWh under average climatic condition for Saudi Arabia	1530kWh	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	65°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^2	-	N
	m) zero-loss efficiency	-	N
	n) First-order coefficient ($W/(m^2. K^2)$	-	N
	o) Second-order coefficient ($W/(m^2. K^2)$	-	N
	p) Incidence angle modifier (I_{am})	-	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_{nonsol} in KWh	-	N
	u) Annual auxiliary electricity consumption Q_{aux}		
	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
	• Instructions necessary for the correct operation of the unit and any special precautions to be observed to ensure its safe use and maintenance	-	N
	• Instruction for packing and unpacking the unit	-	N

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	• Instructions on unit handling and rigging	-	N
	• Net weight of the unit (empty)	-	N

ANNEX C	Calculation of the Energy Efficiency						
C.3	***Calculation of the Energy Efficiency Coefficient ηwh***						
C3.1	***Conventional Water Heaters and HeatPump Water Heaters***						
$\eta_{WH} = \frac{Q_{ref}}{(Q_{fuel} + CC.Q_{elec})(1 - SCF.smart) + Q_{cor}}$		**Q_{ref}**	**Q_{fuel}**	**CC**	**Q_{elec}**	**$SCF._{smart}$**	**Q_{cor}**
		5.85	0	1.00	7.30	0	-0.34
		ηwh =83.90%					

C.5	***Determination of the Ambient Correction Term Qcor***						
(a) for conventional water heaters using electricity:		**Q_{elec}**	**Q_{fuel}**	**Q_{ref}**	**$SCF._{smart}$**	**CC**	**k**
$Q_{cor} = -k.(CC.(Q_{elec}.(1 - SCF.smart) - Q_{ref}))$		7.30	0	5.85	0	1.00	0.23
		Q_{cor} =-0.34					
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 θ_p	62.32°C	
	Corresponds to the quantity of water delivered at least 40°C during test. $V_{40;exp}$	42.90L	
	V_{40}=81.20L		

ANNEX D	Calculation of the Annual Energy Consumption				
D.1	***Principle for Calculation of the Annual Energy Consumption (AECWH)***		-		-
	The annual energy is based on the energy efficiency ratio ***AEC_{WH}*** used for Classification and the reference energy Qrefused to characterize the water heaters.		1557kWh/y		P
D.2	***Weather Data for Saudi Arabia***		-		-
	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		P
D.3	***Calculation and Presentation of the Annual Energy Consumption (AEC_{WH})***				-
D.3.1	***ForConventionalWaterHeaters***				-
AEC_{WH} = 220 x Q_{ref}/ηwh;KSA		***Q_{ref}***	***ηwh;KSA***		-
		5.85	82.60%		-
		AEC_{WH} =1557kWh/y			-
$\eta_{WH;KSA} = \frac{1}{1 + \left(\frac{1 - \eta_{WH}}{\eta_{WH}}\right) \times \left(\frac{65 - \vartheta_{amb;test}}{65 - \vartheta_{amb;KSA}}\right)}$		**ηwh**	**$\vartheta_{amb:test}$**	**$\vartheta_{amb:KSA}$**	-
		83.90%	20°C	24°C	-
		ηwh;KSA=82.60%			-
	Ambient temperature for test: $\vartheta_{amb:test}$=20 °C		-		-
	Ambient temperature for label: $\vartheta_{amb:KSA}$= 24 °C		-		-

Remarks:

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Photo No. 1 (Marking)

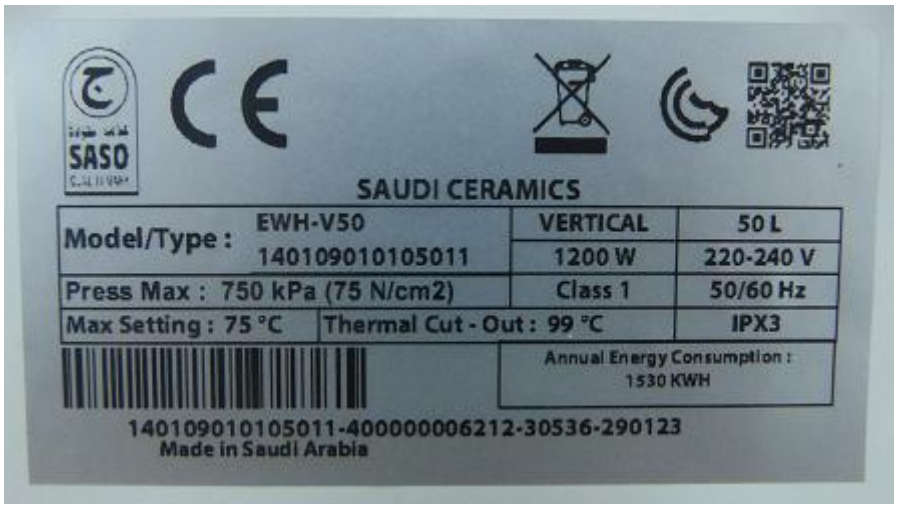

Photo no.2 (General view / External package)

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Photo no.3 (Energy efficiency test report)

SAITCO
Saudi Inspection & Testing Co
الشركة السعودية للفحص و الاختبار

Report Reference E230115EEFS4R03

Storage Water Heater Test Data:

Applicable Standard(s)	SASO-2884:2017, BS EN 50440-2015

Manufacturer	Country of Origin	Model	Type	Sub Type
SAUDI CERAMICS	SAUDI ARABIA	EWH-V50	Electric	Storage

Test Start Date	Testing Stop Date	Load Profile	Rated Power	Actual Power
			W	W
2/16/2023	2/17/2023	M	1200	1106

Actual Capacity	Rated Capacity	T3	T5	Ambient	Smart	SCF
Litres	Litres	°C	°C	°C	0	1
50.00	50.00	67.46	65.12	17.65		

$Q_{testelec}$	Q_{ref}	Q_{H2O}	Q_{elec}	Q_{cor}
kWh	kWh	kWh	kWh	kWh
7.45	5.85	6.07	7.30	-0.34

$V_{full\text{-}drawing\ water}$	CC	η_{elecwh}	η_{wh}	MEPS MIN. η_{wh}
Litres	Coefficient	%	%	%
106.58	1.00	80.05	83.90	73.00

$\eta_{wh;KSA}$	Rated AEC	Actual AEC	Actual AEC_{WH}	Efficiency Class
%	kWh/y	kWh/y	kWh/y	
82.60	1530	1530	1557	E

Tset	θc	θ'p	θ_p
67.39	16.33	62.45	62.32

FlowMeter Start	FlowMeter Stop	V40exp	V40
81629.73	81672.63	42.90	81.20

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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 %			83.90								
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 THECONTROL TEST RESULTS SHEET AUDITNG BY LAB SUPER VISOR.***

<<End of control of test result sheet >>

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مختبر المنتجات الكهربائية والالكترونية
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