

Issue No. 2	الشركة السعودية للفحص والاختبار	
Issue Date : 01/10/2020	SAUDI INSPECTION & TESTING CO. (SAITCO)	
Revision No. 3	ملحق 7 - أ: ملاحق متطلبات العملية- نتائج الاختبارات مختبر الكهرباء	
Issue Date : 05/08/2023	Appendix 7-A: LAB process REQ. TEST RESULTS -ELECTRICAL LAB	

Code of product in Lab :	C-138	--	 
LAB DATA		بيانات المختبر	
Laboratory name	اسم المختبر	Saudi Inspection & Testing Co.(SAITCO)	
Address	العنوان	1st Industrial Area, St. No.4,5,6,7-Riyadh	
Country	الدولة	Saudi Arabia	
Client Data		بيانات العميل	
Sample Date in	تاريخ استلام العينة	28 / 11 / 2023	
Date or period of tests	تاريخ / فترة الاختبار	10/12/2023	14/12/2023
Date of report issue	تاريخ اصدار التقرير	17/12/2023	
Laboratory test report number	رقم التقرير بالمختبر	E-231243-1	
Client Name	اسم العميل	Saudi ceramics company	
Client Address	عنوان العميل	PO Box 3893 Riyadh 11481 kingdom of Saudi Arabia	
Client Reference No. / Date	مرجع العميل	28 / 11 / 2023	
No of received Samples	عدد العينات المستلمة	2	
Sample Data		بيانات العينة	
Product description	وصف المنتج	Electric Storage Water Heater	
Brand name or trademark	العلامة التجارية	SAUDI CERAMICS	
Type or reference	النوع / المرجع	EWH-V80	
Country of Origin	بلد الصنع	Saudi Arabia	
Manufacture Name	اسم المصنع	Saudi ceramics company	
Manufacture Address	عنوان المصنع	PO Box 3893 Riyadh 11481 kingdom of Saudi Arabia	
Products Category	تصنيف المنتج	Water Heaters - Energy Performance Requirements and Labeling	
Standard / TR No.	رقم المواصفة / اللوحة	SASO 2884:2017 / EN 50440	
Test case verdicts		حالات الحكم على نتيجة الاختبار	
Conformity to articles tested		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Test case does not apply to the test object		Not Applicable	N/A
Test item does meet the requirement		Pass	P
Test item does not meet the requirement		Fail	F

Technical Lab supervisor / Manager



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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/A
	- rated capacity from 15 liters as multiples of 5 liters		80L	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		1565kWh	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/A																																		
	Declared load profiles of 3XS, XXS, XS and S							-		N/A																																		
	3XS shall not exceed 7 litres in capacity							-		N/A																																		
	XXS and XS shall not exceed 15 litres in capacity							-		N/A																																		
	S shall not exceed 36 litres in capacity							80L		N/A																																		
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.					-					P																																	
	<table><tr><th colspan="11">Table 1 – MINIMUM ENERGY EFFICIENCY (η_{wh}) 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 (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	Measure d η_{wh} 85.54%
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																																		
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/A																																		
	The limit values for QPR are expressed in table 2, rounded to 2 decimal places.							-		N/A																																		
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																																		

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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)	$\geq 0.90 \times \text{rated power}$	1200W	1080W	1161W	P
	b) Tested Power (W)	$\leq 1.05 \times \text{rated power}$		1260W		
	c) Tested thermal losses (QPR)	$\leq 1.05 \times \text{rated QPR}$	-	-	-	N/A
	d) Tested Standing loss power (S)	$\leq 1.05 \times \text{rated S}$	-	-	-	N/A
AMD 3	e.) Capacity (L)	$\geq 0.95 \times \text{rated Capacity}$	80L	$\geq 76L$	76.10L	P
	f.) Mixed quantity of water (V_{40})	$\geq 0.97 \times \text{rated } V_{40}$	96L	$\geq 93.12L$	94.34L	P
	g.) Tested Energy (any type)	$\leq 1.05 \times \text{rated annual energy}$	1565kWh	$\leq 1,643.25kWh$	1523kWh	P
	h) Tested Collector Aperture (m^2)	$\geq 0.98 \times \text{rated value}$	-	-	-	N/A
	i) Tested Standby Power $P_{sol;stby}$	$\leq 1.03 \times \text{rated } P_{sol;stby}$	-	-	-	N/A
	j) Tested Pump power consumption $P_{sol;pump}$	$\leq 1.03 \times \text{rated } P_{sol;pump}$	-	-	-	N/A
	Qelec	-	7.338kWh	-	7.12kWh	-

6	Marking and instructions		
6.1	General information	-	-
	The following information shall be marked 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:	-	-
	<ul style="list-style-type: none">Manufacturer's name and/or trademark	SAUDI CERAMICS	P
	<ul style="list-style-type: none">Country of origin	Saudi Arabia	P
	<ul style="list-style-type: none">Manufacturer's model or type reference and serial number of the unit	EWB-V80	P
	<ul style="list-style-type: none">Rated voltage or rated voltage range in volts (V)	220-240V	P
	<ul style="list-style-type: none">Rated frequency in hertz (Hz)	50/60Hz	P
	<ul style="list-style-type: none">Rated power input in Watt (W) or kiloWatts (kW)	1200W	P
	<ul style="list-style-type: none">Rated Capacity	80L	P
	<ul style="list-style-type: none">Annual standby losses (kWh/year) or daily standby losses (kWh/24h), when applicable	-	N/A
6.3	Instruction sheet	-	-
	An instruction sheet or manual in both Arabic and English shall be delivered with each water heater	Instruction manual provided	P
	Tables, drawings and circuit diagrams may be depicted in English only	-	P

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	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	EWB-V80	P
c)	Declared load profile	M	P
d)	Energy Efficiency Class of the model	E	P
e)	Water heating energy efficiency in %	86%	P
f)	Annual electricity consumption in kWh under average climatic condition for Saudi Arabia	1565kWh	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/A
h)	Thermostat temperature setting	55°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/A
k)	annual electricity consumption in kWh (or mass of butane equivalent when applicable)	-	N/A
l)	Collector aperture area in m ²	-	N/A
m)	zero-loss efficiency	-	N/A
n)	First-order coefficient (W/(m ² . K ²))	-	N/A
o)	Second-order coefficient (W/(m ² . K ²))	-	N/A
p)	Incidence angle modifier (I _{am})	-	N/A
q)	Storage Capacity in Liters	80L	P
r)	pump power consumption in W	-	N/A
s)	standby power consumption in W,	-	N/A
t)	Annual non-solar heat contribution Q _{nonsol} in KWh	-	N/A
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/A
	• Dimensions of the unit	-	N/A
	• Instruction for mounting and connection to the pipes	-	N/A
	• Instruction for connection to the electrical installation	-	N/A
	• Instructions necessary for the correct operation of the unit and any special precautions to be observed to ensure its safe use and maintenance	-	N/A
	• Instruction for packing and unpacking the unit	-	N/A
	• Instructions on unit handling and rigging	-	N/A
	• Net weight of the unit (empty)	-	N/A

ANNEX C	Calculation of the Energy Efficiency					
C.3	Calculation of the Energy Efficiency Coefficient η_{wh}					
C3.1	Conventional Water Heaters and HeatPump Water Heaters					
$\eta_{WH} = \frac{Q_{ref}}{(Q_{fuel} + CC \cdot Q_{elec})(1 - SCF \cdot smart) + Q_{cor}}$		Q_{ref}	Q_{fuel}	CC	Q_{elec}	SCF.smart
		5.85	0	1.00	7.594	0
		$\eta_{wh} = 81.27\%$				
		Q_{cor}				
		-0.29				

C.5	Determination of the Ambient Correction Term Q_{cor}					
(a) for conventional water heaters using electricity:	Q_{elec}	Q_{fuel}	Q_{ref}	SCF_{smart}	CC	k
$Q_{cor} = -k \cdot (CC \cdot (Q_{elec} \cdot (1 - SCF \cdot smart) - Q_{ref}))$	7.12	0	5.85	0	1.00	0.23
		Q_{cor} = -0.29				
Where the k values are given in Table C1 for each load profile				M		-

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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	48.52°C
		Corresponds to the quantity of water delivered at least 40°C test. $V_{40;exp}$	70.37L
		V₄₀ = 94.34L	-

ANNEX D	Calculation of the Annual Energy Consumption		
D.1	Principle for Calculation of the Annual Energy Consumption (AEC_{WH})		
	The annual energy is based on the energy efficiency ratio AEC_{WH} used for Classification and the reference energy Q _{ref} used to characterize the water heaters.	1523kWh/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	For Conventional Water Heaters		
$AEC_{WH} = 220 \times Q_{ref} / \eta_{wh;KSA}$		Q_{ref}	η_{wh;KSA}
		5.85	84.42%
		AEC_{WH} = 1611kWh/y	
$\eta_{WH;KSA} = \frac{1}{1 + \left(\frac{1 - \eta_{WH}}{\eta_{WH}} \right) \times \left(\frac{65 - \vartheta_{amb;test}}{65 - \vartheta_{amb;KSA}} \right)}$		η_{wh}	ϑ_{amb;test}
		85.61%	20°C
		η_{wh;KSA} = 84.42%	
		ϑ_{amb;KSA}	
		24°C	
		Ambient temperature for test: ϑ_{amb;test} = 20 °C	
		Ambient temperature for label: ϑ_{amb;KSA} = 24 °C	

Remarks:

Photo no. 1 (Marking)

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Photo no.2 (General view / External package)



Photo no.3 (Energy efficiency test report)



Report Reference E231243S1EEFR1

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	EWB-V80	Electric	Storage		
Test Start Date	Testing Stop Date	Load Profile	Rated Power	Actual Power		
10-12-23	11-12-23	M	W	W		
			1200	1161		
Actual Capacity	Rated Capacity	T3	T5	Ambient	Smart	SCF
Litres	Litres	°C	°C	°C		
76.10	80.00	54.80	53.20	20.50	0	1
Q _{testelec}	Q _{ref}	Q _{H2O}	Q _{elec}	Q _{cor}		
kWh	kWh	kWh	kWh	kWh		
7.14	5.85	5.98	7.12	-0.29		
V _{full-drawing water}	CC	η _{elecwh}	η _{wh}	MEPS MIN. η _{wh}		
Litres	Coefficient	%	%	%		
133.09	1.00	82.08	85.61	73.00		
η _{wh,KSA}	Rated AEC	Actual AEC	Actual AEC _{WH}	Efficiency Class		
%	kWh/y	kWh/y	kWh/y	E		
84.42	1515	1499	1523			
Tset	θ _c	θ _p	θ _p			
56.50	15.75	48.66	48.52			
FlowMeter Start	FlowMeter Stop	V40exp	V40			
102838.18	102904.58	70.37	94.34			

Note/s:

Methods and Requirements of the test performed as per SASO-2884:2017

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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 %							85.61					
Bar Color	Energy Class		LOAD PROFILE									
			3XS	2XS	XS	S	M	L	XL	2XL	3XL	4XL
Dark Green	ا	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

Conformity Decision is usually included in the report, unless the agreement states otherwise by the client.

Results Notes: The acceptance criterion is based on :		A-The relevant TR Requirements <input type="checkbox"/>		B-The relevant standard specifications <input type="checkbox"/>	
		C- Manufacturer's manual (product technical data sheet) <input type="checkbox"/>		D- Customer requirements <input type="checkbox"/>	
Acceptance Rule is based on:		Special Case		Rejection Rule (Failing)is based on:	
A- The measured value (+) measurement uncertainty value is less than the maximum required to criteria of acceptance. B- The measured value (-) measurement uncertainty value is greater than the minimum required to criteria of acceptance.		May be accept if: Measured result ≤ the upper limit Measured result ≥lower limit May be rejected if : measured value < the upper limit measured result >lower limit		Reject when a confidence level of less than 95% is acceptable A- The measured value (+) measurement uncertainty value is greater than the maximum required to criteria of acceptance. B- The measured value (-) measurement uncertainty value is less than the minimum required to criteria of acceptance.	
♦ = measurement result with agreed method				I = uncertainty interval of agreed method	

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Notes on results: The acceptance criterion is based on; A-Relevant standard specification <input type="checkbox"/> B-Manufacturer's manual (product technical data sheet) <input type="checkbox"/> C-Customer requirements . <input checked="" type="checkbox"/>			
The rule of acceptance is based on: The measured value fulfills the requirement according to the acceptance criterion, taking into account the uncertainty value in the measurement The rule of rejection is based on: The measured value does not achieve the required according to the acceptance criterion, taking into account the uncertainty value in the measurement			
<input type="checkbox"/> The sample passed all the above-mentioned tests in accordance with the requirements of the product			
<input type="checkbox"/> The sample passed all the tests mentioned above in accordance with the requirements for the product, except for the test where the measured value does not meet the requirements of the product mentioned in the attached standard specifications.			
The result is for the sample referred to in the report, which has been tested only and is only representative of itself.			
Accreditation statues :		All tests are accredit : <input type="checkbox"/>	All tests are accredit except:
REMARK :			
SOFT COPY OF THE CONTROL TEST RESULT SHEET IS AUDITED BY THE LAB SUPERVISOR			
	Inspected by	Lab supervisor/ Reviewer	Technical Manager
Name			
Sign			
Date	17/12/2023	17/12/2023	17/12/2023
"End of Report"			

