



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		OEM 9965/9/1				
					Date issued		2020-02-10				
					Issued by		DQS Hellas				
Licence holder		BSG CALDAIE A GAS S.P.A.			Country	Italy					
Brand (optional)					Web	http://www.biasi.it					
Street, Number		Via Leopoldo Biasi			E-mail	Daniele_Chiesurin@biasi.it					
Postcode, City		37175, Verona			Tel	+39 434238341					
Collector Type					Flat plate collector, glazed						
Collector name	Gross area (A _G)	Gross length	Gross width	Gross height	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² θ _m - θ _a						
	m ²	mm	mm	mm	0 K	10 K	30 K	50 K	70 K	50 K	
	W	W	W	W	W	W	W	W	W	W	
15 SOL BLACK	1,40	1.530	1.030	80	798	739	615	484	344	484	
20 SOL BLACK	1,88	2.030	1.030	80	1.072	992	826	650	462	650	
26 SOL BLACK	2,37	2.030	1.283	80	1.351	1.251	1.042	819	583	819	
Power output per m ² gross area					570	528	440	346	246	346	
Performance parameters test method		Steady state - outdoor									
Performance parameters (related to AG)		η _{0,hem}	a ₁	a ₂							
Units		-	W/(m ² K)	W/(m ² K ²)							
Test results		0,570	4,140	0,007							
Incidence angle modifier test method		Steady state - outdoor									
Bi-directional incidence angle modifiers		No									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal		K _{θT, coll}	1,00	0,97	0,95	0,90	0,82	0,67			0,00
Longitudinal		K _{θL, coll}	1,00	0,97	0,95	0,90	0,82	0,67			0,00
Heat transfer medium for testing		Water									
Flow rate for testing (per gross area, A _G)		dm/dt	0,020		kg/(sm ²)						
Maximum temperature difference for thermal performance calculations		(θ _m - θ _a) _{max}	50		K						
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)		θ _{ste}	138		°C						
Effective thermal capacity, incl. fluid (per gross area, A _G)		C/m ²	7,86		kJ/(Km ²)						
Maximum operating temperature		θ _{max op}	100		°C						
Maximum operating pressure		p _{max op}	1000		kPa						
Testing laboratory		NCSR Demokritos			www.solar.demokritos.gr						
Test report(s)		4080 DE4 4082 DE5 4086 DQ4, 4213 DQ2			Dated		30/8/2018 30/8/2018 30/8/2018				
Comments of testing laboratory		Datashet version: 5.01, 2016-03-01									
This data sheet was issued based on data appeared in the first SKM certificate. This data sheet shows compliance with EN ISO 9806:2013. A gap test report has been issued after sample taking and testing according to EN ISO 9806:2013 has taken place for complementary testing in compliance with document SKN_0241.R0											
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	OEM 9965/9/1
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
15 SOL BLACK		1.130	660	342	779	448	219	583	315	151	635	334	159
20 SOL BLACK		1.517	887	459	1.045	602	294	783	423	203	853	448	214
26 SOL BLACK		1.912	1.118	579	1.318	759	371	987	533	256	1.075	565	270
Annual output per m ² gross area		807	472	244	556	320	156	417	225	108	454	238	114
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane	1765 kWh/m ²			1714 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²			
Mean annual ambient air temperature	18,5°C			3,2°C			7,5°C			9,0°C			
Collector orientation or tracking mode	South, 25°			South, 30°			South, 45°			South, 35°			
The collector is operated at constant temperature ϑ_m (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	A	--
Maximum tested positive load	3000	Pa
Maximum tested negative load	3000	Pa
Hail resistance using steel ball (maximum drop height)	2	m

Energy Labelling Information			
	Reference Area, A_{ref} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
15 SOL BLACK	1,40	Collector efficiency (η_{col})	39 %
20 SOL BLACK	1,88	<i>Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m², expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.</i>	
26 SOL BLACK	2,37		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0,570 --
		First-order coefficient (a_1)	4,14 W/(m ² K)
		Second-order coefficient (a_2)	0,007 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,82 --
		<i>Remark: The data given in this section are related to collector reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.</i>	