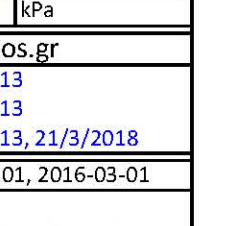




Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		SKM 9965/9							
						Date issued		2018-03-30							
						Issued by		DQS Hellas							
Licence holder		NOBEL INTERNATIONAL EAD				Country		BULGARIA							
Brand (optional)		AELIOS				Web		http://nobel.bg/							
Street, Number		48, VITOSHA BLV				E-mail		info@nobel.bg							
Postcode, City		2100, SOFIA BULGARIA				Tel		+359 2 4210232							
Collector Type						Flat plate collector, glazed									
						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² $\vartheta_m - \vartheta_a$									
Collector name						0 K	10 K	30 K	50 K	70 K	50 K				
						W	W	W	W	W	W				
AELIOS AIB 1500						798	739	615	484	344	484				
AELIOS AIB 2000						1,072	992	826	650	462	650				
AELIOS AIB 2600						1,351	1,251	1,042	819	583	819				
Power output per m² gross area						570	528	440	346	246	346				
Performance parameters test method						Steady state - outdoor									
Performance parameters (related to AG)						$\eta_{0,hem}$	a1	a2							
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						$K_{\vartheta T, coll}$	1.00	0.97	0.95	0.90	0.82	0.67		0.00	
Longitudinal						$K_{\vartheta L, coll}$	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/(sm²)			
Maximum temperature difference for thermal performance calculations						$(\vartheta_m - \vartheta_a)_{max}$	50					K			
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30$ °C)						ϑ_{stg}	138					°C			
Effective thermal capacity, incl. fluid (per gross area, A_G)						C/m^2	7.86					kJ/(Km²)			
Maximum operating temperature						$\vartheta_{max, op}$	100					°C			
Maximum operating pressure						$p_{max, op}$	1000					kPa			
Testing laboratory						NCSR Demokritos									
Test report(s)						4080DE2									
						4082DE2									
						4086DQ2, 4213DQ1									
Testing laboratory						www.solar.demokritos.gr									
Test report(s)						Dated		5/9/2013							
								5/9/2013							
								5/9/2013, 21/3/2018							
Comments of testing laboratory						Datasheet version: 5.01, 2016-03-01									
<p>This data sheet was issued based on data appeared in the first SKM certificate.</p> <p>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</p>						<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belesiotis Tel: +210 6503815 - Fax: +210 6544399 153 10 Ag. Paraskevi - Attiki - Greece</p> 									
Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +301 6233493-4, Fax: +301 6233495, http://www.dqshellas.gr, e-mail: ioannisalexidou@dqshellas.gr															

Annex to Solar Keymark Certificate Supplementary Information		Licence Number		SKM 9965/9									
		Issued		2018-03-30									
Annual collector output in kWh/collector at mean fluid temperature ϑ_m, based on ISO 9806:2013 test results													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	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
AEIOS AIB 1500		1,130	660	342	779	448	219	583	315	151	635	334	159
AEIOS AIB 2000		1,517	887	459	1,045	602	294	783	423	203	853	448	214
AEIOS AIB 2600		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_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}											
AEIOS AIB 1500	1.40	Collector efficiency (η_{col})								39		%	
AEIOS AIB 2000	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>											
AEIOS AIB 2600	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>											
Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +301 6233493-4 , Fax: +301 6233495, http://www.dqshellas.gr , e-mail: ioannisalexou@dqshellas.gr													