



CERTIFICATION LICENCE TO USE KEYMARK

Certificate No SKM 10003

DQS Hellas grants the present certificate to the enterprise:

COSMOSOLAR LTD

for the product / type:

Flat plate Solar Collector type:

EPI16 NV, EPI20 NV, EPI25 NV, EPI30 NV, EPI54 NV

Trademarks: Blue Solar, Cosmosolar, Delta Solar, Falcon, Federman, Skyland, Supernet, Nuevosol, primesolar, viber

which is produced in conformity with the normative document:

EN 12975-1 : 2006

ISO 9806:2013

at the following location:

**Ntrei Road, Dervenochorion Pili
32200 Viotia**



The present certificate is granted in accordance with:

- *the DQS Hellas General Rules for the Certification of Products ,*
- *the Specific Rule for Certification EKIII.001 «Specific Rule for Certification of Solar Collectors, and Thermal Solar Heating Systems for Domestic Hot Water»,*
- *the Specific CEN Keymark Scheme Rules for Solar Thermal Products,*

and is ruled by the terms of the relevant contract between DQS Hellas and the enterprise.

Date of issue: 2019-02-07

Date of valid: 2022-02-07

Panagiotis Giannoutsos
Director of Certification

Dr. Emmanuel Deliyannakis
Managing Director

CERTIFICATE OF CONFORMITY

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A handwritten signature in black ink, appearing to read 'Panagiotis Giannoutsos'.

Panagiotis Giannoutsos
Director of Certification

A handwritten signature in black ink, appearing to read 'Emmanuel Deliyannakis'.

Dr. Emmanuel Deliyannakis
Managing Director




Products Certification
Accreditation No: 735

Accredited Body: 4, Kalavriton Street, 14564 Kifissia - Athens, Greece

ΓΚIII-08 – 15/12/2014



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		SKM 10003				
						Date issued		2016-11-24				
						Issued by		DQS HELLAS				
Licence holder		COSMOSOLAR LTD				Country		Greece				
Brand (optional)		Blue Solar, Cosmosolar, Delta Solar, Falcon, Federman,				Web		http://www.cosmosolar.com/				
Street, Number		Ntrei Road, Dervenochorion Gate				E-mail		info@cosmosolar.com				
Postcode, City		32200, Viotia				Tel		+30 210 3478897 / 210 3479484				
Collector Type						Flat plate collector, glazed						
Collector name	Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² θ _m - θ _a							
					0 K	10 K	30 K	50 K	70 K	50 K		
					W	W	W	W	W	W		
EPI20 NV	1.51	1,501	1,009	85	1,113	1,060	932	774	586	774		
EPI12 NV	1.95	1,500	1,300	85	1,433	1,365	1,200	997	755	997		
EPI25 NV	2.00	2,000	1,000	85	1,470	1,400	1,231	1,023	774	1,023		
EPI16 NV	2.24	1,900	1,180	85	1,648	1,570	1,380	1,146	868	1,146		
EPI54 NV	2.53	2,009	1,258	85	1,857	1,769	1,556	1,292	978	1,292		
Power output per m ² gross area					735	700	616	511	387	511		
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		0.735	3.240	0.025								
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}					0.93				0.00	
Longitudinal		K _{θL, coll}					0.93				0.00	
Heat transfer medium for testing		Water										
Flow rate for testing (per gross area, A _G)		dm/dt	0.021	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 _{stg}	146	°C								
Effective thermal capacity, incl. fluid (per gross area, A _G)		C/m ²	10.7	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)		4191DE1, 4192DE1 4193DE1 1247DE1				Dated		11/10/2016 25/10/2016 8/5/2017				
Comments of testing laboratory						Datasheet version: 5.01, 2016-03-01						
						<p>N.C.S.R "DEMOKRITOS" SOLAR ENERGY LABORATORY Head: Dr Vassilis Belessiotis Tel: +210 6503815 - Fax: +210 6544500 153 10 Ag. Paraskevi - Attiki - Greece</p> 						
Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +30 210 6233493-4 , Fax: +30 210 6233495, http://www.dqshellas.gr, e-mail: ioannisalexio@dqshellas.gr												



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SKM 10003
	Issued	2016-11-24

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
EPI20 NV		1,760	1,234	743	1,333	879	485	985	620	335	1,070	670	356
EPI12 NV		2,266	1,590	957	1,717	1,132	625	1,268	798	432	1,378	862	459
EPI25 NV		2,324	1,631	981	1,761	1,161	641	1,301	819	443	1,413	885	471
EPI16 NV		2,606	1,828	1,100	1,974	1,302	719	1,458	918	497	1,584	992	528
EPI54 NV		2,937	2,060	1,240	2,225	1,467	810	1,643	1,035	560	1,785	1,118	595
Annual output per m ² gross area		1,162	815	491	881	581	321	650	409	221	707	442	235
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	2400	Pa
Maximum tested negative load	2400	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}		
EPI20 NV	1.51	Collector efficiency (η_{col})	57	%
EPI30 NV	1.95	<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>		
EPI25 NV	2.00			
EPI16 NV	2.24			
EPI54 NV	2.53			
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0.735	--
		First-order coefficient (a_1)	3.24	W/(m ² K)
		Second-order coefficient (a_2)	0.025	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.93	--
<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>				