



<b>Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>		<b>Certificate No.</b>	<b>SKM 9921/2</b>
		Date of issue	2/8/2012
<b>Company</b>	<b>COSMOSOLAR LTD</b>	<b>Country</b>	Greece
<b>Brand (optional)</b>	Blue Solar, Cosmosolar, Delta Solar, Falcon, Federman, Skyland, Supernet	<b>Website</b>	<a href="http://www.cosmosolar.com/">http://www.cosmosolar.com/</a>
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<b>Collector Type (flat plate / evacuate tubular / un-glazed)</b>		Flat plate collector	
<b>Integration in the roof possible ?</b>		Yes	

Collector name	Aperture area (A <sub>a</sub> ) [m <sup>2</sup> ]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (A <sub>G</sub> ) [m <sup>2</sup> ]	Power output per collector unit G = 1000 W/m <sup>2</sup> T <sub>m</sub> -T <sub>a</sub> :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
EPI 20	1,30	1.517	1.019	90	1,55	1.011	956	835	697	543
EPI 12	1,61	1.517	1.247	90	1,89					
EPI 25	1,77	2.017	1.017	90	2,05					
EPI 16	2,00	1.917	1.197	90	2,30					
EPI 54	2,26	2.017	1.277	90	2,58	1.728	1.646	1.452	1.218	944

Collector efficiency parameters related to <u>aperture area (A<sub>a</sub>)</u> Note 1	η <sub>0a</sub>	0,77	-
	a <sub>1a</sub>	3,42	W/(m <sup>2</sup> K)
	a <sub>2a</sub>	0,022	W/(m <sup>2</sup> K <sup>2</sup> )

Stagnation temperature - Note 2	t <sub>stg</sub>	184	°C
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Effective thermal capacity	C <sub>eff</sub> = C/A <sub>a</sub>	5,518	kJ/(m <sup>2</sup> K)
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Max. operation pressure - Note 3	p <sub>max</sub>	1000	kPa
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Incidence angle modifiers K <sub>θ</sub> (θ)	G <sub>DIF</sub> /G <sub>TOT</sub>		θ <sub>T</sub> / θ <sub>L</sub>	50°	10°	20°	30°	40°	60°	70°
	min	max								
		0,14	0,18	K <sub>θ</sub> (θ <sub>L</sub> )	0,89					

G<sub>DIF</sub>/G<sub>TOT</sub>: min&max - while measuring

Testing Laboratory	IZES gmbH, TZSB an der HTW
Website	<a href="http://www.izes.de/tzsb">www.izes.de/tzsb</a>
Test report id. number	KT08_03, KT08_04
Date of test report	22/9/2008
Perf. test method	EN 12975-2 6.1.4 (outdoor/außen/extérieur)

Comments of testing laboratory :  
[Example data sheet](#)

Note 1	Test conditions	Fluid	Water	Flow rate	0,02	kg/s per m <sup>2</sup>	Stamp & signature of test lab
Note 2	Irradiance, G <sub>s</sub> =1000 W/m <sup>2</sup> Ambient temperature , T <sub>a</sub> =30 °C						
Note 3	Given by manufacturer						



<b>Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>	<b>Certificate No.</b>	<b>SKM 9921/2</b>
	Issued	41123

Annual collector output kWh / Jährliche Kollektor Leistung kWh / Energie annuelle produite par le capteur																
Collector name	Location and collector temperature (T <sub>m</sub> )															
	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	25°C	50°C	75°C	
EPI 20																
EPI 12																
EPI 25																
EPI 16																
EPI 54																

Collector mounting: Fixed or tracking / Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations				
Location	Latitude °	Gtot kWh/m <sup>2</sup>	Ta °C	Collector orientation or tracking mode
Athens	38	1.765	18,5	South, 25°
Davos	47	1.714	3,2	South, 30°
Stockholm	59	1.166	7,5	South, 45°
Würzburg	50	1.244	9,0	South, 35°

Gtot	Annual total irradiation on collector plane	kWh/m <sup>2</sup>
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (T<sub>m</sub>). Detailed description with all equations used is available from the Solar Keymark web site (direct link: <http://www.estif.org/solarkeymark/annexb1.php>)

<p><b>Central Offices: Dragoumi 6, 145 61 kifisia, Athens, Tel: +301 6233493-4 , Fax: +301 6233495, <a href="http://www.dqshellas.gr">http://www.dqshellas.gr</a>, e-mail: <a href="mailto:ioannisalexiou@dqshellas.gr">ioannisalexiou@dqshellas.gr</a></b></p>	Datasheet version: VERSION 3.4, 30-11-2011 Calculation program version: 3.07 October 2011
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