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Annex to Solar Keymark Certificate							Licence Number			0131.1		
							Date issued			2025-01-10		
							Issued by DQS Hellas					
Licence holder	COSMOSOLAR S.A.					Country Greece						
Brand (optional)	Blue Solar, Cosmosolar, Delta Solar, Falcon,					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 plat	e collecto	r				
conector Type						i lat plat						
Collector name		_	Gross length	Gross width	Gross height	Power output per collector						
		Gross area (A <sub>G</sub> )				Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_{m} - \vartheta_{a}$						
		m <sup>2</sup>	<del>                                     </del>	- 500 - 10		0 K W	10 K W	30 K W	50 K W	70 K W	99 K W	
EPI 54 KNV		2.50	mm 2,000	mm 1,250	mm 85	1,864	1,787	1,610	1,401	1,160	754	
EPI 60 KNV		2.70	2,000	1,350	85	2,014	1,930	1,739	1,513	1,253	814	
EPI 56 KNV		3.00	2,000	1,500	85	2,237	2,145	1,932	1,681	1,392	905	
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		<u> </u>		 								
Power output per m <sup>2</sup> gross area					746	715	644	560	464	302		
Performance parameters test method   Steady state - outdoor						740	713	044	500	404	302	
Performance parameters test me					-2	-1			a7	-0	17-1	
Units	i to A <sub>G</sub> )	η0, b	a1	a2 W/(m²K²)	a3 J/(m³K)	a4	a5 J/(m²K)	a6 s/m	(20,0)	a8 W/(m²K⁴)	Kd	
Test results		0.757	2.92	0.016	0.000	0.00	9,895	0.000	0.00	0.0E+00	0.90	
Incidence angle modifier test me	sh a d	0.737		1001001000000000	W. C.	0.00	9,095	0.000	0.00	U.UL+00	0.90	
				tate - out	800	10°	T 508	COS	700	000	0.00	
Incidence angle modifier Transversal		Angle	10° 1.00	20° 1.00	30° 0.99	40°	50° 0.92	60° 0.83	70° 0.69	80° 0.44	90°	
Longitudinal		K <sub>θT,coll</sub>	1.00	1.00	0.99	0.96	0.92	0.83	0.69	0.44	0.00	
	1	K <sub>θL,coll</sub>	1.00	2.00	0.00	0.50	Water	0.03	0.03	U.74	0.00	
Heat transfer medium for testing Flow rate for testing (per gross a	_	-				-	dm/dt		0.022	ka//cm²	1	
Maximum temperature difference during thermal performance test						1	$(\vartheta_m - \vartheta_a)_r$		0.022 kg/(sm²) 69.1 K			
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a$ = 30 °C)						I	$\vartheta_{\rm stg}$ 238 °C					
Maximum operating temperature							$\vartheta_{max\ op}$		100	°C		
Maximum operating pressure							p <sub>max,op</sub> 100 kPa					
Testing laboratory NCSR "DEMOKRITOS"							www.solar.demokritos.gr					
Test report(s)	_	4434 DE1					Dated 30/09/24					
		4435 DQ1					10/12/24					
4447 DE1							09/12/24					
Comments of testing laboratory							Ver. 6.2 (13.01.2022)					
Example comment												
Thermal efficiency data from Test Report 4447 DE1							N.C.S.R. "D E M O K R I T O S" SOLAR ENERGY LABORATORY Tel: +210 6503815 - Fax: +210 6544582 P.O. BOX 60037, 15310 Ag. Paraskevi, Greece					

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Page 2/2 Annex to Solar Keymark Certificate Licence Number SKM 10131.1 Supplementary Information 2025-01-10 Issued Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ<sub>m</sub> Standard Locations Athens Stockholm Würzburg Davos 50°C 50°C 50°C 75°C 50°C 75°C 25°C 75°C 75°C 25°C 25°C Collector name 25°C EPI 54 KNV 2.204 1.493 1.654 1.074 721 1.835 1.246 768 2.967 2.313 1.152 EPI 60 KNV 2.381 2.498 1.787 1.244 1.346 1,612 1.160 1.827 1.982 829 EPI 56 KNV 3,560 2,645 1,791 2,776 1,985 1,289 2,029 1,382 865 2,202 1,495 921 Gross Thermal Yield per m² gross area 1,187 882 597 925 662 430 676 461 288 734 498 307 Annual efficiency, η<sub>a</sub> 50% 41% 25% 40% 25% 67% 34% 57% 26% 58% 40% 59% Fixed or tracking collector Fixed (slope = latitude - 15 ": rounded to nearest 5" 1166 kWh/m² Annual irradiation on collector plane 1765 kWh/m<sup>2</sup> 1630 kWh/m<sup>2</sup> 1244 kWh/m<sup>2</sup> Mean annual ambient air temperature 18.5°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  $\vartheta$ 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. 6.2 (13.01.2022). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/ **Additional Information** Collector heat transfer medium Water-Glycole The collector is deemed to be suitable for roof integration No The collector was tested successfully under the following conditions: Climate class (A+, A, B or C)  $\theta_a$  (°C) > 20 600  $H_x(MJ/m^2) >$  $G(W/m^2) >$ Maximum tested positive load Pa Maximum tested negative load Pa 2000 Hail resistance using steel ball (maximum drop height) m Additional collector attribute(s) Active or passive measure(s) for self-protection Using external power source(s) for normal operation No Co-generating thermal and electrical power Façade collector(s) No **Energy Labelling Information Additional Informative Technical Data** Reference Area, A<sub>sol</sub> (m<sup>2</sup>) Aperture Area, A<sub>a</sub> (m<sup>2</sup>) **Hydraulic Designation Code** EPI 54 KNV 15-1234S-A:7.2,1850-C:20.6,1350 2.50 2.34 EPI 60 KNV 2.70 17-1234S-A:7.2,1850-C:20.6,1425 2.52 EPI 56 KNV 19-1234S-A:7.2,1850-C:20.6,1578 2.81 3.00 Data required for CDR (EU) No 811/2013 - Reference Area Data required for CDR (EU) No 812/2013 - Reference Area A Collector efficiency (η<sub>col</sub>) Zero-loss efficiency (η<sub>0</sub>) 0.75 First-order coefficient (a<sub>1</sub>) 2.92  $W/(m^2K)$ Remark: Collector efficiency (ncol) is defined in CDR (EU) No Second-order coefficient (a2) 0.016  $W/(m^2K^2)$ 811/2013 as collector efficiency of the solar collector at a Incidence angle modifier IAM (50°) 0.92 temperature difference between the solar collector and the Remark: The data given in this section are related to collector reference surrounding air of 40 K and a global solar irradiance of 1000 W/m², area (A sol) which is aperture area for values according to EN 12975-2 or expressed in % and rounded to the nearest integer. Deviating from aross area for ISO 9806. Consistent data sets for either aperture or gross the regulation ηcol is based on reference area (Asol) which is area can be used in calculations like in the regulation 811 and 812 and aperture area for values according to EN 12975-2 or gross area for simulation programs.

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