



<b>Annex to Solar Keymark Certificate</b>					<b>Licence Number</b>		<b>OEM 9999/2/1</b>							
					<b>Date issued</b>		<b>2022-07-27</b>							
					<b>Issued by</b>		<b>DQS Hellas</b>							
<b>Licence holder</b>		<b>SEVIL S.R.L.</b>			<b>Country</b>		<b>Italy</b>							
<b>Brand (optional)</b>					<b>Web</b>									
<b>Street, Number</b>		<b>VIA A. DE GASPERI, SNC / VIA TAGLIAMENTO,</b>			<b>E-mail</b>		<b>direzione@energialta.info</b>							
<b>Postcode, City</b>		<b>73042 CASARANO / 73052 PARABITA</b>			<b>Tel</b>		<b>+39 0833.504.795</b>							
<b>Collector Type</b>					<b>Flat plate collector</b>									
<b>Collector name</b>					<b>Power output per collector</b>									
					G <sub>b</sub> = 850 W/m <sup>2</sup> , G <sub>d</sub> = 150 W/m <sup>2</sup> & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	89 K				
					m <sup>2</sup>	mm	mm	mm	mm	mm	mm			
					W	W	W	W	W	W				
<b>SEVIL FM 2.72</b>					<b>2,72</b>	<b>2.160</b>	<b>1.260</b>	<b>86</b>	<b>2.107</b>	<b>2.018</b>	<b>1.821</b>	<b>1.597</b>	<b>1.348</b>	<b>1.093</b>
<b>SEVIL FM 2.72H</b>					<b>2,72</b>	<b>1.260</b>	<b>2.160</b>	<b>86</b>	<b>2.107</b>	<b>2.018</b>	<b>1.821</b>	<b>1.597</b>	<b>1.348</b>	<b>1.093</b>
<b>Power output per m<sup>2</sup> gross area</b>					<b>775</b>	<b>742</b>	<b>669</b>	<b>587</b>	<b>495</b>	<b>402</b>				
<b>Performance parameters test method</b>					<b>Steady state - outdoor</b>									
<b>Performance parameters (related to A<sub>G</sub>)</b>					$\eta_0, b$	a1	a2	a3	a4	a5	a6	a7	a8	Kd
<b>Units</b>					-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-
<b>Test results</b>					<b>0,784</b>	<b>3,15</b>	<b>0,012</b>	<b>0,000</b>	<b>0,00</b>	<b>9.720</b>	<b>0,000</b>	<b>0,00</b>	<b>0,0E+00</b>	<b>0,92</b>
<b>Incidence angle modifier test method</b>					<b>Steady state - outdoor</b>									
<b>Incidence angle modifier</b>					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
<b>Transversal</b>					K <sub><math>\theta_{T, coll}</math></sub>	1,00	1,00	1,00	0,99	0,96	0,90	0,78	0,52	0,00
<b>Longitudinal</b>					K <sub><math>\theta_{L, coll}</math></sub>	1,00	1,00	1,00	0,99	0,96	0,90	0,78	0,52	0,00
<b>Heat transfer medium for testing</b>					<b>Water</b>									
<b>Flow rate for testing (per gross area, A<sub>G</sub>)</b>					dm/dt	0,022					kg/(sm <sup>2</sup> )			
<b>Maximum temperature difference during thermal performance test</b>					( $\vartheta_m - \vartheta_a$ ) <sub>max</sub>	58,5					K			
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; <math>\vartheta_a = 30</math> °C)</b>					$\vartheta_{stg}$	190,5					°C			
<b>Maximum operating temperature</b>					$\vartheta_{max, op}$	200					°C			
<b>Maximum operating pressure</b>					$\rho_{max, op}$	1000					kPa			
<b>Testing laboratory</b>					<b>NCSR Demokritos / Solar &amp; other Energy System</b>				<b>www.solar.demokritos.gr</b>					
<b>Test report(s)</b>					4196DE2 4197DQ3				<b>Dated</b>		16/11/2016 2/6/2017			
<b>Comments of testing laboratory</b>											<b>Ver. 6.2 (13.01.2022)</b>			
<p><b>Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +30 210 6233493-4 , Fax: +30 210 6233495, http://www.dqs.gr, e-mail: i.alexiou@dqs.gr</b></p>														



<b>Annex to Solar Keymark Certificate</b> <b>Supplementary Information</b>	<b>Licence Number</b>	<b>OEM 9999/2/1</b>
	<b>Issued</b>	<b>2022-07-27</b>

<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
SEVIL FM 2.72		3.422	2.564	1.786	2.673	1.943	1.310	1.954	1.349	874	2.121	1.461	932
SEVIL FM 2.72H		3.422	2.564	1.786	2.673	1.943	1.310	1.954	1.349	874	2.121	1.461	932
Gross Thermal Yield per m <sup>2</sup> gross area		1.258	942	657	983	714	482	718	496	321	780	537	343
Annual efficiency, $\eta_a$		71%	53%	37%	60%	44%	30%	62%	43%	28%	63%	43%	28%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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 $\vartheta_m$ (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 <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>													

<b>Additional Information</b>			
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)	A		--
G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20
		$H_x$ (MJ/m <sup>2</sup> ) >	600
Maximum tested positive load	3000		Pa
Maximum tested negative load	3000		Pa
Hail resistance using steel ball (maximum drop height)	2		m
<b>Additional collector attribute(s)</b>			
Using external power source(s) for normal operation	No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power	No	Façade collector(s)	No

<b>Energy Labelling Information</b>		<b>Additional Informative Technical Data</b>	
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code	Aperture Area, $A_a$ (m <sup>2</sup> )
SEVIL FM 2.72	2,72	11-V-1234S-A:7.2,2060-C:20.6,1320-	2,57
SEVIL FM 2.72H	2,72	18-V-1234S-A:7.2,1158-C:20.6,2240-	2,57

<b>Data required for CDR (EU) No 811/2013 - Reference Area <math>A_{sol}</math></b>		<b>Data required for CDR (EU) No 812/2013 - Reference Area <math>A_{sol}</math></b>	
Collector efficiency ( $\eta_{col}$ )	63%	Zero-loss efficiency ( $\eta_0$ )	0,77
Remark: Collector efficiency ( $\eta_{col}$ ) 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/m <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.		First-order coefficient ( $a_1$ )	3,15
		Second-order coefficient ( $a_2$ )	0,012
		Incidence angle modifier IAM (50°)	0,96
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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.			