





Annex to Solar Keymark Certificate										Licence Number			011-7S2082 F		
Supplementary Information										Issued			2023-08-08		
Gross Thermal Yield in kWh/collector at mean fluid temperature $\vartheta_m$															
Standard Locations		Athens			Davos			Stockholm			Würzburg				
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C		
SMC3-v		3 031	2 137	1 361	2 284	1 547	936	1 686	1 083	633	1 841	1 175	676		
Gross Thermal Yield per m <sup>2</sup> gross area		1 189	838	534	895	607	367	661	425	248	722	461	265		
Annual efficiency, $\eta_a$		67%	47%	30%	55%	37%	23%	57%	36%	21%	58%	37%	21%		
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										Yes					
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 <sub>x</sub> (MJ/m <sup>2</sup> ) >		600					
Maximum tested positive load										4000		Pa			
Maximum tested negative load										3000		Pa			
Hail resistance using ice balls (diameter)										35		mm			
<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 <sub>sol</sub> (m <sup>2</sup> )							Hydraulic Designation Code			Aperture Area, A <sub>a</sub> (m <sup>2</sup> )					
SMC3-v							2-V-1234S-A:7.1.14592-C:16.8.1129			2.43					
Data required for CDR (EU) No 811/2013 - Reference Area A <sub>sol</sub>							Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>								
Collector efficiency ( $\eta_{col}$ )							57%			Zero-loss efficiency ( $\eta_0$ )		0.74		--	
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 <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.							First-order coefficient (a <sub>1</sub> )		3.58		W/(m <sup>2</sup> K)				
							Second-order coefficient (a <sub>2</sub> )		0.014		W/(m <sup>2</sup> K <sup>2</sup> )				
							Incidence angle modifier IAM (50°)		0.93		--				
							Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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.								
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