



<b>Annex to Solar Keymark Certificate</b>												<b>Licence Number</b>		<b>011-7S3006 F</b>	
<b>Supplementary Information</b>												<b>Issued</b>		<b>2021-03-09</b>	
<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>															
<b>Standard Locations</b>		<b>Athens</b>			<b>Davos</b>			<b>Stockholm</b>			<b>Würzburg</b>				
<b>Collector name</b>	$\vartheta_m$	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>	<b>25°C</b>	<b>50°C</b>	<b>75°C</b>		
SQ+ TECH2.5		2 813	1 944	1 237	2 104	1 421	877	1 551	988	586	1 685	1 061	619		
Annual output per m <sup>2</sup> gross area		1 110	768	488	831	561	346	612	390	231	665	419	244		
Annual efficiency, $\eta_a$		63%	43%	28%	51%	34%	21%	53%	33%	20%	53%	34%	20%		
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. 6.1 (July 2019). 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)											B		--		
G (W/m <sup>2</sup> ) >		900		$\vartheta_a$ (°C) >		15		H <sub>x</sub> (MJ/m <sup>2</sup> ) >		540					
Maximum tested positive load											5000		Pa		
Maximum tested negative load											2890		Pa		
Hail resistance using steel ball (maximum drop height)											1.6		m		
<b>Additional collector attribute(s)</b>															
<input type="checkbox"/> Using external power source(s) for normal operation <input type="checkbox"/> Active or passive measure(s) for self-protection <input type="checkbox"/> Co-generating thermal and electrical power <input type="checkbox"/> Façade collector(s)															
<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> )				
SQ+ TECH2.5							7-VH-1234S-A:5.3,1926-C:16.5,1248				2.34				
<b>Data required for CDR (EU) No 811/2013 - Reference Area A<sub>sol</sub></b>							<b>Data required for CDR (EU) No 812/2013 - Reference Area A<sub>sol</sub></b>								
Collector efficiency ( $\eta_{col}$ )							Zero-loss efficiency ( $\eta_0$ )				0.71			--	
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> )				3.71			W/(m <sup>2</sup> K)	
							Second-order coefficient (a <sub>2</sub> )				0.010			W/(m <sup>2</sup> K <sup>2</sup> )	
							Incidence angle modifier IAM (50°)				0.91			--	
							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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