



<b>Annex to Solar Keymark Certificate</b>							<b>Licence Number</b>		<b>011-7S591 F</b>				
<b>Supplementary Information</b>							<b>Issued</b>		<b>2019-04-18</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>
CFK-1		2 330	1 621	1 029	1 745	1 177	717	1 288	821	484	1 405	887	513
Annual output per m <sup>2</sup> gross area		1 013	705	448	759	512	312	560	357	210	611	386	223
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 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. 6.0 (October 2018). A detailed description of the calculations is available at <a href="http://www.solarkeymark.org/scenocalc">www.solarkeymark.org/scenocalc</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 <sub>x</sub> (MJ/m <sup>2</sup> ) >		600			
Maximum tested positive load											3000		Pa
Maximum tested negative load											2000		Pa
Hail resistance using ice balls (diameter)											35		mm
<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"/> Wind and/or infrared sensitive collector(s) (WISC)									
<input type="checkbox"/> Façade collector(s)													
<b>Energy Labelling Information</b>													
	Reference Area, A <sub>sol</sub> (m <sup>2</sup> )				Hydraulic Designation Code								
CFK-1	2.30				9-VH-1234S-7.2,1891-16.4,1079								
<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 ( $\eta_{col}$ )				50%			Zero-loss efficiency ( $\eta_0$ )			0.64		--	
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> )			3.26		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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