





Annex to Solar Keymark Certificate		Licence Number		OEM 10061/4										
Supplementary Information		Issued		2020-03-20										
<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math>, based on ISO 9806:2013 test results</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	
NHS 1.50		1.518	1.052	635	1.150	759	429	843	533	295	915	570	310	
NHS 1.75		1.771	1.227	741	1.341	886	500	984	621	344	1.067	665	361	
NHS 2.00		2.024	1.403	847	1.533	1.013	572	1.124	710	393	1.219	760	413	
NHS 2.30		2.327	1.613	974	1.763	1.165	657	1.293	817	452	1.402	874	475	
NHS 2.50		2.489	1.725	1.042	1.885	1.246	703	1.383	874	484	1.500	934	508	
Annual output per m <sup>2</sup> gross area		1.012	701	424	766	506	286	562	355	197	610	380	206	
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. 5.01 (March 2016). 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			
Hybrid Thermal and Photo Voltaic collector											No			
The collector is deemed to be suitable for roof integration											No			
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:														
Climate class (A, B or C)											A		--	
Maximum tested positive load											2400		Pa	
Maximum tested negative load											2400		Pa	
Hail resistance using steel ball (maximum drop height)											2		m	
<b>Energy Labelling Information</b>														
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$												
NHS 1.50	1,50	Collector efficiency ( $\eta_{col}$ )										52		%
NHS 1.75	1,75	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 9806:2013.												
NHS 2.00	2,00													
NHS 2.30	2,30													
NHS 2.50	2,46													
		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$												
		Zero-loss efficiency ( $\eta_0$ )										0,676		--
		First-order coefficient ( $a_1$ )										3,04		W/(m <sup>2</sup> K)
		Second-order coefficient ( $a_2$ )										0,020		W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)										0,87		--
		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.												
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