



Annex to Solar Keymark Certificate								Licence Number		011-7S1124 F						
Supplementary Information								Issued		2021-08-19						
Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$																
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			
Vitosol 100-F SV1A		2 860	1 989	1 281	2 133	1 445	901	1 576	1 008	605	1 723	1 092	644			
Annual output per m <sup>2</sup> gross area		1 139	792	510	850	576	359	628	401	241	687	435	256			
Annual efficiency, $\eta_a$		65%	45%	29%	52%	35%	22%	54%	34%	21%	55%	35%	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. 6.1 (September 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								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								2750		Pa						
Maximum tested negative load								2400		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"/> 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				Aperature Area, A <sub>a</sub> (m <sup>2</sup> )							
Vitosol 100-F SV1A	2.51				1-V-1234S-A:8.2,14737-C:20.7,1071				2.33							
Data required for CDR (EU) No 811/2013 - Reference Area					Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>											
Collector efficiency ( $\eta_{col}$ )					56%				Zero-loss efficiency ( $\eta_0$ )		0.72		--			
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					First-order coefficient ( $a_1$ )		3.76		W/(m <sup>2</sup> K)							
					Second-order coefficient ( $a_2$ )		0.008		W/(m <sup>2</sup> K <sup>2</sup> )							
					Incidence angle modifier IAM (50°)		0.90									

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.

*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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