

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2383 F
	Issued	2020-12-18

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
LUMINARY 1.5 AR		1,741	1,130	659	1,248	784	435	933	549	294	1,023	594	313
LUMINARY 1.9 AR		2,134	1,385	808	1,530	961	533	1,144	673	360	1,254	729	384
LUMINARY 2.5 AR		2,797	1,815	1,059	2,005	1,259	698	1,500	883	472	1,643	955	503
Annual output per m ² gross area		1,123	729	425	805	506	280	602	354	189	660	383	202
Annual efficiency, η_a		64%	41%	24%	49%	31%	17%	52%	30%	16%	53%	31%	16%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1630 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
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 ϑ_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 <http://www.estif.org/solarkeymarknew/>

Additional Information					
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)	B		--		
G (W/m ²) >	900	ϑ_a (°C) >	15	H_x (MJ/m ²) >	540
Maximum tested positive load	2400		Pa		
Maximum tested negative load	1200		Pa		
Hail resistance using ice balls (diameter)	25		mm		

Additional collector attribute(s)			
<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)		

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
LUMINARY 1.5 AR	1.55	1-V-1234S-A:7,1185-C:13,967-D	1.38
LUMINARY 1.9 AR	1.90	1-V-1234S-A:7,1535-C:13,967-D	1.76
LUMINARY 2.5 AR	2.49	1-V-1234S-A:7,2035-C:13,967-D	2.32

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	51%	Zero-loss efficiency (η_0)	0.70
Remark: Collector efficiency (η_{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 ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{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.		First-order coefficient (a_1)	4.45
		Second-order coefficient (a_2)	0.008
		Incidence angle modifier IAM (50°)	0.94
		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.	