



Annex to Solar Keymark Certificate	Licence Number	OEM 9999.2.15
Supplementary Information	Issued	2024-06-30

Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m																	
Collector name	Standard Locations					Athens			Davos			Stockholm			Würzburg		
	ϑ_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	25°C	50°C	75°C
FG 27		3.422	2.564	1.786		2.673	1.943	1.310	1.954	1.349	874	2.121	1.461	932			
FGH 27		3.422	2.564	1.786		2.673	1.943	1.310	1.954	1.349	874	2.121	1.461	932			
Gross Thermal Yield per m ² gross area		1.258	942	657		983	714	482	718	496	321	780	537	343			
Annual efficiency, η_a		71%	53%	37%		60%	44%	30%	62%	43%	28%	63%	43%	28%			
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. 6.2 (13.01.2022). 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	No				
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)	A		--		
G (W/m ²) >	1000	ϑ_a (°C) >	20	H_x (MJ/m ²) >	600
Maximum tested positive load	3000		Pa		
Maximum tested negative load	3000		Pa		
Hail resistance using steel ball (maximum drop height)	2		m		

Additional collector attribute(s)			
Using external power source(s) for normal operation	No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power	No	Façade collector(s)	No

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
FG 27	2,72	11-V-1234S-A:7.2,2060-C:20.6,1320-	2,57
FGH 27	2,72	18-V-1234S-A:7.2,1158-C:20.6,2240-	2,57

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})	63%	Zero-loss efficiency (η_0)	0,77
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)	3,15
		Second-order coefficient (a_2)	0,012
		Incidence angle modifier IAM (50°)	0,96
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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.			