

Annex to Solar Keymark Certificate					Licence Number		011-7S1410 F							
Supplementary Information					Issued		2023-12-11							
Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m														
Standard Locations		Athens			Davos			Stockholm			Würzburg			
Collector name	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	
CS 500		3 051	2 168	1 368	2 320	1 572	933	1 704	1 098	631	1 862	1 194	677	
CS 550		3 051	2 168	1 368	2 320	1 572	933	1 704	1 098	631	1 862	1 194	677	
Gross Thermal Yield per m ² gross area		1 187	844	532	903	612	363	663	427	246	725	465	263	
Annual efficiency, η_a		67%	48%	30%	55%	38%	22%	57%	37%	21%	58%	37%	21%	
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)				
CS 500		2.57				1-H-1234S-9.2,21837-20.2,1188-D				2.38				
CS 550		2.57				1-H-1234S-9.2,19525-20.2,1188-D				2.38				
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})		57%				Zero-loss efficiency (η_0)		0.73		--				
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)		3.36		W/(m ² K)								
		Second-order coefficient (a ₂)		0.018		W/(m ² K ²)								
		Incidence angle modifier IAM (50°)		0.98		--								
		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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