

Annex to Solar Keymark Certificate	Licence Number	28.01.004
	Date issued	2023-01-17
	Issued by	ECC
Licence holder	SYRIUS SOLAR INDUSTRY	Country FRANCE
Brand (optional)	SYRIUS SOLAR	Web https://syrius-solar.fr
Street, Number	15 Rue de Perpignan	E-mail contact@syrius-solar.fr
Postcode, City	34884 Lavérune	Tel +33 04 67 82 00 18

Collector Type	Flat plate collector
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Collector name	Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s ϑ _m - ϑ _a					
					0 K	10 K	30 K	50 K	70 K	79 K
					W	W	W	W	W	W
C2500D12c	2,53	2 033	1 245	98	1 683	1 579	1 349	1 090	803	665

Power output per m² gross area	665	624	533	431	317	263
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Performance parameters test method	Steady state - indoor									
Performance parameters (related to A_G)	η _{0, b}	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-
Test results	0,687	3,99	0,014	0,000	0,00	6 175	0,000	0,00	0,0E+00	0,79

Incidence angle modifier test method	Steady state - outdoor									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	K _{θT, coll}	1,00	0,98	0,96	0,92	0,85	0,74	0,49	0,00	0,00
Longitudinal	K _{θL, coll}	1,00	0,98	0,96	0,92	0,85	0,74	0,49	0,00	0,00

Heat transfer medium for testing	Water		
Flow rate for testing (per gross area, A_G)	dm/dt	0,020	kg/(sm ²)
Maximum temperature difference during thermal performance test	(ϑ _m -ϑ _a) _{max}	49	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ _{stg}	180,8	°C
Maximum operating temperature	ϑ _{max, op}	204	°C
Maximum operating pressure	p _{max, op}	1000	kPa

Testing laboratory	Fundación CENER, LEST	http://www.cener.com
Test report(s)	30.3878.0-003 30.3878.0-004	Dated 30/08/2021

Comments of testing laboratory Datasheet version: 6.1, 2019-09-26



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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
C2500D12c		2 455	1 554	865	1 769	1 088	565	1 311	761	391	1 426	811	409
Annual output per m ² gross area		970	614	342	699	430	223	518	301	154	564	321	162
Annual efficiency, η_a		55%	35%	19%	43%	26%	14%	44%	26%	13%	45%	26%	13%
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 (September 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	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	2500	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)
C2500D12c	2,53	8-V-1234S-A:11.2,1866-C:20,6,1310-	2,34

Data required for CDR (EU) No 811/2013 - Reference Area		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	48%	Zero-loss efficiency (η_0)	0,67 --
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)	3,99 W/(m ² K)
		Second-order coefficient (a_2)	0,014 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,84 --
		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.	