
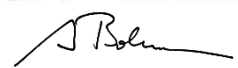


Annex to Solar Keymark Certificate					Licence Number		011-7S2889 F							
					Date issued		2023-11-15							
					Issued by		DIN CERTCO							
Licence holder		Meriaura Energy Oy			Country		Finland							
Brand (optional)		Savosolar			Web		meriauraenergy.com							
Street, Number		Insinöörinkatu 7			E-mail		info@meriaura.com							
Postcode, City		FI-50150 Mikkeli			Tel		+358 10 271 0810							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	118 K				
					m ²	mm	mm	mm	mm	mm	mm			
SF500-15SG-M					15.96	2'591	6'158	213	13'288	12'779	11'665	10'424	9'054	5'247
Power output per m ² gross area					833	801	731	653	567	329				
Performance parameters test method		Steady state - outdoor												
Performance parameters (related to A _G)		$\eta_{0, b}$	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		0.844	3.09	0.010	0.000	0.00	10'220	0.000	0.00	0.0E+00	0.91			
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	1.00	0.99	0.98	0.96	0.88	0.70	0.39	0.00			
Longitudinal		K _{θL, coll}	1.00	1.00	1.00	0.98	0.96	0.89	0.77	0.51	0.00			
Heat transfer medium for testing					Water-Glycole									
Flow rate for testing (per gross area, A _G)					dm/dt	0.020	kg/(sm ²)							
Maximum temperature difference during thermal performance test					($\vartheta_m - \vartheta_a$) _{max}	88	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)					ϑ_{stg}	210	°C							
Maximum operating temperature					$\vartheta_{max, op}$	225	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory		SPF Testing, CH-8640 Rapperswil, Switzerland					www.spf.ch							
Test report(s)		C1704LPEN C1704QPEN C1786ISO					Dated		28.09.2016 28.09.2016 05.10.2018					
Comments of testing laboratory					Draft Ver. 6.2 (22.09.2021)									
					 INSTITUT FÜR SOLARTECHNIK 									
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2889 F
	Issued	2023-11-15

Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m													
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
Collector name													
SF500-15SG-M		21'476	16'522	12'062	17'057	12'840	9'162	12'389	8'880	6'090	13'431	9'610	6'499
Gross Thermal Yield per m ² gross area		1'346	1'035	756	1'069	805	574	776	556	382	842	602	407
Annual efficiency, η_a		76%	59%	43%	66%	49%	35%	67%	48%	33%	68%	48%	33%
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 Draft Ver. 6.2 (22.09.2021). 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	1100		Pa
Maximum tested negative load	1100		Pa
Hail resistance using ice balls (diameter)	45		mm

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)
SF500-15SG-M	15.96	X-H-LRS-A:X-C38.0,2523	14.83

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})	69%	Zero-loss efficiency (η_0)	0.83	
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)	3.09	
		Second-order coefficient (a_2)	0.010	
		Incidence angle modifier IAM (50°)	0.95	--
		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.		