

Certificate number	15975 Rev.0	Replaces	-
Issued	15/10/2018	First edition	15/10/2018
Report number	PKC0003199	Expiry date	14/10/2023
Page	1 of 1	Contract number	PKC0002751

Product Certificate Solar Thermal Products

License holder: Sunerg Solar S.r.l.
Via Donino Donini 51 - 06012 Cinquemiglia - Città di Castello (PG), Italy

Brand name: Solex

Production site(s): Sunerg Solar S.r.l.
Via Donino Donini 51 - 06012 Cinquemiglia - Città di Castello (PG), Italy

Product Solar thermal collector

Model(s): TOP25

Kiwa Cermet Italia hereby declares that the product can be considered complying to the testing requirements and is entitled to use the Solar Keymark Label, based upon the following aspects:

Laboratory testing of the solar thermal products, which are performed by an accredited laboratory in accordance to EN ISO/IEC 17025:2005 -see annex-, using the following standards:

- ISO 9806:2013
Solar Energy – Solar Thermal Collectors – Test Methods

Specific CEN Keymark Scheme Rules for Solar Thermal Products R.31.

Periodic Inspection of the Factory site(s) performed by Kiwa Cermet Italia.

A description of the test results is given in the annex to this certificate.

This certificate is issued in accordance with the Kiwa Cermet Italia regulations.

Publication of the certificate is allowed.

The validity of this certificate is subject to the positive result of periodic surveillance visits.

Chief Operating Officer
Giampiero Belcredi



Kiwa Cermet Italia S.p.A.

Società con socio unico, soggetta all'attività di direzione e coordinamento di Kiwa Italia Holding Srl

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SGQ N° 007A
SGA N° 010D
PRD N° 069B
FSM N° 004I
PRS N° 089C

Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		15975 Rev.0						
					Date issued		2018-10-15						
					Issued by		Kiwa Cermet Italia S.p.A.						
Licence holder	Sunerg Solar S.r.l.				Country	Italy							
Brand (optional)	Solex				Web	http://www.sunergsolar.com							
Street, Number	Via Donino Donini 51				E-mail	info@sunergsolar.com							
Postcode, City	06012 Città di Castello (PG)				Tel	+39 0758540018							
Collector Type					Flat plate collector, glazed								
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 $\vartheta_m - \vartheta_a$								
					0 K W	10 K W	30 K W	50 K W	70 K W	64 K W			
TOP25	2.52	1,987	1,270	100	2,008	1,926	1,750	1,557	1,349	1,413			
Power output per m ² gross area					797	764	694	618	535	561			
Performance parameters test method				Steady state - outdoor									
Performance parameters (related to AG)				$\eta_{0,hem}$	a1	a2							
Units				-	W/(m ² K)	W/(m ² K ²)							
Test results				0.797	3.180	0.008							
Incidence angle modifier test method				Steady state - outdoor									
Bi-directional incidence angle modifiers				No									
Incidence angle modifier				Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal				$K_{gT, coll}$					0.95				
Longitudinal				$K_{gL, coll}$					0.95				
Heat transfer medium for testing				Water-Glycole									
Flow rate for testing (per gross area, A_G)				dm/dt	0.019	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations				$(\vartheta_m - \vartheta_a)_{max}$	64	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)				ϑ_{stg}	224	°C							
Effective thermal capacity, incl. fluid (per gross area, A_G)				C/m ²	10.2	kJ/(Km ²)							
Maximum operating temperature				$\vartheta_{max, op}$	185	°C							
Maximum operating pressure				$p_{max, op}$	600	kPa							
Testing laboratory	ENEA - Centro Ricerche Trisaia				http://www.trisaia.enea.it								
Test report(s)	RP.2018.COL.198.1				Dated	09/05/2018							
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01								
					ENEA DTE-STT Dr. Vincenzo Sobatelli								
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Annex to Solar Keymark Certificate		Licence Number		15975 Rev.0									
Supplementary Information		Issued		2018-10-15									
Annual collector output in kWh/collector at mean fluid temperature ϑ_m, based on ISO 9806:2013 test results													
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
TOP25		3,258	2,473	1,786	2,554	1,899	1,340	1,869	1,319	894	2,025	1,428	951
Annual output per m ² gross area		1,293	981	709	1,014	754	532	742	524	355	804	567	378
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													
Additional Information													
Collector heat transfer medium										Water-Glycole			
Hybrid Thermal and Photo Voltaic collector										No			
The collector is deemed to be suitable for roof integration										Yes			
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:													
Climate class (A, B or C)										A		--	
Maximum tested positive load										2410		Pa	
Maximum tested negative load										2006		Pa	
Hail resistance using steel ball (maximum drop height)										2		m	
Energy Labelling Information													
		Reference Area, A_{sol} (m ²)		Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}									
TOP25		2.52		Collector efficiency (η_{col})					66		%		
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 9806:2013.													
				Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}									
Zero-loss efficiency (η_0)										0.797		--	
First-order coefficient (a_1)										3.18		W/(m ² K)	
Second-order coefficient (a_2)										0.008		W/(m ² K ²)	
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.													
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