



Certificate number	16223 Rev.2	Replaces	16223 Rev.1
Issued	23/11/2022	First edition	13/03/2019
Report number	PKC0003156	Expiry date	12/03/2024
Page	1 of 1	Contract number	PKC0011937

## Product Certificate Solar Thermal Products

<b>License holder:</b>	<b>Greenetica Distribution S.p.A.</b> Via A. Volta 31/A, 35031 Abanoterme (PD), Italy
<b>Production site(s):</b>	Idrocalor S.r.l. Via L. Einaudi 38 – 35030 Saccolongo (PD), Italy
<b>Product</b>	Solar thermal collector
<b>Model(s):</b>	EOS TH

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 SKN\_N0444R6.

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.*

*The validity of this certificate can be verified on request at the following e-mail address: [energy@kiwacermet.it](mailto:energy@kiwacermet.it).*

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President  
Giampiero Belcredi

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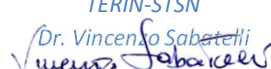


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PRD N° 069B

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC  
Signatory of EA, IAF and ILAC Mutual Recognition Agreements

Annex to Solar Keymark Certificate					Licence Number		16223 Rev.2							
					Date issued		2022-11-23							
					Issued by		Kiwa Cermet Italia S.p.A.							
Licence holder		Greenetica Distribution S.r.l.			Country		Italy							
Brand (optional)					Web		https://greeneticadistribution.com							
Street, Number		Via Alessandro Volta 31/A			E-mail		info@greeneticadistribution.com							
Postcode, City		35031, Abano Terme (PD)			Tel		+39 0498668879							
Collector Type					Concentrating collector									
Collector name					Power output per collector									
					$G_b = 850 \text{ W/m}^2$ , $G_d = 150 \text{ W/m}^2$ & $u = 1.3 \text{ m/s}$ $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	101 K				
					W	W	W	W	W	W				
EOS TH					3.86	3,203	1,206	3,880	2,985	2,955	2,826	2,604	2,290	1,609
Power output per m <sup>2</sup> gross area					773	765	732	674	593	417				
Performance parameters test method		Steady state - outdoor												
Performance parameters (related to A <sub>G</sub> )		$\eta_{0, b}$	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-			
Test results		0.909	0.47	0.030	0.000	0.00	6,756	0.000	0.00	0.0E+00	0.00			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		$K_{\vartheta T, coll}$	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00			
Longitudinal		$K_{\vartheta L, coll}$	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00			
Heat transfer medium for testing		Water												
Flow rate for testing (per gross area, A <sub>G</sub> )		dm/dt	0.043	kg/(sm <sup>2</sup> )										
Maximum temperature difference during thermal performance test		$(\vartheta_m - \vartheta_a)_{max}$	71.4	K										
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a = 30 \text{ }^\circ\text{C}$ )		$\vartheta_{stg}$	196	°C										
Maximum operating temperature		$\vartheta_{max, op}$	100	°C										
Maximum operating pressure		$p_{max, op}$	200	kPa										
Testing laboratory		ENEA Centro Ricerche Trisaia					https://www.trisaia.enea.it							
Test report(s)		RP.2019.COL.204.2					Dated		20/02/2019					
Comments of testing laboratory		Ver. 6.2 (13.01.2022)												
Performance parameters refers to direct normal irradiance (DNI). Flow rate according to manufacturer specification. Collector is provided of active protection controls that prevent damage in any climate class.		 TERIN-STSN Dr. Vincenzo Sabatelli 												
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Annex to Solar Keymark Certificate		Licence Number											
Supplementary Information		Issued											
		16223 Rev.2											
		2022-11-23											
Gross Thermal Yield in kWh/collector at mean fluid temperature $\vartheta_m$													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
EOS TH		5,215	4,776	3,978	4,465	3,855	3,051	3,689	3,204	2,487	3,444	3,008	2,372
Gross Thermal Yield per m <sup>2</sup> gross area		1,350	1,236	1,030	1,156	998	790	955	829	644	892	779	614
Annual efficiency, $\eta_a$		52%	47%	39%	56%	49%	38%	58%	51%	39%	55%	48%	38%
Fixed or tracking collector		2-axis tracking											
Annual irradiation on collector plane		2609 kWh/m <sup>2</sup>			2052 kWh/m <sup>2</sup>			1634 kWh/m <sup>2</sup>			1625 kWh/m <sup>2</sup>		
Mean annual ambient air temperature		18.5°C			3.2°C			7.5°C			9.0°C		
Collector orientation or tracking mode		Tracking			Tracking			Tracking			Tracking		
The collector is operated at constant temperature $\vartheta_m$ (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 <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>													
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)											--		--
G (W/m <sup>2</sup> ) >		$\vartheta_a$ (°C) >						H <sub>x</sub> (MJ/m <sup>2</sup> ) >					
Maximum tested positive load													Pa
Maximum tested negative load													Pa
Hail resistance using steel ball (maximum drop height)													m
Additional collector attribute(s)													
Using external power source(s) for normal operation				No		Active or passive measure(s) for self-protection						Yes	
Co-generating thermal and electrical power				No		Façade collector(s)						No	
Energy Labelling Information					Additional Informative Technical Data								
		Reference Area, A <sub>sol</sub> (m <sup>2</sup> )			Hydraulic Designation Code				Aperture Area, A <sub>a</sub> (m <sup>2</sup> )				
EOS TH		3.86			1-H-LRS-AC:20,1200				3.72				
Data required for CDR (EU) No 811/2013 - Reference Area A <sub>sol</sub>													
Collector efficiency ( $\eta_{col}$ )		71%											
Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>													
Zero-loss efficiency ( $\eta_0$ )		0.77											
First-order coefficient (a <sub>1</sub> )		0.47											
Second-order coefficient (a <sub>2</sub> )		0.030											
Incidence angle modifier IAM (50°)		0.85											
Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.							Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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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