

Certificate number	16223 Rev.0	Replaces	-
Issued	13/03/2019	First edition	13/03/2019
Report number	PKC0003156	Expiry date	12/03/2024
Page	1 of 1	Contract number	PKC0003504

Product Certificate Solar Thermal Products

License holder:	Idrocalor S.r.l. Piazza A. Moro 17, Int.1 – 35030 Rubano (PD), Italy
Production site(s):	Idrocalor S.r.l. Via L. Einaudi 38 – 35030 Saccolongo (PD), Italy
Product	Solar thermal collector
Model(s):	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 ISO/IEC 17025 -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.

The validity of this certificate can be verified on request at the following e-mail address: energy@kiwacermet.it.

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Annex to Solar Keymark Certificate	Licence Number	16223 Rev.0
	Date issued	2019-03-13
	Issued by	Kiwa Cermet Italia S.p.A.

Licence holder	Idrocalor S.r.l.	Country	Italy
Brand (optional)		Web	http://www.idrocalor.com
Street, Number	Piazza A. Moro 17, Int.1 Rubano (PD)	E-mail	info@idrocalor.com
Postcode, City	35030, Rubano (PD)	Tel	+39 049 8015744

Collector Type: Concentrating collector

Collector name	Gross height mm	Gross area (A _G) m ²	Gross length mm	Gross width mm	Aperture area (A _a) m ²	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	101 K
						W	W	W	W	W	W
EOS TH	3,880	3.863	3,500	2,010	3.715	2,985	2,955	2,826	2,604	2,290	1,609
Power output per m ² gross area						773	765	732	674	593	417

Performance parameters test method	Steady state - outdoor										
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 ² K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-	
Test results	0.909	0.47	0.030	0.000	0.00	0	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 _{ET, coll}	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	
Longitudinal	K _{EL, 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 _G)	dm/dt	0.043	kg/(sm ²)
Maximum temperature difference during thermal performance test	(θ _m -θ _a) _{max}	71.4	K
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)	θ _{stg}	196	°C
Maximum operating temperature	θ _{max, op}	100	°C
Maximum operating pressure	p _{max, op}	200	kPa

Testing laboratory	ENEA Centro Ricerche Trisaia	http://www.trisaia.enea.it
Test report(s)	RP.2019.COL.204.2	Dated 20/02/2019

Comments of testing laboratory: 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.

Datashet version: 6.0, 2018-10-30

DTE-STSN
Dr. Vincenzo Sabatini

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	16223 Rev.0
	Issued	2019-03-13

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
EOSTH		5,215	4,776	3,978	4,465	3,855	3,051	3,689	3,204	2,487	3,444	3,008	2,372
Annual output per m ² gross area		1,351	1,237	1,031	1,157	999	790	956	830	644	892	779	615
Fixed or tracking collector		2-axis tracking											
Annual irradiation on collector plane		2609 kWh/m ²			2386 kWh/m ²			1634 kWh/m ²			1625 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		Tracking			Tracking			Tracking			Tracking		
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. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc													

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 ²) >	ϑ_a (°C) >	H_x (MJ/m ²) >	
Maximum tested positive load			Pa
Maximum tested negative load			Pa
Hail resistance using steel ball (maximum drop height)			m

Additional collector attribute(s)	
<input type="checkbox"/> Using external power source(s) for normal operation	<input checked="" type="checkbox"/> Active or passive measure(s) for self-protection
<input type="checkbox"/> Co-generating thermal and electrical power	<input type="checkbox"/> Wind and/or infrared sensitive collector(s) (WISC)
<input type="checkbox"/> Façade collector(s)	

Energy Labelling Information		
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code
EOSTH	3.863	{F)-(O)-(CL)-(A:Ø,L)-(C:Ø,L)-(D)
		{F)-(O)-(CL)-(A:Ø,L)-(C:Ø,L)-(D)

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})	71%	Zero-loss efficiency (η_0)	0.77
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)	0.47
		Second-order coefficient (a_2)	0.030
		Incidence angle modifier IAM (50°)	0.85
		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.	