CERTIFICATE

Certificate number	16620 Rev.0	Replaces	KIP-088937/01
Issued	22/07/2020	First edition	22/07/2015
Report number	140400056/a	Expiry date	21/07/2025
Page	1 of 1	Contract number	PKC0001181

Product Certificate Solar Thermal Products

License holder: **SIC Divisione Elettronica S.r.l.u.**
Via Gran Bretagna – Zona Industriale – 73100 Lecce (LE), Italy

Production site(s): SIC Divisione Elettronica S.r.l.u.
Via Gran Bretagna – Zona Industriale – 73100 Lecce (LE), Italy

Product Photovoltaic thermal collector

Model(s): EASRA024, EASRA026, EASRA028, EASRA030, EASRA032, EASRA034, EASRA036, EASRA038

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:

- EN 12975-2:2006
  Thermal solar systems and components - Solar collectors - Part 2: Test methods

Specific CEN Keymark Scheme Rules for Solar Thermal Products SKN_N0444R3.
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.

Additional information according to the SKN_N0444_Annex P5.1 PVT_R1 of Solar Keymark Scheme Rules:

- PV module tested and certified according to the standards IEC 61215 and IEC 61730;
- Test reports nr.: EPT.15.NRG.0064/52470; EPT.15.NRG.0067/52470; L0002381 rev.00;
- Certificate of Conformity nr.: 15470 Rev.2;
- PV module: manufacturer SIC Divisione Elettronica S.r.l.u.; model name EASRA0xx; power range from 96 to 176 Wp; backsheet colour white.

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.

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
Via Cadriano, 23
40057 Granarolo dell'Emilia (BO)
Tel +39.051.459.3.111
Fax +39.051.763.382
E-mail: info@kiwacermet.it
www.kiwa.it

034

Annex to Solar Keymark Certificate

Licence Number	16620 Rev.0
Date issued	2020-07-22
Issued by	Kiwa Cermet Italia S.p.A.

Licence holder	SIC Divione Elettronica S.r.l.u.	Country	Italy
Brand (optional)		Web	http://www.sic-divisione-elettronica.it
Street, Number	Via Gran Bretagna - Zona Industriale	E-mail	info@sic-divisione-elettronica.it
Postcode, City	73100, Lecce (LE)	Tel	+39 832365945

Collector Type	WISC (Wind and/or infrared sensitive collector)

Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	42 K
	m^2	mm	mm	mm	W	W	W	W	W	W
EASRA024	0,63	1.947	323	43	214	135	0	--	--	0
EASRA026	0,68	2.104	323	43	231	146	0	--	--	0
EASRA028	0,73	2.261	323	43	248	157	0	--	--	0
EASRA030	0,78	2.417	323	43	265	168	0	--	--	0
EASRA032	0,83	2.574	323	43	282	178	0	--	--	0
EASRA034	0,88	2.731	323	43	299	189	0	--	--	0
EASRA036	0,93	2.887	323	43	316	200	0	--	--	0
EASRA038	0,98	3.044	323	43	332	210	0	--	--	0
Power output per m^2 gross area					339	215	0	--	--	0

Performance parameters test method	Steady state - outdoor									
Performance parameters (related to A_G)	η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	J/(m²K)	s/m	W/(m²K⁴)	W/(m²K⁴)	-
Test results	0,358	13,67	0,000	0,718	0,00	48.730	0,000	0,00	0,0E+00	0,65

Incidence angle modifier test method		Steady state - outdoor								
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T,coll}$	1,00	1,00	1,00	0,99	0,95	0,85	0,72	0,50	0,00
Longitudinal	$K_{\theta L,coll}$	1,00	1,00	1,00	0,99	0,95	0,85	0,72	0,50	0,00

Heat transfer medium for testing		Water	
Flow rate for testing (per gross area, A_G)	dm/dt	0,020	kg/(sm²)
Maximum temperature difference during thermal performance test	$(\vartheta_m-\vartheta_a)_{max}$	11,89	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	95,8	°C
Maximum operating temperature	ϑ_{max_op}	110	°C
Maximum operating pressure	$p_{max,op}$	120	kPa

Testing laboratory	EUROFINS – Product Testing Italy S.r.l.		www.eurofins.com
Test report(s)	EPT.15.NRG.0065/52470 EPT.15.NRG.0066/52470	Dated	20/03/2015 20/03/2015

Comments of testing laboratory

Datasheet version: 6.1, 2019-09-26

Thermal performance parameters are given for the PV-module working with max. electrical power output ('MPP mode'). Testing performed according to EN 12975-2, (reference area = gross area). Eurofins laboratory is no longer available, the signature is placed by Kiwa Cermet testing laboratory.

Kiwa Cermet Italia S.p.A.
Società con Socio Unico
Via Cadriano 23
40057 - Granarolo dell'Emilia (BO)
P.I. 00627711203 - C.F. 03502820370

Stamp & signature of testing

Annex to Solar Keymark Certificate	Licence Number	16620 Rev.0
Supplementary Information	Issued	2020-07-22

Annual collector output in kWh/collector at mean fluid temperature ϑ_m

Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	ϑ_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
EASRA024		286			71			80			92		
EASRA026		309			76			86			99		
EASRA028		332			82			93			107		
EASRA030		355			88			99			114		
EASRA032		377			93			105			121		
EASRA034		400			99			112			129		
EASRA036		423			105			118			136		
EASRA038		446			110			124			143		
Annual output per m² gross area		455	--	--	112	--	--	127	--	--	146	--	--
Annual efficiency, η_a		26%	--	--	7%	--	--	11%	--	--	12%	--	--
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1630 kWh/m²			1166 kWh/m²			1244 kWh/m²		
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 ϑm (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)	--	--
G (W/m²) >	ϑ_a (°C) >	H_x (MJ/m²) >
Maximum tested positive load	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using steel ball (maximum drop height)	NA	m

Additional collector attribute(s)

- ☐ Using external power source(s) for normal operation
- ☐ Active or passive measure(s) for self-protection
- ☑ Co-generating thermal and electrical power
- ☐ Façade collector(s)

Energy Labelling Information

	Reference Area, A_{sol} (m²)
EASRA024	0,63
EASRA026	0,68
EASRA028	0,73
EASRA030	0,78
EASRA032	0,83
EASRA034	0,88
EASRA036	0,93
EASRA038	0,98

Data required for CDR (EU) No 811/2013 - Reference Area

Collector efficiency (η_{col})	-16%

Remark: Collector efficiency (ηcol) 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/m², expressed in % and rounded to the nearest integer. Deviating from the regulation ηcol is based on reference area (Asol) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.

Additional Informative Technical Data

	Hydraulic Designation Code	Aperature Area, A_a (m²)
EASRA024	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,60
EASRA026	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,65
EASRA028	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,70
EASRA030	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,75
EASRA032	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,80
EASRA034	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,85
EASRA036	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,90
EASRA038	{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	0,95

Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}

Zero-loss efficiency (η_0)	0,34	--
First-order coefficient (a_1)	12,45	W/(m²K)
Second-order coefficient (a_2)	0,000	W/(m²K²)
Incidence angle modifier IAM (50°)	0,93	--

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.

Kiwa Cermet Italia S.p.A. • Via Cadriano, 23
• 40057 Granarolo dell'Emilia (BO) • Italy
Tel: +39 0514593111 • Fax: +39 051763382 • E-Mail: info@kiwacermet.it • www.kiwa.it