

Number	15425 Rev.0	Replaces	-
Issued	06/12/2017	First edition	06/12/2017
Report number	PKC0001934	Expiry date	05/12/2022
Page	1 of 1	Contract number	PKC0002392

Product Certificate Solar Thermal Products

Kiwa Cermet Italia hereby declares that the **solar thermal collector**, type

X-AIR 14

supplied by **Pleion Industries S.r.l.**
Via Venezia 11 – 37053 Cerea (VR), Italy

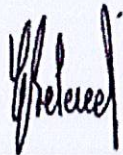
Is entitled to use the Solar Keymark label.

The compliance is based on examination to:
ISO 9806:2013 and the
Specific Keymark Scheme Rules for Solar Thermal Products V30.00

A description of the test results is given in the appendix 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

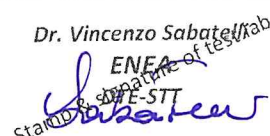



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SGQ N° 007A SSI N° 006G
SGA N° 010D FSM N° 004I
PRD N° 069B

Certificate

Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		15425 Rev.0							
					Date issued		2017-12-06							
					Issued by		Kiwa Cermet Italia S.p.A.							
Licence holder		Pleion Industries S.r.l.			Country		Italy							
Brand (optional)					Web		http://www.pleion.it							
Street, Number		Via Venezia, 11			E-mail		info@pleion.it							
Postcode, City		37053, Cerea (VR)			Tel		+39 0442320295							
Collector Type					Evacuated tubular collector									
Collector name					Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² $\vartheta_m - \vartheta_a$									
					Gross area (A _G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	103 K
					m ²	mm	mm	mm	W	W	W	W	W	W
X-AIR 14					2.63	2,002	1,314	119	1,378	1,338	1,257	1,177	1,096	963
Power output per m ² gross area								524	509	478	448	417	366	
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to A _G)					η _{0,hem}	a1	a2							
Units					-	W/(m ² K)	W/(m ² K ²)							
Test results					0.524	1.530	0.000							
Incidence angle modifier test method					Steady state - outdoor									
Bi-directional incidence angle modifiers					Yes									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{θT, coll}	1.02	1.06	1.14	1.24	1.31	1.31	1.16	0.76	0.00
Longitudinal					K _{θL, coll}	1.00	0.99	0.98	0.96	0.92	0.86	0.73	0.43	0.00
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0.020	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations					(ϑ _m -ϑ _a) _{max}	103.1	K							
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)					ϑ _{stg}	244	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	62.7	kJ/(Km ²)							
Maximum operating temperature					ϑ _{max op}	130	°C							
Maximum operating pressure					p _{max,op}	1000	kPa							
Testing laboratory					Centro Ricerche Trisaia			http://www.trisaia.enea.it						
Test report(s)					RP.2017.COL.197.1			Dated		05/12/2017				
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01									
Performance parameters obtained with a first order fit since negative value for a2 was deduced.					<div style="text-align: right;"> <i>Dr. Vincenzo Sabatelli</i>  ENEAS Standard of Testing E-5TT </div>									
<p style="text-align: center;">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.kiwacermet.it</p>														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	15425 Rev.0
	Issued	2017-12-06

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results

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
X-AIR 14		2,569	2,179	1,839	2,122	1,787	1,506	1,548	1,262	1,030	1,670	1,360	1,107
Annual output per m ² gross area		977	828	699	807	680	573	589	480	392	635	517	421
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	No
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:	
Climate class (A, B or C)	C --
Maximum tested positive load	2400 Pa
Maximum tested negative load	2400 Pa
Hail resistance using steel ball (maximum drop height)	m

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
X-AIR 14	2.63	Collector efficiency (η_{col})	46 %
		<i>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/m², 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.</i>	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.524 --
		First-order coefficient (a_1)	1.53 W/(m ² K)
		Second-order coefficient (a_2)	0.000 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1.19 --
		<i>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.</i>	