



# CERTIFICATE

Certificate number	16941 Rev.0	Replaces	-
Issued	12/10/2021	First edition	12/10/2021
Report number	PKC0004504/B	Expiry date	11/10/2026
Page	1 of 1	Contract number	PKC0005515

## Product Certificate Solar Thermal Products

<b>License holder:</b>	<b>Fototherm S.r.l.</b> Via Olmi,1 – 33050 Gonars (UD), Italy
<b>Production site(s):</b>	Fototherm S.r.l. Via Olmi,1 – 33050 Gonars (UD), Italy
<b>Product</b>	Photovoltaic thermal collector
<b>Model(s):</b>	FTXXXAS (where "XXX" = rated power from 280W to 305W in steps of 5W)

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 12975-1:2006+A1:2010  
Thermal solar systems and components - Solar collectors – Part 1: General requirements
- ISO 9806:2017  
Solar Energy – Solar Thermal Collectors – Test Methods

Specific CEN Keymark Scheme Rules for Solar Thermal Products SKN\_N0444R5.

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.: L0004504/A rev.01;
- Certificate of Conformity nr.: 16940 Rev.0;
- PV module: size 1640x992 mm; power range from 280W to 305W in steps of 5W; backsheet colour black.

*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).*

*Any total or partial reproduction of this document in any form, without Kiwa Cermet Italia express authorization, is prohibited.*

**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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Chief Operating Officer  
Gianpiero Belcredi





Annex to Solar Keymark Certificate					Licence Number		16941 Rev.0							
					Date issued		2021-10-12							
					Issued by		Kiwa Cermet Italia S.p.A.							
Licence holder		Fototherm S.r.l.			Country		Italy							
Brand (optional)					Web		http://www.fototherm.com/							
Street, Number		Via degli Olmi 1			E-mail		luca.maresia@fototherm.com							
Postcode, City		33050, Gonars (UD)			Tel		+39 0432 931595							
Collector Type					WISC (Wind and/or infrared sensitive collector)									
Collector name					Power output per collector									
					G <sub>b</sub> = 850 W/m <sup>2</sup> , G <sub>d</sub> = 150 W/m <sup>2</sup> & u = 1.3 m/s θ <sub>m</sub> - θ <sub>a</sub>									
					0 K	10 K	30 K	50 K	70 K	79 K				
					m <sup>2</sup>	mm	mm	mm	mm	mm	mm			
FTXXXAS (XXX = rated power from 280W to 305W in steps of 5W)					1,63	1.640	992	36	829	704	453	202	0	0
Power output per m <sup>2</sup> gross area					509	432	278	124	0	0				
Performance parameters test method		Steady state - indoor												
Performance parameters (related to A <sub>G</sub> )		η <sub>0, b</sub>	a <sub>1</sub>	a <sub>2</sub>	a <sub>3</sub>	a <sub>4</sub>	a <sub>5</sub>	a <sub>6</sub>	a <sub>7</sub>	a <sub>8</sub>	K <sub>d</sub>			
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		0,480	7,96	0,000	0,156	0,40	92.030	0,049	0,04	0,0E+00	0,89			
Incidence angle modifier test method		Steady state - indoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>eT, coll</sub>	0,99	1,00	1,00	0,98	0,93	0,82	0,64	0,37	0,00			
Longitudinal		K <sub>eL, coll</sub>	0,99	1,00	1,01	0,99	0,94	0,84	0,66	0,38	0,00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A <sub>G</sub> )					dm/dt	0,020	kg/(sm <sup>2</sup> )							
Maximum temperature difference during thermal performance test					(θ <sub>m</sub> -θ <sub>a</sub> ) <sub>max</sub>	49	K							
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; θ <sub>a</sub> = 30 °C)					θ <sub>stg</sub>	90	°C							
Maximum operating temperature					θ <sub>max, op</sub>	80	°C							
Maximum operating pressure					p <sub>max, op</sub>	250	kPa							
Testing laboratory		Kiwa Cermet Italia S.p.A.			http://www.kiwa.com									
Test report(s)		L0004504/B rev.01			Dated		12/10/2021							
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
<p><u>Example comment</u></p> <p>Thermal performance parameters are given for the PV-module working with max. electrical power output ('MPP mode')</p>					<p><b>Kiwa Cermet Italia S.p.A.</b>          Società per azioni          Sede e Direzione Generale          40057 - Granarolo dell'Emilia (BO)          P.I. 00627711203 - C.F. 03602820370</p>									
<p>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.com</p>														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	16941 Rev.0
	Issued	2021-10-12

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$													
Collector name	$\vartheta_m$	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
FTXXXAS (XXX = rated power from 280W to 305W in steps of 5W)		979	292	34	578	154	8	456	123	10	527	143	18
Annual output per m <sup>2</sup> gross area		601	179	21	355	95	5	280	75	6	323	88	11
Annual efficiency, $\eta_a$		34%	10%	1%	22%	6%	0%	24%	6%	1%	26%	7%	1%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 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		South, 25°			South, 30°			South, 45°			South, 35°		

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. 6.1 (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)	A		--
G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20
		$H_x$ (MJ/m <sup>2</sup> ) >	600
Maximum tested positive load	5400	Pa	
Maximum tested negative load	5400	Pa	
Hail resistance using steel ball (maximum drop height)	0,4	m	

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

Energy Labelling Information		Additional Informative Technical Data	
Reference Area, $A_{sol}$ (m <sup>2</sup> )	1,63	Hydraulic Designation Code	Aperture Area, $A_a$ (m <sup>2</sup> )
		{F}-{O}-{CL}-{A:Ø,L}-{C:Ø,L}-{D}	1,56

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 ( $\eta_{col}$ )	20%	Zero-loss efficiency ( $\eta_0$ )	0,51
		First-order coefficient ( $a_1$ )	7,69
		Second-order coefficient ( $a_2$ )	0,000
		Incidence angle modifier IAM (50°)	0,96

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 ( $A_{sol}$ ) 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 ( $A_{sol}$ ) 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.