



Precisely Right.

Page 1/2

Annex to Solar Keymark Certificate					Licence Number		011-7S2582 F							
Summary of EN ISO 9806 Test Results					Issued		2015-09-24							
Collector test standard		EN ISO 9806												
Licence holder		GREENoneTEC Solarindustrie GmbH			Country		Austria							
Brand (optional)					Web		www.greenonetec.com							
Street, Number		Industriepark St. Veit, Energieplatz 1			E-mail		info@greenonetec.com							
Postcode, City		9300 St. Veit an der Glan			Tel		+43 (0)4212-28136-0							
Collector Type					Flat plate collector, glazed									
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>									
					θ <sub>m</sub> - θ <sub>a</sub>									
					0 K	10 K	30 K	50 K	70 K	100 K				
					W	W	W	W	W	W				
FK 8209L 2H					2,03	1.173	1.733	73	1.430	1.348	1.172	983	779	446
FK 8209N 2H					2,03	1.733	1.173	73	1.430	1.348	1.172	983	779	446
FK 8209N 4H					2,03	1.733	1.173	73	1.430	1.348	1.172	983	779	446
FK 8259L 2H					2,53	1.173	2.153	73	1.776	1.674	1.456	1.221	967	554
FK 8259N 2H					2,53	2.153	1.173	73	1.811	1.723	1.528	1.307	1.061	643
FK 8259N 4H					2,53	2.153	1.173	73	1.776	1.674	1.456	1.221	967	554
Power output per m <sup>2</sup> gross area					703	663	577	483	383	219				
Performance parameters test method		Steady state - indoor												
Performance parameters (related to AG)		η <sub>0,hem</sub>	a1	a2										
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )										
Test results		0,703	3,963	0,009										
Incidence angle modifier test method		Quasi dynamic - outdoor												
Bi-directional incidence angle modifiers		No												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>θT, coll</sub>					0,94				0,00			
Longitudinal		K <sub>θL, coll</sub>					0,94				0,00			
Fluid for testing		Water												
Flow rate for testing (per gross area, AG)		dm/dt	0,020	kg/(sm <sup>2</sup> )										
Maximum temperature difference for thermal performance calculations		(θ <sub>m</sub> -θ <sub>a</sub> ) <sub>max</sub>	100	K										
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; θ <sub>a</sub> = 30 °C)		θ <sub>stg</sub>	183	°C										
Effective thermal capacity (per gross area, AG)		C/m <sup>2</sup>	9,57	kJ/(Km <sup>2</sup> )										
Maximum operating temperature		θ <sub>max, op</sub>	220	°C										
Maximum operating pressure		p <sub>max, op</sub>	1000	kPa										
Testing laboratory		AIT Austrian Institute of Technology GmbH					www.ait.ac.at							
Test report(s)		2.04.01265.1.0-1-LT 2.04.01265.1.0-2-LT 2.04.01265.1.0-5-QT					Dated		22.09.2015 22.09.2015 22.09.2015					
Comments of testing laboratory														
<p style="text-align: right;">AIT Austrian Institute of Technology GmbH Donau-City-Straße 1   1220 Wien, Austria T +43 (0) 50550-0   F +43 (0) 50550-0 office@ait.ac.at   www.ait.ac.at</p>														

Datasheet version: 5.01, 2015-07-20



Precisely Right.

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2582 F
	Issued	2015-09-24

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$ , based on ISO 9806 Test Results													
Collector name	Standard Locations $\vartheta_m$	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
FK 8209L 2H		2.268	1.535	950	1.670	1.101	655	1.239	767	439	1.350	827	466
FK 8209N 2H		2.268	1.535	950	1.670	1.101	655	1.239	767	439	1.350	827	466
FK 8209N 4H		2.268	1.535	950	1.670	1.101	655	1.239	767	439	1.350	827	466
FK 8259L 2H		2.818	1.907	1.180	2.075	1.367	814	1.540	953	546	1.677	1.027	579
FK 8259N 2H		2.817	1.907	1.180	2.074	1.367	814	1.539	953	546	1.677	1.027	579
FK 8259N 4H		2.818	1.907	1.180	2.075	1.367	814	1.540	953	546	1.677	1.027	579
Annual output per m <sup>2</sup> gross area		1.116	755	467	822	541	322	610	377	216	664	407	229
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 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. 5.01 (July 2015). A detailed description of the calculations is available at <a href="http://www.solarkeymark.org/scenocalc">www.solarkeymark.org/scenocalc</a>													

Additional Information		
Collector heat transfer medium		Liquid
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 under the following conditions:		
Climate class (A, B or C)		A
Positive Mechanical Load		3072 Pa
Negative Mechanical Load		2810 Pa
Hail resistance using ice balls (diameter)		- mm

Energy Labelling Information			
	Reference Area, A <sub>sol</sub> (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area A <sub>sol</sub>	
FK 8209L 2H	2,03	Collector efficiency ( $\eta_{col}$ )	53 %
FK 8209N 2H	2,03	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.	
FK 8209N 4H	2,03		
FK 8259L 2H	2,53		
FK 8259N 2H	2,53		
FK 8259N 4H	2,53		
		Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>	
		Zero-loss efficiency ( $\eta_0$ )	0,703
		First-order coefficient (a <sub>1</sub> )	3,96 W/(m <sup>2</sup> K)
		Second-order coefficient (a <sub>2</sub> )	0,009 W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0,94
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.			