


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2179 F				
					Date issued		2018-05-04				
					Issued by		TÜV Rheinland Energy GmbH				
Licence holder		ÖkofEN France			Country		France				
Brand (optional)					Web		www.okofen.fr				
Street, Number		Rue des Tenettes			E-mail		info@okofen.fr				
Postcode, City		73190 Saint Baldoph			Tel		+33 04 79 65 01 71				
Collector Type					Flat plate collector, glazed						
Collector name	Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ϑ _m - ϑ _a						
					0 K W	10 K W	30 K W	50 K W	70 K W	90 K W	
PELLESOL i	2.20	2 098	1 050	122	1 569	1 499	1 347	1 178	994	794	
Power output per m ² gross area					712	680	611	535	451	360	
Performance parameters test method		Steady state - indoor									
Performance parameters (related to AG)		η _{0,hem}	a ₁	a ₂							
Units		-	W/(m ² K)	W/(m ² K ²)							
Test results		0.712	3.096	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 _{θT, coll}					0.92				0.00
Longitudinal		K _{θL, coll}					0.92				0.00
Heat transfer medium for testing					Water						
Flow rate for testing (per gross area, A _G)					dm/dt	0.050	kg/(sm ²)				
Maximum temperature difference for thermal performance calculations					(ϑ _m -ϑ _a) _{max}	90	K				
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)					ϑ _{stg}	200	°C				
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	15.93	kJ/(Km ²)				
Maximum operating temperature					ϑ _{max, op}	205	°C				
Maximum operating pressure					p _{max, op}	1000	kPa				
Testing laboratory		TÜV Rheinland Energy GmbH			www.tuv.com/solarpower						
Test report(s)		2.04.01243.1.0-1-LT (AIT; Thermal Performance) 2.04.01243.1.0-1-QT (AIT; Reliability) 06COL470/1OEM07 (ITW; document evaluation))			Dated		16.03.2015 16.03.2015 30.07.2013				
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01						
<p><i>*This data sheet is not complete as the testing of the collector was not performed according to ISO 9806:2013. The steady state test evaluation was recalculated with gross area. The former values related to 2.02 m² aperture area had been: eta0a=0.776; a1a=3.372; a2a=0.010. TÜV Rheinland Energy GmbH is not responsible for the test reports and the results issued by AIT Austrian Institute of Technology.</i></p>					 Genau. Richtig. TÜV Rheinland Energy GmbH Am Grauen Stein 51105 Köln						
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2179 F
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on EN 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
PELLESOL i		2 468	1 809	1 242	1 904	1 365	914	1 394	947	608	1 511	1 020	645
Annual output per m ² gross area		1 120	821	563	864	619	415	632	430	276	686	463	293
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	Yes	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	A	--
Maximum tested positive load	1500	Pa
Maximum tested negative load	1000	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}	
PELLESOL i	2.20	Collector efficiency (η_{col})	57 %
		<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)	0.712 --
		First-order coefficient (a_1)	3.10 W/(m ² K)
		Second-order coefficient (a_2)	0.009 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.92 --
		<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>	