


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S838 F							
					Date issued		2017-02-07							
					Issued by		TÜV Rheinland Energy GmbH							
Licence holder	ökoTech Solarkollektoren GmbH				Country	Austria								
Brand (optional)	ökoTech				Web	http://www.oekotech.biz								
Street, Number	Gradnerstraße 54/C				E-mail	technik@oekotech.biz								
Postcode, City	A-8055 Graz				Tel	+43 316/576077								
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				
ökoTech GS **	4.26	2 050	2 079	121	3 008	2 851	2 503	2 112	1 676	1 196				
ökoTech GS **	16.95	2 353	7 173	115	11 967	11 342	9 961	8 403	6 669	4 759				
Power output per m ² gross area					706	669	588	496	393	281				
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to A _G)					η _{0,hem}	a ₁	a ₂							
Units					-	W/(m ² K)	W/(m ² K ²)							
Test results					0.706	3.555	0.013							
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}	*	*	*	*	0.94	*	*	*	0.00
Longitudinal					K _{θL, coll}	*	*	*	*	0.94	*	*	*	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}	90	K							
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)					ϑ _{stg}	184	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	5.9	kJ/(Km ²)							
Maximum operating temperature					ϑ _{max, op}	-	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory					AIT Austrian Institute of Technology		http://www.ait.ac.at							
Test report(s)					2.04.00667.1.0-1- QT 2.04.00667.1.0-1- LT Declaration "Neubewertung der Stillstandstemperatur"		Dated		29.06.2009 29.06.2009 16.10.2015					
Comments of testing laboratory					Datasheet version: 5.01, 2016-03-01									
<p>*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 3.802 m² aperur area: eta0a=0.790; a1a=3.979; a2a=0.014. ** The collector family ÖkoTech-GS includes modules in different specific dimensions up to a gross area of more than 20 m². TÜV Rheinland Energy GmbH is not responsible for the test reports and it's results issued by AIT Austrian Institute of Technology.</p>					 TÜVRheinland® Genau. Richtig. TÜV Rheinland Energy GmbH Am Grauen Stein 51105 Köln									
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S838 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													
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
ökoTech GS 4.2 m ²		4 484	3 063	1 890	3 362	2 239	1 329	2 463	1 549	897	2 676	1 660	938
ökoTech GS 16.7 m ²		17 842	12 186	7 521	13 377	8 909	5 287	9 801	6 164	3 570	10 646	6 604	3 734
Annual output per m ² gross area		1 053	719	444	789	526	312	578	364	211	628	390	220
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°		

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)	*	--
Maximum tested positive load	*	Pa
Maximum tested negative load	*	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}	
ökoTech GS 4.2 m ²	4.26	Collector efficiency (η_{col})	54 %
ökoTech GS 16.7 m ²	16.95	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/m ² , 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.	
		Data required for CDR (EU) No 812/2013 - Reference Area A _{sol}	
		Zero-loss efficiency (η_0)	0.706 --
		First-order coefficient (a ₁)	3.56 W/(m ² K)
		Second-order coefficient (a ₂)	0.013 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0.94 --
		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.	
*This data sheet is not complete as the			