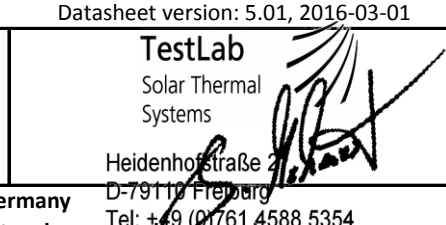


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2765 F							
					Date issued		2017-05-24							
					Issued by		Din Certco							
Licence holder		Aguasol Solartechnik GmbH			Country		Germany							
Brand (optional)					Web		http://www.aguasol-solartechnik.de/							
Street, Number		Dr.-Carl-Schwenkstr. 20			E-mail		technik@aguasol.pro							
Postcode, City		89233 Neu-Ulm			Tel/Fax		0049 (0)731 880070-0							
Collector Type					Flat plate collector, glazed									
Collector name					Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ϑ _m - ϑ _a									
					0 K	10 K	30 K	50 K	70 K	70 K				
					m ²	mm	mm	mm	W	W	W	W	W	W
AS 4.8					4,80	2.400	2.000	120	3.278	3.133	2.791	2.380	1.899	1.899
AS 6					6,00	2.000	3.000	120	4.098	3.917	3.489	2.975	2.374	2.374
AS 6m					6,10	1.520	4.000	120	4.166	3.982	3.547	3.024	2.414	2.414
Power output per m ² gross area									683	653	581	496	396	396
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to AG)					η _{0,hem}	a ₁	a ₂							
Units					-	W/(m ² K)	W/(m ² K ²)							
Test results					0,683	2,84	0,018							
Incidence angle modifier test method					Steady state - outdoor									
Bi-directional incidence angle modifiers					No									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{GT, coll}	1,00	1,00	1,00	0,99	0,97	0,92	0,81	0,56	0,00
Longitudinal					K _{GL, coll}	1,00	1,00	1,00	0,99	0,97	0,92	0,81	0,56	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}	70	K							
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)					ϑ _{stg}	212	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	5,5	kJ/(Km ²)							
Maximum operating temperature					ϑ _{max, op}	130	°C							
Maximum operating pressure					p _{max, op}	600	kPa							
Testing laboratory					TestLab Solar Thermal Systems, Fraunhofer ISE				http://www.collectortest.com					
Test report(s)					ktb-2014-13 ktb-2014-20-k				Dated		04.04.2014 11.11.2014			
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01									
The IAM-Measurement has been performed on the collector AS 7.2 (see test report ktb-2014-20-k)					 <p>TestLab Solar Thermal Systems Heidenhofstraße D-79110 Freiburg Tel: +49 (0)761 4588 5354</p>									
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2765 F
	Issued	2017-05-24

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
AS 4.8		5.356	3.905	2.536	4.130	2.867	1.750	3.034	2.005	1.184	3.298	2.176	1.265
AS 6		6.695	4.881	3.170	5.162	3.583	2.188	3.793	2.506	1.480	4.123	2.720	1.581
AS 6m		6.807	4.962	3.223	5.248	3.643	2.224	3.856	2.548	1.505	4.192	2.765	1.608
Annual output per m ² gross area		1.116	813	528	860	597	365	632	418	247	687	453	264
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)	B	--
Maximum tested positive load	1250	Pa
Maximum tested negative load	1000	Pa
Hail resistance using ice balls (diameter)	0	mm

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
AS 4.8	4,80	Collector efficiency (η_{col})	54	%
AS 6	6,00	<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>		
AS 6m	6,10			
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0,683	--
		First-order coefficient (a_1)	2,84	W/(m ² K)
		Second-order coefficient (a_2)	0,018	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,97	--
		<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>		