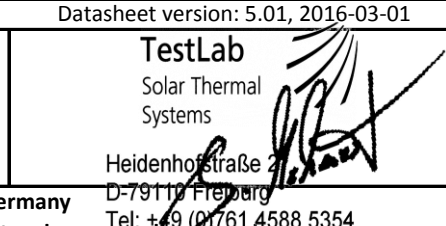


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S1655 R							
					Date issued		2017-05-17							
					Issued by		Din Certco							
Licence holder		Westech Solar Jiangsu Ltd.			Country		China							
Brand (optional)					Web		www.wt-solar.com							
Street, Number		Add: 509 Of West Tower Of Urban Development			E-mail		roger@wt-solar.com							
Postcode, City		Binhu District, Wuxi, China, 214072			Tel/Fax		0086-510-85160845							
Collector Type					Evacuated tubular collector									
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
WT-B58-30					5,05	2.030	2.490	180	1.890	1.836	1.721	1.598	1.466	1.466
WT-B58-25					4,24	2.030	2.090	180	1.587	1.541	1.445	1.341	1.231	1.231
WT-B58-24					4,08	2.030	2.010	180	1.527	1.483	1.390	1.291	1.185	1.185
WT-B58-22					3,76	2.030	1.850	180	1.408	1.367	1.281	1.189	1.092	1.092
WT-B58-20					3,43	2.030	1.690	180	1.284	1.247	1.169	1.085	996	996
WT-B58-18					3,11	2.030	1.530	180	1.164	1.131	1.060	984	903	903
WT-B58-15					2,62	2.030	1.290	180	981	952	893	829	761	761
WT-B58-12					2,13	2.030	1.050	180	797	774	726	674	618	618
WT-B58-10					1,81	2.030	890	180	678	658	617	573	526	526
Power output per m ² gross area									374	364	341	316	290	290
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					0,374	1,06	0,002							
Incidence angle modifier test method					Steady state - outdoor									
Bi-directional incidence angle modifiers					Yes									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{θT, coll}	1,00	1,00	0,99	0,96	0,92	0,84	0,69	0,44	0,00
Longitudinal					K _{θL, coll}	1,00	1,04	1,11	1,26	1,42	1,40	1,05	0,60	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}	239	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	15,6	kJ/(Km ²)							
Maximum operating temperature					ϑ _{max, op}	100	°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-2011-20-k ktb-2011-22-k					Dated		11.07.2011							
							11.07.2011							
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.</i></p> <p><i>According to Scenocalc v5.01 the power output per collector unit of a steady state performance test does not consider the fraction of the diffuse irradiance, but it is calculated based on η_{0,hem} for a global hemispherical irradiance of 1000 W/m².</i></p>					 <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	011-7S1655 R
	Issued	2017-05-17

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
WT-B58-30		3.305	2.758	2.250	2.769	2.279	1.843	1.944	1.533	1.184	2.131	1.688	1.304
WT-B58-25		2.775	2.316	1.889	2.325	1.914	1.547	1.633	1.287	994	1.789	1.417	1.095
WT-B58-24		2.670	2.229	1.818	2.237	1.841	1.489	1.571	1.239	956	1.722	1.364	1.054
WT-B58-22		2.460	2.054	1.675	2.062	1.697	1.372	1.448	1.141	881	1.587	1.257	971
WT-B58-20		2.244	1.874	1.528	1.881	1.548	1.252	1.321	1.041	804	1.448	1.146	886
WT-B58-18		2.035	1.699	1.386	1.705	1.404	1.135	1.197	944	729	1.313	1.039	803
WT-B58-15		1.714	1.431	1.167	1.437	1.182	956	1.009	795	614	1.106	876	677
WT-B58-12		1.394	1.163	949	1.168	961	777	820	647	499	899	712	550
WT-B58-10		1.184	989	806	992	817	661	697	549	424	764	605	468

Annual output per m ² gross area	654	546	446	548	451	365	385	304	234	422	334	258
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	see comment	Pa
Maximum tested negative load	see comment	Pa
Hail resistance using ice balls (diameter)	see comment	mm

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
WT-B58-30	5,05	Collector efficiency (η_{col})	33 %
WT-B58-25	4,24	<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>	
WT-B58-24	4,08		
WT-B58-22	3,76		
WT-B58-20	3,43		
WT-B58-18	3,11		
WT-B58-15	2,62		
WT-B58-12	2,13		
WT-B58-10	1,81		
		Zero-loss efficiency (η_0)	0,374 --
		First-order coefficient (a_1)	1,06 W/(m ² K)
		Second-order coefficient (a_2)	0,002 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,21 --
<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>			