



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2785 R							
					Date issued		2017-08-30							
					Issued by		DIN CERTCO							
Licence holder		Jiangsu Micoe Solar Energy Co., Ltd			Country		China							
Brand (optional)		Micoe			Web		http://en.micoe.com							
Street, Number		No. 199, Yingzhou Road			E-mail		certification@micoe.com							
Postcode, City		222000, Lianyungang City			Tel		86 518-85959567							
Collector Type					Evacuated tubular collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² ; Gd = 150 W/m ² ; u = 3 m/s θ _m - θ _a									
					0 K	10 K	30 K	50 K	70 K	72 K				
					W	W	W	W	W	W				
SZ58/1800/2.2-10HA					1.72	2 000	860	157	709	688	646	603	561	557
SZ58/1800/2.2-15HA					2.50	2 000	1 250	157	1 031	1 000	938	877	815	810
SZ58/1800/2.2-20HA					3.28	2 000	1 640	157	1 353	1 312	1 231	1 150	1 069	1 063
SZ58/1800/2.2-25HA					4.06	2 000	2 030	157	1 674	1 624	1 524	1 424	1 324	1 316
SZ58/1800/2.2-30HA					4.84	2 000	2 420	157	1 996	1 936	1 817	1 697	1 578	1 569
Power output per m ² gross area					412	400	375	351	326	324				
Performance parameters test method				Quasi dynamic										
Performance parameters (related to AG)				η _{0,b}	c ₁	c ₂	c ₃	c ₄	c ₆	K _d				
Units				-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-				
Test results				0.405	1.233	0.000	0.000	0.000	0.000	1.121				
Incidence angle modifier test method				Quasi dynamic - outdoor										
Bi-directional incidence angle modifiers				Yes										
Incidence angle modifier				Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal				K _{θT, coll}	1.02	1.07	1.16	1.34	1.47	1.56	1.50	1.06	0.00	
Longitudinal				K _{θL, coll}	1.00	0.99	0.97	0.94	0.89	0.81	0.63	0.00	0.00	
Heat transfer medium for testing				Water-Glycole										
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}	71.56	K								
Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C)				θ _{stg}	233.9	°C								
Effective thermal capacity, incl. fluid (per gross area, A _G)				C/m ²	13.45	kJ/(Km ²)								
Maximum operating temperature				θ _{max, op}	120	°C								
Maximum operating pressure				p _{max, op}	600	kPa								
Testing laboratory				TÜV Rheinland (Shanghai) Co., Ltd.				www.tuv.com						
Test report(s)				154078702a_EN_SZ58-10HA_Report_zhao 154078702a_EN_SZ58-30HA_Report_zhao				Dated		8/29/2017 8/29/2017				
Comments of testing laboratory				Datashet version: 5.01, 2016-03-01										
During hail resistance test using 45 mm ice balls, the upper end of tested tubes bore the impact while the lower end failed.														
DIN CERTCO • Alboinstraße 56 • 12103 Berlin 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	011-7S2785 R
	Issued	2017-08-30

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on 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
SZ58/1800/2.2-10HA		1 388	1 182	1 001	1 141	963	813	841	689	565	906	742	607
SZ58/1800/2.2-15HA		2 018	1 718	1 455	1 659	1 400	1 181	1 223	1 002	821	1 317	1 078	882
SZ58/1800/2.2-20HA		2 647	2 254	1 908	2 176	1 837	1 550	1 604	1 314	1 077	1 728	1 415	1 157
SZ58/1800/2.2-25HA		3 277	2 790	2 362	2 694	2 273	1 918	1 986	1 627	1 333	2 139	1 751	1 432
SZ58/1800/2.2-30HA		3 906	3 326	2 816	3 211	2 710	2 287	2 368	1 939	1 589	2 550	2 087	1 707
Annual output per m ² gross area		807	687	582	663	560	472	489	401	328	527	431	353
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)	C --
Maximum tested positive load	2400 Pa
Maximum tested negative load	2400 Pa
Hail resistance using ice balls (diameter)	45 mm

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
SZ58/1800/2.2-10HA	1.72	Collector efficiency (η_{col})	36 %
SZ58/1800/2.2-15HA	2.50	<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>	
SZ58/1800/2.2-20HA	3.28		
SZ58/1800/2.2-25HA	4.06		
SZ58/1800/2.2-30HA	4.84		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0.412 --
		First-order coefficient (a_1)	1.23 W/(m ² K)
		Second-order coefficient (a_2)	0.000 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1.26 --
		<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>	