

Holder/Issued to/Manufacturer

Zhejiang Shentai Solar Energy Co., Ltd.

Lianhong Road, Yuanhua Industry Zone, Haining, Zhejiang, China

Product name and description

Vacuum tube solar thermal collectors for water heating.
For technical information see Appendix (2 pages).

Models:	SHC8	SHC9	SHC10	SHC12
	SHC14	SHC15	SHC16	SHC18
	SHC20	SHC21	SHC22	SHC24

Performance specification

The product is found to comply with the requirements in EN 12975-1:2006+A1:2010 Solar collectors, Part 1: General requirements and the Specific CEN Keymark Scheme Rules for Solar Thermal Products and are based on test results according to EN 12975-2:2006 Solar collectors Part 2: Test methods.

Marking

Products conforming to this certificate shall be marked in accordance with the requirements in the Specific CEN Keymark Scheme Rules for Solar Thermal Products. The marking shall, together with the Keymark logo, show the identification code of the empowered certification body (RISE Research Institutes of Sweden AB, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

Validity

This certificate is valid until 2024-01-20 provided that the conditions in the Solar Keymark Rules are fulfilled and the standard or rules are not modified significantly. The validity of the certificate can be checked in the database, see Solar Keymark website <http://www.solarkeymark.org>.

Miscellaneous

The manufacturer's factory production control procedures are under surveillance by the responsibility of RISE. This certificate was first issued 2014-01-20. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Johan Åkesson

Magnus Sturesson

Certificate No. SC0055-14 | issue 2 | 2019-01-11


RISE Research Institutes of Sweden AB | Certification
Box 857, SE-501 15 Borås, Sweden
Phone: +46 10-516 50 00
certifiering@ri.se | www.ri.se

2017-08-08



012



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		SC0055-14				
					Date issued		2019-01-11				
					Issued by		RISE				
Licence holder	Zhejiang Shentai Solar Energy Co., Ltd.				Country	China					
Brand (optional)	Suntask				Web	www.suntasksolar.com					
Street, Number	199 Lianhong road, Yuanhua Industry Zone				E-mail	info@suntasksolar.com					
Postcode, City	314416	Haining, Zhejiang			Tel	+86	573-87861111				
Collector Type					Evacuated tubular collector						
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	63 K W	
SHC8	1,74	1917	910	133	938	917	869	816	757	777	
SHC9	1,96	1917	1020	133	1052	1027	974	914	848	871	
SHC10	2,17	1917	1130	133	1165	1138	1079	1013	940	965	
SHC12	2,59	1917	1350	133	1392	1360	1289	1210	1123	1154	
SHC14	3,01	1917	1570	133	1619	1582	1500	1408	1306	1342	
SHC15	3,22	1917	1680	133	1733	1693	1605	1506	1398	1436	
SHC16	3,43	1917	1790	133	1846	1803	1709	1605	1489	1529	
SHC18	3,85	1917	2010	133	2073	2025	1920	1802	1672	1717	
SHC20	4,28	1917	2230	133	2300	2247	2130	1999	1855	1906	
SHC21	4,49	1917	2340	133	2413	2358	2235	2098	1947	2000	
SHC22	4,70	1917	2450	133	2527	2468	2340	2197	2038	2094	
SHC24	5,12	1917	2670	133	2753	2690	2550	2394	2221	2281	
Power output per m² gross area					538	526	498	468	434	446	
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		0,538	1,206	0,004							
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}	1,02	1,03	1,04	1,05	1,12	1,18	0,79	0,39	0,00
Longitudinal		K _{θL, coll}	1,00	0,99	0,99	0,97	0,95	0,91	0,83	0,57	0,00
Heat transfer medium for testing		Water									
Flow rate for testing (per gross area, A_G)		dm/dt	0,016		kg/(sm ²)						
Maximum temperature difference for thermal performance calculations		(ϑ _m -ϑ _a) _{max}	63,24		K						
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)		ϑ _{stg}	280		°C						
Effective thermal capacity, incl. fluid (per gross area, A_G)		C/m ²	3,17		kJ/(Km ²)						
Maximum operating temperature		ϑ _{max, op}	120		°C						
Maximum operating pressure		p _{max, op}	1000		kPa						
Testing laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch				http://www.intertek.com						
Test report(s)	131016040GZU -001				Dated	2014-01-07					
Comments of testing laboratory		The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed. Tests were performed based on EN 12975-2:2006.									
		Datasheet version: 5.01, 2016-03-01  <i>William zheng</i>									
RISE Research Institutes of Sweden AB Certification Box 857, SE-501 15 Borås, Sweden, Phone: +46 10-516 50 00, certifiering@ri.se www.ri.se											

Annex to Solar Keymark Certificate	Licence Number	SC0055-14
Supplementary Information	Issued	2019-01-11

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
SHC8		1633	1406	1180	1374	1161	961	991	813	654	1069	878	704
SHC9		1830	1576	1322	1541	1302	1077	1111	912	733	1198	984	789
SHC10		2028	1746	1465	1707	1442	1194	1230	1010	812	1327	1091	874
SHC12		2423	2086	1750	2039	1723	1426	1470	1207	970	1586	1303	1044
SHC14		2818	2426	2036	2372	2004	1659	1710	1404	1129	1844	1516	1215
SHC15		3015	2596	2179	2538	2145	1775	1830	1502	1208	1974	1622	1300
SHC16		3212	2766	2321	2704	2285	1891	1949	1600	1286	2102	1728	1384
SHC18		3607	3106	2606	3036	2566	2123	2189	1797	1445	2361	1940	1555
SHC20		4002	3446	2891	3369	2847	2356	2428	1994	1603	2619	2153	1725
SHC21		4200	3616	3034	3535	2987	2472	2548	2092	1682	2749	2259	1810
SHC22		4397	3786	3177	3701	3127	2589	2668	2191	1761	2878	2365	1895
SHC24		4791	4125	3462	4033	3408	2821	2907	2387	1919	3136	2577	2065
Annual output per m ² gross area		936	806	676	788	666	551	568	466	375	613	504	404
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	
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	2860	Pa
Maximum tested negative load	--	Pa
Hail resistance using steel ball (maximum drop height)	0,8	m

Energy Labelling Information				
	Reference Area, A _{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A _{sol}		
SHC8	1,74	Collector efficiency (η_{col})	48	%
SHC9	1,96	<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>		
SHC10	2,17			
SHC12	2,59			
SHC14	3,01			
SHC15	3,22			
SHC16	3,43			
SHC18	3,85			
SHC20	4,28	Data required for CDR (EU) No 812/2013 - Reference Area A _{sol}		
SHC21	4,49	Zero-loss efficiency (η_0)	0,538	--
SHC22	4,70	First-order coefficient (a ₁)	1,21	W/(m ² K)
SHC24	5,12	Second-order coefficient (a ₂)	0,004	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,02	--
<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>				