



# CERTIFICATE

## Solar Keymark Certificate No. SP SC0823-17

### Holder/Issued to/Manufacturer

Company: Haining Jixiang Solar Energy Co., Ltd.

Address: No. 18 Lianhong Road, Yuanhua Industrial Zone, Haining City, Zhejiang Province, China

### Product name and description

Vacuum tube solar thermal collectors for water heating.

For technical information see Appendix (2 pages).

Models:	<b>JXSPC-10</b>	<b>JXSPC-12</b>	<b>JXSPC-15</b>
	<b>JXSPC-18</b>	<b>JXSPC-20</b>	<b>JXSPC-24</b>
	<b>JXSPC-25</b>	<b>JXSPC-30</b>	

### Certificate

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 (SP Technical Research Institute of Sweden, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

### Validity

This certificate is valid until 2022-06-07 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 SP. These products were previously part of DIN CERTCO certificate no. 011-7S1821 R, issued 2012-03-27.

Borås, Sweden 2017-06-19

### SP Technical Research Institute of Sweden Certification

Lennart Aronsson  
Certification Manager

Magnus Stuesson  
Certification Officer



012

### SP Technical Research Institute of Sweden

Box 857, SE-501 15 Borås, Sweden

Phone: +46 10-516 50 00

E-mail/internet: [info@sp.se](mailto:info@sp.se)/[www.sp.se](http://www.sp.se)

Empowered Certification Body No. 012: SP Certification, Sweden

For more information of Solar Keymark visit: [www.solarkeymar.org](http://www.solarkeymar.org)

This certificate may not be reproduced other than in full, except with the prior written approval by SP. SP Certification rules SPCR402 applies.

## Annex to Solar Keymark Certificate

<b>Annex to Solar Keymark Certificate - Summary of ISO 9806:2013 Test Results</b>						<b>Licence Number</b>		<b>SP SC0823-17</b>							
						<b>Date issued</b>		<b>2017-06-19</b>							
						<b>Issued by</b>		<b>SP</b>							
<b>Licence holder</b>	Haining Jixiang Solar Energy Co.,Ltd					<b>Country</b>	China								
<b>Brand (optional)</b>						<b>Web</b>	www.lucky-energy.com								
<b>Street, Number</b>	No. 18 Lianhong Road, Yuanhua Industrial Zone					<b>E-mail</b>	admin@jixiangzc.com								
<b>Postcode, City</b>	314416	Haining City, Zhejiang Province				<b>Tel</b>	+86	573-87871377							
<b>Collector Type</b>						Evacuated tubular collector									
<b>Collector name</b>	<b>Gross area (<math>A_G</math>)</b> m <sup>2</sup>	<b>Gross length</b> mm	<b>Gross width</b> mm	<b>Gross height</b> mm	<b>Power output per collector</b> G <sub>b</sub> = 850 W/m <sup>2</sup> ; G <sub>d</sub> = 150 W/m <sup>2</sup> $\vartheta_m - \vartheta_a$										
					0 K W	10 K W	30 K W	50 K W	70 K W	62 K W					
JXSPC-10	1,60	2020	790	130	662	646	608	564	513	533					
JXSPC-12	2,05	2020	1015	130	851	830	781	724	659	685					
JXSPC-15	2,50	2020	1240	130	1039	1014	954	885	805	837					
JXSPC-18	2,96	2020	1465	130	1228	1197	1127	1045	951	988					
JXSPC-20	3,26	2020	1615	130	1354	1320	1243	1152	1049	1090					
JXSPC-24	3,87	2020	1915	130	1605	1565	1474	1366	1244	1292					
JXSPC-25	4,02	2020	1990	130	1668	1627	1531	1420	1292	1343					
JXSPC-30	4,63	2020	2290	130	1920	1872	1762	1634	1487	1545					
<b>Power output per m<sup>2</sup> gross area</b>					415	405	381	353	321	334					
<b>Performance parameters test method</b>						Steady state - outdoor									
<b>Performance parameters (related to AG)</b>						$\eta_{0,hem}$	a1	a2							
<b>Units</b>						-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )							
<b>Test results</b>						0,415	0,986	0,005							
<b>Incidence angle modifier test method</b>						Quasi dynamic - outdoor									
<b>Bi-directional incidence angle modifiers</b>						Yes									
<b>Incidence angle modifier</b>						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
<b>Transversal</b>						$K_{\theta T, coll}$	1,03	1,07	1,14	1,24	1,47	1,32	0,80	0,05	0,00
<b>Longitudinal</b>						$K_{\theta L, coll}$	1,00	1,00	0,99	0,99	0,97	0,95	0,91	0,78	0,00
<b>Heat transfer medium for testing</b>						Water									
<b>Flow rate for testing (per gross area, <math>A_G</math>)</b>						dm/dt	0,020	kg/(sm <sup>2</sup> )							
<b>Maximum temperature difference for thermal performance calculations</b>						$(\vartheta_m - \vartheta_a)_{max}$	62,40	K							
<b>Standard stagnation temperature (<math>G = 1000 \text{ W/m}^2</math>; <math>\vartheta_a = 30^\circ \text{C}</math>)</b>						$\vartheta_{stg}$	240	°C							
<b>Effective thermal capacity, incl. fluid (per gross area, <math>A_G</math>)</b>						C/m <sup>2</sup>	6,43	kJ/(Km <sup>2</sup> )							
<b>Maximum operating temperature</b>						$\vartheta_{max, op}$	--	°C							
<b>Maximum operating pressure</b>						$p_{max, op}$	600	kPa							
<b>Testing laboratory</b>						TUV Rheinland PTL									
<b>Test report(s)</b>						RK1-TRS110329									
						<b>www.tuvptl.com</b>									
						<b>Dated</b>	2011-03-12								
<b>Comments of testing laboratory</b>						Datasheet version: 5.01, 2016-03-01									
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.															
						Certification Body: SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden www.sp.se info@sp.se tel +4610 516 5000									

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SP SC0823-17
	Issued	2017-06-19

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$ based on ISO 9806:2013 test results													
Collector name	Standard Locations $\vartheta_m$	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
JXSPC-10		1250	1072	886	1050	878	710	758	617	487	820	669	525
JXSPC-12		1606	1378	1138	1349	1128	913	974	793	626	1053	859	674
JXSPC-15		1962	1683	1390	1648	1378	1115	1190	969	765	1286	1050	823
JXSPC-18		2318	1989	1643	1947	1628	1317	1405	1145	903	1520	1240	973
JXSPC-20		2556	2192	1811	2146	1795	1452	1549	1262	996	1675	1367	1072
JXSPC-24		3031	2599	2147	2545	2128	1722	1837	1497	1181	1987	1621	1271
JXSPC-25		3149	2701	2231	2644	2211	1790	1909	1555	1227	2064	1684	1321
JXSPC-30		3624	3108	2568	3043	2545	2059	2197	1790	1412	2376	1938	1520
Annual output per m <sup>2</sup> gross area		783	672	555	658	550	445	475	387	305	514	419	329
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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  $\vartheta_m$  (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](http://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	1000	Pa
Maximum tested negative load	--	Pa
Hail resistance using steel ball (maximum drop height)	--	m

Energy Labelling Information			
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$	
JXSPC-10	1,60	Collector efficiency ( $\eta_{col}$ )	37 %
JXSPC-12	2,05	<i>Remark: Collector efficiency (<math>\eta_{col}</math>) 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<sup>2</sup>, expressed in % and rounded to the nearest integer. Deviating from the regulation <math>\eta_{col}</math> is based on reference area (<math>A_{sol}</math>) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.</i>	
JXSPC-15	2,50		
JXSPC-18	2,96		
JXSPC-20	3,26		
JXSPC-24	3,87		
JXSPC-25	4,02		
JXSPC-30	4,63		
		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$	
		Zero-loss efficiency ( $\eta_0$ )	0,415 --
		First-order coefficient ( $a_1$ )	0,99 W/(m <sup>2</sup> K)
		Second-order coefficient ( $a_2$ )	0,005 W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	1,23 --
		<i>Remark: The data given in this section are related to collector reference area (<math>A_{sol}</math>) 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>	