CERTIFIKAT

Solar Keymark Certificate
No. SP SC0976-13

Holder/Issued to

Company: Changzhou He Jia Solar Energy CO., LTD
Address: NO. 16, Changjiao Road, Dongqing Town, Changzhou, Jiangsu, China

Product name and description

Vacuum tube thermal solar collector for water heating. For technical information see Appendix.

Model:	**HFC-2-S**

Certificate

The product mentioned above is found to comply with requirements in EN 12975-1:2006+A1:2010 and EN 12975-2: 2006 and the Specific CEN Keymark Scheme Rules for Solar Thermal Products.

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 2018-08-19 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. This is the first version of this certificate.

Borås, Sweden 19th August 2013

SP Technical Research Institute of Sweden
Certification

Lennart Aronsson
Product Certification Manager

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SWEDAC ACKREDITERING
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Appendix to Solar Keymark Certificate

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate number	SP SC0976-13
	Date of issue	19-08-2013

Company holding the licence	Changzhou He Jia Solar Energy CO.,LTD		**Country**	China	
Brand (optional)	Hejiasun		**Website**	www.hjsolar.com	
Street, number	No.16, Changjiao Road, Dongqing Town		**E-mail**	info@hjsolar.com	
Postal Code	213114		**Tel.**	+86	519-88967878
City	Changzhou		**Fax**	+86	519-88967868

Collector Type (flat plate / evacuate tubular / un-glazed)	Evacuated tubular collector
Integration in the roof possible ?	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector unit G = 1000 W/m² Tm-Ta : 0 K	10 K	30 K	50 K	70 K
	[m²]	[mm]	[mm]	[mm]	[m²]	[W]	[W]	[W]	[W]	[W]
HFC-2-S	1.57	1982	1010	110	2.00	918	901	863	819	770

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0.59	-
	a_{1a}	1.03	W/(m²K)
	a_{2a}	0.005	W/(m²K²)
Stagnation temperature - Weather conditions see note 2	tstg	285.5	°C
Effective thermal capacity	ceff = C/Aa	7.31	kJ/(m²K)
Max. operation pressure - see note 3	pmax	600	kPa

Incidence angle modifiers $K_\theta(\theta)$	G_{DIF}/G_{TOT} min	G_{DIF}/G_{TOT} max	θ_T / θ_L	50°	10°	20°	30°	40°	60°	70°
			$K_\theta(\theta_T)$	--	--	*0.98*	--	*1.02*	*1.09*	--
	0.13	0.18	$K_\theta(\theta_L)$	0.86	--	--	--	--	--	--
G_{DIF}/G_{TOT}: min&max - while measuring					***Optional values***					

Testing Laboratory	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Website	www.intertek.com
Test report id. number	130123015GZU-001
Date of test report	01-08-2013
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :

No comment.

Note 1	**Fluid**	Water	**Flow rate**	0.020	kg/s per m²
Note 2	**Irradiance, Gs=1000 W/m²; Ambient temperature , Ta=30 °C**				
Note 3	**Given by manufacturer**				

Sharon Wang

VERSION 3.6, 2012.01.20

Appendix to Solar Keymark Certificate

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate number	SP SC0976-13
	Date of issue	19-08-2013

Annual collector output kWh

Collector name	Location and collector temperature ™														
	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			
HFC-2-S	1466	1283	1090	1329	1148	960	901	753	615	966	808	657			

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations

Location	Latitude °	Gtot kWh/m²	Ta °C	Collector orientation or tracking mode
Athens	38	1 765	18.5	South, 25°
Davos	47	1 714	3.2	South, 30°
Stockholm	59	1 166	7.5	South, 45°
Würzburg	50	1 244	9.0	South, 35°

Gtot	Annual total irradiation on collector plane	kWh/m²
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). Detailed description with all equations used is available from the Solar Keymark web site (direct link: http://www.estif.org/solarkeymark/annexb1.php)