CERTIFIKAT

Solar Keymark Certificate
No. SP SC0054-14

Holder/Issued to

Company: Westech Solar Technology Wuxi Co., Ltd

Address: No.28 ChangKang Road, Wuhaoqiao Industrial Park, Mashan, Wuxi, Jiangsu, China 214091

Product name and description

Vacuum tube thermal solar collector. For technical information see Appendix.

Model:	**WT-TF-2**

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 2019-01-15 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 2014-01-15

SP Technical Research Institute of Sweden
Certification

Lennart Aronsson
Product Certification Manager

Susanne Hansson
Certification Officer

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Annex to Solar Keymark Certificate

Summary of EN 12975 Test Results,	Certificate number	SP SC0054-14
annex to Solar KEYMARK Certificate	Date of issue	2014-01-15

		Country	China
Company holding the licence	Westech Solar Technology Wuxi Co., Ltd		
Brand (optional)	Westech	Website	www.westechsolar.com
Street, number	Changkang Road,No.28	E-mail	sales@westechsolar.com
Postal Code	214091	Tel.	+86 510 8516 6075
City	Wuxi	Fax	+86 510 8516 6176

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

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

Collector efficiency parameters related to aperture area (Aa)	η_{0a}	0.59	-
Type of fluid and flow rate see note 1	a_{1a}	1.03	W/(m²K)
	a_{2a}	0.005	W/(m²K²)

Stagnation temperature - Weather conditions see note 2	t_{stg}	285.5	°C
Effective thermal capacity	$C_{eff} = C/A_a$	7.31	kJ/(m²K)
Max. operation pressure - see note 3	p_{max}	600	kPa

Incidence angle modifiers $K_\theta(\theta)$	G_{DIF}/G_{TOT}		θ_T / θ_L	50°	10°	20°	30°	40°	60°	70°
	min	max	$K_\theta(\theta_T)$	--	--	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	131224052GZU-001
Date of test report	2014-01-02
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**				

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SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden

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Annual collector output based on EN 12975 Test Results,	Certificate number	SP SC0054-14
annex to Solar KEYMARK Certificate	Date of issue	2014-01-15

Annual collector output kWh

Collector name	Location and collector temperature (Tm)														
	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-TF-2	1466	1283	1090	1249	1070	895	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)

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