TÜVRheinland®
DIN CERTCO

SPF Solartechnik Prüfung Forschung

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	**Certificate No.**	**011-7S1693 F**
	Date of issue	24.01.2012

Company	HEWALEX Sp. z o.o. Sp. k.	**Country**		Poland
Brand (optional)	--	**Website**		www.hewalex.eu
Street, number	ul. Juliusza Slowackiego, 33	**E-mail**		hewalex@hewalex.pl
Postal Code	PL-43-502	**Tel.**	+48	32 214 17 10
City	Czechowice-Dziedzice	**Fax**	+48	32 214 50 04

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
Integration in the roof possible ?	Yes

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]
KS2000 TLP AC; KS2000 TP AC	1.827	2'020	1'035	90	2.091	1'451	1'370	1'204	1'030	849
KS2300 TLP AC; KS2300 TP AC	2.040	2'020	1'142	90	2.307	1'620	1'530	1'344	1'150	948
KS2500 TLP AC; KS2500 TP AC	2.236	2'020	1'245	90	2.515	1'775	1'677	1'473	1'261	1'039

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0.794	-
	a_{1a}	4.36	W/(m²K)
	a_{2a}	0.0049	W/(m²K²)
Stagnation temperature - Weather conditions see note 2	tstg	202	°C
Effective thermal capacity	ceff = C/Aa	5.5	kJ/(m²K)
Max. operation pressure - see note 3	pmax	1000	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°*
			$K_\theta(\theta_T)$	0.96	*1.00*	*1.00*	*1.00*	*0.99*	*0.88*	*0.68*
	0.14	0.30	$K_\theta(\theta_L)$	0.96	*1.00*	*1.00*	*1.00*	*0.99*	*0.88*	*0.68*
G_{DIF}/G_{TOT}: min&max - while measuring					***Optional values***					

Testing Laboratory	SPF, CH-8640 Rapperswil
Website	www.solarenergy.ch
Test report id. number	C1333LPEN-A1, C1334LPEN-A1, C1334QPEN-A1
Date of test report	24.01.2012 / 24.01.2012 / 24.01.2012
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :

The only difference between the TLP AC and TP AC collectors is the casing coated in RAL7022 (Umbra grey).

Note 1	**Fluid**	Water-Glycole	**Flow rate**	0.022	kg/s per m²
Note 2	**Irradiance, Gs=1000 W/m²** **Ambient temperature , Ta=30 °C**				
Note 3	**Given by manufacturer**				

Dr. Andreas Bohren

VERSION 3.5, 2012.01.13

DIN CERTCO ● Alboinstraße 56 ● 12103 Berlin
Tel: +49 30 7562-1131 ● Fax: +49 30 7562-1141 ● E-Mail: info@dincertco.de ● www.dincertco.de

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Certificate No.	011-7S1693 F
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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
KS2000 TLP AC; KS2000 TP AC	2'310	1'601	1'047	1'852	1'260	807	1'268	816	502	1'382	879	534
KS2300 TLP AC; KS2300 TP AC	2'579	1'788	1'169	2'068	1'407	901	1'416	911	561	1'543	981	596
KS2500 TLP AC; KS2500 TP AC	2'827	1'959	1'281	2'267	1'542	988	1'552	999	614	1'691	1'076	654

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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Datasheet version:
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Calculation program version:
3.07, October 2011 (SP)