Certificado

Certificate no.
Certificado nº **PSK – 012/2015**

Name and address of certificate holder:
Nome e morada do titular do certificado:

THERMIC, LTD.
26th km. Old National Road Athens-Thiva
19600 Mandra
Greece

Product:
Produto:

Thermal Solar Collector
Coletor Solar Térmico

Type references:
Referências:

TS1,5, TS2 *and* / e TS2,5

Trademark(s):
Marca(s) comercial(is):

Thermicsol

Technical characteristics:
Características técnicas:

Summary of EN 12975 Test Results: Registration No. PSK-012/2015 (in annex)
Resumo dos resultados dos ensaios realizados segundo a norma EN 12975: Registo N.º PSK-012/2015 (em anexo)

This product is in conformity with:
Este produto está em conformidade com:

EN 12975-1:2006+A1:2010, EN 12975-2:2006

and with the Specific Keymark Scheme Rules for Solar Thermal Products
e com as Regras Particulares do CEN Keymark Scheme para Produtos Solares Térmicos.

Test report(s) ref. / Issued by:
Relatório(s) de ensaios nº(s) / Emitido(s) por:

30.0959.0-2, 30.0959.1-1, 30.0959.1-2 / CENER
4075 DE1 / DEMOKRITOS

Additional information (if any):
Informação adicional (se existir):

This certificate is valid until:
Este certificado é válido até:

2020-07-16

and supersedes certificate no:
e substitui o certificado nº:

Date of issue:
Data de emissão:

2015-07-17

Francisco Barroca
General Manager / *Diretor Geral*

This Certificate includes one Annex with 2 (two) pages
Este Certificado é constituído por um Anexo com 2 (duas) páginas

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Associação para a Certificação

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	PSK-012/2015
		Issued	2015-07-17

Company holding the	THERMIC LTD.	Country	GREECE
Brand (optional)	--	Website	www.thermyk.gr
Street, street number	26 Km. Old National Road Athens-Thiva	E-mail	info@thermicsol.com
Postal Code / City, province	19600 Mandra	Tel/Fax	30 210 5555 523 / 668

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Flat plate collector - glazed
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module 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
TS1,5	1,32	1.493	990	99	1,48	911	855	731	591	433
TS2	1,82	2.000	1.000	100	2,00	1.256	1.179	1.008	814	597
TS2,5	2,30	2.000	1.260	100	2,52	1.587	1.490	1.274	1.029	755

Performance test method	Glazed liquid heating collector - steady state - indoor			
Performance parameters related to aperture	η0	a1	a2	
Units	-	W/(m²K)	W/(m²K²)	
Test results - Flow rate and fluid see note 1	0,690	4,050	0,016	

Bi-directional incidence angle	No	*Kθ values are obligatory for 50°.*									
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)					0,87				0,00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	195,6	°C
Effective thermal capacity	ceff = C/Ag	11,98	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	100	°C
Max. operation pressure - see note 3	pmax,op	1000	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area

Flow rate	kg/(s m²)	0,000	0,013	0,028	0,043	0,060	0,075				
Pressure drop, ΔP	Pa	0	30	70	130	210	290				

Optional weather data	Location		Link	
Testing Laboratory	Fundación CENER-CIEMAT / DEMOKRITOS			
Website	www.cener.com www.solar.demokritos.gr			
Test report id. number	30.0959.0-2 / 30.0959.1-1 30.0959.1-2 / 4075 DE1	Date of test report	16/10/2009 / 01/10/2010	

During the test GDIF/GTOT was always between	0,15	and	0,17	

Comments of testing laboratory:

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Note 1	Flow rate	0,020	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

CENER
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Datasheet version: 4.06_2014-01-15

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	PSK-012/2015
	Issued	17/07/2015

Annual collector output kWh/module

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
TS1,5	1.350	863	480	977	602	311	724	422	215	788	450	226
TS2	1.862	1.190	661	1.347	830	429	998	582	297	1.086	621	311
TS2,5	2.353	1.503	836	1.702	1.049	542	1.261	736	375	1.373	785	393

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

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). A detailed description of the calculations is available at http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx.

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ScenoCalc version: Ver. 4.06 (Jan, 2014)