

AENOR

Keymark Certificate Solar thermal energy



078/000349


AENOR certifies that the organization

TERMICOL ENERGÍA SOLAR, S.L.

registered office	POLIGONO INDUSTRIAL LA ISLA - CL RIO VIEJO, 39 41703 DOS HERMANAS (Sevilla - España)
supplies	Solar collectors
in compliance with	UNE-EN 12975-1:2006+A1:2011 (EN 12975-1:2006+A1:2010)
Trade Mark Technical information	G21, G21H, G26, G26H Specified in Annexes to the Certificate
Production site	POLIGONO INDUSTRIAL LA ISLA - CL RIO VIEJO, 39 41703 DOS HERMANAS (Sevilla - España)
Certification scheme	In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tasks periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 078.01.
First issued on	2020-02-28
Validity date	2025-02-28

Rafael GARCÍA MEIRO
Chief Executive Officer



Annex to Solar Keymark Certificate					Licence Number		078/000349							
					Date issued		2020-02-28							
					Issued by		AENOR							
Licence holder		TERMICOL ENERGIA SOLAR, S.L.			Country		SPAIN							
Brand (optional)		--			Web		http://www.termicol.es							
Street, Number		C/ Rio Viejo 39			E-mail		info@termicol.com							
Postcode, City		41703 Dos Hermanas - SEVILLA			Tel		+34 954 930 545							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m ² , Gd = 150 W/m ² & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	84 K				
					W	W	W	W	W	W				
G21					2,14	2.044	1.045	81	1.466	1.376	1.080	631	28	0
G21H					2,12	1.030	2.030	81	1.452	1.363	1.070	625	27	0
G26H					2,53	1.230	2.030	81	1.733	1.626	1.277	746	33	0
G26					2,54	2.045	1.240	81	1.740	1.633	1.282	749	33	0
Power output per m ² gross area					685	643	505	295	13	0				
Performance parameters test method		Steady state - indoor												
Performance parameters (related to A _G)		η_0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-			
Test results		0,689	3,30	0,010	0,000	0,00	4.243	0,000	0,00	0,0E+00	0,96			
Incidence angle modifier test method		Steady state - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K _{θT, coll}	1,00	0,99	0,99	0,97	0,95	0,91	0,83	0,57	0,00			
Longitudinal		K _{θL, coll}	1,00	0,99	0,99	0,97	0,95	0,91	0,83	0,57	0,00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0,020	kg/(sm ²)							
Maximum temperature difference during thermal performance test					($\vartheta_m - \vartheta_a$) _{max}	54	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)					ϑ_{stg}	209,4	°C							
Maximum operating temperature					$\vartheta_{max, op}$	210	°C							
Maximum operating pressure					p _{max, op}	800	kPa							
Testing laboratory		Fundación CENER, LEST					http://www.cener.com							
Test report(s)		30.3598.0-001 30.3598.0-002 / 30.3598.0-003 30.3598.0 / 30.3598.1					Dated		20/02/2020					
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26									
<p>- The collectors models G21M and G26M were tested according to ISO 9806:2017. According to SKM rules, the results of the collector model G26M are representative for the whole GOLDM family.</p>														
<p>AENOR INTERNACIONAL, S.A.U. - Génova, 6. - 28004 - Madrid, España - Tel. 91 432 60 00- www.aenor.com</p> <p>Product certification body accredited by ENAC, number 1/C-PR271</p>														



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000349
	Issued	2020-02-28

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
G21		2.344	1.334	393	1.631	708	110	1.252	556	102	1.376	608	118
G21H		2.322	1.322	389	1.616	701	109	1.241	551	101	1.363	603	117
G26H		2.771	1.578	464	1.929	837	130	1.481	658	121	1.627	719	140
G26		2.782	1.584	466	1.936	840	130	1.486	660	121	1.633	722	140
Annual output per m ² gross area		1.095	624	183	762	331	51	585	260	48	643	284	55
Annual efficiency, η_a		62%	35%	10%	47%	20%	3%	50%	22%	4%	52%	23%	4%
Fixed or tracking collector		Fixed (slope = latitude - 15°, rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1630 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
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 ϑ_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. 6.1 (September 2019). A detailed description of the calculations is available at <http://www.estif.org/solarkeymarknew/>

Additional Information			
Collector heat transfer medium	Water-Glycole		
The collector is deemed to be suitable for roof integration	No		
The collector was tested successfully under the following conditions:			
Climate class (A+, A, B or C)	A		--
G (W/m ²) >	1000	ϑ_a (°C) >	20
		H_x (MJ/m ²) >	600
Maximum tested positive load	2500		Pa
Maximum tested negative load	2500		Pa
Hail resistance using ice balls (diameter)	25		mm

Additional collector attribute(s)			
<input type="checkbox"/> Using external power source(s) for normal operation	<input type="checkbox"/> Active or passive measure(s) for self-protection		
<input type="checkbox"/> Co-generating thermal and electrical power	<input type="checkbox"/> Façade collector(s)		

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
G21	2,14	1-V-1234S-A:7.2,1915-C:16,1084-D	2,00
G21H	2,12	1-H-1234S-A:7.2,915-C:16,2108-D	2,09
G26H	2,53	1-H-1234S-A:7.2,115-C:16,2108-D	2,50
G26	2,54	1-V-1234S-A:7.2,1915-C:16,1284-D	2,41

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
Collector efficiency (η_{col})	41%	Zero-loss efficiency (η_0)	0,68
Remark: Collector efficiency (η_{col}) 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 ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.		First-order coefficient (a_1)	3,30
		Second-order coefficient (a_2)	0,090
		Incidence angle modifier IAM (50°)	0,94
		Remark: The data given in this section are related to collector reference area (A_{sol}) 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.	