

AENOR

Keymark Certificate Solar thermal energy



078/000034

AENOR certifies that the organization

TERMICOL ENERGIA SOLAR, S.L.

registered office	PI LA ISLA - CL RIO VIEJO, 39 41703 DOS HERMANAS (Sevilla - España)
supplies	Solar collectors
in compliance with	UNE-EN 12975-1:2006 (EN 12975-1:2006)
Trade Mark	T20PS, T20PSH, T25PS, T25PSH
Technical information	Specified in Annexes to the Certificate
Production site	PI 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 78.01.
	This certificate supersedes 078/000034, dated 2012-03-29
First issued on	2012-03-29
Modified on	2017-01-12
Validity date	2022-01-12

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Chief Executive Officer

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Product certification body accredited by ENAC, number 01/C-PR002.078



Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		078/000034				
						Date issued		2017-01-12				
						Issued by		AENOR				
Licence holder			TERMICOL ENERGÍA SOLAR, S.L.			Country		SPAIN				
Brand (optional)						Web		www.termicol.es				
Street, Number			C/Río Viejo, 39			E-mail		ingenieria@termicol.es				
Postcode, City			41703 - Dos Hermanas (Sevilla)			Tel		+34 954930545				
Collector Type						Flat plate collector, glazed						
Collector name	Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ϑ _m - ϑ _a							
					0 K	10 K	30 K	50 K	70 K	60 K		
					W	W	W	W	W	W		
T25PS	2,56	2.130	1.204	85	1.818	1.656	1.322	977	619	799		
T25PSH	2,54	1.200	2.130	83	1.803	1.643	1.312	969	614	793		
T20PSH	2,02	970	2.130	83	1.434	1.306	1.043	771	488	631		
T20PS	2,07	2.130	974	85	1.470	1.339	1.069	790	500	646		
Power output per m ² gross area					710	647	517	382	242	312		
Performance parameters test method			Steady state - outdoor									
Performance parameters (related to AG)			η _{0,hem}	a ₁	a ₂							
Units			-	W/(m ² K)	W/(m ² K ²)							
Test results			0,710	6,270	0,006							
Incidence angle modifier test method			Steady state - outdoor									
Bi-directional incidence angle modifiers			No									
Incidence angle modifier			Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal			K _{θT, coll}					0,83				0,00
Longitudinal			K _{θL, coll}					0,83				0,00
Heat transfer medium for testing						Water-Glycole						
Flow rate for testing (per gross area, A _G)						dm/dt	0,020	kg/(sm ²)				
Maximum temperature difference for thermal performance calculations						(ϑ _m -ϑ _a) _{max}	60	K				
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)						ϑ _{stg}	100	°C				
Effective thermal capacity, incl. fluid (per gross area, A _G)						C/m ²	5,32	kJ/(Km ²)				
Maximum operating temperature						ϑ _{max, op}	200	°C				
Maximum operating pressure						p _{max, op}	600	kPa				
Testing laboratory			ITC and INTA			http://www.inta.es						
Test report(s)			CA/RPT/4451/002/INTA/12 Ed01 EL008-10, Ed. 2			Dated		22/02/2012 28/04/2011				
Comments of testing laboratory						Datasheet version: 5.01, 2016-03-01						
Performance parameters of data sheet belong to results from second test, since there was a modification on product after initial tests. T20PS is the representative collector for the family. Collectors tested according to EN 12975-2:2006.												



Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000034
	Issued	2017-01-12

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_{m,r}$ based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	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
T25PS		2.557	1.352	611	1.679	872	361	1.271	620	252	1.389	656	271
T25PSH		2.537	1.342	607	1.666	865	358	1.261	615	250	1.378	651	269
T20PSH		2.018	1.067	483	1.325	688	285	1.003	489	199	1.096	517	214
T20PS		2.068	1.094	494	1.358	705	292	1.028	501	204	1.123	530	219
Annual output per m ² gross area		999	528	239	656	341	141	497	242	98	543	256	106
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	1020	Pa
Maximum tested negative load	1010	Pa
Hail resistance using steel ball (maximum drop height)	-	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
T25PS	2,56	Collector efficiency (η_{col})	45 %
T25PSH	2,54	<i>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/m², 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 9806:2013.</i>	
T20PSH	2,02		
T20PS	2,07		
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0,710 --
		First-order coefficient (a_1)	6,27 W/(m ² K)
		Second-order coefficient (a_2)	0,006 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	0,83 --
		<i>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.</i>	