

# AENOR

## Keymark Certificate Solar thermal energy



078/000020

AENOR certifies that the organization

### IMS CALEFACCION, S.L.

registered office PI RIO GALLEGO, CL G PARCELA 28-1 50840 SAN MATEO DE GÁLLEGO  
(Zaragoza - España)

supplies Solar collectors

in compliance with UNE-EN 12975-1:2006 (EN 12975-1:2006)

Trade Mark ML 1840, ML 1840 H, ML 1986, ML 1986 H, ML 2049, ML 2049 H, ML 2203,  
ML 2203 H, ML 2259, ML 2259 H, ML 2430, ML 2430 H

Technical information Specified in Annexes to the Certificate

Production site PI RIO GALLEGO, CL G PARCELA 28-1 50840 SAN MATEO DE GÁLLEGO  
(Zaragoza - 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.

This certificate supersedes 078/000020, dated 2016-10-05

First issued on 2011-10-05  
Modified on 2017-11-23  
Validity date 2021-10-05


Rafael GARCÍA MEIRO  
Chief Executive Officer

Original Electronic Certificate

AENOR INTERNACIONAL S.A.U.  
Génova, 6. 28004 Madrid. España  
Tel. 91 432 60 00.- www.aenor.com

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		078/000020								
						Date issued		2017-11-23								
						Issued by		AENOR								
Licence holder		IMS CALEFACCION, S.L.				Country		SPAIN								
Brand (optional)		CPC				Web		www.imsheating.com								
Street, Number		PI RIO GALLEG0, CL G PARCELA 28-1				E-mail		jmontero@cpcsolar.com								
Postcode, City		50840, SAN MATEO DE GALLEG0 (ZARAGOZA)				Tel		+34 976684128								
Collector Type						Flat plate collector, glazed										
Collector name					Gross area (A <sub>G</sub> ) m <sup>2</sup>	Gross length mm	Gross width mm	Gross height mm	Power output per collector G <sub>b</sub> = 850 W/m <sup>2</sup> ; G <sub>d</sub> = 150 W/m <sup>2</sup> ∅ <sub>m</sub> - ∅ <sub>a</sub>							
									0 K W	10 K W	30 K W	50 K W	70 K W	70 K W		
ML 1840					2,01	2.005	1.005	80	1.481	1.417	1.268	1.091	888	888		
ML 1840 H					2,01	1.005	2.005	77	1.481	1.417	1.268	1.091	888	888		
ML 1986					2,15	2.150	1.000	77	1.585	1.516	1.356	1.167	949	949		
ML 1986 H					2,15	1.000	2.150	77	1.585	1.516	1.356	1.167	949	949		
ML 2049					2,21	2.000	1.104	77	1.629	1.558	1.394	1.200	976	976		
ML 2049 H					2,21	1.104	2.000	77	1.629	1.558	1.394	1.200	976	976		
ML 2203					2,37	2.150	1.104	77	1.747	1.671	1.495	1.287	1.047	1.047		
ML 2203 H					2,37	1.104	2.150	77	1.747	1.671	1.495	1.287	1.047	1.047		
ML 2259					2,43	2.000	1.215	77	1.791	1.713	1.533	1.319	1.073	1.073		
ML 2259 H					2,43	1.215	2.000	77	1.791	1.713	1.533	1.319	1.073	1.073		
ML 2430					2,63	2.155	1.220	80	1.938	1.854	1.659	1.428	1.161	1.161		
ML 2430 H					2,63	1.220	2.155	77	1.938	1.854	1.659	1.428	1.161	1.161		
Power output per m <sup>2</sup> gross area									737	705	631	543	442	442		
Performance parameters test method					Steady state - outdoor											
Performance parameters (related to AG)					η <sub>0,hem</sub>	a1	a2									
Units					-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )									
Test results					0,737	3,030	0,017									
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 <sub>θT, coll</sub>					0,88				0,00		
Longitudinal					K <sub>θL, coll</sub>					0,88				0,00		
Heat transfer medium for testing					Water-Glycole											
Flow rate for testing (per gross area, A <sub>G</sub> )					dm/dt	0,020								kg/(sm <sup>2</sup> )		
Maximum temperature difference for thermal performance calculations					(∅ <sub>m</sub> -∅ <sub>a</sub> ) <sub>max</sub>	70								K		
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; ∅ <sub>a</sub> = 30 °C)					∅ <sub>stg</sub>	107								°C		
Effective thermal capacity, incl. fluid (per gross area, A <sub>G</sub> )					C/m <sup>2</sup>	5,7								kJ/(Km <sup>2</sup> )		
Maximum operating temperature					∅ <sub>max op</sub>	120								°C		
Maximum operating pressure					p <sub>max,op</sub>	1000								kPa		
Testing laboratory					INTA				http://www.inta.es							
Test report(s)					CA/RPT/4451/012/INTA/11 Ed. 01				Dated		26/09/2011					
Comments of testing laboratory					ML 1840 is the representative collector for the family. Collectors tested according to EN 12975-2:2006.						Datashet version: 5.01, 2016-03-01					
																
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	078/000020
	Issued	2017-11-23

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$ , based on ISO 9806:2013 test results													
Collector name	Standard Locations	Athens			Davos			Stockholm			Würzburg		
	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
ML 1840		2.245	1.622	1.057	1.734	1.207	752	1.266	842	508	1.371	902	536
ML 1840 H		2.245	1.622	1.057	1.734	1.207	752	1.266	842	508	1.371	902	536
ML 1986		2.402	1.735	1.130	1.855	1.291	805	1.354	900	543	1.466	964	573
ML 1986 H		2.402	1.735	1.130	1.855	1.291	805	1.354	900	543	1.466	964	573
ML 2049		2.469	1.784	1.162	1.906	1.327	827	1.392	925	559	1.507	991	589
ML 2049 H		2.469	1.784	1.162	1.906	1.327	827	1.392	925	559	1.507	991	589
ML 2203		2.647	1.913	1.246	2.044	1.423	887	1.492	992	599	1.616	1.063	632
ML 2203 H		2.647	1.913	1.246	2.044	1.423	887	1.492	992	599	1.616	1.063	632
ML 2259		2.714	1.961	1.278	2.096	1.459	909	1.530	1.018	614	1.657	1.090	648
ML 2259 H		2.714	1.961	1.278	2.096	1.459	909	1.530	1.018	614	1.657	1.090	648
ML 2430		2.938	2.123	1.383	2.269	1.579	984	1.656	1.101	665	1.794	1.180	701
ML 2430 H		2.938	2.123	1.383	2.269	1.579	984	1.656	1.101	665	1.794	1.180	701
Annual output per m <sup>2</sup> gross area													
Fixed or tracking collector													
Annual irradiation on collector plane													
Mean annual ambient air temperature													
Collector orientation or tracking mode													

The collector is operated at constant temperature  $\vartheta_m$  (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](http://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	1006	Pa
Maximum tested negative load	1006	Pa
Hail resistance using steel ball (maximum drop height)	-	m

Energy Labelling Information				
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$		
ML 1840	2,01	Collector efficiency ( $\eta_{col}$ )	59	%
ML 1840 H	2,01	Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ 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.		
ML 1986	2,15			
ML 1986 H	2,15			
ML 2049	2,21			
ML 2049 H	2,21			
ML 2203	2,37			
ML 2203 H	2,37			
ML 2259	2,43			
ML 2259 H	2,43	Zero-loss efficiency ( $\eta_0$ )	0,737	--
ML 2430	2,63	First-order coefficient ( $a_1$ )	3,03	W/(m <sup>2</sup> K)
ML 2430 H	2,63	Second-order coefficient ( $a_2$ )	0,017	W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0,88	--
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.				