

AENOR

Keymark Certificate Solar thermal energy



078/000151

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 2.0 BLUE, ML 2.0 BLUE H, ML 2.1 BLUE, ML 2.1 BLUE H, ML 2.2 BLUE,
ML 2.2 BLUE H, ML 2.3 BLUE, ML 2.3 BLUE H, ML 2.5 BLUE, ML 2.5 BLUE H,
ML 2.6 BLUE, ML 2.6 BLUE H, ML 2.7 BLUE, ML 2.7 BLUE H, ML 2.8 BLUE,
ML 2.8 BLUE H, ML 3.0 BLUE, ML 3.0 BLUE 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.

First issued on 2013-01-10
Last issued 2018-01-10
Validity date 2023-01-10

Rafael GARCÍA MEIRO
Chief Executive Officer



Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence number	078/000151
		Date of issue	2018-01-10
Company holding the licence	IMS Calefaccion S.L.	Country	Spain
Brand (optional)	CPC	Website	www.imsheating.com
Street, number	c/G, parcela 28-1	E-mail	jmontero@cpcsolar.com
Postal Code	50840	Tel.	+34 976684128
City	San Mateo de Gallego (Zaragoza)	Fax	+34 976690837
Collector Type (flat plate / evacuate tubular / un-glazed)		Flat plate collector	
Integration in the roof possible ?		No	

Collector name	Aperture area (Aa) [m ²]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (Ag) [m ²]	Power output per collector unit G = 1000 W/m ² T _m -T _a :				
						0 K	10 K	30 K	50 K	70 K
						[W]	[W]	[W]	[W]	[W]
ML 2.0 BLUE	1,87	2.004	1.004	79	2,01	1.403	1.323	1.129	890	607
ML 2.1 BLUE	2,02	2.154	1.004	79	2,16	1.515	1.429	1.219	962	656
ML 2.2 BLUE	2,11	2.004	1.123	79	2,25	1.583	1.492	1.274	1.005	685
ML 2.3 BLUE	2,16	2.304	1.004	79	2,31	1.620	1.528	1.304	1.028	701
ML 2.5 BLUE	2,27	2.154	1.123	79	2,42	1.703	1.605	1.370	1.081	737
ML 2.6 BLUE	2,34	2.004	1.242	79	2,49	1.755	1.655	1.413	1.114	759
ML 2.7 BLUE	2,43	2.304	1.123	79	2,59	1.823	1.719	1.467	1.157	789
ML 2.8 BLUE	2,52	2.154	1.242	79	2,68	1.890	1.782	1.521	1.200	818
ML 3.0 BLUE	2,70	2.304	1.242	79	2,86	2.025	1.909	1.630	1.285	876
ML 2.0 BLUE H	1,87	1.004	2.004	79	2,01	1.403	1.323	1.129	890	607
ML 2.1 BLUE H	2,02	1.004	2.154	79	2,16	1.515	1.429	1.219	962	656
ML 2.2 BLUE H	2,11	1.123	2.004	79	2,25	1.583	1.492	1.274	1.005	685
ML 2.3 BLUE H	2,16	1.004	2.304	79	2,31	1.620	1.528	1.304	1.028	701
ML 2.5 BLUE H	2,27	1.123	2.154	79	2,42	1.703	1.605	1.370	1.081	737
ML 2.6 BLUE H	2,34	1.242	2.004	79	2,49	1.755	1.655	1.413	1.114	759
ML 2.7 BLUE H	2,43	1.123	2.304	79	2,59	1.823	1.719	1.467	1.157	789
ML 2.8 BLUE H	2,52	1.242	2.154	79	2,68	1.890	1.782	1.521	1.200	818
ML 3.0 BLUE H	2,70	1.242	2.304	79	2,86	2.025	1.909	1.630	1.285	876

Collector efficiency parameters related to aperture area (Aa)	η_{0a}	0,75	-
Type of fluid and flow rate see note 1	a_{1a}	3,98	W/(m ² K)
	a_{2a}	0,03	W/(m ² K ²)

Stagnation temperature - Weather conditions see note 2	t _{stg}	126,16	°C
---	------------------	--------	----

Effective thermal capacity	C _{eff} = C/Aa	16	kJ/(m ² K)
-----------------------------------	-------------------------	----	-----------------------

Max. operation pressure - see note 3	p _{max}	1000	kPa
---	------------------	------	-----

Incidence angle modifiers K _θ (θ)	G _{DIF} /G _{TOT}		θ _T / θ _L	50°	10°	20°	30°	40°	60°	70°
	min	max	K _θ (θ _T)	0,95						
	0,06	0,06	K _θ (θ _L)	0,95						
G _{DIF} /G _{TOT} : min&max - while measuring					Optional values					

Testing Laboratory	INTA
Website	www.inta.es
Test report id. number	CA/RPT/4451/009/INTA/12, Ed. 02
Date of test report	09/01/2013
Perf. test method	EN 12975-2 6.1.4 (outdoor)

Comments of testing laboratory :	Example data sheet - page 1 and page 2
---	--

Note 1	Fluid	Water	Flow rate	0,020	kg/s per m ²		
Note 2	Irradiance, G_s=1000 W/m²; Ambient temperature , T_a=30 °C						
Note 3	Given by manufacturer						

VERSION 3.7, 2012.03.22



Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	078/000151
	Issued	2018-01-10

Annual collector output kWh														
Collector name	Location and collector temperature (T _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		
ML 2.0 BLUE	2.242	1.472	786	1.764	1.056	488	1.224	708	330	1.335	765	353		
ML 2.1 BLUE	2.421	1.590	849	1.906	1.141	527	1.322	765	356	1.442	826	381		
ML 2.2 BLUE	2.529	1.661	887	1.991	1.192	551	1.381	799	372	1.506	863	398		
ML 2.3 BLUE	2.589	1.700	908	2.038	1.220	564	1.414	818	381	1.542	883	408		
ML 2.5 BLUE	2.721	1.786	954	2.142	1.282	593	1.486	859	400	1.620	928	428		
ML 2.6 BLUE	2.805	1.842	984	2.208	1.322	611	1.532	886	413	1.670	957	442		
ML 2.7 BLUE	2.913	1.912	1.021	2.293	1.373	635	1.591	920	429	1.735	994	459		
ML 2.8 BLUE	3.021	1.983	1.059	2.378	1.423	658	1.649	954	445	1.799	1.031	475		
ML 3.0 BLUE	3.237	2.125	1.135	2.547	1.525	705	1.767	1.022	476	1.927	1.104	509		
ML 2.0 BLUE H	2.242	1.472	786	1.764	1.056	488	1.224	708	330	1.335	765	353		
ML 2.1 BLUE H	2.421	1.590	849	1.906	1.141	527	1.322	765	356	1.442	826	381		
ML 2.2 BLUE H	2.529	1.661	887	1.991	1.192	551	1.381	799	372	1.506	863	398		
ML 2.3 BLUE H	2.589	1.700	908	2.038	1.220	564	1.414	818	381	1.542	883	408		
ML 2.5 BLUE H	2.721	1.786	954	2.142	1.282	593	1.486	859	400	1.620	928	428		
ML 2.6 BLUE H	2.805	1.842	984	2.208	1.322	611	1.532	886	413	1.670	957	442		
ML 2.7 BLUE H	2.913	1.912	1.021	2.293	1.373	635	1.591	920	429	1.735	994	459		
ML 2.8 BLUE H	3.021	1.983	1.059	2.378	1.423	658	1.649	954	445	1.799	1.031	475		
ML 3.0 BLUE H	3.237	2.125	1.135	2.547	1.525	705	1.767	1.022	476	1.927	1.104	509		

Collector mounting: Fixed or tracking No tracking; Slope = latitude - 15° (rounded to nearest 5°)

Overview of locations				
Location	Latitude °	Gtot kWh/m ²	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/m ²
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 (T_m). Detailed description with all equations used is available from the Solar Keymark web site (direct link: <http://www.estif.org/solarkeymark/annexb1.php>)

<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 01/C-PR002.078</p>	Datasheet version:
	VERSION 3.7, 2012.03.22
	Calculation program version:
	3.07, October 2011 (SP)