

AENOR

Keymark Certificate Solar thermal energy



078/000194

AENOR certifies that the organization

SUNEX, S.A.

registered office UL. PIASKOWA, 7 47-400 RACIBÓRZ (Polonia)

supplies Solar collectors

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

Trade Mark AMX 2.38, AMX 2.51, AMX 2.85
Technical information Specified in Annexes to the Certificate

Production site UL. PIASKOWA, 7 47-400 RACIBÓRZ (Polonia)

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 078/000194, dated 2013-07-19

First issued on 2013-05-06
Modified on 2017-11-23
Validity date 2018-05-06

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



Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	078/000194
	Date of issue	2017-11-23

Company holding the licence	SUNEX S.A.	Country	Poland
Brand (optional)	AMX	Website	www.sunex.pl/kontakt.html
Street, number	Ul. Piaskowa 7	E-mail	info@sunex.pl
Postal Code	47-400 Racibórz	Tel.	+48 32 414 92 12
City	Śląskie	Fax	+48 32 414 92 13

Collector Type (flat plate / evacuate tubular / un-glazed)	Flat plate collector
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Integration <u>in</u> the roof possible ?	Yes
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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]
AMX 2.85	2,67	2.246	1.277	90	2,87	2.176	2.082	1.857	1.584	1.262
AMX 2.51	2,32	2.246	1.126	90	2,53	1.891	1.809	1.614	1.376	1.096
AMX 2.38	2,19	2.246	1.066	90	2,39	1.785	1.708	1.523	1.299	1.035

Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1	η_{0a}	0,82	-
	a_{1a}	3,29	W/(m ² K)
	a_{2a}	0,023	W/(m ² K ²)

Stagnation temperature - Weather conditions see note 2	t _{stg}	143	°C
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Effective thermal capacity	C _{eff} = C/A _a	8,9	kJ/(m ² K)
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Max. operation pressure - see note 3	p _{max}	1000	kPa
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Incidence angle modifiers K _θ (θ)	G _{DIF} /G _{TOT}		θ _T / θ _L K _θ (θ _T)	50°	10°	20°	30°	40°	60°	70°
	min	max		0,94	1,00	0,99	0,98	0,97	0,90	0,81
	G _{DIF} /G _{TOT} : min&max - while measuring			K _θ (θ _L)	0,94	1,00	0,99	0,98	0,97	0,90

Optional values

Testing Laboratory	INTA
Website	www.inta.es
Test report id. number	CA/RPT/4451/006/INTA/13 Ed.01
Date of test report	25/04/2013
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/m ² ; 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	078/000194
	Issued	2017-11-23

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		
AMX 2.85	3.486	2.538	1.635	2.884	1.985	1.181	1.978	1.304	763	2.146	1.412	812		
AMX 2.51	3.029	2.206	1.421	2.506	1.725	1.026	1.719	1.133	663	1.865	1.227	706		
AMX 2.38	2.859	2.082	1.341	2.366	1.628	968	1.623	1.070	626	1.760	1.158	666		

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

Overview of locations				
Location	Latitude °	G _{tot} kWh/m ²	T _a °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°

G _{tot}	Annual total irradiation on collector plane	kWh/m ²
T _a	Mean annual ambient air temperature	°C
T _m	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>)

AENOR INTERNACIONAL, S.A.U. - Génova, 6.-28004 - Madrid, España - Tel. 91 432 60 00 - www.aenor.com	Datasheet version: VERSION 3.7, 2012.03.22
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