

AENOR

Keymark Certificate Solar thermal energy



078/000196

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 2.0**
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 078/000196, dated 2013-05-06

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

Rafael GARCÍA MEIRO
Chief Executive Officer



Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate				Licence number		078/000196					
				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							
Integration in the roof possible ?				Yes							
Collector name	Aperture area (Aa) [m ²]	Gross length [mm]	Gross width [mm]	Gross height [mm]	Gross area (Ae) [m ²]	Power output per collector unit G = 1000 W/m ² Tm-Ta :					
						0 K [W]	10 K [W]	30 K [W]	50 K [W]	70 K [W]	
AMX 2.0	1,84	1.907	1.067	90	2,03	1.475	1.398	1.239	1.074	902	
Collector efficiency parameters related to aperture area (Aa) Type of fluid and flow rate see note 1						η _{0a}		0,80		-	
						a _{1a}		4,16		W/(m ² K)	
						a _{2a}		0,004		W/(m ² K ²)	
Stagnation temperature - Weather conditions see note 2						t _{stg}		143		°C	
Effective thermal capacity						C _{eff} = C/Aa		8		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	1,00	0,99	0,98	0,97	0,90	0,81	
G _{DIF} /G _{TOT} : min&max - while measuring				K _θ (θ _L)	0,95	1,00	0,99	0,98	0,97	0,90	0,81
						<i>Optional values</i>					
Testing Laboratory				INTA							
Website				www.inta.es							
Test report id. number				CA/RPT/4451/004/INTA/13 Ed.01							
Date of test report				22/04/2013							
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/m²; Ambient temperature, T_a=30 °C										
Note 3	Given by manufacturer										





Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence number	078/000196
	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 2.0	2.373	1.683	1.138	1.921	1.336	879	1.319	867	550	1.434	937	585			

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

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	Datasheet version: VERSION 3.7, 2012.03.22 Calculation program version: 3.07, October 2011 (SP)
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