

### Solar Keymark / Solar Keymark

Range Name / Nom de Gamme :  
D12C Series

This document is valid at the date of issue - *Document valable à la date d'émission*

#### Participant/Titulaire

SYRIUS SOLAR INDUSTRY  
15 rue du Perpignan - ZAC Descartes  
34880 Laverune, France

This product performance certificate is issued by Eurovent Certita Certification according to the certification rules:

**SK - « Solar Keymark » in force at established date.**

Pursuant to the decision notified by Eurovent Certita Certification, the right to use the mark KEYMARK shall be granted to the beneficiary company for the above Range in the conditions defined by the certification program mentioned.

Unless withdrawn or suspended, this certificate remains valid as long as the requirements for the certification program framework are met.

THIS CERTIFICATE HAS BEEN ISSUED ON 17/01/2023

THIS CERTIFICATE IS VALID UNTIL 31/12/2023

*Ce certificat de performance produit est délivré par Eurovent Certita Certification dans les conditions fixées par le référentiel :*

**SK – « Solar Keymark » en vigueur à date d'édition.**

*En vertu de la décision notifiée par Eurovent Certita Certification, le droit d'usage de la marque KEYMARK, est accordé à la société qui en est bénéficiaire pour la gamme visée ci-dessus, dans les conditions définies par le programme de certification mentionné.*

*Sauf retrait ou suspension, ce certificat demeure valide tant que les conditions du référentiel du programme de certification sont respectées.*

*CE CERTIFICAT A ÉTÉ EMIS LE 17/01/2023*

*CE CERTIFICAT EST VALIDE JUSQU'AU 31/12/2023*

Paris, 17 janvier 2023



Organisme accrédité n° 5-0517 Certification Produits et Services selon la norme NF EN ISO/CEI 17065:2012  
Portée disponible sur [www.cofrac.fr](http://www.cofrac.fr)

Accreditation #5-0517 Products and Services Certification according to NF EN ISO/CEI 17065:2012 –  
Scope available on [www.cofrac.fr](http://www.cofrac.fr)

COFRAC est signataire des accords MLA d'EA et MLA d'IAF,

COFRAC is signatory of EA MLA and IAF MLA,  
list of EA members is available on

[www.european-accreditation.org/ea-members](http://www.european-accreditation.org/ea-members)

list of IAF members is available on

[www.iaf.nu/articles/IAF\\_MEMBERS\\_SIGNATORIES/4](http://www.iaf.nu/articles/IAF_MEMBERS_SIGNATORIES/4)

MANAGING BOARD MEMBER / MEMBRE DIRECTOIRE



## Appendix / Annexe

This document is valid at the date of issue - Check the current validity on:

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*La liste des références et caractéristiques certifiées est disponible sur le site :*

[www.eurovent-certification.com](http://www.eurovent-certification.com)

This product performance certificate is valid for the following trade names:

*Ce certificat de performance produit est valide pour les marques commerciales suivantes:*

Trade Name / Marque Commerciale


SYRIUS SOLAR

This product performance certificate is valid for the following manufacturing places:

*Ce certificat de performance produit est valide pour les sites de production suivants:*

Manufacturing Place / Site de Production

Laverune, France  
Fort-de-France 97200, Martinique, France  
Nouvelle-Calédonie, France  
Saint-Louis 97450, La Réunion, France

Annex to Solar Keymark Certificate		Licence Number		23.01.004						
		Date issued		2023-01-17						
		Issued by		ECC						
Licence holder	SYRIUS SOLAR INDUSTRY			Country	FRANCE					
Brand (optional)	SYRIUS SOLAR			Web	https://syrius-solar.fr					
Street, Number	15 Rue de Perpignan			E-mail	contact@syrius-solar.fr					
Postcode, City	34884 Lavérune			Tel	+33 04 67 82 00 18					
Collector Type	Flat plate collector									
Collector name	Gross area ( $A_G$ ) m <sup>2</sup>	Gross length mm	Gross width mm	Gross height mm	Power output per collector Gb = 850 W/m <sup>2</sup> , Gd = 150 W/m <sup>2</sup> & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					0 K W	10 K W	30 K W	50 K W	70 K W	80 K W
C2000D12c	2,06	2 033	1 015	98	1 399	1 317	1 133	923	687	558
Power output per m <sup>2</sup> gross area					679	639	550	448	333	271
Performance parameters test method	Steady state - indoor									
Performance parameters (related to $A_G$ )	$\eta_{0, b}$	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-
Test results	0,699	3,82	0,016	0,000	0,00	6 361	0,000	0,00	0,0E+00	0,81
Incidence angle modifier test method	Steady state - outdoor									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T, coll}$	1,00	0,98	0,96	0,93	0,86	0,76	0,53	0,00	0,00
Longitudinal	$K_{\theta L, coll}$	1,00	0,98	0,96	0,93	0,86	0,76	0,53	0,00	0,00
Heat transfer medium for testing	Water									
Flow rate for testing (per gross area, $A_G$ )	dm/dt		0,020		kg/(sm <sup>2</sup> )					
Maximum temperature difference during thermal performance test	$(\vartheta_m - \vartheta_a)_{max}$		50		K					
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a$ = 30 °C)	$\vartheta_{stg}$		180		°C					
Maximum operating temperature	$\vartheta_{max, op}$		204		°C					
Maximum operating pressure	$p_{max, op}$		1000		kPa					
Testing laboratory	Fundación CENER, LEST					http://www.cener.com				
Test report(s)	30.3878.0-001 30.3878.0-002					Dated		30/08/2021		
Comments of testing laboratory	Datasheet version: 6.1, 2019-09-26  									

<b>Annex to Solar Keymark Certificate</b>	<b>Licence Number</b>	<b>23.01.004</b>
<b>Supplementary Information</b>	<b>Issued</b>	<b>2023-01-17</b>

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$													
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
C2000D12c		2 069	1 341	760	1 509	944	498	1 116	661	345	1 214	707	361
Annual output per m <sup>2</sup> gross area		1 004	651	369	732	458	242	542	321	167	590	343	175
Annual efficiency, $\eta_a$		57%	37%	21%	45%	28%	15%	46%	28%	14%	47%	28%	14%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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  $\vartheta_m$  (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.1 (September 2019). A detailed description of the calculations is available at <http://www.estif.org/solarkeymarknew/>

Additional Information			
Collector heat transfer medium	Water-Glycole		
The collector is deemed to be suitable for roof integration	No		
The collector was tested successfully under the following conditions:			
Climate class (A+, A, B or C)	A		--
G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >	20
		$H_x$ (MJ/m <sup>2</sup> ) >	600
Maximum tested positive load	3000		Pa
Maximum tested negative load	3000		Pa
Hail resistance using ice balls (diameter)	25		mm

Additional collector attribute(s)			
<input type="checkbox"/> Using external power source(s) for normal operation	<input type="checkbox"/> Active or passive measure(s) for self-protection		
<input type="checkbox"/> Co-generating thermal and electrical power	<input type="checkbox"/> Façade collector(s)		

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code	Aperture Area, $A_a$ (m <sup>2</sup> )
C2000D12c	2,06	8-V-1234S-A:11.2,1866-C:20,6,1060-	1,89

Data required for CDR (EU) No 811/2013 - Reference Area		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$	
Collector efficiency ( $\eta_{col}$ )	50%	Zero-loss efficiency ( $\eta_0$ )	0,68
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 9806:2017.		First-order coefficient ( $a_1$ )	3,82
		Second-order coefficient ( $a_2$ )	0,016
		Incidence angle modifier IAM (50°)	0,86
			--
		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.	