



# CERTIFIKAT

## Solar Keymark Certificate No. SP SC0180-14

### Holder/Issued to

Company: SolarWall Europe Sarl.  
Address: 66 Avenue des Champs Elysees, FR-75008 PARIS, France

### Product name and description

Solar thermal air collector for heating of indoor air. For technical information see Appendix (2 pages).

Model:	<b>SolarWall Single-Stage, Transpired Air Heating Collector</b>
--------	---

### Certificate

The product is found to comply with the requirements in EN 12975-1:2006+A1:2010 and the Specific CEN Keymark Scheme Rules for Solar Thermal Products, and are based on test results according to EN-ISO 9806:2013.

### Marking

Products conforming to this certificate shall be marked in accordance with the requirements in the Specific CEN Keymark Scheme Rules for Solar Thermal Products. The marking shall, together with the Keymark logo, show the identification code of the empowered certification body (SP Technical Research Institute of Sweden, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

### Validity

This certificate is valid until 2020-11-25 provided that the conditions in the Solar Keymark Rules are fulfilled and the standard or rules are not modified significantly. The validity of the certificate can be checked in the database, see Solar Keymark website <http://www.solarkeymark.org>

### Miscellaneous

The manufacturer's factory production control procedures are under surveillance by the responsibility of SP. This is the first version of this certificate.

Borås, Sweden 2015-11-25

### SP Technical Research Institute of Sweden Certification



Lennart Aronsson  
Product Certification Manager



Susanne Hansson  
Certification Officer



012

### SP Technical Research Institute of Sweden

Postal address: SP, Box 857, SE-501 15 Borås, SWEDEN  
Phone / Fax: +4610 516 50 00, +4633 13 55 02  
Reg. number: 556464-6874  
E-mail / Internet: info@sp.se, www.sp.se

Certificate page 1 (1)

Empowered Certification Body No. 012: SP Certification, Sweden  
For more information of Solar Keymark visit: [www.solarkeymark.org](http://www.solarkeymark.org)  
This certificate may not be reproduced other than in full, except with the prior written approval by SP. SP Certification rules SPCR402 applies. 4P01299

<b>Summary of ISO 9806:2013 Test Results</b>						<b>Licence Number</b>		<b>SP SC0180-14</b>			
						<b>Issued</b>		2015-11-25			
<b>Company holding the</b>		SolarWall Europe SARL				<b>Country</b>		France			
<b>Brand (optional)</b>		SolarWall Single Stage				<b>Website</b>		www.solarwall.com			
<b>Street, street number</b>		66 avenue des champs élysées				<b>E-mail</b>		info@solarwall.eu			
<b>Postal Code / City, province</b>		75008 Paris				<b>Tel/Fax</b>		+33 611972894			
<b>Collector Type (flat plate glazed/un-glazed; evacuate tubular)</b>						Open to ambient air heating collector					
Thermal / photo voltaic hybrid collector? (PVT collector)						No					
Integration in the roof possible ? (manufacturers declaration)						Yes					
Collector name	Aperture area (Aa) m <sup>2</sup>	Gross length mm	Gross width mm	Gross height mm	Gross area (AG) m <sup>2</sup>	<b>Power output per collector module</b>					
						wind speed, u = 0.97 m/s					
						Air flow rate [kg/h]***	Net irradiance, G" (W/m <sup>2</sup> )				
							400	700	1000		
SolarWall Single Stage*	6.60	2 795	2 445	380**	6.83	301	1 085	1 898	2 712		
						1031	1 868	3 268	4 669		
						1448	1 982	3 468	4 954		
						wind speed, u = 1.84 m/s					
						Air flow rate [kg/h]***	Net irradiance, G" (W/m <sup>2</sup> )				
							400	700	1000		
						301	941	1 646	2 352		
						1037	1 754	3 070	4 386		
						1450	1 909	3 341	4 773		
						wind speed, u = 3.34 m/s					
						Air flow rate [kg/h]***	Net irradiance, G" (W/m <sup>2</sup> )				
							400	700	1000		
						300	755	1 321	1 887		
						1037	1 539	2 694	3 848		
						1450	1 719	3 009	4 298		
<b>Performance test method</b>		Air heating collector - steady state - indoors									
<b>Performance parameters related to gross area</b>		$\eta_{\max, 0 \text{ m/s}}$ (300 kg/h)			$\eta_{\max, 0 \text{ m/s}}$ (600 kg/h)			$\eta_{\max, 0 \text{ m/s}}$ (1400 kg/h)			
<b>Units</b>		-			-			-			
<b>Test results - Flow rate and fluid see note 1</b>		0.442			0.612			0.769			
<b>Bi-directional incidence angle modifiers?</b>		No <i>K<math>\theta</math> values are obligatory for 50°.</i>									
<b>Incidence angle modifiers K<math>\theta</math>(<math>\theta</math>)</b>		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
		K $\theta$ ( $\theta$ )	--	--	--	--	1.07	--	--	--	0.00
<b>Incidence angle modifier not bi-directional - leave fields blank</b>											
<b>Stagnation temperature - Weather conditions see note 2</b>						Tstg	81	°C			
<b>Effective thermal capacity</b>						ceff = C/Ag	--	kJ/(m <sup>2</sup> K)			
<b>Max. intended operation temperature - see note 3</b>						Tmax,op	--	°C			
<b>Max. operation pressure - see note 3</b>						pmax,op	--	kPa			
<b>Pressure drop table - for a collector family, the values shall be for the module with highest <math>\Delta P</math> per m<sup>2</sup> aperture area</b>											
<b>Flow rate air ****</b>	kg/h (m <sup>3</sup> /h/m <sup>2</sup> )	0 (0)	150 (19)	300 (39)	600 (78)	1050 (136)					
<b>Pressure drop, <math>\Delta P</math></b>	Pa	0	5	20	80	229					
<b>Optional weather data</b>		Location				Link					
<b>Testing Laboratory</b>		Exova, Mississauga									
<b>Website</b>		www.exova.com									
<b>Test report id. number</b>		14-06-M0508-2 Rv. 1 / 14-06-S0035-2				<b>Date of test report</b>		2015-02-10 / 2015-02-23			
During the test GDIF/GTOT was always between		-	and	-							
<b>Comments of testing laboratory:</b> SKN data sheet template for air collectors is not available. This data sheet has been adapted to air collectors and is based on collector data sheet available from ScenoCalc. * Custom built collector (tested size); ** Including plenum											
*** Average RH during testing = 11.6 %. **** Air flow rate is given per m <sup>2</sup> collector aperture area.											
Back and side insulation are DM40 Mesa CFC-free foamed-in-place polyisocyanurate foam insulation panels, 5.1 cm thick with R16 R-value. Incidence angle modifier measured indoors at 50° using only direct radiation.											
<b>Note 1</b>	<b>Flow rate</b>	300 - 1450	kg/h	<b>Fluid</b>	Air						
<b>Note 2</b>	<b>Irradiance, G = 1000 W/m<sup>2</sup>; Ambient temperature, Ta=30 °C</b>										
<b>Note 3</b>	<b>Given by manufacturer</b>										
4P01299						Based on data sheet version: 4.06, 2014-01-15					
Certification Body: <b>SP Technical Research Institute of Sweden</b> Box 857, 501 15 Borås, Sweden											
www.sp.se info@sp.se tel +4610 516 5000											

# Annex to Solar Keymark Certificate

Annual collector output based on ISO 9806:2013 Test Results, annex to Solar KEYMARK Certificate	Licence Number	SP SC0180-14
	Issued	2015-11-25

Annual collector output kWh/module													
Collector name	Location and collector temperature (Tm)												
	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	
SolarWall Single Stage	--	--	--	--	--	--	--	--	--	--	--	--	

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
---------------------------------------	---

Overview of locations				
Location	Latitude °	Gtot kWh/m <sup>2</sup>	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 <sup>2</sup>
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

The calculation of the annual collector performance with the official Solar Keymark spreadsheet ScenoCalc is not possible at the moment for open to ambient solar air heating collectors. Contact SolarWall Europé SARL for a RETScreen simulation to provide calculated (simulated) energy output from a SolarWall Single Stage collector for each specific application.