



CERTIFIKAT

Solar Keymark Certificate No. SP SC0181-14

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:	2-Stage Glazed SolarWall
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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
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SP Technical Research Institute of Sweden

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Empowered Certification Body No. 012: SP Certification, Sweden
For more information of Solar Keymark visit: www.solarkeymar.org
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Summary of ISO 9806:2013 Test Results						Licence Number	SP SC0181-14									
						Issued	2015-11-25									
Company holding the		SolarWall Europe SARL				Country	France									
Brand (optional)		SolarWall 2-Stage				Website	www.solarwall.com									
Street, street number		66 avenue des champs élysées				E-mail	info@solarwall.eu									
Postal Code / City, province		75008	Paris			Tel/Fax	+33 611972894									
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						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)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module										
						wind speed, u = 0.97 m/s										
						[kg/h]***	Net irradiance, G ⁿ (W/m ²)									
							400	700	1000							
							151	955	1 671	2 387						
						SolarWall 2-Stage*	6.59	2 792	2 445	320**	6.83	302	1 360	2 381	3 401	
												602	1 730	3 028	4 325	
							wind speed, u = 1.84 m/s									
												[kg/h]***	Net irradiance, G ⁿ (W/m ²)			
													400	700	1000	
													152	913	1 598	2 283
													303	1 297	2 269	3 242
													598	1 668	2 919	4 170
													wind speed, u = 3.34 m/s			
												[kg/h]***	Net irradiance, G ⁿ (W/m ²)			
400	700	1000														
153	845	1 479	2 114													
							302	1 173	2 053	2 932						
							599	1 566	2 741	3 916						
							Performance test method					Air heating collector - steady state - indoors				
Performance parameters related to gross area		$\eta_{max, 0 m/s}$ (150 kg/h)		$\eta_{max, 0 m/s}$ (300 kg/h)		$\eta_{max, 0 m/s}$ (600 kg/h)										
Units		-		-		-										
Test results - Flow rate and fluid see note 1		0.368		0.531		0.661										
Bi-directional incidence angle		No		<i>Kθ values are obligatory for 50°.</i>												
Incidence angle modifiers Kθ(θ)		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°					
		K θ (θ)	--	--	--	--	1.09	--	--	--	0.00					
Incidence angle modifier not bi-directional - leave fields blank																
Stagnation temperature - Weather conditions see note 2						Tstg	103	°C								
Effective thermal capacity						ceff = C/Ag	--	kJ/(m ² K)								
Max. intended operation temperature - see note 3						Tmax,op	--	°C								
Max. operation pressure - see note 3						pmax,op	--	kPa								
Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area																
Flow rate (air) ****	kg/h (m ³ /h/m ²)	0 (0)	150 (19)	301 (37)	527 (65)	894 (111)										
Pressure drop, ΔP	Pa	0	20	72	199	548										
Optional weather data		Location		Link												
Testing Laboratory		Exova, Mississauga														
Website		www.exova.com														
Test report id. number		14-06-M0508-1 Rv. 1 / 14-06-S0035-1				Date of test report		2015-02-10 / 2015-03-19								
During the test GDIF/GTOT was always between		-	and	-												
<p>Comments of testing laboratory: 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 m² collector aperture area.</p> <p>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</p>																
Note 1	Flow rate	150 - 600	kg/h	Fluid	Air											
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature, Ta=30 °C															
Note 3	Given by manufacturer															
4P01299						Based on data sheet version: 4.06, 2014-01-15										
<p>Certification Body: SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden</p> <p>www.sp.se info@sp.se tel +4610 516 5000</p>																



Annex to Solar Keymark Certificate

Annual collector output based on ISO 9806:2013 Test Results, annex to Solar KEYMARK Certificate	Licence Number	SP SC0181-14
	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 2-Stage	--	--	--	--	--	--	--	--	--	--	--	--		

Collector mounting: Fixed or tracking Fixed; 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

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 Europe S.A.R.L for a RETScreen simulation to provide calculated (simulated) energy output from a SolarWall 2-Stage collector for each specific application.