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:	**SolarWall Single-Stage, Transpired Air Heating Collector**

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

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ISO/IEC 17065

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Annex to Solar Keymark Certificate

Licence Number	**SP SC0180-14**
Summary of ISO 9806:2013 Test Results	**Issued** 2015-11-25

Company holding the	SolarWall Europe SARL	**Country**	France
Brand (optional)	SolarWall Single 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 hybid 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)
	m²	mm	mm	mm	m²
SolarWall Single Stage*	6.60	2 795	2 445	380**	6.83

Power output per collector module

wind speed, u = 0.97 m/s			
Air flow rate [kg/h]***	Net irradiance, G" (W/m²)		
	400	700	1000
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/m²)		
	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/m²)		
	400	700	1000
300	755	1 321	1 887
1037	1 539	2 694	3 848
1450	1 719	3 009	4 298

Performance test method	Air heating collector - steady state - indoors			
Performance parameters related to gross area	$\eta_{max,\ 0\ m/s}$ (300 kg/h)	$\eta_{max,\ 0\ m/s}$ (600 kg/h)	$\eta_{max,\ 0\ m/s}$ (1400 kg/h)	
Units	-	-	-	
Test results - Flow rate and fluid see note 1	0.442	0.612	0.769	

Bi-directional incidence angle modifiers?	No	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)	--	--	--	--	1.07	--	--	--	0.00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - Weather conditions see note 2	Tstg	81 °C
Effective thermal capacity	ceff = C/Ag	-- kJ/(m²K)
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 (m³/h/m²)		0 (0)	150 (19)	300 (39)	600 (78)	1050 (136)
Pressure drop, ΔP	Pa	0	5	20	80	229

Optional weather data	Location		Link	

Testing Laboratory	Exova, Mississauga		
Website	www.exova.com		
Test report id. number	14-06-M0508-2 Rv. 1 / 14-06-S0035-2	**Date of test report**	2015-02-10 / 2015-02-23

During the test GDIF/GTOT was always between	-	and	-	

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.

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.

Note 1	**Flow rate**	300 - 1450	kg/h	**Fluid**	Air
Note 2	**Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C**				
Note 3	**Given by manufacturer**				

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Based on data sheet version: 4.06, 2014-01-15

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/m²	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/m²
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.

Certification Body:
SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden
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Datasheet version: 4.06, 2014-01-15

ScenoCalc version: Ver. 4.06 (Jan, 2014)