



CERTIFICATE

Solar Keymark Certificate No. SP SC1073-17

Holder/Issued to/Manufacturer

Company: ATMOSFERA POLSKA Sp. z o. o.
Address: Kraszewskiego str. 36/128, 30-110, Krakow, POLAND.

Product name and description

Vacuum tube solar thermal collectors for water heating.
For technical information see Appendix (2 pages).

Models:	SVK-A 10	SVK-A 12	SVK-A 15
	SVK-A 18	SVK-A 20	SVK-A 22
	SVK-A 24	SVK-A 25	SVK-A 30

Certificate

The product is found to comply with the requirements in EN 12975-1:2006+A1:2010 Solar collectors Part 1: General requirements and the Specific CEN Keymark Scheme Rules for Solar Thermal Products, and are based on test results according to EN 12975-2:2006 Solar collectors Part 2: Test methods.

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 2019-06-24 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 2017-08-01

SP Technical Research Institute of Sweden Certification

Johan Åkesson
Certification Manager

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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
This certificate may not be reproduced other than in full, except with the prior written approval by SP. SP Certification rules SPCR402 applies.



Annex to Solar Keymark Certificate

Annex to Solar Keymark Certificate - Summary of ISO 9806:2013 Test Results					Licence Number		SP SC1073-17								
					Date issued		2017-08-01								
					Issued by		SP								
Licence holder		ATMOSFERA POLSKA Sp. z o.o.			Country		POLAND								
Brand (optional)		ATMOSFERA			Web		http://atmo-sfera.eu								
Street, Number		Kraszewskiego str. 36/128			E-mail		info@atmo-sfera.eu								
Postcode, City		30-110	Krakow		Tel		+48	692 009243							
Collector Type					Evacuated tubular collector										
					Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² θ _m - θ _a										
										0 K	10 K	30 K	50 K	70 K	71 K
Collector name					Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	W	W	W	W	W	W	
SVK-A 10					1,68	1990	845	137	745	732	688	622	533	530	
SVK-A 12					2,17	1990	1090	137	961	944	888	802	687	684	
SVK-A 15					2,65	1990	1330	137	1172	1152	1083	979	839	834	
SVK-A 18					3,12	1990	1570	137	1384	1360	1279	1156	990	985	
SVK-A 20					3,44	1990	1730	137	1525	1498	1409	1274	1091	1085	
SVK-A 22					3,76	1990	1890	137	1666	1637	1540	1391	1192	1186	
SVK-A 24					4,08	1990	2050	137	1807	1775	1670	1509	1293	1286	
SVK-A 25					4,24	1990	2130	137	1878	1845	1735	1568	1343	1336	
SVK-A 30					4,89	1990	2455	137	2164	2126	2000	1807	1548	1540	
Power output per m² gross area									443	435	409	370	317	315	
Performance parameters test method					Steady state - outdoor										
Performance parameters (related to AG)					η _{0,hem}	a ₁	a ₂								
Units					-	W/(m ² K)	W/(m ² K ²)								
Test results					0,443	0,611	0,017								
Incidence angle modifier test method					Steady state - outdoor										
Bi-directional incidence angle modifiers					Yes										
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
Transversal					K _{θT, coll}	1,03	1,06	1,12	1,18	1,33	1,47	0,98	0,49	0,00	
Longitudinal					K _{θL, coll}	0,98	0,97	0,95	0,94	0,92	0,69	0,46	0,23	0,00	
Heat transfer medium for testing					Water										
Flow rate for testing (per gross area, A_G)					dm/dt	0,011		kg/(sm ²)							
Maximum temperature difference for thermal performance calculations					(θ _m -θ _a) _{max}	70,57		K							
Standard stagnation temperature (G = 1000 W/m²; θ_a = 30 °C)					θ _{stg}	250		°C							
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	4,55		kJ/(Km ²)							
Maximum operating temperature					θ _{max, op}	226		°C							
Maximum operating pressure					p _{max, op}	600		kPa							
Testing laboratory					Intertek Testing Services Shenzhen Ltd. Guangzhou Branch					http://www.intertek.com					
Test report(s)					170526073GZU-001					Dated		2017-07-11			
Comments of testing laboratory					<p>The "negative pressure test of the collector" according to EN12975-2:2006,5.9.2 was not performed.</p> <p>Tests were performed based on EN 12975-2:2006.</p>										
					Datasheet version: 5.01, 2016-03-01 										
Certification Body: SP Technical Research Institute of Sweden Box 857, 501 15 Borås, Sweden www.sp.se info@sp.se tel +4610 516 5000															

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SP SC1073-17
	Issued	2017-08-01

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_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
SVK-A 10		1356	1167	894	1148	921	660	837	662	466	900	716	500
SVK-A 12		1750	1505	1154	1481	1188	852	1079	855	601	1160	924	645
SVK-A 15		2135	1837	1408	1807	1449	1039	1317	1043	733	1416	1128	787
SVK-A 18		2520	2168	1662	2133	1711	1227	1554	1231	866	1671	1331	929
SVK-A 20		2777	2389	1831	2350	1885	1351	1713	1356	954	1842	1467	1023
SVK-A 22		3034	2610	2000	2567	2060	1476	1871	1482	1042	2012	1602	1118
SVK-A 24		3290	2831	2170	2785	2234	1601	2030	1607	1130	2182	1738	1213
SVK-A 25		3419	2942	2254	2893	2321	1664	2109	1670	1175	2267	1806	1260
SVK-A 30		3940	3390	2598	3335	2676	1918	2431	1925	1354	2613	2081	1452
Annual output per m ² gross area		807	694	532	683	548	393	498	394	277	535	426	297
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
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 ϑ_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. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	3100	Pa
Maximum tested negative load	--	Pa
Hail resistance using steel ball (maximum drop height)	1,0	m

Energy Labelling Information				
	Reference Area, A _{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A _{sol}		
SVK-A 10	1,68	Collector efficiency (η_{col})	39	%
SVK-A 12	2,17	Remark: Collector efficiency (η_{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 ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A _{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.		
SVK-A 15	2,65			
SVK-A 18	3,12			
SVK-A 20	3,44			
SVK-A 22	3,76			
SVK-A 24	4,08			
SVK-A 25	4,24			
SVK-A 30	4,89	Data required for CDR (EU) No 812/2013 - Reference Area A _{sol}		
		Zero-loss efficiency (η_0)	0,443	--
		First-order coefficient (a ₁)	0,61	W/(m ² K)
		Second-order coefficient (a ₂)	0,017	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,10	--
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.				