

Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		011-7S2754 R							
					Date issued		2017-04-12							
					Issued by		Din Certco							
Licence holder		Fonderie SIME S.p.A.			Country		Italy							
Brand (optional)		SV 3.4 S			Web		www.sime.it							
Street, Number		Via Garbo, 27			E-mail		erika_modena@sime.it							
Postcode, City		37045 Legnago			Tel/Fax		0039 0442 631111							
Collector Type					Evacuated tubular collector									
Collector name					Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² ∅ _m - ∅ _a									
					0 K	10 K	30 K	50 K	70 K	70 K				
					m ²	mm	mm	mm	W	W	W	W	W	W
SV 3.4 S					3,42	2.000	1.710	120	1.843	1.792	1.690	1.585	1.478	1.478
Power output per m ² gross area									539	524	494	463	432	432
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					0,539	1,46	0,001							
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}	1,00	1,01	1,05	1,05	1,11	1,15	1,13	-	0,00
Longitudinal					K _{θL, coll}	1,00	0,99	0,98	0,95	0,91	0,84	0,69	-	0,00
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A _G)					dm/dt	0,020	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations					(∅ _m -∅ _a) _{max}	70	K							
Standard stagnation temperature (G = 1000 W/m ² ; ∅ _a = 30 °C)					∅ _{stg}	240	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)					C/m ²	12,6	kJ/(Km ²)							
Maximum operating temperature					∅ _{max, op}	110	°C							
Maximum operating pressure					p _{max, op}	1000	kPa							
Testing laboratory					TestLab Solar Thermal Systems, Fraunhofer ISE				http://www.collectortest.com					
Test report(s)					KT13_03 (TZSB / IZES) ktb-2017-04				Dated		25.11.2013 10.04.2017			
Comments of testing laboratory					Datasheet version: 5.01 / 2016-03-01 TestLab Solar Thermal Systems Heidenhofstraße 7 D-79110 Freiburg Tel: +49 (0)761 4588 5354									
This data sheet is not complete as the testing of the collector was not performed according to ISO 9806:2013. According to Scenocalc v5.01 the power output per collector unit of a steady state performance test does not consider the fraction of the diffuse irradiance, but it is calculated based on η _{0,hem} for a global hemispherical irradiance of 1000 W/m ² .														
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2754 R
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Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on EN 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
SV 3.4 S		3.187	2.694	2.255	2.636	2.209	1.843	1.916	1.553	1.255	2.065	1.673	1.347
Annual output per m ² gross area		932	788	659	771	646	539	560	454	367	604	489	394
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)	EN 12975-2 --
Maximum tested positive load	see comment Pa
Maximum tested negative load	see comment Pa
Hail resistance using ice balls (diameter)	see comment mm

Energy Labelling Information

	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
SV 3.4 S	3,42	Collector efficiency (η_{col})	48 %
		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.	
		Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}	
		Zero-loss efficiency (η_0)	0,539 --
		First-order coefficient (a_1)	1,46 W/(m ² K)
		Second-order coefficient (a_2)	0,001 W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,00 --
		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.	