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IGTE

Annex to Solar Keymark Certificate		Licence Number	011-7S2966 F
		Date issued	2025-04-04
		Issued by	DINCERTCO

Licence holder	SST GmbH	**Country**	Austria
Brand (optional)		**Web**	https://www.sst-energy.com
Street, Number	Barnabas-Fink-Straße 2	**E-mail**	david.moeslinger@sst-energy.com
Postcode, City	A-6845 Hohenems	**Tel**	+43 5525 20 580-11

Collector Type	Flat plate collector

Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$					
					0 K	10 K	30 K	50 K	70 K	111 K
	m²	mm	mm	mm	W	W	W	W	W	W
SST ECO SA	4.56	2 004	2 274	99	3 023	2 853	2 491	2 099	1 679	725
SST ECO SA	1.00	1 000	1 000	99	663	626	546	460	368	159
Power output per m² gross area					663	626	546	460	368	159

Performance parameters test method	Quasi dynamic									
Performance parameters (related to A_G)	η0, b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	J/(m²K)	s/m	W/(m²K⁴)	W/(m²K⁴)	-
Test results	0.669	3.65	0.008	0.000	0.00	10 540	0.000	0.00	0.0	0.94

Incidence angle modifier test method		Quasi dynamic - outdoor								
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T,coll}$	1.00	1.00	0.99	0.98	0.91	0.78	0.54	0.27	0.00
Longitudinal	$K_{\theta L,coll}$	1.00	1.00	0.99	0.98	0.91	0.78	0.54	0.27	0.00

Heat transfer medium for testing		Water	
Flow rate for testing (per gross area, A_G)	dm/dt	0.020	kg/(sm²)
Maximum temperature difference during thermal performance test	$(\vartheta_m-\vartheta_a)_{max}$	81	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	170	°C
Maximum operating temperature	$\vartheta_{max\ op}$	k.A.	°C
Maximum operating pressure	$p_{max,op}$	800	kPa

Testing laboratory	Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)	http://www.igte.uni-stuttgart.de	
Test report(s)	19COL1506/1 19COL1506Q/1 24COL1767	**Dated**	09.11.2023 09.11.2023 25.02.2025

Comments of testing laboratory Ver. 6.2 (13.01.2022)

Collectors can be manufactured in customer-specific sizes. This data sheet replaces the SK data sheet issued 4th December 2023. Reason for the replacement: change of absorber supplier.

TZS Forschungs- und Testzentrum für Solaranlagen
Institut für Thermodynamik und Wärmetechnik
Universität Stuttgart
Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)

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Supplementary Information	Issued	2025-04-04

Gross Thermal Yield in kWh/collector at mean fluid temperature ϑ_m

Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
SST ECO SA		4 795	3 277	2 062	3 564	2 381	1 452	2 619	1 645	967	2 867	1 782	1 027
SST ECO SA		1 052	719	452	782	522	318	574	361	212	629	391	225
Gross Thermal Yield per m² gross area		1 052	719	452	782	522	318	574	361	212	629	391	225
Annual efficiency, η_a		60%	41%	26%	48%	32%	20%	49%	31%	18%	51%	31%	18%
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m²			1630 kWh/m²			1166 kWh/m²			1244 kWh/m²		
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 ϑm (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.2 (13.01.2022). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/

Additional Information

Collector heat transfer medium				Water-Glycole	
The collector is deemed to be suitable for roof integration				No	
The collector was tested successfully under the following conditions:					
Climate class (A+, A, B or C)				B	--
G (W/m²) >	900	ϑ_a (°C) >	15	H_x (MJ/m²) >	540
Maximum tested positive load				3000	Pa
Maximum tested negative load				2750	Pa
Hail resistance using steel ball (maximum drop height)				2	m

Additional collector attribute(s)

Using external power source(s) for normal operation	No	Active or passive measure(s) for self-protection	No
Co-generating thermal and electrical power	No	Façade collector(s)	Yes

Energy Labelling Information

	Reference Area, A_{sol} (m²)
SST ECO SA	4.56
SST ECO SA	1.00

Additional Informative Technical Data

Hydraulic Designation Code	Aperture Area, A_a (m²)
19-V-24R -7.2,2144-20.6,1917-D	4.18
not specified	

Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}

Collector efficiency (η_{col})	50%

Remark: Collector efficiency (ηcol) 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/m², expressed in % and rounded to the nearest integer. Deviating from the regulation ηcol is based on reference area (Asol) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.

Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}

Zero-loss efficiency (η_0)	0.66	--
First-order coefficient (a_1)	3.65	W/(m²K)
Second-order coefficient (a_2)	0.008	W/(m²K²)
Incidence angle modifier IAM (50°)	0.96	--

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.

DIN CERTCO ● Alboinstraße 56 ● 12103 Berlin, Germany
Tel: +49 30 7562-1131 ● Fax: +49 30 7562-1141 ● E-Mail: info@dincertco.de ● www.dincertco.de