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Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results		Licence Number	011-7S1687 F
		Date issued	2018-08-08
		Issued by	DIN CERTCO

Licence holder	SST Solar GmbH	Country	Austria
Brand (optional)	-	Web	www.sst-solar.com
Street, Number	Galinastraße 14	E-mail	office@sst-solar.com
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Collector Type	Flat plate collector, glazed

Collector name	Gross area (A_G)	Gross length	Gross width	Gross height	Power output per collector Gb = 850 W/m²; Gd = 150 W/m² ϑm - ϑa					
					0 K	10 K	30 K	50 K	70 K	100 K
	m²	mm	mm	mm	W	W	W	W	W	W
SST ECO E 2125	2.52	2 015	1 252	128	1 791	1 704	1 517	1 311	1 088	718
SST ECO E 2150	3.03	2 015	1 502	128	2 149	2 045	1 820	1 573	1 305	861
SST ECO E 2200	4.03	2 015	2 002	128	2 864	2 725	2 426	2 097	1 739	1 148
SST ECO E 2250	5.04	2 015	2 502	128	3 579	3 406	3 031	2 621	2 174	1 435
SST ECO E 2300	6.05	2 015	3 002	128	4 295	4 086	3 637	3 144	2 608	1 722
SST ECO E 3125	3.76	3 005	1 252	128	2 671	2 542	2 262	1 956	1 622	1 071
SST ECO E 3150	4.51	3 005	1 502	128	3 205	3 049	2 714	2 346	1 946	1 285
SST ECO E 3200	6.02	3 005	2 002	128	4 271	4 064	3 617	3 127	2 594	1 712
SST ECO E 3250	7.52	3 005	2 502	128	5 338	5 079	4 521	3 908	3 241	2 140
SST ECO E 3300	9.02	3 005	3 002	128	6 405	6 094	5 424	4 689	3 889	2 567
SST ECO E 4125	5.00	3 995	1 252	128	3 551	3 379	3 007	2 600	2 156	1 423
SST ECO E 4150	6.00	3 995	1 502	128	4 260	4 054	3 608	3 119	2 587	1 708
SST ECO E 4200	8.00	3 995	2 002	128	5 679	5 403	4 809	4 157	3 448	2 276
SST ECO E 4250	10.00	3 995	2 502	128	7 097	6 753	6 010	5 196	4 309	2 845
SST ECO E 4300	11.99	3 995	3 002	128	8 515	8 102	7 211	6 234	5 170	3 413
SST ECO E 5125	6.24	4 985	1 252	128	4 431	4 216	3 753	3 244	2 691	1 776
SST ECO E 5150	7.49	4 985	1 502	128	5 316	5 058	4 502	3 892	3 228	2 131
SST ECO E 5200	9.98	4 985	2 002	128	7 086	6 742	6 001	5 188	4 303	2 840
SST ECO E 5250	12.47	4 985	2 502	128	8 855	8 426	7 499	6 483	5 377	3 550
SST ECO E 5300	14.96	4 985	3 002	128	10 625	10 110	8 998	7 779	6 452	4 259
SST ECO E 6125	7.48	5 975	1 252	128	5 311	5 054	4 498	3 888	3 225	2 129
SST ECO E 6150	8.97	5 975	1 502	128	6 372	6 063	5 396	4 665	3 869	2 554
SST ECO E 6200	11.96	5 975	2 002	128	8 493	8 081	7 192	6 218	5 157	3 404
SST ECO E 6250	14.95	5 975	2 502	128	10 614	10 099	8 989	7 771	6 445	4 255
SST ECO E 6300	17.94	5 975	3 002	128	12 735	12 117	10 785	9 324	7 733	5 105
SST ECO E 7125	8.72	6 965	1 252	128	6 191	5 891	5 243	4 533	3 759	2 482
SST ECO E 7150	10.46	6 965	1 502	128	7 428	7 067	6 290	5 438	4 510	2 977
SST ECO E 7200	13.94	6 965	2 002	128	9 900	9 420	8 384	7 248	6 012	3 968
SST ECO E 7250	17.43	6 965	2 502	128	12 373	11 773	10 478	9 058	7 513	4 960
SST ECO E 7300	20.91	6 965	3 002	128	14 845	14 125	12 572	10 868	9 014	5 951
SST ECO E 8125	9.96	7 955	1 252	128	7 071	6 728	5 989	5 177	4 294	2 835
SST ECO E 8150	11.95	7 955	1 502	128	8 483	8 072	7 184	6 211	5 151	3 401
SST ECO E 8200	15.93	7 955	2 002	128	11 307	10 759	9 576	8 278	6 866	4 533
SST ECO E 8250	19.90	7 955	2 502	128	14 131	13 446	11 968	10 346	8 581	5 665
SST ECO E 8300	23.88	7 955	3 002	128	16 955	16 133	14 359	12 413	10 296	6 797
SST ECO E Sondergröße*										
Power output per m² gross area					710	676	601	520	431	285

Performance parameters test method		Steady state - indoor								
Performance parameters (related to AG)		η0,hem	a1	a2						
Units		-	W/(m²K)	W/(m²K²)						
Test results		0.710	3.354	0.009						
Incidence angle modifier test method		Steady state - outdoor								
Bi-directional incidence angle modifiers	No									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	$K_{\theta T,coll}$					0.97				0.00
Longitudinal	$K_{\theta L,coll}$					0.97				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 for thermal performance calculations	$(\vartheta_m-\vartheta_a)_{max}$	100	K
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)	ϑ_{stg}	190	°C
Effective thermal capacity, incl. fluid (per gross area, A_G)	C/m²	5.768	kJ/(Km²)
Maximum operating temperature	ϑ_{max_op}	-	°C
Maximum operating pressure	$p_{max,op}$	1000	kPa

Testing laboratory	TZS, ITW University Stuttgart	www.itw.uni-stuttgart.de	
Test report(s)	18COLP20400780101	**Dated**	25.04.2018
	18COLP20400780101Q		25.04.2018

Comments of testing laboratory Datasheet version: 5.01, 2016-03-01

This data sheet replaces the data sheet issued 25.04.2018
Documented preformance parameters are taken from 18COLP20400780101 (SST ECO E 2200)
* This collector type is beeing offered in customer-specific dimensions
On page 2, the annual collector output from SST ECO E 5125 was corrected.

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Annex to Solar Keymark Certificate	Licence Number	011-7S1687 F
Supplementary Information	Issued	2018-08-08

Annual collector output in kWh/collector at mean fluid temperature ϑ_m, based on ISO 9806:2013 test results

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 E 2125	2 943	2 129	1 434	2 240	1 576	1 025	1 655	1 098	685	1 800	1 192	730
SST ECO E 2150	3 530	2 554	1 720	2 688	1 891	1 229	1 986	1 318	822	2 159	1 430	876
SST ECO E 2200	4 706	3 404	2 293	3 582	2 520	1 639	2 647	1 756	1 095	2 878	1 906	1 167
SST ECO E 2250	5 881	4 254	2 866	4 477	3 149	2 048	3 307	2 195	1 368	3 597	2 381	1 459
SST ECO E 2300	7 056	5 105	3 438	5 372	3 779	2 457	3 968	2 633	1 642	4 316	2 857	1 750
SST ECO E 3125	4 389	3 175	2 139	3 341	2 350	1 528	2 468	1 638	1 021	2 684	1 777	1 089
SST ECO E 3150	5 265	3 809	2 566	4 008	2 819	1 833	2 961	1 965	1 225	3 220	2 132	1 306
SST ECO E 3200	7 018	5 077	3 420	5 342	3 758	2 444	3 947	2 619	1 633	4 292	2 842	1 741
SST ECO E 3250	8 770	6 345	4 274	6 676	4 697	3 054	4 933	3 273	2 041	5 364	3 552	2 175
SST ECO E 3300	10 523	7 613	5 128	8 011	5 635	3 664	5 918	3 927	2 449	6 436	4 261	2 610
SST ECO E 4125	5 835	4 221	2 843	4 442	3 124	2 032	3 281	2 177	1 358	3 569	2 363	1 447
SST ECO E 4150	7 000	5 064	3 411	5 328	3 748	2 437	3 937	2 612	1 629	4 281	2 834	1 736
SST ECO E 4200	9 330	6 749	4 546	7 102	4 996	3 249	5 247	3 482	2 171	5 707	3 778	2 314
SST ECO E 4250	11 660	8 435	5 682	8 876	6 244	4 060	6 558	4 352	2 713	7 132	4 722	2 892
SST ECO E 4300	13 990	10 120	6 817	10 650	7 492	4 872	7 868	5 221	3 255	8 557	5 665	3 470
SST ECO E 5125	7 280	5 267	3 548	5 542	3 899	2 535	4 095	2 717	1 694	4 453	2 948	1 806
SST ECO E 5150	8 734	6 318	4 256	6 649	4 677	3 041	4 912	3 260	2 032	5 342	3 537	2 166
SST ECO E 5200	11 642	8 422	5 673	8 862	6 234	4 054	6 547	4 345	2 709	7 121	4 714	2 888
SST ECO E 5250	14 549	10 525	7 090	11 076	7 791	5 066	8 183	5 430	3 385	8 899	5 892	3 609
SST ECO E 5300	17 457	12 628	8 507	13 289	9 348	6 079	9 818	6 515	4 062	10 677	7 069	4 330
SST ECO E 6125	8 726	6 313	4 252	6 643	4 673	3 039	4 908	3 257	2 031	5 337	3 534	2 164
SST ECO E 6150	10 469	7 573	5 101	7 969	5 606	3 646	5 888	3 907	2 436	6 403	4 239	2 597
SST ECO E 6200	13 954	10 094	6 800	10 622	7 472	4 859	7 848	5 208	3 247	8 535	5 650	3 461
SST ECO E 6250	17 439	12 615	8 498	13 275	9 339	6 073	9 808	6 508	4 058	10 666	7 062	4 325
SST ECO E 6300	20 924	15 136	10 196	15 928	11 205	7 286	11 767	7 809	4 869	12 798	8 473	5 190
SST ECO E 7125	10 172	7 359	4 957	7 743	5 447	3 542	5 721	3 796	2 367	6 222	4 119	2 523
SST ECO E 7150	12 203	8 828	5 947	9 290	6 535	4 250	6 863	4 554	2 840	7 464	4 942	3 027
SST ECO E 7200	16 266	11 767	7 926	12 382	8 710	5 664	9 148	6 070	3 785	9 949	6 587	4 034
SST ECO E 7250	20 328	14 706	9 906	15 475	10 886	7 079	11 433	7 587	4 730	12 434	8 232	5 042
SST ECO E 7300	24 391	17 644	11 885	18 567	13 061	8 493	13 717	9 103	5 675	14 918	9 877	6 050
SST ECO E 8125	11 618	8 405	5 661	8 844	6 222	4 046	6 534	4 336	2 703	7 106	4 705	2 882
SST ECO E 8150	13 938	10 083	6 792	10 610	7 464	4 854	7 839	5 202	3 243	8 525	5 644	3 457
SST ECO E 8200	18 578	13 439	9 053	14 142	9 948	6 469	10 448	6 933	4 323	11 363	7 523	4 608
SST ECO E 8250	23 218	16 796	11 314	17 674	12 433	8 085	13 058	8 665	5 402	14 201	9 402	5 759
SST ECO E 8300	27 857	20 152	13 575	21 206	14 918	9 701	15 667	10 396	6 482	17 039	11 281	6 910
SST ECO E Sondergröße*	27 857	20 152	13 575	21 206	14 918	9 701	15 667	10 396	6 482	17 039	11 281	6 910
Annual output per m² gross area	1 167	844	568	888	625	406	656	435	271	713	472	289
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane	1765 kWh/m²			1714 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. 5.01 (March 2016). A detailed description

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	1000	Pa
Maximum tested negative load	1000	Pa
Hail resistance using steel ball (maximum drop height)	-	m

Energy Labelling Information

	Reference Area, A_{sol} (m^2)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
SST ECO E 2125	2.52	Collector efficiency (η_{col})	56	%
SST ECO E 2150	3.03	*Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No*		

SST ECO E 2200	4.03
SST ECO E 2250	5.04
SST ECO E 2300	6.05
SST ECO E 3125	3.76
SST ECO E 3150	4.51
SST ECO E 3200	6.02
SST ECO E 3250	7.52
SST ECO E 3300	9.02
SST ECO E 4125	5.00
SST ECO E 4150	6.00
SST ECO E 4200	8.00
SST ECO E 4250	10.00
SST ECO E 4300	11.99
SST ECO E 5125	6.24
SST ECO E 5150	7.49
SST ECO E 5200	9.98
SST ECO E 5250	12.47
SST ECO E 5300	14.96
SST ECO E 6125	7.48
SST ECO E 6150	8.97
SST ECO E 6200	11.96
SST ECO E 6250	14.95
SST ECO E 6300	17.94
SST ECO E 7125	8.72
SST ECO E 7150	10.46
SST ECO E 7200	13.94
SST ECO E 7250	17.43
SST ECO E 7300	20.91
SST ECO E 8125	9.96
SST ECO E 8150	11.95
SST ECO E 8200	15.93
SST ECO E 8250	19.90
SST ECO E Sondergröße*	#BEZUG!

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 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)	0.710	--
First-order coefficient (a_1)	3.35	W/(m²K)
Second-order coefficient (a_2)	0.009	W/(m²K²)
Incidence angle modifier IAM (50°)	0.97	--

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.

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