


Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results						Licence Number		011-7S2091 F							
						Date issued		2017-09-13							
						Issued by		DIN CERTCO							
Licence holder		Walter Bösch GmbH & Co KG				Country		Austria							
Brand (optional)						Web		www.boesch.at							
Street, Number		Industrie Nord				E-mail		Ralf.Andres@boesch.at							
Postcode, City		6890 Lustenau				Tel		+43 557 781 311 050							
Collector Type						Flat plate collector, glazed									
Collector name						Power output per collector Gb = 850 W/m ² ; Gd = 150 W/m ² ; u = 3 m/s $\vartheta_m - \vartheta_a$									
						Gross area (A _G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	104 K
						m ²	mm	mm	mm	W	W	W	W	W	W
SBK25WA						2.52	1 170	2 150	83	1 834	1 744	1 548	1 332	1 096	648
Power output per m ² gross area						728	692	614	529	435	257				
Performance parameters test method						Quasi dynamic									
Performance parameters (related to AG)						$\eta_{0,b}$	c1	c2	c3	c4	c6	Kd			
Units						-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	s/m	-			
Test results						0.732	3.487	0.010	0.000	0.000	0.000	0.963			
Incidence angle modifier test method						Quasi dynamic - outdoor									
Bi-directional incidence angle modifiers						No									
Incidence angle modifier						Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal						K _{θT, coll}	1.00	1.00	1.00	1.00	0.96	0.87	0.69	0.35	0.00
Longitudinal						K _{θL, coll}	1.00	1.00	1.00	1.00	0.96	0.87	0.69	0.35	0.00
Heat transfer medium for testing						Water-Glycole									
Flow rate for testing (per gross area, A _G)						dm/dt	0.020	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations						($\vartheta_m - \vartheta_a$) _{max}	104	K							
Standard stagnation temperature (G = 1000 W/m ² ; $\vartheta_a = 30$ °C)						ϑ_{stg}	197	°C							
Effective thermal capacity, incl. fluid (per gross area, A _G)						C/m ²	11.73	kJ/(Km ²)							
Maximum operating temperature						$\vartheta_{max, op}$	197	°C							
Maximum operating pressure						p _{max, op}	1000	kPa							
Testing laboratory						TZS, ITW University Stuttgart				www.itw.uni-stuttgart.de					
Test report(s)						16COL1346OEM01 16COL 1346QOEM01				Dated		13.09.2017 13.09.2017			
Comments of testing laboratory						Datashet version: 5.01, 2016-03-01									
Documented performance parameters are taken from test report 16COL1346OEM01						 TZS Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70550 Stuttgart (Vaihingen)									
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S2091 F
	Issued	2017-09-13

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
SBK25WA		2 997	2 154	1 434	2 286	1 599	1 032	1 674	1 107	684	1 828	1 202	732
Annual output per m ² gross area		1 189	855	569	907	635	410	664	439	271	726	477	291
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	
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)	A	--
Maximum tested positive load	3000	Pa
Maximum tested negative load	2750	Pa
Hail resistance using steel ball (maximum drop height)	2	m

Energy Labelling Information			
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}	
SBK25WA	2.52	Collector efficiency (η_{col})	57 %
		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)	0.728 --
		First-order coefficient (a_1)	3.49 W/(m ² K)
		Second-order coefficient (a_2)	0.010 W/(m ² K ²)
		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.	