


Annex to Solar Keymark Certificate					Licence Number		011-7S1939 F								
					Date issued		2022-06-08								
					Issued by		DIN CERTCO								
Licence holder		KWB- Kraft und Wärme aus Biomasse GmbH			Country		Österreich								
Brand (optional)					Web		www.kwb.at								
Street, Number		Industriestr. 235			E-mail		office@kwb.at								
Postcode, City		8321 St. Margarethen an der Raab			Tel		+43 3115 6116 6117								
Collector Type					Flat plate collector										
Collector name					Power output per collector G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s ϑ _m - ϑ _a										
					0 K	10 K	30 K	50 K	70 K	118 K					
					m ²	mm	mm	mm	W	W	W	W	W	W	
KWB FlexiSun FK8250N					2.52	2150	1170	85	1866	1769	1556	1316	1050	304	
Power output per m ² gross area					741	702	617	522	417	121					
Performance parameters test method		Quasi dynamic													
Performance parameters (related to A _G)		η _{0, b}	a1	a2	a3	a4	a5	a6	a7	a8	Kd				
Units		-	W/(m ² K)	W/(m ² K ²)	J/(m ³ K)	-	J/(m ² K)	s/m	W/(m ² K ⁴)	W/(m ² K ⁴)	-				
Test results		0.744	3.720	0.013	0.000	0.00	10360	0.000	0.00	0.0	0.97				
Incidence angle modifier test method		Quasi dynamic - outdoor													
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°				
Transversal		K _{θT, coll}	1.00	1.00	1.00	0.99	0.96	0.90	0.73	0.37	0.00				
Longitudinal		K _{θL, coll}	1.00	1.00	1.00	0.99	0.96	0.90	0.73	0.37	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 during thermal performance test		(ϑ _m -ϑ _a) _{max}	88		K										
Standard stagnation temperature (G = 1000 W/m ² ; ϑ _a = 30 °C)		ϑ _{stg}	200		°C										
Maximum operating temperature		ϑ _{max, op}	n.a.		°C										
Maximum operating pressure		p _{max, op}	1000		kPa										
Testing laboratory		Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung (IGTE)					http://www.igte.uni-stuttgart.de								
Test report(s)		20COL1538/1OEM07 20COL1538Q/2OEM07					Dated		08.06.2022 08.06.2022						
Comments of testing laboratory		Ver. 6.2 (13.01.2022)													
This data sheet replaces the data sheet issued on 29.07.2019 According to the Solar Keymark Scheme rules the collector was retested after 10 years after the previous test.															
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															

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Supplementary Information		Issued		2022-06-08										
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	
KWB FlexiSun FK8250N		3 053	2 146	1 370	2 299	1 560	950	1 692	1 086	636	1 850	1 180	682	
Gross Thermal Yield per m ² gross area		1 211	852	544	912	619	377	672	431	253	734	468	270	
Annual efficiency, η_a		69%	48%	31%	56%	38%	23%	58%	37%	22%	59%	38%	22%	
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane		1765 kWh/m ²			1630 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. 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											Yes			
The collector was tested successfully under the following conditions:														
Climate class (A+, A, B or C)											A		--	
G (W/m ²) >		1000		ϑ_a (°C) >		20		H _x (MJ/m ²) >		600				
Maximum tested positive load											3000		Pa	
Maximum tested negative load											2500		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)	No
Energy Labelling Information						Additional Informative Technical Data								
						Reference Area, A _{sol} (m ²)		Hydraulic Designation Code			Aperture Area, A _a (m ²)			
KWB FlexiSun FK8250N						2.52		12-V-12S-A:7.2,1988- C:20.4,1215			2.31			
Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}						Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}								
Collector efficiency (η_{col})						57%		Zero-loss efficiency (η_0)			0.74		--	
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 9806:2017.						First-order coefficient (a ₁)			3.72		W/(m ² K)			
						Second-order coefficient (a ₂)			0.013		W/(m ² K ²)			
						Incidence angle modifier IAM (50°)			0.98		--			
						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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