


Annex to Solar Keymark Certificate					Licence Number		011-7S2173 F							
					Date issued		2023-11-02							
					Issued by		DIN CERTCO							
Licence holder		GREENoneTEC Solarindustrie GmbH			Country		Austria							
Brand (optional)					Web		www.greenonetec.com							
Street, Number		Industriepark St. Veit, Energieplatz 1			E-mail		info@greenonetec.com							
Postcode, City		A - 9300 St. Veit/Glan			Tel		+43 (0) 4212 28136-0							
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 $\vartheta_m - \vartheta_a$									
					Gross area (A_G)	Gross length	Gross width	Gross height	0 K	10 K	30 K	50 K	70 K	115 K
					m ²	mm	mm	mm	W	W	W	W	W	W
FK8207N 4M FG					2.02	1,728	1,168	83	1,491	1,412	1,242	1,056	854	340
FK8257N 4M FG					2.51	2,148	1,168	83	1,853	1,755	1,544	1,312	1,061	422
FK8207L 4M FG					2.02	1,168	1,728	83	1,491	1,412	1,242	1,056	854	340
FK8257L 4M FG					2.51	1,168	2,148	83	1,853	1,755	1,544	1,312	1,061	422
Power output per m² gross area					738	699	615	523	423	168				
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/(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		0.740	3.81	0.010	0.000	0.00	10,900	0.000	0.00	0.0E+00	0.98			
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	0.99	0.98	0.96	0.88	0.67	0.34	0.00			
Longitudinal		K_{θL, coll}	1.00	1.00	0.99	0.98	0.96	0.88	0.67	0.34	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}		85		K								
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)		ϑ_{stg}		220		°C								
Maximum operating temperature		$\vartheta_{max, op}$		220		°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)		23COL1697 23COL1698 23COL1698Q/1					Dated		25.08.2023 25.08.2023 02.11.2023					
Comments of testing laboratory		Ver. 6.2 (13.01.2022)												
This data sheet replaces the version from 25.08.2023		Documented performance parameters are taken from 23COL1697 (FK8207L 4M FG)												
		 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 6, 70560 Stuttgart (Vaihingen)												
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Supplementary Information					Issued		2023-11-02							
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	
FK8207N 4M FG		2,429	1,707	1,102	1,826	1,245	774	1,345	866	517	1,472	940	554	
FK8257N 4M FG		3,018	2,121	1,369	2,269	1,547	962	1,671	1,076	643	1,829	1,168	688	
FK8207L 4M FG		2,429	1,707	1,102	1,826	1,245	774	1,345	866	517	1,472	940	554	
FK8257L 4M FG		3,018	2,121	1,369	2,269	1,547	962	1,671	1,076	643	1,829	1,168	688	
Gross Thermal Yield per m ² gross area		1,202	845	546	904	616	383	666	429	256	729	465	274	
Annual efficiency, η_a		68%	48%	31%	55%	38%	24%	57%	37%	22%	59%	37%	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										3000		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)				
FK8207N 4M FG		2.02				1-H-1234S-7.2,18200-16.6,1153-D				1.88				
FK8257N 4M FG		2.51				1-H-1234S-7.2,22800-16.6,1153-D				2.35				
FK8207L 4M FG		2.02				1-H-1234S-7.2,17000-16.6,1713-D				1.88				
FK8257L 4M FG		2.51				1-H-1234S-7.2,21200-16.6,2133-D				2.35				
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)				3.81		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.								
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