


Annex to Solar Keymark Certificate					Licence Number		011-7S185 F				
					Date issued		2021-10-11				
					Issued by		DIN CERTCO				
Licence holder		GREEoneTEC Solarindustrie GmbH			Country		Österreich				
Brand (optional)					Web		www.greenonetec.com				
Street, Number		Industriepark St. Veit, Energieplatz 1			E-mail		info@greenonetec.com				
Postcode, City		9300 St. Veit			Tel		+43 4212 28136 0				
Collector Type					Flat plate collector						
Collector name					Power output per collector						
					$G_b = 850 \text{ W/m}^2$, $G_d = 150 \text{ W/m}^2$ & $u = 1.3 \text{ m/s}$ $\vartheta_m - \vartheta_a$						
					0 K	10 K	30 K	50 K	70 K	110 K	
					W	W	W	W	W	W	
FK7250N 2H					1746	1658	1464	1244	1000	438	
FK7250N 4H					1746	1658	1464	1244	1000	438	
FK7250L 2H					1746	1658	1464	1244	1000	438	
Power output per m² gross area					679	645	569	484	389	171	
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		0.684	3.307	0.012	0.000	0.00	10350	0.000	0.00	0.0	0.956
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	0.97	0.93	0.84	0.64	0.32	0.00
Longitudinal		$K_{\theta L, coll}$	1.00	1.00	0.99	0.97	0.93	0.84	0.64	0.32	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					$(\vartheta_m - \vartheta_a)_{max}$		80	K			
Standard stagnation temperature (G = 1000 W/m²; $\vartheta_a = 30 \text{ }^\circ\text{C}$)					ϑ_{stg}		190	°C			
Maximum operating temperature					$\vartheta_{max, op}$		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)		17COL1386 17COL1387, 17COL1388 17COL1387Q/1					Dated		28.11.2017 28.11.2017, 28.11.20217 11.10.2021		
Comments of testing laboratory					Datasheet version: 6.1, 2019-09-26						
This data sheet replaces the data sheet issued on 05.12.2017. Max. tested positive and negative load are corrected (page 2). Documented performance parameters are taken from test report 17COL1386 (FK7250N 2H)					 Forschungs- und Testzentrum für Solaranlagen Institut für Thermodynamik und Wärmetechnik Universität Stuttgart Pfaffenwaldring 8, 70550 Stuttgart (Vaihingen)						
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Annex to Solar Keymark Certificate Supplementary Information	Licence Number	011-7S185 F
	Issued	2021-10-11

Annual collector output in kWh/collector at mean fluid temperature ϑ_m													
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
FK7250N 2H		2 812	1 987	1 277	2 126	1 450	893	1 563	1 010	599	1 707	1 095	640
FK7250N 4H		2 812	1 987	1 277	2 126	1 450	893	1 563	1 010	599	1 707	1 095	640
FK7250L 2H		2 812	1 987	1 277	2 126	1 450	893	1 563	1 010	599	1 707	1 095	640
Annual output per m ² gross area		1 094	773	497	827	564	347	608	393	233	664	426	249
Annual efficiency, η_a		62%	44%	28%	51%	35%	21%	52%	34%	20%	53%	34%	20%
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. 6.1 (September 2019). 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	2750		Pa
Maximum tested negative load	2250		Pa
Hail resistance using steel ball (maximum drop height)	2		m

Additional collector attribute(s)	
<input type="checkbox"/> Using external power source(s) for normal operation	<input type="checkbox"/> Active or passive measure(s) for self-protection
<input type="checkbox"/> Co-generating thermal and electrical power	<input type="checkbox"/> Façade collector(s)

Energy Labelling Information		Additional Informative Technical Data	
	Reference Area, A_{sol} (m ²)	Hydraulic Designation Code	Aperture Area, A_a (m ²)
FK7250N 2H	2.57	6,6-V-12S-A:7.2,1910-C:20.4,1258	2.30
FK7250N 4H	2.57	12-V-1234S- A:7.2,1910-C:20.4,1258D	2.30
FK7250L 2H	2.57	12-H-12S-A:7,2,1910-C:20,4,1352	2.30

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})	53%	Zero-loss efficiency (η_0)	0.68
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)	3.31
		Second-order coefficient (a_2)	0.012
		Incidence angle modifier IAM (50°)	0.94
		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.	