


Annex to Solar Keymark Certificate					Licence Number		011-7S1636 F																	
					Date issued		2022-09-30																	
					Issued by		DINCERTCO																	
Licence holder		Solarbayer GmbH			Country		Germany																	
Brand (optional)		-			Web		www.solarbayer.de																	
Street, Number		Am Dörrenhof 22			E-mail		info@solarbayer.de																	
Postcode, City		85131, Pollenfeld-Preith			Tel		+49 8421 93598-0																	
Collector Type					Flat plate collector																			
Collector name					Gross area (A_G)		Gross length		Gross width		Gross height		Power output per collector											
					G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s						$\vartheta_m - \vartheta_a$													
					m ²		mm		mm		mm		0 K		10 K		30 K		50 K		70 K		100 K	
					W		W		W		W		W		W		W		W		W		W	
PremiumPlus AL 2.86 V					2.86		2 270		1 260		99		2 125		2 025		1 806		1 562		1 292		841	
PremiumPlus AL 2.86 H					2.86		1 260		2 270		99		2 125		2 025		1 806		1 562		1 292		841	
Power output per m² gross area					743		708		631		546		452		294									
Performance parameters test method					Quasi dynamic																			
Performance parameters (related to A_G)					$\eta_{0, b}$	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					0.752	3.39	0.011	0.000	0.00	3 269	0.000	0.00	0.0E+00	0.92										
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	0.99	0.97	0.94	0.89	0.81	0.63	0.32	0.00										
Longitudinal					$K_{\theta L, coll}$	1.00	0.99	0.97	0.94	0.89	0.81	0.63	0.32	0.00										
Heat transfer medium for testing					Water																			
Flow rate for testing (per gross area, A_G)					dm/dt		0.019		kg/(sm ²)															
Maximum temperature difference during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$		70		K															
Standard stagnation temperature (G = 1000 W/m²; ϑ_a = 30 °C)					ϑ_{stg}		220		°C															
Maximum operating temperature					$\vartheta_{max, op}$		-		°C															
Maximum operating pressure					$p_{max, op}$		600		kPa															
Testing laboratory					TÜV Rheinland Solar GmbH					http://www.tuv.com/solar														
Test report(s)					300100588.001					Dated 30.09.2022														
Comments of testing laboratory					none																			
					Ver. 6.2 (13.01.2022)  Genau. Richtig. TÜV Rheinland Solar GmbH Am Grauen Stein 51105 Köln																			
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Supplementary Information		Issued		2022-09-30										
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	
PremiumPlus AL 2.86 V		3 341	2 404	1 597	2 549	1 781	1 145	1 873	1 241	768	2 039	1 341	817	
PremiumPlus AL 2.86 H		3 341	2 404	1 597	2 549	1 781	1 145	1 873	1 241	768	2 039	1 341	817	
Gross Thermal Yield per m ² gross area		1 168	841	558	891	623	400	655	434	269	713	469	286	
Annual efficiency, η_a		66%	48%	32%	55%	38%	25%	56%	37%	23%	57%	38%	23%	
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										3600		Pa		
Maximum tested negative load										1500		Pa		
Hail resistance using ice balls (diameter)										35		mm		
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)			
PremiumPlus AL 2.86 V					2.86			1-H-1234S-A:8.6,26840-C:19,1280			2.67			
PremiumPlus AL 2.86 H					2.86			1-H-1234S-A:8.6,24750-C:19,2290			2.67			
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})					59%			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)			3.39			W/(m ² K)			
					Second-order coefficient (a_2)			0.011			W/(m ² K ²)			
					Incidence angle modifier IAM (50°)			0.89			--			
					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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