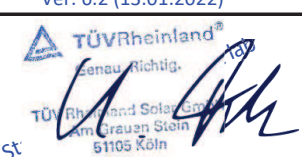


Annex to Solar Keymark Certificate					Licence Number		011-7S2940 F							
					Date issued		2024-04-15							
					Issued by		DINCERTCO							
Licence holder		Solarbayer GmbH			Country		Germany							
Brand (optional)					Web		www.solarbayer.de							
Street, Number		Am Dörrenhof 22			E-mail		info@solarbayer.de							
Postcode, City		85131. Pollenfeld-Preith			Tel		+49 (0)8421 93598-0							
Collector Type					Flat plate collector									
Collector name					Power output per collector									
					Gb = 850 W/m <sup>2</sup> , Gd = 150 W/m <sup>2</sup> & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	100 K				
					m <sup>2</sup>	mm	mm	mm	mm	mm	mm			
Premium Flair AL 2.52 V					2.52	2 100	1 200	85	1 693	1 604	1 405	1 178	923	488
Premium Flair AL 2.52 H					2.52	1 200	2 100	85	1 693	1 604	1 405	1 178	923	488
Premium Flair AL 2.85 V					2.85	2 373	1 200	85	1 915	1 814	1 589	1 333	1 044	551
Premium Flair AL 2.85 H					2.85	1 200	2 373	85	1 915	1 814	1 589	1 333	1 044	551
Power output per m <sup>2</sup> gross area					672	637	558	468	366	193				
Performance parameters test method		Steady state - outdoor												
Performance parameters (related to A <sub>G</sub> )		$\eta_{0, b}$	a1	a2	a3	a4	a5	a6	a7	a8	Kd			
Units		-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-			
Test results		0.682	3.38	0.014	0.000	0.00	6 042	0.000	0.00	0.0E+00	0.90			
Incidence angle modifier test method		Quasi dynamic - outdoor												
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°			
Transversal		K <sub>GT, coll</sub>	1.00	0.99	0.97	0.95	0.91	0.83	0.68	0.34	0.00			
Longitudinal		K <sub>GL, coll</sub>	1.00	0.99	0.97	0.95	0.91	0.83	0.68	0.34	0.00			
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A <sub>G</sub> )					dm/dt	0.024	kg/(sm <sup>2</sup> )							
Maximum temperature difference during thermal performance test					$(\vartheta_m - \vartheta_a)_{max}$	70	K							
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; $\vartheta_a = 30$ °C)					$\vartheta_{stg}$	200	°C							
Maximum operating temperature					$\vartheta_{max, op}$	120	°C							
Maximum operating pressure					p <sub>max, op</sub>	600	kPa							
Testing laboratory		TÜV Rheinland Solar GmbH					www.tuv.com/solar							
Test report(s)		DE23SF4L 001 DE23NEYH 001 DE24VO04 001					Dated		04.07.2023 04.07.2023 15.04.2024					
Comments of testing laboratory					Ver. 6.2 (13.01.2022)									
														
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Annex to Solar Keymark Certificate							Licence Number		011-7S2940 F						
Supplementary Information							Issued		2024-04-15						
<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>															
Standard Locations		Athens			Davos			Stockholm			Würzburg				
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C		
Premium Flair AL 2.52 V		2 646	1 821	1 119	1 976	1 307	760	1 460	915	518	1 591	987	548		
Premium Flair AL 2.52 H		2 646	1 821	1 119	1 976	1 307	760	1 460	915	518	1 591	987	548		
Premium Flair AL 2.85 V		2 992	2 060	1 266	2 234	1 478	860	1 651	1 035	585	1 799	1 116	620		
Premium Flair AL 2.85 H		2 992	2 060	1 266	2 234	1 478	860	1 651	1 035	585	1 799	1 116	620		
Gross Thermal Yield per m <sup>2</sup> gross area		1 050	723	444	784	518	302	579	363	205	631	392	217		
Annual efficiency, $\eta_a$		59%	41%	25%	48%	32%	19%	50%	31%	18%	51%	31%	17%		
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)													
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1630 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>				
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 $\vartheta_m$ (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 <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>															
<b>Additional Information</b>															
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 <sup>2</sup> ) >		1000		$\vartheta_a$ (°C) >		20		$H_x$ (MJ/m <sup>2</sup> ) >		600					
Maximum tested positive load							3000							Pa	
Maximum tested negative load							2000							Pa	
Hail resistance using ice balls (diameter)							35							mm	
<b>Additional collector attribute(s)</b>															
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		
<b>Energy Labelling Information</b>							<b>Additional Informative Technical Data</b>								
		Reference Area, $A_{sol}$ (m <sup>2</sup> )			Hydraulic Designation Code				Aperture Area, $A_a$ (m <sup>2</sup> )						
Premium Flair AL 2.52 V		2.52			1-H-12345-A:8.6,22100-C:20.0,1169				2.33						
Premium Flair AL 2.52 H		2.52			1-H-12345-A:8.6,20070-C:20.0,2069				2.33						
Premium Flair AL 2.85 V		2.85			1-H-12345-A:8.6,25415-C:20.0,1169				2.52						
Premium Flair AL 2.85 H		2.85			1-H-12345-A:8.6,22770-C:20.0,2342				2.52						
<b>Data required for CDR (EU) No 811/2013 - Reference Area <math>A_{sol}</math></b>							<b>Data required for CDR (EU) No 812/2013 - Reference Area <math>A_{sol}</math></b>								
Collector efficiency ( $\eta_{col}$ )		51%			Zero-loss efficiency ( $\eta_0$ )				0.67		--				
Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ 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 ( $a_1$ )				3.38				W/(m <sup>2</sup> K)					
		Second-order coefficient ( $a_2$ )				0.014				W/(m <sup>2</sup> K <sup>2</sup> )					
		Incidence angle modifier IAM (50°)				0.90				--					
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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