
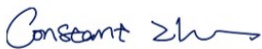


<b>Annex to Solar Keymark Certificate</b>					<b>Licence Number</b>		<b>011-7S2892 F</b>				
					<b>Date issued</b>		<b>2024-11-04</b>				
					<b>Issued by</b>		<b>DIN CERTCO</b>				
<b>Licence holder</b>		Dezhou BTE Solar Co., Ltd			<b>Country</b>		China				
<b>Brand (optional)</b>		BTE			<b>Web</b>		en.btesolar.com				
<b>Street, Number</b>		No. 3387 Chongde First Avenue			<b>E-mail</b>		sales@btesolar.com				
<b>Postcode, City</b>		253000, Dezhou City, Shandong Province			<b>Tel</b>		+86 (0)534-8051280				
<b>Collector Type</b>					Flat plate collector						
<b>Collector name</b>					<b>Power output per collector</b>						
					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	94 K	
					W	W	W	W	W	W	
<b>BTE1.5-2</b>					1 087	1 029	906	771	626	439	
<b>BTE1.78</b>					1 290	1 221	1 075	915	743	521	
<b>BTE2.0-2</b>					1 450	1 372	1 207	1 028	835	585	
<b>BTE2.4-2</b>					1 739	1 647	1 449	1 234	1 002	702	
<b>BTE2.43</b>					1 761	1 667	1 467	1 249	1 015	711	
<b>BTE2.5-2</b>					1 826	1 729	1 521	1 296	1 052	737	
<b>BTE3.0-2</b>					2 174	2 058	1 811	1 543	1 253	878	
<b>Power output per m<sup>2</sup> gross area</b>					725	686	604	514	418	293	
<b>Performance parameters test method</b>		Quasi dynamic									
<b>Performance parameters (related to A<sub>G</sub>)</b>		$\eta_0, b$	a1	a2	a3	a4	a5	a6	a7	a8	Kd
<b>Units</b>		-	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> )	-
<b>Test results</b>		0.732	3.77	0.009	0.000	0.00	11 756	0.000	0.00	0.00	0.93
<b>Incidence angle modifier test method</b>		Quasi dynamic - outdoor									
<b>Incidence angle modifier</b>		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
<b>Transversal</b>		K <sub>θT, coll</sub>	1.00	0.99	0.97	0.94	0.89	0.81	0.63	-	0.00
<b>Longitudinal</b>		K <sub>θL, coll</sub>	1.00	0.99	0.97	0.94	0.89	0.81	0.63	-	0.00
<b>Heat transfer medium for testing</b>					Water						
<b>Flow rate for testing (per gross area, A<sub>G</sub>)</b>					dm/dt	0.020	kg/(sm <sup>2</sup> )				
<b>Maximum temperature difference during thermal performance test</b>					( $\vartheta_m - \vartheta_a$ ) <sub>max</sub>	64	K				
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; <math>\vartheta_a = 30</math> °C)</b>					$\vartheta_{stg}$	213	°C				
<b>Maximum operating temperature</b>					$\vartheta_{max, op}$	99	°C				
<b>Maximum operating pressure</b>					p <sub>max, op</sub>	1000	kPa				
<b>Testing laboratory</b>		TÜV Rheinland (Guangdong) Ltd.				<a href="http://www.tuv.com">http://www.tuv.com</a>					
<b>Test report(s)</b>		CN24GUJQ 001 50185938-001 (issued by TÜV Rheinland (Shanghai) Co., Ltd.) 50185939-001 (issued by TÜV Rheinland (Shanghai) Co., Ltd.)				<b>Dated</b>		2024-11-01 2018-10-18 2018-10-18			
<b>Comments of testing laboratory</b>					Ver. 6.2 (13.01.2022)						
<i>Given collector parameters are determined on BTE1.5-2;</i>					 <b>TÜVRheinland®</b> Precisely Right. 						
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Annex to Solar Keymark Certificate							Licence Number			011-7S2892 F				
Supplementary Information							Issued			2024-11-04				
<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	
BTE1.5-2		1 709	1 186	760	1 276	862	534	942	601	359	1 028	650	381	
BTE1.78		2 028	1 407	901	1 514	1 023	634	1 118	713	426	1 220	771	452	
BTE2.0-2		2 279	1 581	1 013	1 701	1 149	712	1 256	801	479	1 371	866	508	
BTE2.4-2		2 735	1 897	1 215	2 041	1 379	855	1 507	961	574	1 646	1 039	610	
BTE2.43		2 769	1 921	1 230	2 066	1 397	865	1 526	973	581	1 666	1 052	617	
BTE2.5-2		2 872	1 992	1 276	2 143	1 448	897	1 582	1 010	603	1 728	1 091	640	
BTE3.0-2		3 419	2 372	1 519	2 551	1 724	1 068	1 884	1 202	718	2 057	1 299	762	
Gross Thermal Yield per m <sup>2</sup> gross area		1 140	791	506	850	575	356	628	401	239	686	433	254	
Annual efficiency, $\eta_a$		65%	45%	29%	52%	35%	22%	54%	34%	21%	55%	35%	20%	
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)							B			--				
G (W/m <sup>2</sup> ) >		900		$\vartheta_a$ (°C) >		15		H <sub>x</sub> (MJ/m <sup>2</sup> ) >		540				
Maximum tested positive load							2200			Pa				
Maximum tested negative load							1650			Pa				
Hail resistance using steel ball (maximum drop height)							1.0			m				
<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 <sub>sol</sub> (m <sup>2</sup> )			Hydraulic Designation Code				Aperture Area, A <sub>a</sub> (m <sup>2</sup> )					
BTE1.5-2		1.50			8-HV-1234S-A:8,1384-C:20.4,1060				1.39					
BTE1.78		1.78			8-HV-1234S-A:8,1810-C:20.4,985				1.63					
BTE2.0-2		2.00			8-VH-1234S-A:8,1884-C:20.4,1060				1.87					
BTE2.4-2		2.40			8-VH-1234S-A:8,1904-C:20.4,1060				2.25					
BTE2.43		2.43			8-VH-1234S-A:8,1984-C:20.4,1280				2.30					
BTE2.5-2		2.52			10-VH-1234S-A:10,2084-C:20.4,1260				2.34					
BTE3.0-2		3.00			10-VH-1234S-A:10,2284-C:20.4,1260				2.84					
<b>Data required for CDR (EU) No 811/2013 - Reference Area A<sub>sol</sub></b>					<b>Data required for CDR (EU) No 812/2013 - Reference Area A<sub>sol</sub></b>									
Collector efficiency ( $\eta_{col}$ )		56%			Zero-loss efficiency ( $\eta_0$ )				0.72					
					First-order coefficient ( $a_1$ )				3.77					
					Second-order coefficient ( $a_2$ )				0.009					
					Incidence angle modifier IAM (50°)				0.89					
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 <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.					Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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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