


<b>Annex to Solar Keymark Certificate</b>					<b>Licence Number</b>		<b>011-7S3240 P</b>							
					<b>Date issued</b>		<b>2025-01-15</b>							
					<b>Issued by</b>		<b>DIN CERTCO</b>							
<b>Licence holder</b>			<b>ZHEJIANG KESUN NEW ENERGY CO., LTD.</b>			<b>Country</b>		China						
<b>Brand (optional)</b>			ENSUN			<b>Web</b>		www.kesunsolar.com						
<b>Street, Number</b>			No.28-1 Anren Road, Jianshan New District			<b>E-mail</b>		alan@ensunchina.com						
<b>Postcode, City</b>			Haining City, Zhejiang Province			<b>Tel</b>		+86 13586432400						
<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	75 K				
					m <sup>2</sup>	mm	mm	mm	mm	mm				
PVT430					1.94	1,725	1,125	41	786	677	450	210	0	0
PVT450					2.17	2,094	1,038	41	881	758	504	235	0	0
PVT550					2.58	2,279	1,134	41	1,047	902	599	280	0	0
PVT580					2.58	2,278	1,134	41	1,046	901	599	280	0	0
PVT600					2.83	2,172	1,303	41	1,146	988	656	307	0	0
PVT670					3.11	2,390	1,300	41	1,259	1,084	720	336	0	0
<b>Power output per m<sup>2</sup> gross area</b>					405	349	232	108	0	0				
<b>Performance parameters test method</b>			Steady state - outdoor											
<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>			0.415	5.54	0.008	0.000	0.00	6,646	0.000	0.00	0.00	0.84		
<b>Incidence angle modifier test method</b>			Steady state - 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	0.88	0.78	0.63	0.39	0.00		
<b>Longitudinal</b>			K <sub>θL, coll</sub>	1.00	0.99	0.97	0.94	0.88	0.78	0.63	0.39	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>	45.49	K							
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; <math>\vartheta_a = 30</math> °C)</b>					$\vartheta_{stg}$	90	°C							
<b>Maximum operating temperature</b>					$\vartheta_{max, op}$	90	°C							
<b>Maximum operating pressure</b>					p <sub>max, op</sub>	600	kPa							
<b>Testing laboratory</b>			Intertek Testing Services Shenzhen Ltd. Guangzhou Branch				http://www.intertek.com							
<b>Test report(s)</b>			240312065GZU-001				<b>Dated</b>		2025/1/6					
<b>Comments of testing laboratory</b>					Ver. 6.2 (13.01.2022)									
All test results in this datasheet are test from model PVT-430W. Thermal performance parameters are given for the PV-module working with max. electrical power output (PV-module mode NES108-7-430M), the max electrical power of the PVT collector is 430 Wmpp. IEC 61215 and IEC 61730 is certified by TÜV SUD under Z2 124191 0003 Rev.0 2024/12/09 based on the test report 7040624104001-00 (2024/11/27) issued by TÜV SUD.					 Stamp & signature u									
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<b>Annex to Solar Keymark Certificate</b> <b>Supplementary Information</b>	<b>Licence Number</b>	<b>011-7S3240 P</b>
	<b>Issued</b>	<b>2025-01-15</b>

<b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>													
Collector name	Standard Locations $\vartheta_m$	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
PVT430		1,135	419	83	624	197	22	503	156	18	558	169	23
PVT450		1,271	469	93	699	221	24	564	175	20	625	189	26
PVT550		1,511	558	111	831	263	29	670	208	24	744	224	31
PVT580		1,511	558	111	830	262	29	670	208	24	743	224	31
PVT600		1,655	611	121	910	288	32	734	228	26	814	246	34
PVT670		1,817	671	133	999	316	35	806	250	29	894	270	38
Gross Thermal Yield per m <sup>2</sup> gross area		585	216	43	321	102	11	259	80	9	288	87	12
Annual efficiency, $\eta_a$		33%	12%	2%	20%	6%	1%	22%	7%	1%	23%	7%	1%
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 <http://www.estif.org/solarkeymarknew/>

<b>Additional Information</b>			
Collector heat transfer medium	Water-Glycole		
The collector is deemed to be suitable for roof integration	No		
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
		$H_x$ (MJ/m <sup>2</sup> ) >	540
Maximum tested positive load	1500		Pa
Maximum tested negative load	1500		Pa
Hail resistance using steel ball (maximum drop height)	2		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	Yes	Façade collector(s)	No

<b>Energy Labelling Information</b>		<b>Additional Informative Technical Data</b>	
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	<b>Hydraulic Designation Code</b>	Aperture Area, $A_a$ (m <sup>2</sup> )
PVT430	1.94	X-VH-LRR-A:8, 7588-C:X	1.74
PVT450	2.17	X-VH-LRR-A:8, 9076-C:X	2.05
PVT550	2.58	X-VH-LRR-A:8, 12295-C:X	2.45
PVT580	2.58	X-VH-LRR-A:8, 12295-C:X	2.45
PVT600	2.83	X-VH-LRR-A:8, 14132-C:X	2.69
PVT670	3.11	X-VH-LRR-A:8, 15404-C:X	2.96

<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 ( $\eta_{col}$ )	17%	Zero-loss efficiency ( $\eta_0$ )	0.41
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 ( $a_1$ )	5.54
		Second-order coefficient ( $a_2$ )	0.008
		Incidence angle modifier IAM (50°)	0.88
		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.	