

Annex to Solar Keymark Certificate					Licence Number		011-7S2479 R				
					Date issued		2025-08-07				
					Issued by		DIN CERTCO				
Licence holder		HAINING JU YANG NEW ENERGY CO., LTD			Country	P.R. China					
Brand (optional)		ONOSI			Web	www.onosisolar.com					
Street, Number		Puqiao Industry, No. 58 Beitang road, Puqiao Village, Yuanhua Town			E-mail	onosi@onosisolar.com					
Postcode, City		314416 Haining City, Zhejiang Province			Tel	+86 13606738816					
Collector Type					Evacuated tubular collector						
Collector name	Gross area (A_G) m ²	Gross length mm	Gross width mm	Gross height mm	Power output per collector G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s θ _m - θ _a						
					0 K	10 K	30 K	50 K	70 K	80 K	
					W	W	W	W	W	W	
ONS-HPC03-8	1.82	1950	935	137	1013	985	915	828	723	664	
ONS-HPC03-9	2.04	1950	1045	137	1136	1104	1026	928	810	744	
ONS-HPC03-10	2.25	1950	1155	137	1252	1217	1131	1023	894	821	
ONS-HPC03-12	2.68	1950	1375	137	1492	1450	1347	1219	1065	978	
ONS-HPC03-14	3.11	1950	1595	137	1731	1683	1564	1414	1236	1135	
ONS-HPC03-15	3.32	1950	1705	137	1848	1796	1669	1510	1319	1211	
ONS-HPC03-16	3.54	1950	1815	137	1971	1915	1780	1610	1406	1292	
ONS-HPC03-18	3.97	1950	2035	137	2210	2148	1996	1806	1577	1449	
ONS-HPC03-20	4.40	1950	2255	137	2449	2381	2212	2001	1748	1606	
ONS-HPC03-21	4.61	1950	2365	137	2566	2494	2318	2097	1831	1682	
ONS-HPC03-22	4.83	1950	2475	137	2689	2613	2428	2197	1919	1762	
ONS-HPC03-24	5.26	1950	2695	137	2928	2846	2644	2392	2090	1919	
Power output per m² gross area					557	541	503	455	397	365	
Performance parameters test method		Steady state - outdoor									
Performance parameters (related to A_G)		η ₀ , b	a1	a2	a3	a4	a5	a6	a7	a8	K _d
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		0.558	1.44	0.012	0.000	0.00	6380	0.000	0.00	0.00	0.98
Incidence angle modifier test method		Steady state - outdoor									
Incidence angle modifier		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal		K _{gT, coll}	1.01	1.02	1.07	1.12	1.17	1.22	0.85	0.41	0.00
Longitudinal		K _{gL, coll}	1.00	1.00	0.99	0.97	0.93	0.85	0.71	0.46	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		(θ _m - θ _a) _{max}		50.00		K					
Standard stagnation temperature (G = 1000 W/m²; θ_a = 30 °C)		θ _{stg}		210		°C					
Maximum operating temperature		θ _{max, op}		99		°C					
Maximum operating pressure		p _{max, op}		600		kPa					
Testing laboratory		TÜV Rheinland (Guangdong) Ltd.					http://www.tuv.com				
Test report(s)		CN25H7LE 001 CN25XOMJ 001					Dated		2025-08-01 2025-08-01		
Comments of testing laboratory											
Ver. 6.2 (13.01.2022)											
Above parameters come from type ONS-HPC03-8.											
 TÜVRheinland® Precisely Right. <i>Consent</i>											
DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de											

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Supplementary Information							Issued			2025-08-07					
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		
ONS-HPC03-8		1 784	1 470	1 126	1 467	1 160	854	1 066	818	586	1 152	887	628		
ONS-HPC03-9		2 000	1 647	1 262	1 645	1 300	958	1 195	917	657	1 292	994	704		
ONS-HPC03-10		2 206	1 817	1 392	1 814	1 434	1 056	1 318	1 011	724	1 425	1 096	776		
ONS-HPC03-12		2 627	2 164	1 658	2 161	1 708	1 258	1 570	1 205	863	1 697	1 306	925		
ONS-HPC03-14		3 049	2 511	1 924	2 507	1 982	1 460	1 822	1 398	1 001	1 969	1 515	1 073		
ONS-HPC03-15		3 254	2 681	2 054	2 677	2 116	1 559	1 945	1 492	1 069	2 102	1 617	1 146		
ONS-HPC03-16		3 470	2 859	2 190	2 854	2 256	1 662	2 074	1 591	1 140	2 242	1 724	1 221		
ONS-HPC03-18		3 892	3 206	2 456	3 201	2 530	1 864	2 326	1 785	1 278	2 514	1 934	1 370		
ONS-HPC03-20		4 313	3 553	2 722	3 547	2 804	2 066	2 578	1 978	1 416	2 786	2 143	1 518		
ONS-HPC03-21		4 519	3 723	2 852	3 717	2 938	2 164	2 701	2 072	1 484	2 919	2 246	1 591		
ONS-HPC03-22		4 735	3 900	2 988	3 894	3 078	2 267	2 830	2 171	1 555	3 058	2 353	1 667		
ONS-HPC03-24		5 156	4 248	3 254	4 241	3 352	2 469	3 082	2 365	1 693	3 331	2 562	1 815		
Gross Thermal Yield per m ² gross area		980	808	619	806	637	469	586	450	322	633	487	345		
Annual efficiency, η_a		56%	46%	35%	49%	39%	29%	50%	39%	28%	51%	39%	28%		
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										No					
The collector was tested successfully under the following conditions:															
Climate class (A+, A, B or C)										B		--			
G (W/m ²) >		900		ϑ_a (°C) >		15		H _x (MJ/m ²) >		540					
Maximum tested positive load										2400		Pa			
Maximum tested negative load										1000		Pa			
Hail resistance using steel ball (maximum drop height)										0.4		m			
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)					
ONS-HPC03-8		1.82				1-H-12S-C:20,1030-D				1.51					
ONS-HPC03-9		2.04				1-H-12S-C:20,1140-D				1.70					
ONS-HPC03-10		2.25				1-H-12S-C:20,1250-D				1.89					
ONS-HPC03-12		2.68				1-H-12S-C:20,1470-D				2.27					
ONS-HPC03-14		3.11				1-H-12S-C:20,1690-D				2.64					
ONS-HPC03-15		3.32				1-H-12S-C:20,1800-D				2.83					
ONS-HPC03-16		3.54				1-H-12S-C:20,1910-D				3.02					
ONS-HPC03-18		3.97				1-H-12S-C:20,2130-D				3.40					
ONS-HPC03-20		4.40				1-H-12S-C:20,2350-D				3.78					
ONS-HPC03-21		4.61				1-H-12S-C:20,2460-D				3.96					
ONS-HPC03-22		4.83				1-H-12S-C:20,2570-D				4.15					
ONS-HPC03-24		5.26				1-H-12S-C:20,2790-D				4.55					
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})		48%				Zero-loss efficiency (η_0)				0.56		--			
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. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.						First-order coefficient (a_1)				1.44		W/(m ² K)			
						Second-order coefficient (a_2)				0.012		W/(m ² K ²)			
						Incidence angle modifier IAM (50°)				1.07		--			
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