TÜVRheinland®
DIN CERTCO

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2264 R
	Issued	2017-02-27

Company holding the	HAINING ONOSI NEW ENERGY CO.,LTD.	Country	P.R. China
Brand (optional)	ONOSI	Website	www.onosisolar.com
Street, street number	Xinkai River No.2 Bridge,Wanshou Village	E-mail	onosi@onosisolar.com
Postal Code / City, province	314412 Yanguan, Haining, Zhejiang	Tel/Fax	86 573 87718911 / 87718900

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Evacuated tubular collector
Thermal / photo voltaic hybid collector? (PVT collector)	No
Integration in the roof possible ? (manufacturers declaration)	No

Collector name	Aperture area (Aa)	Gross length	Gross width	Gross height	Gross area (AG)	Power output per collector module Gb = 850 W/m²; Gd = 150 W/m² Tm-Ta 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	m²	W	W	W	W	W
ONS-HPC-10	0.95	2 010	805	158	1.62	669	658	625	579	519
ONS-HPC-12	1.14	2 010	955	158	1.92	803	789	750	695	623
ONS-HPC-15	1.42	2 010	1 180	158	2.37	1 003	986	938	868	778
ONS-HPC-16	1.51	2 010	1 255	158	2.52	1 070	1 052	1 000	926	830
ONS-HPC-18	1.70	2 010	1 405	158	2.82	1 204	1 184	1 125	1 042	934
ONS-HPC-20	1.89	2 010	1 555	158	3.13	1 338	1 315	1 250	1 158	1 038
ONS-HPC-22	2.08	2 010	1 705	158	3.43	1 471	1 447	1 375	1 273	1 142
ONS-HPC-24	2.27	2 010	1 855	158	3.73	1 605	1 578	1 500	1 389	1 246
ONS-HPC-25	2.37	2 010	1 930	158	3.88	1 672	1 644	1 563	1 447	1 297
ONS-HPC-30	2.84	2 010	2 305	158	4.63	2 006	1 973	1 875	1 736	1 557

Performance test method	Liquid heating collector - quasi-dynamic - outdoor								
Performance parameters related to aperture	η0b	c1	c2	c3	c4	c6	Kθd		
Units	-	W/(m²K)	W/(m²K²)	J/(m³K)	-	s/m	-		
Test results - Flow rate and fluid see note 1	0.684	1.001	0.018	0.000	0.000	0.000	1.219		

Bi-directional incidence angle	Yes	*Kϑ values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θT) transversal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θT)	1.00	1.00	0.99	0.98	0.97	0.94	0.88	0.00	0.00
Incidence angle modifiers Kθ(θL) longitudinal direction	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θL)	1.03	1.07	1.20	1.34	1.50	1.53	1.51	1.40	0.00

Stagnation temperature - Weather conditions see note 2	Tstg	201.9	°C
Effective thermal capacity	ceff = C/Ag	97.97	kJ/(m²K)
Max. intende operation temperature - see note 3	Tmax,op	99	°C
Max. operation pressure - see note 3	pmax,op	600	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area

Flow rate	kg/(s m²)	-	-	-	-	-	-	-	-	-	-
Pressure drop, ΔP	Pa	-	-	-	-	-	-	-	-	-	-

Optional weather data	Location		Link	
Testing Laboratory	TUV Rheinland (Shanghai) Co., Ltd.			
Website	www.tuv.com			
Test report id. number	154026306_EN_30_Report_Gao; 154026306_EN_P_10_Report_Gao	Date of test report	2013/10/28	
During the test GDIF/GTOT was always between	0.11	and	0.92	

Comments of testing laboratory:

Pressure drop test not performed

Note 1	Flow rate	0.021	kg/(s m²)	Fluid	Water
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , Ta=30 °C				
Note 3	Given by manufacturer				

Datasheet version: 4.06, 2014-01-15

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Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S2264 R
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Annual collector output kWh/module

Collector name	Location and collector temperature (Tm)											
	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
ONS-HPC-10	1 268	1 119	914	1 102	926	724	770	632	477	848	702	533
ONS-HPC-12	1 522	1 343	1 097	1 322	1 111	868	924	758	572	1 017	843	640
ONS-HPC-15	1 903	1 679	1 371	1 653	1 389	1 085	1 155	948	716	1 272	1 054	800
ONS-HPC-16	2 029	1 790	1 462	1 763	1 482	1 158	1 232	1 011	763	1 356	1 124	854
ONS-HPC-18	2 283	2 014	1 645	1 984	1 667	1 302	1 386	1 137	859	1 526	1 264	960
ONS-HPC-20	2 537	2 238	1 828	2 204	1 852	1 447	1 540	1 264	954	1 695	1 405	1 067
ONS-HPC-22	2 791	2 462	2 011	2 424	2 038	1 592	1 694	1 390	1 049	1 865	1 545	1 174
ONS-HPC-24	3 044	2 686	2 194	2 645	2 223	1 737	1 848	1 516	1 145	2 034	1 686	1 280
ONS-HPC-25	3 171	2 798	2 285	2 755	2 316	1 809	1 925	1 580	1 193	2 119	1 756	1 334
ONS-HPC-30	3 805	3 357	2 742	3 306	2 779	2 171	2 309	1 896	1 431	2 543	2 107	1 600

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)

Overview of locations

Location	Latitude °	Gtot kWh/m²	Ta °C	Collector orientation or tracking mode
Athens	38	1 765	18.5	South, 25°
Davos	47	1 714	3.2	South, 30°
Stockholm	59	1 166	7.5	South, 45°
Würzburg	50	1 244	9.0	South, 35°

Gtot	Annual total irradiation on collector plane	kWh/m²
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (Tm). A detailed description of the calculations is available at http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx.

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ScenoCalc version: Ver. 4.06 (Jan, 2014)