TÜVRheinland®
DIN CERTCO

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S1471 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 G = 1000 W/m², Tm-Ta 0 K	10 K	30 K	50 K	70 K
	m²	mm	mm	mm	m²	W	W	W	W	W
ONS58-15	1.414	1 924	1 190	137	**2.290**	820	783	703	616	522
ONS58-18	1.697	1 924	1 470	137	**2.726**	984	939	844	739	627
ONS58-20	1.885	1 924	1 568	137	**3.016**	1 093	1 044	937	821	697
ONS58-24	2.262	1 924	1 870	137	**3.598**	1 312	1 252	1 124	986	836

Performance test method	Glazed liquid heating collector - steady state - outdoor									
Performance parameters related to aperture area	η0	a1	a2							
Units	-	W/(m²K)	W/(m²K²)							
Test results - *Flow rate and fluid see note 1*	0.580	2.580	0.006							

Bi-directional incidence angle modifiers?	Yes	Kθ *values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θT)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
transversal direction	Kθ(θT)	1.01	1.06	1.16	1.31	1.46	1.38	1.06	-	0.00
Incidence angle modifiers Kθ(θL)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
longitudinal direction	Kθ(θL)	0.93	1.00	1.00	0.99	0.97	0.85	0.70	-	0.00

Stagnation temperature - *Weather conditions see note 2*	T_{stg}	185	°C
Effective thermal capacity	$c_{eff} = C/A_g$	14.2	kJ/(m²K)
Max. intende operation temperature - *see note 3*	$T_{max,op}$	100	°C
Max. operation pressure - *see note 3*	$p_{max,op}$	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	SPF,CH-8640 Rapperswil			
Website	www.solarenergy.ch			
Test report id. number	C1180LPEN/C118LPEN/C1181QPEN	**Date of test report**	2010/12/23	

During the test G_{DIF}/G_{TOT} was always between	0.12	and	0.15

Comments of testing laboratory:

All reliability and performance tests were prepared in SPF,CH-8640 Rapperswil, Switzerland.

Note 1	**Flow rate**	0.019	kg/(s m²)	**Fluid**	Water
Note 2	**Irradiance, G = 1000 W/m²; Ambient temperature , T_a=30 °C**				
Note 3	**Given by manufacturer**				

Datasheet version: 4.06, 2014-01-15

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	011-7S1471 R
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Annual collector output kWh/module

	Location and collector temperature (Tm)														
	Athens			Davos			Stockholm			Würzburg			-		
Collector name	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
ONS58-15	1 521	1 162	844	1 190	889	630	873	621	424	951	677	455			
ONS58-18	1 825	1 394	1 013	1 428	1 067	756	1 047	746	509	1 141	813	546			
ONS58-20	2 027	1 549	1 125	1 586	1 185	839	1 163	828	566	1 268	903	607			
ONS58-24	2 433	1 858	1 350	1 903	1 422	1 007	1 396	994	679	1 521	1 083	728			

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°
-				South, -15°

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)