



<b>Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>						<b>Certificate No.</b>		<b>OEM 9949/2/3</b>							
						Date of issue		17/3/2015							
<b>Company</b>			Solar Technologie International GmbH			<b>Country</b>		Germany							
<b>Brand (optional)</b>			STI			<b>Website</b>									
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<b>City</b>			Meerane			<b>Fax</b>		+049 3764 7956115							
<b>Collector Type</b> (flat plate / evacuate tubular / un-glazed)						Flat plate collector									
<b>Integration in the roof possible ?</b>						Yes									
						<b>Power output per collector unit</b> G = 1000 W/m <sup>2</sup> T <sub>m</sub> -T <sub>a</sub> :									
						Aperture area (A <sub>a</sub> )		Gross length	Gross width	Gross height	Gross area (A <sub>G</sub> )	0 K	10 K	30 K	50 K
<b>Collector name</b>						[m <sup>2</sup> ]	[mm]	[mm]	[mm]	[m <sup>2</sup> ]	[W]	[W]	[W]	[W]	[W]
Stico 150						1,38	1.480	1.010	86	1,50	1.087	1.014	854	674	476
Stico 180						1,72	1.480	1.230	86	1,82	1.355	1.264	1.064	840	593
Stico 200						1,86	1.980	1.010	86	2,00	1.466	1.367	1.150	909	642
Stico 200H						1,86	1.010	1.980	86	2,00	1.466	1.367	1.150	909	642
Stico 235						2,23	1.930	1.230	86	2,37	1.757	1.639	1.379	1.089	769
Stico 235H						2,23	1.230	1.930	86	2,37	1.757	1.639	1.379	1.089	769
Stico 275						2,57	2.160	1.260	86	2,72	2.025	1.889	1.590	1.255	886
Stico 275H						2,57	1.260	2.160	86	2,72	2.025	1.889	1.590	1.255	886
<b>Collector efficiency parameters related to aperture area (A<sub>a</sub>)</b>						η <sub>0a</sub>		0.788		-					
Note 1						a <sub>1a</sub>		5.140		W/(m <sup>2</sup> K)					
						a <sub>2a</sub>		0.017		W/(m <sup>2</sup> K <sup>2</sup> )					
<b>Stagnation temperature - Note 2</b>						t <sub>stg</sub>		151.9		°C					
<b>Effective thermal capacity</b>						C <sub>eff</sub> = C/A <sub>a</sub>		9.78		kJ/(m <sup>2</sup> K)					
<b>Max. operation pressure - Note 3</b>						p <sub>max</sub>		1		Mpa					
<b>Incidence angle modifiers K<sub>θ</sub>(θ)</b>						G <sub>DIF</sub> /G <sub>TOT</sub>		θ <sub>T</sub> / θ <sub>i</sub>	50°	10°	20°	30°	40°	60°	70°
						min	max	K <sub>θ</sub> (θ <sub>T</sub> )	0.80						
G <sub>DIF</sub> /G <sub>TOT</sub> : min&max - while measuring								K <sub>θ</sub> (θ <sub>L</sub> )							
						<i>Optional values</i>									
<b>Testing Laboratory</b>						Demokritos									
<b>Website</b>						<a href="http://www.solar.demokritos.gr">www.solar.demokritos.gr</a>									
<b>Test report id. number</b>						4122 DE1, 4123 DQ1, 4125 DE1									
<b>Date of test report</b>						5/6/13, 23/7/13, 12/7/13									
<b>Perf. test method</b>						EN 12975-2 6.1.4 (outdoor/außen/extérieur)									
<b>Comments of testing laboratory :</b>															
<a href="#">Example data sheet</a>															
Note 1	Test conditions		Fluid	Water		Flow rate	0.020		kg/s per m <sup>2</sup>						
Note 2	Irradiance, G <sub>s</sub> =1000 W/m <sup>2</sup>														
Note 3	Ambient temperature, T <sub>a</sub> =30 °C														
	Given by manufacturer														



<b>Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>	Certificate No.	<b>OEM 9949/2/3</b>
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**Annual collector output kWh / Jährliche Kollektor Leistung kWh / Energie annuelle produite par le capteur kWh**

Collector name	Location and collector temperature (T <sub>m</sub> )														
	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	25°C	50°C	75°C
Stico 150	1.514	911	479	1.070	628	304	795	441	212	862	467	223			
Stico 180	1.888	1.136	597	1.334	783	379	991	558	264	1.075	582	278			
Stico 200	2.041	1.228	645	1.445	847	410	1.071	594	285	1.162	630	300			
Stico 200H	2.041	1.228	645	1.443	847	410	1.071	594	285	1.162	630	300			
Stico 235	2.447	1.473	774	1.730	1.015	492	1.285	713	342	1.394	755	360			
Stico 235H	2.447	1.473	774	1.730	1.015	492	1.285	713	342	1.394	755	360			
Stico 275	2.820	1.697	892	1.993	1.170	567	1.480	821	394	1.606	870	413			
Stico 275H	2.820	1.697	892	1.993	1.170	567	1.480	821	394	1.606	870	413			

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

Overview of locations				
Location	Latitude °	Gtot kWh/m <sup>2</sup>	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/m <sup>2</sup>
Ta	Mean annual ambient air temperature	°C
Tm	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

Calculation of the annual collector performance is done by the official Solar Keymark spreadsheet tool. Hour by hour the collector output is calculated according to the efficiency parameters from the Keymark test using constant collector operating temperature (T<sub>m</sub>). Detailed description with all equations used is available from the Solar Keymark web site (direct link: <http://www.estif.org/solarkeymark/annexb1.php>)

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