


Precisely Right.

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate						Licence Number		011-7S823 F				
						Issued		2015-03-13				
Company holding the		Chromagen (ACS) ltd.				Country		Israel				
Brand (optional)		Kibbutz Sha'ar Haa'makim				Website		www.chromagen.com				
Street, street number		--				E-mail		yair@chromagen.com				
Postal Code / City, province		3658800 --				Tel/Fax		972 4-9538839				
Collector Type (flat plate glazed/un-glazed; evacuate tubular)						Flat plate collector - glazed						
Thermal / photo voltaic hybrid collector? (PVT collector)						No						
Integration in the roof possible? (manufacturers declaration)						Yes						
Collector name	Aperture area (Aa) m ²	Gross length mm	Gross width mm	Gross height mm	Gross area (AG) m ²	Power output per collector module						
						G = 1000 W/m ²						
						Tm-Ta						
						0 K	10 K	30 K	50 K	70 K		
						W	W	W	W	W		
QA-K	1,51	1.820	922	90	1,68	1.066	985	811	621	416		
QA-D	1,77	1.919	1.082	90	2,07	1.250	1.155	951	728	487		
QA-E	2,17	2.199	1.082	90	2,37	1.532	1.415	1.165	893	597		
QA-F	2,58	2.190	1.275	90	2,80	1.821	1.683	1.385	1.061	710		
Performance test method						Glazed liquid heating collector - steady state - indoor						
Performance parameters related to aperture		η_0	a1	a2								
Units		-	W/(m ² K)	W/(m ² K ²)								
Test results - Flow rate and fluid see note 1		0,706	5,243	0,013								
Bi-directional incidence angle		No	<i>Kθ values are obligatory for 50°.</i>									
Incidence angle modifiers K θ (θ)		Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°	
		K θ (θ)					0,86				0,00	
Incidence angle modifier not bi-directional - leave fields blank												
Stagnation temperature - Weather conditions see note 2						Tstg	162 °C					
Effective thermal capacity						ceff = C/Ag	4,853 kJ/(m ² K)					
Max. intended operation temperature - see note 3						Tmax,op	160 °C					
Max. operation pressure - see note 3						pmax,op	1000 kPa					
Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m ² aperture area												
Flow rate	kg/(s m ²)	0,000	0,008	0,018	0,030	0,040	0,050					
Pressure drop, ΔP	Pa	0	42	107	204	303	419					
Optional weather data		Location				Link						
Testing Laboratory		Fundación CENER-CIEMAT										
Website		www.cener.com										
Test report id. number		30.1166.0-1-1; 30.1166.0-2-1; 30.1166.0-3-1; 30.1126.0-2-3; 30.166.0				Date of test report		30/04/2009 - 06/05/2009 - 05/06/2009				
During the test GDIF/GTOT was always between		0,12	and	0,17								
Comments of testing laboratory: QA-K is representative collector of the collectors QA-D, QA-E and QA-F.												
Note 1	Flow rate	0,020 kg/(s m ²)	Fluid	Water								
Note 2	Irradiance, G = 1000 W/m ² ; Ambient temperature , Ta=30 °C											
Note 3	Given by manufacturer											
						 Datashet 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	011-7S823 F
	Issued	13/03/2015

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
QA-K	1.551	896	441	1.065	595	267	798	420	186	872	447	198
QA-D	1.818	1.050	517	1.248	697	313	935	492	218	1.022	524	232
QA-E	2.229	1.287	634	1.530	855	383	1.147	604	268	1.253	643	285
QA-F	2.650	1.530	754	1.819	1.016	456	1.363	718	318	1.490	764	339

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
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Overview of locations				
Location	Latitude °	Gtot kWh/m ²	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 ²
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)