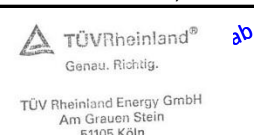


<b>Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results</b>					<b>Licence Number</b>		<b>011-7S2614 F</b>							
					<b>Date issued</b>		<b>2019-02-01</b>							
					<b>Issued by</b>		<b>TÜV Rheinland Energy GmbH</b>							
<b>Licence holder</b>		<b>Ariston Thermo S.p.A.</b>			<b>Country</b>		<b>Italy</b>							
<b>Brand (optional)</b>		<b>Chaffoteaux</b>			<b>Web</b>		<b>http://www.aristonthermo.com</b>							
<b>Street, Number</b>		<b>Via A. Merloni 45</b>			<b>E-mail</b>		<b>public.relation@aristonthermo.com</b>							
<b>Postcode, City</b>		<b>60044 Fabriano</b>			<b>Tel</b>		<b>+39 02763209-1</b>							
<b>Collector Type</b>					<b>Flat plate collector, glazed</b>									
<b>Collector name</b>					<b>Power output per collector</b> Gb = 850 W/m <sup>2</sup> ; Gd = 150 W/m <sup>2</sup> ϑ <sub>m</sub> - ϑ <sub>a</sub>									
					0 K	10 K	30 K	50 K	70 K	90 K				
					m <sup>2</sup>	mm	mm	mm	W	W	W	W	W	W
<b>Kairos CF 2.0-1</b>					2.01	2 004	1 004	78	1 347	1 274	1 115	937	739	522
<b>Power output per m<sup>2</sup> gross area</b>					<b>670</b>	<b>634</b>	<b>555</b>	<b>466</b>	<b>368</b>	<b>260</b>				
<b>Performance parameters test method</b>					<b>Steady state - indoor</b>									
<b>Performance parameters (related to AG)</b>					η <sub>0,hem</sub>	a <sub>1</sub>	a <sub>2</sub>							
<b>Units</b>					-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )							
<b>Test results</b>					<b>0.670</b>	<b>3.480</b>	<b>0.012</b>							
<b>Incidence angle modifier test method</b>					<b>Quasi dynamic - outdoor</b>									
<b>Bi-directional incidence angle modifiers</b>					<b>No</b>									
<b>Incidence angle modifier</b>					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
<b>Transversal</b>					K <sub>GT, coll</sub>	1.00	0.99	0.97	0.94	0.90	0.81	0.64	0.32	0.00
<b>Longitudinal</b>					K <sub>GL, coll</sub>	1.00	0.99	0.97	0.94	0.90	0.81	0.64	0.32	0.00
<b>Heat transfer medium for testing</b>					<b>Water</b>									
<b>Flow rate for testing (per gross area, A<sub>G</sub>)</b>					dm/dt	0.025	kg/(sm <sup>2</sup> )							
<b>Maximum temperature difference for thermal performance calculations</b>					(ϑ <sub>m</sub> -ϑ <sub>a</sub> ) <sub>max</sub>	90	K							
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; ϑ<sub>a</sub> = 30 °C)</b>					ϑ <sub>stg</sub>	190	°C							
<b>Effective thermal capacity, incl. fluid (per gross area, A<sub>G</sub>)</b>					C/m <sup>2</sup>	3.92	kJ/(Km <sup>2</sup> )							
<b>Maximum operating temperature</b>					ϑ <sub>max, op</sub>	190	°C							
<b>Maximum operating pressure</b>					p <sub>max, op</sub>	600	kPa							
<b>Testing laboratory</b>					<b>TÜV Rheinland Energy GmbH</b>			<b>www.tuv.com/solarpower</b>						
<b>Test report(s)</b>					<b>21229451.002</b>			<b>Dated</b>		<b>01.12.2015</b>				
<b>Comments of testing laboratory</b>					<b>Datasheet version: 5.01, 2016-03-01</b>									
The performance values related to 1.833 m <sup>2</sup> aperture area are: eta0a=0.740; a1a=3.82; a2a=0.013.					 Genau. Richtig. TÜV Rheinland Energy GmbH Am Grauen Stein 51105 Köln									
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														

<b>Annex to Solar Keymark Certificate Supplementary Information</b>	<b>Licence Number</b>	<b>011-7S2614 F</b>
	<b>Issued</b>	<b>2019-02-01</b>

<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math>, based on EN ISO 9806:2013 test results</b>													
Standard Locations		Athens			Davos			Stockholm			Würzburg		
Collector name	$\vartheta_m$	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
Kairos CF 2.0-1		2 059	1 403	863	1 532	1 012	596	1 131	707	404	1 229	758	425
Annual output per m <sup>2</sup> gross area		1 024	698	429	762	504	297	563	352	201	611	377	211
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m <sup>2</sup>			1714 kWh/m <sup>2</sup>			1166 kWh/m <sup>2</sup>			1244 kWh/m <sup>2</sup>		
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 $\vartheta_m$ (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 5.01 (March 2016). A detailed description of the calculations is available at <a href="http://www.solarkeymark.org/scenocalc">www.solarkeymark.org/scenocalc</a>													

<b>Additional Information</b>		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	Yes	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	A	--
Maximum tested positive load	5400	Pa
Maximum tested negative load	3500	Pa
Hail resistance using steel ball (maximum drop height)	35	m

<b>Energy Labelling Information</b>				
	Reference Area, A <sub>sol</sub> (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area A <sub>sol</sub>		
Zelios CF 2.0-1	2.01	Collector efficiency ( $\eta_{col}$ )	51	%
		Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.		
		Data required for CDR (EU) No 812/2013 - Reference Area A <sub>sol</sub>		
		Zero-loss efficiency ( $\eta_0$ )	0.670	--
		First-order coefficient (a <sub>1</sub> )	3.48	W/(m <sup>2</sup> K)
		Second-order coefficient (a <sub>2</sub> )	0.012	W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0.90	--
		Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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.		