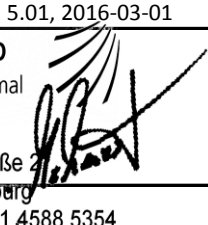


<b>Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results</b>					<b>Licence Number</b>		<b>011-7S2739 F</b>																	
					<b>Date issued</b>		<b>2017-02-15</b>																	
					<b>Issued by</b>		<b>Din Certco</b>																	
<b>Licence holder</b>		<b>Biorlegi Chile SpA</b>			<b>Country</b>		<b>Chile</b>																	
<b>Brand (optional)</b>					<b>Web</b>		<b>www.nuevaenergia.cl</b>																	
<b>Street, Number</b>		<b>Ctra. General San Martin, 6000</b>			<b>E-mail</b>		<b>pgarasa@nuevaenergia.cl</b>																	
<b>Postcode, City</b>		<b>Colina - Santiago de Chile</b>			<b>Tel/Fax</b>		<b>+56225814655</b>																	
<b>Collector Type</b>					<b>Flat plate collector, glazed</b>																			
<b>Collector name</b>					<b>Gross area (A<sub>G</sub>)</b>		<b>Gross length</b>		<b>Gross width</b>		<b>Gross height</b>		<b>Power output per collector</b> G <sub>b</sub> = 850 W/m <sup>2</sup> ; G <sub>d</sub> = 150 W/m <sup>2</sup> ϑ <sub>m</sub> - ϑ <sub>a</sub>											
					m <sup>2</sup>		mm		mm		mm		0 K		10 K		30 K		50 K		70 K		65 K	
<b>EK 250 V PREMIUM</b>					2,58		2.081		1.242		96		1.881		1.794		1.602		1.387		1.150		1.211	
<b>Power output per m<sup>2</sup> gross area</b>					729		695		621		537		445		469									
<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>					0,729		3,28		0,011															
<b>Incidence angle modifier test method</b>					<b>Steady state - 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>θT, coll</sub>		1,00		1,00		0,99		0,97		0,93		0,86		0,72		0,46		0,00	
<b>Longitudinal</b>					K <sub>θL, coll</sub>		1,00		1,00		0,99		0,97		0,93		0,86		0,72		0,46		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		0,018		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>		65		K															
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; ϑ<sub>a</sub> = 30 °C)</b>					ϑ <sub>stg</sub>		196		°C															
<b>Effective thermal capacity, incl. fluid (per gross area, A<sub>G</sub>)</b>					C/m <sup>2</sup>		4,1		kJ/(Km <sup>2</sup> )															
<b>Maximum operating temperature</b>					ϑ <sub>max, op</sub>		n.a.		°C															
<b>Maximum operating pressure</b>					p <sub>max, op</sub>		1000		kPa															
<b>Testing laboratory</b>					<b>TestLab Solar Thermal Systems, Fraunhofer ISE</b>							<b>http://www.collectortest.com</b>												
<b>Test report(s)</b>					<b>ktb-2011-29-k-a</b>							<b>Dated</b>		<b>08.02.2017</b>										
<b>Comments of testing laboratory</b>					Datasheet version: 5.01, 2016-03-01 <i>This data sheet is not complete as the testing of the collector was not performed according to ISO 9806:2013.</i> <i>According to Scenocalc v5.01 the power output per collector unit of a steady state performance test does not consider the fraction of the diffuse irradiance, but it is calculated based on η<sub>0,hem</sub> for a global hemispherical irradiance of 1000 W/m<sup>2</sup>.</i>																			
<b>DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany</b> <b>Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de</b>					<b>TestLab</b> Solar Thermal Systems Heidenhofstraße D-79110 Freiburg Tel: +49 (0)761 4588 5354																			

<b>Annex to Solar Keymark Certificate Supplementary Information</b>	<b>Licence Number</b>	<b>011-7S2739 F</b>
	<b>Issued</b>	<b>2017-02-15</b>

Annual collector output in kWh/collector at mean fluid temperature $\vartheta_m$ , based on EN ISO 9806:2013 test results													
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
EK 250 V PREMIUM		2.988	2.166	1.452	2.293	1.617	1.052	1.681	1.122	701	1.825	1.211	744
Annual output per m <sup>2</sup> gross area		1.158	839	563	889	627	408	651	435	271	707	469	288
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>													

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	C	--
Maximum tested positive load	1000	Pa
Maximum tested negative load	1000	Pa
Hail resistance using ice balls (diameter)	0	mm

Energy Labelling Information			
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$	
EK 250 V PREMIUM	2,58	Collector efficiency ( $\eta_{col}$ )	58 %
		<i>Remark: Collector efficiency (<math>\eta_{col}</math>) 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 <math>\eta_{col}</math> is based on reference area (<math>A_{sol}</math>) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.</i>	
		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$	
		Zero-loss efficiency ( $\eta_0$ )	0,729 --
		First-order coefficient ( $a_1$ )	3,28 W/(m <sup>2</sup> K)
		Second-order coefficient ( $a_2$ )	0,011 W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0,93 --
		<i>Remark: The data given in this section are related to collector reference area (<math>A_{sol}</math>) 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.</i>	