



# CERTIFICATION LICENCE TO USE KEYMARK

Certificate No OEM 10115.1.2

*DQS Hellas grants the present certificate to the enterprise:*

**FERROLI S.p.A.**

Via Ritonda 78/A, 37047 San Bonifacio (VR) 37047, Italy

*for the product:*

**Flat plate Solar Collectors type:**

**SOLEXTECH 2.1 V, SOLEXTECH 2.6 V, SOLEXTECH 2.6 H, SOLEXTECH 3 V,  
SOLEXTECH 3 H**

*which is produced in conformity with the normative document:*

**EN 12975-1:2011  
EN ISO 9806:2017**



*at the following location:*

**Kyra Vrisi Korinthias, Korinthos**

*The present certificate is granted in accordance with:*

- *the DQS Hellas General Rules for the Certification of Products,*
- *the Specific Rule for Certification EKIII.001 «Specific Rule for Certification of Solar Collectors, and Thermal Solar Heating Systems for Domestic Hot Water»,*
- *the Specific CEN Keymark Scheme Rules for Solar Thermal Products,*

*and is ruled by the terms of the relevant contract between DQS Hellas and the enterprise.*

*Date of issue:* **2024-05-30**

*Date of valid:* **2025-05-30**

**Ioannis Alexiou**  
*Head of Products Certification*

**Panagiotis Giannoutsos**  
*Director of Certification*



<b>Annex to Solar Keymark Certificate</b>					<b>Licence Number</b>		<b>OEM 10115.1.2</b>							
					<b>Date issued</b>		<b>2023-04-20</b>							
					<b>Issued by</b>		<b>DQS Hellas</b>							
<b>Licence holder</b>			<b>FERROLI S.p.A.</b>		<b>Country</b>		<b>Italy</b>							
<b>Brand (optional)</b>			<b>SOLEXTECH</b>		<b>Web</b>		<b>www.ferroli.com</b>							
<b>Street, Number</b>			<b>Via Ritonda 78/A</b>		<b>E-mail</b>		<b>info@ferroli.it</b>							
<b>Postcode, City</b>			<b>37047 San Bonifacio (VR) 37047</b>		<b>Tel</b>		<b>+39 0456139411</b>							
<b>Collector Type</b>					<b>Flat plate collector</b>									
<b>Collector name</b>					<b>Power output per collector</b> Gb = 850 W/m2, Gd = 150 W/m2 & u = 1.3 m/s $\vartheta_m - \vartheta_a$									
					0 K	10 K	30 K	50 K	70 K	88 K				
					m <sup>2</sup>	mm	mm	mm	W	W	W	W	W	W
<b>SOLEXTECH 2.1 V</b>					2,09	1.696	1.230	86	1.640	1.559	1.375	1.165	928	694
<b>SOLEXTECH 2.6 V</b>					2,60	2.111	1.230	86	2.041	1.939	1.711	1.449	1.154	864
<b>SOLEXTECH 2.6 H</b>					2,60	1.230	2.111	86	2.041	1.939	1.711	1.449	1.154	864
<b>SOLEXTECH 3 V</b>					3,00	1.996	1.500	86	2.355	2.237	1.974	1.672	1.332	997
<b>SOLEXTECH 3 H</b>					3,00	1.500	1.996	86	2.355	2.237	1.974	1.672	1.332	997
<b>Power output per m<sup>2</sup> gross area</b>									<b>785</b>	<b>746</b>	<b>658</b>	<b>557</b>	<b>444</b>	<b>332</b>
<b>Performance parameters test method</b>					<b>Steady state - outdoor</b>									
<b>Performance parameters (related to A<sub>G</sub>)</b>					$\eta_{0, b}$	a1	a2	a3	a4	a5	a6	a7	a8	Kd
<b>Units</b>					-	W/(m <sup>2</sup> K)	W/(m <sup>2</sup> K <sup>2</sup> )	J/(m <sup>3</sup> K)	-	J/(m <sup>2</sup> K)	s/m	W/(m <sup>2</sup> K <sup>4</sup> )	W/(m <sup>2</sup> K <sup>4</sup> )	-
<b>Test results</b>					<b>0,795</b>	<b>3,75</b>	<b>0,016</b>	<b>0,000</b>	<b>0,00</b>	<b>0</b>	<b>0,000</b>	<b>0,00</b>	<b>0,0E+00</b>	<b>0,92</b>
<b>Incidence angle modifier test method</b>					<b>Steady state - outdoor</b>									
<b>Incidence angle modifier</b>					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
<b>Transversal</b>					$K_{\theta T, coll}$	1,00	1,00	1,00	0,98	0,96	0,89	0,76	0,51	0,00
<b>Longitudinal</b>					$K_{\theta L, coll}$	1,00	1,00	1,00	0,98	0,96	0,89	0,76	0,51	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		0,022		kg/(sm <sup>2</sup> )					
<b>Maximum temperature difference during thermal performance test</b>					$(\vartheta_m - \vartheta_a)_{max}$		57,8		K					
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; <math>\vartheta_a = 30</math> °C)</b>					$\vartheta_{stg}$		175,7		°C					
<b>Maximum operating temperature</b>					$\vartheta_{max, op}$				°C					
<b>Maximum operating pressure</b>					$p_{max, op}$		1000		kPa					
<b>Testing laboratory</b>			<b>NCSR Demokritos / Solar &amp; other Energy System</b>			<b>www.solar.demokritos.gr</b>								
<b>Test report(s)</b>			4295 DQ1 4301 DE1 4302 DE1			<b>Dated</b>		4/12/2020 4/12/2020 4/12/2020						
<b>Comments of testing laboratory</b>					<b>Datasheet version: 6.1, 2019-09-26</b>									
<b>Central Offices: Kalavriton 2, 145 64 kifisia, Athens, Tel: +301 6233493-4 , Fax: +301 6233495, http://www.dqs.gr, e-mail: i.alexiou@dqs.gr</b>														



Annex to Solar Keymark Certificate		Licence Number		OEM 10115.1.2									
Supplementary Information		Issued		2023-04-20									
<b>Annual collector output in kWh/collector at mean fluid temperature <math>\vartheta_m</math></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
SOLEXTECH 2.1 V		2.637	1.867	1.190	1.999	1.361	826	1.472	948	555	1.602	1.026	591
SOLEXTECH 2.6 V		3.281	2.323	1.480	2.487	1.693	1.027	1.832	1.180	690	1.993	1.277	736
SOLEXTECH 2.6 H		3.281	2.323	1.480	2.487	1.693	1.027	1.832	1.180	690	1.993	1.277	736
SOLEXTECH 3 V		3.785	2.680	1.708	2.870	1.953	1.185	2.113	1.361	797	2.300	1.473	849
SOLEXTECH 3 H		3.785	2.680	1.708	2.870	1.953	1.185	2.113	1.361	797	2.300	1.473	849
Annual output per m <sup>2</sup> gross area		1.262	893	569	957	651	395	704	454	266	767	491	283
Annual efficiency, $\eta_a$		71%	51%	32%	59%	40%	24%	60%	39%	23%	62%	39%	23%
Fixed or tracking collector	Fixed (slope = latitude - 15°; rounded to nearest 5°)												
Annual irradiation on collector plane	1765 kWh/m <sup>2</sup>			1630 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. 6.1 (September 2019). A detailed description of the calculations is available at <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>													
<b>Additional Information</b>													
Collector heat transfer medium	Water-Glycole												
The collector is deemed to be suitable for roof integration	No												
The collector was tested successfully under the following conditions:													
Climate class (A+, A, B or C)											A	--	
G (W/m <sup>2</sup> ) >	1000	$\vartheta_a$ (°C) >		20	$H_x$ (MJ/m <sup>2</sup> ) >		600						
Maximum tested positive load											3000	Pa	
Maximum tested negative load											3000	Pa	
Hail resistance using steel ball (maximum drop height)											1,6	m	
<b>Additional collector attribute(s)</b>													
Using external power source(s) for normal operation						Active or passive measure(s) for self-protection							
Co-generating thermal and electrical power						Façade collector(s)							
<b>Energy Labelling Information</b>						<b>Additional Informative Technical Data</b>							
	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Hydraulic Designation Code						Aperture Area, $A_a$ (m <sup>2</sup> )					
SOLEXTECH 2.1 V	2,09	14-VH-1234S-A:7.2,1600-C:20.6,1295-						1,96					
SOLEXTECH 2.6 V	2,60	14-VH-1234S-A:7.2,2009-C:20.6,1295-						2,44					
SOLEXTECH 2.6 H	2,60	18-H-1234S-A:7.2,1131-C:20.6,2170-						2,44					
SOLEXTECH 3 V	3,00	17-VH-1234S-A:7.2,1900-C:20.6,1563-						2,84					
SOLEXTECH 3 H	3,00	18-H-1234S-A:7.2,1400-C:20.6,2060-						2,84					
<b>Data required for CDR (EU) No 811/2013 - Reference Area <math>A_{sol}</math></b>						<b>Data required for CDR (EU) No 812/2013 - Reference Area <math>A_{sol}</math></b>							
Collector efficiency ( $\eta_{col}$ )	61%					Zero-loss efficiency ( $\eta_0$ )	0,78			--			
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 ( $A_{sol}$ ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017.						First-order coefficient ( $a_1$ )	3,75			W/(m <sup>2</sup> K)			
						Second-order coefficient ( $a_2$ )	0,016			W/(m <sup>2</sup> K <sup>2</sup> )			
						Incidence angle modifier IAM (50°)	0,96			--			
						Remark: The data given in this section are related to collector reference area ( $A_{sol}$ ) 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.							
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