



# ΠΙΣΤΟΠΟΙΗΤΙΚΟ ΑΔΕΙΑ ΧΡΗΣΕΩΣ KEYMARK

Αρ. Πιστοποιητικού OEM 10061.7

Η DQS Hellas χορηγεί την παρούσα άδεια στην επιχείρηση:

**ΗΟΝΑΤ ΜΟΝΟΠΡΟΣΩΠΗ Ε.Π.Ε.**

Θέση Στεφάνι, Παραλία Ασπροπύργου, 19300 Ασπρόπυργος

για το προϊόν:

**Επίπεδοι Ηλιακοί Συλλέκτες τύπου:**

**HOV-1.5, HOV-1.75, HOV-2.0, HOV-2.3, HOV-2.5**

το οποίο παράγεται σύμφωνα με τα τυποποιητικά έγγραφα:

EN 12975-1:2011  
EN ISO 9806:2013



στην ακόλουθη θέση:

**ΒΙ.ΠΕ. Σίνδου, 57022 Θεσσαλονίκη**

Η παρούσα Άδεια χορηγείται σύμφωνα με:

- το Γενικό Κανονισμό Πιστοποίησης Προϊόντων της DQS Hellas,
- τον Ειδικό Κανονισμό Πιστοποίησης ΕΚΠΠ.001 «Ειδικός Κανονισμός Πιστοποίησης Ηλιακών Συλλεκτών, και Οικιακών Ηλιακών Συστημάτων Θέρμανσης Νερού»,
- τον Ειδικό Κανονισμό της CEN Σχήματος SOLAR KEYMARK για ηλιακά θερμικά προϊόντα,

και διέπεται από τους όρους της αντίστοιχης σύμβασης μεταξύ της DQS Hellas και της επιχείρησης.

Ημερομηνία Έκδοσης: 2023-03-20

Ημερομηνία Λήξεως: 2024-03-20

**Ιωάννης Αλεξίου**  
Επικεφαλής Πιστοποίησης Προϊόντων

**Παναγιώτης Γιαννούτσος**  
Διευθυντής Πιστοποίησης



# CERTIFICATION LICENCE TO USE KEYMARK

Certificate No OEM 10061.7

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

**HOVAT M. Ltd**

Thesi Stefani, 19300 Aspropyrgos

*for the product:*

**Flat plate Solar Collectors type:**

**HOV-1.5, HOV-1.75, HOV-2.0, HOV-2.3, HOV-2.5**

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

**EN 12975-1:2011**

**EN ISO 9806:2013**



**E 31**



*at the following location:*

**Industrial Area Sindos, 57022 Thessaloniki**

*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:* **2023-03-20**

*Date of valid:* **2024-03-20**

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

**Panagiotis Giannoutsos**  
*Director of Certification*



<b>Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results</b>					<b>Licence Number</b>		<b>OEM 10061/7</b>							
					<b>Date issued</b>		<b>2023-03-20</b>							
					<b>Issued by</b>		<b>DQS Hellas</b>							
<b>Licence holder</b>		<b>HOVAT M. Ltd</b>			<b>Country</b>		<b>Greece</b>							
<b>Brand (optional)</b>					<b>Web</b>									
<b>Street, Number</b>		<b>Thesi Stefani</b>			<b>E-mail</b>		<b>info@hovat-mepe.gr</b>							
<b>Postcode, City</b>		<b>19300 Aspropyrgos</b>			<b>Tel</b>		<b>+30 2105570893-4</b>							
<b>Collector Type</b>					<b>Flat plate collector, glazed</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>									
					0 K	10 K	30 K	50 K	70 K	55 K				
<b>Collector name</b>					W	W	W	W	W	W				
					W	W	W	W	W	W				
<b>HOV-1.5</b>					1.014	965	850	711	548	672				
<b>HOV-1.75</b>					1.183	1.126	992	830	639	785				
<b>HOV-2.0</b>					1.352	1.287	1.134	948	730	897				
<b>HOV-2.3</b>					1.555	1.480	1.304	1.090	840	1.031				
<b>HOV-2.5</b>					1.663	1.583	1.394	1.166	898	1.103				
<b>Power output per m<sup>2</sup> gross area</b>					<b>676</b>	<b>644</b>	<b>567</b>	<b>474</b>	<b>365</b>	<b>448</b>				
<b>Performance parameters test method</b>					<b>Steady state - outdoor</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>0,676</b>	<b>3,040</b>	<b>0,020</b>							
<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>					<b>0,87</b>			<b>0,00</b>	
<b>Longitudinal</b>					K <sub>θL, coll</sub>					<b>0,87</b>			<b>0,00</b>	
<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		<b>0,021</b>	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>		<b>55</b>	K						
<b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; θ<sub>a</sub> = 30 °C)</b>					θ <sub>stg</sub>		<b>172</b>	°C						
<b>Effective thermal capacity, incl. fluid (per gross area, A<sub>G</sub>)</b>					C/m <sup>2</sup>		<b>9,08</b>	kJ/(Km <sup>2</sup> )						
<b>Maximum operating temperature</b>					θ <sub>max op</sub>		<b>180</b>	°C						
<b>Maximum operating pressure</b>					p <sub>max,op</sub>		<b>1000</b>	kPa						
<b>Testing laboratory</b>					<b>NCSR Demokritos / Solar &amp; other Energy System Laboratory</b>			<b>www.solar.demokritos.gr</b>						
<b>Test report(s)</b>					4240 DE1 4241 - 4242 DQ1 4243 DE1			<b>Dated</b>		31/10/2018 5/11/2018 30/10/2018				
<b>Comments of testing laboratory</b>					Datasheet version: 5.01, 2016-03-01									
<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 Supplementary Information	Licence Number	OEM 10061/7
	Issued	2023-03-20

**Annual collector output in kWh/collector at mean fluid temperature  $\vartheta_m$ , based on ISO 9806:2013 test results**

Collector name	Standard Locations $\vartheta_m$	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
HOV-1.5		1.518	1.052	635	1.150	759	429	843	533	295	915	570	310
HOV-1.75		1.771	1.227	741	1.341	886	500	984	621	344	1.067	665	361
HOV-2.0		2.024	1.403	847	1.533	1.013	572	1.124	710	393	1.219	760	413
HOV-2.3		2.327	1.613	974	1.763	1.165	657	1.293	817	452	1.402	874	475
HOV-2.5		2.489	1.725	1.042	1.885	1.246	703	1.383	874	484	1.500	934	508
Annual output per m <sup>2</sup> gross area		1.012	701	424	766	506	286	562	355	197	610	380	206
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 [www.solarkeymark.org/scenocalc](http://www.solarkeymark.org/scenocalc)

**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)	A	--
Maximum tested positive load	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using steel ball (maximum drop height)	2	m

**Energy Labelling Information**

	Reference Area, $A_{sol}$ (m <sup>2</sup> )	Data required for CDR (EU) No 811/2013 - Reference Area $A_{sol}$	
HOV-1.5	1,50	Collector efficiency ( $\eta_{col}$ )	52 %
HOV-1.75	1,75	<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>	
HOV-2.0	2,00		
HOV-2.3	2,30		
HOV-2.5	2,46		
		Data required for CDR (EU) No 812/2013 - Reference Area $A_{sol}$	
		Zero-loss efficiency ( $\eta_0$ )	0,676 --
		First-order coefficient ( $a_1$ )	3,04 W/(m <sup>2</sup> K)
		Second-order coefficient ( $a_2$ )	0,020 W/(m <sup>2</sup> K <sup>2</sup> )
		Incidence angle modifier IAM (50°)	0,87 --
		<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>	