



Annex to Solar Keymark Certificate	Licence Number	SKM 10087
	Date issued	2019-09-24
	Issued by	DQS Hellas

Licence holder	PAPAEMMANOUEL S.A.	Country	Greece
Brand (optional)	MTEC-2.72	Web	www.papaemmanouel.gr
Street, Number	1o Km Inofyta – St. Thomas, Inofyta Viotia	E-mail	exports@papaemmanouel.gr
Postcode, City	32011, Viotia	Tel	+30 22620 31931

Collector Type	Flat plate collector
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Collector name	Gross height mm	Gross area (A <sub>G</sub> ) m <sup>2</sup>	Gross length mm	Gross width mm	Aperture area (A <sub>a</sub> ) m <sup>2</sup>	Power output per collector G <sub>b</sub> = 850 W/m <sup>2</sup> , G <sub>d</sub> = 150 W/m <sup>2</sup> & u = 1.3 m/s θ <sub>m</sub> - θ <sub>a</sub>					
						0 K	10 K	30 K	50 K	70 K	85 K
						W	W	W	W	W	W
MTEC-27V	101	2.73	2,162	1,261	2.56	2,220	2,119	1,904	1,671	1,420	1,220
MTEC-27H	101	2.73	2,162	1,261	2.56	2,220	2,119	1,904	1,671	1,420	1,220
Power output per m <sup>2</sup> gross area						813	776	697	612	520	447

Performance parameters test method	Quasi dynamic									
Performance parameters (related to A <sub>G</sub> )	η <sub>0</sub> , b	a1	a2	a3	a4	a5	a6	a7	a8	Kd
Units	-	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> )	-
Test results	0.820	3.61	0.008	0.000	0.00	0	0.000	0.00	0.0E+00	0.94

Incidence angle modifier test method	Quasi dynamic - outdoor									
Incidence angle modifier	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal	K <sub>θT, coll</sub>	1.00	1.00	0.99	0.97	0.93	0.84	0.69	0.44	0.00
Longitudinal	K <sub>θL, coll</sub>	1.00	1.00	0.99	0.97	0.93	0.84	0.69	0.44	0.00

Heat transfer medium for testing	Water-Glycole	
Flow rate for testing (per gross area, A <sub>G</sub> )	dm/dt	0.022 kg/(sm <sup>2</sup> )
Maximum temperature difference during thermal performance test	(θ <sub>m</sub> - θ <sub>a</sub> ) <sub>max</sub>	55 K
Standard stagnation temperature (G = 1000 W/m <sup>2</sup> ; θ <sub>a</sub> = 30 °C)	θ <sub>stg</sub>	200.37 °C
Maximum operating temperature	θ <sub>max, op</sub>	210 °C
Maximum operating pressure	p <sub>max, op</sub>	1000 kPa

Testing laboratory	NCSR Demokritos / Solar & other Energy System	www.solar.demokritos.gr
Test report(s)	4248 DQ1 4254 DE1	Dated 1/8/2019 11/7/2019

Comments of testing laboratory: Datasheet version: 6.0, 2018-10-30

**N.C.S.R "DEMOKRITOS"**  
 SOLAR ENERGY LABORATORY  
 Head: Dr Vassilis Belessiotis  
 Tel: +210 6503015 - Fax: +210 6541600  
 153 10 Ag. Paraskevi - Attiki - Greece

