

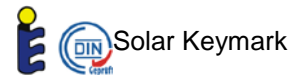
Solar Collector Factsheet

Papaemmanouel SOLAR FLAME MSFC100-



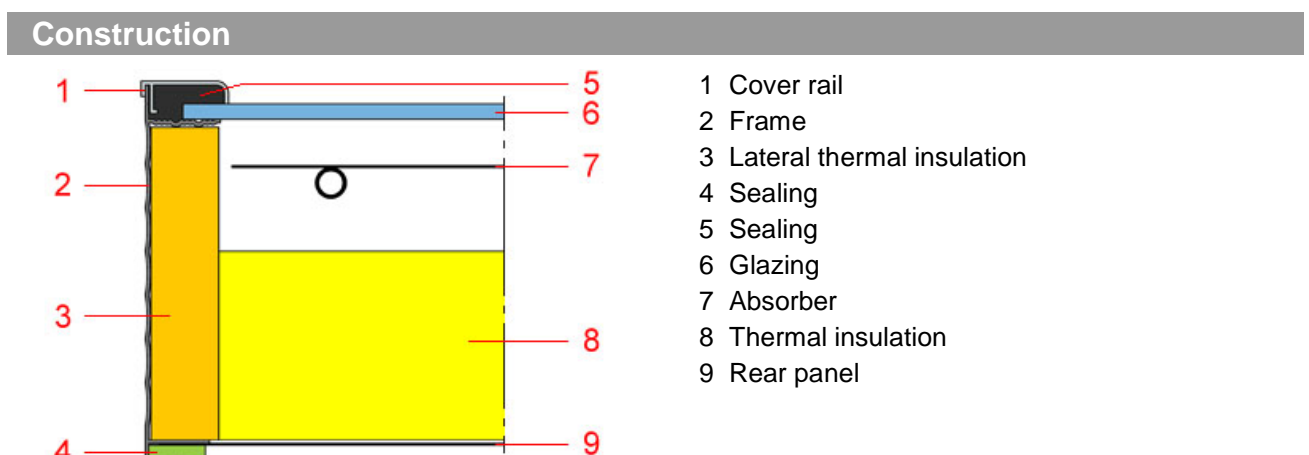
Model	SOLAR FLAME MSFC100-2.72m2
Type	Flat plate collector
Manufacturer	Papaemmanouel S.A.
Address	1st. Km. Inofyta-St. Thomas
	GR-32011 Inofyta-Viotia
Telephone	+30 22620 31931
Fax	+30 22620 32166
Email	exports@papaemmanouel.gr
Internet	www.papaemmanouel.gr
Test date	01.2014

- Performance test EN12975:2006
- Quality test EN12975:2006

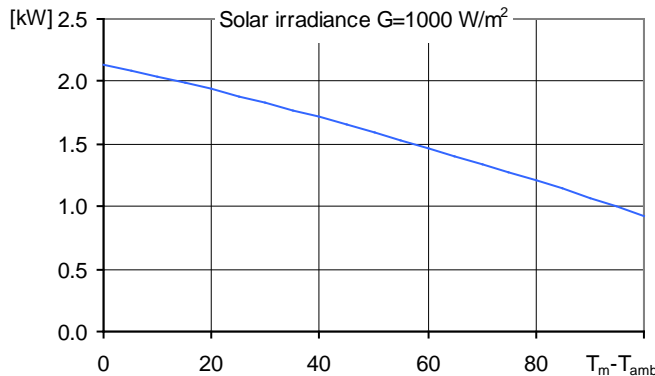


Dimensions		Technical data	
Total length	2.165 m	Minimum flowrate	95 l/h
Total width	1.266 m	Nominal flowrate	100 l/h
Gross area	2.741 m ²	Maximum flowrate	150 l/h
Aperture area	2.576 m ²	Fluid content	2.2 l
Absorber area	2.563 m ²	Maximum operating pressure	10 bar
Weight empty	53 kg	Stagnation temperature	205 °C

Types of mounting	Further information
<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Construction for sloping roof <input checked="" type="checkbox"/> Integration into sloping roof <input checked="" type="checkbox"/> On flat roof with stand <input type="checkbox"/> Facade 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Units in different sizes available <input type="checkbox"/> Glazing replaceable <p>Hydraulic connection Copper pipe, nominal diameter 22 mm</p>

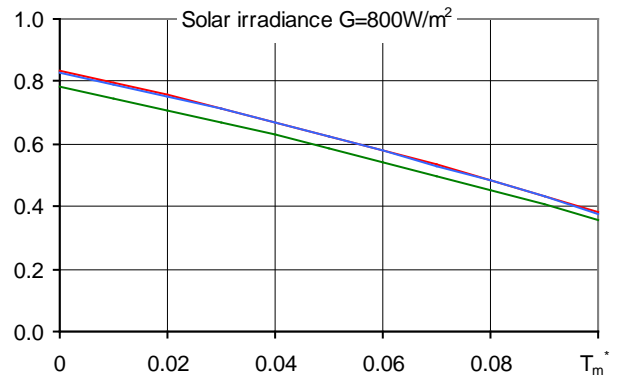


Peak Power per collector unit W_{peak}



Peak Power W_{peak}	2140 W
Thermal capacity*	9.4 kJ/K
Flowrate during test	150 l/h
Fluid for test	Water-Glycol 33.3%

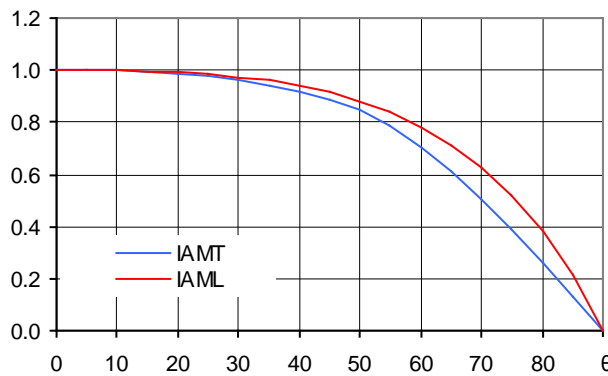
Relative efficiency η



Reference	Gross	Aperture	Absorber
η_0	0.781	0.831	0.835
a_1 [$WK^{-1}m^{-2}$]	3.55	3.78	3.80
a_2 [$WK^{-2}m^{-2}$]	0.0087	0.0093	0.0093

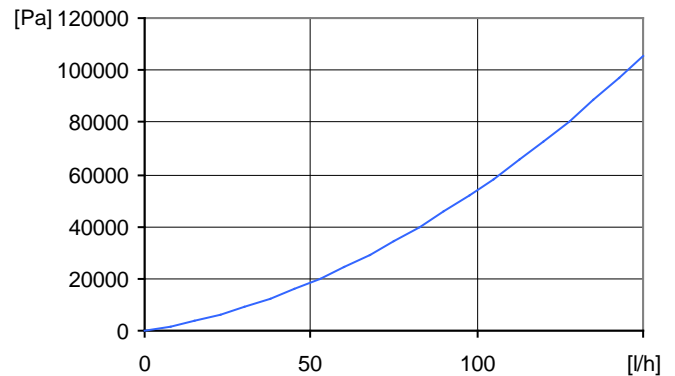
*) Specific thermal capacity C of the collector without fluid, determined according to 6.1.6.2 of EN12975-2:2006

Incident angle modifier IAM



K1, transversal IAM at 50°	0.84
K2, longitudinal IAM at 50°	0.88

Pressure drop Δp



Pressure drop at nominal flowrate
$\Delta p = 54034 \text{ Pa}$ ($T=20^\circ\text{C}$)

SPF Simulation of systems using Polysun

Short description of the system

Climate: Central Switzerland, orientation of the collectors: South, Cold water 10°C, Hot water 50°C

Domestic hot water: $F_{ss}^* = 60\%$

Tank 450 l, collector inclination 45°, Daily energy demand 10 kWh (4-6 persons) Energy demand of the reference system 4200 kWh/year

Water pre-heating: $F_{ss}^* = 25\%$

2 Tanks: 1500 l & 2500 l, collector inclination 30°, Domestic hot water consumption 10'000 l/day (200 persons) Daily heat losses (circulation and tanks) 60 kWh, Energy demand of the reference system 191'700 kWh/year

Space heating system: $F_{ss}^* = 25\%$

Combined storage 1200 l, collector inclination 45°, Daily energy demand 10 kWh (4-6 persons), Building 200 m², moderately heavy construction, well insulated, Heating power demand 5.8 kW (ambient temperature -8°C), Energy demand space heating 12140 kWh/year, Energy demand of the reference system 16340 kWh/year

Surface demand
Number of collectors**

Solar yield**

4.98 m²
1.9 collectors 510 kWh/m²

64.7 m²
25.1 collectors 742 kWh/m²

15.6 m²
6.1 collectors 345 kWh/m²

*) Fractional solar savings: Proportion of the final energy that, thanks to the solar system, can be saved compared to a reference system.
**) Surface demand and solar yield are given with respect to the aperture area.