

Solar Collector Factsheet

Papaemmanouel SOLAR FLAME MSFC100-



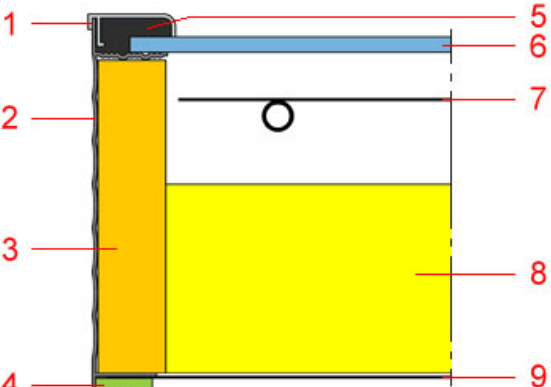
Model	SOLAR FLAME MSFC100-1.50m2
Type	Flat plate collector
Manufacturer	Papaemmanouel S.A.
Address	1st. Km. Inofyta-St. Thomas
	GR-32011 Inofyta-Viotia
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Email	exports@papaemmanouel.gr
Internet	www.papaemmanouel.gr
Test date	01.2014

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

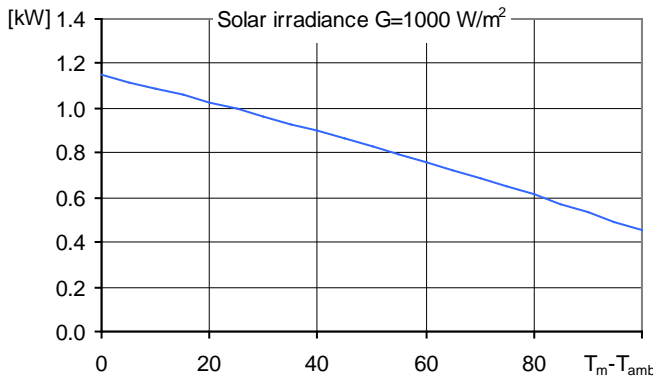


Dimensions		Technical data	
Total length	1.485 m	Minimum flowrate	50 l/h
Total width	1.017 m	Nominal flowrate	60 l/h
Gross area	1.510 m ²	Maximum flowrate	120 l/h
Aperture area	1.385 m ²	Fluid content	1.5 l
Absorber area	1.374 m ²	Maximum operating pressure	10 bar
Weight empty	30 kg	Stagnation temperature	205 °C

Types of mounting	Further information
<input checked="" type="checkbox"/> Construction for sloping roof	<input checked="" type="checkbox"/> Units in different sizes available
<input checked="" type="checkbox"/> Integration into sloping roof	<input type="checkbox"/> Glazing replaceable
<input checked="" type="checkbox"/> On flat roof with stand	Hydraulic connection
<input type="checkbox"/> Facade	Copper pipe, nominal diameter 22 mm

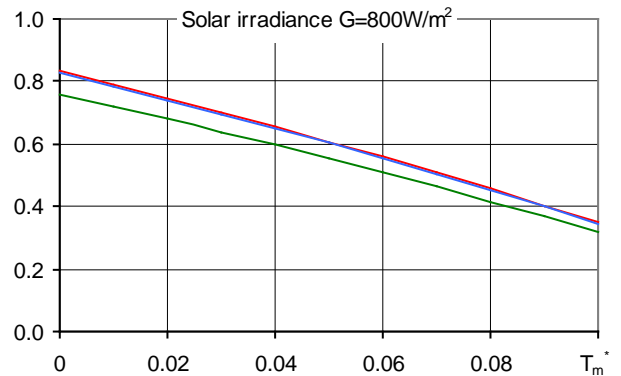
Construction	
	<ul style="list-style-type: none"> 1 Cover rail 2 Frame 3 Lateral thermal insulation 4 Sealing 5 Sealing 6 Glazing 7 Absorber 8 Thermal insulation 9 Rear panel

Peak Power per collector unit W_{peak}



Peak Power W_{peak}	1146 W
Thermal capacity*	5.4 kJ/K
Flowrate during test	100 l/h
Fluid for test	Water-Glycol 33.3%

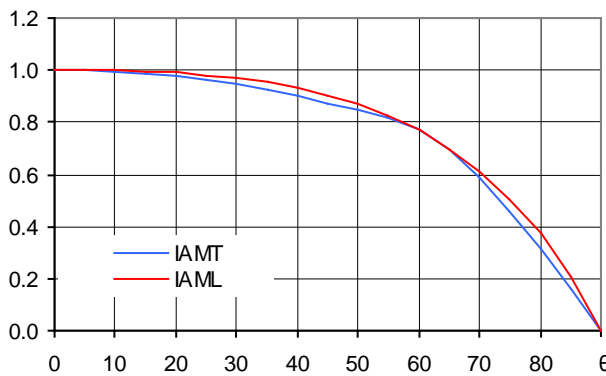
Relative efficiency η



Reference	Gross	Aperture	Absorber
η_0	0.759	0.827	0.834
a_1 [WK ⁻¹ m ²]	3.80	4.15	4.18
a_2 [WK ⁻² m ²]	0.0077	0.0084	0.0085

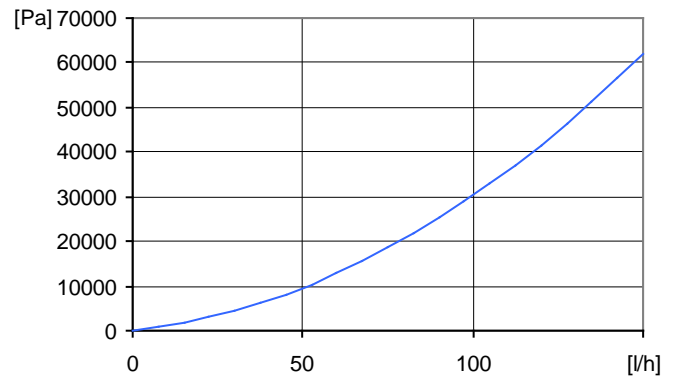
*) Specific thermal capacity C of the collector without fluid, determined according to 6.1.6.2 of EN12975-2:2006

Incident angle modifier IAM



K1, transversal IAM at 50°	0.85
K2, longitudinal IAM at 50°	0.87

Pressure drop Δp



Pressure drop at nominal flowrate
 $\Delta p = 12948 \text{ Pa}$ (T=20°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°

Domestic hot water: Fss* = 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: Fss* = 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: Fss* = 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**

5.27 m²
3.8 collectors 483 kWh/m²

66.8 m²
48.2 collectors 720 kWh/m²

17.0 m²
12.3 collectors 316 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.