

# Solar Collector Factsheet

## Navitron SFB 20



<b>Model</b>	<b>SFB 20</b>
<b>Type</b>	Evacuated tube collector
<b>Manufacturer</b>	Navitron Ltd
<b>Address</b>	2 Lands End Way
	UK-LE15 6RB Oakham
<b>Telephone</b>	+44 1572 725512
<b>Fax</b>	+44 1572 724390
<b>Email</b>	sales@navitron.org.uk
<b>Internet</b>	<a href="http://www.navitron.org.uk">www.navitron.org.uk</a>
<b>Test date</b>	12.2006

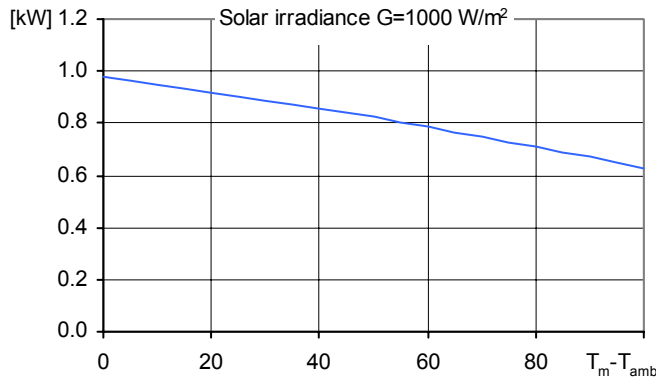
- Performance test EN12975:2001
- Quality test EN12975:2001

Dimensions		Technical data	
<b>Total length</b>	1.639 m	<b>Minimum flowrate</b>	30 l/h
<b>Total width</b>	1.466 m	<b>Nominal flowrate</b>	120 l/h
<b>Gross area</b>	2.403 m <sup>2</sup>	<b>Maximum flowrate</b>	200 l/h
<b>Aperture area</b>	1.747 m <sup>2</sup>	<b>Fluid content</b>	1.1 l
<b>Absorber area</b>	2.655 m <sup>2</sup>	<b>Maximum operating pressure</b>	8 bar
<b>Weight empty</b>	49 kg	<b>Stagnation temperature</b>	225 °C

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

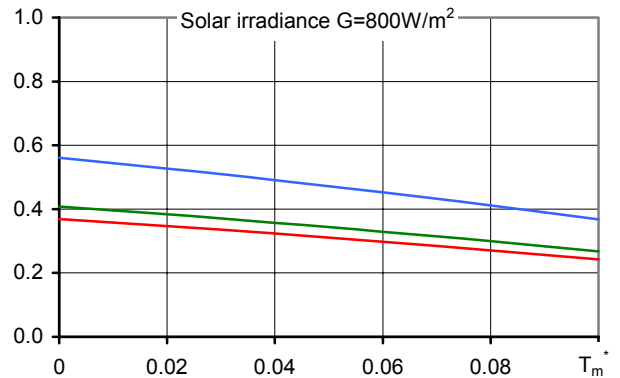
Construction	
	<ul style="list-style-type: none"> <li>1 Glazing</li> <li>2 Vacuum</li> <li>3 Absorber</li> <li>4 Heat-conducting metal sheet</li> <li>5 Heat pipe</li> </ul>

**Peak Power per collector unit  $W_{peak}$**



<b>Peak Power <math>W_{peak}</math></b>	980 W
<b>Thermal capacity*</b>	13.7 kJ/K
<b>Flowrate during test</b>	119 l/h
<b>Fluid for test</b>	Water-Glycol 33.3%

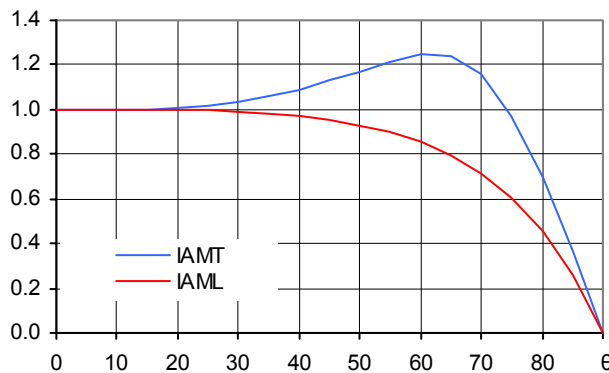
**Relative efficiency  $\eta$**



<b>Reference</b>	<b>Gross</b>	<b>Aperture</b>	<b>Absorber</b>
$\eta_0$	0.408	0.561	0.369
$a_1$ [ $WK^{-1}m^{-2}$ ]	1.17	1.61	1.06
$a_2$ [ $WK^{-2}m^{-2}$ ]	0.0029	0.0040	0.0026

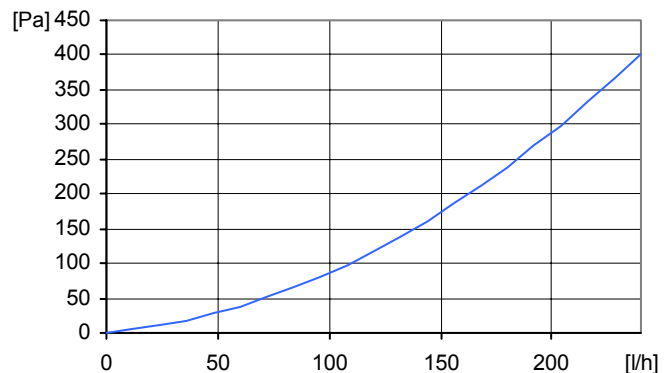
\*) Specific thermal capacity C of the collector without fluid, determined according to 6.1.6.2 of EN12975-2:2001

**Incident angle modifier IAM**



<b>K1, transversal IAM at 50°</b>	1.17
<b>K2, longitudinal IAM at 50°</b>	0.93

**Pressure drop  $\Delta p$**



**Pressure drop at nominal flowrate**  
 $\Delta p = 118 \text{ Pa}$  ( $T=20^\circ\text{C}$ )

**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°

**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 m<sup>2</sup>, 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\*\***

5.49 m<sup>2</sup>  
3.1 collectors      464 kWh/m<sup>2</sup>

74.7 m<sup>2</sup>  
42.8 collectors      626 kWh/m<sup>2</sup>

15.8 m<sup>2</sup>  
9.1 collectors      344 kWh/m<sup>2</sup>

\*) 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.