

Test Centre for Solar Thermal
Components and Systems

1. Summary of the Results

Company:	Wagner & Co Solartechnik GmbH Zimmermannstr. 12 D-35091 Cölbe, Germany	Report no.:	50-07/D
		Report date:	21.05.2007 (end of tests: 18.05.2001)
Type:	EURO C20 HTF	Serial no.:	94275
		Year of production:	2001

The following results were obtained from a test of the thermal performance of a solar collector according to **EN 12975-2:2006**. They apply to the collector described more precisely in the test report no. 50-07/D and to the tests and procedures described herein.

Description of the collector

Type	flat plate collector	Aperture area	2.373 m ²
Length/Width/Height	2151 / 1231 / 110 mm	Absorber area	2.373 m ²
Max. operation pressure	10 bar	Gross area	2.609 m ²
Weight, empty	49.2 kg	Recommended flow rate	90 kg/m ² h
Heat transfer fluid	water glycol mixture	Thickness of absorber sheet	0.2 mm
		Tube distance	114 mm

Test results

Coefficients of efficiency

(determined in the sun simulator SUSI I)

$$\eta = \eta_0 - a_1 \cdot (t_m - t_a) / G - a_2 \cdot (t_m - t_a)^2 / G$$

Based on: aperture area absorber area

$\eta_0 =$	0.818	0.818
$a_1 =$	3.47 W/m ² K	3.47 W/m ² K
$a_2 =$	0.0101 W/m ² K ²	0.0101 W/m ² K ²

Incident angle modifier

(determined outdoor)

$$K_{\theta b}(\theta) = 1 - b_0 (1 / \cos \theta - 1)$$

$K_{\theta}(50^\circ) =$	0.94, for $G_d / G = 0.2$
$b_0 =$	0.0134
$K_{\theta d} =$	0.88

Power output per collector unit

$T_m - T_a$	400 W/m ²	Irradiance 700 W/m ²	1000 W/m ²
10 K	692 W	1274 W	1856 W
30 K	508 W	1090 W	1673 W
50 K	305 W	887 W	1469 W

Peak power per collector unit **1941 W_{peak}** at $G = 1000 \text{ W/m}^2$ and $t_m - t_a = 0 \text{ K}$

Pressure drop (water, 20 °C) $\Delta p = 3.0 \text{ mbar}$ at $\dot{m} = 61.0 \text{ kg/h}$
 $\Delta p = 19.5 \text{ mbar}$ at $\dot{m} = 227.0 \text{ kg/h}$

Thermal capacity (calculated) $c = 4.7 \text{ kJ/(m}^2\text{K)}$ $C = 11.1 \text{ kJ/K}$

Stagnation temperature $t_{stg} = 227 \text{ °C}$ at $G_S = 1000 \text{ W/m}^2$ and $t_{as} = 30 \text{ °C}$

Emmerthal, 21.05.2007

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