

2.3.2 Power output per collector unit

2.3.2.1 Peak power

Peak power W_{peak} per collector unit for normal incident irradiation of 1000 W/m^2 .

$$W_{\text{peak}} = 1846 \text{ [W]}$$

2.3.2.2 Diagram

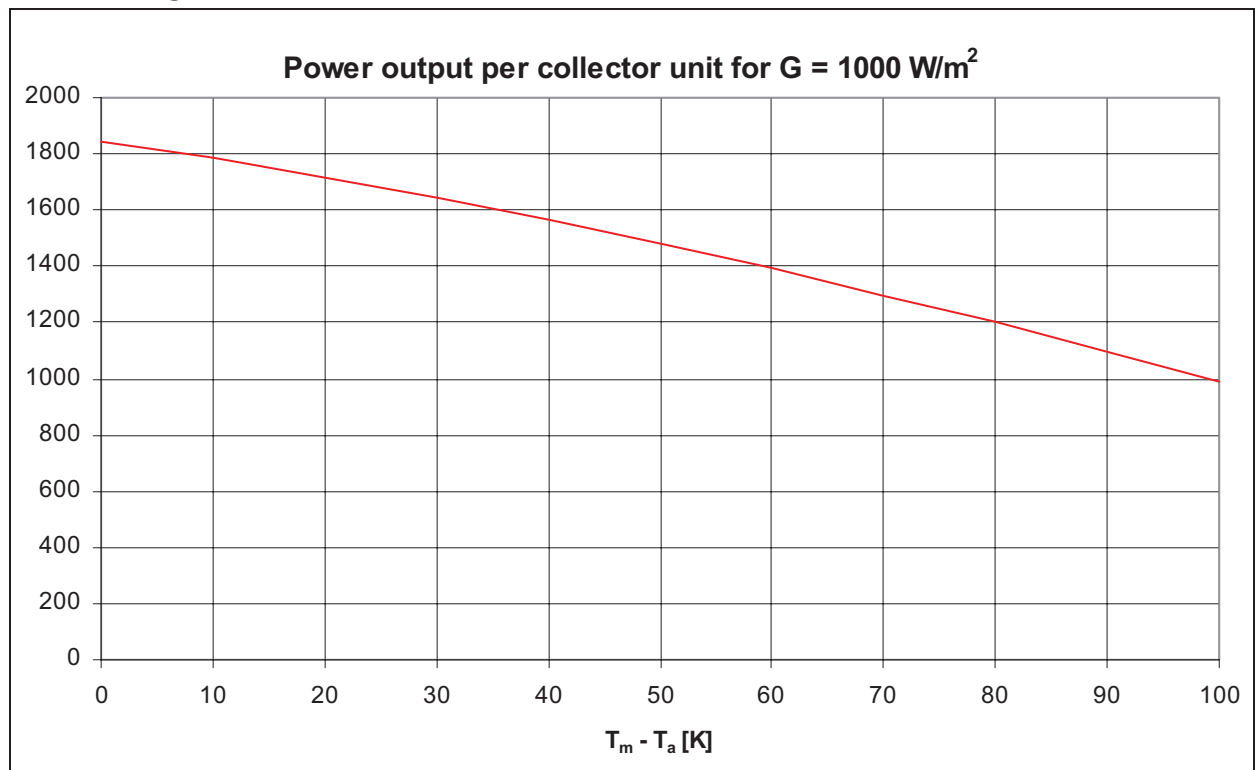


Fig. 2.2: Power output per collector unit at irradiance $G = 1000 \text{ W/m}^2$

2.3.2.3 Power output per collector unit

$T_m - T_a$	Global irradiance G		
	$G=400 \text{ W/m}^2$	$G=700 \text{ W/m}^2$	$G=1000 \text{ W/m}^2$
10 K	675 W	1229 W	1783 W
30 K	534 W	1088 W	1642 W
50 K	372 W	926 W	1480 W

2.3.3 Efficiency curve

The efficiency curves with reference to the absorber-, aperture- and gross areas are indicated in addition to the requirements of the norm.

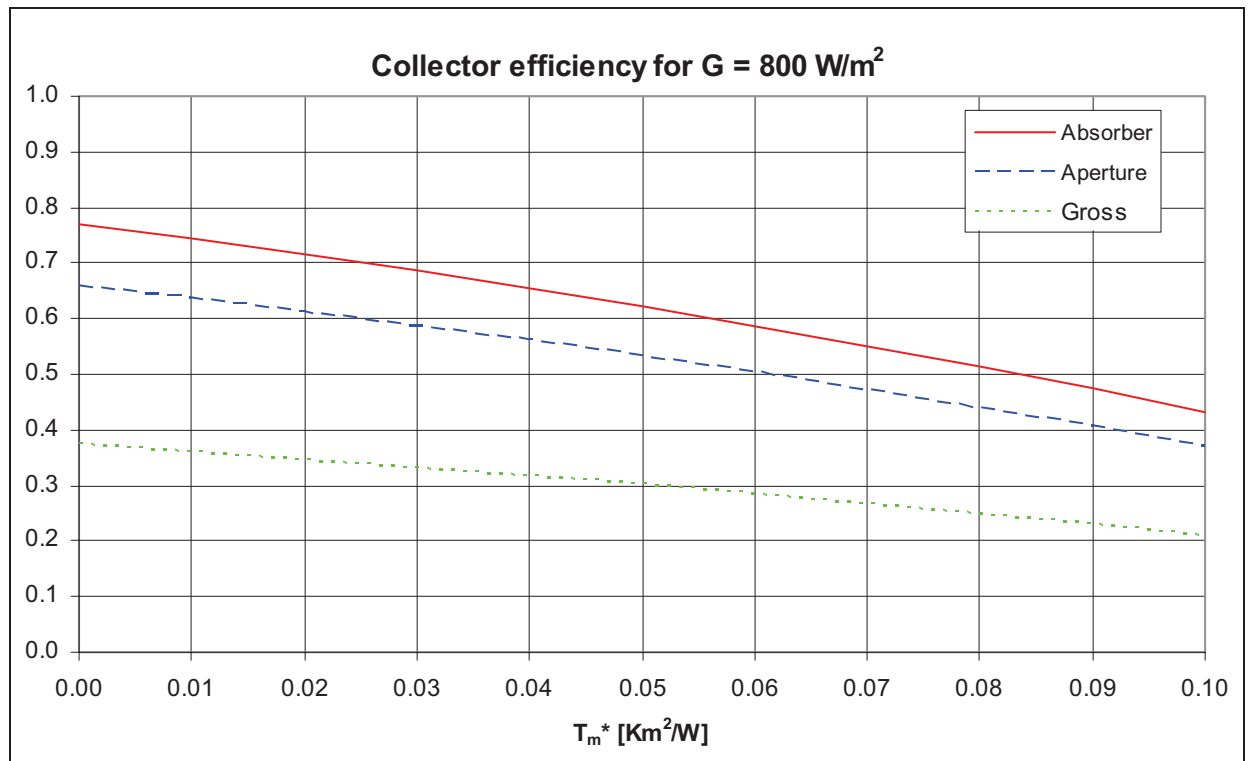


Fig. 2.3: Efficiency diagram for G = 800 W/m²

2.3.3.1 Parameters for efficiency equation

Reference area	Absorber area	Aperture area	Gross area
η_0 (-)	0.769	0.659	0.373
a_1 (W/m²K)	2.52	2.16	1.22
a_2 (W/m²K²)	0.0106	0.0091	0.0051

From repetitive measurements of a reference collector, we estimate the following dispersion for the efficiency measurement (standard deviation of the mean, multiplied with a coverage factor 2):

At $T_m^*=0.02$: 0.27 Efficiency-%,
 at $T_m^*=0.05$: 0.44 Efficiency-%,
 at $T_m^*=0.08$: 0.62 Efficiency-%.

2.4 Incident Angle Factor

2.4.1 Table of the Incidence Angle Modifier (IAM)

	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
K_{θ} (longitudinal)	1.00	1.00	1.00	0.99	0.98	0.95	0.88	0.75	0.50	0.00
K_{θ} (transversal)	1.00	1.01	1.06	1.13	1.25	1.44	1.45	1.16	0.63	0.00

2.4.2 Diagram of the Incidence Angle Modifier



Fig. 2.4: Incident angle modifiers

2.7 Pressure Drop

2.7.1 Diagram

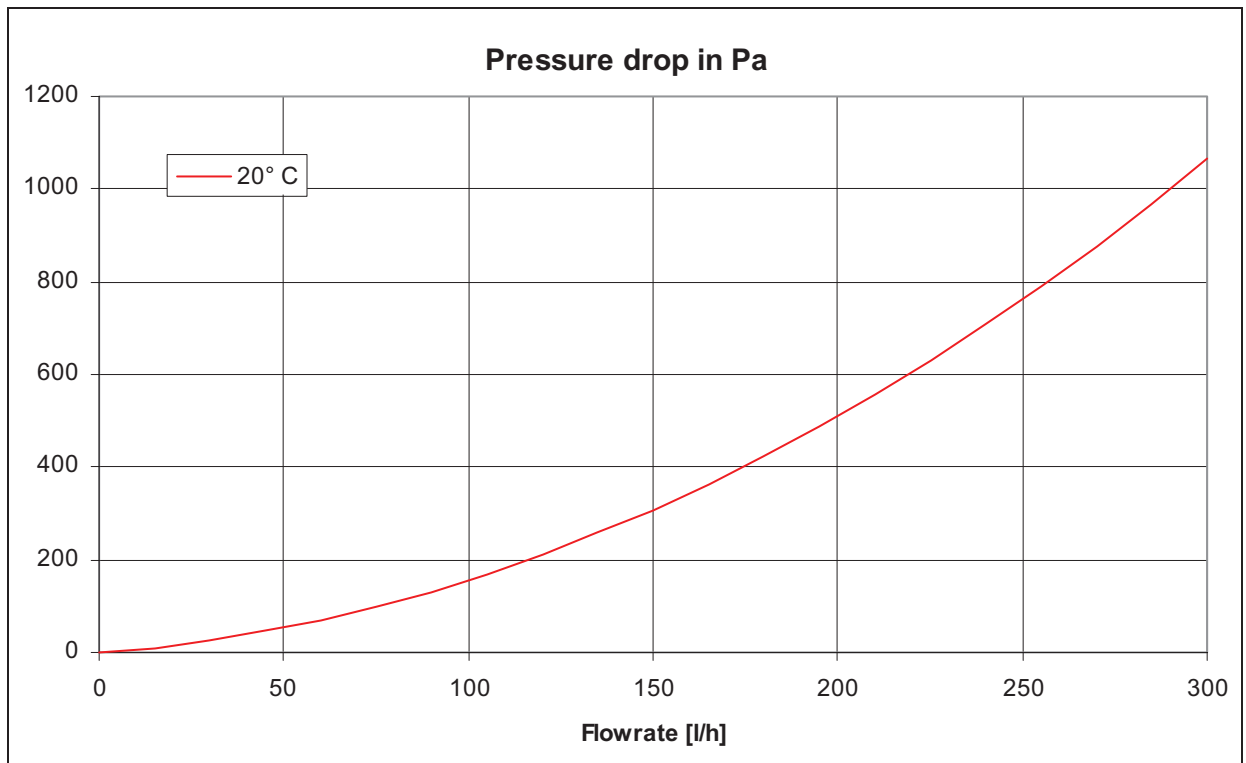


Fig. 2.5: Pressure drop as a function of volume flowrate

2.7.2 Pressure drop at rated flowrate

Conditions:

$T_m = 20^\circ\text{C}$ and $dV/dt = 0 \text{ l/h}$

$\Delta p = 0 \text{ Pa}$

2.7.3 Table of pressure drop data in Pa

Conditions:

$T_m = 20^\circ\text{C}$

Flow rate [l/h]	0	50	100	150	200	300
Pressure drop [Pa]	0	53	156	309	511	1064