

# ARCON solar collector - type HT-SA 28/10

## Data

External dimensions:	2.27 x 5.96 x 0.14 m
Gross area:	13.57 m <sup>2</sup>
Aperture area:	12.52 m <sup>2</sup>
Weight, excl. fluid:	250 kg
Fluid content:	9.3 litre

## Efficiency

$$\eta = \eta_0 - \frac{a_1 \cdot (T_m - T_a)}{G} - \frac{a_2 \cdot (T_m - T_a)^2}{G}$$

where:

$T_a$	= Ambient temperature [°C]
$T_m$	= Mean fluid temperature [°C]
$G$	= Irradiance [W/m <sup>2</sup> ]

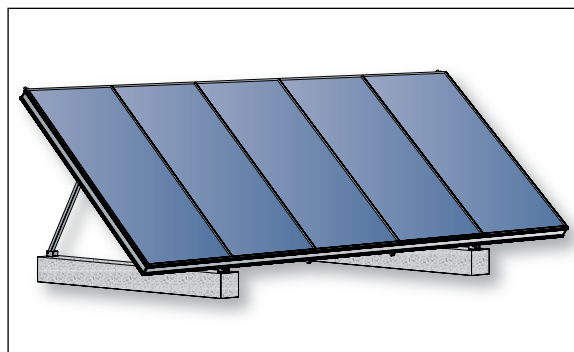


Figure 1: HT-SA collector mounted on concrete foundations

Efficiency based on aperture area of 12.56 m<sup>2</sup>, a flow of 25 ltr/min and a wind velocity of 3 m/s:

$\eta_0$	= 0.817
$a_1$	= 2.205 [W/(m <sup>2</sup> K)]
$a_2$	= 0.0135 [W/(m <sup>2</sup> K <sup>2</sup> )]

Conditions:

Fluid	= 40 %
Flow	= 25 L/min
Irradiance [G]	> 800 W/m <sup>2</sup>

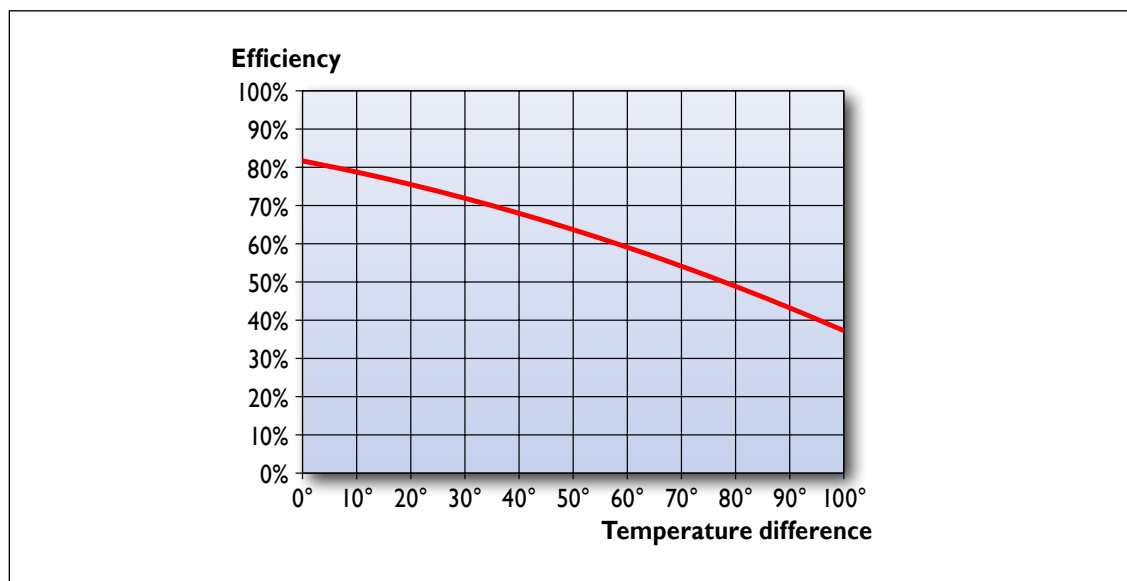


Figure 2: Efficiency graph (G = 800 W/m<sup>2</sup>)



ARCON Solar A/S  
Skørping Nord 3  
DK-9520 Skørping  
Tel. +45 98 39 14 77  
arcon@arcon.dk  
www.arcon.dk

Collector power output [W]			
Temperature difference [K] $T_m - T_a$	Irradiance [W/m <sup>2</sup> ]		
	400	700	1000
10	3800	6870	9940
30	3113	6183	9253
50	2290	5360	8430
70	802	3872	6942

Figure 3: Collector power output at different irradiance

## Absorber

Type: Selective - Alanod  
 Material: Copper/aluminum  
 Coating: Mirotherm,  $\alpha > 0.95$ ;  $\varepsilon < 0.05$   
 Pipe system: 18xØ10 parallel pipes and 2xØ28 distribution pipes  
 Sectional area: 66 mm<sup>2</sup>  
 Material thickness: 0.5 mm

## Finish

Number of layers: 2  
 Material: Anti reflex treated glass + ETFE foil  
 Thickness: 3.2 + 0.025 mm

## Connection

Stainless flex tube: 2 x 28 mm

## Insulation

Back side: 75 mm mineral wool  
 Side: 30 mm mineral wool

## Pressure

Recommended max. working pressure: 10 bar  
 Testing pressure: 13 bar  
 Maximum flow: 3.3 m<sup>3</sup>/h

## Incidence angle modifiers

$$K_{\theta} = 1 - \tan^a (\theta / 2)$$

where:

$\theta$  = incidence angle [°]

$a$  = exponent (4.51)

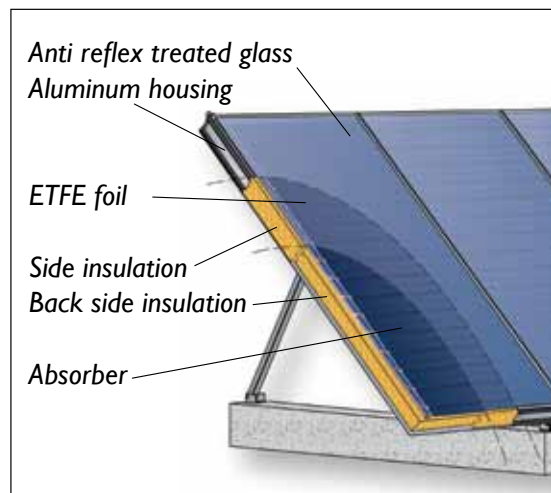


Figure 4: Cut through HT-SA solar collector

## Pressure loss

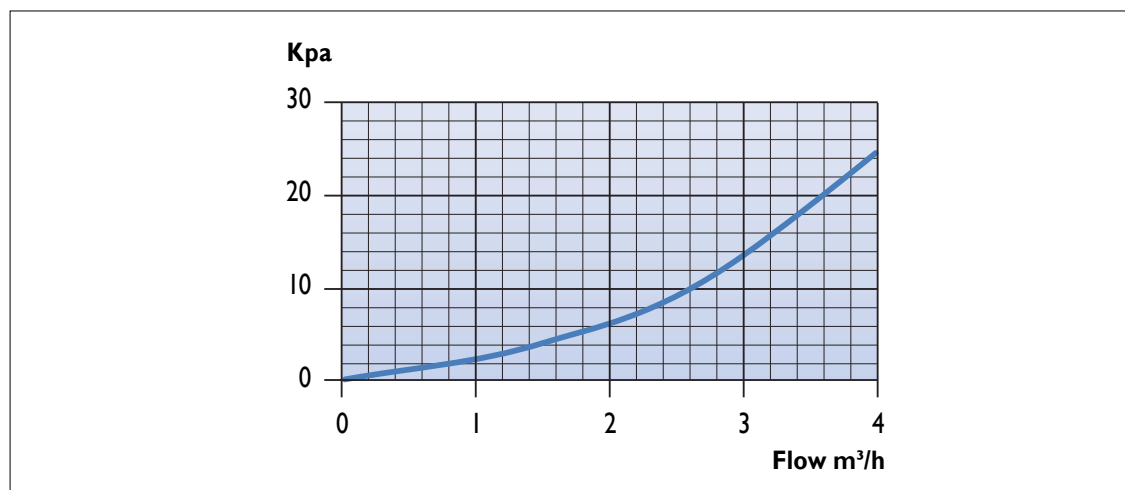


Figure 5: Pressure loss graph



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