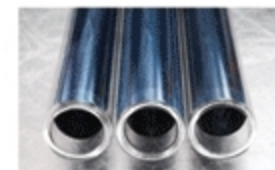


## THREE-TARGET TUBE

### Three-target all-glass vacuum heat collection tube property and specification

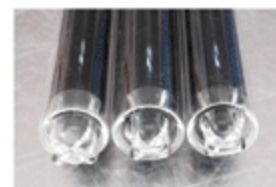
Structure		All-glass double-tube co-axial structure	
Glass material		High borosilicate 3.3 glass	
External pipe diameter and thickness		$\Phi=47 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=58 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=70 \pm 0.7\text{mm} \ \&=2.0\text{mm}$	
Internal pipe diameter and thickness		$\Phi=37 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=47 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=58 \pm 0.7\text{mm} \ \&=1.6\text{mm}$	
Pipe length		800mm   1200mm   1500mm   1600mm 1800mm   1900mm   2000mm   2100mm	
Absorptive coating property	Structure	Cu/SS-ALN(H) /SS-ALN(L) / ALN	
	Sediment method	3 target magnetron sputtering plating	
	Specific absorption	$a_s=0.93 \sim 0.96$ (AM1.5)	
	Emission ratio	$\epsilon_s=0.04 \sim 0.06$ (80°C ± 5°C)	
Vacuum tightness		$P \leq 5.0 \times 10^{-3}$ 帕 (Pa)	
Idle sunning property parameters		$Y=260 \sim 300\text{m}^2 \cdot \text{C}/\text{KW}$	
Solar irradiation for obtaining a preset water temperature	$H \leq 4.7\text{MJ}/\text{m}^2$ ( $\Phi 58$ )	$H=3.7 \sim 4.2\text{MJ}/\text{m}^2$	
	$H \leq 3.7\text{MJ}/\text{m}^2$ ( $\Phi 47$ )	$H=2.9 \sim 3.2\text{MJ}/\text{m}^2$	
Average heat loss coefficient		$U_{LT}=0.4 \sim 0.6\text{W}/(\text{m}^2 \cdot \text{C})$	



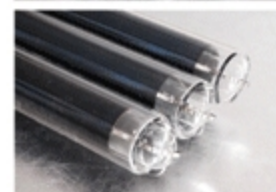
## SINGLE TARGET TUBE

### Single target All-glass vacuum heat collection tube property and specification

Structure		All-glass double-tube co-axial structure	
Glass material		High borosilicate 3.3 glass	
External pipe diameter and thickness		$\Phi=47 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=58 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=70 \pm 0.7\text{mm} \ \&=2.0\text{mm}$	
Internal pipe diameter and thickness		$\Phi=37 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=47 \pm 0.7\text{mm} \ \&=1.6\text{mm}$ $\Phi=58 \pm 0.7\text{mm} \ \&=1.6\text{mm}$	
Pipe length		800mm   1200mm   1500mm   1600mm 1800mm   1900mm   2000mm   2100mm	
Absorptive coating property	Structure	AL/AL-ALN(H)/AL-ALN(L)/ ALN	
	Sediment method	Single target magnetron sputtering plating	
	Specific absorption	$a_s=0.90 \sim 0.93$ (AM1.5)	
Emission ratio		$\epsilon_s=0.05 \sim 0.075$ (80°C ± 5°C)	
Vacuum tightness		$P \leq 5.0 \times 10^{-3}$ 帕 (Pa)	
Idle sunning property parameters		$Y=220 \sim 260\text{m}^2 \cdot \text{C}/\text{KW}$	
Solar irradiation for obtaining a preset water temperature	$H \leq 4.7\text{MJ}/\text{m}^2$ ( $\Phi 58$ )	$H=4.1 \sim 4.4\text{MJ}/\text{m}^2$	
	$H \leq 3.7\text{MJ}/\text{m}^2$ ( $\Phi 47$ )	$H=3.1 \sim 3.4\text{MJ}/\text{m}^2$	
Average heat loss coefficient		$U_{LT}=0.6 \sim 0.7\text{W}/(\text{m}^2 \cdot \text{C})$	



## THREE-CAVITY TUBE



### Specification of three-cavity glass vacuum solar energy collecting tube

Adding one more complete glass tube in the normal tube, raising the heating efficiency by decreasing the water content, not the heating area. The heating efficiency can improve 30% by this way.