



CERTIFIED SOLAR THERMAL COLLECTOR

SUPPLIER:
Apricus Inc.
 370 State St
 Suite 2
 North Haven, CT 06473 USA
 www.apricus.com

MODEL: **ETC-20**
 THERMAL COLLECTOR TYPE: Tubular
CERTIFICATION #: **100573**
 Original Certification: August 28, 2015
 Expiration Date: May 13, 2035

This solar collector was evaluated by the Florida Solar Energy Center (FSEC) in accordance with prescribed methods and was found to meet the minimum standards established by FSEC. This evaluation was based on solar collector tests performed by an FSEC approved laboratory. The purpose of the tests is to verify initial performance conditions and quality of construction only. The resulting certification is not a guarantee of long term performance or durability. This collector has been rated for energy output on measured performance and an assumed standard day. Total solar energy available for the standard day is 5045 Watt-hour/m² (1600 Btu/ft²) distributed over a 10 hour period.

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Category Inlet	Low 30°C	Intermediate 50°C	High 100°C	Category Inlet	Low 86°F	Intermediate 122°F	High 212°F
ENERGY OUTPUT	6.5	5.7	3.5	ENERGY OUTPUT	22.2	19.5	12.0

COLLECTOR SPECIFICATIONS					
Gross Area:	2.994 m ²	32.23 ft²	Dry Weight:	95 kg	209 lb
Net Aperture Area:	1.647 m ²	17.73 ft ²	Fluid Capacity:	0.7 liter	0.2 gal
Absorber Area:	1.421 m ²	15.30 ft ²	Test Pressure:	1264 kPa	183 psi

TECHNICAL INFORMATION			Tested in accordance with: ISO 9806		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
SI UNITS:	$\eta = 0.437 - 0.959(P/G) - 0.007(P^2/G)$		Y Intercept:	0.441	Slope: -1.506 W/m ² .°C
IP UNITS:	$\eta = 0.437 - 0.169(P/G) - 0.001(P^2/G)$		Y Intercept:	0.441	Slope: -0.265 Btu/hr.ft ² .°F

Transverse Incident Angle Modifier								Longitudinal Incident Angle Modifier at 50°:		
θ	10	20	30	40	50	60	70	Test Fluid:	Water	
K_{τα}								Test Mass Flow Rate:	0.0045 kg/(s m ²)	3.35 lb/(hr ft ²)

REMARKS:

Joseph Walters
 Technical Director





CERTIFIED SOLAR THERMAL COLLECTOR

SUPPLIER:
Apricus Inc.
 370 State St
 Suite 2
 North Haven, CT 06473 USA
 www.apricus.com

MODEL: ETC-20
 THERMAL Tubular
 COLLECTOR
 TYPE:
 CERTIFICATION 100573
 #: Original August 28, 2015
 Certification:
 Expiration Date: May 13, 2035

This solar collector was evaluated by the Florida Solar Energy Center (FSEC) in accordance with prescribed methods and was found to meet the minimum standards established by FSEC. This evaluation was based on solar collector tests performed by an FSEC approved laboratory. The purpose of the tests is to verify initial performance conditions and quality of construction only. The resulting certification is not a guarantee of long term performance or durability.

This collector has been rated for energy output on measured performance and an assumed standard day. Total solar energy available for the standard day is 5045 Watt-hour/m² (1600 Btu/ft²) distributed over a 10 hour period.

ADDITIONAL INFORMATION (click here to return to the rating page)			
Test Lab:	TUV Rheinland PTL, LLC	Test Report Date:	May 13, 2015
Test Report Number:	154027353A_SRCC_ETC-30_REPORT_ZHAO	Test conducted:	outdoors

SOLAR COLLECTOR CONSTRUCTION DETAILS					
Header Enclosure:					
Gross Length:	2.004 m	Gross Width:	1.494 m	Gross Depth:	0.5 m
Tube Bank:					
Gross Length:	2.190 m	Gross Width:	0.129 m		

COLLECTOR MATERIALS					
Outer Cover:	Glass Tube	Enclosure back:		Back Insulation:	None,
Inner Cover:	None	Enclosure side:	None	Side Insulation:	,
Absorber Description:	Glass Tubes	Flow Pattern:			Parallel/Harp
Riser Tube:	Copper	Fin:			Aluminum
Absorber Coating:	Selective	Tube to fin connection			

Glazing	Outer Cover	Inner Cover
Material:	Glass Tube	None
Surface Characteristics:		
Thickness:		N/A
Transmissivity:		
Gross Tube Length (uninstalled):		
Diameter:	0.058 m	
Tube Glazing to Header Enclosure Seal:		
Reflector Shape:		Reflector Material:





ABSORBER:					
Header Material:	Copper	Header OD:	21.2 mm	Header Wall:	
Riser Tube Material:	Copper	Riser Tube OD:	47.0 mm	Riser Tube Wall Thickness:	
Fin Material:	Aluminum	Fin Thickness:			
Flow Pattern:	Parallel/Harp	Number of Flow Tubes / Heat Pipes:	1	Tube / Heat Pipe Spacing:	73.0 mm
Number of absorber tubes:	30	Flow Tube to Fin Bond:		Length of Flow Path:	
Length of Flow Path:		Riser to Fin/Plate Bond:			

INSULATION:					
Location	Type	Thickness	Location	Type	Thickness
Back – Top Layer:	None		Sides – Inner Layer:		
Back – Bottom Layer:			Sides – Outer Layer:		
Enclosure Fastening Methods:			Header Enclosure:	Aluminum	

Power Output per Collector(W) [Ti-Ta, G = 1000 W/m ²]				
0	10	30	50	70

PRESSURE DROP	
SI UNITS:	$\Delta P = \text{pressure drop (kpa)}$, $f = \text{mass flow rate (kg/s)}$ $\Delta P = + f + f^2$
IP UNITS:	$\Delta P = \text{pressure drop (psi)}$, $f = \text{mass flow rate (lb/s)}$ $\Delta P = + f + f^2$

