


SOLAR COLLECTOR CERTIFICATION AND RATING  SRCC OG-100	<u>CERTIFIED SOLAR COLLECTOR</u> SUPPLIER: BTF, Ltd. P.O. Box 409 Fennville, MI 49408 MODEL: Solar Patriot SP-20 COLLECTOR TYPE: Tubular CERTIFICATION #: 100-2004-013A
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COLLECTOR THERMAL PERFORMANCE RATING							
Megajoules Per Panel Per Day				Thousands of Btu Per Panel Per Day			
CATEGORY (Ti-Ta)	CLEAR DAY 23 MJ/m ² ·d	MILDLY CLOUDY 17 MJ/m ² ·d	CLOUDY DAY 11 MJ/m ² ·d	CATEGORY (Ti-Ta)	CLEAR DAY 2000 Btu/ft ² ·d	MILDLY CLOUDY 1500 Btu/ft ² ·d	CLOUDY DAY 1000 Btu/ft ² ·d
A (-5°C)	28	21	14	A (-9°F)	26	20	13
B (5°C)	26	20	13	B (9°F)	25	19	12
C (20°C)	25	18	11	C (36°F)	23	17	11
D (50°C)	21	14	7	D (90°F)	20	13	7
E (80°C)	16	10	3	E (144°F)	15	9	3

A-Pool Heating (Warm Climate) B-Pool Heating (Cool Climate) C-Water Heating (Warm Climate) D-Water Heating (Cool Climate) E-Air Conditioning

Original Certification Date: January 7, 2005

COLLECTOR SPECIFICATIONS

Gross Area:	3.075 m ²	33.10 ft ²	Net Aperture Area:	2.336 m ²	25.15 ft ²
Dry Weight:	55.4 kg	122 lb	Fluid Capacity:	1.3 l	0.3 gal
Test Pressure:	1103 kPa	160 psig	Max. Oper. Temp.:	100 °C	212 °F

COLLECTOR MATERIALS

Frame:	Stainless Steel
Cover (Outer):	Glass Vacuum Tube
Cover (Inner):	Glass tube
Absorber Material:	Tube - Glass / Plate - Aluminum
Absorber Coating:	Sputtered aluminum nitride
Insulation (Side):	Vacuum
Insulation (Back):	Vacuum

PRESSURE DROP

Flow		Δ P	
ml/s	gpm	Pa	in H ₂ O
20	0.32	21	0.08
50	0.79	172	0.69
80	1.27	482	1.93

TECHNICAL INFORMATION

Efficiency Equation [NOTE: (P) = Ti-Ta]				Y Intercept	Slope
S I Units:	$\eta = 0.342$	$-0.8539 (P)/I$	$-0.0050 (P)^2/I$	0.345	-1.153 W/m ² ·°C
I P Units:	$\eta = 0.342$	$-0.1505 (P)/I$	$-0.0005 (P)^2/I$	0.345	-0.203 Btu/hr-ft ² ·°F

Incident Angle Modifier [(S) = 1/cos θ - 1, 0° ≤ θ ≤ 60°]

$K_{arr} = 1.0$	+1.1787 (S)	-0.6569 (S) ²
$K_{arr} = 1.0$	+0.49 (S)	(Linear Fit)

Model Tested:	SP-20
Test Fluid:	Water
Test Flow Rate:	55 ml/s 0.87 gpm

REMARKS: Collector tested with long axis of tubes oriented north-south. IAM perpendicular to the tubes is listed above. IAM parallel to the tubes = 1.0 - 0.04(S); Absorber is a heat pipe.

January, 2005

Certification must be renewed annually. For current status contact:

SOLAR RATING & CERTIFICATION CORPORATION

c/o FSEC ♦ 1679 Clearlake Road ♦ Cocoa, FL 32922 ♦ (321) 638-1537 ♦ Fax (321) 638-1010