



SOLAR RATING & CERTIFICATION CORPORATION

**CERTIFIED SOLAR COLLECTOR**

SUPPLIER:  
**EnerWorks, Inc.**  
 969 Juliana Drive  
 Woodstock, ON N4V 1C1 Canada  
 www.enerworks.com  
 In Accordance with:  
**SRCC Standard 100-2008-02**

BRAND: S-Power  
 MODEL: S-Power 20/2000 TPS Inside  
 COLLECTOR TYPE: Tubular  
 CERTIFICATION #: 2009062B  
 Original Certification: September 03, 2010  
 Expiration Date: June 14, 2022

The solar collector listed below has been evaluated by the Solar Rating & Certification Corporation™ (SRCC™), an ISO/IEC 17065 accredited and EPA recognized Certification Body, in accordance with SRCC OG-100, Operating Guidelines and Minimum Standards for Certifying Solar Collectors, and has been certified by the SRCC. This award of certification is subject to all terms and conditions of the Program Agreement and the documents incorporated therein by reference. This document must be reproduced in its entirety.

COLLECTOR THERMAL PERFORMANCE RATING							
Kilowatt-hours (thermal) Per Panel Per Day				Thousands of Btu Per Panel Per Day			
Climate ->	High Radiation (6.3 kWh/m <sup>2</sup> .day)	Medium Radiation (4.7 kWh/m <sup>2</sup> .day)	Low Radiation (3.1 kWh/m <sup>2</sup> .day)	Climate ->	High Radiation (2000 Btu/ft <sup>2</sup> .day)	Medium Radiation (1500 Btu/ft <sup>2</sup> .day)	Low Radiation (1000 Btu/ft <sup>2</sup> .day)
Category (Ti-Ta)				Category (Ti-Ta)			
A (-5 °C)	9.5	7.1	4.7	A (-9 °F)	32.3	24.1	15.9
B (5 °C)	9.1	6.7	4.3	B (9 °F)	31.0	22.8	14.6
C (20 °C)	8.4	6.0	3.6	C (36 °F)	28.6	20.3	12.1
D (50 °C)	6.7	4.3	2.0	D (90 °F)	22.7	14.7	6.8
E (80 °C)	4.5	2.4	0.5	E (144 °F)	15.4	8.1	1.8

A- Pool Heating (Warm Climate) B- Pool Heating (Cool Climate) C- Water Heating (Warm Climate)  
 D- Space & Water Heating (Cool Climate) E- Commercial Hot Water & Cooling

COLLECTOR SPECIFICATIONS					
<b>Gross Area:</b>	3.184 m <sup>2</sup>	34.27 ft <sup>2</sup>	<b>Dry Weight:</b>	51 kg	112 lb
<b>Net Aperture Area:</b>	2.174 m <sup>2</sup>	23.40 ft <sup>2</sup>	<b>Fluid Capacity:</b>	3.2 liter	0.8 gal
<b>Absorber Area:</b>	1.862 m <sup>2</sup>	20.05 ft <sup>2</sup>	<b>Test Pressure:</b>	1000 kPa	145 psi

TECHNICAL INFORMATION			Tested in accordance with:		
<b>ISO Efficiency Equation</b> [NOTE: Based on gross area and (P)=Ti-Ta]					
<b>SI UNITS:</b>	$\eta = 0.487 - 1.09840(P/G) - 0.01077(P^2/G)$	<b>Y Intercept:</b>	0.490	<b>Slope:</b>	-1.716 W/m <sup>2</sup> .°C
<b>IP UNITS:</b>	$\eta = 0.487 - 0.19358(P/G) - 0.00105(P^2/G)$	<b>Y Intercept:</b>	0.490	<b>Slope:</b>	-0.302 Btu/hr.ft <sup>2</sup> .°F

Transverse Incident Angle Modifier								Longitudinal Incident Angle Modifier at 50°:		
$\theta$	10	20	30	40	50	60	70	<b>Test Fluid:</b>	Water	
<b>K<sub>τα</sub></b>	1.00	1.00	0.99	0.98	0.96	0.93	0.82	<b>Test Mass Flow Rate:</b>	0.0214 kg/(s m <sup>2</sup> )	15.78 lb/(hr ft <sup>2</sup> )

REMARKS:

*Jen Higgins*

Technical Director

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ADDITIONAL INFORMATION ( <a href="#">click here to return to the rating page</a> )			
Test Lab:	TÜV Rheinland Energie und Umwelt GmbH	Test Date:	June 14, 2010
Test Report Number:		Test Location:	

SOLAR COLLECTOR CONSTRUCTION DETAILS					
<b>Header Enclosure:</b>					
<b>Gross Length:</b>	2.170 m	<b>Gross Width:</b>	1.470 m	<b>Gross Depth:</b>	
<b>Tube Bank:</b>					
<b>Gross Length:</b>		<b>Gross Width:</b>			

COLLECTOR MATERIALS					
<b>Outer Cover:</b>	Glass sheet	<b>Enclosure back:</b>	Aluminum	<b>Back Insulation:</b>	Foam, None
<b>Inner Cover:</b>	None	<b>Enclosure side:</b>	Aluminum	<b>Side Insulation:</b>	
<b>Absorber Description:</b>		<b>Flow Pattern:</b>			
<b>Riser Tube:</b>		Copper	<b>Fin:</b>		
<b>Absorber Coating:</b>		Selective	<b>Tube to fin connection</b>		

GLAZING	Outer Cover	Inner Cover
<b>Material:</b>	Glass sheet	None
<b>Surface Characteristics:</b>		
<b>Thickness:</b>	1.8 mm	N/A
<b>Transmissivity:</b>		
<b>Gross Tube Length (uninstalled):</b>	2.095 m	
<b>Diameter:</b>	0.056 m	
<b>Tube Glazing to Header Enclosure Seal:</b>	EPDM gasket	
<b>Reflector Shape:</b>		<b>Reflector Material:</b>



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ABSORBER					
Header Material:		Header OD:		Header Wall:	
Riser Tube Material:	Copper	Riser Tube OD:		Riser Tube Wall Thickness:	
Fin Material:		Fin Thickness:	0.12 mm		
Flow Pattern:		Number of Flow Tubes / Heat Pipes:	20	Tube / Heat Pipe Spacing:	
Number of absorber tubes:	20	Flow Tube to Fin Bond:		Length of Flow Path:	2.10 m
Length of Flow Path:	2.10 m	Riser to Fin/Plate Bond:			

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

Power Output per Collector(W) [ Ti-Ta, G = 1000 W/m² ]				
0	10	30	50	70

PRESSURE DROP				
Flow	ΔP		Flow	ΔP
ml/s	Pa		gpm	in H <sub>2</sub> O
20			0.32	
50			0.79	
80			1.27	



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