



SOLAR RATING & CERTIFICATION CORPORATION

CERTIFIED SOLAR COLLECTOR

SUPPLIER:
Kingspan Environmental Ltd.
 180 Gilford Road
 Portadown, CO. ARMAGH BT63 5LF United Kingdom (UK)
 www.kingspanenviro.com

BRAND: Varisol
 MODEL: Varisol DF
 COLLECTOR TYPE: Tubular
 CERTIFICATION #: 10001724
 Original Certification: September 06, 2012
 Expiration Date: May 31, 2024

In Accordance with:
SRCC Standard 100-2010-08

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 ² .day)	Medium Radiation (4.7 kWh/m ² .day)	Low Radiation (3.1 kWh/m ² .day)	Climate ->	High Radiation (2000 Btu/ft ² .day)	Medium Radiation (1500 Btu/ft ² .day)	Low Radiation (1000 Btu/ft ² .day)
Category (Ti-Ta)				Category (Ti-Ta)			
A (-5 °C)	10.1	7.7	5.2	A (-9 °F)	34.5	26.1	17.7
B (5 °C)	9.6	7.1	4.6	B (9 °F)	32.7	24.3	15.9
C (20 °C)	8.7	6.3	3.8	C (36 °F)	29.8	21.3	13.0
D (50 °C)	7.1	4.7	2.3	D (90 °F)	24.3	16.0	7.9
E (80 °C)	5.4	3.1	1.0	E (144 °F)	18.3	10.7	3.4

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					
Gross Area:	2.793 m ²	30.06 ft ²	Dry Weight:	43 kg	95 lb
Net Aperture Area:	2.083 m ²	22.42 ft ²	Fluid Capacity:	5.9 liter	1.6 gal
Absorber Area:	1.980 m ²	21.31 ft ²	Test Pressure:	896 kPa	130 psi

TECHNICAL INFORMATION			Tested in accordance with: ISO 9806:1994		
ISO Efficiency Equation [NOTE: Based on gross area and (P)=Ti-Ta]					
SI UNITS:	$\eta = 0.599 - 1.74950(P/G) - 0.00440(P^2/G)$	Y Intercept:	0.599	Slope:	-1.994 W/m ² .°C
IP UNITS:	$\eta = 0.599 - 0.30834(P/G) - 0.00043(P^2/G)$	Y Intercept:	0.599	Slope:	-0.351 Btu/hr.ft ² .°F

Transverse Incident Angle Modifier								Longitudinal Incident Angle Modifier at 50°:		0.98
θ	10	20	30	40	50	60	70	Test Fluid:	Water	
K _{τα}	1.00	0.99	0.98	0.97	0.93	0.86	0.64	Test Mass Flow Rate:	0.0201 kg/(s m ²)	14.78 lb/(hr ft ²)

REMARKS:

Jen Higgins

Technical Director

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ADDITIONAL INFORMATION (click here to return to the rating page)			
Test Lab:	TÜV Rheinland PTL, LLC	Test Date:	May 31, 2012
Test Report Number:	RS2-TEU120119	Test Location:	outdoors

SOLAR COLLECTOR CONSTRUCTION DETAILS					
Header Enclosure:					
Gross Length:	1.946 m	Gross Width:	1.435 m	Gross Depth:	0.145 m
Tube Bank:					
Gross Length:	0.266 m	Gross Width:	1.435 m		

COLLECTOR MATERIALS					
Outer Cover:	Glass Tube	Enclosure back:	Aluminum	Back Insulation:	Vacuum,
Inner Cover:	None	Enclosure side:	Aluminum	Side Insulation:	,
Absorber Description:	Tubes connected to Fins		Flow Pattern:	Series/Meander	
Riser Tube:	Copper		Fin:	Copper	
Absorber Coating:	Selective		Tube to fin connection	Ultrasonic Weld	

GLAZING	Outer Cover	Inner Cover
Material:	Glass Tube	None
Surface Characteristics:	Smooth	
Thickness:	1.4 mm	N/A
Transmissivity:	High (equal to or greater than 90%)	
Gross Tube Length (uninstalled):	1.680 m	
Diameter:	0.065 m	
Tube Glazing to Header Enclosure Seal:	EPDM gasket	
Reflector Shape:		Reflector Material:



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ABSORBER					
Header Material:		Header OD:		Header Wall:	
Riser Tube Material:	Copper	Riser Tube OD:	11.9 mm	Riser Tube Wall Thickness:	0.8 mm
Fin Material:	Copper	Fin Thickness:	0.10 mm		
Flow Pattern:	Series/Meander	Number of Flow Tubes / Heat Pipes:	20	Tube / Heat Pipe Spacing:	70.4 mm
Number of absorber tubes:	20	Flow Tube to Fin Bond:	Ultrasonic Weld	Length of Flow Path:	
Length of Flow Path:		Riser to Fin/Plate Bond:	Ultrasonic Weld		

INSULATION:					
Location	Type	Thickness	Location	Type	Thickness
Back – Top Layer:	Vacuum	61.9 mm	Sides – Inner Layer:		
Back – Bottom Layer:			Sides – Outer Layer:		
Enclosure Fastening Methods:	Rivets		Header Enclosure:	Aluminum	

Power Output per Collector(W) [Ti-Ta, G = 1000 W/m²]				
0	10	30	50	70
1672	1622	1514	1397	1270



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PRESSURE DROP				
Flow	ΔP		Flow	ΔP
m/s	Pa		gpm	in H ₂ O
20	0		0.32	0.0
50	0		0.79	0.0
80	0		1.27	0.0



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