SOLAR RATING & CERTIFICATION CORPORATION™

An ICC Evaluation Service Program

OG-100 Solar Thermal Collector Certification

No./10002230

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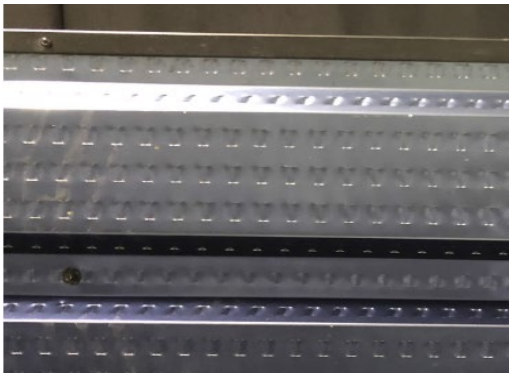
www.solar-rating.org | **(800) 423-6587** | **(562) 699-0543**

CERTIFICATION HOLDER:	**EVALUATION SUBJECT**	
Trigo Energies, Inc. 450 Avenue Deveault Louiseville, Québec J5V 3B2 Canada www.trigoenergies.com	**BRAND:**	Fresco
	MODEL:	SL
	TYPE:	Solar Air Heating Collector - Transpired, Unitary, Unglazed

PRODUCT CERTIFICAITON SYSTEM:

The ICC-SRCC OG-100 certification program includes evaluation and performance ratings for solar thermal collectors as established in the *ICC-SRCC Rules for Solar Heating & Cooling Product Listing Reports*. The program also includes periodic factory inspections and surveillance of the manufacturer's quality management system.

COMPLIANCE WITH THE FOLLOWING STANDARD(S): *ICC 901/SRCC 100 - 2020, Solar Thermal Collectors Standard*
THERMAL PERFORMANCE TEST STANDARD: ISO 9806-2017

COLLECTOR SPECIFICATIONS		
Collector Gross Area	6.38 m^2 (68.62 ft^2)	
Collector Gross Width	1.06 m (41.73 in)	
Collector Gross Length	6.02 m (237.01in)	
Empty Weight		
Air Inlet	Absorber panel perforations	
Air Outlet	(1) ø6" rear-facing duct connection	
Max. Design Air Flow Rate	2.7 scmm/m^2 (9.0 scfm/ft^2)	
Orientation	Landscape, 0° (horizontal) - 90° (vertical)	
Absorber Type	Perforated, profiled metal plate with multi-layer selective coating	
Absorber Material	Aluminum, 0.75 mm (0.030") thick	
Absorber Profile	BWS392 profile (shown right)	

IDENTIFICATION:

Certified collectors must be identified with the OG-100 certification mark below in accordance with the *Rules for Certification Mark and Certificate Use* and labeled in with the information below per *ICC 901/SRCC 100*:

ICC-SRCC RATED ™

1. Manufacturer's name and model number.
2. ICC-SRCC OG-100 collector certification number
3. Maximum operating temperature
4. Dry (empty) weight
5. Fluid volume
6. Compatible heat transfer fluids
7. Standard stagnation temperature
8. Year of manufacture and/or serial number.

THERMAL EFFICIENCY:

The efficiency of solar thermal collectors is determined using test methods set in ICC 901/SRCC 100, based on ISO 9806 procedures. Results are processed to provide unique coefficients for the efficiency equation below in SI and Imperial units. Instantaneous power output at normal solar incidence is given by the efficiency equation using coefficients corresponding to the airflow through the collector. Incident Angle Modifiers (IAMs) are also provided to indicate the change in output as the angle of solar irradiance changes on the collector plane.

SECOND ORDER THERMAL PERFORMANCE EQUATION

$$\dot{Q} = K_b A_g G''(\dot{\eta}_{0,hem} - b_u u)$$

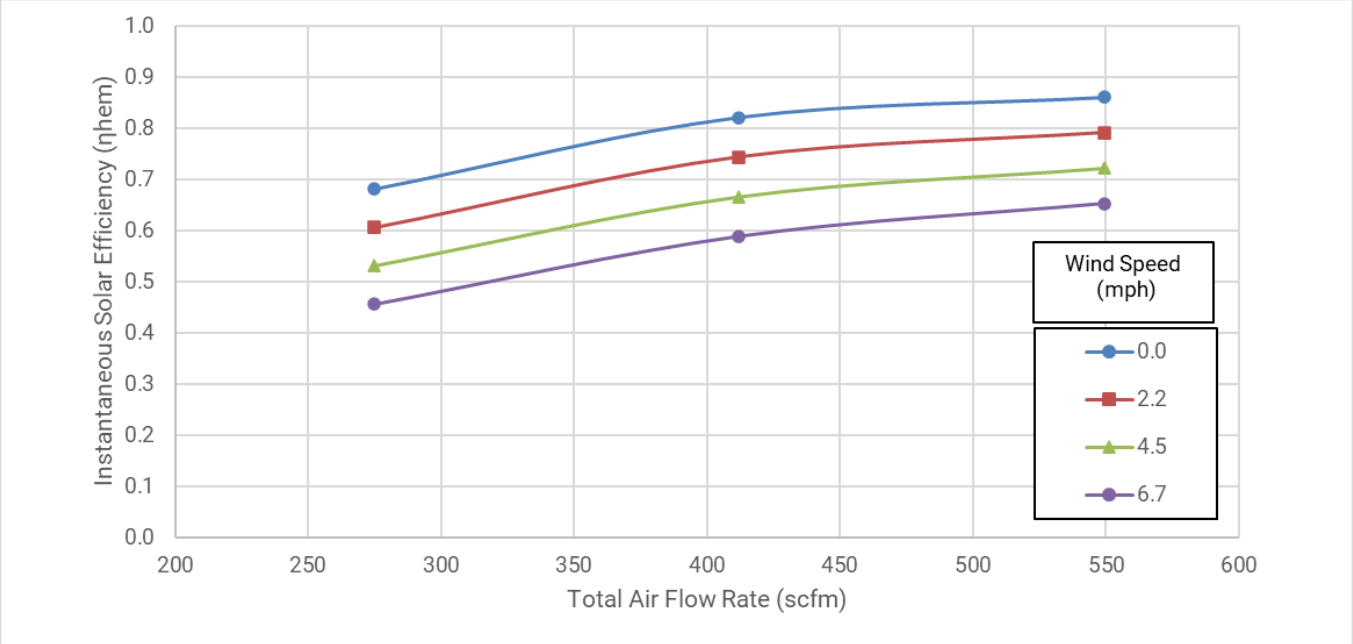
where $G'' = G_{hem} + \frac{\varepsilon}{\alpha}(E_L - \sigma\alpha T_a^4)$

$\dot{Q}$: Instantaneous power production in W or.
K_b: Incident angle modifier (1 for normal incidence)
A_g: Gross area of the collector in m^2 or ft^2
T_a: Temperature of the ambient air around the collector in °C or °F
G: Hemispherical solar irradiance in W/m^2
E_L: Longwave (infrared) irradiance in W/m^2 or
ε/α: Absorber emissivity/absorptance ratio.
σ: Stefan-Boltzmann constant $5.670374419 \times 10^{-8}$ $W/(m^2 \cdot K^4)$

SI UNITS			IP UNITS		
Air Flow Rate ($scmm/m^2$)	**$\eta_{0,hem}$**	**b_u (s/m)**	**Air Flow Rate ($scfm/ft^2$)**	**$\eta_{0,hem}$**	**b_u (s/ft)**
1.2	0.694	0.075	4.0	0.694	0.023
1.8	0.831	0.078	6.0	0.831	0.024
2.4	0.867	0.069	8.0	0.867	0.021

OG-100 SOLAR AIR HEATING COLLECTOR EFFICIENCY RATINGS (η_a)

Wind Speed[3] ▶		No Wind (0 m/s, 0 mph)	Low Wind (1.0 m/s, 2.2 mph)	Medium Wind (2.0 m/s, 4.5 mph)	High Wind (3.0 m/s, 6.7 mph)
Air Flow Rate					
4.0 $scfm/ft^2$	**275 scfm**	0.68	0.61	0.53	0.46
6.0 $scfm/ft^2$	**412 scfm**	0.82	0.74	0.67	0.59
8.0 $scfm/ft^2$	**549 scfm**	0.86	0.79	0.72	0.65



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LABORATORY TESTING SUMMARY

Laboratory testing of a collector sample is required for OG-100 certification to confirm that the collector passes qualification tests and to obtain performance results. These sections provide information on the sample tested for the purposes of OG-100 certification and the test conditions used. The test results measured for this sample were scaled to produce the performance ratings for the certified collector, which is a different size.

TESTING DETAILS		TEST SAMPLE		
Test Lab	Fraunhofer, ISE	**Gross Dimensions (LXWXH)**		2.44 m x 1.03 m x 25 cm (8.0 ft x 3.4 ft x 9.8 in)
Test Report Number	2020-02-k2	**Gross Area (A_g)**		2.56 m^2 (27.56 ft^2)
Test Report Date	July 21, 2020	**Aperture Area (A_a)**		2.43 m^2 (26.16 ft^2)
Test Standard	ISO 9806-2017	**Absorber**	**Material**	Aluminum
Testing Location	Indoor solar simulator		**Coating**	Multi-Layer Selective
Test Method	Steady-state		**Absorptivity**	0.935 (measured by lab)
Flow Rates	98, 320, 540 kg/s		**Emissivity**	0.025 (measured by lab)
Wind Speeds	0, 1.5, 3.0 m/s		**Porosity**	Not Reported
		Added Back/Side Insulation		2" rigid foam (R-16)

CONDITIONS:

1. Collector must be installed and operated in accordance with the manufacturer's published instructions and local codes and regulations.
2. Standard Performance Ratings have been calculated for the tested components using standardized conditions established by the test standards. Actual performance will vary based on the specific usage, installation, and local environmental conditions. Thermal performance values are valid only for collectors with the same absorber profile, porosity, and color and where a pressure drop across the collector is less than 25 Pa.
3. Wind impact on efficiency should not be extrapolated to large-scale systems due to differences in the ratio of wind-blown edge loss to thermal gain across the surface area between large and small collectors.
4. The collector listed in this ICC-SRCC OG-100 certification must be labeled with the information listed above in accordance with the *ICC-SRCC Rules for Mark and Certificate Use*.
5. OG-100 certifications do not include mounting hardware and fixtures.
6. Solar thermal collectors and mounting hardware and appurtenances must comply with all applicable local requirements for fire resistance. Solar thermal collectors must be mounted in accordance with the requirements of the collector and mounting hardware manufacturers to comply with local codes for structural loading for wind, seismic, snow and other loads.
7. Solar thermal collectors must be used with the heat transfer fluids listed in this document.
8. Solar thermal collector manufactured under a quality control program subject to periodic evaluation in accordance with the requirements of ICC-SRCC.
9. This document must be reproduced in its entirety.
10. Certification status should be confirmed on the ICC-SRCC Directory at www.solar-rating.org

Vincent Chui, S.E. VP of Evaluation Services

ACCREDITED
CERTIFICATE # 3299.01, 3299.03

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