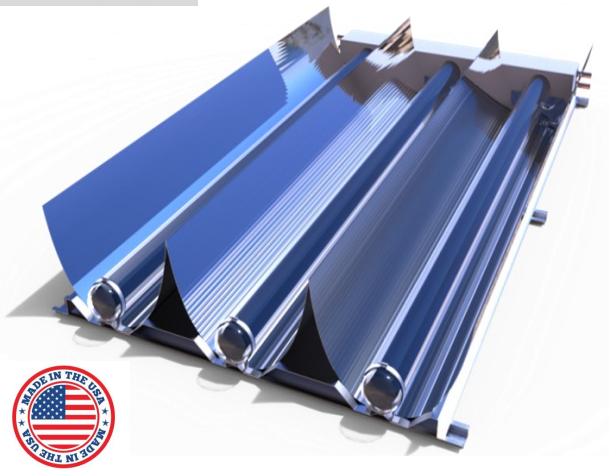
artic solar

The Cool Side of Solar Thermal

External Concentrating Parabolic Collector (XCPC)

The XCPC is a patented Non-Imaging Concentrating Collector (NICC).

XCPC –Emperor



Artic Solar's revolutionary high temperature solar heating collector solves the heating needs of the enormous, yet underserved, commercial and industrial heating market. This potentially multi-billion dollar market for high temperature Industrial Process Heat (IPH) includes such diverse applications as:

- Absorption chilling
- Food processing
- Pasteurization, and sterilization
- Thermo-chemical treatment
- Waste treatment
- Incineration
- Extraction processes for the oil and gas industry
- Metals preheating
- Drying
- Dehumidification
- Glass melting
- Mining

Our system can replace or reduce the burden on the 163,000 commercial/industrial boilers in the US, 50% of which have exceeded their useful lives.

The XCPC is a patented Non-Imaging Concentrating Collector (NICC)

Artic Solar's unique non-imaging optics of the east/west reflector is tuned to the collector to ensure maximum absorption of solar energy, maintaining peak energy generation even at an exceedingly wide angle of acceptance. This results in a concentration ratio of 1.4, meaning the absorber collects 40% more radiation without costly tracking systems.

The XCPC's simple and smart design, including such features as integrated fluid channels and an integrated mounting system, reduces component materials and costs. Altogether, our system provides the lowest levelized cost of energy (LCOE) in the solar energy industry today.

Our patented collector outpaces all other high temperature (>120°C/248°F) solar thermal technologies, i.e., trough and linear Fresnel.

The XCPC:

- Achieves temperatures in excess of 200°C at more than 50% efficiency (the percentage of incident solar radiation converted to useful heat energy) which current market incumbents cannot approach without tracking.
- Maintains efficiency even at high operating temperatures. Flat plate and other evacuated tube collectors exhibit good efficiency at lower temperatures but heat losses mean that their effectiveness falls off rapidly beginning at 80-100°C/176-212°F.
- Is a low-profile, roof or ground mountable system, combining aesthetics and practicability. The other technologies are high profile (up to 20ft) and thus require large land areas to be effective.
- Is non-tracking, i.e., has no moving parts. All other roof-top systems that can achieve these temperatures use tracking mechanisms that require expensive and ongoing maintenance.

The XCPC is ready for the commercial market and is made with pride in Jacksonville, FL, USA by a Veteran Owned Small Business.

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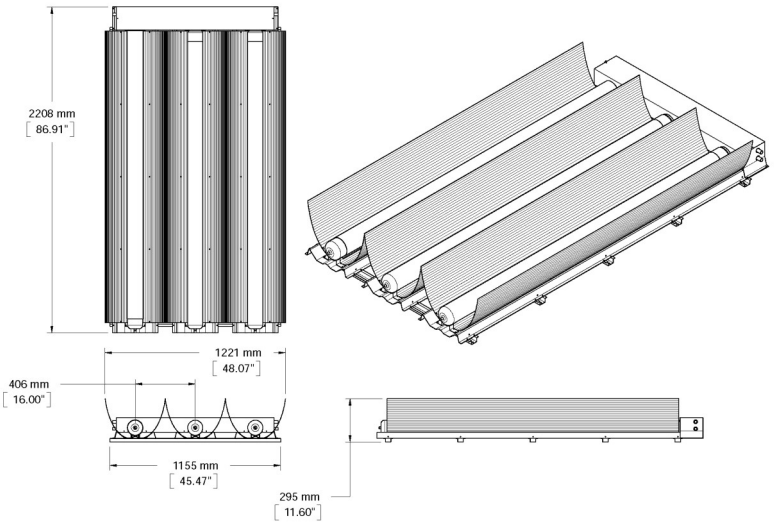
Specifications

Emperor LH-3-2M

Gross Area:		2.7 m^2 – 29.05 ft^2
Aperture Area:		2.41 m^2 – 25.92 ft^2
Length:		2208 mm – 86.91 Inches
Width:		1220.63 mm – 48 1/16th Inches
Height:		295 mm – 11.6 inches
Weight:	Dry	37.29kg – 82.2 lbs.
	Wet	39.29kg – 86.61lbs.
Fluid volume		2 liters – 0.53 gallons
Reflector Geometric Concentration Ratio:		1.49X
Outside Diameter of Absorber Riser Tube:		8mm outer diameter,
Thickness of Absorber Riser Tube:		0.75mm
Absorber Fin Thickness:		0.12mm thick copper fin
Absorber area:		(272mm X 1850mm)/1,000,000, 0.503m^2 absorber area per tube, X 3 = 1.51 m^2/collector
Flow Pattern:		Single U-bend flow tube per Absorber tube assembly
Number of Absorber Tube runs:		3 for each collector
Center to Center of riser tube runs:		406.4 mm – 16.0 inches
Number of risers:		3 per collector
Outside Diameter of absorber riser:		8mm
Thickness of absorber riser tube:		.75mm
Absorber to fin connection:		Continuous ultrasonic welding
Absorber fin thickness:		.12mm
Solar absorption, αsol:		0.95 ± 0.02
Thermal emission, ε100 °C:		0.05 ± 0.02
Recommended Flow Rate		0.87 gpm – 3.29liter/minute (1.0 gpm maximum)



U.S. Patent # 9,383,120 B1

Solar Thermal Concentrator Apparatus, System and Method