

Absolicon Production line of Solar Thermal Collector T160





Absolicon production line for Solar Thermal Collector T160. Härnösand, Sweden

Welcome to Absolicon!



Foreword The offer of Absolicon Solar Collector AB

The world is rapidly changing. On a political level, the Paris agreement have resulted in national plans that are now being implemented. Outside our cities, wind mills are being raised and crops and forests are utilized to make biofuels and to heat our buildings. Inside our cities, our cars are powered up in electrical charging stations and our rooftops are being covered with photovoltaics for electricity and solar collectors for hot tap water. In the industrial sector, our multinational companies are now setting up their own targets to save energy and severely decrease their carbon emissions.

At Absolicon, our vision is to be a leading part of the transition. Our company rests upon a long Swedish research tradition, where Solar research grew strong already in the 1970s. Our latest Solar Collector is the Absolicon T160, a glazed Parabolic Trough Collector designed for cheap mass production, longtime durability and deployment in the industrial and the district heating sectors.

The T160 is an industrial thermal Solar Collector, that can produce heat and steam up to temperatures of 160°C. The temperature range and efficiency profile of the Solar Collector makes it an excellent choice for district heating and heating of industrial processes. Despite the competitive cost, the T160 has a record high optical efficiency and excellent durability, allowing us to deliver Collectors with 25 years lifetime.

Together with the Solar Collector, Absolicon has developed a complete production line for our T160, with the capacity to produce one complete Solar Collector every 6 minutes. The target is to deploy production lines that supply a local market with high quality Solar Collectors, in order to minimize transports and to optimize the logistics economy of the Solar Collectors. The local production also allows local supply of material and with our streamlined Collector design, the manufacturing price can be optimized by adapting the material choices to the conditions of the local market.

From Absolicon, we now offer our production technology and Solar Collector system to new manufacturers all over the world. Together with Absolicon, you can now be a leader in the movement from fossil fuels to green energy.



Applications.

District heating - Hospital - Hotel - Pool Research - Residential - Industry

3008 m². Total installed area

1-9_{years.} Operation time

Worldwide Reference Installation Sites

Starting from 2008, Absolicon has installed thousands of square meters of our unique parabolic Solar Collector, at sites all around the world.

We have installed Solar Collectors for many different applications and with a range of different customer groups. We have shown that our Solar Collectors can be used in industrial applications, in large and small heating networks and for Solar cooling. During the years, our Solar Collectors have endured everything from record cold Swedish winters to scorching Indian summers.

Together, these installations represent the first steps towards the vision of Absolicon; to change the energy supply of the world.

We now welcome you to become a member of our ever-growing family.

See more information in Absolicon Thermal Installations Reference Catalogue 2019



T160 Solar Collector showcase and testing site. Härnösand, Sweden

T160 Solar Thermal Collector System

The T160 is a medium sized parabolic concentrator for heat production on temperatures up to 160 °C. The collector produces heat by concentrating the incoming sunlight onto a receiver tube, where the heat transfer fluid is circulated.

The T160 Solar Collectors are installed in units of four collectors, on special tracking beams. Each such unit is referred to as a Solar Collector Group. The groups are installed with a certain distance, to allow effective service and swift installation.

The tracking beams contain an active tracking system that allows the Solar Collectors to track the sun during normal operation. The tracking system also protects the Solar Collectors in case of overheating or severe weather.

See More information in Absolicon T160 Solar Thermal Collector Data Sheet

Efficiency and quality certificate



Solar Keymark Registration no: 011-7S2902C

The Absolicon T160 is the only solar concentrator in the world that has the Solar Keymark certification. The testing has been conducted at the prominent swiss testing institue SPF.

The Solar Keymark is the standard test for any Solar Thermal Collector and the certification is a proof of a reliability and high quality of the product.

Following the Solar Keymark procedure, the T160 has been tested according to the standards EN 12975-1:2010 and ISO 9806:2017.

The Solar Collector performance has been tested under varying outdoor conditions and the Solar Collector safety and durability is thoroughly investigated.



Key test results

Performance Parameters

ηο	0.76
κ _d	0.12

Incidence angle modifier in east-west orientation

θ	10	20	30	40	50	60	70	80	90
K _b (0,θ)	0.99	0.99	0.98	0.96	0.91	0.77	0.53	0.18	0

Mechanical load test:	No damage at ± 1000 PA/m2
Impact resistance test	No damage after impact in 25 mm ice ball test
High-wind protection	Collector system passed test. Active wind protection activated at 32 m/s.
Loss of Power test	Collector system passed test. UPS activated upon main power interruption.



Total final energy consumption 2014: 260 EJ, Source IEA / IRENA, graphic from Solar Payback - promoting the use of Solar Heat for Industrial Processes (SHIP)



Our partner, the german company Industrial Solar GmbH, develops, manufactures and installs industrial Solar Fresnel Collectors, with an operating temperature up to 400°C. Their product is perfectly suited to provide the industry with e.g. high pressure steam.

Find more about Industrial Solar www.industrial-solar.de 150-400 .с.

Medium-temp heat Distilling, nitrate melting, dyeing, compression.



With an operational temperature of up to 160°C, our Absolicon T160 can supply heat to a wide spectrum of processes and industrial segments. Our system can also be used as preheating stages to higher-temperature processes, further expanding the application range.

Find more about Absolicon Solar Collector AB www.absolicon.com

<150 °c.

Low-temp heat

Boiling, pasteurising, sterilising, cleaning, drying, washing, bleaching, steaming, pickling, cooking.



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T160 Production Line Semi-automatized, high-precision production

Absolicon has designed a Production Line for low cost mass production of the T160 Concentrating Solar Collector. The production process is designed in accordance with the philosophy of lean production, as formulated at the Swedish University of Linköping. The production capacity and production economy is optimized by producing the product in one continuous motion from material to finished product, with no storage of intermediates.

The production process is divided into 6 working stations, each equipped with equipment optimized for a specific subtask. A total number of 10 fixture wagons are rotated between the stations and in the wagons, the Solar Collector is built up step by step. All stations are operated with a 6 minute cycle time, resulting in a total production capacity of 100,000 m² of Solar Collectors annually, assuming 250 working days, 1 shift and a 93% uptime.

The production precision is integrated into the framework of both product design and production process. All manual tasks are designed for fail-proof operation and all components are designed for one-configuration mounting. To allow early detection of equipment deterioration, subcomponent flaws or operator errors, every Solar Collector undergoes comprehensive automatized optical testing, as an integrated part of the production process. The testing procedure also verifies that only perfect products are delivered to the final customer.



6 Min. One collector produced every six minutes



Operator Crew

The maximum production capacity is obtained with a total of 10 crew members.

Five skilled operators are needed to operate the work stations and an additional crew of 3 production assistants are needed for logistics assistance; to feed the line with raw materials and components. It is further recommended that one supervisor and one assistant are working to manage the operations. Tasks include supply chain management, logistics, maintenance management and continuous quality management. In the design of the production line, the workers' safety has been our most prioritized concern. All solutions and systems are designed to ensure the workers safety, in compliance with Swedish legislation.

Contact Absolicon for more information.

WORK STATION 1

Loading of shaping elements

In the first station, the operator starts with an empty Fixture Wagon. Back ribs are loaded into the Fixture Wagon. In parallel, a reflector sheet is automatically prepared in adjacent machinery.

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6 Min.

Cycle time



WORK STATION 2

Mounting of reflector In the second station, an industrial robot applies adhesive to the shaping elements. After gluing, the prepared reflector sheet is loaded into the collector.



Operator







WORK STATION 3

Mounting of receiver

In the third station, the selectively coated receiver tube is mounted in the Fixture Wagon, together with the receiver holder components.

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Operator









WORK STATION 4

Mounting of Glass

In the fourth station, an industrial robot applies adhesive to the contact area between the glass and reflector. The same robot then mounts the glass, all in the same cycle.











WORK STATION 5

Hardening of adhesive

The fifth station is a park of ovens, where the adhesive is hardened in a controlled environment, to attain full strength with complete replicability.



6 Min. Cycle time



WORK STATION 6

Unloading & Verification In the last station, the Solar Collector is unloaded from the Fixture Wagon. The Solar Collector is optically verified in the measuring equipment, before mounting of final protective elements.



Operator



6 Min.

Cycle time























Cooperation & Suppliers

Equipment	Standard supplier	
Mechanical design		
Bearings	SKF	
Linear guides	Festo	
Motors	SEW, Festo	
Pneumatic valves	Festo	
Actuators	Festo	
Glue and chemicals	Dow Corning, Loctite, 3M, Wacker	
Electric and Control design		
PLC	Siemens	
Circuit breaker	ABB	
Cabinets	Schneider electrics, Rittal	
Relays and contactors	Omron, Siemens	
Sensors	Ifm, Festo, Siemens, ABB	





ABB Robotics

6-axis industrial robots

Two work stations are equipped with ABB industrial robots, tasked with adhesive application and glass mounting. The industrial robot production ensures rapid production pace, perfect replicability and high quality of critical process steps. The robotic controls are completely integrated into the production line control system.





Siemens Automation

PLC systems, Human Machine Interfaces & Controllers

Siemens automation systems are used to control all aspect of the production line operation. Siemens PLC systems controls the production flow and machine movements and the operators communicate with the system through HMI units in the work stations. In the Siemens system, all relevant production parameters are also logged and displayed to the production supervision, to allow continuous quality and production management.

Premises Requirements

Plant

Production area	Free space min. 1 500 - 2 500m ²
Adjacent transport and storage space	2 m around (columns may be allowed), 150 $m^{\scriptscriptstyle 2}$
Industrial floor, floor loading capacity	1000 kg/m ²
Material Storage area	300 m ²
Product storing area	700 m ² (2 100 m ² solar collector)
Ceiling height	Minimum 5 m
Loading (if necessary for the producer)	Platform for 40" container (2 bays)
Electric and control connections	Cable ladders or cable racks in floor ducts

Air conditioning

Temperature	16°C – 25°C
Humidity	Relative humidity 20% - 60% percent year round
Air quality	Dust free air (Office quality) PM10 < 150 μ g/m ³

Machinery

Fork lift, electric	5 000 kg
Pallet jack lift, manual	2 x 2 500 kg

Main electric supply

Electric power	3 N, 380 V, 100 A
Mains voltage tolerance	Max ±10%
Mains frequency tolerance	Max ±0,5 Hz
Electrical energy 8 hour operation	100 kWh daily (estimated)

Compressed air supply

Air pressure	7 bars Dried
Air flow rate	1 500 liter/min
Air quality ISO 8573-1	4.4.1
Particle size	Max 0,015 mm
Water content	6 g/m ³
Oil concentration	Mac 0,01 mg/m ³

Are you interested in Solar energy application and want to know more about our technology? Do not hesitate to contact us!



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We speak your language!

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- Hello! Hej!
- Ciao!

iHola!

- 您好!
- مرحبا!
- Hallo!
- Salut!
- Szia!
- JZIA
- Bună!
- Cześć!



Production

Contact me for technical questions regarding production line design and production process.



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