CASSO-SOLAR TECHNOLOGIES

PRODUCT BULLETIN P104
Type Unitube

With new product and process technology under continuous development, production equipment is required to give precise and flexible control over production quality, while operating efficiently with minimum maintanence. With over 50 years of experience, Casso-Solar Technologies has been providing our customers the competitive edge.

SPECIAL FEATURES

VARIETY OF END TERMINALS
The Unitube Heater is available with a variety of end termination designs.

NO EXTERNAL REFLECTOR REQUIRED
The Unitube Heater has an internal reflector which does not require maintenance. The reflector has a groove to position the coil and is rigidized for extended life.

CUSTOM WATTAGE AND VOLTAGES
The Unitube® heater is available in watt densities up to 60 watts per lineal inch, and up to 600 volts.

ADAPTABILITY
Unitubes can be oriented across product flow or canted in direction of product flow, to eliminate the possibility of "striping" sensitive products.

COOLING AIR NOT REQUIRED
Terminal ends of the Unitubes do not require cooling air.

COMBINATION INFRARED/AIR SYSTEMS
Infrared used in combination with heated air can enhance some drying and curing processes.

NO REFLECTORS REQUIRED

Unlike conventional tubular quartz heaters, the Unitube directs over 90% of its radiant energy output to the product. A patented construction utilizes a specially shaped refractory, built into the quartz tube, eliminating the need for external

CONSERVES ENERGY

The Unitube® provides energy efficiencies of up to 80%, drastically reducing electrical power consumption overcompetitive tubular heaters.

Like all Casso Solar Technologies Infrared Heaters, the Unitube can be tuned to match the peak consumption point of the material being heated over the usable wavelength range of 2.4-6.0 microns, with emitter temperatures of up to 1800°F.

Unitubes® can be arranged to provide temperature profiling, or can be shut down to conserve energy with narrow width products.

FAST RESPONSE

Rapid warm-up is an important feature of the Unitube. Peak radiant output can be achieved in less than 15 seconds with complete saturation in under one minute. Complete cool down can be within seconds of a line stoppage with the aid of a purge blower, thus protecting valuable product.

STURDY CONSTRUCTION

A heavy walled, 5/8" diameter, quartz tube is used in the Unitube construction, making the heater one of the strongest of its kind.

EASY TO CONTROL

Through the use of fast cycle zero-crossing SCRs, or phase angle firing SCR power controllers for precision applications, the Unitube can maintain product temperature to within ± 2°F across the web. With both control options, a thermocouple located within a quartz thermowell can accurately measure the emitter temperature. Optional optical pyrometers can measure product temperature and automatically control the process.

DESIGN FLEXIBILITY

Unitubes can be mounted together to form banks; prewired into single or multiple zones. Supply and exhaust air systems can be provided for moisture removal or use in solvent environments.

Sales & Technical Information

1-845-354-2010

Fax: 1-845-547-0328
Website: www.cassosolartechnologies.com
E-mail: **sales@cassosolartechnologies.com**

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506 AIRPORT EXECUTIVE PARK, NANUET, NY 10954

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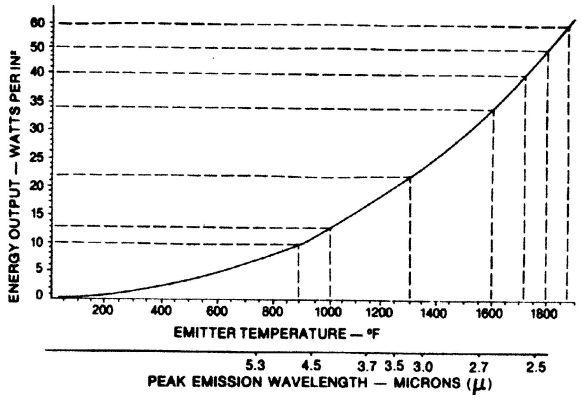
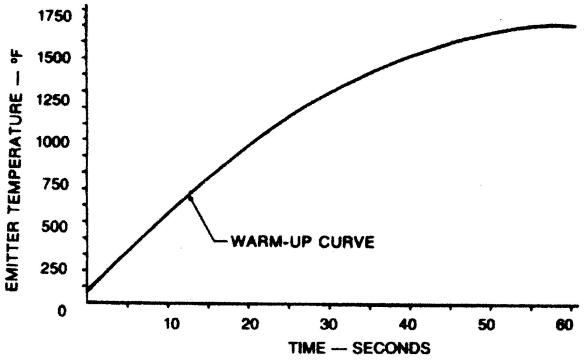


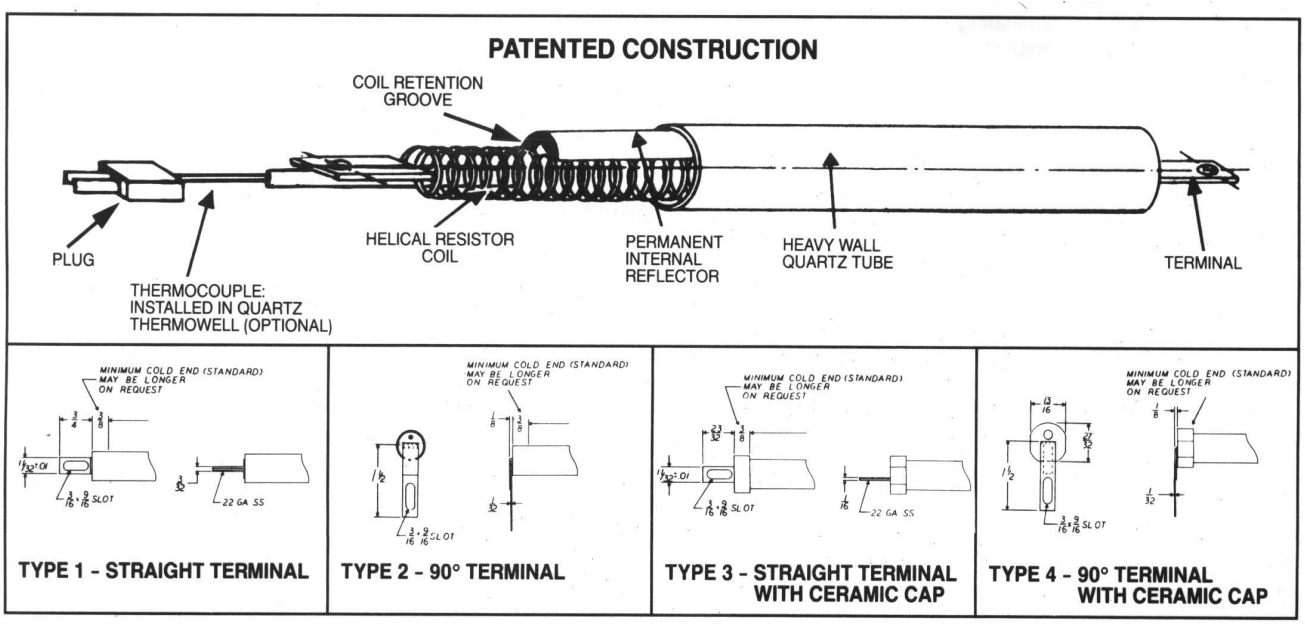
EMISSION OUTPUT CURVE

The emission output curve at the left shows emitter temperature versus watt density and the corresponding wavelength emitted for a specific emitter temperature. For example, an emitter temperature of 1300°F would correspond to a peak wavelength of 3.2 microns with a free air watt density of 22 watts per square inch. The key to efficiency is to select the emitter wavelength that best matches the peak absorbsion of the product to be processed.

WARM-UP CURVE

The warm-up curve at right shows the response time of the Unitube®, as measured by the thermocouple, from a cold start to a maximum temperature, for a 50 watt per lineal inch heater. Changes in temperature, or partial warm-up, will be along this characteristic curve.





SPECIFICATIONS:

WATT DENSITIES:	Up to 80 watts per lineal inch (32 watts per centimeter) generating watt densities up to 80 watts per square inch (12.6 watts/cm²).
VOLTAGES:	Up to 600 volts.
SIZES:	All heaters are custom built. Available heated lengths from 3" (8 cm) to 144" (365 cm). Nominal size range: 12" (31 cm) to 96" (244 cm). All tubes 5/8" diameter (1.6 cm). Clear quartz.
WAVELENGTH EMISSION:	2.5 - 6.0 microns, peak adjustable by emitter temperature.
TEMPERATURE RANGE:	Up to1800°F(980°C).

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506 Airport Executive Park, Nanuet, NY 10954 Tel: 1-845-354-2010 www.cassosolartechnologies.com