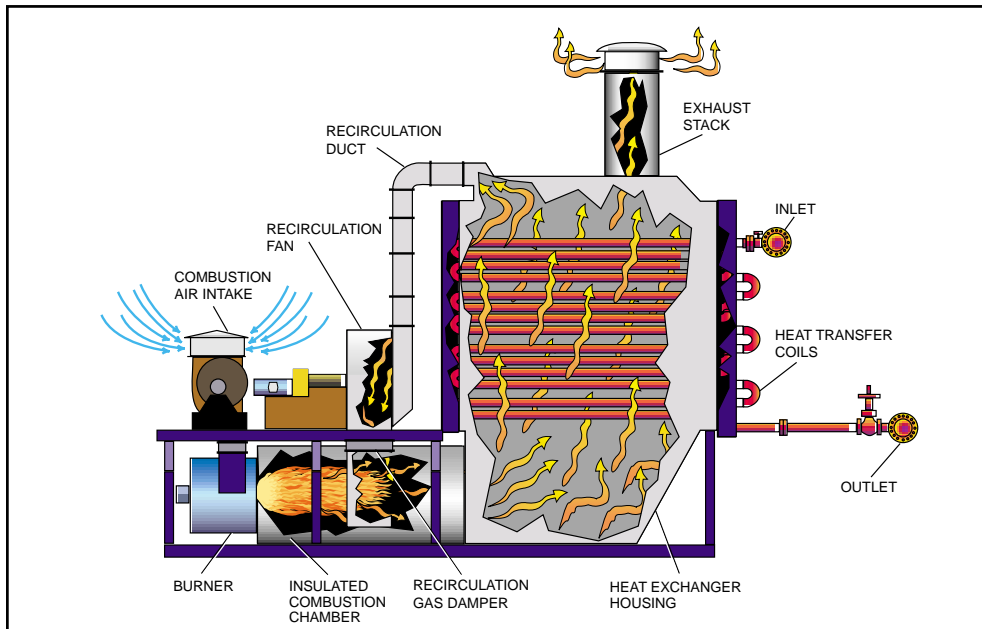


# HEATEC BULLETIN

Product news from Heatec Inc., an Astec Company 5200 Wilson Road, Chattanooga, TN 37410 Phones 423-821-5200 800-235-5200 www.Heatec.com



The product is heated as it flows through the heat transfer coils. The coils are heated by convection gases as they pass around the outer surfaces of the coils. The gases are recirculated to boost efficiency and to limit radiation from the burner flame.

## Heatec Convectec™ Heater Avoids High Film Temperatures

The Heatec Convectec™ heater is used for a wide variety of applications, especially for heating fluids highly sensitive to overheating. Film temperatures produced at the tube walls of the heat exchanger are precisely controlled by the all-convection design. The heater can heat fluid products without subjecting them to film temperatures more than 5 degrees F above their bulk temperature.

The Convectec heater is used in the petrochemical, chemical, automotive and manufacturing industries. It is used to heat water, gases, crude oil, thermal fluids, and viscous liquids. The heater is also used for heating cryogenic liquids such as LNG, liquid ammonia, and nitrogen. Capacities range from 3–125 million Btu/hr.

Heatec is currently building five Convectec heaters for use by Cabinda Gulf Oil Limited at their oil wells in Angola, South Africa. Heatec has supplied Cabinda with several Convectec heaters in recent years. The crude oil is piped directly from their production fields to the heaters and then to their refinery. The crude oil flows through the heater's heat-exchanger coils, which are heated exclusively by convection gases to avoid high film temperatures. Crude oil is highly sensitive to high film temperatures, which can be a problem with radiant energy produced by a burner flame. The heaters raise the temperature of the crude to about 120 degrees F thereby lowering its viscosity so it can be easily distributed within the refinery. The crude flows through each heater at a rate of approximately 3,000 gpm.

The Convectec heater uses a burner that fires into an insulated combustion chamber. The burner flame extends only a limited distance into the chamber. The hot gases produced by the burner flame travel out of the combustion chamber into the bottom of the heat exchanger housing, in a zone where there are no heat transfer coils. (The heat transfer coils are in the upper portion of the housing where they are not subject to radiant energy of the flame.)

### One of the Convectec heaters that Heatec supplied to Cabinda



The gases are diverted upwards through the top section of the heat exchanger housing, which contains heat transfer coils. The gases pass around heat-transfer coils and heat the coils by convection.

A portion of the gases exits the heater through the exhaust stack. And a set amount of the gases is recirculated back to the combustion chamber where they are mixed with the freshly heated gases being produced by the flame.

Recirculating the gases more than doubles the efficiency of the heater and significantly reduces the amount of  $\text{NO}_x$  that exits the exhaust stack. Thermal efficiencies up to 90 percent (LHV) can be achieved. Moreover, the amount of gases recirculated limits the temperature and amount of radiation produced by the burner.



**HEATEC**

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