ECLIPSE

RADIANT TUBE RECUPERATIVE SYSTEMS
Up to 65% of the heat supplied to many gas furnaces is wasted through the exhaust stack. Why? Because much of the energy released by the burning fuel heats inert elements in the combustion air instead of the work load.

Eclipse Therm-Thief recuperative systems for radiant tube furnaces let you steal much of this energy back by transferring waste exhaust heat to the burner air supply. Preheating the combustion air in this way allows the process to continue with a lower fuel input. The nomogram shows expected fuel savings for various exhaust and preheat temperatures.

Example: 900°F preheat from 1900°F flue gives 30% fuel savings.

Eclipse Series 63 TFB burners are sealed nozzle-mixing burners developed especially for radiant tube recuperative systems. They are designed to provide uniform heat release down the entire length of the firing tube, eliminating hot spots and ensuring long radiant tube life. Two models are available: the 63 TFB-L for firing "U" or Trident tubes at inputs up to 200,000 Btu/Hr; and the 63 TFB-H for "W" tubes or any tube requiring more than 200,000 Btu/Hr. When used to replace older, inefficient burners, the 63 TFB burners can provide an additional 8% to 10% fuel savings to a recuperative system.

NEW OR RETROFIT Therm-Thief Recuperative Systems can be easily installed in either new or existing furnaces. In most cases they require no special brickwork, radiant tube, or exhaust modifications. Multi-tube furnaces need not be shut down during retrofit; only the tube being fitted must be turned off. In-house maintenance staff can usually install a Therm-Thief burner/recuperator set in as little as two hours. Furnaces readily equipped with Therm-Thief products include:

- Atmosphere Furnace Co.
- Beevermatic
- Dow
- Drever
- Electric Furnace Co.
- Flinn & Dreffein
- Hevi-Duty (currently Lindberg)
- Holcroft Batch & Continuous
- Ipsen
- Lee Wilson
- Lindberg (Unit of General Signal)
- Salem
- Selas (formerly Pacific Scientific)
- Standard Fuel Engineering Co.
- Sunbeam Equipment
- Surface Combustion

The Therm-Thief Bayonet-Ultra is a recuperator designed to fit into the exhaust leg of "U", "O", "W", or Trident type radiant tubes. The Ultra has several heat transfer tubes to provide as large a surface area as possible for a given radiant tube diameter. Preheat temperatures from this recuperator typically range from 700° to 1000°F. Maximum temperature of the radiant tube exhaust flowing through the recuperator is 2100°F.

Bayonet-Ultra recuperators are available in four sizes to fit radiant tubes with inside diameters from 3" to 8". Each size can be ordered as a standard model for maximum efficiency, or as a low pressure drop model with half the air pressure drop but lower efficiency. In addition, a single-tube version of the Bayonet recuperator can be supplied for applications that have dirty, corrosive exhaust gases or very low pressure drop requirements.
**FEATURES**
- Combustion air temperatures to 950°F.
- Easy installation and burner accessibility
- Exceptional flame stability
- Low air and gas pressure requirements
- Good flame visibility
- Minimum high fire excess air
- High heat transfer at low noise levels
- Excellent radiant tube temperature uniformity
- Direct spark ignition

**63 TFB-L**
- Single size for all diameter radiant tubes
- Maximum input 200,000 Btu/Hr.
- Minimum input 5,000 Btu/Hr.
- For straight, "U", and Trident type tubes

**63 TFB-H**
- Adjustable flame length
- Nozzle size tailored to radiant tube diameter
- Maximum input 200,000 to 600,000 Btu/Hr.
- Minimum input 20,000 Btu/Hr.
- For any type of radiant tube

**FEATURES**
- Choice of pressure drops
- Combustion air circulates through the inlet/outlet housing, cooling external surfaces and increasing preheated air temperatures
- Insulated exhaust extension reduces heat losses
- No expansion joints to fail
- Simple installation and maintenance
- Special alloy construction available

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The Auto-Recupe contains a burner and recuperator coaxially mounted in a single-ended radiant tube. Preheat temperatures to the burner typically range from 850° to 1100°F, providing fuel savings from 35% to 55%. When used to replace atmospheric burners, an additional 8% to 10% fuel savings can be expected. Auto-Recupe tubes are available with 3” through 7-1/2” radiant tube diameters.

**FEATURES**
- Counterflow air/exhaust for maximum heat transfer
- No hot air ductwork and related heat losses
- Recuperative section is located within the furnace wall, minimizing heat loss
- Uniform, progressive combustion down the tube minimizes hot spots
- Sandwich type flange design accommodates thermal expansion, eliminates bolt hole alignment problems
- Integral orifice meter provides airflow measurement for easy set-up and monitoring
- Simple installation and maintenance