

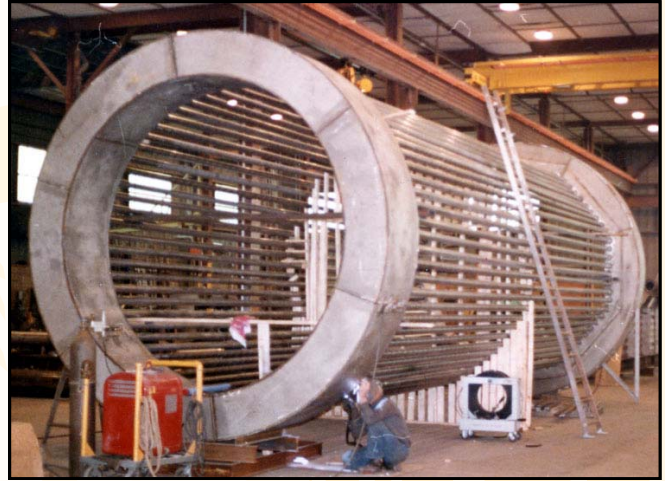
RADIATION RECUPERATORS

RADIATION RECUPERATORS

Radiation recuperators are high temperature heat exchangers that utilize radiation heat transfer to preheat combustion air or gas for the purpose of saving fuel. These recuperators accommodate very high-temperature, particulate-laden flue gas streams while yielding a negligible flue gas pressure drop. Thermal Transfer Corporation manufactures two (2) types of radiation recuperators - the TURA (TUbular RAdition) type and the stack or double shell type.

TURA TYPE DESIGN

The TURA recuperator is most widely used on larger direct fired glass melters with firing rates typically between 15 MM.BTU/Hr. and 60 MM.BTU/Hr. The TURA design incorporates a cylindrical alloy steel tube bundle suspended within a refractory-lined outer shell, operating with waste gas temperatures up to 2600°F and generating air preheat temperatures as high as 1500°F. TURA recuperators have proven reliable under adverse corrosion and fouling conditions often present in these larger melting furnaces.



STACK TYPE DESIGN

The stack type recuperator is commonly used on smaller direct fired glass melters with firing rates typically between 0.5 MM.BTU/Hr. and 20 MM.BTU/Hr. This design is comprised of concentric, cylindrical metallic inner and outer shells traditionally operating with waste gas temperatures up to 2300°F and combustion air temperatures up to 1000°F. However, recent advances in design and materials technology now permit higher temperature operation with the stack recuperator design.

For the most demanding applications, both TURA and stack recuperators are used in combination to achieve very high combustion air preheat temperatures.



THERMAL TRANSFER CORPORATION

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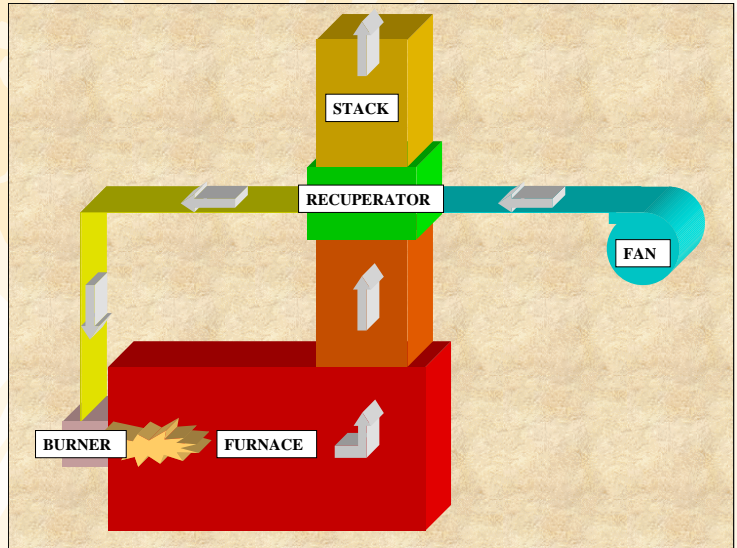
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RADIATION RECUPERATORS

FUEL SAVINGS

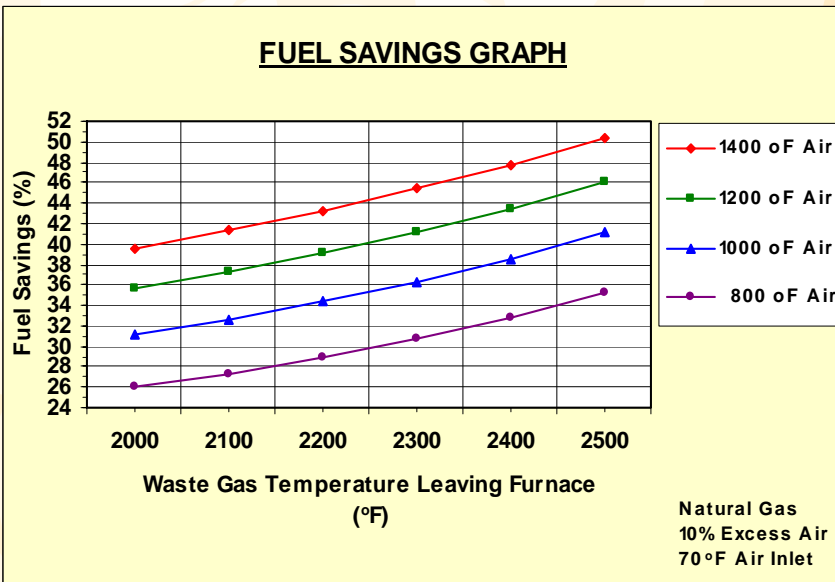
For very high temperature industrial furnaces, such as glass melting furnaces, recuperators are valuable tools for increasing furnace efficiency. Up to seventy-five percent (75%) of the available energy in the fuel may be carried out of the furnace in the waste gas, therefore, heat recovery is essential for fuel conservation and economical operation. With fuel costs rising, recuperation is certain to play a vital role in the future.



Radiation recuperators save fuel by recovering heat from the hot waste gas exiting a furnace and transferring it to the combustion air feeding the burners. Fuel usage can be

reduced by an average of thirty-five percent (35%), and in many cases, greater savings are realized. Waste gas temperatures entering convection recuperators are usually in the 2000°F to 2500°F range, and combustion air preheat temperatures are usually in the 800°F to 1400°F range.

FUEL SAVINGS GRAPH



APPLICATIONS

Glass melting furnaces
Fiberglass furnaces
Glass day tanks
Glass continuous tanks
Glass pot furnaces
Glass refiners

Glass forehearths
Ceramic and refractory kilns
Steel forge furnaces
Steel heat treat furnaces
Aluminum die cast furnaces
Calciners



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