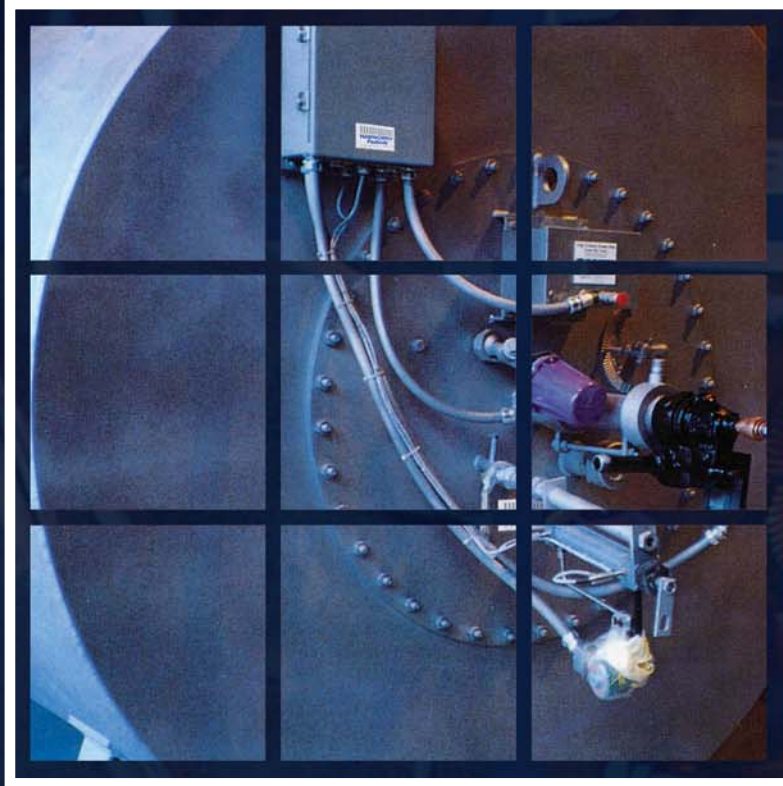


P R O V E N   C O M B U S T I O N   S O L U T I O N S

# Direct Fired Air Heaters



**Industrial Steam  
Generation**



**Utility & Power  
Generation**



**HAMWORTHY  
Peabody**

C O M B U S T I O N

# PROVEN COMBUSTION SOLUTIONS

## DIRECT FIRED AIR HEATERS



Hamworthy Peabody Combustion air heaters have been providing process industries with a source of dependable, economical and environmentally clean process heat for more than 50 years. Each air heater is custom designed to individual requirements and can be supplied as an individual component or as a complete system.

### Wherever heated air is needed

Efficient Hamworthy Peabody air heaters are used in a wide variety of process industries including paper mills, refineries, starch and cement plants, chemical and pharmaceutical processes, and the food industry. They are employed for start-up heating, spray drying, liquor concentration, rotary drying, catalyst regeneration,

pulverized coal drying, fluidized bed drying and start-up, acid concentration, catalytic cracking processing, and many other applications.

### To meet your process requirements

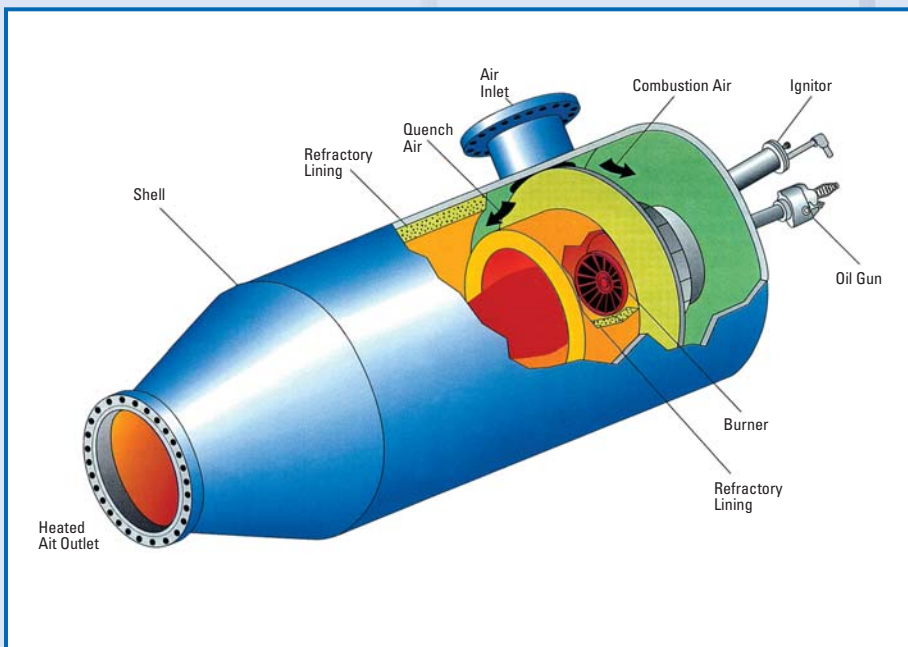
Hamworthy Peabody Combustion manufactures several types of direct-fired air heaters. Selection depends on process requirements such as throughput, temperature, materials being handled, and response to changing process and fuel needs. Less commonly used indirect-fired air heaters are available when contact with products of combustion must be avoided. Used primarily in the food and pharmaceutical industries, indirect-fired units feature air-to-air heat exchangers.

### There's a Hamworthy Peabody air heater for the job

Double shell air heaters with single or double air inlets are most commonly used for conventional applications such as rotary and spray drying. They provide better flame control and respond quickly when outlet temperatures need to be changed. In addition, the units are able to maintain lower outlet temperatures. In the single-inlet design the air flow is split into combustion and quench streams. Quench air cools the outer shell and makes material selection less critical. At high heat output, double-inlet units may be more economical to operate because of quench air fan efficiencies.

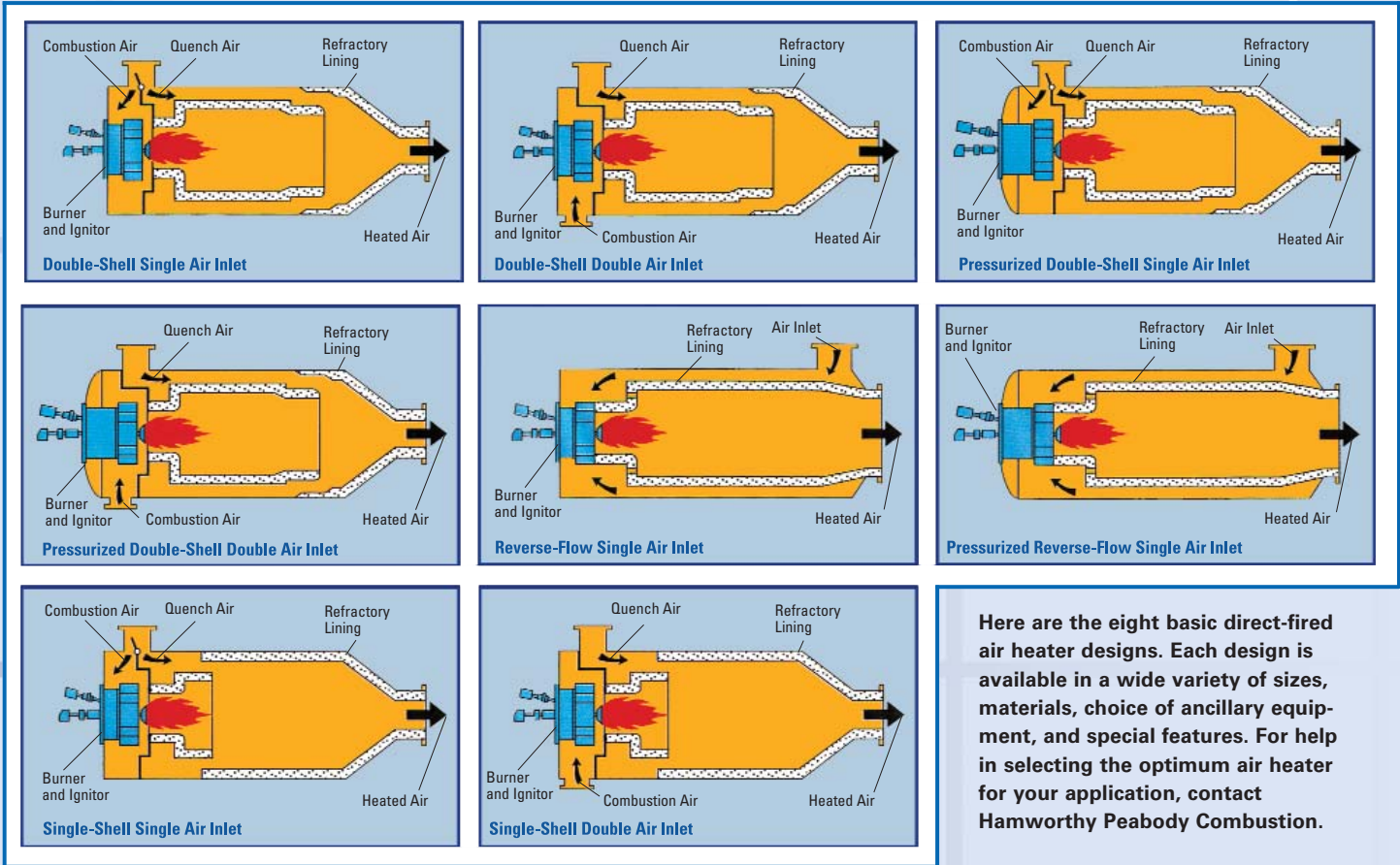
Pressurized designs are required for many processes and are fabricated to meet ASME and other codes. Reverse-flow air heaters offer higher thermal efficiencies. Countercurrent air flow through the unit preheats combustion air and also provides furnace cooling. They can be designed to accommodate hot erosive and corrosive recycle gases.

Single-shell air heaters often are less expensive to construct and provide higher and more uniform temperatures. However, they require additional refractory to keep skin temperatures within OSHA requirements.



*Cutaway view of basic air heater design shows combustion and quench air inlet and diverter, position of oil gun and ignition equipment, single-shell design with refractory lining, and heated air outlet. Air heaters can be installed in all positions including up-, down- and horizontal-firing.*

## A Heater For Every Purpose



Here are the eight basic direct-fired air heater designs. Each design is available in a wide variety of sizes, materials, choice of ancillary equipment, and special features. For help in selecting the optimum air heater for your application, contact Hamworthy Peabody Combustion.

### Features & Benefits

- Complete line of balanced and pressurized, single and double wall, straight and reverse flow, direct-fired air heaters.
- Range of capacities from 5 to 200 MM BTU/hr standard models plus special designs such as coal-fired, high temperature tandem design, indirect-fired, and special construction materials.
- High efficiency, low NO<sub>x</sub> and low excess air designs are available.
- Complete systems include air heater, burners, ignitors, flame detectors, fuel handling equipment, FD and quench fans, and burner management.

- Equipment is designed to meet local and insurance codes including IRI and NFPA standards and all pressurized units conform to ASME specifications.

- Air heaters are available to burn almost any fuel or combination of fuels.

### Typical Specifications of Air Heaters

Heat Output (MM BTU/hr)	Airflow (SCFH)	Diameter (feet-inches)	Length (feet-inches)
5	70,000	4-0	9-0
25	350,000	6-1	16-0
50	700,000	7-5	18-2
100	1,400,000	8-11	22-10
150	2,100,000	10-1	26-3
200	2,800,000	11-0	28-2

Hamworthy Peabody Combustion makes 14 standard direct-fired air heaters ranging from 5 to 200 MM BTU/hr and many special designs, here are some typical specifications.

## Special Designs

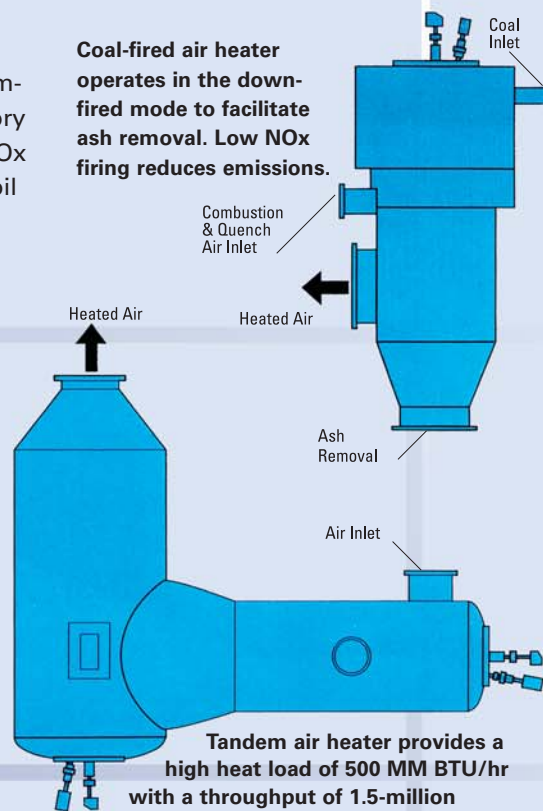
In addition to standard air heater designs, Hamworthy Peabody Combustion can fabricate special units to meet your specific requirements. The use of temperature- and corrosion-resistant materials, burners capable of firing almost any fuel and indirect-fired air heaters for processing materials that must not be contaminated with combustion products are a few examples of special designs. Two recent Hamworthy Peabody Combustion projects include a low NOx coal-fired unit and a high temperature, high-throughput tandem air heater.

In the coal-fired heater, total air enters through a single inlet and travels up to the windbox through an annulus along the outer wall to help cool the inner

furnace wall. Bustles and registers apportion the air flow to control combustion, protect the furnace refractory and temper the exit gas. The low NOx multi-fuel tertiary burner can burn oil and gas as well as pulverized coal. Ash removal is facilitated by using a down-firing configuration.

The tandem air heater was designed for use at a continuous process gasoline production facility in Saudi Arabia. It uses two pressurized single-shell, single-inlet units firing natural gas or high-hydrogen refinery gas to produce temperatures as high as 1300° F at air pressures up to 12.8 psig. The series arrangement is a unique solution to high heat and high throughput requirements.

**Coal-fired air heater operates in the down-fired mode to facilitate ash removal. Low NOx firing reduces emissions.**



**Tandem air heater provides a high heat load of 500 MM BTU/hr with a throughput of 1.5-million pounds/hr for a MTBE process.**

## Proven Combustion Solutions Worldwide



USA



UK



Brazil



Canada



China



France



Germany



India



Italy



Japan



Mexico



Netherlands



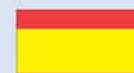
Poland



Singapore



South Korea



Spain

For further information or to obtain a quotation dealing with any Hamworthy Peabody product, contact:

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