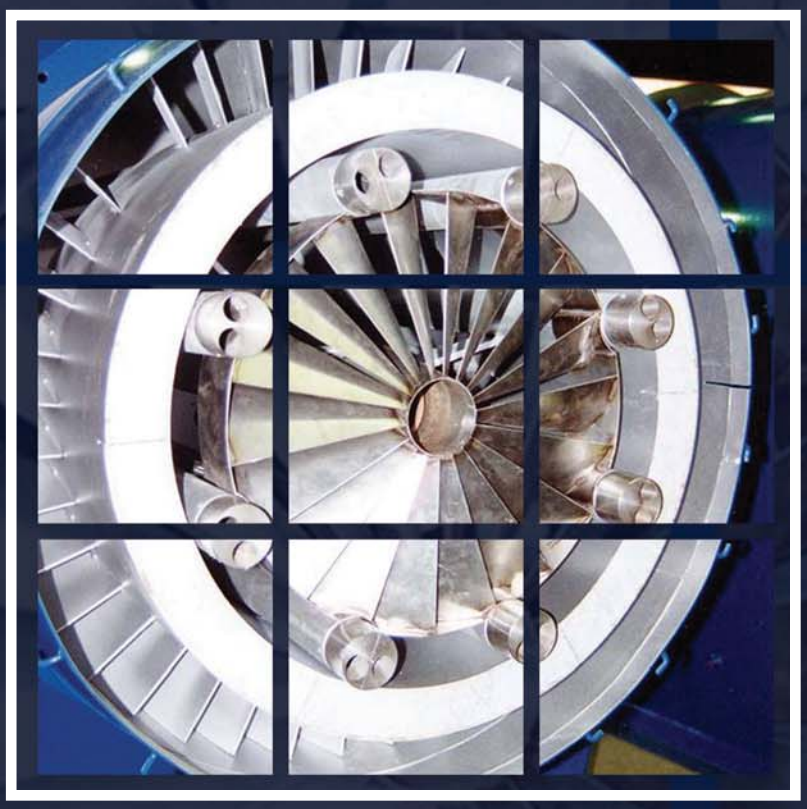
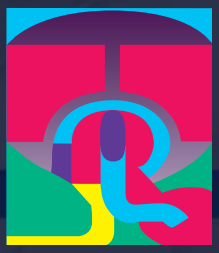
PROVEN COMBUSTION SOLUTIONS

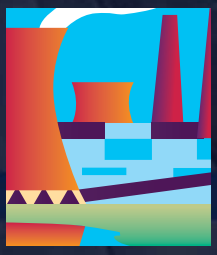
Low-NOx Oil & Gas Burner

Model MSC





Industrial Steam Generation



Utility & Power Generation

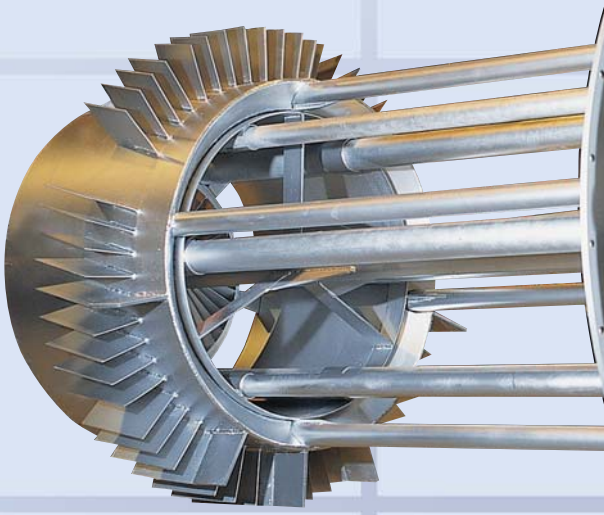
HAMWORTHY
Peabody
COMBUSTION

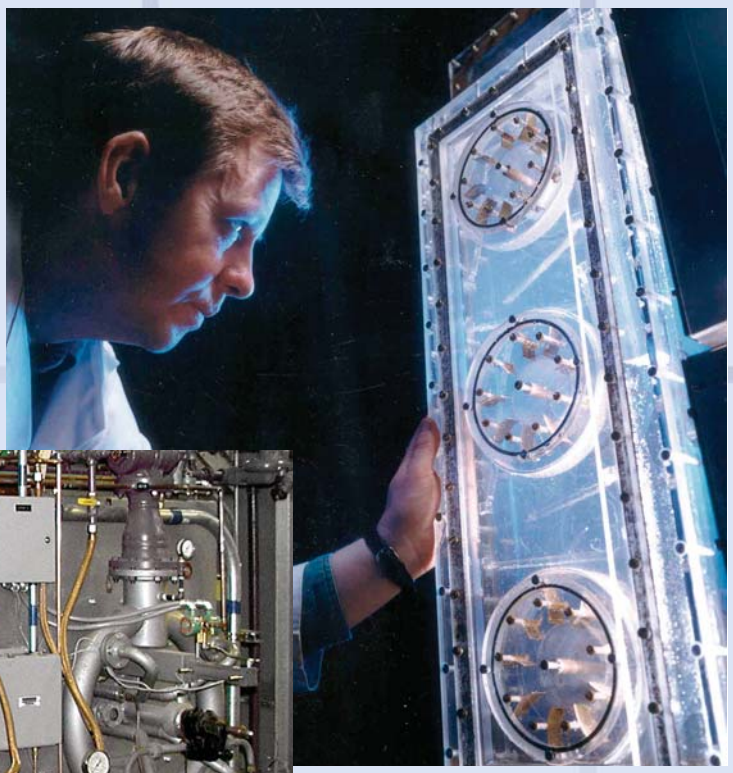
PROVEN COMBUSTION SOLUTIONS

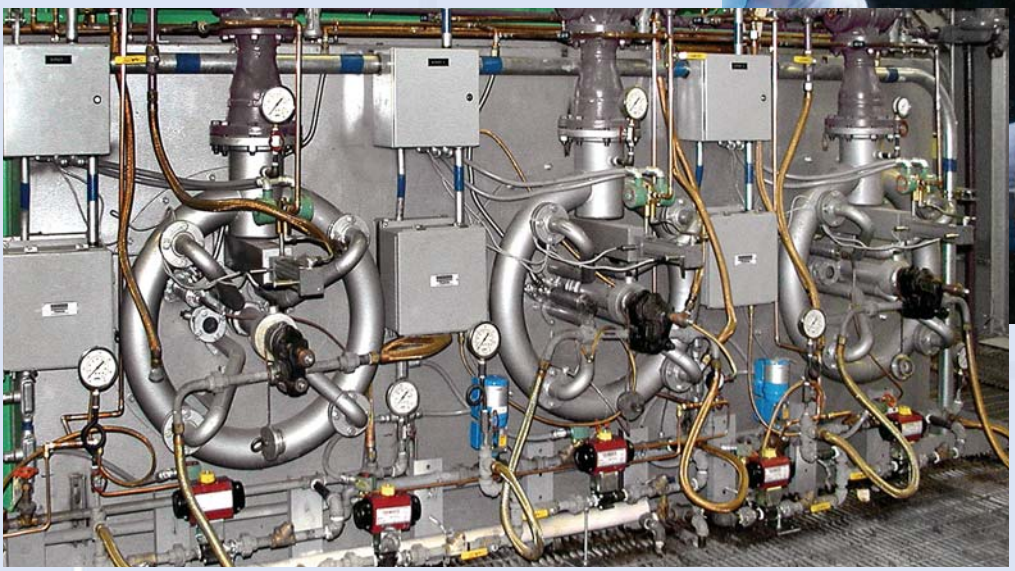
MODEL MSC LOW-NOx OIL & GAS BURNER

Multi-Stage Combustion (MSC) techniques coupled with precision flame shaping offer these performance benefits for new or retrofit applications:

- Up to 80% NOx reduction including both thermal and fuel NOx
- Ten percent or less excess air operation and significantly reduced particulate formation
- Meets required NOx reduction while maintaining acceptable CO levels
- Precise flame fit capability with excellent stability
- Available with 12 to 52 inch throat diameters and firing capacities from 20 to more than 400 million BTU/hour
- Oil unit and air slide can be pneumatically controlled for remote operation
- Adjustable gas spud geometry available
- Suitable for use with or without flue gas recirculation
- Available with water or steam injection







The Hamworthy Peabody Multi-Stage Combustion (MSC) burner achieves NOx emission compliance without compromising efficiency or other emission performance.

The flexible, high efficiency burner can be retrofitted to most existing boiler designs, and is also ideal for use with new field-erected or package boilers.

Low CO levels with full load excess air values of less than 10% are typical when firing either oil or gas. This performance is coupled with outstanding flame stability characteristics resulting in efficient, reliable and safe operation.

How It Works

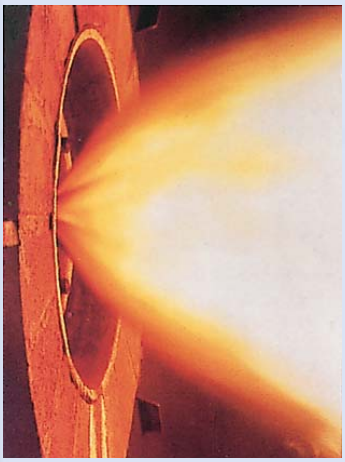
Combustion air and fuel are staged to produce rich, lean flame zones thus inhibiting NOx formation. Single source combustion air is divided into two streams. Primary air passes through the center of the flow divider and air diffuser. Secondary air flows in an annular section via swirl vanes, and discharges through a convergent/divergent throat.

Gas jets and fuel oil atomizers are designed to further enhance combustion staging as well as produce the precision flame shaping essential for CO and particulate performance.

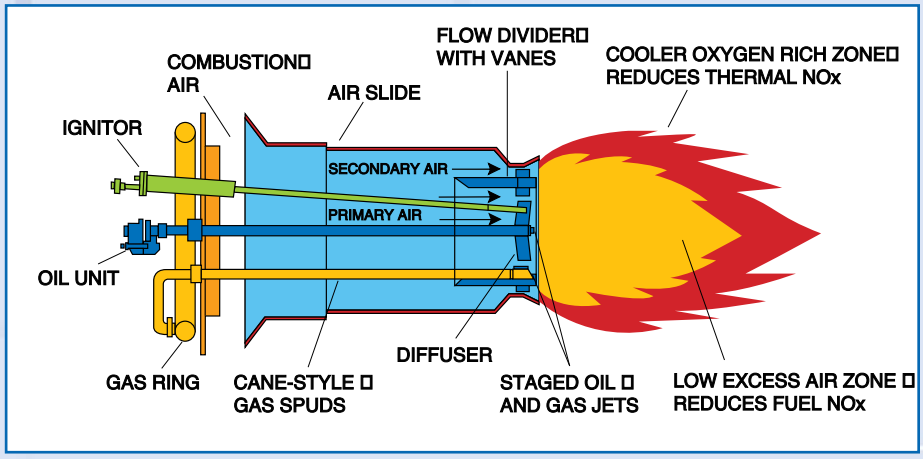
The above techniques result in low excess air in the primary combustion zone limiting the oxygen available to combine with nitrogen in the fuel. In the second combustion stage, additional air is introduced forming a cooler oxygen-rich zone where combustion is completed and the formation of thermal NOx is limited.

Efficient, Safe Combustion

The blending of these technologies within the Hamworthy Peabody MSC burner results in reduced NOx formation without compromising other performance criteria. Exceptional flame stability, even when using flue gas recirculation, ensures that operational safety is not compromised.



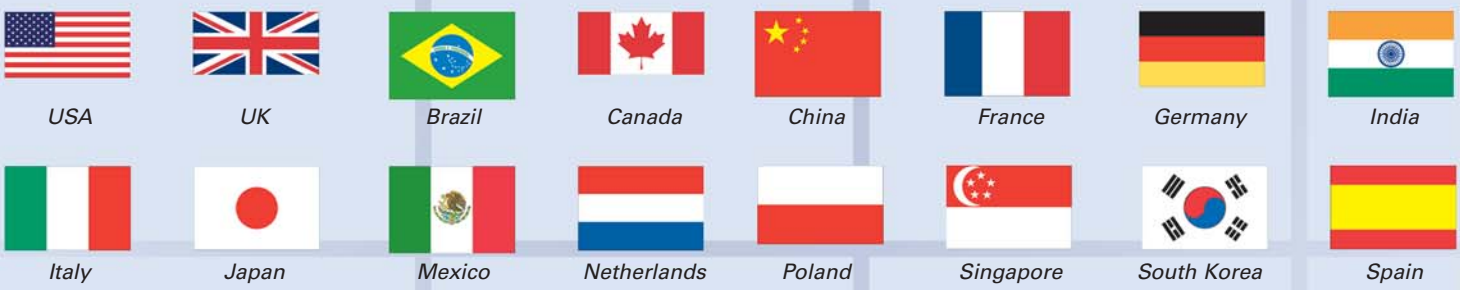
Operation of Low-NOx MSC Burner



Specifications of Model MSC Low-NOx Burner

Throat diameter:	12 to 52 inches
Firing rate:	20 to >400 million BTU/hr
NOx reduction:	To 60%, up to 80% with flue gas recirculation
CO Emissions:	<100 ppm corrected to 3% O_2
Excess air operation:	10% or less typical firing oil or gas
Fuels fired:	Light and heavy oil Natural gas and propane Waste gases
Oil atomization:	Choice of steam, air, or mechanical
Gas unit:	Internal plenum or external gas ring with gas spuds
Register:	Multiple concentric annular flow and axial swirl flame stabilization
Ignitor:	Hamworthy Peabody gas-electric, oil-electric, or direct spark-high energy
Auxiliary ports:	Flame scanner, sight port
Turndown ratio:	Up to 10:1
Combustion air:	Ambient to 700°F
Fuel pressure:	Oil, 150 psig typical Gas, 8 psig typical

Proven Combustion Solutions *Worldwide*



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

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