

DNS Burners

Heat Uniformity, Stability

A proven way to improve the performance of existing furnaces

- Complete, stable combustion within burner cup.
- Rapid, highly efficient heat transfer to the workpiece.
- Uniform heating of the workpiece.
- Excellent turndown characteristics.
- Immediate response to control changes.
- Significant reduction of flame impingement, hot spots, scaling, and decarburization.
- Furnace can be smaller, less costly.

Increase efficiency, production rates, product quality. Replace outdated combustion equipment in your existing furnaces with Selas DNS Duradiant Nozzle-Mix Gas Burners.

Selas DNS Duradiant burners differ in operation and performance from conventional open-flame burners. The cup-like design and the manner in which the burning air/gas mixture sweeps across the cup are responsible for their outstanding performance.

The DNS nozzle-mix burner quickly and thoroughly mixes the fuel and combustion air. The air/gas mixture enters the cup at its base. Ignition is enhanced and combustion stabilized by the incandescent surface. The mixture, subjected to turbulence, burns rapidly and completely within a small area as it sweeps across the cup. The burner distributes the fully reacted combustion products into the furnace where the hot gas heats the work directly. Because the products of combustion are broadly distributed, they more uniformly transfer heat to the work, thus minimizing localized overheating often caused by concentrated impingement from flame-type burners.

Combustion is rapid so there is a quick release of the total heat potential of the fuel and the heat is radiated from fully reacted gases that are closer to the theoretical flame temperature. Also, because combustion is complete within the cup, the heat exiting from the cup is uniform, stable and highly controllable. In contrast, with conventional flame-type burners combustion takes place over a longer period of time with temperature and heat transfer characteristics varying over the length of the flame, and the maximum potential flame temperature is not achieved.

DNS burners eliminate many other deficiencies inherent in conventional furnace firing systems. With flame-type burners, where the combustion extends into the furnace, the burner-to-workpiece distance must be increased to avoid flame impingement, hot spots, scaling and decarburization. This increases furnace size and cost beyond what would be required with DNS burners. Slow fuel/air mixing in flame-type burners necessitates extra, fuel-wasting air to improve combustion. DNS burners provide complete combustion without excess air and therefore do not waste partially burned fuel up the stack, thus operating at higher thermal efficiencies and lower stack temperatures.



Features

- Adaptable to all standard control and flame safety systems.
- Burns commercially available industrial gas.
- Can be placed closer to the work pieces than conventional flame-type burners.
- Accepts preheated air temperature to 500°F (260°C). Designs are available for 800°F (427°C) service; consult the factory.
- Operates at stoichiometric conditions, thus eliminating the heat load that exists with excess-air burners.
- Step design of burner provides flow barrier to protect casing from overheating.
- Bellville washers permit growth due to differential thermal expansion of dissimilar materials without excessive loading of block.
- Models to fit most applications in ratings from 250,000 to 1,000,000 Btu/hr (63,000 to 252,000 kcal/hr).

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- Angled lighting hole provides reliable ignition facility and permits flame monitoring.
- Designed for easy, on-site installation.
- Easily removable for maintenance from outside furnace.
- Simple rugged construction for years of trouble-free operation and low maintenance.
- Relatively quiet operation – well within OSHA regulations. (For more information on actual retrofit applications where the DNS burner has satisfied OSHA noise regulations, please contact the factory.)

Proven and perfected

The DNS burner was developed by Selas for use in its proprietary furnaces. These furnaces have set new standards for precise, short-cycle heating, reduced rejects and improved product quality. These same burners are now available for installation on existing furnaces to provide the same high standards of performance.

Recommended Applications

Selas DNS burners may be installed to replace or augment conventional burners. Furnaces with DNS burners are being used for the heating and heat treating of ferrous and nonferrous metals, as a primary heater or booster for heating continuous strip, for chemical processing and many other applications. The design, which permits the DNS to be fired directly into the furnace close to the work or applied in confined places, makes its use practicable where flame-type burners cannot be used.

The DNS burner can be mounted in furnace roofs or walls, of either brick or monolithic refractory construction. Installation can be made in space vacated by removed burners of another type or new mounting arrangements may be made. (See back cover for installation details.)

More Efficient, More Economical Ignition Systems

The redesigned DNS burners feature new ignition system pilots which require 60% less fuel and extend burner refractory life. The new pilots are smaller and located closer to the burner's combustion zone. They require only 6,000 to 8,000 Btu/hr (1,500 to 2,000 kcal/hr) as compared to 15,000 to 20,000 Btu/hr (3,800 to 5,000 kcal/hr) for those in previous burners. In addition, lower heat from the pilot flame means that the burner refractory will have lower thermal stresses, thus reducing maintenance and extending burner refractory life.

Each igniter mounts in a single common-sized hole in the burner. The five types are fully interchangeable and may be replaced from the outside while the burner is installed in the furnace wall. Also, the ultraviolet flame detector may be added to a type B or C after removal of a cap.

Since the igniter does not affect burner performance, the complement of burners in any furnace may be all of the same type or any combination of types.

Five new igniters are available

A. Manual ignition of burner, no pilot. Visual monitoring of burner.

B. Manual ignition of pilot which lights burner. Visual monitoring of pilot.

C. Electric ignition of pilot which lights burner; emergency manual ignition of pilot. Visual monitoring of pilot.

D. Manual ignition of pilot which ignites burner. Ultraviolet flame detection for pilot and/or main burner. Visual monitoring of pilot.

E. Electric ignition of pilot which lights burner; emergency manual ignition of pilot. Ultraviolet flame detection for pilot and/or main burner. Visual monitoring of pilot.

Photo Caption:

NOTE: Removal of cap, permits installation of a U.V. Flame detector without replacing ignition/observation port assembly.

Dimension and Installation Data

| Catalog No. Part No. | Rated Capacity Btu/hr. (Kcal/hr.) | Burner Pressure* | | Dimensions, Inches (mm) | | | | | | | | | | |
|-------------------------|---|-------------------------------|--------------|-------------------------|---------------|---------------|---------------|---------------|--------------|----------------|-------------|-------|----|--|
| | | Air Inches H2O (mm H2O) | Gas | A | C | D | E | F | G | H | K | L | M | |
| DNS-250 127568-01 | 250,000 63,000 | 12 1/2 318 | 5 1/2 140 | 6 3/4 171 | 11 1/2 292 | 12 305 | 14 1/2 368 | 13 1/4 337 | 3 76 | 7 1/2 191 | 2 3/8 60 | 1 1/2 | 1 | |
| DNS-500 127569-01 | 500,000 126,000 | 16 406 | 6 152 | 8 203 | 11 1/2 292 | 12 305 | 14 1/2 368 | 13 1/4 337 | 3 1/4 83 | 8 203 | 2 3/8 60 | 2 | 1 | |
| DNS-1000 127570-01 | 1,000,000 252,000 | 11 279 | 7 178 | 10 1/2 267 | 15 3/4 400 | 16 1/4 413 | 19 483 | 17 3/4 451 | 4 5/8 117 | 10 3/16 259 | 3 3 | 1 1/4 | 76 | |

*Burner pressures are for rated capacity using natural gas at STP conditions.