

USGasTech Inc

Providing gas-related technologies to the American Gas Industry

The ONERA burner

**A NEW BROAD CAPACITY RANGE AND LOW
EMISSIONS SURFACE COMBUSTION BURNER**

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➤ Development



A major European gas company has developed and patented a unique surface combustion burner with very Low-Nox (5-7 ppm), a 1 to 35 turn down ratio and a power output up to 2,900,000 Btuh/ft² (9 MW/m²).

This burner is brought to the USA by USGasTech, Inc.

➤ Description



This burner is made of metallic fibers compressed together to form a mesh .

The fibers are created by casting the metal alloy on a water-cooled rotating wheel. Pieces are ejected from the wheel, forming fibers. The ring shape is obtained by compressing these fibers in a mold and welding them with a high intensity current.

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This process allows to use metal alloys bearing very high temperatures : on alloys with a high rate of aluminum, a small layer of aluminum builds up on the surface protecting the core of the material.

The external diameter of the ring can be adjusted to fit a particular model of boiler. For the tests, the chosen dimensions were 2 " internal and 2.75 " external diameter. The optimal porosity of the material was found to be 80%.

The combustion occurs at the surface of the material. The use of a refractory alloy allows to operate the burner in a radiant mode (flame very close to the ring surface) without risks of damaging the material or in a blue flame mode to reach higher outputs.



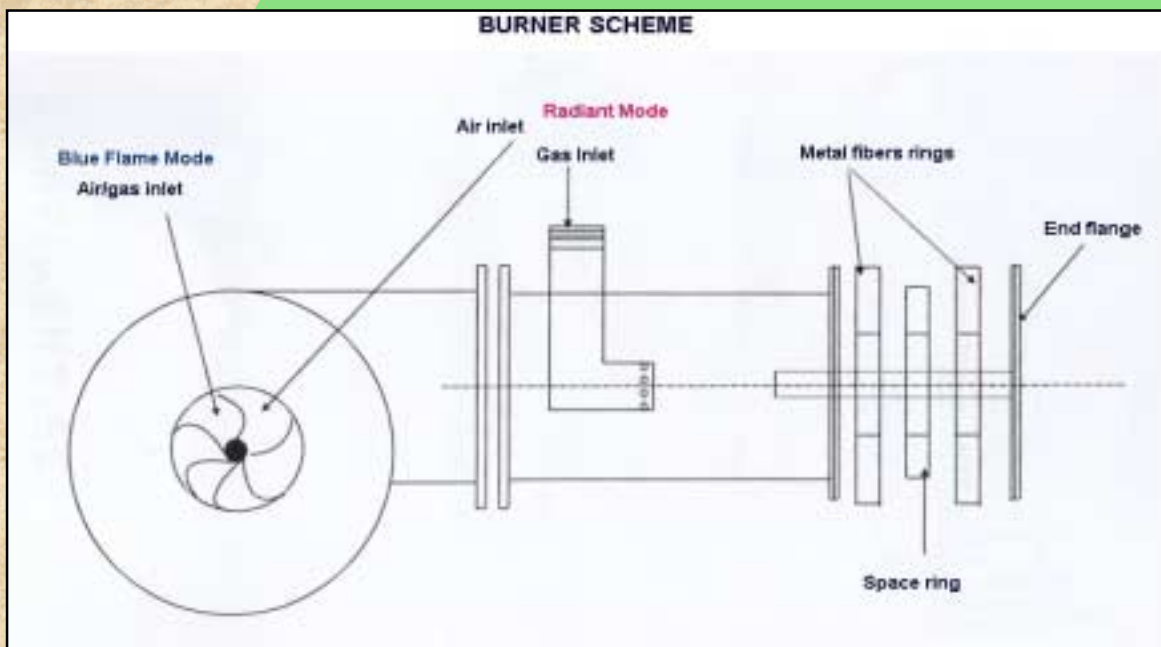
A burner is either assembled by stacking necessary number of rings with space rings in between each combustion ring or simply by shaping the burner surface (flat, bended, ...) during the construction.

➤ Combustion

Air and gas are mixed and introduced by a fan into the cylinder. In the radiant mode, the gas is injected after the fan through a mixer head to obtain the best mixture of the low velocity fluids.

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The mixture goes through the wires. An ignition rod provides the spark to initiate the combustion of the mixture, the flame moves from one ring to the next one.



A non porous space ring inserted in between each ring allows a very good flame stability as well as a reduction of the number of rings for the same output and at a much lower cost.

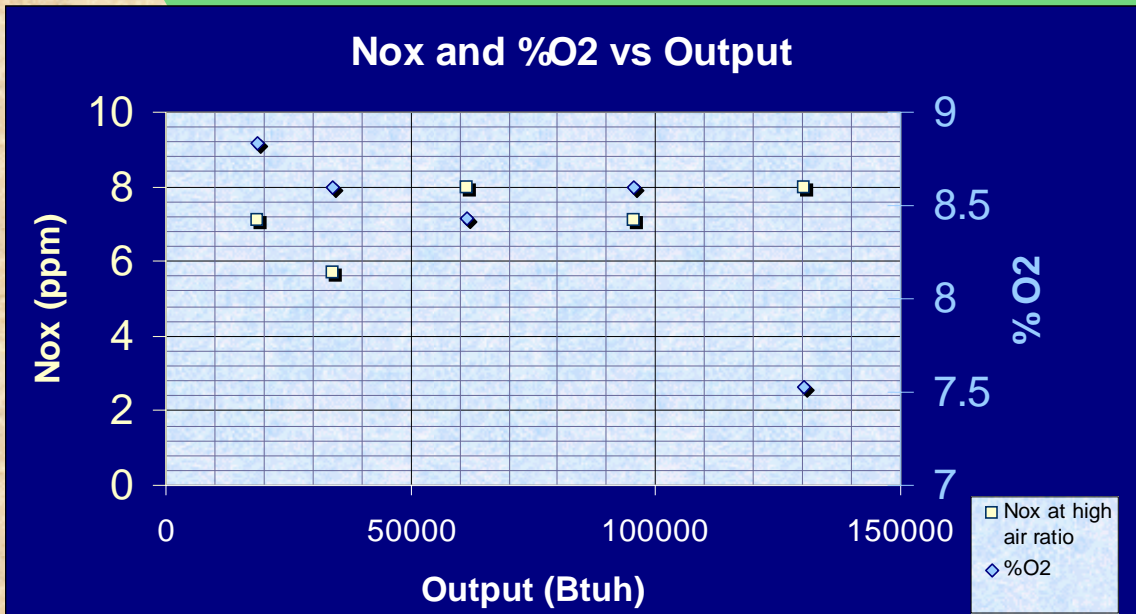
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➤ Emissions

Combustion tests have shown that emissions levels are well below any European or North American standards.

The results obtained during the preliminary tests (two rings and a space ring) can be seen on the following chart.



- ✓ CO levels are almost undetectable.
- ✓ NOx are below 11 ppm at 3% O2 on the whole output range

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