



## A FivesNA Hot Gas Generator delivers:

- **Increased production**  
More tons per hour
- **Reduced downtime**  
More process availability
- **Lower energy consumption**  
Less dollars per ton
- **Lower emissions**  
For "green" goals or regulation requirements
- **Improved product quality**  
Less scrap
- **Reduced labor costs**  
More profit per ton



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## Hot Gas Generators



State-of-the-art hot gas generators (HGG) for any process requiring a heated air stream.

## Heat processing systems for Hot Gas Generators

We have the experience, people, and technology to best meet the increasingly demanding needs of the air heating industry.

Fives North American Combustion is a world leader in process heating and combustion technology with a long history of providing high quality Hot Gas Generators. Our experience in heating and drying spans a vast array of products including coal, gypsum board, paper, grain, and minerals. Higher temperature applications include calcining and thermal oxidation.

Overall we have produced hundreds of hot gas generators in a very wide range of capacities for once through and recirculated process streams.

In order to properly integrate the HGG into your system, we analyze the unique and complex relationship between the heated air and the rest of the process in order to understand the requirements for temperature uniformity, heat transfer, efficiency, and emissions.

All FivesNA systems are custom engineered to be compact and efficient to meet the specific process needs identified. We welcome the opportunity to provide a cost effective system for you.

## Critical considerations for the HGG

### ■ Production and energy efficiency.

Uneven heat distribution of the process air stream reduces production, produces harmful mechanical stresses and wastes energy. FivesNA's unique injection mixing method produces exceptional uniformity, in many cases +/- 5% of the target temperature, positively impacting efficiency.

Recirculated product gases, as part of the air supply, can improve efficiency and lower emissions.

■ **Emissions.** Excessively high NO<sub>x</sub> and CO emissions can restrict production. Our Best Available Control Technology (BACT) can reduce emissions to as low as 8 ppm (at 3% oxygen) with no FGR, even with preheated or vitiated combustion air.

### ■ Footprint and capital costs.

Many HGG's builders use very large heaters with long residence time to achieve a moderate level of temperature uniformity. FivesNA's technology allows the most compact designs available – saving factory floor space and capital.

■ **Greenhouse gas.** Poor energy efficiency yields unnecessary CO<sub>2</sub>. FivesNA's improved controls and temperature uniformity provide for a reduction in both.

## Valuable features

**Wide range of sizes.** To 400 MMBtu/Hr.

**Low pressure loss.** Less than 4 inches/10 mbar.

**Wide operating range.** Over 20 to 1 turndown with natural gas fuel.

**Multiple fuels capable.** Use natural gas, biogas, land fill gas, light and heavy oil, waste gases, and liquids.

**Minimal internal refractory.** Increases responsiveness and decreases maintenance.

**Code compliance.** Assurance that the system complies with the applicable codes.



A 115 MM Btu HGG being transported to site.

