

## Injection of DNCG to Jansen High-energy Combustion Air Nozzles™

The injection of dilute non-condensable gases (DNCG) into existing boilers using the Jansen High Energy Combustion Air Nozzle can be done in different ways:

1. Mixing these gases into the existing or new air delivery system.
  - In a recovery boiler, this could be accomplished by mixing the DNCG stream with combustion air being supplied to the secondary air (SA) and/or tertiary air (TA) air level.
  - In a power boiler by mixing DNCG with the combustion air being supplied to the boiler, specifically the overfire air (OFA) system.

In either scenario above, the DNCG stream can be mixed with combustion air at select nozzle locations, or into the overall SA and TA systems on recovery boilers, and in the OFA system on power boilers.

2. Providing separate/dedicated DNCG injection locations. This uses a blower, does not have air mixing, and is delivered to the boiler through a select number of new nozzles.
  - The DNCG are not mixed with combustion air, and the DNCG stream is exclusively delivered into the boiler through a select number of new nozzles dedicated for DNCG delivery only.

The scope of work for installing Jansen air nozzles for DNCG disposal include:

- Initial process evaluation to determine the best location and injection method.
- Custom design of the injection system, including specific nozzle construction and related ducting.
- Full Engineering-Procurement-Construction services, as needed.

The features and benefits of the Jansen High-energy Combustion Air Nozzle are:

- The nozzle has a clean, open discharge with high jet velocity, and no back flows or tube impingement.
- Nozzle tips are corrosion resistant. If dedicated DNCG delivery nozzles are required, the entire nozzle body is composed of corrosion resistant material.
- Dampers are located outside the boiler and have low maintenance needs.
- Rapid combustion of DNCG components means no emissions excursions.
- Boiler stability is not affected.
- System has easy shut-off and isolation capability.



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