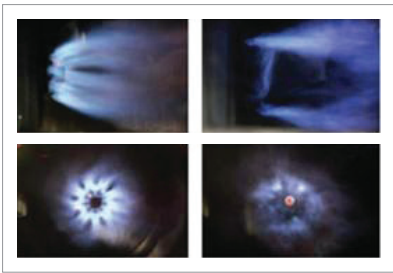


Plasma Combustor with Low-NOx Generation

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⇒ A combustor that stabilizes lifted flame and enables ultra-low NOx generation by supplying reformed gas containing hydrogen with the plasma reactor inside the combustor

Client / Market

- Burner, combustor manufacturer or a company with production facilities that use boilers or industrial burners that are subject to total NOx emission regulation

Necessity of this Technology

- To develop combustion technology that minimizes emission of NOx that inevitably occurs from a burner or combustor
- Existing low-NOx burner requires additional facilities such as staged combustor and excessive EGR.
- A new technology is required to reduce NOx without excessive change in the combustor or additional facilities.
- If the regulations such as total NOx emission regulation that grow stricter cannot be fulfilled, facility extension is limited in the whole industry, and ultra-low NOx emission realized through combustion technology without an after treatment requiring excessive cost and facility is an economic and effective countermeasure.

Technical Differentiation

- Without additional facility installation or an after treatment facility other than existing burner facility, the new technology can be applied within the existing burner and combustor installation condition.
- Compared to existing low-NOx emission burner, it is a new concept combustion technology that enables single digit ppm NOx emission without EGR.
- Additional cost for realization of ultra-low NOx emission is within the range that does not greatly affect existing price of burner.
- Plasma burner technology for ultra-low NOx emission maintains the appearance of existing burner while achieving improvements.
- The simple structure and form of plasma burner has benefits in terms of durability and reliability.
- It can realize stabilization of lifted flame, which cannot be done with existing burner.

DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

Other

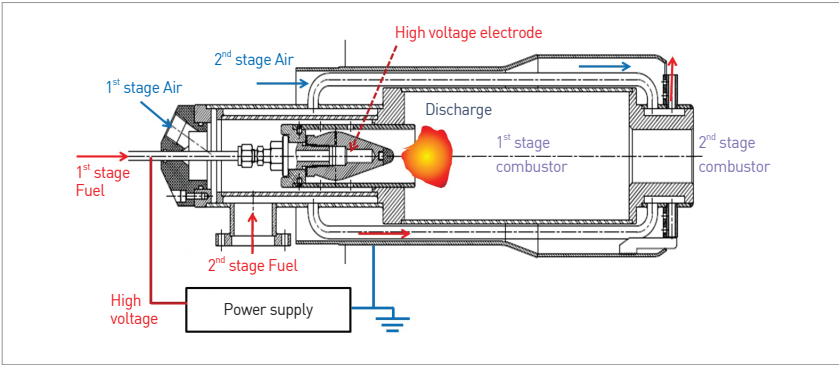


TECHNOLOGY READINESS LEVEL [TRL]



Excellence of Technology

- Plasma reactor installed inside the burner head reforms the fuel to supply gas rich in hydrogen to the combustor.
- Reformed gas containing hydrogen stabilizes flame while the main flame is lifted through rapid flame stabilization.
- Lifted flame quickly improves the characteristics in mixing of air and fuel, and removes high temperature condition in flame root, also, the synthetic gas provided by the plasma reactor inside the burner itself acts as a reducer.
- Published the paper, NOx Reduction Strategy by Staged Combustion with Plasma-Assisted Flame Stabilization (Energy & Fuels 2012; 26; 7; 4284-4290)
- Received the 2007 Patented Technology Award (The Most Excellent Researcher Award) and commissioner's prize from Korea Intellectual Property Office in 2014



Current Intellectual Property Right Status

PATENT

- Plasma Burner (KR1525140)
- Plasma Burner (KR1527960)
- Plasma Torch (KR2013-013652)
- Plasma Burner (KR1174094)