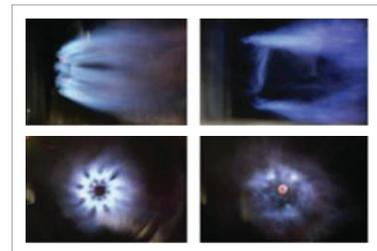


Plasma Combustor with Low-NO_x Generation

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⇒ A combustor that stabilizes lifted flame and enables ultra-low NO_x 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 NO_x emission regulation

Necessity of this Technology

- To develop combustion technology that minimizes emission of NO_x that inevitably occurs from a burner or combustor
- Existing low-NO_x burner requires additional facilities such as staged combustor and excessive EGR.
- A new technology is required to reduce NO_x without excessive change in the combustor or additional facilities.
- If the regulations such as total NO_x emission regulation that grow stricter cannot be fulfilled, facility extension is limited in the whole industry, and ultra-low NO_x 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-NO_x emission burner, it is a new concept combustion technology that enables single digit ppm NO_x emission without EGR.
- Additional cost for realization of ultra-low NO_x emission is within the range that does not greatly affect existing price of burner.
- Plasma burner technology for ultra-low NO_x 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

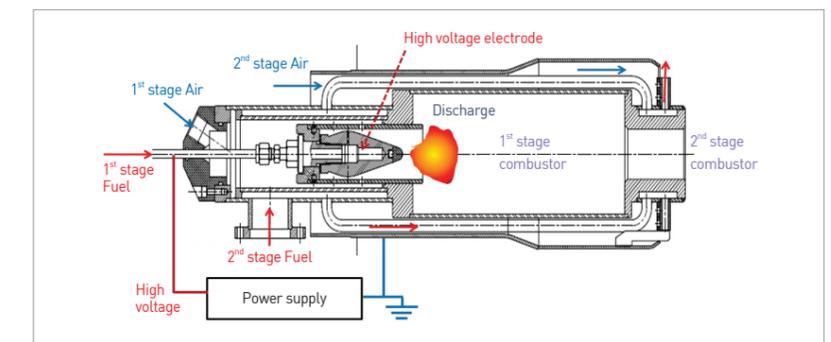


TECHNOLOGY READINESS LEVEL [TRL]

Research, basic explanation | Project concept or idea development | Technology idea verification | Prototype development | Trial product production/evaluation in similar environment | Pilot field demonstration | Development and optimization of commercial model | Commercial product demonstration | Mass production and initial market launch

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, NO_x 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)