

HONEYWELL UOP CALLIDUS[®] PROPRIETARY CUBH BURNER FOR STEAM METHANE REFORMERS

Meet Tighter Emissions Goals in Flexible
CO₂ Capture in Blue and Green Hydrogen

As the world strives to reduce greenhouse gases, Honeywell UOP Callidus CUBH burners are a powerful tool to help decarbonize your plant today to meet your emissions goals.

The CUBH burner utilizes novel, yet field proven, dynamic cavity stabilization technology to rapidly switch between highly variable and changing fuel sources. The CUBH lights-off, starts-up, stands-by, ramps-up and operates to full capacity while dynamically transitioning and switching between any specified fuel requiring no special operator intervention.

BLUE HYDROGEN - RETROFIT AND NEW APPLICATIONS

When an existing process unit is upgraded for CO₂ capture, the fuel gas composition and rates for various operating case can change significantly. For example, it may be necessary to light-off and startup on natural gas or conventional refinery fuel gas and then, as the processing unit and carbon-capture systems ramp up to normal operation, the fuel gas supplied to the burners may change to one containing highly and rapidly varying amounts of various amounts of hydrogen, hydrocarbons or inert gasses such as nitrogen, water vapor or even carbon dioxide.

And there may be one set of fuel gasses for carbon-capture mode operation and a different set for returning to conventional, non-carbon-capture mode, if necessary or desirable. If or when economics or regulatory environments change and conventional CO₂ emitting operation is warranted, the CUBH immediately transitions to those different fuel gases requiring no special operator intervention. Simply flip the switch on the process equipment and the CUBH burners will respond automatically and seamlessly requiring no special operator interaction.

In retrofit applications, it is possible, and even likely, that the existing burners are not capable of firing on the new, carbon-capture mode fuel gases without compromised performance, flame instability, and likely resulting in higher NO_x emissions. Thus, in any retrofit case, the burners and fired equipment must be scrutinized and reviewed. Significant burner modification or complete burner replacement may be necessary to meet performance requirements with the new, altered fuel gases. And the revamp process may require new emissions permitting at lower emissions limits than the existing burners can provide.



FEATURES AND BENEFITS

- Ready-now, commercially field proven Callidus CUB Low NO_x burner technology
- Patent pending dynamic cavity stabilization for highly varying fuel gas
- Customer tailored for retrofit or new units in either Blue or Green Hydrogen services
- Fits existing burner cut-outs

CARBON-CAPTURE RETROFITS: FIRED EQUIPMENT FEASIBILITY STUDIES

Existing furnaces or fired heaters should be inspected to identify any maintenance, repair, technology updates necessary to meet new process, performance and emissions requirements. The Honeywell UOP Callidus team is uniquely qualified to review the existing fired equipment and burners to assess the feasibility of operating the existing equipment in new carbon-capture operating modes. And we can recommend and provide, with our fired equipment partners, any equipment, beyond just the burners, that may be required for the revamp.

And if there are any questions or doubts as to whether the Callidus proposed solution will meet the new performance and emissions requirements, Callidus can provide pre-award or FEED level performance fired testing. Pre-award testing reduces project risk and establishes the exact technical design

solutions for the specific applications, thereby speeding and streamlining the project timeline upon project execution. The performance data from pre-award or FEED study testing may be in working with permitting authorities to understand that the proposed technical solutions are achievable, well in hand and completely scoped out.

GREEN HYDROGEN - 100% HYDROGEN FIRING

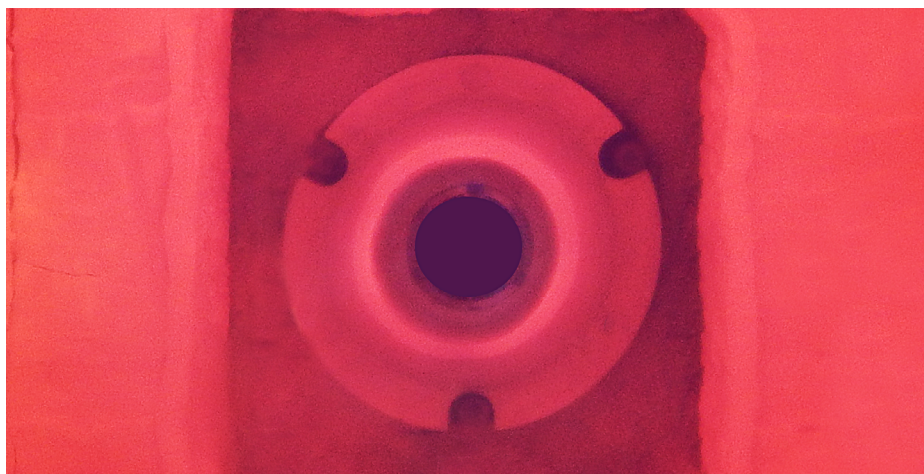
Having been tested and field proven on all ranges of hydrogen firing applications, the CUBH burner is well suited for Green Hydrogen, 100% hydrogen operations, where no hydrocarbons are ever fired. Light-off, ramp-up and normal operation on hydrogen applications are well understood and field proven.

Mechanical integrity of the critical burner component including burner gas tips and refractory tile is field proven with a decades long Callidus installed base. And in the inquiry and

feasibility study phase, Callidus will identify and make the necessary material recommendations and selections for your specific applications.

EXTREMELY FLEXIBLE FUEL OPERATION

The CUBH is designed, tested and field proven to fire on any combustible fuel gas mixture from 100% hydrogen to 100% natural gas and any hydrogen, hydrocarbon or inert fuel gas blend in between. The CUBH operates well on 100% low pressure fuel gas such as PSA purge gas while at low design fuel pressures of less than 3 PSIG. Thus, the assist gas can be premixed at low pressure with the purge gas or off-gases or operated separately at typical higher design pressures of 20 to 30 Psig. This flexibility in design pressure allows simplification of fuel piping and control all while delivering the industry standard setting low NOx emissions that Callidus is relied upon to deliver.



SEE FOR YOURSELF

- Pre-qualify the technology to meet your performance requirements with performance testing
- Greatly reduce or eliminate project schedule and performance risk by addressing all design questions
- Callidus can perform feasibility and suitability studies of any fired equipment
- Pre-award and FEED study performance validation testing available

For more information

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