

Propulsion

Quick Change Ceramic Flame Holder

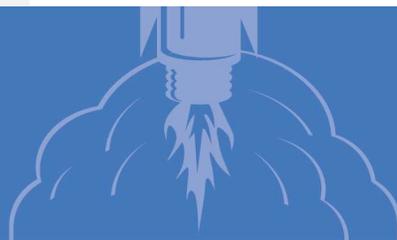
For high-output torches

NASA's Langley Research Center is seeking to improve upon stock stainless steel flame holders. Researchers at NASA's Langley Research Center have developed a new ceramic design with a service temperature of 4,000F. The combination of high strength and high temperature capability and a twist lock mounting method to the steel burner sets this flame holder apart from existing technology.

BENEFITS

- ➔ Enables roughly double the torch output without damaging the torch
- ➔ Can operate at higher temperature (4,000F) than stainless steel (1,600F)
- ➔ Allows the torch to be optimized for different applications (e.g., may use a mixing nozzle or a supersonic nozzle)
- ➔ Can be used with either venturi or blown burners
- ➔ Is easily replaceable without tools
- ➔ Operates without torch/holder rusting together after use
- ➔ Permits a modified torch to still use a conventional flame holder

technology solution



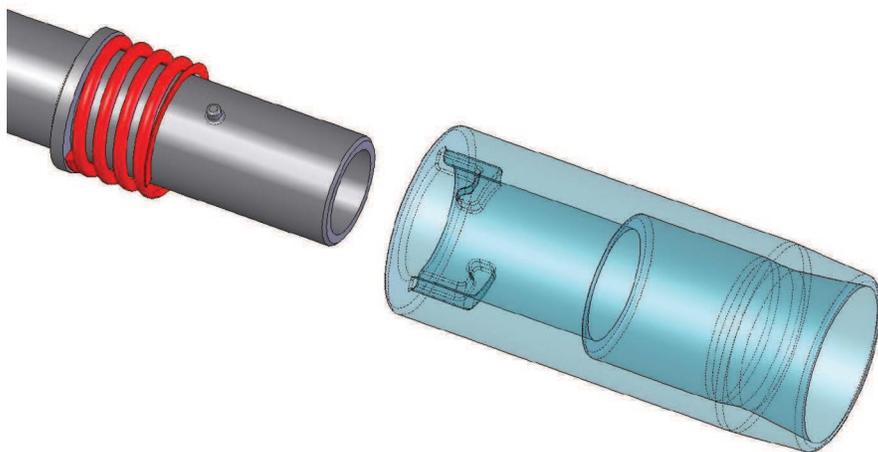
NASA Technology Transfer Program

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THE TECHNOLOGY

The high output flame holder was developed in support of the U.S. Navy's efforts to design a jet engine simulator for infrared plume studies. Previous tests had shown that off-the-shelf components would melt or burn up in a short time. Given these design and performance criteria, NASA developed a ceramic flame holder that has a much longer life cycle and can be used with a variety of torches or burners. Where the stainless flame holders showed signs of oxidation, flaking after only three hours of testing, NASA's ceramic flame holder has over 150 hours and 200 cycles of use in a casting furnace, and soot marks are the only signs of use; there are no signs of deterioration.

NASA expects the new technology to help enhance safety through increased reliability and flame control. Additionally, the total cost of ownership is less due to decreased maintenance and improved efficiency.



The new design uses a twist lock attachment (an improvement over set screws), and has a service temperature of 4000F. The flame holder slides onto the torch and roll pins engage the bayonet fitting grooves.

APPLICATIONS

The technology has several potential applications:

- Aerospace - jet engine simulation
- Manufacturing - torches for forging, casting furnaces, and pottery kilns

PUBLICATIONS

Patent No: 8,529,249

Patent Pending

National Aeronautics and Space Administration

The Technology Gateway

Langley Research Center

Mail Stop 151
Hampton, VA 23681
757.864.1178
LARC-DL-technologygateway@mail.nasa.gov

<http://technology.nasa.gov/>

www.nasa.gov

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