

2G02: A NOVEL MESO-SCALE COMBUSTION SYSTEM FOR OPERATION WITH LIQUID FUELS.
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Comment by Dieter Most, Siemens AG, Germany

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You are using a burner design with very narrow channels and, additionally, an air driven fuel injector. Both cause a comparative high pressure drop. Can you state this pressure drop? Please give an estimation of the electric power which would be needed for operation of the burner (burner fan for air supply and the fuel injector) considering the above mentioned pressure drops. Also compare it to the released thermal power.

From my past experience at developing additional car heaters I know there are problems that rise with evaporating kerosene in a porous media. At still moderate temperatures polymerization can occur, which leads to a something we called "gum". This gum can block the porous media of the burner (e.g., in durability tests about more than 150h.

I would doubt that you really need an air injector for optimized burn out. I think, this is something that is over-engineered. A simple film evaporation mechanism using the outside of the inner wall of the combustion chamber would be probably sufficient enough. Can you test this?

No reply received from the authors.

Comment by Sebastien Candel, Ecole Centrale Paris, EM2C lab, CNRS, France

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There are some clever features in this arrangement. One of them is the use of an aerodynamic atomizer which looks very much like perfume nebulizers (we have used such an arrangement to obtain a spray of small droplets to seed the flow for LDV or PIV). It would be interesting to quote the value of the pressure drop needed in this device and that used in the complete system. Then, compare the power needed to obtain these pressure drops to the power obtained from the system.

No reply received from the authors.