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# AN ASSESSMENT OF THE SELF-ASPIRATING CONCEPT OF LEAN MIXTURE SUPPLY FOR RADIANT BURNERS OPERATING IN THE INTERNAL COMBUSTION MODE*

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During the last decade, thin-shell radiant burners [1-3] made of porous SHS-intermetallics [4,5] have been developing in TSC SB RAS. There are exactly two options on how all the air needed for premixed lean combustion could inflow into the reaction zone: (*i*) the concept of forced air supply using an adjustable electrical blower, and (*ii*) the self-aspirating concept using a simple combination of single-hole nozzle injector and venturi-like mixing tube. The latter method is of interest because no electricity supply is required for IR heater operation. In the self-aspirating concept, the high-speed jet of fuel entrains the air directly into the burner by following the Bernoulli principle. A venturi geometry of pipe is required to mix a fuel jet with entrained air before the gas mixture reaches a combustion zone. Typically, a combination of proper nozzle parameters and geometry of venturi tube provides sufficient air-entrainment, especially at a low firing rate. However, this method of fresh mixture supply has never been described in the literature for radiant burners operated in the internal combustion mode. The experiments have proven that the self-aspirating approach is suitable for the lean combustion of LPG and natural gas (Fig.1). My presentation will be focused on the first results and prospects of applying the self-aspirating concept for radiant burners operated in the internal combustion mode.


Fig.1. Image of IR heater based on self-aspirated radiant burner operated in the internal combustion mode.

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