

Pulse Combustion Technology

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Abstract: Pulse combustion has been used in a variety of ways since first being discovered in 1877. This a combustion process that occurs under oscillatory conditions with changing state variables, such as pressure, temperature and velocity. This paper looks at the historic uses of pulse combustion, and it provides an overview of this unique process. Pulse combustion has been used to amplify thrust power with the German V-1 rockets. Pulse combustion has been used to optimize flame efficiencies, and it is now re-emerging in many new industrial applications including some for Waste to Energy.

What is Pulse Combustion?

Pulsating Combustion is a combustion process that occurs under oscillatory conditions. That means, that the state variables, such as pressure, temperature, velocity of combustion gases, etc., that describe the condition in the combustion zone, vary periodically with time.

Furthermore, acoustic oscillations generated in the combustion process are coupled with heat and released into the process at the same time.

The first known example of pulse combustion is so called “singing flame” discovered by Dr. Higgins in 1777.

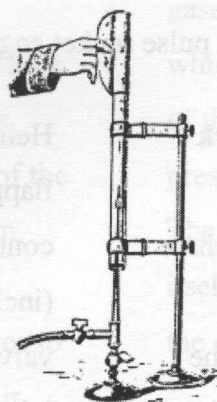


Fig 1. Discovery of a Singing Flame by Dr. Higgins, 1777