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mgr inż. Adrian Trzeciak  
Autor pracy

Streszczenie rozprawy doktorskiej nt.:

**„Badania procesu pulsacyjnego spalania”**

**„Research on the pulsed combustion process”**

Based on the analysis of the literature, it can be concluded that despite a large number of various studies conducted over the years, many issues regarding the operation of pulsating combustors still remain unexplained. Comparing some publications with each other, it can be seen many contradictory statements. What's more, the conducted analysis did not notice the works on the efficiency of the combustion process in the pulsating combustion chamber.

In this work, the author made an attempt to determine the factors influencing the course and efficiency of the pulse combustion process.

An extensive research program of a valveless pulse combustion chamber has been developed. A research stand was constructed and a methodology for measuring the basic parameters of the pulsating combustion chamber was proposed. The methodology of precise measurement of the thrust force and non-invasive method of determining the location of the places where combustion zones are formed are the subject of patent applications.

The "efficiency coefficient" was introduced - a parameter that allows a reliable comparison of the efficiency of heat release inside the pulsating combustion chamber during its operation in various configurations. It also applies when comparing different pulse combustors.

Experimental studies were supplemented with numerical simulations.

In the summary of the work carried out, the theses put forward in the dissertation were confirmed. It has been shown that the main factor determining the high efficiency of the heat release process in the pulsating combustion chamber is the appropriately dynamic and efficient process of mixing the fuel with the oxidant. The author proved that it is possible to operate a pulsating combustion chamber in a wide range of fuel mass flow rate, frequency, average thrust, thrust amplitude and pressure pulsation in the combustion chamber. The operation of the pulse combustor is controlled, unlike most currently used devices, to a lesser extent by changing the fuel flow rate and to a greater extent by changing the mechanism of the pulse combustion process.

Based on the results of the research, in the final part of the work, the author discusses the legitimacy of treating the pulsating combustion chamber as an acoustic device..

**Keywords:**

pulse combustion, pulsating combustion chamber, pulse jet engine, jet engine



Podpis Doktoranta