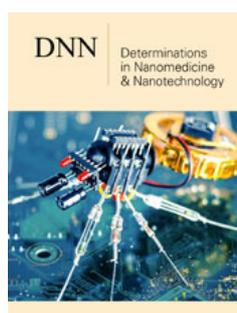


Ensuring Operational Performance of Aircraft in Pre-Flight Training

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Abstract

The paper explores ways to improve the quality of knowledge-intensive products using electrical processing methods. This issue is particularly acute in aerospace engineering, where any emergency can cause not only material losses, but also a major international resonance. Using non-traditional processing methods, some of which may be under development. Indicators in the process of creating knowledge-intensive technology

Introduction

To ensure the required quality of the products created, it is necessary to work together with design developers, technologists, manufacturers, customers of products with the required performance indicators, some of which may be embodied in the object being created, others are not feasible at the moment [1].

Customer requirements are limited to both developers and manufacturers, as is revealed when working out the technology. But even with the positive results of this stage, it is not always possible for the manufacturer to make such nodes in the mass-produced production of the product [2]. It's possible that new processing methods that the production doesn't own will require, and their creation doesn't fit within the existing time range of new product development [3]. Development of production technology, where come to an agreement on the use of various technological (both traditional and non-traditional) processes, where electric processing methods occupy a special place. Usually, the decisions made are checked by modeling or during testing in experimental production (Figure 1).

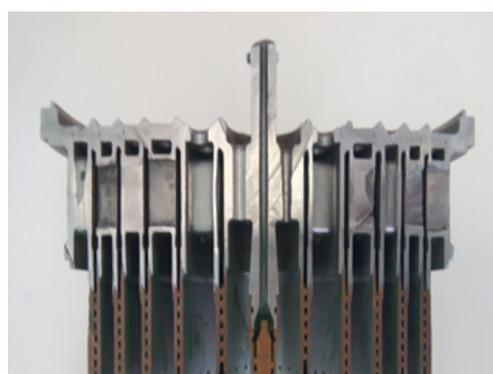


Figure 1: Rocket engine fire drive.

The next stage of technology development includes analysis and adjustment of materials for serial production and subsequent operation of products (maintenance, repair, regulatory work, etc.) [4]. The process of coordination between the customer, developer and manufacturer, where the timing and costs are specified, the parameters of the product. Here the main figure is a technologist who owns created and created new technological processes. In all thermal engines, one of the factors that determines the quality of products is the perfection of the combustion process when injecting fuel through injectors, the design of which is increasingly complicated [5]. In the course of the experimental work, the developers proposed the design of the nozzle with a partition in the channel, allowing to improve fuel spraying (Figure 2).

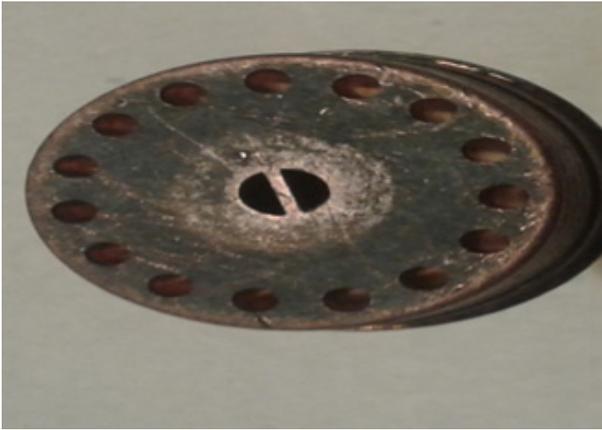


Figure 2: Stok nozzles with a split stream.

The diameter of the hole can be less than 1mm, and rounding radii about 0.1mm. In the development of technology, it was proposed to use for this purpose a combined erosion-chemical treatment of a wire electrode. The task is even more complicated if the profile of the channel performs in the form of a Laval nozzle, which accelerates the flow, pushes the hot zone away from the nozzle and increases the durability of the injectors [6]. combined treatment, carried out by anode dissolution, with the unilateral subjugation of the electrode.

The next stage of the creation of new types of injectors is the use for this purpose of mineral ceramics, which increase heat resistance by 200-300 degrees. Using ultrasonic radiation for intensification. Mass-nose. This allowed to receive channels of different profile of the section and its length with a diameter of less than 10 microns and a depth of more than 100 diameters.

Further development of this direction is the manufacture of ceramic filters for fine cleaning fuels for aircraft and rocket engines, where the diameter of the holes can be a hundredth of a millimeter. But there is a danger of forming on the surface of droplets of frozen metal, weakly connected to the base, which is dangerous for injectors. the filtering capacity of the product, requires an increase in its size and mass. We have proposed a new design of a multi-electrode tool made of solid harvesting by partially cutting it with

a wire electrode with a diameter of more than 0.1mm. Tool way allows you to simultaneously stitch up to 500 holes that can have both a square and round section Proposed way allows you to get quality filters with increased bandwidth (according to our studies up to 35%), and in the manufacture of multifaceted channels, this figure increases to 40% [7,8].

Developed combustion chambers with a mineral-ceramic heat proof coating. to keep the combustion camera and jet nozzle for 4-5 launches, the proposed technology increases this figure to 20-25, and the technologists are tasked to bring the engine's capabilities to 50 launches, which gives a huge economic effect.

Conclusion

The article presents the results of recent research, which are embodied in promising products of aerospace technology to improve the operational performance of aircraft at the pre-flight stage Research suggests that breakthrough technologies will be developed in the future to meet the needs of the industry.

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