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STATE OF THE ART IN THE DEVELOPMENT OF ORBITAL INDUSTRIAL PLATFORMS

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The goal of this article is to analyze the state of the art in the development of orbital industrial platforms and their components. The article proposes the general arrangement of a base orbital industrial platform, which consists of main supporting structures, onboard systems, an onboard control system, onboard service devices, receiving docks, a primary processing module, a secondary processing module, an industrial module, and an assembly module. The state of the art in the development of the key component modules of an orbital industrial platform is analyzed, and it is concluded that space conditions make it possible to produce new materials and substances whose characteristics are improved in comparison with their earth counterparts. The most interest in the development of production processes in vacuum and zero gravity conditions is shown by the USA, Russia, and the EU countries. It is shown that at the initial stage of development of orbital industrial platforms raw materials for the production of unique materials can be supplied from the Earth. With further technological development, it will be possible to use space resources. Orbital industrial platforms are a new class of engineering systems. To develop a mathematical model of an orbital platform and components thereof, its functional diagram with the key functional links between the platform components is presented. The problem of orbital industrial platform development is complex, and thus it has a wide range of different aspects of its solution. The need to develop a scientific methodology for the process of orbital industrial platform development has given rise to a package of scientific and technological problems generated by the features of this problem. This package includes the development of new classifiers, construction arrangements, mathematical models, and design methods for a base platform and components thereof.

Keywords: *industrialization of space, large space structures, orbital industrial platform, production processes in space.*

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