

**Model for assessing the mass of a space industrial platform and its modules**

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The goal of this paper is to develop mass models of a space industrial platform and its modules. At the initial stage of development of a new spacecraft, a limited set of basic data is available. For a space industrial platform, they are as follows: the configuration of its main and auxiliary modules, the parameters of the technological processes to be implemented on the platform (the vacuum and the microgravity level, the equipment energy capacity), and the manufacturing equipment configuration. A feature of industrial platform design is that there are few, if any, theoretical works on the choice of platform parameters and the logic of platform conceptual design. In this paper, the design process is considered as applied to the conceptual design stage. This stage is characterized by that nothing is known about the system to be developed except for the general concept of the platform layout, the expected types of the main service systems, some basic data, and the parameters of the technological processes to be implemented on the platform. The process of designing a new complex space system such as an industrial platform is a multilevel iterative and optimization process, during which its characteristics and the mass fractions of its components are determined and refined. The paper presents a mass model of an industrial platform and its modules, in whose development the platform and its components were decomposed to the level of system elements. A statistical analysis of the mass fractions of the onboard spacecraft systems was carried out. The mean values of the mass fractions for the sample of spacecraft under study and their scattering coefficients (the dispersion and the mean square deviation) were determined. For the mean values and the dispersion, 99.9 confidence intervals were determined. Further studies on the design of space industrial platforms are planned to be carried using the mass fractions of satellite systems and the confidence intervals, namely, the minimum and the maximum possible mass for a particular system, determined in this study.

**Keywords:** *space, conceptual design, industrial platform, module, weight model, statistical parameters.*

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<https://doi.org/10.15407/itm2022.01.026>

Received on August 30, 2022,  
in final form on October 4, 2022