

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
New Materials and Structural Concepts (4)

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DIMENSIONALLY STABLE PRECISION STRUCTURES OF SPACE APPLICATION WITH LONG
SERVICE LIFE: ASPECTS OF MATERIAL SCIENCE, TECHNOLOGY, AND MANUFACTURE.
PROSPECTS OF MANUFACTURE IN UKRAINE

Abstract

Yuzhnoye State Design Office has a great experience in the development and manufacture of space rocket structures made of composite materials. The report describes the examples of application of state-of-the-art materials and technologies in structures of various applications: 1. Solar array carriers of three-layer honeycomb structure made of carbon-filled plastic, with specific weight of 1.0 kg/m². 2. Heat shields of three-layer honeycomb structure made of carbon-filled plastic, which are applied to provide the thermal mode of a satellite and protect it against outer space effects. 3. Support structures of optical devices (scanners, telescopes, objective lenses). Distinctive features of such structures are high structural characteristics of dimensions stability under conditions of cyclic change of temperature from minus 150 to plus 150. 4. Truss structures made of carbon-filled plastic, which have a high level of heat and dimensions stability in the outer space environment. 5. Large-sized carbon-filled plastic nose fairing and dry bays of three-layer honeycomb structure for launch vehicles. 6. Large-sized carbon-filled plastic bottles for transportation of natural gas under pressure. Prospects of application of composite materials in the space rocket field in Ukraine are also mentioned in the report.