Key Technology of Space Exploration (8)
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AERO SEKUR TECHNOLOGIES FOR EXPLORATION

Abstract

AERO SEKUR is an Italian SME specialized in flexible, foldable and inflatable structures based on single and multi-layer textiles and in air management/filtration systems The missions IXV and EXOMARS 2016 demonstrated the good performance of the AERO SEKUR designed and developed subsystems. In particular, for IXV Mission AERO SEKUR provided the Floating Devices, while for EXOMARS 2016 provided the Parachute and the High Efficiency Filter for Planetary Protection. Starting from its heritage, AERO SEKUR developed technologies that could be utilized in the Exploration missions. As a matter of facts, AERO SEKUR could provide technologies in the Entry Descent and Landing field of application, as well as Inflatable/Flexible Modules and Biorigenerative Life Support for future Space Habitats. In particular, for Entry, Descent and Landing AERO SEKUR developed, in addition to the floating devices for IXV and the Parachute for EXOMARS 2016 missions, other subsystems/equipment, namely: inflatable thermal shroud for atmospheric reentry, which scaled models have been tested in a Plasma Wind Tunnel, Airbags for EXOMARS 2016 Descent Module (that performed several successful drop tests) and for Small Martian Payloads. For future Space Habitats, AERO SEKUR developed several inflatable Modules, and studied the Air Management system for a Space Greenhouse as well as a module for water potabilization. Presently AERO SEKUR is designing, manufacturing and qualifying the Parachute system (composed by a supersonic and a subsonic chutes with relevant pilots) for EXOMARS 2020 mission, as well as the Descent System for Space Rider vehicle (composed by a drogue and a parafoil). In the field of Flexible Modules, Aero Sekur is presently working on radiation and micrometeorids protection. The paper will describe the technologies developed by AERO SEKUR, and will present the most updated state of the art of the development activities achieved so far.