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DEVELOPMENT OF A SUBLIMATOR FOR CHINA FEITIAN EVA SPACESUIT

Abstract

Sublimator is the key unit of Portable Life Support System (PLSS) for Extravehicular Activity Spacesuit (EVA SS). Due to no active control, no moving parts, reliability, flight readiness, 100 percent of water usage efficiency, a sublimator has been used for heat rejection for Chinese FEITIAN EVA SS. The sublimator consists of a porous material, a feedwater distribution part, a liquid and gas heat exchanger. In order to assure EVA astronaut's thermal comfort and safety, heat from FEITIAN EVA SS will be dissipated by sublimator. At the same time, moisture in low pressure circulating oxygen loop will be condensed and separated in the sublimator. A sublimator has been developed by Astronaut Center of China(ACC), which has been successfully used in the Chinese SHENZHOU 7 EVA mission. This paper describes sublimator design characteristic, key material and experiment evaluation method. This paper also presents results of sublimator performance. Ground test data and flight data show that the unit can satisfy all FEITIAN EVA SS requirements and has excellent performance.