

Test Report: Flagsuit's Full Spacesuit Pressurization

Peter Homer, Flagsuit LLC
Trent Tresch, University of Arizona Center for Human Space Exploration

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Overview:

In October of 2024 Flagsuit tested its new prototype full space suit using air as an internal pressure, breathing and temperature regulating gas (21% oxygen, 78% nitrogen). Conducting two tests over the course of two days, the resulting photos and data are shown below.

Flagsuit, in previous NASA challenges has shown its pressure garment technology can hold gas up to 22 psi before burst, which is about 1.7 times the pressure acceptance test requirement by NASA (13 psi) and 6.2 times legacy spacesuit operating pressures (3.5 psi).

In the photos below we see the full suit operating at 3.25-3.5 psid. The operator was able to effectively walk, reach for the chest mounted suit controls, rest in a seated position, perform a deep crouch without assistance and even climb up and down a ladder (with overhead arm reach). Future testing will be performed at higher suit operating pressures.

Suit Movements and Postures Demonstrated

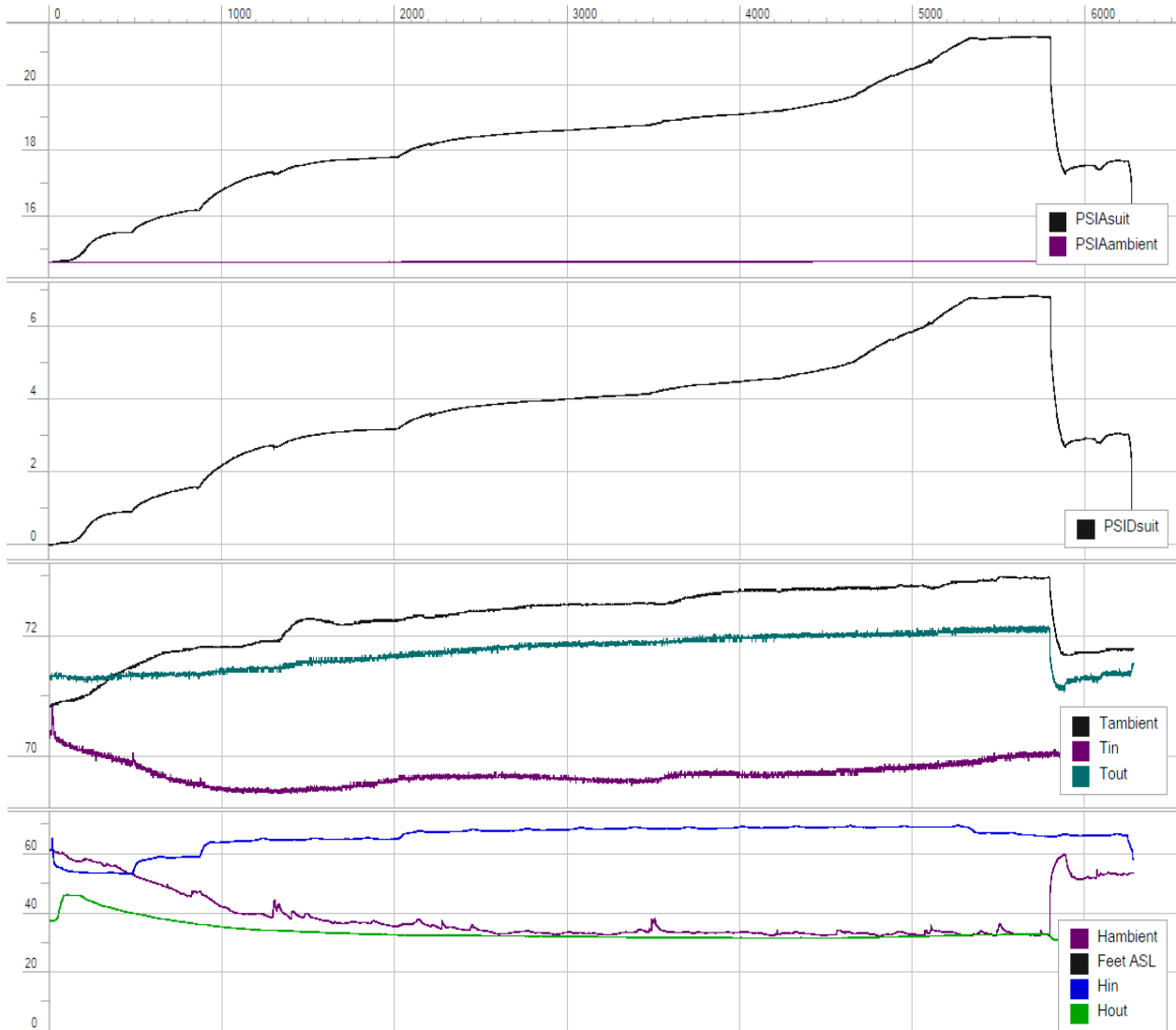


In the suited movement test demonstration, we were pleased to see ample user maneuverability through different postures. Further research is planned to assess range of motion and joint torques as well as vacuum chamber demonstrations in full space like conditions.

The day prior to the suited movement test, the bench top test took place over a period of 1.5 hours where the suit was verified for appropriate operation and reached pressures of 6.8 psid. From first-hand experience with NASA testing, Flagsuit protocol mirrors that of the space agency where a suit is tested to 1.5x operating pressure (structural test) prior to each round of human in suit testing.

Bench Top High Pressure Test

(x axis time in seconds, y axis pressure in pounds per square inch, or temperature in Fahrenheit)



Suited Movement Test

(x axis time in seconds, y axis pressure in pounds per square inch, or temperature in Fahrenheit)

