



Space Shuttle Helium Barrier Bag

PROBLEM:

Space shuttle main engine fuel lines required encapsulation with a removable device that could contain gaseous helium and ensure no build-up of flammable liquid hydrogen in the compartment.

SOLUTION:

A lightweight, inflatable, zip-on bag was designed that could be wrapped around the rocket engine's liquid hydrogen fuel lines. The bag is pressurized with helium gas to create a non-flammable atmosphere around the fuel line. The pressurized helium leaks out of the zipped closure and several bleed holes to maintain a continuous non-flammable gas environment around these lines and ensures that no explosive environmental conditions develop.



MATERIAL:

PTG-5 high performance PTFE coated fiberglass reinforced jacket combined with FEP-10 Teflon film end seals, and a Z-Track® closure made of FEP Teflon.

PTG-5 high performance PTFE coated fiberglass reinforced jacket
PTG-5

FEP-10 Teflon film
FEP-10

Z-Track (FEP) Closure
Z-Track® (FEP)

CONCLUSION:

The helium barrier bags successfully flew on every US Space Shuttle flight since their introduction to the program in the late 1980's.