



An Overview of Technical Textiles on Spacecraft Parachutes

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Background

Material and Textile Evaluation and Selection for Spacecraft Parachutes

Spacecraft Parachute Examples

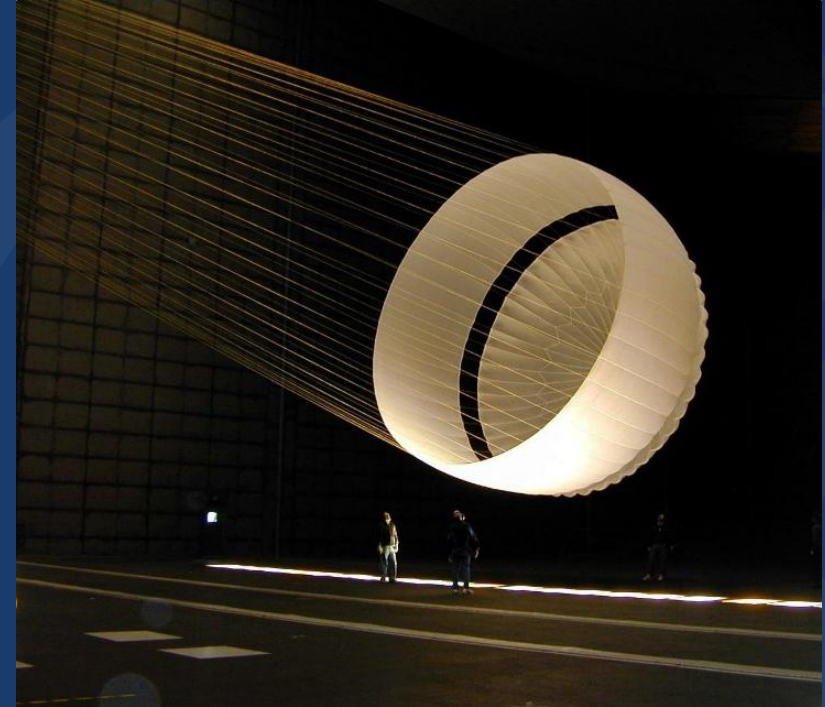
Composition and Structure

Finished Product Construction

Spacecraft Parachutes



Orion CPAS Drop Testing



MER Parachute Deployment Testing

Orion CPAS Materials



Orion CPAS Drop Testing

Materials

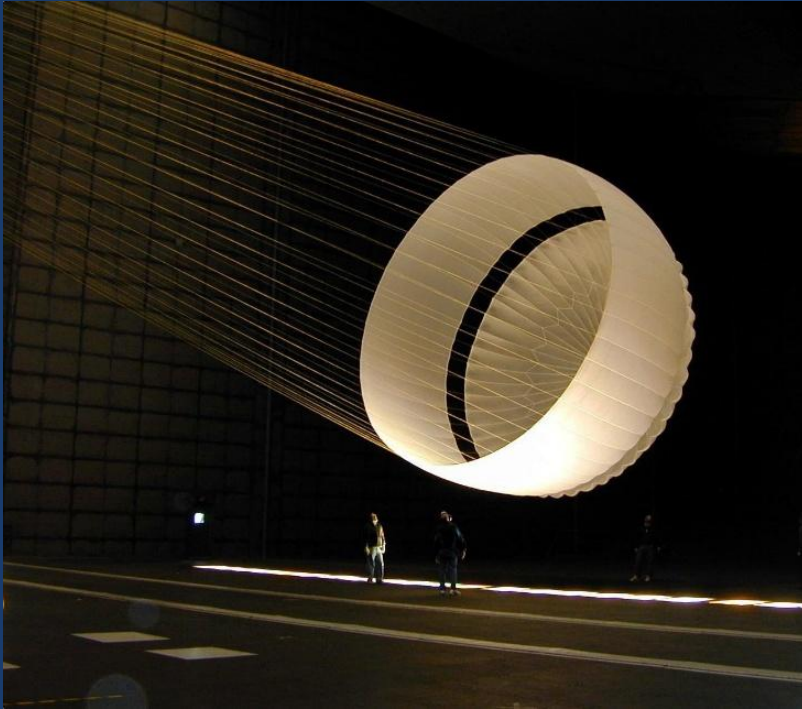
Forward Bay Cover- Kevlar

Drogue Parachute- Kevlar and nylon

Reefing Line Cutter Lanyard- Kevlar

Main Parachute Canopy- Nylon broadcloth

MER Parachute Materials



MER Parachute Deployment Testing

Materials

Deployment Bag Canopy-Vent Band Attachment-
Kevlar webbing

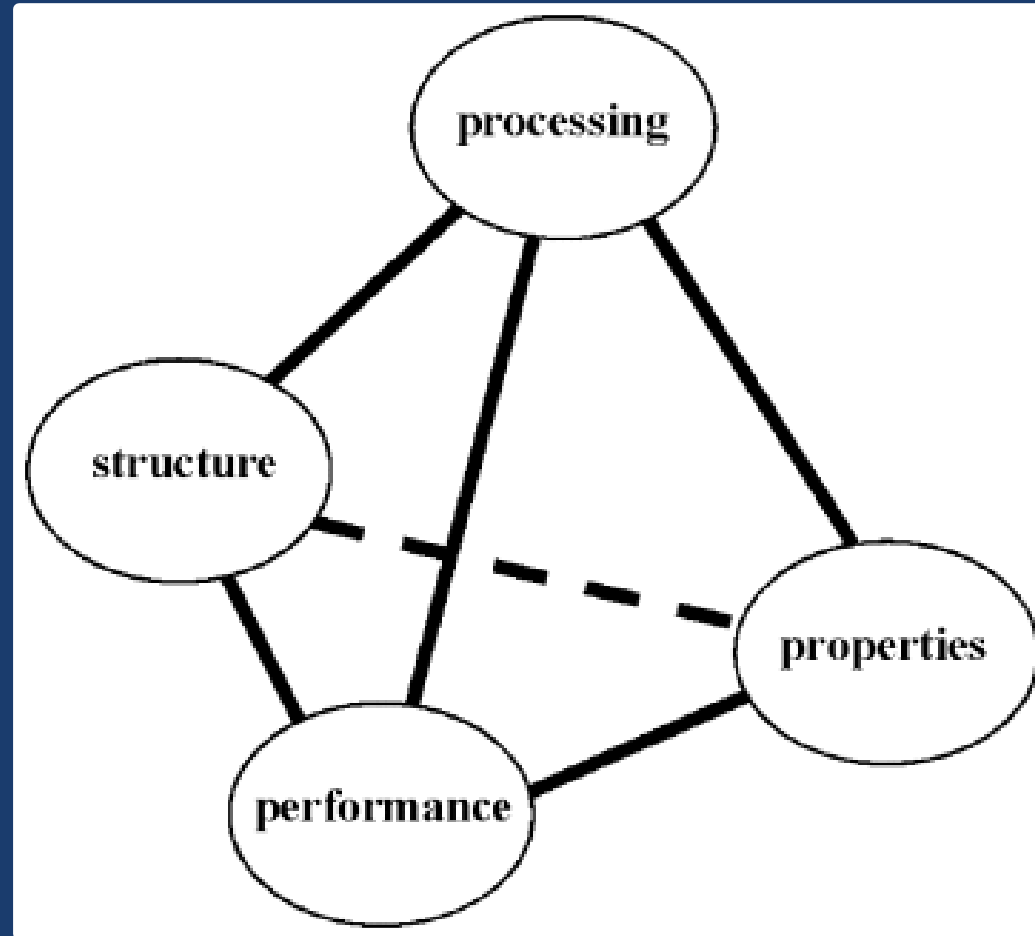
Deployment Bag Liner- Teflon fabric

Canopy Disk- Nylon, Mil-C-7020 Type I (Nylon 6,6
ripstop fabric)

Canopy Band- Polyester fabric

Suspension Lines- Kevlar cord

Materials Science Tetrahedron



Common Spacecraft Parachute Materials

Composition and Structure

Poly[imino(1,6-dioxo-1,6-hexanediyl)imino-1,6-hexanediyl] (Nylon 6,6)

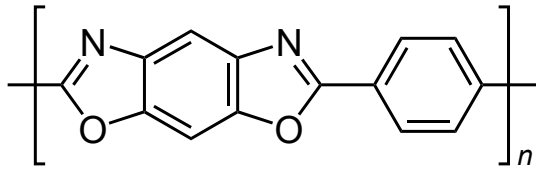
Poly(azanediyl-1,4-phenyleneazanediylterephthaloyl) (PPTA / Kevlar)

Poly(p-phenylene-2,6-benzobisoxazole (PBO / Zylon)

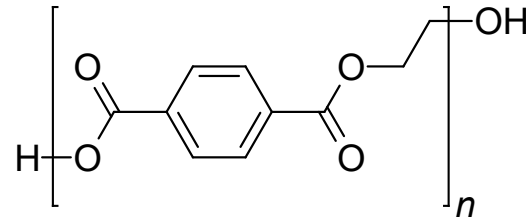
(Poly)ethylene Terephthalate (PET)

Polytetrafluoroethylene (PTFE)

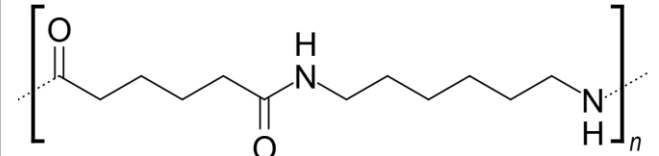
Composition and Structure



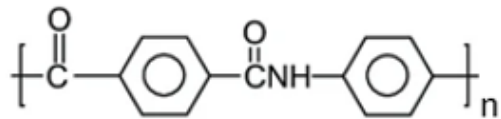
PBO Structure



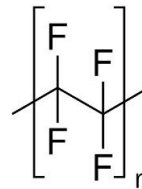
PET Structure



Nylon 6,6 Structure

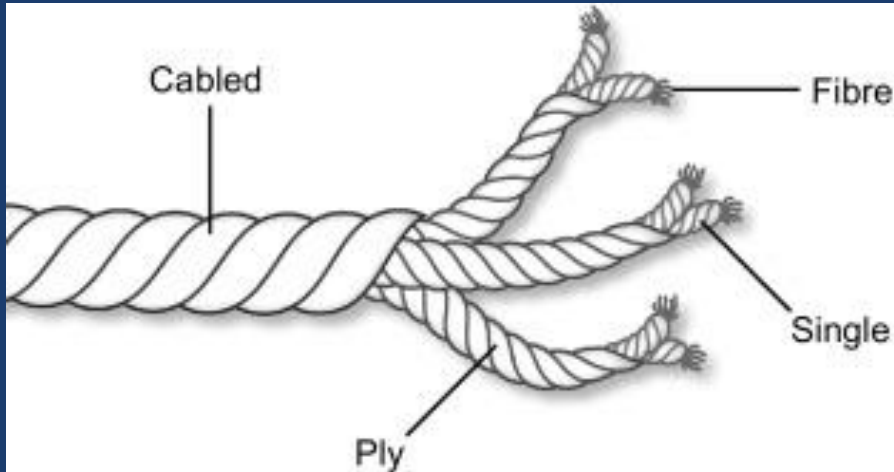


PPTA Structure

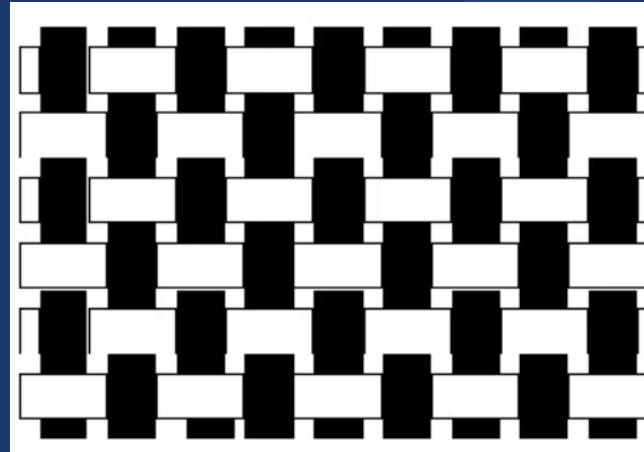


PTFE Structure

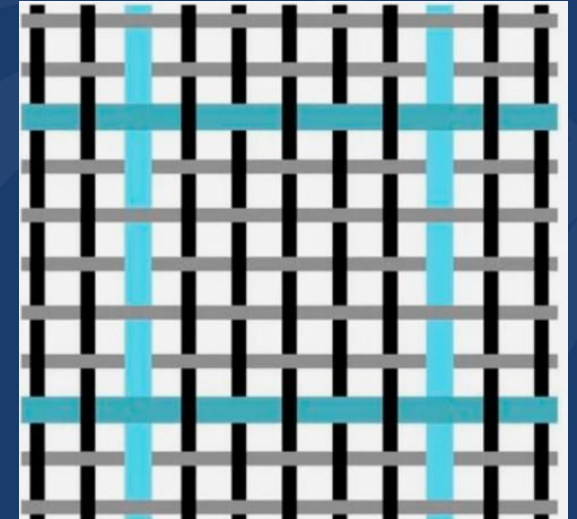
Finished Product Construction



Cord Construction



Plain Weave Fabric



Ripstop Fabric

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Thank You