

Mechanical and Fluid Systems

Dust Tolerant Quick Disconnect With Self-Sealing Barrier

Unique Filament Grid Removes Dust During Connector Mating

NASA Kennedy Space Center seeks partners interested in the commercial application of the Dust Tolerant Quick Disconnect With Self-Sealing Barrier. NASA's Kennedy Space Center (KSC) is offering companies licensing and partnering opportunities for the development and commercialization of this innovative technology. Designed at KSC, this technology is intended for use in dusty environments where dust particles can contaminate connectors resulting in wear on connector surfaces and unreliable connections. The Quick Disconnect (QD) employs columnar arrays of parallel filaments on both sides of a connector to remove dust from the connector surfaces prior to mating.

National Aeronautics and
Space Administration



BENEFITS

- Safety - maintaining cleanliness of umbilical connectors helps ensure connections are reliable, complete, and secure.
- Maintainability - extends connector life by reducing wear and tear on connector surfaces and gaskets caused by dust and debris.
- Cost Savings - clean connectors help reduce gas/fluid loss caused by leakage.

technology solution

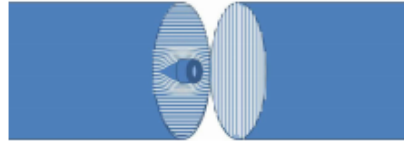


THE TECHNOLOGY

Dusty, dirty environments can be very tough on connectors. The abrasive nature of dust and dirt particles can rub and wear down connector surfaces through friction, and have a negative effect on coatings used on gaskets to seal equipment. Dust on umbilical connections can also make mating and de-mating electrical and fluid connections difficult, hazardous, and unreliable. NASA's Quick Disconnect (QD) design consists of columnar arrays of parallel filaments. All the pins of the electrical connector easily penetrate the barriers when the umbilicals are brought together. They are wiped clean of dust when they penetrate the barrier and mate cleanly and reliably. Likewise, the male end of a fluid connector penetrates the filament arrays of both connector ends. Since the filament arrays are oriented perpendicular to each other, the entire circumference of the connector is contacted by the filaments that stretch around, conform to, and sweep off dust from the mating surface ensuring a clean and secure connection.



Electrical Connector Protruding Through Filament Barrier



Fluid Connector Protruding Through Filament Barrier

APPLICATIONS

The technology has several potential applications:

- ➡ Oil and Gas Drilling
- ➡ Oil and Gas Installation, Repair, and Maintenance
- ➡ Commercial Space Applications
 - Breathing Air
 - Electrical/Fluid Transfers

PUBLICATIONS

Patent No: 9,620,888