

Luna Innovations has developed new uniform textiles with superhydrophobic and superoleophobic properties. These materials will resist fouling by water or oil based fluids for a high level of chemical protection and decreasing the logistical burden of laundering in the field

Problem

- Current chemical / biological warfare agent (CBWA) protective clothing have difficulties with excessive weight (e.g. activated carbon) or poor breathability (e.g. butyl rubber)
- Logistical burden is high to provide soldiers with washing facility in the field
- Performance and durability of an omniphobic (water and oil repellent) coating upon repeated flexing and abrasion is critical and depends on the coating material and application technique
- There is no commercially available solution to impart significant fluid resistance to fabrics that are compatible with ACU, FR-ACU, JSLIST overgarment, and other DOD currently fielded uniforms

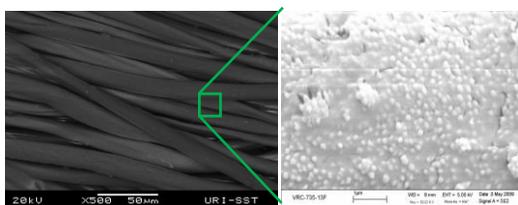
Luna's solution

Luna utilizes an extremely low surface energy nanostructured coating to generate an oil and water resistant surface. The benefits for self-cleaning surfaces with Luna's technology include compatibility with other fabric treatments, easy application and scale-up, breathable, lightweight, and durable under harsh conditions.



Luna's fluid resistant textile has distinct advantages in the following areas:

- Simple process – Luna's coating uses conventional fabric treatment process to be treated in any textile mill
- Inexpensive – No additional equipment is necessary, and processing costs are comparable to current processes; the coating formulation is produced from readily available materials
- Scalable - Luna has successfully demonstrated the coating of 400 yards of 60" fabric and 25 Army Combat Uniforms (ACU); both the chemistry and process can be easily scaled
- Environmentally responsible – Luna's coating is water based with no volatile organic compounds; the process is less energy intensive than other technologies (plasma deposition, microwave treatment, chemical vapor deposition)
- Low loading (<2% weight gain) results in excellent flexibility and air permeability for comfort and reducing heat exhaustion
- The inherent resistance of these materials to soiling with dirt, oils, or other chemicals will eliminate or minimize the amount of laundering required



Textile fiber with hydrophobic / oleophobic surface treatment

Fluids bead up without wetting surface



Water



Octane