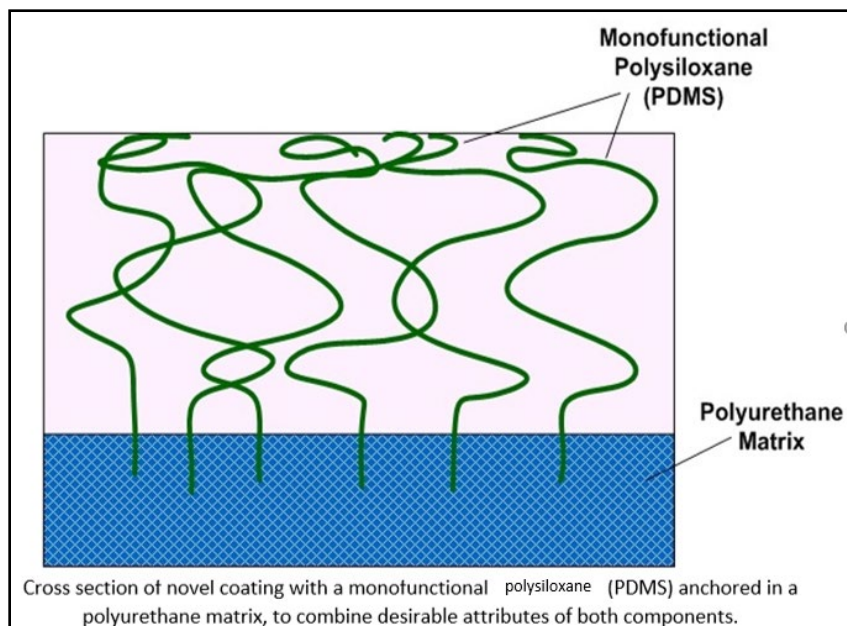


## NOVEL SILOXANE-POLYURETHANE COATINGS FOR ANTI-FOULING APPLICATIONS (RFT-231)

### Technology:

This NDSU invention describes a novel siloxane-urethane composition that may be used to form fouling-release coatings for applications such as protecting ship hulls and creating anti-graffiti paints. The coatings were developed from unique single-end-functional siloxane polymers, which are incorporated into polyurethane coatings and result in coatings having low surface energy but good adhesion and mechanical properties.



### Invention Summary:

This NDSU invention is based on the synthesis of (PDMS) Polydimethylsiloxane-modified polyurethane coatings to generate coatings that have low surface energy under water due to the crosslinking, and are tough with good adhesion to various substrates. Multiple components were mixed and applied to the substrate where the solvent evaporated and crosslinking took place. Due to the low surface energy of the PDMS, it preferentially rises to the surface of the coating. However, due to the organo-functional end groups, it reacts with the isocyanate and becomes incorporated into the polymer network. This process creates a self-stratifying coating which separates into two or more distinct layers upon application; an outer layer with low surface energy and one or more durable lower layers. The PDMS component forms the top, low-energy layer, and the polyurethane component forms the durable underlayer.

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**Benefits:**

- These NDSU coatings exhibit excellent adhesion and mechanical strength, and low surface energy, significantly improved over currently available silicone-based fouling release coatings.
- Coatings are self-stratifying (self-organize into two or more distinct layers upon application), with a low surface energy, low modulus top layer and a tougher lower layer.
- Potential commercial significance in applications related to marine antifouling coatings, anti-graffiti and others.

**Phase of Development:**

This technology has successfully completed laboratory testing with reproducible results.

**Patents:**

This technology is the subject of two issued US Patents; No. [8,299,200](#) and No. [8,604,152](#), and is available for licensing and partnering opportunities.

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