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MEMORANDUM FOR PRS (In-House Contractor Publication)

FROM: PROI (STINFO) 17 Dec 2001

SUBJECT: Authorization for Release of Technical Information, Control Number: **AFRL-PR-ED-AB-2001-243** Rusty Blanski; Justin Leland (ERC); Brent Viers; Shawn Phillips "Hybrid Inorganic-Organic Performance Fluids Based on Polyhedral Oligomeric Silsesquioxanes (POSS)" *ABSTRACT ONLY*

Materials Research Society Meeting **(Statement A)**
(San Francisco, CA, 1-6 April 2002) **(Deadline: 31 Jan 2002)**

1. This request has been reviewed by the Foreign Disclosure Office for: a.) appropriateness of distribution statement, b.) military/national critical technology, c.) export controls or distribution restrictions, d.) appropriateness for release to a foreign nation, and e.) technical sensitivity and/or economic sensitivity.
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PHILIP A. KESSEL Date
Technical Advisor
Space and Missile Propulsion Division

HYBRID INORGANIC-ORGANIC PERFORMANCE FLUIDS BASED ON POLYHEDRAL OLIGOMERIC SILSESQUIOXANES (POSS)

Rusty Blanski, Justin Leland, Brent Viers and Shawn H. Phillips

Performance fluids that operate at high temperature can be useful for many applications including highly efficient automobile engines and jet turbines. One challenging aspect to this project is to increase the use temperature of the performance fluid while maintaining low temperature pourability. One possible solution to this hurdle is to combine the high temperature stability of a silsequioxane framework with the lubricity of hydrocarbons. Data will be presented on a wide variety of POSS alkyls were synthesized to test the various POSS frameworks for temperature stability and pourability at lower temperatures. Thermal and viscosity data will also be discussed.