ADN Now a Viable Ingredient for Propellant and Explosive Formulations

S0753 - Ammonium Dinitramide Manufacturing Technology (ADN)

OBJECTIVE

This project developed the technology to reduce the manufacturing cost of ammonium dinitramide (ADN) from between $3,000 to $5,000/lb for laboratory scale quantities, to less than $100/lb for pilot scale production quantities. Pure ADN is very hygroscopic, has poor thermal stability and has needle-like morphology, which make it extremely difficult to process. The Navy's Energetics Manufacturing Technology Center (EMTC), ATK Launch Systems, and SRI International have developed a prilling process for manufacturing spherical propellant-grade ADN that alleviates these shortcomings.

PAY OFF

ADN is now an affordable and viable energetic material for propellant and explosive formulations and can have broad applications for rocket propulsion and warheads, such as tactical and strategic missiles, torpedoes, undersea explosives, and a variety of ordnance devices. ADN shows unique promise as a minimum smoke propellant ingredient compared to other current or projected energetic oxidizers. Use of ADN is expected to reduce rocket motor signature and weight, increase specific impulse and increase underwater explosive bubble energy.

IMPLEMENTATION

A pilot production unit capable of producing over one pound per day of this material has been evaluated and implemented at ATK Launch Systems. Prilled stabilized ADN is now available at the multi-hundred pound scale, and future needs could be met by the installation of a larger prilling tower with increased capacity. The Navy ManTech Program served as a bridge between the laboratory discovery and the availability of a mature production material.

Period of Performance
Sep 1995 to Jan 2000

Stakeholder
ONR Generic

Performing Activity
EMTC

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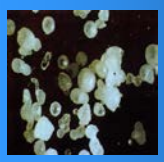
Unprocessed ADN



Prilled ADN

Prototype Prilling Tower

Total ManTech Investment
$1,335,000

Please visit the Navy EMTC Web site:
http://www.navsea.navy.mil/nswc/indianhead/codeCA/EMTC/main.aspx
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