
Opportunity

Seeking a licensing and development partner to scale into manufacturing.

Development Stage

Validated in the lab

Intellectual Property

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Safer Method to Manufacture TNT-Coated High Explosive Particles

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PROBLEM STATEMENT

Trinitrotoluene (TNT) is often mixed with High Explosives (HEs) to desensitize and solidify them. TNT-coated HEs have traditionally been manufactured by either melt pour casting or melt cast and pressed. Both methods have significant drawbacks. Melt pour casting often yields inconsistent charges due to variations in TNT density and crystallinity influenced by cooling rate. Similarly, melt cast and pressed lack the necessary control over the particle size density needed within a pressed charge. There is a need for a method to make safe, affordable, and consistent HE:TNT charges.

SOLUTION

Researchers at Missouri University of Science and Technology have developed a novel method TNT coated HE powder-making process using trinitroperhydro triazine (RDX) as the HE. Utilizing powdered HE dispersed in boiling water allows the TNT to slowly melt in solution for uniform coating. Under microscopy, the new powder consisted of individually coated HE particles. Sensitivity testing showed that the new powder was less sensitive to friction than both powdered HE and crushed TNT. Compared to melt cast charges, the pressed TNT coated HE powder demonstrated the most consistent density and performance and had the highest relative effectiveness.

VALUE PROPOSITION

The new method for making consistent and press-able TNT/HE charges is a step forward in manufacturing economical, scalable, and safer consistent HE:TNT charges. The new coated powder charge was found to have the highest relative effectiveness of all charges with a higher detonation pressure and faster reaction rate.