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Chemring Nobel product compositions – Alkyl-NENA

Alkyl-NENA Energetic Plasticisers

Butyl NENA (known as BuNENA) is a member of the family of energetic plasticizers known as NENA's (Nitrato Ethyl Nitramines).

NENA's possess both a nitrate ester and a nitramine moiety, and consequently are of high interest to both the gun propulsion and IM rocket propulsion communities. This should also make them of interest to the IM explosive community. NENA's offer several benefits as energetic materials. Their most outstanding properties are:

- They readily plasticize cellulosic polymers (such as nitrocellulose, ethyl cellulose, and cellulose acetate butyrate), GAP, poly NMMO, and poly GLYN to yield new families of solid propellants
- They offer low molecular weight combustion gases, so they provide higher impetus at any given flame temperature than do conventional gun propellant ingredients
- Their melting points and glass transition temperatures are not sharply defined, so they freeze in a gradual fashion
- Eutectic mixtures of various NENA's are possible. These exhibit lower melting points than conventional nitrate esters, offering the promise of better low temperature mechanical properties
- As opposed to conventional nitrate esters, the alkyl-NENA's do not impose any impact sensitivity issues.
- Thermal stability appears to be greater than conventional nitrate esters of similar heat of explosion
- The butyl version BuNENA is unresponsive to #8 blasting cap.
- NENA's offer a wide spectrum of burning rate and ballistic performance for both gun and rocket propulsion
- They provide a low risk approach to new advanced solid propellants.
  A large family of alkyl NENA's is available — methyl, ethyl, propyl, and butyl, among others — offering a wide range of heats of explosion from a maximum of 1113 cal/gram (MeNENA) to 259 cal/gram (BuNENA), and even lower for the higher molecular weight homologues.

Further information can be provided if requested.

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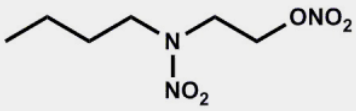
Bu-NENA key data

Product name: Bu-NENA

Chemical structure:



Formula: $C_6H_{13}N_3O_5$

Chemical name:

N-butylnitratoethylnitramine

Appearance: Light amber, oily liquid

Molecular weight: 207.2

Melting point: -27 °C

Density: 1.22 g/cm^3

Transport classification: 1.3C

UN-number: 0477, 0190

CAS no.: 82486-82-6

REACH Reg No.:

In progress

EC no.: 279-976-7

Safety Data Sheet: MSDS Butyl-NENA