MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE / AND OF THE COMPANY

Product name: HNS
Chemical name: 2,2’,4,4’,6,6-Heksanitrostilben
Producer/supplier: Chemring Nobel AS, High Energy Materials
Address: Engeneveien 7, N-3475 Saetre, Norway.
Telephone - Telefax: +47 3227 8600 - +47 3227 8610

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>Formula</th>
<th>CAS-No.</th>
<th>Contents:</th>
<th>Warning symbols:</th>
<th>R-phrases:</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNS</td>
<td>( \text{C}_14\text{N}<em>6\text{O}</em>{12}\text{H}_6 )</td>
<td>20062-22-0</td>
<td>60-100 %</td>
<td>Xn E</td>
<td>R-2, R-20/22</td>
</tr>
</tbody>
</table>


3. HAZARDS IDENTIFICATION

Harmful by inhalation and ingestion

Risk of explosion by shock, friction, fire or other sources of ignition.

4. FIRST AID MEASURES

General:
Remove the patient from the source of exposure immediately. Normal first aid. Keep calm and warm in fresh air. If unconsciousness, loose tight-fitting clothes and place in a stable side lying position. If breathing has stopped, give artificial respiration aid and if hearth has stopped, give hearth compression. SEEK MEDICAL ATTENTION.

Ingestion:
Conscious people: Induce vomiting (a finger in the throath or large quantities of milk). Keep head low to avoid content in stomach to reach lungs. Seek medical attention.

Eyes:
Flush immediately with water for at least 15 minutes. Obtain medical aid if irritation persists.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:
Automatic sprinkler system. Use only remote controlled fire extinguishing system.

Do not use fire extinguishing powder.
Fire in explosives:
Do not attempt to extinguish the fire, as an explosion may occur. Evacuate immediately.
In case of fire and/or explosion, do not breath fumes.

Preventive measures:
Store only in a permanent magazine.
No naked lights.
No smoking or use of open fire.

6. ACCIDENTAL RELEASE MEASURED

Safety precautions:
Avoid impact, friction or other sources of ignition. Risk of explosion.
Avoid skin contact and breathing of vapors. Use necessary personal protection.

Environmental precaution:
Production as far as possible in protected systems. Containers must be well closed. Working place and methods must be planned in such a way that direct contact with HNS is avoided and potential wastage from leaking production kettles can be taken care of before contaminating the sewage system.

Waste shall be moistened and collected 100 % together with possible contaminated soil and put into separate container. Store waste in closed containers.

7. HANDLING AND STORAGE

Handling:
Risk of explosion by shock, friction, fire or other sources of ignition. Handle with care.

Storage:
Stored in tight closed containers and only in places approved for explosives.
Smoking and use of open fire near explosives is prohibited.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

HTP values:
Dust exposure: 10 mg/m$^3$ (1979 ACGIH).

General:
Avoid skin contact and breathing of dust.

Breath protection:
Use mask with dust filter.

Hand protection:
Tightly lined gloves of plastic, or plastic gloves with cotton inside glove.

Skin protection:
Use protective clothing to avoid spill on the skin.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Powder</td>
</tr>
<tr>
<td>Colour</td>
<td>Yellow-brown</td>
</tr>
<tr>
<td>Odour</td>
<td>None</td>
</tr>
<tr>
<td>Melting point</td>
<td>316 °C (decomposes)</td>
</tr>
<tr>
<td>Density / filling weight</td>
<td>1.7 / 0.2-0.7 g/ cm$^3$</td>
</tr>
<tr>
<td>Decomposition temp.</td>
<td>316 °C</td>
</tr>
<tr>
<td>Solubility</td>
<td>Not soluble in water or alcohol.</td>
</tr>
<tr>
<td>Soluble in DMF</td>
<td></td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Stability:
Impact, friction, electrostatic spark, open fire or other sources of ignition can lead to explosion. Burning of large amount can lead to explosion. Heating under confinement can lead to explosion.

Reactive compounds:
Strongly oxidizing compounds, as nitric acid.

Hazardous decomposition products:
Nitrous fumes.

11. TOXICOLOGICAL INFORMATION

Skin irritation : None
Eye irritation (rabbit) : Mild and passing irritation
Oral rat (single oral dose toxicity), LD<sub>50</sub> : >4000 mg/kg
Rabbit (single dose percutaneous toxicity) : >2000 mg/kg

Positive bio-activity by HNS is registrated in Ames test (weak mutagen). HNS can thus be regarded having a possible health risk.

Pregnant women shall not work with HNS.

12. ECOLOGICAL INFORMATION

No data available, but possibly the same biodegradation effect as with TNT (BOD 0.5 g/g, COD 1.2 g/g, BOD/COD 0.4).

No toxicity data.

13. DISPOSAL CONSIDERATIONS

Explosion risk. Small quantities of HNS may be dissolved in dimethylformamide or aceton and burned. Solid HNS together with organic material can be burned in an open flame on safe distance by destruction experts.

National regulations for handling explosives must be followed.

14. TRANSPORT INFORMATION

General:
The packing (cardboardbox/drum) is signed with explosion label tradename, UN-number, lot and chargenumber, production month/year, net- and grossweight and transport class. The cardboardbox/drum is type proved according to UN Transport of Dangerous Goods.
Transport and danger class:
UN No.: 0392
Sea/land (IMDG/ADR/RID): Class 1.1 D

15. REGULATORY INFORMATION

Classification:

Letter code on packing:
Xn - HARMFUL
E – EXPLOSIVE

Composition:
HNS (Hexanitrostilbene) 60-100 %

Risk phrases:
R-2: Risk of explosion by shock, friction, fire or other sources of ignition.
R-20/22: Harmful by inhalation and if swallowed.

Safety phrases:
S-22: Do not breathe dust.
S-35: This material and its container must be disposed of in a safe way.

National regulations:
Based on Norwegian regulations.

16. OTHER INFORMATION

Prepared by: Richard Gjersøe

Superseding safety data sheet dated:

References:
HNS Material Safety Data Sheet, Chemtronics Inc., USA.


Suppliers notes:

Users notes: