



Material Safety Data Sheet

Preparation Date: 16-Jun-2004

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Revision Number: 2

SECTION 1 – PRODUCT AND COMPANY IDENTIFICATION

Supplier(s):

Orica Canada Inc.
Maple Street
Brownsburg, QC

Orica USA Inc.
33101 E. Quincy Avenue
Watkins, CO 80137-9406
For MSDS Requests: 1-303-268-5000

For MSDS Requests: 1-450-533-4201

Product Name: Ammonium Nitrate Fuel Oil

Product Code: 125

Alternate Name(s): AMEX™, ANFO

UN-No: UN0331

Recommended Use: A booster sensitive blasting agent.

Emergency Telephone Number: FOR CHEMICAL EMERGENCIES (24 HOUR) INVOLVING TRANSPORTATION, SPILL, LEAK, RELEASE, FIRE OR ACCIDENTS: **IN CANADA CALL:** THE ORICA TRANSPORTATION EMERGENCY RESPONSE SYSTEM AT **1-877-561-3636. IN THE U.S. CALL: CHEMTREC 1-800-424-9300. IN THE U.S.:** FOR LOST, STOLEN, OR MISPLACED EXPLOSIVES CALL: BATF **1-800-800-3855.** FORM ATF F 5400.0 MUST BE COMPLETED AND LOCAL AUTHORITIES (STATE/MUNICIPAL POLICE, ETC.) MUST BE ADVISED.

SECTION 2 – HAZARD IDENTIFICATION

Emergency Overview:

Risk of explosion by shock, fire of other sources of ignition. If misused or disposed of improperly, material could explode and cause death or serious injury. This product contains one or more substances, which are classified in the EU as carcinogenic, mutagenic and/ or reprotoxic. Irritating to eyes, respiratory system and skin. Harmful if swallowed. Oxidizing agent.

Appearance:
Off-white prills

Physical State:
Solid

Odor:
Diesel fuel oil

SECTION 3 – COMPOSITION/ INFORMATION ON INGREDIENTS

Chemical Name
Ammonium Nitrate
Fuels, Diesel, no. 2

CAS-No
6484-52-2
68476-34-6

Weight %
60-82
5-10

SECTION 4 – FIRST AID MEASURES

General Advice: In case of accident or if you feel unwell, seek medical advice IMMEDIATELY (show the product label where possible).

Eye Contact: Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Immediate medical attention is required.

Skin Contact: Wash off immediately with soap and plenty of water, removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.

Ingestion: Immediate medical attention is required. Do not induce vomiting. Clean mouth with water and afterwards drink plenty of water. If spontaneous vomiting occurs, have victim lean forward with head

positioned to avoid breathing in of vomitus, rinse mouth and administer more water. Never give anything by mouth to and unconscious person.

Notes to physician: Symptomatic. Administer oxygen if there are signs of cyanosis. If clinical condition deteriorates, administer 10cc Methylene Blue intravenously. It is unlikely for this to be required with methemoglobin level of less than 40%.

SECTION 5 – FIRE-FIGHTING MEASURES

Flammable properties: Not itself combustible but assists fire in burning materials. The product does not flash. Rate of burning: does not sustain burning at atmospheric pressure.

Suitable extinguishing media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Evacuate surrounding areas. When controlling fire before involvement of explosives, fire-fighters should wear positive pressure self-containing breathing apparatus (SCBA) and full turnout gear. Water may be applied through fixed extinguishing system (sprinklers) as long as people need not be present for the system to operate.

Unsuitable extinguishing media: DO NOT FIGHT FIRES INVOLVING EXPLOSIVES. Attempts to smother a fire involving this product will be ineffective as it is its own oxygen source. Smother this product could lead to decomposition and explosion. This product is more sensitive to detonation if contaminated with organic or oxidisable material or if heated while confined. Unless the mass of product on fire is flooded with water, re-ignition is possible.

Specific hazards arising from the chemical: This product is a high explosive with mass detonation hazard. DO NOT FIGHT FIRES INVOLVING EXPLOSIVE MATERIALS. Immediately evacuate all personnel from the area to a safe distance. Guard against re-entry. Thermal decomposition can lead to release of irritating gases and vapors.

Protective equipment and precautions for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH approved (or equivalent) and full protective gear.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Methods for containment: Avoid dust formation. Do not breathe dust.

Methods for cleaning up: Avoid the use of metal tools containing iron and/or copper. Be careful to avoid shock, friction, and contact with grit. Collect product for recovery or disposal. For release to land, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Collect contaminated soil and water, and absorbent for proper disposal. Notify applicable government authority if release is reportable or could adversely affect the environment.

Other information: Deactivating chemicals: Not applicable.

SECTION 7 – HANDLING AND STORAGE

Handling: This product is an explosive and should only be used under the supervision of trained personnel. The use of coveralls is recommended. Use good industrial hygiene and housekeeping practices. Keep away from open flames, hot surfaces and sources of ignition.

Storage: Store under moderate temperatures recommended by a technical services representative. Store under dry conditions in a well ventilated magazine that has been approved for either detonator storage or explosive storage. Do NOT store explosives in a detonator magazine or detonators in an explosive magazine. Keep away from heat, spark and flames. Keep containers closed. Explosives should be kept well away from initiating explosives; protected from physical damage; separated from oxidizing materials; combustibles, and sources of heat. Keep away from incompatibles. Ideal storage temperature is 10-27°C (50-80°F). Do not expose sealed containers to temperatures above 40°C (104°F).

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|----------------------|-------------------------------------|----------|------------|
| Fuels, Diesel, no. 2 | TWA: 100 mg/ m ³ Skin | | |

| | |
|--------------------------------------|--|
| Other exposure guidelines: | Ammonium Nitrate: ORICA Guideline 5 mg/m ³ (internal TWA). |
| Engineering Measures: | No information available. |
| Personal Protective Equipment | |
| Eye/Face Protection: | Tightly fitting safety goggles. |
| Skin Protection: | User should verify impermeability under normal conditions of use prior to general use. Impervious butyl rubber gloves. |
| Respiratory Protection: | In case of insufficient ventilation wear suitable respiratory equipment. A NIOSH-approved respirator, if required. |
| Hygiene Measures: | Handle in accordance with good industrial hygiene and safety practice. Recommendations listed in this section indicate the type of equipment, which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace. |

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|----------------------------------|-------------------|---|---|
| Appearance: | Off-white prills | Odor: | Diesel fuel oil |
| Physical State: | Solid | Viscosity: | No information available |
| pH: | No data available | Flash Point: | 52°C/ 126°F (Diesel fuel) |
| Autoignition Temperature: | 230- 265°C | Boiling Point/Range: | None |
| Melting Point/Range: | 170°C/ 338°F | Flammable Limits (Upper): | Not Applicable |
| Flammable Limits (Lower): | Not Applicable | Explosion Power: | 350-400 kJ/ 100g |
| Specific Gravity: | No data available | Water Solubility: | Dissolves slowly with prolonged exposure to water |
| Other Solubility: | Not available | Vapor Pressure: | 0.4 mmHg @ 20°C /68°F (diesel fuel oil) |
| Oxidizing Properties: | Oxidizer | Partition Coefficient (n-octanol/water): | No data available |

SECTION 10 – STABILITY AND REACTIVITY

| | |
|--|--|
| Stability: | Stable under normal conditions. Decomposition Temperature: Ammonium Nitrate will spontaneously decompose at 210°C (410°F). |
| Conditions to avoid: | Keep away from open flames, hot surfaces and sources of ignition. Not expected to be sensitive to static discharge. Not expected to be sensitive to mechanical impact. |
| Incompatible materials: | Avoid oxidizable materials, metal powder, bronze & copper alloys, fuels (e.g. lubricants, machine oils), fluorocarbon lubricants, acids, corrosive liquids, chlorate, sulphur, sodium nitrite, charcoal, coke and other finely divided combustibles. Strong oxidizing and reducing agents. |
| Hazardous decomposition products: | The following toxic decomposition products may be released. At temperatures above 210°C, decomposition may be explosive, especially if confined. Nitrogen oxides (NOx). Carbon oxide. Hydrocarbons. |
| Hazardous Polymerization: | None under normal processing. Hazardous polymerization does not occur. Explosive material under shock conditions. |

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information: Irritating to eyes. May cause skin irritation. Harmful if swallowed.

| Chemical name | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|----------------------|-----------------|--------------------|-------------------|
| Ammonium Nitrate | 2217 mg/kg Rat | 3000 mg/kg Rabbit | 88.8 mg/L Rat 4 h |
| Fuels, Diesel, no. 2 | >5000 mg/kg Rat | >5000 mg/kg Rabbit | |

Subchronic Toxicity (28 Days): Ammonium Nitrate: Ingestion may cause methemoglobinemia. Initial manifestation of methemoglobinemia is cyanosis, characterized by navy lips, tongue and mucous membranes, with skin color being slate grey. Further manifestation is characterized by headache, weakness, dyspnea, dizziness, stupor, respiratory distress and death due to anoxia. If ingested, nitrates may be reduced to nitrites by bacteria in the digestive tract. Signs and symptoms of nitrite poisoning include methemoglobinemia, nausea, dizziness, increased heart rate, hypotension, fainting and, possibly shock.

Chronic Toxicity: May cause methemoglobinemia.
Carcinogenicity: The table below lists whether each agency has listed any ingredient as a carcinogen.

| Chemical Name | ACGIH | IARC | NTP | OSHA |
|----------------------|-------|------|-----|------|
| Fuels, Diesel, no. 2 | A3 | | | |

Legend: A3: Confirmed animal carcinogen.
Mutagenic effects: There is no evidence of mutagenic potential.
Irritation: Irritating to eyes. May cause irritation of respiratory tract. May cause skin irritation in susceptible persons.
Reproductive effects: No information is available and no adverse reproductive effects are anticipated.
Developmental effects: No information is available and no adverse developmental effects are anticipated.
Target Organ: Eyes, skin, respiratory system, blood, kidney, liver, urinary tract, blood, endocrine system, immune system & gastrointestinal tract (GI).

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity effects: Dissolves slowly in water. Harmful to aquatic life at low concentrations.
Environmental Effects: Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

Persistence/Degradability: Some water resistance but soluble with extended time periods.
Mobility in Environmental media: Dissolves slowly in water.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method: Burn under supervision of an expert at an explosive burning ground or destroy by detonation in boreholes, in accordance with applicable local, provincial and federal regulations. Call upon the services of an Orica Technical Representative.

SECTION 14 – TRANSPORT INFORMATION

DOT Proper Shipping Name: Explosive, blasting type B
Hazard Class: 1.5D
UN-No: UN0331
Packing group: II

TDG Proper Shipping Name: Explosive, blasting type B
Hazard Class: 1.5D
UN-No: UN0331
Packing group: II

Transportation Emergency Telephone Number: 1-877-561-3636 or CHEMTREC: 1-800-424-9300

SECTION 15 – REGULATORY INFORMATION

CANADIAN CLASSIFICATION: This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS contains all the information required by the CPR

WHMIS hazard class: This product is an explosive and is not regulated by WHMIS.

USA CLASSIFICATION:

SARA Regulations Sections 313 and 40 CFR 372: This product contains the following toxic chemical(s) subject to reporting requirements, Ammonium Nitrate (6484-52-2) & Fuels, Diesel no.2 (68476-34-6).

SARA 311/312 Hazardous Categorization

Acute Health Hazard: Yes
Chronic Health Hazard: Yes
Fire Hazard: Yes
Reactive Hazard: Yes
Sudden Release of Pressure Hazard: No

Ozone Protection and 40 CFR 42: No reportable quantities of ozone depleting agents

Other Regulations/Legislations which apply to this product: New Jersey Right-to-Know, Pennsylvania Right-to-Know, Massachusetts Right-to-Know, Rhode Island Right-to-Know, Florida, New Jersey Special Health Hazard Substance List, Minnesota Hazardous Substance List, California Director's List of Hazardous Substances, California Proposition 65.

TSCA: Complies

DSL: Complies

NDSL: Complies

The components in the product are on the following international inventory lists:

| Chemical Name | TSCA | DSL | NDSL | ENCS | EINECS | ELINCS | CHINA | KECL | PICCS | AICS |
|----------------------|------|-----|------|------|--------|--------|-------|------|-------|------|
| Ammonium Nitrate | X | X | - | - | X | - | X | X | X | X |
| Fuels, Diesel, no. 2 | X | X | - | X | X | - | X | X | X | X |

Legend: X – Listed

SECTION 16 – OTHER INFORMATION

Prepared by: Safety Health & Environment
303-268-5000

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End of MSDS