1,4SHIP (1,4-DIMETHYLNAPHTHALENE)
MATERIAL SAFETY DATA SHEET
Revision Date: May 31, 2012

EMERGENCY TELEPHONE NUMBER: PERS 1-800-633-8253

SECTION 1: MANUFACTURER'S INFORMATION

D-I-1-4, a division of 1,4GROUP, Inc.
P.O. Box 860
Meridian, ID 83680
Telephone: 208-887-9766

SECTION 2: PRODUCT IDENTITY

TRADE NAME: 1,4SHIP®
CHEMICAL NAME: 1,4-Dimethylnaphthalene (1,4-DMN)
COMMON NAME: 1,4-DMN
CAS #: 571-58-4
CHEMICAL FAMILY: Alkyl-substituted naphthalene
CHEMICAL FORMULA: $C_{12}H_{12}$
EPA REGISTRATION NUMBER: 67727-4

SECTION 3: HAZARDOUS INGREDIENTS

EPA PESTICIDE PRECAUTION: WARNING
INGREDIENTS STATEMENT

1,4-Dimethylnaphthalene:	63.8%
Other Ingredients:	36.2%

SECTION 4: PHYSICAL DATA (for 1,4-DMN)

COLOR: Pale yellow @ 21°C
PHYSICAL STATE: Clear liquid @ 21°C
ODOR: Petroleum distillate @ 21°C
BOILING POINT: 264°C @ 744 mm Hg
MELTING POINT: 5°C
SPECIFIC GRAVITY (H_2O=1): 1.014 (25°C/25°C)
pH: 5.9
VISCOSITY: 6 cps @25°C @ 12 and 30 rpm
SOLUBILITY: Water = 5.1 ppm @ 25°$\pm$1°C

VAPOR PRESSURE (Air =1): 1.88×10^{-2} mm of mercury @ 25°C (2.5 Pa @ 25°C)
4.85×10^{-2} mm of mercury @ 35°C (4.85 Pa @ 35°C)
8.75×10^{-2} mm of mercury @ 45°C (11.7 Pa @ 45°C)
FLASH POINT: 122°C @ 760 mm Hg (Pensky-Martens Closed Tester)
EXPLODABILITY: Not explosive @ 25°C @ minimum drop height of 32.25 inches

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY: Extremely Flammable. Will support combustion and decompose under fire conditions to form toxic organic materials and toxic/corrosive oxides of carbon and nitrogen.
FLASH POINT: -134°F
EXTINGUISHING MEDIA: Water spray, CO_2, foam, or dry chemical.
SPECIAL FIRE FIGHTING PROCEDURES: As in any fire, prevent exposure to smoke, fumes, and products of combustion. Keep containers cool using water spray to avoid bursting. Use appropriate equipment to protect personnel from bursting containers. Evacuate non-essential personnel. Fire fighters should wear NIOSH/MSHA-approved full-face, self-contained breathing apparatus and impervious clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Contents under pressure. Do not use near fire, sparks, or flame. Do not puncture or incinerate container. Exposure to temperatures above 120EF may cause container to burst.

SECTION 6: TOXICOLOGY/HEALTH HAZARD DATA

ACUTE LD_{50} ORAL = 2730 mg/kg (rats)
ACUTE LD_{50} DERMAL > 2000 mg/kg (rabbits)
ACUTE LC_{50} INHALATION > 4.2 mg/L (rats); 4-hour exposure
SKIN IRRITATION: Can cause moderate irritation
EYE IRRITATION: Can cause moderate irritation
HYPERSENSITIVITY: Did not cause hypersensitivity reaction (guinea pigs)
HYPERSENSITIVITY INCIDENTS: None
MUTAGENICITY - **Gene Mutation**: Non-mutagenic
MUTAGENICITY- **Micronucleus Assay**: Non-mutagenic
MUTAGENICITY- Unscheduled DNA Synthesis: Non-mutagenic
CARCINOGENICITY: Not listed as a carcinogen by IARC, NTP, ACGIH or OSHA

SECTION 7: ENVIRONMENTAL HAZARDS

AVIAN ACUTE ORAL TOXICITY: LD_{50} >2000 mg/kg (Bobwhite quail)
FRESHWATER FISH TOXICITY: LC_{50} = 0.67 mg/L (Rainbow trout)
FRESHWATER INVERTEBRATE TOXICITY: LC_{50} = 0.56 mg/L (*Daphnia magna*)

This product is highly toxic to freshwater fish and aquatic invertebrates.
Do not contaminate water by disposal of can wash waters.

SECTION 8: EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure by inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure

ROUTES OF EXPOSURE: The primary routes of exposure are inhalation and skin contact.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: There are no medical conditions that are known to be aggravated by exposure to this product.
ACUTE EXPOSURE: Can cause substantial but temporary eye injury. Harmful if swallowed. Do not get in eyes, on skin, or on clothing. Wear goggles, face shield or safety glasses. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove and wash contaminated clothing before reuse.
EMERGENCY AND FIRST AID PROCEDURES

If in eyes	▫ Hold eye open and rinse slowly and gently with water for 15-20 minutes. ▫ Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. ▫ Call a poison control center or doctor for treatment advice.
If swallowed	▫ Call a poison control center or doctor immediately for treatment advice. ▫ Have person sip a glass of water if able to swallow. ▫ Do not induce vomiting unless told to do so by a poison control center or doctor. ▫ Do not give anything by mouth to an unconscious person.
If on skin or clothing	▫ Take off contaminated clothing. ▫ Rinse skin immediately with plenty of water for 15-20 minutes. ▫ Call a poison control center or doctor for treatment advice.

SECTION 9: REACTIVITY DATA

STABILITY: No decomposition for 14 days @ 55°C in dark
13.7% decomposition for 14 days @ 55°C in light
No decomposition for 1 hour @ l00°C in presence of Al, Fe, and Sn powders

HAZARDOUS POLYMERIZATION: Will not occur.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide and nitrogen oxides may form during combustion.

SECTION 10: LEAK PROCEDURES

For spill, leak, fire, exposure, or accident call PERS 1-800-633-8253.
STEPS TO BE TAKEN IF MATERIAL IS RELEASED: Immediately evacuate the area and provide maximum ventilation. Remove all ignition sources. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area.

SECTION 11: SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Face-sealing goggles, unless a full-face respirator is worn; and a respirator with an organic vapor-removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G) or a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any R, P or HE prefilter.
VENTILATION: General or local exhaust sufficient to minimize employee exposure.
EYE PROTECTION: Chemical goggles or face shield.
OTHER PROTECTIVE EQUIPMENT: Applicators and other handlers must wear long-sleeved shirt, long pants, shoes plus socks, and chemical resistant gloves (such as Nitrile or Butyl). For reentry into treated areas during application and prior to ventilation or settling of aerosol fog, workers must additionally wear coveralls.

SECTION 12: SPECIAL PRECAUTIONS

GENERAL
- 1,4SHIP® is used as an aerosol to enhance the dormancy of potatoes during the storage phase.
- 1,4SHIP® must not be applied to potatoes in the field.
- Do not use on seed potatoes.
- Do not allow vapors to come in contact with storage areas used for seed potatoes within 60 days of their planting.

STORAGE
- Keep container closed. Do not contaminate water, food, or feed by storage or disposal. This product temporarily inhibits germination of seed potatoes.

PESTICIDE DISPOSAL
- Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL
- Do not puncture or incinerate! Non refillable container. Do not reuse or refill this container. If empty: Place in trash or offer for recycling if available. If partly filled: Call your local solid waste agency or 1-800-CLEANUP for disposal instructions.

Revisions
Initially prepared - April 5, 2000
Revised – December 14, 2004, January 9, 2006, March 31, 2006, January 19, 2007, February 23, 2007, August 27, 2009, May 31, 2012