



SAFETY DATA SHEET

ANGUS CHEMICAL COMPANY

Product name : AVANTANE® PA 4000 Performance
Enhancing Specialty Ink Additive

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ANGUS CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name AVANTANE® PA 4000 Performance Enhancing
Specialty Ink Additive

Manufacturer or supplier's details

Company name of supplier ANGUS CHEMICAL COMPANY

Address 1500 E. LAKE COOK ROAD
Buffalo Grove IL 60089-6553

Customer Information +1-847-808-3711
Number

E-mail address NAR_CC@ANGUS.COM

Emergency telephone 800-424-9300
number

Recommended use of the chemical and restrictions on use

Recommended use Additive for paints.
Coatings and paints.
Ink additive.
The ANGUS Chemical Company recommends that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact the Customer Information Group (see Section 1 of this data sheet).

2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids Category 3

Other hazards

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Components

Chemical Name	CAS-No.	Concentration (% w/w)
Nitroethane	79-24-3	> 20.0 %
1-Nitropropane	108-03-2	>= 12.5 %

4. FIRST AID MEASURES

If inhaled	Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
In case of skin contact	Wash off with plenty of water.
In case of eye contact	Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.
If swallowed	Do not induce vomiting. Call a physician and/or transport to emergency facility immediately. Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.
Most important symptoms and effects, both acute and delayed	Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11:

Protection of first-aiders	<p>Toxicology Information. First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.</p>
Notes to physician	<p>Maintain adequate ventilation and oxygenation of the patient. Administer 100% oxygen to relieve headache and a general sense of weakness. Determine methemoglobin concentration of blood every 3 to 6 hours for first 24 hours. It should return to normal within 24 hours. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. The treatment of toxic methemoglobinemia may include the intravenous administration of methylene blue. If methemoglobin >10-20% consider methylene blue 1-2 mg/kg body weight as 1% solution intravenously over 5 minutes followed by 15-30 cc flush (Price D, Methemoglobinemia, Goldfrank Toxicologic Emergencies, 5th ed., 1994). Also provide 100% oxygen.</p> <p>Skin contact may aggravate preexisting dermatitis. Methemoglobinemia may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemia.</p>

5. FIREFIGHTING MEASURES

Suitable extinguishing media	<p>Water fog or fine spray. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Dry chemical fire extinguishers rated tri-class ABC (containing monoammonium phosphate).</p>
Unsuitable extinguishing media	<p>Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire. Do not use bicarbonate based dry chemical extinguishers (Class BC).</p>
Specific hazards during firefighting	<p>Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Container may rupture from gas generation in a fire situation. Flammable mixtures may exist within the vapor space of containers at room temperature.</p>

	<p>Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.</p> <p>Contamination with sensitizing compounds (amines, alkalies, acids, heavy metal salts) can cause formation of shock sensitive or highly reactive materials.</p> <p>Flammable concentrations of vapor can accumulate at temperatures above flash point; see Section 9.</p>
Hazardous combustion products	<p>During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.</p> <p>Combustion products may include and are not limited to:</p> <p>Carbon dioxide.</p> <p>Carbon monoxide.</p> <p>Nitrogen oxides.</p>
Further information	<p>Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate.</p> <p>Do not use direct water stream. May spread fire.</p> <p>Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles.</p> <p>Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.</p> <p>Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container.</p> <p>Move container from fire area if this is possible without hazard.</p> <p>Water may not be effective in extinguishing fire.</p> <p>Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed.</p> <p>Eliminate ignition sources.</p> <p>Do not use bicarbonate based dry chemical extinguishers (Class BC).</p> <p>Hand held ABC type dry chemical, carbon dioxide or water extinguishers may be used for small fires.</p> <p>Reaction with alkaline bicarbonates or other strong alkalis can form salts that may reignite when dry.</p> <p>If bicarbonate extinguishers are used and salts are formed, keep residues wet with water and dispose of in accordance with local regulations.</p>
Special protective equipment for firefighters	<p>Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves).</p> <p>If protective equipment is not available or not used, fight fire from a protected location or safe distance.</p>

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and	Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all
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emergency procedures	containers and handling equipment. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. Vapor explosion hazard. Keep out of sewers. No smoking in area. For large spills, warn public of downwind explosion hazard. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental precautions	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
Methods and materials for containment and cleaning up	Contain spilled material if possible. Vapor explosion hazard. Keep out of sewers. Use non-sparking tools in cleanup operations. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Pump with explosion-proof equipment. If available, use foam to smother or suppress. If available, use foam to smother or suppress. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Advice on safe handling	Avoid breathing vapor. Keep away from heat, sparks and flame. No smoking, open flames or sources of ignition in handling and storage area. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Never use air pressure for transferring product. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Electrically bond and ground all containers and equipment. Do not use positive displacement pumps with this material. Avoid contact with strong alkalis, amines or acids. Do not swallow. Avoid contact with eyes. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL
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PROTECTION.

Conditions for safe storage

Keep container closed.
 Store in a cool, dry place.
 Minimize sources of ignition, such as static build-up, heat, spark or flame.
 Corrosive when wet (greater than 0.2 weight percent). Store in stainless steel or aluminum if wet.
 Do not store in:
 Copper.
 Copper alloys.
 Lead and its alloys.
 Brass.
 See Section 10 for more specific information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

CAS-No.	Components	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
79-24-3	Nitroethane	TWA	100 ppm	ACGIH
79-24-3	Nitroethane	TWA	100 ppm 310 mg/m3	NIOSH REL
79-24-3	Nitroethane	TWA	100 ppm 310 mg/m3	OSHA Z-1
79-24-3	Nitroethane	TWA	100 ppm 310 mg/m3	OSHA P0
108-03-2	1-Nitropropane	TWA	25 ppm	ACGIH
108-03-2	1-Nitropropane	TWA	25 ppm 90 mg/m3	NIOSH REL
108-03-2	1-Nitropropane	TWA	25 ppm 90 mg/m3	OSHA Z-1
108-03-2	1-Nitropropane	TWA	25 ppm 90 mg/m3	OSHA P0

Engineering measures

Local exhaust ventilation may be necessary for some operations.
 Use engineering controls to maintain airborne level below exposure limit requirements or guidelines.
 If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation.

Personal protective equipment

Respiratory protection

For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.
 In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.
 Respiratory protection should be worn when there is a

potential to exceed the exposure limit requirements or guidelines.
If there are no applicable exposure limit requirements or guidelines, use an approved respirator.
When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.

Hand protection

Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Chlorinated polyethylene. Polyvinyl alcohol ("PVA"). Polyethylene. Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection

Use safety glasses (with side shields).
If exposure causes eye discomfort, use a full-face respirator.

Skin and body protection

Wear clean, body-covering clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid.
Color	Clear
Odor	Characteristic
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	No test data available
Freezing point	No test data available
Boiling point/boiling range	114 - 133 °C (237 - 271 °F) Method: Literature
Flash point	34.39 °C (93.90 °F)

	Method: Tag Closed Cup ASTM D56
Evaporation rate	No test data available
Flammability (solid, gas)	No data available.
Upper explosion limit	No test data available
Lower explosion limit	>= 2.6 %(V) Method: Literature
Vapor Pressure	11.06 mmHg (20 °C) Method: Literature
Relative Vapor Density (air = 1)	2.6 Method: Literature
Relative density	1.02 (20 °C) Method: Literature
Water solubility	2.6 % (20 °C) Method: Literature
Auto-ignition temperature	> 415 °C Method: Literature
Decomposition temperature	No test data available
Viscosity Viscosity, kinematic	0.76 cS Method: Literature
Explosive properties	No data available.
Oxidizing properties	No data available.
Molecular weight	No test data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity	No dangerous reaction known under conditions of normal use.
Chemical stability	Stable under recommended storage conditions. See Storage, Section 7.
Possibility of hazardous	Polymerization will not occur.

reactions

Conditions to avoid	Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.
Incompatible materials	Avoid unintended contact with sensitizing chemicals such as: Alkali metal hydroxides. Amines. Carbonates. Acids. Heavy metal oxides. Sensitizing chemicals greatly decrease the stability of the material. Salts formed by the reaction of these materials may self ignite when dry. If product reacts with sensitizing materials to form salts, keep salts wet with water and dispose of in accordance with local regulations. Avoid unintended contact with: Aldehydes. Reducing agents. Strong oxidizers. Alkenes. Avoid contact with metals such as: Lead. Copper alloys. Brass. Avoid contact with absorbent materials such as: Clay-based absorbents. Activated carbon.
Hazardous decomposition products	Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Nitrogen oxides. Ethylene. Propylene.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Product:

Acute oral toxicity

Remarks: Low toxicity if swallowed.
Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
May cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen.

Remarks: Based on information for component(s):

LD50 (Rat): 484 - 1,500 mg/kg

Acute inhalation toxicity Remarks: Vapor concentrations are attainable which could be hazardous on single exposure.
Excessive exposure may cause irritation to upper respiratory tract (nose and throat).
Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

Remarks: Based on information for component(s):

LC50 (Rat): > 11 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Estimated.

Acute dermal toxicity Remarks: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Remarks: For component(s) tested.

LD50
(Rabbit): > 2,000 mg/kg
Symptoms: No deaths occurred at this concentration.
Assessment: The substance or mixture has no acute dermal toxicity

Components:
1-Nitropropane

Acute oral toxicity LD50 (Rat, female): 484 mg/kg

LD50 (Rat, male): 528 mg/kg

Acute inhalation toxicity Remarks: Vapor concentrations are attainable which could be hazardous on single exposure.
Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.
May cause respiratory irritation and central nervous system depression.

LC50 (Rat): 15.95 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity LD50 (Rabbit): > 2,000 mg/kg

Nitroethane

Acute oral toxicity LD50 (Rat, female): 1,083 mg/kg
Remarks: May cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen.

LD50 (Rat, male): 1,428 mg/kg

Acute inhalation toxicity	Remarks: Vapor concentrations are attainable which could be hazardous on single exposure. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. May cause central nervous system effects. May cause respiratory tract irritation. LC50 (Rat): > 6.754 mg/l Exposure time: 4 h Test atmosphere: vapour Assessment: The component/mixture is moderately toxic after short term inhalation.
Acute dermal toxicity	LD50 (Rabbit): > 2,000 mg/kg Symptoms: No deaths occurred at this concentration. Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Product:

Remarks: May cause drying and flaking of the skin.
Prolonged exposure not likely to cause significant skin irritation.

Components:

1-Nitropropane

Remarks: May cause drying and flaking of the skin.
Prolonged exposure not likely to cause significant skin irritation.

Nitroethane

Remarks: Prolonged exposure not likely to cause significant skin irritation.

Serious eye damage/eye irritation

Product:

Remarks: May cause slight eye irritation.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Components:

1-Nitropropane

Remarks: May cause slight temporary eye irritation.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Nitroethane

Remarks: May cause slight eye irritation.
Corneal injury is unlikely.
Vapor may cause eye irritation experienced as mild discomfort and redness.

Respiratory or skin sensitization

Product:

Remarks: For the component(s) tested:
Did not cause allergic skin reactions when tested in guinea pigs.

Remarks: For respiratory sensitization:
No relevant data found.

Components:

1-Nitropropane

Remarks: For skin sensitization:
Did not cause allergic skin reactions when tested in guinea pigs.

Remarks: For respiratory sensitization:
No relevant data found.

Nitroethane

Remarks: For skin sensitization:
Did not cause allergic skin reactions when tested in guinea pigs.

Remarks: For respiratory sensitization:
No relevant data found.

Carcinogenicity

Product:

Contains component(s) which did not cause cancer in laboratory animals.

Components:

1-Nitropropane

Did not cause cancer in laboratory animals.

Nitroethane

Did not cause cancer in laboratory animals.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Teratogenicity

Product

Based on information for component(s):
Has been toxic to the fetus in laboratory animals at doses toxic to the mother.
Did not cause birth defects in laboratory animals.

Components:

1-Nitropropane

Did not cause birth defects or any other fetal effects in laboratory animals.

Nitroethane

For similar material(s):
Has been toxic to the fetus in laboratory animals at doses toxic to the mother.
Did not cause birth defects in laboratory animals.

Mutagenicity

Product

For the component(s) tested:
Animal genetic toxicity studies were negative.
In vitro genetic toxicity studies were predominantly negative.

Components:

1-Nitropropane

Animal genetic toxicity studies were negative.
In vitro genetic toxicity studies were negative.

Nitroethane

Animal genetic toxicity studies were negative.
In vitro genetic toxicity studies were negative.

Reproductive toxicity

Product:

In animal studies on component(s), effects on reproduction were seen only at doses that produced significant toxicity to the parent animals.

Components:

1-Nitropropane

In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Nitroethane

Limited data in laboratory animals suggest that the material does not affect reproduction.

Reproductive toxicity - Suspected human reproductive toxicant
Assessment

STOT - single exposure

Product:

Assessment: Available data are inadequate to determine single exposure specific target organ toxicity.

Components:

1-Nitropropane

Assessment: Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Nitroethane

Assessment: Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Repeated dose toxicity

Product:

Remarks: For some component(s):

May cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen.

Contains component(s) which have been reported to cause effects on the following organs in animals:

Kidney.

Liver.

Nasal tissue.

Spleen.

Components:

1-Nitropropane

Remarks: In animals, effects have been reported on the following organs:

Liver.

Nitroethane

Remarks: May cause methemoglobinemia, thereby impairing the blood's ability to transport oxygen.

In animals, effects have been reported on the following organs:

Kidney.

Liver.

Nasal tissue.

Spleen.

Aspiration toxicity

Product:

Aspiration Hazard

May be harmful if swallowed and enters airways.

Components:

1-Nitropropane

May be harmful if swallowed and enters airways.

Nitroethane

May be harmful if swallowed and enters airways.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

1-Nitropropane

Toxicity to fish	Remarks: Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested). LC50 (Oncorhynchus mykiss (rainbow trout)): 227 mg/l Exposure time: 96.0 h Test Type: flow-through test Method: OECD Test Guideline 203 or Equivalent LC50 (Danio rerio (zebra fish)): 205 mg/l Exposure time: 48.0 h Test Type: static test Method: OECD Test Guideline 203 or Equivalent
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 380.00 mg/l Exposure time: 48.0 h Test Type: static test Method: OECD Test Guideline 202 or Equivalent
Toxicity to algae	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 456 mg/l End point: Growth rate inhibition Exposure time: 96 h Method: OECD Test Guideline 201 or Equivalent
Toxicity to bacteria	EC50 (activated sludge): 14 mg/l End point: Respiration rates. Exposure time: 30 min Test Type: static test Method: OECD 209 Test
Nitroethane	
Toxicity to fish	Remarks: Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). LC50 (Danio rerio (zebra fish)): 880 mg/l Exposure time: 48.0 h Test Type: static test Method: OECD Test Guideline 203 or Equivalent
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): > 21.90 mg/l Exposure time: 48.0 h Test Type: static test Method: OECD Test Guideline 202 or Equivalent
Toxicity to algae	ErC50 (Pseudokirchneriella subcapitata (green algae)): 17.4

	mg/l End point: Growth rate inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 or Equivalent
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC (Daphnia magna (Water flea)): 2.44 mg/l Exposure time: 21 d End point: number of offspring Test Type: semi-static test
Toxicity to bacteria	EC50 (Bacteria): 310 mg/l End point: Respiration rates. Exposure time: 0.5 h

Persistence and degradability

Components:

1-Nitropropane

Biodegradability	Result: Not readily biodegradable. Remarks: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. Biodegradation: 23.3 % Exposure time: 5 d Method: GSF Activated Sludge Test Remarks: 10-day Window: Fail Inoculum: activated sludge Concentration: 2.99 mg/l Biodegradation: 9 % Exposure time: 28 d Method: OECD Test Guideline 301D or Equivalent Remarks: 10-day Window: Fail Inoculum: activated sludge, domestic, non-adapted Concentration: 100 mg/l Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 301F or Equivalent Remarks: 10-day Window: Fail
Chemical Oxygen Demand (COD)	0.770 mg/mg Method: Estimated.
ThOD	1.800 mg/mg Method: Estimated.
Photodegradation	Test Type: Half-life (indirect photolysis) Sensitiser: OH radicals Rate constant: Degradation half life: 37 d Method: Estimated.

Nitroethane

Biodegradability
Result: Not readily biodegradable.
Remarks: Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).
Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

Biodegradation: < 0.1 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent
Remarks: 10-day Window: Fail

Biodegradation: 24 %
Exposure time: 5 d
Method: GSF Activated Sludge Test
Remarks: 10-day Window: Fail

ThOD 1.490 mg/mg

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitiser: OH radicals
Rate constant: Degradation half life: 72 d
Method: Estimated.

Bioaccumulative potential

Components:

1-Nitropropane

Bioaccumulation
Species: Fish.
Bioconcentration factor (BCF): 1.3
Exposure time: 3 d
Method: Measured

Partition coefficient: n-octanol/water
log Pow: 0.79
Method: Measured
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Nitroethane

Bioaccumulation
Species: Fish.
Bioconcentration factor (BCF): 1
Method: Measured

Partition coefficient: n-octanol/water
log Pow: 0.162
Method: OECD Test Guideline 107
Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in soil

Components:

1-Nitropropane

Distribution among environmental compartments Koc: 71
Method: Estimated.
Remarks: Potential for mobility in soil is high (Koc between 50 and 150).

Nitroethane

Distribution among environmental compartments Koc: 19
Method: Estimated.
Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Other adverse effects

Product:

Ozone-Depletion Potential Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I
Substances
Remarks: This product neither contains, nor was
manufactured with a Class I or Class II ODS as defined by the
U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +
B).

Components:

1-Nitropropane

Results of PBT and vPvB assessment This substance is not considered to be persistent,
bioaccumulating and toxic (PBT). This substance is not
considered to be very persistent and very bioaccumulating
(vPvB).

Nitroethane

Results of PBT and vPvB assessment This substance is not considered to be persistent,
bioaccumulating and toxic (PBT). This substance is not
considered to be very persistent and very bioaccumulating
(vPvB).

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues DO NOT DUMP INTO ANY SEWERS, ON THE GROUND,
OR INTO ANY BODY OF WATER.
All disposal practices must be in compliance with all Federal,
State/Provincial and local laws and regulations.
Regulations may vary in different locations.
Waste characterizations and compliance with applicable laws
are the responsibility solely of the waste generator.
THE INFORMATION PRESENTED HERE PERTAINS ONLY

TO THE PRODUCT AS SHIPPED IN ITS INTENDED
CONDITION AS DESCRIBED IN MSDS SECTION:
Composition Information.
FOR UNUSED & UNCONTAMINATED PRODUCT, the
preferred options include sending to a licensed, permitted:
Incinerator or other thermal destruction device.
Landfill.
ANGUS HAS NO CONTROL OVER THE MANAGEMENT
PRACTICES OR MANUFACTURING PROCESSES OF
PARTIES HANDLING OR USING THIS MATERIAL.

14. TRANSPORT INFORMATION

International Regulation

IATA-DGR

UN/ID No.	UN 1263
Proper shipping name	Paint related material
Class	3
Packing group	III
Labels	Flammable Liquids
Packing instruction (cargo aircraft)	366
Packing instruction (passenger aircraft)	355

IMDG-Code

UN number	UN 1263
Proper shipping name	PAINT RELATED MATERIAL
Class	3
Packing group	III
Labels	3
EmS Code	F-E, S-E
Marine pollutant	no
Remarks	Stowage category A

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR (DOT) – NON BULK

UN/ID/NA number	1263
Proper shipping name	PAINT RELATED MATERIAL

Class	3
Packing group	III
Labels	Class 3 - Flammable Liquid
ERG Code	128
Marine pollutant	no

49 CFR (DOT) - BULK

UN/ID/NA number	1263
Proper shipping name	PAINT RELATED MATERIAL
Class	3
Packing group	III
Labels	Class 3 - Flammable Liquid
ERG Code	128
Marine pollutant	no

Reportable Quantity: 2-NITROPROPANE

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

OSHA Hazards This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)
2-Nitropropane	79-46-9	10

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 302 No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Massachusetts Right To Know

Massachusetts Right to Know List of Chemicals and Hazard Classifications

Cas No.	Component
108-03-2	1-Nitropropane
79-24-3	Nitroethane
79-46-9	2-Nitropropane

Pennsylvania Right To Know

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Cas No.	Component
108-03-2	1-Nitropropane
79-24-3	Nitroethane
79-46-9	2-Nitropropane

New Jersey Right To Know

The following chemicals are listed because of the additional requirements of New Jersey law:

Cas No.	Component
108-03-2	1-Nitropropane
79-24-3	Nitroethane

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Cas No.	Component
79-46-9	2-Nitropropane
75-52-5	Nitromethane

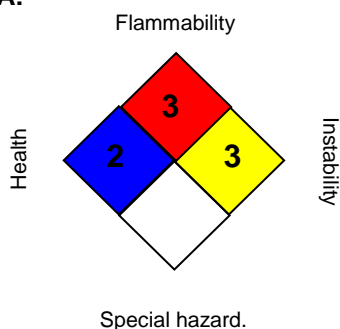
The components of this product are reported in the following inventories:

United States TSCA Inventory
All Components OK

16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	1
FLAMMABILITY	3
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

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US / EN

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Full text of other abbreviations

(Q)SAR - (Quantitative) Structure Activity Relationship; ASTM - American Society for the Testing of Materials; bw - Body weight; DIN - Standard of the German Institute for Standardisation; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; IARC - International Agency for Research on Cancer; IATA - International Air

Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISO - International Organisation for Standardization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative; DSL - Domestic Substances List (Canada); KECI - Korea Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); AICS - Australian Inventory of Chemical Substances; IECSC - Inventory of Existing Chemical Substances in China; ENCS - Existing and New Chemical Substances (Japan); ISHL - Industrial Safety and Health Law (Japan); PICCS - Philippines Inventory of Chemicals and Chemical Substances; NZIoC - New Zealand Inventory of Chemicals; TCSI - Taiwan Chemical Substance Inventory; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; DOT - Department of Transportation; EHS - Extremely Hazardous Substance; HMIS - Hazardous Materials Identification System; MSHA - Mine Safety and Health Administration; NFPA - National Fire Protection Association; RCRA - Resource Conservation and Recovery Act; RQ - Reportable Quantity; SARA - Superfund Amendments and Reauthorization Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; GLP - Good Laboratory Practice; ERG - Emergency Response Guide; NTP - National Toxicology Program; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods