

FROM A. B. MC KEE  
ALCOA TECHNICAL CENTER - C

TO MEMBERS, CORPORATE HAZARDOUS  
MATERIALS CONTROL COMMITTEE

1980 August 28

RECEIVED  
SEP 3 - 1980

RE: ALCOA MATERIAL SAFETY DATA SHEET MANUAL  
AMSDS No. 91, 114-122  
For Preliminary Review and Comments  
Please Respond by 1980 September 11

AMSDS NO.

|     |                                       |
|-----|---------------------------------------|
| 91  | Alcoa Electrical Joint Compound No. 2 |
| 114 | Fryquel 550 Hydraulic Fluid (ML925)   |
| 115 | Copper Sulfate                        |
| 116 | Hydrogen Chloride Gas, Anhydrous      |
| 117 | 2-Nitropropane                        |
| 118 | Pyridine                              |
| 119 | Aluminum Fluoride                     |
| 120 | Ammonium Hydroxide (ca 28%)           |
| 121 | Aniline                               |
| 122 | Chlorobenzene                         |

*ABM*  
A. B. MC KEE

ABM:km

Attachment

cc: Members of Corporate Hazardous  
Materials Control Committee

H. P. Brueschke, Pittsburgh 19  
R. L. Byers, Pittsburgh 07  
A. E. Davis, Pittsburgh 24  
R. E. Edgington, Pittsburgh 22  
G. C. Heise, Pittsburgh 06  
R. M. James, Pittsburgh 07  
R. L. Miller, Pittsburgh 08  
A. B. McKee, ATC-C  
B. N. Peak, Pittsburgh 18  
R. T. Shillinger, Pittsburgh 03  
J. R. Stemler, ATC-C  
D. A. Whitfield, Pittsburgh WPH3

Others

R. W. Flanagan, Pittsburgh 07

*File Has  
mat  
Committee -  
Flanagan  
will  
handle*

PLAINTIFF'S  
EXHIBIT  
AL-1119

411538 0227



# MATERIAL SAFETY DATA SHEET

No. 91

## HAZARD CHARACTERISTICS

- ☐ Flammable ☐ Combustible  
☐ Corrosive ☐ Explosive  
☐ Water Reactive ☐ Radioactive  
☐ Oxidizer ☐ Chemically Reactive

## Toxic By:

- ☐ Ingestion  
☒ Inhalation  
☐ Absorption

PRODUCT <sup>ALCOA</sup> Electrical  
Joint Compound No. 2  
Phone No.  
Date:

## Section I. MATERIAL DESCRIPTION

Material Name: <sup>ALCOA</sup> Electrical Joint Compound No. 2 (U.S. Pat. No. 2,844,479)

Chemical Name &amp; Formula:

Other Designation:

Corporate Stock No.:

Manufacturer: Alcoa

For Internal Company Use Only -  
Not To Be Distributed Outside The Company

## Section II. INGREDIENTS

Petroleum grease  
Detergent to which fluoride has been added.

Fluoride

%

Less Than  
5%

## HAZARD DATA

OSHA PEL

FLUORIDE 2.5 mg/m<sup>3</sup>

## Section III. PHYSICAL DATA

Physical Form: Grease

Boiling Temp.: -

Freeze-Melt Temp.: -

Vapor Pressure: -

Evaporation Rate: -

Specific Gravity: -

Density: -

"Solubility In H<sub>2</sub>O": Insoluble

Color: ?

Odor: ?

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint

450° F (232°C)

Auto-Ignition Temp.

Flammability Limits In Air

Lower

Upper

In case of fire, use a dry chemical fire extinguisher.

## Section V. REACTIVITY DATA

Keep away from strong oxidizers.

No. 91

Section VI. HEALTH HAZARD INFORMATION | TLV OSHA PEL - FLUORIDE = 2.5 mg/m<sup>3</sup>

Inhalation - If EJC #2 is heated significantly, the vapors can be irritating

Skin Contact - May irritate skin; avoid skin contact (not a sensitizer); components are not absorbed through the skin.

Ingestion - May be harmful if swallowed. Do not take internally by virtue of the fluoride known to be present.

First Aid:

Eye Contact - Can irritate eyes. Flush with water for 15 minutes; get medical attention.

Skin Contact - Wash with soap and water.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Section VIII. SPECIAL PROTECTION INFORMATION

When heated, use with adequate ventilation and avoid breathing the vapors. Where respiratory protection is needed, NIOSH approved respiratory should be used. The selection of appropriate respiratory equipment should be based on the actual or potential airborne contaminants and concentrations present. Avoid skin contact.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

Chemical substance components have been reported to the E.P.A. Office of Toxic Substances in accordance with the requirements of the Toxic Substances Control Act (Title 40 CFR 710).

D.O.T. Requirements

Section X. REFERENCES

ASTM No.:

Chemical Abstracts No.:

CMA Chemical Safety Data Sheet No.:

NEPA Guides No.:

NSC Data Sheets:

Supplier Product Literature:

Other:

Information herein is given in good faith as authoritative and valid; however, no warranty, express or implied, can be made.



# MATERIAL SAFETY DATA SHEET No. 114

## HAZARD CHARACTERISTICS

- |                                         |                                              |
|-----------------------------------------|----------------------------------------------|
| <input type="checkbox"/> Flammable      | <input type="checkbox"/> Combustible         |
| <input type="checkbox"/> Corrosive      | <input type="checkbox"/> Explosive           |
| <input type="checkbox"/> Water Reactive | <input type="checkbox"/> Radioactive         |
| <input type="checkbox"/> Oxidizer       | <input type="checkbox"/> Chemically Reactive |

### Toxic By:

- |                                     |
|-------------------------------------|
| <input type="checkbox"/> Ingestion  |
| <input type="checkbox"/> Inhalation |
| <input type="checkbox"/> Absorption |

## PRODUCT

FRYQUELL 550 HYDRAULIC FLUID

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: A fire resistant hydraulic fluid, Triaryl Phosphate,

Other Designation: Diphenyl Mono(p-tert-butylphenyl) phosphate

p-tert-butylphenyl diphenyl phosphate

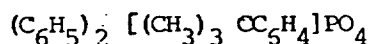
Corporate Stock No.: Alcoa ML-925

Manufacturer: Stauffer Chem. Co., Westport, CT 06880

## Section II. INGREDIENTS

Triaryl Phosphate.....

Mol. wt. 382.4



%

99+

## HAZARD DATA

No TLV established

## Section III. PHYSICAL DATA

Physical Form: Liquid

Boiling Temp.: at 1 atm..... 735F (391C)

Pour Point Temp.:..... -30 to +30F (-34 to -1C)

Vapor Pressure: at 25C..... Low

Evaporation Rate:

Specific Gravity: 60/60F..... 1.12 - 1.21

Density:

"Solubility In H<sub>2</sub>O":..... 0.1 g/100g of water

Color: ..... Colorless to pale straw colored liquid

Odor: Slight

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint C.O.C.

450F (232C)

Auto-Ignition Temp.

1050F min. (566C)

Flammability Limits In Air

NA

Lower

Upper

Extinguishing Media: Water fog, dry powder or carbon dioxide may be used. Fires of this material will tend to self-extinguish if the source of ignition is removed and the surroundings have not reached the autoignition temperature.

Remove the ignition source where practical. Cool and/or smother the flame.

Firefighters should wear NIOSH approved self-contained breathing apparatus.

When heated to decomposition, emits toxic fumes.

## Section V. REACTIVITY DATA

This material is stable in closed containers at room temperature. It is not shock sensitive and does not polymerize. Special storage facilities are not required. Carbon steel is the preferred construction for storage tankage. Aryl phosphates will hydrolyze with water at elevated temperature; hydrolysis is accelerated by acids or bases. Under ambient conditions no vigorous reactions are expected with common acids, bases, oxidizing agents or reducing agents.

This material is inert to all common metals but can be detrimental to certain plastics and elastomers, especially vinyl based resins.

**Section VI. HEALTH HAZARD INFORMATION** | TLV NONE ESTABLISHED

Inhalation of excessive concentrations of vapor, mist, or spray can produce non-specific irritation of the upper respiratory tract. Tests with rabbits indicate that the fluid can irritate the skin and eyes. Ingestion of large doses may produce nausea, vomiting, cramps and diarrhea, the symptoms of gastrointestinal irritation.

**FIRST AID:**

Eye Contact: Flush eyes with running water for 15 minutes. Hold eyelids open for thorough flushing. Obtain medical help if irritation persists.

Skin Contact: Flush well with water. Remove contaminated clothing promptly. Obtain medical help if irritation persists.

Inhalation: Remove to fresh air. Consult physician if respiratory discomfort continues.

Ingestion: Give large amounts of water to drink and induce vomiting. Repeat until vomitus is clear. Obtain medical help.

**Section VII. SPILL, LEAK & DISPOSAL PROCEDURES**

Provide ventilation. Contact safety and environmental personnel if large spill occurs. Contain and recover spilled material for reclaim or scrap. Remove ignition sources. Pick up small spills with absorbent solid. Residues are flushed with detergents and water to remove. Those involved in clean up should use protective equipment to avoid liquid contact or inhalation of mist or vapors.

DISPOSAL: Scrap can be burned, but incinerator should have an alkaline scrubber to trap phosphorus oxide fume. Follow Federal, State, and local regulations for disposal or reclamation.

**Section VIII. SPECIAL PROTECTION INFORMATION**

Because of its low vapor pressure, general ventilation is suitable where this material is used except when heated or misted. Under these conditions local exhaust ventilation may be desirable. Where thermal-oxidative degradation occurs, protection by an approved respirator may be required.

Avoid repeated or prolonged skin contact by the use of rubber gloves and protective glasses for eye protection.

An eyewash station and safety shower shall be located in the work area and be immediately accessible for emergency use.

**Section IX. SPECIAL PRECAUTIONS & COMMENTS**

Since the chronic exposure properties of this material are not fully known, handle with caution. Follow good personal hygiene practice. Prevent contact with liquid and inhalation of vapors, mists, and thermal-oxidative degradation products.

*D.O.T. Requirements*

**Section X. REFERENCES**

ASTM No.:

Other:

CAS No.:

CMA Chemical Safety Data Sheet No.:

NFPA Guides

NSC Data Sheets:

Supplier Product Literature:



# MATERIAL SAFETY DATA SHEET No. 115

## HAZARD CHARACTERISTICS

- |                                         |                                              |
|-----------------------------------------|----------------------------------------------|
| <input type="checkbox"/> Flammable      | <input type="checkbox"/> Combustible         |
| <input type="checkbox"/> Corrosive      | <input type="checkbox"/> Explosive           |
| <input type="checkbox"/> Water Reactive | <input type="checkbox"/> Radioactive         |
| <input type="checkbox"/> Oxidizer       | <input type="checkbox"/> Chemically Reactive |

### Toxic By:

- |                                               |
|-----------------------------------------------|
| <input checked="" type="checkbox"/> Ingestion |
| <input type="checkbox"/> Inhalation           |
| <input type="checkbox"/> Absorption           |

## PRODUCT

COPPER SULFATE

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: Cupric sulfate pentahydrate,  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$   
Other Designation: Copper (II) sulfate, Bluestone, Blue or roman vitriol

Corporate Stock No.:

Manufacturer: Many sources

## Section II. INGREDIENTS

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  (36.1% water).....  
Mol. Wt. 249.7

%

99+

## HAZARD DATA

TLV

1 mg/m<sup>3</sup> as Cu

Oral, Rat LD<sub>50</sub>

960 mg/kg of  
pentahydrate or  
300 mg/kg of  
anhydrous  $\text{CuSO}_4$

## Section III. PHYSICAL DATA

Physical Form: Solid (crystals or powder)

Boiling Temp.:

Freeze-Melt Temp.: (4H<sub>2</sub>O)..... 230F (110C) See Section V

Vapor Pressure:

Evaporation Rate:

Specific Gravity:..... 2.284

Density:

"Solubility In H<sub>2</sub>O": g/100g..... at 0°C, 31.6; at 100C, 203.

Color: ..... Transparent, blue granular crystals(white when anhydrous)

Odor: ..... None; has nauseous, metallic Taste (toxic)

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint

NA

Auto-Ignition Temp.

NA

Flammability Limits In Air

NA

Lower

---

Upper

---

This material is a nonflammable solid.

When heated above 230F (110C) material will melt and flow. It can splatter if water hits the hot melted material. Also, above 752F (400C) it can decompose to give off sulfur oxide (toxic!) If heated, tightly sealed containers may rupture from pressure of water vapor released from the crystals.

## Section V. REACTIVITY DATA

This material loses water of hydration by slow efflorescence in dry air or rapidly on heating (-2H<sub>2</sub>O at 45C, -4H<sub>2</sub>O at 110C, and -5H<sub>2</sub>O at 200-300 C) to give white anhydrous cupric sulfate. Heating above 400C can decompose cupric sulfate to give cupric oxide and sulfur oxide.

When dissolved in water, this material is slightly acidic. The solution can react with magnesium metal to evolve flammable hydrogen gas.

No. 115 COPPER SULFATE

Section VI. HEALTH HAZARD INFORMATION | TLV 1 mg/m<sup>3</sup> as Cu

Copper sulfate is toxic! Ingestion of significant amounts is corrosive to the GI tract and can cause severe abdominal pain, nausea and vomiting. Death has occurred in humans from ingestion of as little as 10 g (as CuSO<sub>4</sub>). Except for dust inhalation, the inhalation hazard of this material is low because of the low vapor pressure of the solid. It can irritate the skin and mucous membranes.

**FIRST AID:**

Eye Contact: Flush thoroughly with water for 15 minutes. Get medical help if irritation persists.

Skin Contact: Wash exposed areas with water.

Ingestion: Give victim 2 or 3 glasses of milk or water; induce vomiting. Follow with saline catharsis. Get medical attention.

Inhalation: Remove from exposure. Rinse out mouth with water. Get medical attention for serious exposure if irritation persists.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Advise environmental personnel. Sweep up or vacuum for recovery or disposal. Avoid dusting condition. If necessary use NIOSH approved protective breathing equipment to meet TLV dust requirement. Dispose via licensed disposer in compliance with existing regulations.

Section VIII. SPECIAL PROTECTION INFORMATION

Provide adequate ventilation to meet TLV requirements, especially when dusting conditions are possible; use of NIOSH approved dust mask may also be indicated.

Where CuSO<sub>4</sub>/water solutions are used, eye wash station shall be located in the work area and be immediately accessible for emergency use.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

Store in tightly sealed containers to avoid loss of some water of hydration - See Section V. Follow good hygiene practice in handling this material.

*D.O.T. Requirements*

Section X. REFERENCES

ASTM No.:

Other:

CAS No.: 007-758-998

CMA Chemical Safety Data Sheet No.:

NFPA Guides

NSC Data Sheets:

Supplier Product Literature:

411538 0233



# MATERIAL SAFETY DATA SHEET No. 116

## HAZARD CHARACTERISTICS

- ☐ Flammable ☐ Combustible  
☒ Corrosive ☐ Explosive  
☐ Water Reactive ☐ Radioactive  
☐ Oxidizer ☐ Chemically Reactive

### Toxic By:

- ☐ Ingestion  
☒ Inhalation  
☐ Absorption

## PRODUCT

HYDROGEN CHLORIDE GAS

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: Hydrogen chloride gas, anhydrous HCl

Description: a gas, usually supplied in a cylinder as a liquid under its own vapor pressure or as a compressed gas.

Corporate Stock No.:

Manufacturer: Many suppliers

## Section II. INGREDIENTS

Hydrogen chloride.....

HCl Mol. Wt. 36.46

%

99

## HAZARD DATA

TLV Ceiling  
5 ppm or 7 mg/m<sup>3</sup>

## Section III. PHYSICAL DATA

Physical Form: Gas

Boiling Temp.: at 1 atm..... -121F (-85C)

Freeze-Melt Temp.: 1 atm..... -173F (-114C)

Vapor Pressure: at 70F..... 613 psig

Evaporation Rate:

Specific Gravity:

Density: Vapor (air=1)..... 1.27

"Solubility in H<sub>2</sub>O": at 0°C, 1 atm..... 82.3 g/100g of water

Color: ..... Colorless corrosive gas

Odor: ..... Sharp, pungent, suffocating odor

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint

Nonflammable

Auto-ignition Temp.

NA

Flammability Limits in Air

NA

Lower

Upper

Extinguishing media: Select that suitable for surrounding fire.

This material is not flammable; but it can produce hydrogen gas upon reaction with certain metals, such as iron, especially in the presence of moisture.

If cylinders of this material are present in a fire situation, they should be cooled with a water spray to prevent rupturing from pressure build up from heat. Fire-fighters should use NIOSH approved self-contained breathing apparatus and full body protection.

## Section V. REACTIVITY DATA

HCl is a stable material as confined in a cylinder at room temperature; however, it is a reactive and corrosive material. It dissolves in water with liberation of heat to form hydrochloric acid, and thus is highly reactive with alkaline materials and with many metals (with which it reacts to liberate flammable hydrogen gas).

For Internal Company Use Only -  
Not To Be Distributed Outside The Company

No. 116 HYDROGEN CHLORIDE GAS, ANHYDROUS

Section VI. HEALTH HAZARD INFORMATION | TLV 5 ppm ceiling

Hydrogen chloride is corrosive to human tissue. Inhalation of gas concentrations moderately above the TLV can damage the teeth and irritate the nasal passages. Inhalation of higher concentrations (50+ ppm) will cause choking and coughing and produce severe irritation and damage of the mucous membranes of the upper respiratory tract; 1300-2000 ppm is immediately dangerous to life. HCl can cause tissue burns. (Anhydrous hydrogen chloride is more damaging than hydrochloric acid mist, since it has an additional dehydrating effect on tissues.)

FIRST AID:

Eye and Skin contact: Flush skin and/or eyes thoroughly with water immediately for 15 minutes. Get medical aid.

Inhalation: Remove to fresh air; restore breathing if required. Oxygen can be given under proper supervision. Get medical aid. Keep patient warm.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Follow emergency preplan for large leaks. Report significant leaks to safety and environmental personnel immediately. Remove sources of ignition. Supply ventilation. Stay upwind of leakage in outside areas. Those involved in emergency procedures must use full protective clothing and NIOSH approved self-contained breathing apparatus. Stop the leakage (Notify supplier if necessary.) Flush down the area with water spray, if required; and, after neutralization of washings flush to the sewer. Small leak location can be done by opening bottle of Concentrated  $\text{NH}_4\text{OH}$  near the suspected leakage area. (White fumes will reveal the leak location.)

Section VIII. SPECIAL PROTECTION INFORMATION

Provide adequate exhaust ventilation in areas of use or storage to meet TLV requirements. Face velocity of hoods should exceed 100 lfm. Use NIOSH approved respirator for low concentration or self-contained breathing apparatus and full protective clothing for emergency or non-routine conditions. Protective clothing and equipment such as rubber gloves, rubber aprons, and suitable gas-tight chemical goggles, should be used by those working with HCl gas. Woolen outside clothing (or other acid resistant fabric) has been recommended. Eye wash fountains and instant-acting showers shall be located in work area and be immediately accessible for emergency use.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

Emergency planning is required where large quantities of hydrogen chloride are used. Suppliers will usually cooperate in establishing emergency plans. Follow supplier's recommendations in handling cylinders of HCl. Avoid inhalation of hydrogen chloride. If odor can be detected, workers are being overexposed. Odor of HCl gives adequate warning for a prompt voluntary withdrawal from the exposure area.

*D.O.T. Requirements* CORROSIVE GAS

Section X. REFERENCES

ASTM No.:  
CAS No.: 007-647-010

Other:

CMA Chemical Safety Data Sheet No.:  
NFPA Guides  
NSC Data Sheets:  
Supplier Product Literature:

411538 0235



# MATERIAL SAFETY DATA SHEET No. 117

## HAZARD CHARACTERISTICS

- ☒ Flammable ☐ Combustible  
☐ Corrosive ☐ Explosive  
☐ Water Reactive ☐ Radioactive  
☐ Oxidizer ☐ Chemically Reactive

### Toxic By:

- ☐ Ingestion  
☐ Inhalation  
☐ Absorption

## PRODUCT

2-NITROPROPANE

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: CH3CHNO2CH3

Other Designation: Sec-nitropropane

Corporate Stock No.:

Manufacturer: Eastman Kodak

## Section II. INGREDIENTS

2-Nitropropane

Mol. Wt. 89.09

%

## HAZARD DATA

TLV

25 ppm  
90 mg/m<sup>3</sup>

## Section III. PHYSICAL DATA

Physical Form: Liquid

Boiling Temp.: 246F (119C)

Freeze-Melt Temp.: -135F (-93C)

Vapor Pressure: at 20C. 13 mm Hg

Evaporation Rate: (BuAc=1) 1.1

Specific Gravity: 25/4C. 0.9821

Density: Vapor (air=1) 3.1

"Solubility in H<sub>2</sub>O": Moderate

Color: Colorless liquid

Odor: Sweet

## Section IV. FIRE AND EXPLOSION DATA

| Flashpoint          | Auto-Ignition Temp. | Flammability Limits in Air | Lower | Upper |
|---------------------|---------------------|----------------------------|-------|-------|
| 103F (39.4C) T.O.C. |                     |                            |       |       |
| 75F (24 C) T.C.C.   | 802F (428C)         | % by Vol.                  | 2.6   | ---   |

Extinguishing media: CO<sub>2</sub>, dry chemical, alcohol-type foam or water fog. Move containers from fire area if without risk. Wear full protective clothing. Overheated containers may rupture violently. Cool containers with water spray. Heavier than air vapors may travel some distance from source. NIOSH approved self-contained breathing apparatus should be available.

## Section V. REACTIVITY DATA

This chemical is stable under normal conditions and will not undergo hazardous polymerization. Avoid exposure to strong oxidizers, alkalies, copper and lead. Alkali or amine salts of 2-nitropropane may be explosive when dry. Burning may produce nitrogen and carbon oxides.

For Internal Company Use Only -  
Not To Be Distributed Outside The Company

No. 117 2-NITROPROPANE

Section VI. HEALTH HAZARD INFORMATION | TLV 25 ppm

Vapors cause irritation of the respiratory tract. Overexposure may cause headache, nausea, narcosis and possible cyanosis with liver or kidney injury. Contact of liquid or vapors with eyes or skin will cause irritation.

FIRST AID:

Inhalation: Remove to fresh air. If not breathing give artificial respiration or if breathing is difficult, give oxygen and call physician.

Eyes: Immediately flush with plenty of water for at least 15 minutes.

Skin: Immediately flush generously with water.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Advise safety and environmental personnel. Eliminate all ignition sources. Stop leak if without risk. Use water spray to reduce vapors. Wearing suitable protective clothing absorb small spills on vermiculite or other absorbent material. Dike large spills for later disposal. Place saturated absorbent material in fiber drums for incineration or send to a licensed disposal or recovery site.

Section VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation and local exhaust as required.

Use protective gloves and chemical safety goggles if splashing is possible.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

Keep away from heat, sparks and open flame.

Post no smoking signs.

D.O.T. Requirements FLAMMABLE LIQUID

Section X. REFERENCES

ASTM No.:

CAS No.: 000-079-469

Other:

CMA Chemical Safety Data Sheet No.:

NFPA Guides

NSC Data Sheets:

Supplier Product Literature: Eastman Kodak (716-458-1000 XT 85566)

411538 0237



# MATERIAL SAFETY DATA SHEET No. 118

## HAZARD CHARACTERISTICS

- ☒ Flammable ☐ Combustible  
☐ Corrosive ☐ Explosive  
☐ Water Reactive ☐ Radioactive  
☐ Oxidizer ☐ Chemically Reactive

### Toxic By:

- ☐ Ingestion  
☐ Inhalation  
☐ Absorption

## PRODUCT

PYRIDINE

Phone No.

Date:

For Internal Company Use Only -  
Not To Be Distributed Outside The Company

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula:  $C_5H_5N$

Other Designation:

Corporate Stock No.:

Manufacturer: Several suppliers: Koppers, Reilly Tar & Chemical

## Section II. INGREDIENTS

Pyridine .....  
Mol. Wt. 79.10

%

95

## HAZARD DATA

8 hr TWA  
OSHA & ACGIH (1978)  
5 ppm  
15 mg/m<sup>3</sup>  
Rat, Oral LD<sub>50</sub>  
891 mg/kg  
Rat, inhalation LC<sub>50</sub>  
4000 ppm for 4 hr.

## Section III. PHYSICAL DATA

Physical Form: Liquid  
Boiling Temp.: at 1 atm. .... 239F (115C)  
Freeze-Melt Temp.: .... -44F (-42C)  
Vapor Pressure: at 13.2C. .... 10 mm Hg  
Evaporation Rate:  
Specific Gravity: at 20C. .... 0.983  
Density: Vapor (air=1) .... 2.73  
"Solubility In H<sub>2</sub>O": .... Soluble  
Color: Colorless to yellow  
Odor: Sharp, Nauseating odor; recognition threshold, 0.02 ppm in air

## Section IV. FIRE AND EXPLOSION DATA

| Flashpoint T.C.C. | Auto-Ignition Temp. | Flammability Limits In Air | Lower | Upper |
|-------------------|---------------------|----------------------------|-------|-------|
| 68F (20C)         | 900F (482C)         | % by Vol.                  | 1.8   | 12.4  |

Extinguishing Media: Carbon Dioxide, dry chemical or "alcohol" foam. Water may be ineffective in putting out fire but can be used to cool fire-exposed containers or to dilute and flush spills.  
These heavy vapors may flow along surfaces to a distant ignition source and flash back. It is a dangerous fire hazard when exposed to heat or flame. Vapors form explosive mixtures in air. Firefighters should use NIOSH approved self-contained breathing equipment, eye protection against vapors and protective clothing.

## Section V. REACTIVITY DATA

Pyridine is a stable material when stored in closed containers at room temperature. It does not polymerize.  
This flammable liquid (OSHA Class IB) should be kept separate from strong oxidizing agents. Thermal-oxidative decomposition can produce toxic nitrogen-containing materials, including oxides of nitrogen, cyanides, etc.  
Pyridine is a weakly basic material; it will react exothermically with acids.  
Heated maleic anhydride is decomposed by pyridine with rapid gas evolution.

|                                       |                    |
|---------------------------------------|--------------------|
| Section VI. HEALTH HAZARD INFORMATION | TLV 8 hr TWA 5 ppm |
|---------------------------------------|--------------------|

Pyridine is toxic by inhalation of vapors and by ingestion. It is irritating to skin and may be absorbed through the skin. Eye contact is irritating and can be damaging. Excessive inhalation produces irritation of the respiratory tract, asthmatic breathing, headache, dizziness, nausea and central-nervous system depression. Ingestion will upset the GI tract. Systemic effects can include kidney and liver damage.

**FIRST AID:**

**Eye contact:** Flush immediately with plenty of running water, including under eye lids, for 15 minutes. Get medical help.

**Skin Contact:** Wash contact areas well with soap and water. Remove contaminated clothing promptly.

**Inhalation:** Remove to fresh air. If necessary, give artificial respiration.

**Ingestion:** Contact physician immediately for gastric lavage.

## Section VII. SPILL, LEAK &amp; DISPOSAL PROCEDURES

Inform safety and environmental personnel. Provide maximum explosion-proof ventilation. Eliminate sources of ignition. Stop discharge if possible. Personnel involved in clean-up should use protection against liquid contact and vapor inhalation. Cover and absorb small spill with 9:1 mixture of sand and soda ash; pick up and place in a cardboard box with crumpled paper, scrap wood excelsior, etc. for prompt burning. Pyridine can be flushed away from sensitive location with a water spray.

**DISPOSAL:** Burn waste material (as indicated above or in flammable solvent solution) in an approved incinerator with afterburner and scrubber. (nitrogen oxides emitted).

Follow Federal, State and local regulations.

High concentrations are dangerous to aquatic life.

## Section VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation and local exhaust ventilation to meet TLV requirements.

NIOSH approved, self-contained breathing apparatus must be available for non-routine and emergency use.

Protect skin against contact with liquid by use of butyl rubber gloves, aprons, other protective clothing as required by exposure risk. Use chemical goggles for eye protection. An eyewash station shall be located in the work area and be immediately accessible for emergency use. A safety shower is required where contact with large amounts of pyridine is possible.

## Section IX. SPECIAL PRECAUTIONS &amp; COMMENTS

Store as a flammable liquid (OSHA Class IB), away from acids and strong oxidizing agents. Outside or detached storage considered preferable. Protect containers from physical damage. Electrically bond and ground metal containers for transfers to prevent static sparks.

Regular physical exam of exposed workers recommended. Restrict exposure of those with central nervous system, kidney, or liver disorders.

## D.O.T. Requirements FLAMMABLE LIQUID

## Section X. REFERENCES

ASTM No. D2323

CAS No. 000-110-861

CMA Chemical Safety Data Sheet No.:

NFPA Guides

NSC Data Sheets: No. 310

Supplier Product Literature:

Other: AIA Bulletin C-56

AIHA Hygenic Guide 8-63



# MATERIAL SAFETY DATA SHEET No. 119

## HAZARD CHARACTERISTICS

- |                                         |                                              |                                                                                                                                      |
|-----------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Flammable      | <input type="checkbox"/> Combustible         | <i>Toxic By:</i><br><input type="checkbox"/> Ingestion<br><input type="checkbox"/> Inhalation<br><input type="checkbox"/> Absorption |
| <input type="checkbox"/> Corrosive      | <input type="checkbox"/> Explosive           |                                                                                                                                      |
| <input type="checkbox"/> Water Reactive | <input type="checkbox"/> Radioactive         |                                                                                                                                      |
| <input type="checkbox"/> Oxidizer       | <input type="checkbox"/> Chemically Reactive |                                                                                                                                      |

## PRODUCT

ALUMINUM FLUORIDE

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: Aluminum Fluoride (Anhydrous);  $AlF_3$

Other Designation:

Corporate Stock No.:

Manufacturer: Allied Chem. Corp. Olin Corp. Stauffer Chem. Co.

## Section II. INGREDIENTS

Aluminum Fluoride.....,...

Mol. Wt. 83.98

Commercial Product contains about 85%  $AlF_3$  and 12-14%  $Al_2O_3$ .

%

85-90%

## HAZARD DATA

TLV

Not Established

## Section III. PHYSICAL DATA

Physical Form: Solid powder or granules

Boiling Temp.: .....

Sublimes at 2300F (1260C)

Freeze-Melt Temp.: .....

2356F (1291C)

Vapor Pressure: at 1238C.....

1 mm Hg

Evaporation Rate:

Specific Gravity: at 25C.....

2.88

Density:

"Solubility In  $H_2O$ ": .....

Insoluble

Color: White

Odor: Odorless

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint

Auto-Ignition Temp.

Flammability Limits In Air

Lower

Upper

NOT FLAMMABLE

NA

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When heated to sublimation conditions, emits toxic fluoride fumes. In fire area wear goggles and self-contained breathing apparatus. Avoid contact with dust. Use appropriate fire extinguishing agents for the specific fire conditions.

## Section V. REACTIVITY DATA

This material is stable under conditions of storage, shipment or normal use. It does not react hazardously with water and other common materials including acids or alkalis.

Section VI. HEALTH HAZARD INFORMATION | TLV NOT AVAILABLE

Symptoms following exposure: Respiratory irritation, possible with nosebleed or vomiting. Continued exposure may aggravate bronchitis/asthma and cause increased bone density. Liquid or solid contact with the skin is essentially harmless.

FIRST AID:

For acute poisoning, see physician. Administer limewater orally. Provide intravenous infusion of glucose and injections of calcium gluconates.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Collect spilled powder in suitable containers. Minimize dusting and/or use approved respirator. Ship to approved disposal site. Conform to Federal, State and local disposal regulations.

Low concentrations of this chemical may be harmful to aquatic life. 60 ppm may be lethal to fresh water fish.

Section VIII. SPECIAL PROTECTION INFORMATION

Use goggles to protect against airborne particles and NIOSH approved respirator for intermittent heavy dust exposure. Avoid breathing dust.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

*D.O.T. Requirements*

Section X. REFERENCES

ASTM No.:

CAS No.: 007-784-181

CMA Chemical Safety Data Sheet No.:

NFPA Guides

NSC Data Sheets:

Supplier Product Literature.

Other: CHRIS (1974)



# MATERIAL SAFETY DATA SHEET No. 120

## HAZARD CHARACTERISTICS

- ☐ Flammable ☐ Combustible  
☒ Corrosive ☐ Explosive  
☐ Water Reactive ☐ Radioactive  
☐ Oxidizer ☐ Chemically Reactive

### Toxic By:

- ☒ Ingestion  
☒ Inhalation  
☐ Absorption

## PRODUCT

AMMONIUM HYDROXIDE

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: Ammonium Hydroxide, Aqueous (approx. 28%);  $\text{NH}_4\text{OH}$

Other Designation: Aqueous ammonia, Ammonia water, Ammonium hydrate

Corporate Stock No.:

Manufacturer: American Oil Co.; CF Industries

## Section II. INGREDIENTS

Ammonium Hydroxide - Aqueous.....

Mol. Wt. 35.05

%

ca 28.

## HAZARD DATA

Inhalation

TLV 1 ppm

STIL - Ammonia gas

100 ppm for 30 minutes

500 ppm for 10 minutes

Odor threshold is 50 ppm

## Section III. PHYSICAL DATA

Physical Form: Colorless liquid

Boiling Temp.: ..... 101F (38.5C)

Freeze-Melt Temp.: ..... -107F (-77C)

Vapor Pressure:

Evaporation Rate:

Specific Gravity: @ 20C..... 0.89

Density:

"Solubility in  $\text{H}_2\text{O}$ ":

Color: Colorless

Odor: Sharp, irritating, ammonia odor

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint

NOT FLAMMABLE

Auto-Ignition Temp.

Flammability Limits in Air

Lower

Upper

This material not flammable. Use extinguishing agents appropriate for materials burning in fire area.  $\text{NH}_4\text{OH}$  creates no special hazards of combustion products. Avoid contact with liquid and vapor. Wear goggles and approved self-contained breathing apparatus.

## Section V. REACTIVITY DATA

This product is stable during shipment and storage. It is corrosive to copper, copper alloys and galvanized surfaces.

|                                       |                                             |
|---------------------------------------|---------------------------------------------|
| Section VI. HEALTH HAZARD INFORMATION | TLV 1 ppm inhalation of NH <sub>3</sub> Gas |
|---------------------------------------|---------------------------------------------|

Contact of liquid or vapor with skin, mucous membranes, lungs or gastroenteric tract causes marked local irritation. Ingestion causes burning pain in mouth, throat, stomach with vomiting blood, passage of loose stool containing blood. Breathing difficulty, convulsions and shock may result. Exposure to 5000 ppm or ingestion of 3-4 ml may be fatal.

FIRST AID:

Inhalation: Move to fresh air. Give artificial respiration and oxygen if needed. Enforce rest.

Ingestion: Do not induce vomiting. Lavage stomach with water or lemon juice, milk or demulcents. Delay may cause perforation of esophagus or stomach. Swelling of Glottis may necessitate tracheostomy.

Eye or Skin: Wash with plenty of water. Short exposure can cause first-degree burns.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Wear self-contained breathing apparatus, goggles and rubber overclothing including gloves. Stop discharge if possible. Restrict access to the spill area. Stay upwind and use water spray to knock-down vapors. Isolate and remove spilled material. Dispose via a licensed operator in compliance with Federal, State and local regulations. Low concentrations (6-15 ppm) may be lethal to aquatic life.

Section VIII. SPECIAL PROTECTION INFORMATION

If splashing is possible wear chemical safety goggles and safety face mask. Use protective clothing to avoid contact with skin. Use NIOSH approved self-contained breathing apparatus if TLV is or may be exceeded. If contacted by liquid, remove contaminated clothing and shoes promptly. Flush affected areas with plenty of water.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

Vapors cause sufficient irritation that personnel will find high concentrations intolerable. The effect is temporary.

*D.O.T. Requirements*

Section X. REFERENCES

ASTM No.:

Other:

CAS No.:

CMA Chemical Safety Data Sheet No.:

NEPA Guides

NSC Data Sheets

Supplier Product Literature:



# MATERIAL SAFETY DATA SHEET No. 121

## HAZARD CHARACTERISTICS

☐ Flammable ☒ Combustible *Toxic By:*  
☐ Corrosive ☐ Explosive ☐ Ingestion  
☐ Water Reactive ☐ Radioactive ☒ Inhalation  
☐ Oxidizer ☐ Chemically Reactive ☐ Absorption

## PRODUCT

ANILINE

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: Aniline;  $C_6H_5NH_2$  Mol. Wt. 93.13  
Other Designation: Aminobenzene; Phenylamine; Blue oil; Aniline oil

Corporate Stock No.:

Manufacturer: DuPont, Mobay Chem. Co.

## Section II. INGREDIENTS

Aniline (commercial grade).....

%

99.5

## HAZARD DATA

8 hr TWA (skin)

5 ppm or

19 mg/m<sup>3</sup>

STIL: 50 ppm, 30 minutes

Toxicity by ingestion

LD<sub>50</sub>

50-500 mg/kg

## Section III. PHYSICAL DATA

Physical Form: Oily liquid

Boiling Temp.: @ 1 atm..... 363F (184C)

Freeze-Melt Temp.: ..... 21F (-6.2C)

Vapor Pressure:

Evaporation Rate:

Specific Gravity: @ 20C..... 1.022

Density: Vapor (air=1)..... 3.2

"Solubility In H<sub>2</sub>O": ..... Slightly soluble

Color: Colorless to yellowish brown

Odor: Weak aromatic amine like odor; odor threshold is 0.5 ppm

## Section IV. FIRE AND EXPLOSION DATA

Flashpoint

158F (70C) E.C.

Auto-Ignition Temp.

1139F (615C)

Flammability Limits In Air

% by Vol.

Lower

1.3

Upper

----

Fire extinguishing agent: dry chemical, CO<sub>2</sub>, alcohol-type foam. Toxic vapors are generated when heated. Vapor may explode if ignited in an enclosed area. Wear chemical protective suit and NIOSH approved self-contained breathing apparatus. Cool fire exposed containers with water.

## Section V. REACTIVITY DATA

Aniline is a stable product. It has no hazardous reactivity with water or other common materials.

Aniline can react vigorously with oxidizers.

No. 121 ANILINE

Section VI. HEALTH HAZARD INFORMATION | TLV

Symptoms following exposure: Acute - Blue discoloration of finger-tips, lips and nose. Nausea, vomiting, headache and drowsiness followed by delirium, coma and shock. Chronic Exposure: Loss of appetite and weight, visual disturbances and skin lesions. The most important body response is the formation of methemoglobin, with resulting anoxemia and depression of the central nervous system.

FIRST AID:

Remove victim to fresh air and call physician at once.

Eye: Flush with water for 15 minutes.

Skin: Wash thoroughly. If cyanosis is present, shower with soap and warm water, with special attention to scalp and finger nails. Administer oxygen till physician arrives.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Inform safety and environmental personnel. Avoid contact with liquid and vapor. Keep people away. Wear chemical protective suit and self-contained breathing apparatus. Stop discharge if possible. Isolate and collect spilled material. Water pollution can be harmful to aquatic life. Dispose via licensed disposal company in compliance with existing regulations.

Section VIII. SPECIAL PROTECTION INFORMATION

Avoid contact with liquid and vapor. Wear splash proof goggles, rubber gloves and boots (if necessary). Use NIOSH approved breathing apparatus if the TLV is or may be exceeded.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

If liquid is spilled on clothing, remove contaminated clothing (& shoes) and wash thoroughly. Aniline is a mild sensitizer and a poison. Local contact may cause dermatitis.

*D.O.T. Requirements*

Section X. REFERENCES

ASTM No.:

CAS No.: 62-53-3

CMA Chemical Safety Data Sheet No.

NEPA Guides

NSC Data Sheets:

Supplier Product Literature:

Other:

411538 0245



# MATERIAL SAFETY DATA SHEET No. 122

## HAZARD CHARACTERISTICS

- |                                               |                                              |                                     |
|-----------------------------------------------|----------------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> Flammable | <input type="checkbox"/> Combustible         | <i>Toxic By:</i>                    |
| <input type="checkbox"/> Corrosive            | <input type="checkbox"/> Explosive           |                                     |
| <input type="checkbox"/> Water Reactive       | <input type="checkbox"/> Radioactive         |                                     |
| <input type="checkbox"/> Oxidizer             | <input type="checkbox"/> Chemically Reactive |                                     |
|                                               |                                              | <input type="checkbox"/> Ingestion  |
|                                               |                                              | <input type="checkbox"/> Inhalation |
|                                               |                                              | <input type="checkbox"/> Absorption |

## PRODUCT

CHLOROBENZENE

Phone No.

Date:

## Section I. MATERIAL DESCRIPTION

Chemical Name & Formula: Monochlorobenzene  $C_6H_5Cl$  Mol. Wt. 112.56  
Other Designation: Phenyl Chloride, Benzene Chloride; Chlorobenzol

Corporate Stock No.:

Manufacturer: Dow, Monsanto

## Section II. INGREDIENTS

Monochlorobenzene.....

%

99.5%

## HAZARD DATA

TLV 75 ppm  
350 mg/m<sup>3</sup>

Toxicity by ingestion  
LD<sub>50</sub> mg/kg  
Rat 2910  
Rabbit 2830

## Section III. PHYSICAL DATA

Physical Form: ..... Liquid  
Boiling Temp.: at 1 atm. .... 270F (132C)  
Freeze-Melt Temp.: .... -50.1F (-45.6C)  
Vapor Density (air=1) .... 3.9 Vapor pressure at 22.2C. .... 10. mm Hg  
Evaporation Rate: .....  
Specific Gravity: at 20C. .... 1.11  
Density: Liquid. .... 9.19 LB/Gal  
"Solubility in H<sub>2</sub>O": .... Insoluble  
Color: .... Colorless, Clear  
Odor: .... Sweet, Almond odor

## Section IV. FIRE AND EXPLOSION DATA

| Flashpoint       | Auto-Ignition Temp. | Flammability Limits in Air | Lower | Upper |
|------------------|---------------------|----------------------------|-------|-------|
| 84F (28.9C) C.C. |                     |                            |       |       |
| 97F (34.4C) O.C. | 1184F (640C)        | % by Vol.                  | 1.3   | 7.1   |

Extinguishing agents: CO<sub>2</sub>, dry chemical, alcohol-type foam, water spray. Burning in an open flame can form toxic phosgene (see No. 58) and HCl gas. Wear goggles, self-contained breathing apparatus and full protective fire gear. Flash back along vapor trail may occur. Vapor may explode if ignited in enclosed area.

## Section V. REACTIVITY DATA

This material is stable during shipment and storage and does not have hazardous reactions with water and other common materials. It does not under go hazardous polymerization.

For Internal Company Use Only -  
Not To Be Distributed Outside The Company

Section VI. HEALTH HAZARD INFORMATION | TLV : 75 ppm

Symptoms following exposure: Fumes are irritating to skin, eyes and mucous membranes. Repeated skin exposure may cause dermatitis. Inhalation of vapors or mist may result in irregular pulse, deep and rapid respiration, drowsiness, unconsciousness and in damage to lungs, liver and kidneys. Acute vapor exposures can cause symptoms ranging from coughing to transient anesthesia to central nervous system depression.

FIRST AID: Get medical attention for all eye exposures and any serious over-exposure.

Inhalation: Remove to fresh air. Give oxygen if needed.

Ingestion: Dilute by drinking water. If vomiting occurs, drink more water. Administer saline laxative.

Eyes: Flush thoroughly with water.

Skin: Remove contaminated clothing. Wash exposed area with soap and water.

Section VII. SPILL, LEAK & DISPOSAL PROCEDURES

Stop discharge if possible. Extinguish sources of ignition. Avoid contact with liquid and vapor. Keep people away. Isolate and remove spilled material. Dispose waste material in an approved incinerator or via an approved disposal facility in compliance with existing federal, state and local regulations.

Small spills can be absorbed with paper towel and evaporated in hood.

Section VIII. SPECIAL PROTECTION INFORMATION

Provide adequate exhaust ventilation in areas of use to meet TLV requirements. Use NIOSH approved breathing apparatus (organic vapor-acid gas respirator or self-contained breathing apparatus) based on the actual or anticipated concentration. Wear goggles for eye protection and a face shield if splashing is possible.

Section IX. SPECIAL PRECAUTIONS & COMMENTS

Store in closed containers in well-ventilated area. Keep away from sources of heat or ignition. Post no smoking signs.

D.O.T. Requirements FLAMMABLE LIQUID

Section X. REFERENCES

ASTM No.:  
CAS No.: 000-108-907  
CMA Chemical Safety Data Sheet No.:  
NFPA Guides  
NSC Data Sheets:  
Supplier Product Literature:

Other: AIA Bulletin C-20  
AIHA Hygenic Guide 2-64  
Chris (1974)