



ECLIPSE
AVIATION

MATERIAL SAFETY DATA SHEET

Product Name: PhostrEx™

SECTION I: MANUFACTURER'S INFORMATION

Manufacturer's Name & Address

Eclipse Aviation Corporation 2503 Clark Carr Loop SE Albuquerque, NM 87106 www.eclipseaviation.com	Emergency Telephone Number:	1-877-350-0538
	After normal business hours:	1-888-350-0911
	Number for Information:	1-866-898-1097

SECTION II: HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Hazardous Components	CAS	%
Phosphorous Tribromide (PBr ₃)	7789-60-8	>99

Non-Hazardous Components	CAS	%
Nitrogen gas (N ₂)	7727-37-9	<1
Helium gas (He)	7440-59-7	< 1

SECTION III: PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point:	173 C [°] (1atm)
Vapor Pressure (mm Hg.):	2 @ 20°C
Vapor Density (Air = 1):	9.38
Specific Gravity (H ₂ O = 1):	2.85 g/cm ³
Melting / Freezing Point of active ingredient	-45° C
By-product (HBr) vapor density	2.78
Solubility in Water:	Reacts rapidly with water to produce water soluble acids HBr and H ₃ PO ₃
Appearance and Odor:	Pale yellow, dense, low viscosity liquid with medicinal odor from HBr produced by reaction with ambient moisture.

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used):	NA
Flammable Limits:	NA
Extinguishing Media	Non-flammable
Special Fire Fighting Procedures:	Non-flammable
Unusual Fire and Explosion:	None
Auto ignition Temperature	N.A.

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SECTION V: REACTIVITY DATA

Stability	Stable
Conditions to avoid	None known
Incompatibility (Materials to Avoid)	Moisture decomposes PBr_3 into simple acid irritants
Hazardous decomposition or by-products	Reacts with water to form soluble hydrobromic (HBr) (CAS 10035-10-6) and orthophosphorous (H_3PO_3) (CAS 13598-36-2) acids
Hazardous Polymerization	Not known to occur
Conditions to Avoid:	Avoid direct contact with skin and eyes; avoid inhalation of vapors.

SECTION VI: HEALTH HAZARD DATA

Inhalation:	Inhaled PBr_3 is rapidly hydrolyzed on mucosa to produce water soluble acid irritants HBr and H_3PO_3 .
Skin Contact:	Material hydrolyzes on skin to produce water soluble acid irritants HBr and H_3PO_3 .
Skin Absorption:	No. Material reacts at surface to produce dermal irritants HBr and H_3PO_3 .
Ingestion:	No. Material is typically too reactive to be ingested; if taken by mouth it normally hydrolyzes to simple acids HBr and H_3PO_3 (irritants)
Eye or Skin contact:	Flush with copious quantities of water. Remove contact lenses or affected clothing.
Reactivity:	The material is hermetically sealed so that exposure is precluded except when a cartridge is discharged. On contact with moisture in the air or on ambient surfaces it is rapidly (less than one second) converted to gaseous hydrogen bromide (HBr) and solid phosphonic acid (H_3PO_3), which are both soluble in water. These acids stick to ambient surfaces where they are diluted or neutralized and pose minimal risk.
Toxicology data for PBr_3 (Acute and Chronic)	<ul style="list-style-type: none">Acute inhalation toxicity (4 hr NOAEL (No Observable Adverse Effect Level) 0.4 mg/L, rats)Subchronic inhalation toxicity (28 day, rats) NOAEL 0.1 mg/L Acute aquatic toxicity testing96-hour LC50 (Concentration for 50% lethality at 96 hours) value for fathead minnows at 71 mg/L25 mg/L NOEC (No Observable Effects Concentration)48-hour EC50 (Exposure for 50% lethality, 48 hours) value for Daphnia magna at 22.6 mg/L (6.25 mg/L NOEC).
Carcinogenicity	Genotoxicity testing using bacterial Salmonella strains (AMES test) indicate PBr_3 is not a mutagen for either frame shift or base-pair substitution tester strains in both buffered and unbuffered solutions.
Signs and Symptoms of Exposure	Irritant to eyes and skin; direct contact may cause reddening or blistering of skin.
Medical Conditions Generally aggravated by Exposure	None
Emergency and first aid procedures:	Vigorous irrigation with water. Contact a physician immediately.
Note to Physician:	Agent reacts rapidly with moisture to make acidic by-products HBr gas and H_3PO_3 solid, both products are soluble in water.

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SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE

Eyes	<p>Wear safety glasses or a face shield to protect eyes from direct contact with liquid. As with any potential source of irritant vapor, contact lens use is not recommended if material is released.</p> <p>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Flush with large quantities of water. Remove contact lenses if present.</p>
Skin	<p>Material reacts rapidly with ambient moisture to produce simple, water soluble acids. Cleaning or etching of surfaces may result from sustained exposure to concentrated byproducts.</p> <p>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Flush exposed areas with large quantities of water.</p>
Ground spill	<p>STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Quench with large quantities of water and ventilate to dissipate gaseous HBr byproduct.</p> <p>The byproducts HBr and H_3PO_3 are soluble and can be diluted with additional water to reduce pH before flushing down the drain.</p>
Waste disposal method	<p>Safe to wash into waste systems after dilution or quenching with base such as NaOH to make the bromide and phosphate salts.</p>

SECTION VIII: CONTROL MEASURES

Respiratory Protection (Specific Type):	<p>Material is designed to remain hermetically sealed. If acute release occurs an acid gas filter or breathing apparatus will protect personnel from HBr gas that may be evolved from the hydrolysis of PBr_3.</p>
Ventilation: Use with adequate ventilation	<p>Ventilation conditions can be estimated using guidelines for HBr exposure presuming all PBr_3 is converted to HBr on release.</p>
Mechanical (General):	<p>Material is hermetically sealed in a pressurized cartridge by design. Leaking or suspect canisters can be discharged and quenched while completely submerged in water.</p>
Special	<p>None</p>
Other:	<p>None</p>
Protective Gloves	<p>Nitrile recommended</p>
Eye Protection	<p>Safety Goggles or face shield Avoid contact lenses</p>
Other Protective Clothing or Equipment:	<p>Proximate source of water (hose, sink, safety shower, eyewash) to apply if accidental discharge occurs.</p>
Work/Hygienic Practices:	<p>Use good housekeeping practices.</p>


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SECTION IX: TRANSPORTATION and REGULATORY CODES

UN No.	1808
IMO	Class: 8 - Corrosives
Ammdt.	32-04
IMDG	page 88
IMO-labels	Corrosive (8)
Packing group	II
EMS	F-A, S-B
ICAO/IATA	Class: 8
Packing group	II
IATA label	Corrosive (8)
Cargo aircraft (CAO)	813
ADR/RID	Class: 8 - Corrosives
Classification code	C1
Hazard ID	X80
UK	Emergency Action Code: 4WE
DOT	Class: 8 - Corrosives
DOT label	Corrosive (8)
Packing group	II
DOT ID	UN1808
NAERG	137
Indication of danger	 Corrosive, symbol required (C)
- R Phrases	R 14: Reacts with water. R 34: Causes burns. R 37: Irritating to respiratory system.
- S Phrases	S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45: In case of accident or if you don't feel well, seek medical advice immediately (show label where possible)
USA	Reported in the EPA TSCA Inventory
New Jersey right-to-know list	Listed
RTECS#	TH4460000
Canada	Listed in DSL Listed in WHMIS.
Japanese inventory (ENCS)	1-117X
Australia	Listed in AICS
China inventory	Listed
South Korea (ECL)	KE-28722
Philippines	Listed in PICCS
Switzerland	WARENVERZEICHNIS 21905, Toxic Category 1 Giftliste 1 G-2747

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