MATERIAL SAFETY DATA SHEET

I - PRODUCT IDENTIFICATION

Product:	Trichloroisocyanuric Acid
Synonyms:	TCCA; trichlor

II - TRANSPORTATION DATA

U.S. Department of Transportation - 49 CFR

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL

Land and Air:

Proper Shipping Name:	Trichloroisocyanuric acid dry
Hazard Class/Division Number:	5.1
ID Number:	UN2468
Packing Group:	II
Label Required:	Oxidizer (5.1)
ERG Number:	141
Emergency Telephone Number:	Chemtrec 800-424-9300

Water:

Proper Shipping Name:	Trichloroisocyanuric acid dry
Hazard Class/Division Number:	5.1
ID Number:	UN2468
Packing Group:	II
IMDG Page Number:	5190
EmS Number	5.1-05
Label Required:	Oxidizer (5.1)
ERG Number:	141
Emergency Telephone Number:	Chemtrec 800-424-9300

Reportable Quantity:

Not applicable (per 49CFR 172.101, Appendix)

Emergency Guide Number:

141

III - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Chemical Name:	trichloro-s-trizainetrione
CAS Number:	87-90-1
Percentage Range:	96-100
Hazardous Per 29 CFR 1910.1200:	yes
Exposure Standards:	none established

Chemical Name:	dichloroisocyanuric acid
CAS Number:	2782-57-2
Percentage Range:	0-4
Hazardous Per 29 CFR 1910.1200:	yes
Exposure Standards:	none established

IV - PHYSICAL/CHEMICAL CHARACTERISTICS

Odor:	sharp chlorine-like, bleach odor
Color:	white
Appearance:	granular or tablet-form
Total acidity:	2.7 – 2.9 (1% solution)
Freezing Point:	N/A
Solubility in Water:	1.2% at 25°C
Vapor Density (Air=1):	N/A
Evaporation Rate:	N/A
Molecular Weight:	232.5
Specific Gravity (H_2O=1):	> 1 at 20°C
Bulk Density:	
Granular:	0.89 – 1.1 g/cc
Tablets:	1.16 – 1.90 g/cc
Vapor Pressure (mm Hg):	not available
Percent volatile by volume:	N/A
Boiling Point (@ 760 mm Hg):	N/A
Decomposition Temperature:	225°C (437°F)
Coefficient of Oil/Water Dist.:	not available

V - FIRE AND EXPLOSION HAZARD DATA

Flammability Data:
- Flammable: no
- Combustible: no
- Pyrophoric: no

Flash Point:
- N/A

Auto-ignition Temperature:
- N/A

Flammable Limits
- LEL: N/A
- UEL: N/A

Extinguishing Media:
- N/A

Special Fire-fighting Procedures:

Use water to cool containers exposed to fire. On small fires, use water spray or fog. On large fires, use heavy deluge or fog streams. Flooding amounts of water may be required before extingushment can be accomplished. Do not use dry chemical extinguishers containing ammonia compounds.

VI - REACTIVITY DATA

Stability:

( ) Unstable (X) Stable

Stable under normal conditions of storage, shipment and/or use. Do not package in paper or cardboard. Avoid temperatures above 225°C (437°F).

NOTE – Avoid contact with small amounts of water. Damp or slightly wet product will evolve nitrogen trichloride

Incompatibility:

Organic materials, reducing agents, nitrogen containing materials, other oxidizers, acids, bases, oils, grease, sawdust, dry fire extinguishers containing ammonium compounds

Hazardous Decomposition or By-Products:

Nitrogen trichloride, chlorine, nitrous oxides, cyanates, carbon monoxide, carbon dioxide

Hazardous Polymerization:

( ) May Occur (X) Will Not Occur

Summary of Reactivity:

Oxidizer:	Yes	Pyrophoric:	No
Organic Peroxide:	No	Water Reactive:	No

VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Personal Protection for Emergency Spill and Fire-Fighting Situations:

Wear a half mask cartridge type NIOSH approved respirator, with chlorine cartridges. All other response to this material requires the use of a self-contained breathing apparatus (SCBA). Additional protective clothing, including boots, gloves, hard hat, splash-proof goggles, and impervious clothing, must be worn to prevent personal contact with this material. Compatible materials for response to this material are neoprene, chlorinated polyethyulene, butyl rubber and saranex

CAUTION – Protection concerns must also address the following:

If the material becomes damp/wet or contaminated in a container the formation of nitrogen trichloride gas by occur and an explosive condition may exist

Steps To Be Taken In Case Material Is Spilled Or Released:

Hazardous concentrations in air may be found in local spill area and immediately downwind. If spill material is still dry, do not put water directly on this product as a gas evolution may occur

Air Release:

Vapors may be suppressed by the use of water fog

Water Release:

This material is heavier than water. This material is soluble in water. Stop flow of material into water source as soon as possible. Begin monitoring for available chlorine and pH immediately

Land Spill:

Do not contaminate spill material with any organic materials, ammonia, ammonium salts or urea. Clean up all spill material with clean, dry dedicated equipment and place in a clean dry container

Waste Disposal Method:

If this product becomes a waste, it will be hazardous waste, which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly. As a hazardous solid waste, it must be disposed of in accordance with local, state, and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment.

Care must be taken to prevent environmental contamination from the use of this material. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and non-hazardous wastes

Precautions to Be Taken in Handling and Storage:

Handling:

Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water

Storage:

Store in a clean, dry, well-ventilated area. Keep away from incompatible chemicals. Do not store at temperatures above 60°C (140°F). product has an indefinite self life. Available chlorine loss can be as little as 0.1% per year at ambient temperatures

VIII - HEALTH HAZARD DATA

OSHA Hazard Classification:

Oxidizer, corrosive, skin and eye hazard, lung toxin, toxic by ingestion and inhalation

NFPA-HMIS Ratings:

Health:	3	3
Flammability:	0	0
Reactivity:	2	2
Special Hazard:	oxidizer	

Primary Route(s) of Entry:

Ingestion:	(X)
Inhalation:	(X)

Skin Contact: (X)
Eye Contact: (X)

Medical Conditions Aggravated By Exposure:

Asthma, respiratory and cardiovascular disease

Primary Health Hazards:

Harmful is swallowed. Harmful if in haled. Causes skin, eye, digestive tract and respiratory tract burns

Immediately Dangerous to Life or Health:

No IDLH concentrations has been established for this product, TCCA has the potential to be immediately dangerous to life and health

Signs & Symptoms of Exposure:

Eyes: sever irritation and/or burns can occur following eye exposure. Contact may cause impairment of vision and corneal damage

Skin: dermal exposure can cause sever irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause destruction of the dermis with impairment of the skin at site of contact to regenerate. Repeated skin exposure may cause tissue destruction due to the corrosive nature of the product

Inhalation: irritating to the nose, mouth, throat and lungs. It may also cause burns to the respiratory tract with the production of lung edema, which can result in shortness of breath, wheezing, choking, chest pain, and impairment of lung function. Inhalation of high concentrations can result in permanent lung damage. Chronic inhalation exposure may cause impairment of lung function and permanent lung damage

Ingestion: irritation and/or burns can occur to the gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding and/or tissue ulceration. Ingestion causes severe damage to the gastrointestinal tract with the potential to cause perforation. Chronic ingestion of significant amounts of the product is unlikely because of it acute corrosive action

Emergency and First Aid Procedures:

Ingestion: immediately drink large quantities of water. DO NOT induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious of if having convulsions

Inhalation: if person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough

vapor to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work

Skin Contact: immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use

Eye Contact: immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once

IX - CONTROL MEASURES

Exposure Control/Personal Protection:

Respiratory: a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. When dusty conditions are encountered, wear a NIOSH/MSHA approved full face-piece respirator equipped with chemical cartridge for protection against chlorine gas and a dust/mist type pre-filter

Ventilation: use local exhaust ventilation to minimize dust and chlorine levels where industrial use occurs. Otherwise, ensure good ventilation

Skin: avoid contact with skin. Neoprene gloves should be worn when using this substance. Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. Rinse and remove gloves immediately after use. Wash hands with soap and water

Eye: use chemical safety glasses (ANSI Z87.1) to avoid eye contact. Where industrial use occurs, chemical goggles may be required

Hygiene: safety shower and eye bath should be provided. Do not eat, drink or smoke until showering and changing clothes

Other: for industrial use, wear chemically resistant (neoprene) apron and full impermeable suit or other impervious clothing to avoid skin and eye contact

X – TOXICILOGICAL INFORMATION

Acute Toxicity:

Inhalation LC50:	Approximately 0.68 mg/l (4 hour, rats – nose only)
Oral LD50:	490 mg/kg (rat)
Dermal LD50:	> 2 g/kg (rabbit)
Irritation:	causes burns to eyes and skin

Target Organ Toxicity:

This product is corrosive to all tissues contacted and upon inhalation, may cause irritation to mucous membranes and respiratory tract. There are no known or reported effects from repeated exposure. Toxicological investigation indicates it does not produce significant function of fetal development

Reproductive and Developmental Toxicity:

There are no known or reported effects on reproductive function or fetal development. Toxicological investigation indicates it does not effect reproductive function of fetal development

Carcinogenicity:

This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA

Mutagenicity:

Trichloroisocyanuric acid has been tested in microbial mutagenicity assays. The microbal mutagenicity assays employed five Salmonella strains and one E. coli strain with and without mammalian microsomal activation. No mutagenic effects were observed in these assays

XI – ECOLOGICAL INFORMATION

Aquatic Toxicity

Rainbow trout (96-hour LC50): 0.32 ppm
Bluegill Sunfish (96-hour LC50): 0.30 ppm
Daphnia magna (48-hour LC50): 0.21 mg/l

Avian Toxicity:

Mallard duck (8-day dietary LC50 exposure): >10,000 ppm
Mallard duck (LD50): 1.6 g/kg
Bobwhite quail (8-day dietary LC50 exposure): 7,422 ppm

XII – REGULATORY INFORMATION

Workplace Classification:

This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200)

SARA Title III, Section 311/312 Categorization (40 CFR 370.2):

This product is categorized as an immediate health hazard, and fire and reactivity physical hazard

SARA Title III, Section 313 Information (40 CFR 372):

This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations

Waste Classifications:

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number – D001

United States:

This product is subject to regulation under the US Toxic Substances Control Act Inventory listing requirements

XIII - ADDITIONAL INFORMATION

ALWAYS COMPLY WITH ALL APPLICABLE INTERNATIONAL, FEDERAL, STATE AND LOCAL REGULATIONS REGARDING THE TRANSPORTATION, STORAGE, USE AND DISPOSAL OF THIS CHEMICAL.

Due to the changing nature of regulatory requirements, the REGULATORY INFORMATION listed in Section XII of this document should NOT be considered all-inclusive or authoritative. International, Federal, State and Local regulations should be consulted to determine compliance with all required reporting requirements.

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Revised: 14-May-98