

BALCHEM™

ANIMAL NUTRITION & HEALTH

World-Class Quality  Worldwide Service

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MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 50% Choline Chloride – Dry
60% Choline Chloride – Dry
70% Choline Chloride – Dry
75% Choline Chloride – Dry
70% Choline Chloride – Aqueous
75% Choline Chloride – Aqueous

SYNONYMS: Choline Chloride
2-Hydroxy-N,N,N-trimethylethanaminium chloride
(beta-Hydroxyethyl) trimethylammonium chloride
(2-Hydroxyethyl) trimethylammonium chloride
Bilineurin Chloride
Biocolina
Biocoline
Cholinium Chloride
Hepacholine
Hormocline
Lipotril
Luridin Chloride
Neocolina
Paresan
Trimethyl (2-hydroxyethyl) ammonium chloride
Chlorure de Choline
Cholinchlorid

TYPICAL USES: Nutritional Additive

MANUFACTURER: Balchem Corporation
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2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>COMPONENTS</u>	<u>WEIGHT %</u>	<u>CAS #</u>	<u>EXPOSURE LIMITS</u>	<u>CITATION</u>
Dry				
C ₅ H ₁₄ CINO	50-75	67-48-1	OSHA Nuisance Dust PELs – Respirable fraction = 5 mg/m ³ - Total = 15 mg/m ³	(29 CFR 1910.1000)
Carrier*	25-50	-----	OSHA Nuisance Dust PELs – Respirable fraction = 5 mg/m ³ - Total = 15 mg/m ³	(29 CFR 1910.1000)

*Cereal or Amorphous Silica carrier. SiO₂ • H₂O (CAS #63231-67-4) is a synthetic amorphous silica not to be confused with crystalline silica. Epidemiological studies indicate low potential for adverse health effects from amorphous silica.

Aqueous				
C ₅ H ₁₄ CINO	70-75	67-48-1	None	None
H ₂ O	30-25	-----		

<u>HAZARDOUS COMPONENTS</u>	<u>WEIGHT %</u>	<u>CAS #</u>	<u>EXPOSURE LIMITS</u>
None			

3. HAZARDS IDENTIFICATION

Emergency Overview

Dry: Tan to off-white granule or powder with odor ranging from little to cereal. Hazards include dust explosion and dust irritation hazards. Absorbs moisture (hygroscopic) and may be slippery when spilled.

Aqueous: Colorless to light amber solution; slight amine (fish-like) odor; poses little or no immediate hazards.

Potential Health Effects

Eye: No hazard expected from aqueous. Dust from Dry may cause eye irritation.

Inhalation: No hazard expected. Breathing dust may cause respiratory irritation.

Skin: No hazard expected. Dust may cause skin irritation.

Ingestion: Convulsions may occur with ingestion of 100% choline chloride. Effects reported in rats exposed to 200-670 mg/ml included an initial excitement period, characterized by jerking movements and occasional convulsions; bloody tears; a subsequent depression with complete relaxation and depressed respiration which terminated in respiratory paralysis. No hazard expected from swallowing dry or aqueous.

Systemic: No known physiological hazards.

Medical Conditions Aggravated by Exposure: None determined

Exposure Symptoms: Acute – None expected
Chronic – None determined

4. FIRST AID MEASURES

Eye: Flush with clean, low-pressure water for at least 15 minutes while occasionally lifting eyelids. If irritation occurs and persists, get medical attention.

Inhalation: No adverse effects anticipated by breathing small amounts during proper industrial handling. If there is difficulty breathing, remove to fresh air and get medical attention.

Skin: Wash with water, use soap if available. If extensive skin contact occurs, remove contaminated clothing and wash contacted skin with soap and water. In the unlikely event that irritation does occur/persist after contact, check with medical personnel. Wash contaminated clothing before reuse.

Ingestion: Seek medical attention.

Note to Physician: Medical attention should not be required. There are no adverse effects expected from exposure to this product. If medical attention is sought, treatment should be based on the judgement of the physician in response to the reactions of the patient.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash point – not applicable; Method – not applicable

Flammable Limits: Lower Flammable Limit (LFL) – not applicable
Upper Flammable Limit (UFL) – not applicable

Auto Ignition Temperature: Not available

Hazardous Combustion Products: No specific hazards. Combustion will produce compounds of carbon, hydrogen, nitrogen, oxygen and chlorine including carbon monoxide, carbon dioxide and hydrogen chloride. The exact composition of the products of combustion will depend on the conditions of combustion. Aqueous will not support combustion until all water is boiled off.

Other Fire and Explosion Hazards: Possible dust explosion

Extinguishing Media: Water, Foam, CO₂, Dry Chemical

Fire Fighting Equipment: Full protective equipment (Bunker Gear) and NIOSH/MSHA approved SCBA should be used for all indoor and any significant outdoor fires. For small outdoor fires which may easily be extinguished with a portable fire extinguisher, use of a SCBA may not be required.

Fire Fighting Instructions: Water run off can cause environmental damage. Dike and collect water used to fight fires.

6. ACCIDENTAL RELEASE MEASURES

If liquid, use absorbent (e.g. corn cob), vacuum or sweep material and place in a disposal container.

7. HANDLING AND STORAGE

General Handling Precautions

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid breathing dust. Minimize dust generation and minimize accumulation on floors to prevent slips. Ensure containers are properly secured before moving.

Storage Information

Storage temperature: Ambient recommended. No known minimum; keep containers closed and away from moisture.

Shelf Life: No known limit. Clumping may occur under humid conditions for Dry products. Discoloration may occur for Aqueous products. Use within 1 year recommended.

Special Sensitivity: None

Miscellaneous: Dry is hygroscopic (will absorb moisture from air).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls Provide ventilation and particulate control to maintain airborne levels below the exposure guidelines.

Eye Protection: Use safety glasses. If there is a potential for exposure to particles which would cause mechanical injury to the eye, wear chemical goggles.

Respiratory Protection: For most conditions, no respiratory protection should be needed; however, in dusty atmospheres, use an approved dust respirator. In confined or poorly ventilated areas or emergency and other conditions where the exposure guidelines may be greatly exceeded, use an approved positive pressure self-contained breathing apparatus.

Skin Protection: As a general precaution, use gloves. No additional precautions other than clean body-covering clothing should be needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

	<u>Dry</u>	<u>Aqueous</u>
Appearance:	Off-white to tan granule or powder	Clear to light amber liquid
Physical state:	Solid	Liquid
Chemical Family:	Aliphatic amines	Aliphatic amines
Odor:	Little to Cereal odor	Amine odor
Molecular Formula:	Mixture	C ₅ H ₁₄ CINO
Molecular Weight:	Mixture	Mixture
Specific Gravity:	0.46 Dry	1.1

Bulk Density:	28-32 lbs/ft ³	Not applicable
Solubility:	50%-50% w/w Dry 60%-60% w/w Dry 70%-70% w/w Dry 75%-75% w/w Dry	Completely soluble in water
Octanol/Water Partition Coefficient:	Not available	Not available
pH:	Not available	6.5-8.0
Melting Point:	Not available	Not available
Boiling Point:	Not available	70%-257°F (125°C)
Evaporation Rate:	Not available (assumed to be very low)	Not available (assumed to be very low)
VOC Content:	Not available (assumed to be essentially zero)	Not available (assumed to be essentially zero)
Vapor Pressure:	Not available (assumed to be very low)	70%-15 mmHg @ 25°C.
Vapor Density:	Not available	Not available

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions

Material Incompatibility: Dry may generate heat upon contact with moisture. Avoid contact with strong acids and bases.

Hazardous Decomposition Products: Compounds of carbon, hydrogen, nitrogen, oxygen, and chlorine.

Hazardous Polymerization: None

11. TOXICOLOGICAL INFORMATION (100% Choline Chloride)

LD₅₀ – 3400 mg/kg oral (rat)
LD₅₀ – 450 mg/kg intraperitoneal (rat)
LD₅₀ – 3900 mg/kg oral (mouse)
LD₅₀ – 320 mg/kg intraperitoneal (mouse)
LD_{LO} – 735 mg/kg subcutaneous (mouse)
LD₅₀ – 53 mg/kg intravenous (mouse)
LD_{LO} – 5 mg/kg intravenous (dog)
LD_{LO} – 25 mg/kg intravenous (cat)
LD_{LO} – 500 mg/kg intraperitoneal (rabbit)
LD_{LO} – 1 g/kg subcutaneous (rabbit)

LD_{LO} – 1100 µg/kg intravenous (rabbit)
LD_{LO} – 1 g/kg rectal (rabbit)
LD_{LO} – 1500 mg/kg (frog)
TD_{LO} – 331 mg/kg/14 weeks continuous oral (rat)
TD_{LO} – 4950 mg/kg/30 days intermittent intraperitoneal (rat)
TD_{LO} – 6250 mg/kg/10 weeks intermittent intraperitoneal (rat)
TD_{LO} – 3564 mg/kg/5 weeks intermittent intraperitoneal (rat)

12. ECOLOGICAL INFORMATION (100% Choline Chloride)

10,000 mg/L 24 weeks (mortality) Coho Salmon, Silver Salmon (*Oncorhynchus kisutch*)

13. DISPOSAL CONSIDERATIONS

Not considered a hazardous waste under Federal Hazardous Waste Regulations (40 CFR 261). Product solutions should be treated in a wastewater treatment plant after securing treatment plant acceptance. Powder or absorbed solution should be landfilled after securing Environmental Regulatory Agency and landfill operations approval. Consult state and local regulations regarding proper disposal as they may be more restrictive or otherwise different from Federal regulations.

14. TRANSPORT INFORMATION

Not a D.O.T. Hazardous Material (49 CFR 172.101).

Labeling: Containers of this product need no special warning labels. Only a product identity label is needed.

15. REGULATORY INFORMATION

U.S. Federal Regulations

OSHA: This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

PSM: This product is not subject to Process Safety Management (29 CFR 1910.119).

FIFRA: Not applicable

TSCA: On TSCA inventory

CERCLA: Reportable Quantity – None (40 CFR 302.4)

SARA TITLE III: Section 302 Extremely Hazardous Substances – None (40 CFR 355)
Section 311/312 Hazard Categories – None (40 CFR 370.2)
Section 313 Toxic Chemicals – None (40 CFR 372.65)

RMP: Not listed under the Risk Management Plan (40 CFR 68).

RCRA: If discarded in purchased form, this product is not a listed or characteristic hazardous waste. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24).

CWA: Release into a waterway may require reporting to the National Response Center @ 800-424-8802 (40 CFR 116.4).

FDA/USDA: Follow Good Manufacturing Practice (GMP)

International Regulations

Canadian Domestic Substance List (DSL): Listed

European Inventory of Existing Commercial Chemical Substances (EINECS): No. 200-655-4

Australian Inventory of Chemical Substances (AICS): Listed.

Korean Existing Chemicals List (ECL): No. KE-20909

Japan ENCS: 2-341X; 9-1994X

State Regulations

This product is not subject to California Proposition 65.

There are no known additional requirements necessary for compliance with state right-to-know regulations.

16. OTHER INFORMATION

FDA: This product does not contain protein derived from mammalian tissues and is certified to be free of the agent that causes transmissible spongiform encephalopathy (TSE) [21 CFR 589.2000].

Reason for Issue: Corrected address/contact info.

Hazard Ratings – The following hazard ratings are recommended for this product:

<u>NFPA</u>	
Fire	- 1 for dry, 0 for aqueous
Health	- 0
Reactivity	- 0
Specific Hazard	- None

Abbreviations – The following abbreviations may be used in this document:

% - percent

µg/kg - micrograms per kilogram

g/kg – grams per kilogram

lbs/ft³ – pounds per cubic foot

mg/kg – milligrams per kilogram

mg/m³ – milligrams per cubic meter

mmHg – millimeters of mercury

ppm – parts per million

w/w – Weight per weight

ACGIH – American Council of Governmental Industrial Hygienists

AICS – Australian Inventory of Chemical Substances

CAS – Chemical Abstract Service

CERCLA – Comprehensive Emergency Response, Compensation and Liability Act

CFR – Code of Federal Regulations

CWA – Clean Water Act

D.O.T. – Department of Transportation

DSL – Domestic Substance List (Canada)
ECL – Existing Chemicals List (Korea)
EINECS – European Inventory of Existing Commercial Substances
FDA – Food and Drug Administration
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act
IDLH – Immediately Dangerous to Life and Health
LD₅₀ – Lethal dose for 50% mortality of subject species
LD_{LO} – Lethal dose low; the lowest dose of a substance introduced by any route other than inhalation reported to have caused death in humans or animals.
LFL – Lower Flammable Limit
MSHA – Mine Safety Health Administration
NFPA – National Fire Protection Association
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety and Health Administration
PEL – Permissible Exposure Limit (default 8-hour day, 40-hour week TWA)
PSM – Process Safety Management
RCRA – Resource Conservation and Recovery Act
REL – Recommended Exposure Limit (default 10-hour day, 40-hour week TWA)
RMP – Risk Management Plan
SARA – Superfund Amendment and Reauthorization Act
STEL – Short Term Exposure Limit (default 15-minute TWA)
TD_{LO} – Lowest dose to which humans or animals have been exposed and reported to produce a toxic effect other than cancer
TSCA – Toxic Substance Control Act
TWA – Time Weighted Average
UFL – Upper Flammable Limit
USDA – United States Department of Agriculture

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