



CAIROX[®] Potassium Permanganate

EC- SAFETY DATA SHEET is prepared according to the latest adaptations to (CLP) Regulations (EC) No 1272/2008 and (EC) No 1907/2006.

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MSDS # CP-103

Revision Date: November 2010

Supersedes: August 2010

Section 1 Identification of the Substance/Preparation and of the Company/Undertaking

SUBSTANCE/PREPARATION NAME: Potassium permanganate, KMnO ₄	
PRODUCT NAME: CAIROX [®] Potassium Permanganate	
TRADE NAME: CAIROX [®] Potassium Permanganate	
SYNONYMS: Permanganic acid potassium salt, Chameleon mineral, Condy's crystal, Permanganate of potash	
USES OF SUBSTANCE: Potassium Permanganate is an oxidant recommended for applications that require a strong oxidant.	
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COMPANY NAME (US): CARUS CORPORATION	COMPANY ADDRESS: 315 Fifth Street Peru, IL 61354, USA INFORMATION: (815) 223-1500 (815) 224-6816 (FAX) www.caruscorporation.com (Web) salesmkt@caruscorporation.com (Email) EMERGENCY TELEPHONE: (800) 435 –6856 (USA) (815) 223-1500 (Other countries) (800) 424-9300 (CHEMTREC [®] , USA) (703) 527-3887 (CHEMTREC [®] , Other countries)

Section 2 Hazards Identification

GLOBAL HARMONIZED SYSTEM (GHS) OF CLASSIFICATION OF THE SUBSTANCE

Oxidizing solid, Category 2

Acute toxicity, Category 4

Aquatic toxicity (acute), Category 1

Aquatic toxicity (chronic), Category 1

GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

Signal Word: DANGER

Label Codes: GHS03, GHS07, GHS09

Hazard Statements: H272, H302, H400, H410



H272	May intensify fire, oxidizer
H302	Harmful, if swallowed
H410	Very toxic to aquatic life with long lasting effects
P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking
P220	Keep/Store away from clothing/combustible materials.
P260	Do not breathe dust
P280	Wear protective gloves/protective clothing/eye protection/face protection
P370 + P378	In case of fire: Use water for extinction
P501	Dispose of contents/container to appropriate places
P273	Avoid release to the environment.



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Section 2 Hazards Identification (contd.)

EU CLASSIFICATION

HAZARD SYMBOLS: O, Xn, N

RISK PHRASES: 8,22, 50/53

HUMAN AND ENVIRONMENTAL HAZARDS

Contact with combustible material may cause fire.

Harmful if swallowed.

Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.

This substance is hazardous in the European Union according to the latest adaptations to Regulations (EC) No 1272/2008 and (EC) No 1907/2006.

OTHER HAZARDS

EYE CONTACT

Potassium Permanganate is damaging to eye tissue on contact. It may cause burns that result in damage to the eye.

SKIN CONTACT

Momentary contact of solution at room temperature may be irritating to the skin, leaving brown stains. Prolonged contact is damaging to the skin. Concentrated solutions at elevated temperature and crystals are damaging to the skin.

INHALATION

Acute inhalation toxicity data are not available. However, airborne concentrations of potassium permanganate in the form of dust or mist may cause damage to the respiratory tract.

INGESTION

Potassium Permanganate, if swallowed, may cause burns to mucous membranes of the mouth, throat, esophagus, and stomach.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS) RATINGS

Health: 1 - Slight

Flammability: 0 - None

Reactivity: 0 - None

Personnel Protective Equipment: goggles face shield, apron, respirator and proper gloves.

Section 3 Composition/Information on Ingredients

CAS#	Component / EC#	Percent	Symbols	Risks
7722-64-7	Potassium permanganate	>97.5	Xn N O	8,22, 50/53
	231-760-3			

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Permanganates, inorganic, n.o.s., Manganese compounds, inorganic

Substance Registration Number(s)

This material is produced in amounts > 1 tonne/annum and is therefore subject to REACH registration.

01-2119480139-34-0000



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Section 4 First Aid Measures

EYES

Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Do not attempt to neutralize chemically. Seek medical attention immediately. **Note to physician:** Decomposition products are alkaline. Insoluble decomposition product formed is brown colored manganese dioxide.

SKIN

Immediately wash contaminated areas with water. Remove contaminated clothing and footwear. Wash clothing and decontaminate footwear before reuse. Seek medical attention immediately if irritation is severe or persistent.

INHALATION

Remove person from contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.

INGESTION

Never give anything by mouth to an unconscious or convulsing person. If person is conscious, give large quantities of water. Seek medical attention immediately.

NOTE TO PHYSICIANS

For inhalation, consider oxygen.

Avoid gastric lavage or emesis.

Decomposition products are alkaline. Insoluble decomposition product formed is brown colored manganese dioxide.

Section 5 Fire Fighting Measures

NFPA* HAZARD SIGNS

Health Hazard	1	=	Materials that under emergency conditions, can cause significant irritation. Materials that on the skin could cause irritation.
Flammability Hazard	0	=	Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone and sand.
Instability Hazard	0	=	Materials that in themselves are normally stable, even under fire conditions.
Special Hazard	OX	=	Oxidizer

*National Fire Protection Association 704 (USA)

FIRST RESPONDERS

Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach incident with caution.

FLASHPOINT

None

FLAMMABLE OR EXPLOSIVE LIMITS

Lower: Nonflammable Upper: Nonflammable

EXTINGUISHING MEDIA

Use large quantities of water. Water will turn pink to purple when in contact with potassium permanganate. Dike to contain. Do not use dry chemicals, CO₂, Halon[®] or foams, because they are not effective.

SPECIAL FIREFIGHTING PROCEDURES

If material is involved in fire, flood with water. Cool all affected containers with large quantities of water. Apply water from as far a distance as possible. Wear self-contained breathing apparatus and full protective clothing.



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Section 5 Fire Fighting Measures (contd.)

UNUSUAL FIRE AND EXPLOSION

Powerful oxidizing material. May decompose spontaneously if exposed to heat (135°C / 275°F). May be explosive in contact with certain other chemicals (Section 10). May react violently with finely divided and readily oxidizable substances. Increases burning rate of combustible material.

THERMAL DECOMPOSITION PRODUCTS:

Combustion: oxides of potassium, oxides of manganese. Fire may produce irritating, poisonous and/or corrosive fumes.

Section 6 Accidental Release Measures

OCCUPATIONAL SPILL/RELEASE

Avoid contact with combustible materials. Do not touch spilled material. Move containers away from spill to a safe area. Keep unnecessary people away, isolate hazard area and deny entry.

PERSONAL PRECAUTIONS

Ensure adequate ventilation. Avoid dust formation. Personnel should wear protective clothing suitable for the task. Remove all ignition sources and incompatible materials before attempting clean up.

ENVIRONMENTAL PRECAUTIONS

Do not flush into sanitary sewer system or surface water. If accidental release into the environment occurs, inform the responsible authorities. Keep the product away from drains, sewers, surface and ground water and soil.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Clean up spills immediately by sweeping or shoveling up the material. Do not return spilled material to the original container; transfer to a clean metal or plastic drum. To clean up potassium permanganate solutions, follow either of the following two options.

Option # 1: Dilute to approximately 6% with water, and then reduce with sodium thiosulfate, a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Decant or filter and deposit sludge in approved landfill. Where permitted, the sludge may be drained into sewer with large quantities of water.

Option # 2: Absorb with inert media like diatomaceous earth or inert floor dry, collect into a drum and dispose of properly. Does not use saw dust or other incompatible media. Disposal of all materials shall be in full and strict compliance with all federal, state, and local regulations pertaining to permanganates.

To clean contaminated floors, flush with abundant quantities of water into sewer, if permitted by federal, state, and local regulations. If not, collect water and treat as described above.

Section 7 Handling and Storage

WORK/HYGIENIC PRACTICES

Wash hands thoroughly with soap and water after handling potassium permanganate. Do not eat, drink or smoke when working with potassium permanganate. Wear proper protective equipment. Remove clothing if it becomes contaminated.

VENTILATION REQUIREMENTS

Provide sufficient mechanical and/or local exhaust to maintain exposure below the TLV/TWA.

CONDITIONS FOR SAFE STORAGE

Store in accordance with NFPA 430 requirements for the Storage of Class II oxidizing materials. Protect containers from physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides, formaldehyde, and all combustible, organic, or easily oxidizable materials including antifreeze and hydraulic fluid.



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Section 8 Exposure Controls and Personal Protection

COMPONENT EXPOSURE LIMITS

Potassium permanganate (7722-64-7)

ACGIH: 0.2 mg/m³ TWA (as Mn)

VENTILATION

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYES/FACE

Face shield, goggles, or safety glasses with side shields should be worn. Provide eyewash in working area.

GLOVES

Rubber or plastic gloves should be worn.

OTHER PROTECTIVE EQUIPMENT

Chemically resistant clothing covering arms and legs, and rubber or plastic apron should be worn. **Caution:** If clothing becomes contaminated, wash off immediately.

RESPIRATORY PROTECTION

In cases where overexposure to dust may occur, the use of an approved NIOSH-MSHA dust respirator or an air supplied respirator is advised. Engineering or administrative controls should be implemented to control dust.

Measurement Element: Manganese (Mn)

10 mg/m³

Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any supplied-air respirator.

25 mg/m³

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a high-efficiency particulate filter.

50 mg/m³

Any air-purifying, full-facepiece respirator equipped with an N100, R100, or P100 filter.

Any supplied-air respirator with a tight-fitting face piece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting face piece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full face piece.

Any supplied-air respirator with a full face piece.

500 mg/m³

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full face piece and is operated in a pressure-demand or other positive-pressure mode.

Escape

Any air-purifying, full-face piece respirator equipped with an N100, R100, or P100 filter.

Any appropriate escape-type, self-contained breathing apparatus.



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Section 9 Physical and Chemical Properties (CONTD.)

APPEARANCE	Dark purple solid with metallic luster
ODOR	Odorless
pH OF THE SUBSTANCE	Not applicable
BOILING POINT/BOILING RANGE	Not applicable
FLASH POINT	Not applicable
FLAMMABILITY (SOLID, GAS)	Not flammable
EXPLOSIVE PROPERTIES	Explosive in contact with sulfuric acid or peroxides, or readily oxidizable substances
OXIDIZING PROPERTIES	Strong oxidizer
VAPOR PRESSURE	Not applicable
RELATIVE DENSITY (AT 20°C)	2.7
SOLUBILITY	
WATER SOLUBILITY	6% (by weight) at 20°C and 20% (by weight) at 65°C
PARTITION COEFFICIENT: n-OCTONAL/WATER	
VISCOSITY	Not applicable
VAPOUR DENSITY	Not applicable
EVAPORATION RATE	Not applicable
MELTING POINT	Starts to decompose with evolution of oxygen (O ₂) at temperatures above 150°C. Once initiated, the decomposition is exothermic and self sustaining.
MOLECULAR WEIGHT	158.034

Section 10 Stability and Reactivity

STABILITY

Under normal conditions, the material is stable.

CONDITIONS TO AVOID

Contact with incompatible materials or heat (150°C / 302°F) could result in violent exothermic chemical reaction.

MATERIALS TO AVOID

Acids, peroxides, formaldehyde, anti-freeze, hydraulic fluids and all combustible organic or readily oxidizable inorganic materials including metal powders. With hydrochloric acid, chlorine gas is liberated.

HAZARDOUS DECOMPOSITION PRODUCTS

When involved in a fire, potassium permanganate may liberate irritating, poisonous and/or corrosive fumes. Oxides of potassium and manganese may be formed.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

Material is not known to polymerize.

Section 11 Toxicological Information

EXPOSURE SYMPTOMS DESCRIPTION

INHALATION

The product may be absorbed into the body by inhalation. Major effects of exposure: respiratory disorder, cough.

INGESTION

Harmful, if swallowed. The estimated lethal human dose is 10 g. Ingestion may cause nausea, vomiting, sore throat, stomach-ache, and eventually lead to a perforation of the intestine. Liver and kidney injuries may occur.



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Section 11 Toxicological Information (contd.)

SKIN CONTACT

The product may be absorbed into the body through the skin. Major effects of exposure: severe irritation, damage to the skin, and brown staining of skin.

EYE CONTACT

Contact with eye is damaging to eye tissues. It may cause severe burns that result in damage to the eye.

ACUTE TOXICITY

LC 50 inhalation: No data available.

LD 50 dermal: No data available.

LD 50 oral rat: 780 mg/kg male (14 days); 525 mg/kg female (14 days).

Harmful if swallowed. ALD: 10g. Ingestion may cause nausea, vomiting, sore throat, stomach-ache and eventually lead to a perforation of the intestine. Liver and kidney injuries may occur.

CHRONIC TOXICITY

No known cases of chronic poisoning due to permanganates have been reported. Prolonged exposure, usually over many years, to heavy concentrations of manganese oxides in the form of dust and fumes may lead to chronic manganese poisoning, chiefly involving the central nervous system.

CARCINOGENICITY

Potassium permanganate has not been classified as a carcinogen by ACGIH, NIOSH, OSHA, NTP, or IARC.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Potassium permanganate will cause further irritation of tissue, open wounds, burns or mucous membranes.

Section 12 Ecological Information

ECO TOXICITY

Very toxic to aquatic organisms.

COMPONENT ANALYSIS - AQUATIC TOXICITY

Potassium permanganate (7722-64-7)

96Hr LC50	Rainbow trout	1.8 mg/L
96Hr LC50	Bluegill sunfish	2.3 mg/L
96Hr LC50	Milk fish (Chanos Chanos)	>1.4 mg/L
96Hr LC50	Carassius auratus	3.3-3.93 mg/L (static)
96Hr LC50	Cyprinus carpio	2.97-3.11 mg/L
96Hr LC50	Cyprinus carpio	3.16-3.77 mg/L
96Hr LC50	Lepomis macrochirus	2.3 mg/L (flow-through)
96Hr LC50	Lepomis macrochirus	1.8-5.6 mg/L (static)
96Hr LC50	Lepomis macrochirus	2.7 mg/L (static)
96Hr LC50	Oncorhynchus mykiss	1.08-1.38 mg/L
96Hr LC50	Oncorhynchus mykiss	0.77-1.27 mg/L

MOBILITY

Miscible in water.

PERSISTENCE AND DEGRADABILITY

Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble MnO₂.



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Section 12 Ecological Information

BIOACCUMULATIVE POTENTIAL

In non-reducing and non-acidic environments, MnO₂ is insoluble and has a very low bioaccumulative potential.

OTHER ADVERSE EFFECTS

Harmful to aquatic organisms.

Section 13 Disposal Considerations

WASTE DISPOSAL

Offer surplus and non-recyclable product or solutions to a licensed disposal company. Disposal of all materials shall be in full and strict compliance with all federal, state, and local regulations. This material and its container must be disposed of as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. When it becomes a waste, potassium permanganate is considered a D001 hazardous (ignitable) waste. For disposal of potassium permanganate solutions, follow procedures in Section 6 and deactivate the permanganate to insoluble manganese dioxide. Dispose of it in a permitted landfill. Contact Carus Corporation for additional recommendations. Packaging materials must be triple rinsed to remove all residues prior to re-cycling or disposal as a non-hazardous waste.

RCRA P-Series: None listed. **RCRA U-Series:** None listed.

Section 14 Transport Information

USA (Land, DOT) and Canada (TDG)	ID Number:	UN 1490
	Proper Shipping Name:	Potassium permanganate
	Hazard Class:	Oxidizer
	Packing Group:	II
	Division:	5.1
	<u>Product packaging containing ≥100 lbs</u>	
	ID Number:	UN 1490
	Proper Shipping Name:	Potassium permanganate, RQ
	Hazard Class:	Oxidizer
	Packing Group:	II
	Division:	5.1
	Additional Info.: If this product is spilled or leaked into the environment, the CERCLA (40 CFR 302.4) reportable quantity is 100 lbs, and requires National Response Center notification within United States of America.	
European Labeling in accordance Road/Rail Transport (ADR/RID)	ID Number:	UN 1490
	ADR/RID Class:	5.1
	Description of Goods:	Potassium permanganate
	Packing Group:	II
European Labeling in accordance with EC directive (Water, IMDG)	Hazard Identification No.:	50
	ID Number:	UN 1490
	Proper Shipping Name:	Potassium permanganate
	Hazard Class:	Oxidizer
European Labeling in accordance with EC directive (IACO, IATA)	Packing Group:	II
	Division:	5.1
	Marine Pollutant:	No
	ID Number:	UN 1490
	Proper Shipping Name:	Potassium permanganate
	Hazard Class:	Oxidizer
	Packing Group:	II
	Division:	5.1



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Section 15 Regulatory Information

EUROPEAN AND INTERNATIONAL REGULATIONS

GERMANY WATER CLASSIFICATION

Potassium permanganate (7722-64-7)

Number 1936, hazard class 3 - severe hazard to waters

CLP CLASSIFICATION

This product is hazardous according to the Regulation (EC) No. 1272/2008 on Classification, Labeling and Packaging of Substances and Mixtures (CLP).

Oxidizing solid, Category 2

Acute toxicity, Category 4

Hazardous to the Aquatic Environment - Hazard, Category 1

Hazardous to the Aquatic Environment - Hazard, Category 1

CLP HAZARD SYMBOLS



CLP HAZARD STATEMENTS

H272	May intensify fire, oxidizer
H302	Harmful, if swallowed
H410	Very toxic to aquatic life with long lasting effects
P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking
P220	Keep/Store away from clothing/combustible materials.
P260	Do not breathe dust
P280	Wear protective gloves/protective clothing/eye protection/face protection
P370 + P378	In case of fire: Use water for extinction
P501	Dispose of contents/container to appropriate places
P273	Avoid release to the environment.

COMPONENT ANALYSIS – INVENTORY

COMPONENT	CAS#	US	CA	EU	AU	PH	JP	KR	CN	NZ
Potassium permanganate	7722-64-7	TSCA	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes

This product has also been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR, Canada) and the MSDS contains all of the information required by the CPR.



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Section 15 Regulatory Information (contd.)

US FEDERAL REGULATIONS:

FEDERAL, STATE & INTERNATIONAL REGULATIONS – PART 1

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>SARA 302</u>		<u>SARA 313</u>	
		<u>RQ</u>	<u>TPQ</u>	<u>List</u>	<u>Chemical Category</u>
Potassium permanganate	7722-64-7	No	No	Yes	Yes (Manganese compounds)

FEDERAL, STATE & INTERNATIONAL REGULATIONS – PART 2

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CERCLA</u>	<u>RCRA</u>	<u>TSCA 8(d)</u>
Potassium permanganate	7722-64-7	Yes (RQ = 100 lbs)	D001	No

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CWC</u>	<u>TSCA 12(b)</u>	<u>CDTA</u>	<u>SARA 311/312</u>
Potassium permanganate	7722-64-7	No	No		4545 Kg

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Acute</u>	<u>Chronic</u>	<u>Fire</u>	<u>Pressure</u>	<u>Reactivity</u>	<u>Pure/Liquid</u>
Potassium permanganate	7722-64-7	Yes	Yes	Yes	No	No	Pure

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Australian Hazchem</u>	<u>WHMIS</u>	<u>IDL</u>
Potassium permanganate	7722-64-7	IYE	C, D2B	Yes

Section 16 Other Information

ADR/RID	Agreement on Dangerous Goods by Road /Regulations Concerning the International Transport of Dangerous Goods by Rail
C	Ceiling Exposure Limit
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHEMTREC	Chemical Transportation Emergency Center
EINECS	Inventory of Existing Chemical Substances (European)
DOT	Department of Transportation
DSL/NDSL	The Domestic Substances and the Non-Domestic Substances List (Canada)
HIMS	Hazardous Materials Information System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
ICAO	International Civil Aviation Center
IDL	Ingredient Disclosure List
IMDG	International Maritime Dangerous Goods
OSHA	Occupational Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
MSHA	Mine Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
TDG	Transport Dangerous Goods (Canada)
TSCA	Toxic substances control Act
TLV-TWA	Threshold Limit Value-Time Weighted Average
UN	United Nations
WHMIS	Workplace Hazardous Materials Information System



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Section 16 Other Information (contd.)

The information contained herein is accurate to the best of our knowledge. However, data, safety standards and government regulations are subject to change and, therefore, holders and users should satisfy themselves that they are aware of all current data and regulations relevant to their particular use of product. CARUS CORPORATION DISCLAIMS ALL LIABILITY FOR RELIANCE ON THE COMPLETENESS OR ACCURACY OR THE INFORMATION INCLUDED HEREIN. CARUS CORPORATION MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR USE OR PURPOSE OF THE PRODUCT DESCRIBED HEREIN. All conditions relating to storage, handling, and use of the product are beyond the control of Carus Corporation, and shall be the sole responsibility of the holder or user of the product.

This safety data sheet was reviewed according to Annex II of the regulation of the European Parliament and European Council (EC) No. 1907/2006-REACH and 1272/2008.

CARUS CORPORATION, 315 5TH STREET, PERU, ILLINOIS 61354, USA
CARUS EUROPE IS A DIVISION OF CARUS CORPORATION

Chithambarathanu Pillai (S.O.F.)
November 2010



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