HMIS Label	
1*	Health
2	Flammability
1	Reactivity

MATERIAL SAFETY DATA SHEET

Kowa American Corporation

CHEMTREC 24-HOUR EMERGENCY NUMBER (800) 424-9300

SECTION 1
CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: ***para*-Chlorobenzotrifluoride [PCBTF]**

Distributor's Name and Address in United States:

Kowa American Corporation
55 East 59th Street, 19th Floor
New York, NY 10022
Telephone: (800) 337-8377
Telephone: (212) 223-0020
Facsimile: (212) 310-0101

CHEMTREC 24-Hour Emergency Number: **(800) 424-9300**

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SECTION 2
COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredient	CAS Registry No.	Weight %	Exposure Limits
Benzene, 1-chloro-4-(trifluoromethyl)-	**98-56-6**	**99.0 - 100.0%**	**20 ppm[1] (8-hour TWA)**
Benzene, 1-chloro-2-(trifluoromethyl)-	88-16-4	< 0.5%	NE
Benzene, 1-chloro-3-(trifluoromethyl)-	98-15-7	< 0.5%	NE
Benzene, 1,2-chloro-4-(trifluoromethyl)-	328-84-7	< 0.1%	NE

Notes on *Composition and Information on Ingredients*

NE = Not established

[1] The 20 ppm exposure level is Kowa American Corp.'s recommended 8-hour TWA occupational exposure level. No exposure levels have been established by OSHA, ACGIH, or NIOSH.

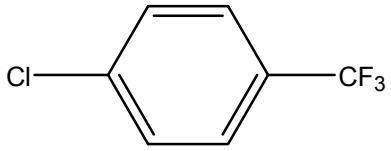
OTHER PRODUCT INFORMATION

Chemical Name: Benzene, 1-chloro-4-(trifluoromethyl)- (9CI)

Synonyms/Common Names:
- PCBTF
- p-Chlorotrifluoromethylbenzene
- 4-Chlorobenzotrifluoride
- Toluene, p-chloro- .α.,.α.,.α.-trifluoro-
- (p-Chlorophenyl)trifluoromethane
- Oxsol® 100 (*Trade name of a competitive product. See disclaimer in Section 16.*)

Chemical Category: Chlorobenzotrifluorides

Chemical Structure:



Molecular Formula: $C_7H_4ClF_3$

Molecular Weight: 180.56

EINECS No.: 202-681-1

SECTION 3
HAZARDS IDENTIFICATION

Emergency Overview

Clear colorless liquid with aromatic odor. Combustible in the presence of an ignition source. Irritating to skin, eyes, and upper respiratory tract. Wear skin and eye protection. Wear respiratory protection if there is the potential for inhalation exposure. Do not release to the environment.

POTENTIAL HEALTH EFFECTS

INHALATION: Vapors may be irritating to the upper respiratory tract (including nasal tissues). Prolonged or exposure to high concentrations may be harmful and cause adverse effects including labored breathing and drowsiness. Excessive exposure can cause injury and symptoms of central nervous system effects and depression.

SKIN: Material may be irritating to the skin. Exposure may also cause dermatitis due to defatting of the skin resulting in irritation, dryness, and cracking of the skin.

EYE: Material (including vapors) may cause eye irritation. More serious effects may result if exposure is prolonged or not treated.

INGESTION: The oral toxicity of this material is low. Ingestion may cause vomiting. During vomiting the material may be aspirated into the lungs which may result in aspiration pneumonia. Excessive exposure may also cause liver, kidney, and/or thyroid damage.

CHRONIC EFFECTS/CARCINOGENICITY: No long-term chronic effects or carcinogenicity data are known or available on this product. This substance is not regulated or identified as a carcinogen.

NTP: *Not listed*
IARC: *Not listed*
OSHA: *Not listed*

MUTAGENICITY: This substance has generally produced negative results in both in vitro and in vivo mutagenicity studies. See Section 11 for additional information.

TERATOGENICITY (birth defects): No teratogenicity data are available on this material.

REPRODUCTIVE TOXICITY: This substance is not expected to cause adverse reproductive effects based on animal testing. See Section 11 for additional information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Chronic or overexposure may cause adverse effects in individuals with liver, kidney, lung, or thyroid disorders.

INCOMPATIBILITY: None known.

SIGNS AND SYMPTOMS OF EXPOSURE: Inhalation exposure may cause labored breathing, dizziness, and drowsiness. May cause irritation to the upper respiratory tract, skin, and eyes. Material may cause defatting of the skin.

SECTION 4
FIRST AID MEASURES

FIRST AID MEASURES

SKIN: Wash with plenty of water, then with soap and water for 15 minutes. Discard contaminated clothing and shoes. Call physician immediately if exposed to large quantities, if contact is prolonged, or if exposure causes more than minor discomfort.

EYES: Immediately flush eyes with a continuous water stream for at least 20 minutes. Washing immediately after exposure is expected to be effective in preventing damage to the eyes. Get immediate medical attention.

INHALATION: Remove to fresh air. If not breathing give artificial respiration. If there is breathing difficulty, give oxygen. Get immediate medical attention.

INGESTION/SWALLOWED: Do not induce vomiting. Take measures to prevent aspiration during any vomiting that may occur. Do not give fluids. Nothing by mouth if unconscious. Get immediate medical attention.

SECTION 5
FIRE FIGHTING MEASURES

FLASH POINT:	109 °F / 43 °C	[closed cup]
EXPLOSION/FLAMMABLE LIMITS:	LEL: 0.9%	UEL: 10.5%

INFORMATION ON SUSTAINED CONBUSTIBILITY TESTING: This compound is classified as a combustible liquid under the OSHA Hazard Communication Standard (HCS) based on its flash point value. OSHA's HCS provides no exception to this classification for substances that are shown to not sustain combustibility. However, this compound has been evaluated under ASTM Standard D4206 (Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus) for sustained combustibility. This testing was conducted at Kidde Fenwal's Combustion Research Center for Kowa American Corp. The compound was not found to sustain combustion at a test temperature of 48 °C and it was determined that this substance immediately self-extinguishes upon removal of an ignition source. Contact Kowa American Corp. for a copy of the test report.

EXTINGUISHING MEDIA: Use dry chemical, foam, carbon dioxide, and water spray/fog as needed. For large fires alcohol resistant foams are preferred. Synthetic or protein foams can be used, but may not be as effective. Water may not be as effective for large fires.

SPECIAL FIRE FIGHTING PROCEDURES: Wear a self-contained breathing apparatus pressure demand device (MSHA/NIOSH approved or equivalent) and full protective gear. Toxic vapors may evolve. Fight fires from a safe distance or protected areas. Fire hoses with fog nozzles may be used for controlling fires but care must be exercised not to spread flaming. Use of large volumes of water may produce run-off that could be toxic to wildlife and/or pose a hazardous waste disposal issue. Water may not be effective for large fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This material will not sustain combustion in the absence of an ignition source. However, in the presence of an ignition source, this compound is combustible. Sealed containers can explode in the heat of fire. Vapors may travel to ignition source because they are heavier than air. Run off may create an explosion, fire, and environmental hazard.

OTHER INFORMATION: Use of this product as a replacement material for flammable compounds may decrease the risk of fire during storage, handing, and use due to the fact that testing has shown that this material will not sustain combustion in the absence of an ignition source.

SECTION 6
ACCIDENTAL RELEASE MEASURES

SPILL/RELEASE AND CLEANUP PROCEDURES: In case of spill, evacuate the area and remove all ignition sources. Dike and contain spill with vermiculite, clay-based absorbents, or other absorbent materials such as polyethylene fiber and polypropylene fiber products. This material may be harmful to aquatic organisms. Do not discharge the washings and other effluents into ponds, streams, or lakes. Wear appropriate respiratory and protective clothing as described in Section 8 during any cleanup and response activities. In the event of an uncontrolled release of this material, the user should determine if the release is reportable under applicable laws and regulations.

SECTION 7
HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: This material will not sustain combustion in the absence of an ignition source. However, in the presence of an ignition source, this compound is combustible. As a result, storage of this material with flammable or combustible compounds presents an additional flammability risk. Conversely, storage of this material with non-flammable or non-combustible compounds is generally expected to present a reduced flammability risk.

Do not drop. Keep away from fire, heat, open flames, lights, and other ignition sources. Wear goggles and gloves when handling. Harmful if inhaled, absorbed through the skin, or swallowed. Avoid breathing vapors. Eyewash stations and emergency showers must be present in areas where this product is handled, especially areas where loading/unloading operations occur. Wash hands thoroughly after handling and before eating, drinking, or smoking. Ground all containers when transferring the material.

Do not contaminate water, food, or feed by storage or disposal. Keep the product in original containers. Store in cool, dry, well ventilated, low fire risk area away from sunlight. Keep containers closed. Store only in approved containers, under approved conditions. An automatic water spray device should be immediately available. A spill control and containment plan should be provided. Storage area should be indoors and not subject to rapid temperature changes as such changes may cause increased internal pressure. Isolate from toxic materials or substances that may release corrosive, toxic, or flammable fumes on reaction.

SECTION 8
EXPOSURE CONTROLS AND PERSONNEL PROTECTION

RESPIRATORY PROTECTION: Respirators equipped with organic vapor cartridges are anticipated to provide adequate respiratory protection during short-term exposures to low vapor concentrations of the material. Workers should wear a supplied-air respirator or self-contained breathing apparatus any time exposure is above low levels or during extended exposure periods. Use MSHA/NIOSH-approved respiratory equipment. Respirators should be selected based on the form and concentration of the contaminant in the air and in accordance with OSHA (29 CFR 1910.134). Handle only in the presence of adequate ventilation.

PROTECTIVE GLOVES: Wear chemical resistant gloves appropriate to the conditions to prevent skin exposure. Glove material comparisons indicate that (supported) **POLYVINYL ALCOHOL** gloves generally afford adequate hand protection. (Note: polyvinyl alcohol gloves are not appropriate in the presence of water.) Under conditions of limited exposure and abrasion, nitrile gloves were found to be satisfactory. Gloves made of butyl rubber, PVC, and neoprene were not found to provide adequate hand protection. Rinse and remove gloves immediately after use, and wash hand thoroughly with soap and water. Gloves should be removed and replaced immediately if there are any signs of degradation or breakthrough.

PROTECTIVE CLOTHING: Wear protective clothing and boots impervious to the product for the duration of the anticipated exposure if there is a potential for skin contact. An emergency shower should be readily accessible. Discard any contaminated clothing.

EYE PROTECTION: Chemical safety goggles meeting the specifications of ANSI Standard Z87.1 should be worn whenever there is the possibility of contact with the eyes. Spectacle type safety glasses do not provide satisfactory protection. An eyewash fountain should be readily accessible. Wear plastic face shield in addition to safety goggles where there is a danger of splashing.

AIR MONITORING: No information is available.

EXPOSURE GUIDELINES: No official exposure guidelines have been established for this substance. Kowa American Corp. recommends that an 8-hour time-weighted average of 20 ppm be observed.

SECTION 9
PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless clear liquid
Odor:	Aromatic odor
Boiling Point:	139 °C (760 mm Hg)
Specific Gravity:	1.34 (25 °C)
Vapor Pressure:	5.3 mm Hg (20 °C)
	7.6 mm Hg (25 °C)
Sat'd Vapor Concentration:	~7,000 ppm (20 °C)
Vapor Density (air = 1):	6.24
Viscosity:	0.67 cps (38 °C)
	0.32 cps (99 °C)

Refractive Index (n_D):	1.4431 (30 °C)
Freezing Point:	< -33 °C
Solubility in Water:	Nearly insoluble
Odor Threshold:	0.11 ppm
Weight per Gallon:	11.28 lbs. (15.5 °C)
Volatile Percentage:	100%
VOC Content	0%[1]

Notes on *Physical and Chemical Properties*

[1] See Section 15 concerning this compound's exclusion from the definition of VOC under the federal Clean Air Act.

SECTION 10
STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, fire, open flames, direct light, ignition sources, and UV radiation.

INCOMPATIBILITY/MATERIALS TO AVOID: Incompatible with oxidizing agents such as permanganates and dichromates. Reaction with sodium dimethyl sulfinate is expected to be strongly exothermic.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Hydrogen fluoride, hydrogen chloride, and organic halides.

HAZARDOUS POLYMERIZATION: Not expected to occur.

SECTION 11
TOXICOLOGICAL INFORMATION

ACUTE TOXICOLOGICAL DATA:

Test	Result
Oral Rat LD_{50}	> 6,700 mg/kg
Inhalation Rat LC_{50} [4-hr]	4,470 ppm (33.0 mg/l)
Dermal Rabbit LD_{50}	> 2,700 mg/kg

OTHER ACUTE TOXICOLOGICAL INFORMATION: Ingestion may cause vomiting. During vomiting the material may be aspirated into the lungs which may result in aspiration pneumonia.

EYE IRRITATION DATA: In eye irritation studies, the compound was found to be slightly to moderately irritating.

SKIN IRRITATION DATA: In skin irritation studies, the compound was found to be slightly to moderately irritating.

SKIN SENSITIZATION DATA: No skin sensitization data are available on this material.

SUBCHRONIC DATA: A 13-week inhalation study was conducted in rats exposed for 6 hours per day, 5 days a week at concentrations of 0, 10, 51, or 252 ppm. An increase in liver weights was seen in the high dose group. No macroscopic effects were noted. No adverse central nervous system effects were observed as measured by motor activity, functional observation battery, or neuropathology. In a separate study, rats were dosed daily via oral gavage for three months at 0, 10, 40, 150, or 500 mg/kg. Effects noted included initial decrease in body weight gain, decreased food consumption, and changes in biochemical parameters. Increases were noted in liver, kidney, and thyroid weights in both sexes in most treatment groups. Microscopic effects were also observed in these same organs. No overt physical signs of toxicity were observed during treatment. Effects similar to those described in the above two studies have also been observed in shorter inhalation and oral gavage testing.

REPRODUCTIVE TOXICITY: In a two-generation reproduction study rats were exposed daily via oral gavage at doses of 0, 5, 15, and 45 mg/kg. Only limited reproductive effects were noted. Contact Kowa American Corp. for more information on the results of this study.

TERATOGENICITY (birth defects): No teratogenicity data are available on this material.

MUTAGENICITY: This material was found to be negative in the following in vitro mutagenicity studies: chromosomal aberration study, cell transformation assay, DNA repair deficiency assay, and the mouse lymphoma forward mutation assay. In the in vitro Ames test, the compound was generally found to be negative; however two strains at the high dose produced positive results. In the in vitro sister chromatid exchange test, the compound produced positive results. In the in vivo cytogenetic assay in rats, the compound was found to be negative.

CHRONIC EFFECTS/CARCINOGENICITY: There are no chronic effects or carcinogenicity data available on this material.

SECTION 12
ECOLOGICAL INFORMATION

SUMMARY OF ECOLOGICAL DATA: This compound is harmful to fish, Daphnia, and algae. Relatively biodegradable. This substance is not expected to bioaccumulate. Insoluble in water; water volatility may be high.

ECOTOXICOLOGICAL DATA:

Test	Result
Fish –*Lepomis macrochirus*	
[24-hr LC_{50}]	15.9 - 22.9 mg/l
[48-hr LC_{50}]	11.5 - 15.8 mg/l
[72-hr LC_{50}]	11.4 - 14.1 mg/l
[96-hr NOEC]	5.6 mg/l
Fish – *Salmo gairdneri*	
[24-hr LC_{50}]	13.5 mg/l
Aq. Invertebrates – *Daphnia magna*	
[24-hr EC_{50}]	~ 4 -15 mg/l
[48-hr EC_{50}]	~ 4 - 14 mg/l
[4-day EC_{50}]	0.12 - 0.22 mg/l
[21-day EC_{50}]	0.047 - 0.107 mg/l

OTHER ECOTOXICOLOGICAL DATA: In a chronic fish study in *Pimephales promelas*, the NOEC and LOEC values were found to be 0.54 mg/l and 1.4 mg/l, respectively.

ENVIRONMENTAL FATE DATA: In an anaerobic screening study, the substance was found to degrade 64% after 59 days. This substance is not expected to bioaccumulate based on an estimated bioconcentration factor (BCF) of 120.

PHYSICAL/CHEMICAL PROPERTIES: The measured Log K_{ow} was determined to be 3.7 (25 °C). Based on this value, the K_{oc} was calculated ~2,200. Due to the high K_{oc}, soil absorption is anticipated. The Henry's Law constant was calculated to be 3.5×10^{-2} atm · m^3/mol.

SECTION 13
DISPOSAL CONSIDERATIONS

RCRA CLASSIFICATION: If discarded in its manufactured form, this product is expected to be a characteristic hazardous waste under RCRA. However, it is the responsibility of the user to determine at the time of disposal whether a material containing the product or derived from the product that should be classified as a hazardous waste.

SPECIAL INSTRUCTIONS: This material is harmful to aquatic organisms. Do not discharge effluent containing this product into municipal sewers or open bodies of water. This substance is expected to be a characteristic hazardous waste under RCRA. All recovered material should be packaged, labeled, transported, and disposed of in conformance with applicable laws and regulations. Incinerate the wastes in an approved facility which complies with local, state, and federal regulations. For disposing of the container, completely empty the container. Rinse empty container with water and dispose of the container in a sanitary landfill or by incineration.

SECTION 14
TRANSPORT INFORMATION

U.S./INTERNATIONAL SHIPPING INFORMATION: Kowa American Corp. has determined that this material is not regulated as dangerous or hazardous goods under DOT, IMO/IMDG, IATA, ICAO, or UN shipping requirements. This determination is based on the exception discussed in the following subsection. See also notes below.

CLASSIFICATION EXCEPTION UNDER U.S./INTERNATIONAL REQUIREMENTS: Under U.S. and international shipping regulations, this material would otherwise be classified as a combustible liquid (ground only) or a flammable liquid, respectively. However, pursuant to U.S. regulations at 49 CFR 173.120(a)(3) and equivalent international regulations, this material is not considered flammable under the following exception: any liquid with a flash point greater than 35 °C (95 °F) which does not sustain combustion under ASTM Standard D4206 is not considered to be a flammable liquid. PCBTF has been tested by Kowa American Corp. under ASTM Standard D4206 and was not found to sustain combustion. Based on this test result, PCBTF is not regulated as a flammable compound for purposes of U.S. or international shipping requirements. See also notes below.

Notes on *Transport Information*

Note-1: Kowa American Corp. has made the determination that this material is not flammable based on the results of testing under ASTM Standard D4206. Other shippers are responsible for making their own determination regarding this material's classification under U.S. and international transportation requirements. At the shipper's option, this material may be classified as a flammable liquid under the proper shipping name, Chlorobenzotrifluorides [Class 3, Packaging Group III; UN 2234].

Note-2: ASTM Standard D4206 (Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus).

Note-3: The sustained combustibility test results under ASTM Standard D4206 pertain solely to PCBTF in pure (100%) form. A mixture formulated with this material would need to undergo the same testing to determine whether that mixture sustains combustibility and whether a different product may qualify for the exception described above.

SECTION 15
REGULATORY INFORMATION

REGULATORY STATUS: All chemical substances contained within this product either are listed on the Toxic Substances Control Act (TSCA) Chemical Substance Inventory or exempt under TSCA. The chemical substances contained within this product, including its impurities, may be subject to specific reporting/notification, recordkeeping, and/or testing requirements under: TSCA, EPCRA/SARA III, RCRA, CERCLA, CAA, SDWA, and CWA.

CLEAN AIR ACT: PCBTF has been determined to have negligible photochemical reactivity for purposes of attaining the ozone national ambient air quality standard (NAAQS). As such, the substance has been excluded from the definition of volatile organic compounds (VOCs) under 40 CFR 51.100(s)(1), subject to certain conditions at part 51.100(s)(2)-(4).

CLEAN AIR ACT, CONT'D: Note: states are not necessarily obligated to exclude from control a VOC compound, such as PCBTF, which EPA has determined to be negligibly reactive. Customers should verify that a particular state, in which this compound is being used, has maintained the exclusion for this substance as a VOC under the applicable State Implementation Plan (SIP).

This product contains no chemicals that that are identified as Hazardous Air Pollutants (HAPs) under Section 112 of the Clean Air Act.

CALIFORNIA PROPOSITION 65: This product contains no chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

OTHER STATE CHEMICAL LISTS: This compound and two of the two impurities given in Section 2 are identified on several state chemical lists.

CONSUMER PRODUCT SAFETY COMMISION: The Consumer Product Safety Commission (CPSC) has identified an aspiration hazard for products containing 10% or more by weight of benzene, toluene, xylene, and petroleum distillates. See CPSC regulations at 16 CFR 1500.14(b)(3). Due to the similar structure and nature of PCBTF to these compounds, it is recommended that users of this substance follow the regulatory requirements identified by the CPSC.

INTERNATIONAL CLASSIFICATION & LABELING INFORMATION: Under the European Union's (EU's) classification and labeling scheme, a material having a flash point greater than 21 °C and less than or equal to 55 °C need not be classified as flammable (risk phrase R-10) if the material could not in any way support combustion. Based on this standard and the sustained combustibility testing described elsewhere in this MSDS, this material would not be considered flammable for classification and labeling purposes in the EU.

This exception is being reviewed by OSHA as part of its participation in the international effort to establish a Globally Harmonized System (GHS) for classifying substances and harmonizing hazard communication documents. OSHA is aware that this exception is utilized in reclassifying materials that are otherwise flammable or combustible and that this exception may be appropriate for the GHS. However, at this time OSHA has not made any regulatory changes to its Hazard Communication Standard.

SECTION 16
OTHER INFORMATION

DISCLAIMER: The information presented herein is believed to be factual. However, none of this information is to be taken as a warranty or representation for which the Kowa American Corp., Kowa Company, Ltd., the manufacturer, or the preparer bears legal responsibility. The user should review any recommendation in the specific context of the intended use to determine whether it is appropriate.

OTHER INFORMATION: *Oxsol® is a registered trademark of the Makhteshim Agan Group, and reference to it in this MSDS is merely intended to assist as a safety guide, and does not express or imply any statement of quality, endorsement, affiliation, sponsorship, and/or commonality of origin, by, or with, Kowa American or its products, with respect to any other company or its products.*