Royce International Corp.

Safety Data Sheet

Section 1 - Identification

Date of SDS Revision: April 24, 2015

1.1 Product identifier
Product Name: **RoyOxy™ RAA-3072**
Description: **Chlorobenzotrifluoride**
Manufacturer/Supplier: Royce International

1.2 Relevant identified uses of the preparation and uses identified against
Use: Accelerator for epoxy formulations
For industrial use only

1.3 Details of the supplier of the safety data sheet

Royce International Corp.
35 Carlton Avenue
East Rutherford, NJ 07073

Telephone: (201)438-5200 Fax: (201)438-5207
Web: www.royceintl.com
Contact: info@royceintl.com

1.4 Emergency telephone number
CHEMTREC: (800)424-9300
(International): (703)527-3887

Section 2 - Hazards Identification

2.1 Classification of the substance/mixture

2.1.1 Classification according to OSHA 29CFR1910.1200 and EU (EC) 1272/2008

Flammable liquids, cat. 3	H226
Skin irritation, cat. 2	H315
Eye irritation, cat. 2	H319
STOT-se/respiratory, cat. 3	H335
Aquatic toxicity acute, cat. 2	H401
Aquatic toxicity chronic, cat. 2	H411

2.2 Labeling elements

2.2.1 Labeling according to OSHA 29CFR1910.1200 and EU (EC) 1272/2008

Signal Word: Warning

Hazard pictogram:

Hazard statements
H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H411 Toxic to aquatic life with long lasting effects

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting equipment.
P261 Avoid breathing mist/vapors/spray.
P264 Wash hands and skin contact areas thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves / eye protection / face protection.
P312 Call a POISON CENTER or doctor if you feel unwell.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 If skin irritation occurs: Get medical attention.
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P337 + P313 If eye irritation persists: Get medical attention.
P362 Take off contaminated clothing and wash before re-use.
P370 + P378 In case of fire: Use recommended extinguishing media for extinction.
P391 Collect spillage.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents/container through a waste management company authorized by the local government.

2.3 OSHA GHS classification
This product is classified as hazardous as defined within the OSHA Hazard Communication Standard 29CFR1910.1200.

Section 3 - Composition / Information on Ingredients

3.1 Substances

Components	CAS No.	EINECS No.	%
1-Chloro-4-(trifluoromethyl)benzene	98-56-6	202-681-1	>99

3.2 Mixtures
Not applicable

Section 4 - First Aid Measures

4.1 Description of First Aid measures
General advice: leave hazard area; remove exposed individuals to fresh air in a clean warm area
In the event of skin contact: Immediately flush with running water for at least 15 minutes; then wash thoroughly with soap and water. Consult a physician.
In the event of eye contact: Immediately gently flush the eyes with running water for at least 15 minutes; remove contact lenses if applicable. Consult a physician.
In the event of swallowing: Do not induce vomiting. If conscious, rinse mouth with water. Consult a physician.
In the event of exposure by inhalation: Move person to fresh air. If breathing is difficult, administer oxygen. If unconscious, check for breathing and apply artificial respiration if necessary. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
Irritation to the skin, eyes and respiratory tract

4.3 Indication of any immediate medical attention and special treatment needed
Eye wash stations and emergency showers should be available.

Section 5 - Fire Fighting Measures

5.1 Extinguishing media
Carbon dioxide, foam, dry chemical, water fog; use water spray to cool fire-exposed containers

5.2 Special hazards arising from the substance or mixture
Exposure to decomposition products may be harmful to health; combustion products may include but are not limited to: carbon monoxide, carbon dioxide, hydrogen chloride, hydrogen fluoride, organic halides.

5.3 Advice for fire fighters: Use protective fire fighting clothing and positive pressure self-contained breathing apparatus to protect against potential harmful and/or irritating fumes.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures
Isolate area; keep unnecessary and unprotected personnel from entering the involved area. Ventilate the area; remove all sources of ignition; beware of vapors accumulating to form explosive concentrations. Avoid contact with skin, eyes and clothing; do not breathe vapors. Use appropriate safety equipment.

6.2 Environmental precautions:
Prevent contamination of soil and water.

6.3 Methods and material for containment and cleaning up
Collect with suitable inert absorbent material (sand, diatomaceous earth); place in suitable disposal container. Dispose of in accordance with applicable local and federal environmental control laws and regulations.

6.4 Reference to other sections
For more information on exposure controls, personal protection and disposal, review data in section 8 and section 13 of this SDS.

Section 7 - Handling and Storage

7.1 Precautions for safe handling
Ensure adequate ventilation of workplace and storage areas; take measures to prevent the build-up of electrostatic charge. Avoid skin contact; do not breathe vapors or mists; use recommended personal protective equipment wash thoroughly after handling. Do not eat, drink or smoke in the work area.

7.2 Conditions for safe storage, including any incompatibilities
Store in a cool, dry place. Keep away from incompatible materials. Keep container tightly closed. Always keep material in packaging made of identical material to the original.

Section 8 - Exposure Controls and Personal Protection

8.1 Control parameters
Occupational exposure limits: OSHA PEL/TWA: 2.5 ppm (19 mg/m^3) (listed under fluorides)

8.1.2 Recommended monitoring procedures
If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference can be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents for the determination of hazardous substances.

8.2 Exposure Controls:
Follow good industrial workplace practices; follow recommendations in this SDS.

8.2.1 Appropriate engineering controls
Ensure adequate ventilation through local exhaust.

8.2.2 Individual protection measures, such as personal protective equipment

8.2.2.1 Eye/face protection
Wear tight-fitting chemical safety goggles; use full face shield if a potential splashing hazard exists; also refer to European Standard EN166.

8.2.2.2 Skin protection
Wear impervious clothing as necessary to protect against product contact; safety shoes/boots. Refer to CFR1910.132 and CFR1910.136 for OSHA approved standards on protective clothing and footwear.

8.2.2.3 Respiratory protection
A respiratory protection program in compliance with 29CFR1910.134 (also see Canadian CSA Standard Z94.4-93; European Standard CR 529), or other applicable regulatory standard must be followed if exposure limits are exceeded, if engineering controls are not feasible, or if insufficient ventilation or workplace conditions warrant respirator use. In such cases a NIOSH approved air-purifying respirator equipped with an organic vapor/acid gas cartridge is

recommended. In emergency situations or when airborne concentrations are unknown, a full-face supplied air respirator should be used.

8.2.2.4 Hand protection
Wear nitrile rubber or other suitable impervious gloves; refer to European Standard EN374. Gloves selected must have a breakthrough rating appropriate for the work shift (>480 minutes).

Other Protective Equipment: The type and degree of personal protective equipment appropriate will depend on the specific work operation.

8.3 Environmental exposure controls
Observe good industrial workplace practices. Observe release response guidelines in section 6 and storage recommendations in section 7.

Section 9 - Physical and Chemical Properties

9.1 Information on basic physical and chemical properties
General information:
Physical state: Liquid
Color: Colorless
Important health, safety and environmental information:
Odor: Aromatic
Odor threshold: 0.11 ppm
Vapor pressure: 5.3 mm Hg at 20°C
Vapor density (Air=1): 6.2
Evaporation rate (BuAc=1): 0.9
Flash point: 43°C (109°F) (closed cup)
Flammable limits in air: LEL: 0.9% UEL: 10.5%
Autoignition temperature: >500°C (932°F)
Melting point: -36°C (-33°F)
Boiling point: 136-138°C (277-280°F)
Octanol/water partition coefficient (Log K_{ow}): 3.7
Volatiles: 100%
VOC Content: Negligible
Specific gravity: 1.35
Water solubility: Nearly insoluble
pH: Not applicable
Oxidizing properties: No data available
Molecular Formula: $C_7H_4ClF_3$
Molecular Weight: 180.56

Section 10 - Stability and Reactivity

10.1 Stability and Reactivity

10.1 Reactivity
Reacts vigorously with strong oxidizing materials such as permanganates and dichromates.

10.2 Stability
Stable under normal use and storage conditions.

10.3 Possibility of hazardous reactions
Reaction with sodium dimethyl sulfinate is expected to be strongly exothermic.

10.4 Conditions to avoid
Avoid heat, open flames, ignition sources, direct light, UV radiation.

10.5 Incompatible materials
Strong oxidizing agents, strong bases, sodium peroxide, sodium hydroxide, hydrogen peroxide, potassium hydroxide, potassium permanganate, potassium dichromate, chromic acid, nitric acid, perchloric acid, sodium dimethyl sulfinate.

10.6 Hazardous decomposition products
Combustion products include but are not limited to carbon monoxide, carbon dioxide, hydrogen chloride, hydrogen fluoride, organic halides.

Section 11 - Toxicological Information

11.1 Information on toxicological effects
Acute Oral Toxicity: LD50(rat): 13,000 mg/kg
Acute Dermal Toxicity: LD50(rabbit): >2700 mg/kg
Inhalation: LC50(rat)(4-hr): 4470 ppm
Absorption: May be harmful if absorbed through the skin.
Skin irritation: Slightly to moderately irritating.
Eye irritation: Slightly to moderately irritating.
Gastrointestinal irritation: May cause digestive tract irritation.
Respiratory or skin sensitization: Not known to cause sensitization.
Germ cell mutagenicity: Genotoxicity in vitro – human embryo; unscheduled DNA synthesis.
Carcinogenicity: No known carcinogenic effects.
Reproductive toxicity: No data available.
Specific target organ toxicity – single exposure: Inhalation – may cause respiratory irritation.
Specific target organ toxicity – single exposure: No data available
Aspiration hazard: Ingestion may cause vomiting; material aspirated into the lungs during vomiting may result in aspiration pneumonia.
Potential health effects
Skin: Causes irritation.
Eyes: Causes serious irritation.
Inhalation: Causes respiratory tract irritation.
Ingestion: May be harmful if swallowed; excessive exposure may result in liver, kidney, thyroid damage.
Signs and symptoms of exposure: itching, redness, swelling, coughing, labored breathing, drowsiness, CNS effects.
Additional information
Additional acute and chronic toxicity data for this substance can be found in the Registry of Toxic Effects of Chemical Substances at RTECS No. XS9145000.

Section 12 - Ecological Information

12.1 Toxicity
Aquatic Toxicity: LC50(Lepomis macrochirus)(24-hr): 15.9-22.9 mg/l
LC50(Lepomis macrochirus)(48-hr): 11.5-15.8 mg/l
LC50(Lepomis macrochirus)(72-hr): 11.4-14.1 mg/l
LC50(Lepomis macrochirus)(96-hr, NOEC): 5.6 mg/l

LC50(Salmo gairdneri)(24-hr): 13.5 mg/l
EC50(Daphnia magna)(24-hr): 4-15 mg/l
EC50(Daphnia magna)(48-hr): 4-14 mg/l

12.1.1 Acute/prolonged toxicity to fish
LC50(Lepomis macrochirus)(24-hr): 15.9-22.9 mg/l
LC50(Lepomis macrochirus)(48-hr): 11.5-15.8 mg/l
LC50(Lepomis macrochirus)(72-hr): 11.4-14.1 mg/l
LC50(Lepomis macrochirus)(96-hr, NOEC): 5.6 mg/l
LC50(Salmo gairdneri)(24-hr): 13.5 mg/l

12.1.2 Acute/prolonged toxicity to aquatic invertebrates
EC50(Daphnia magna)(24-hr): 4-15 mg/l
EC50(Daphnia magna)(48-hr): 4-14 mg/l

12.1.3 Acute/prolonged toxicity to aquatic plants
No data available

12.1.4 Toxicity to bacteria, to soil dwelling organisms and to terrestrial plants
No data available

12.1.5 Chronic toxicity to aquatic organisms
IC50 (Green & Blue-green algae)(72-hr): 500 mg/l

12.1.6 General effect
Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability
Biodegradation of this material is inconclusive due to volatility; this material, due to its high volatility, will preferentially partition to the atmosphere, making it unlikely to represent a significant threat to aquatic or terrestrial environments.

12.3 Bioaccumulative potential
Not expected to bioaccumulate based on an estimated bioconcentration of BCF = 120.

12.4 Mobility in soil
No data available.

12.5 Results of PBT and vPvB assessment (EC reg. 453/2010)
Not classified as Persistent, Bioaccumulative and Toxic
Not classified as very Persistent or very Bioaccumulative

12.6 German WGK classification
WGK = 1 (self-assessment)

12.7 Other adverse effects
No other adverse effects are identified.

Section 13 - Disposal Considerations

13.1 Waste treatment methods
Disposal: Do not dump to ground, sewers or watercourses. Soak up with inert absorbent material and dispose of in compliance with all applicable federal, state and local environmental

control laws and regulations. This material, when disposed of, may be a characteristic hazardous waste (ignitable) as defined within RCRA; waste characterization and compliance with applicable laws are the responsibility solely of the waste generator.
Container Disposal: Containers should be drained of all residual product prior to disposal. Empty containers may contain product residue and should be disposed of by a certified disposal contractor.

Section 14 - Transport Information

14.1 Shipping description

DOT Proper Shipping Description:
UN2234 Chlorobenzotrifluorides Hazard Class 3 PG III
ERG No. 130

IMDG:
UN2234 Chlorobenzotrifluorides Hazard Class 3 PG III
Marine Pollutant: No
EmS: F-E, S-D

IATA:
UN2234 Chlorobenzotrifluorides Hazard Class 3 PG III
EmS: F-E, S-D

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
SARA Title III Section 311/312 (40CFR370): Acute health hazard, fire hazard
SARA Title III Section 313 (40CFR372): No reportable components
CERCLA Status (40CFR302): No reportable components
CAA: Because this material has been determined to have negligible photochemical reactivity for purposes of attaining the ozone National Ambient Air Quality Standard, it has been excluded from the definition of volatile organic compounds under 40CFR51.100(s)(1)-(4).
OSHA/NTP/IARC Carcinogen Status: Not listed
WHMIS Classification: B3, D2B
Chemicals Known to the State of California to Cause Cancer or Reproductive Toxicity: None known to be in the product at levels requiring a warning.

REACH Annex XIV (SVHC)
No listed components
REACH Annex XVII (Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles)
No listed components

REACH Status (EC 1907/2006): This material has been registered, pre-registered or is otherwise exempted from registration under the Registration, Evaluation and Authorization of Chemical Substances.

Chemical safety assessment
No data available

Section 16 - Other Information

HMIS Ratings:

Health:	**2**
Flammability:	**2**
Reactivity:	**0**

(Personal protective equipment selection is best assigned by the user after performing a hazard assessment on the product as it is to be used in the specific work process.)

Synonyms:

1-Chloro-4-(trifluoromethyl)benzene
Chlorobenzotrifluoride
p-Chlorobenzotrifluoride

National chemical inventories

All components of this product are listed on the following chemical substance inventories:
TSCA (USA)
DSL (Canada)
EINECS (Europe)
ENCS (Japan)
ECL (Korea)
AICS (Australia)
PICCS (Philippines)

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	International carriage of dangerous goods by Road
AICS	Australian Inventory of Chemical Substances
BCF	Bioconcentration Factor
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CLP	Classification, Labeling and Packaging regulation
CNS	Central nervous system
DOT	Department of Transportation
DSL	Domestic Substances List
EINECS	European Inventory of Existing Chemical Substances
ECL	Existing Chemicals List (Korea)
EmS	IMO/IMDG Emergency Response Procedures for Ships Carrying Dangerous Goods
ENCS	Existing and New Chemical Substances Inventory (Japan)
EN 689	Workplace atmospheres – Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy
ERG	Emergency Response Guide
F-E, S-D	Non-water reactive flammable liquids
GHS	Globally Harmonized System
HMIS	Hazardous Materials Information System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IDLH	Immediately Dangerous to Life and Health
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
LD50	Lethal dose to 50% of test animal population
LEL	Lower explosive limit
MAK	Maximale Arbeitsplatz Konzentration
NOEC	No observable effect concentration
NTP	National Toxicology Program

OEL	Occupational Exposure Limit
OSHA	Occupational Safety & Health Administration
PBT	Persistent, Bioaccumulative and Toxic
vPvB	Very Persistent and Very Bioaccumulative
PEL	Permissible exposure limit
PICCS	Philippine Inventory of Commercial Chemical Substances
PNEC	Predicted No Effect Concentration
REACH	Registration, evaluation and authorization of chemical substances
RID	International carriage of dangerous goods by Rail
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
STOT SE	Specific Target Organ Toxicity – Single exposure
SVHC	Substance of Very High Concern
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UEL	Upper explosive limit
VOC	Volatile organic compound
WGK	Wassergefahrdungsklasse (Water Hazard Class)
WHMIS	Workplace Hazardous Materials Identification System