



ZHEJIANG RAYFULL HOLDING CO., LTD

Tel: +86-577-88905587,88908857

Fax: +86-577-88905567

EMAIL: //www.rayfull.com

MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

ZHEJIANG RAYFULL CHEMICALS CO.,LTD

ADD: NO.52 PUCHANG ROAD, PUZHOU INDUSTRIAL PARK, LONGWAN DISTRICT,
WENZHOU ZHEJIANG P.R. CHINA

Tel: +86-577-88905587

Fax: +86-577-88905567

Email: info@rayfull.com

sales@rayfull.com

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name : CHLOROTHALONIL TECHNICAL
Chemical description : Chlorothalonil: 2,4,5,6-Tetrachloroisophthalonitrile
CAS number : 1897-45-6

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use : Fungicide

1.3. Details of the supplier of the safety data sheet

Company identification : ZHEJIANG RAYFUL HOLDING CO., LTD.
ADD: NO.52 PUCHANG ROAD, PUZHOU INDUSTRIAL
PARK, LONGWAN DISTRICT, WENZHOU ZHEJIANG P.R.
CHINA

1.4. Emergency telephone number

Emergency phone nr : 112

2. Hazards Identification

2.1. Classification of the substance or mixture

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

- Health hazards : Acute toxicity, inhalation - Category 2 (H330), Eye Dam.- Category 1 (H318), Respiratory sensitization-Category 1 (H317)



- Environmental hazards : Hazardous to the aquatic environmental-Acute hazard- Category 1- Warning
Hazardous to the aquatic environmental- Chronic hazard - Category 1- Warning

Classification EC 67/548 or EC 1999/45

- Symbol(s) : Xn - Harmful
- R-code(s) : N - Dangerous for the environment

2.2. Label elements

Labelling according to Regulation EC 1272/2008 (CLP)

Hazard pictograms :



- Hazards pictograms -code : GHS07 -GHS09
- Signal words : Danger
- Hazard statements : H330 - Fatal if inhaled
H335 - May cause respiratory irritation
H318 - Causes serious eye damage
H317 - May cause an allergic skin reaction
H410 - Very toxic to aquatic life with long lasting effects
- Precautionary statements
 - Prevention : P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P260 - Do not breathe dust
P271 - Use only outdoors or in a well-ventilated area
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves, protective clothing, face protection, eye protection
 - Response : P302+P352 - IF ON SKIN: Wash with plenty of water
P304+P340 - IF INHALED: Remove person to fresh air and keep 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
P308+P313 - IF exposed or concerned: Get medical advice/attention



ZHEJIANG RAYFULL HOLDING CO., LTD

Tel: +86-577-88905587,88908857

Fax: +86-577-88905567

EMAIL: //www.rayfull.com

| | | |
|----------|---|---|
| | | P310 - Immediately call a doctor, a POISON CENTER |
| | | P312 - Call a doctor, a POISON CENTER if you feel unwell |
| | | P320 - Specific treatment is urgent (see a doctor, a POISON CENTER on this label), P321 - Specific treatment (see a doctor, a POISON CENTER on this label) |
| | | P333+P313 - If skin irritation or rash occurs: Get medical advice/attention |
| | | P362+P364 - Take off contaminated clothing and wash it before reuse |
| | | P391 - Collect spillage, |
| Storage | : | P403+P233 - Store in a well-ventilated place. Keep container tightly closed |
| | | P405 - Store locked up |
| Disposal | : | P501 - Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste |

2.2. Other hazards

None under normal conditons.

3. Hazards Identification

This product is considered to be hazardous and contains hazardous components

| Substance name | Value (s) | CAS No | Index No | Classification (Dir.67/548) | EU - GHS Substance Classification | REACH No |
|----------------------|-----------|-----------|--------------|---|---|-------------------|
| Chlorothalonil (ISO) | 98% | 1897-45-6 | 608-014-00-4 | Carc. Cat. 3; R40 T+; R26 Xi; R41 Xi; R37 R43 N; R50-53 | STOT SE 3 (H335) Carc. 2 (H351) Acute Tox. 2 (H330) Eye Dam. 1 (H318) Skin Sens. 1 (H317) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410) | no data available |

For the full text of the R phrases mentioned in this Section, see Section 16

For the full text of the H-Statements mentioned in this Section, see Section 16



4. Hazards Identification

4.1. Description of first aid measures

First aid

- General advice : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
- Ingestion : Call a POISON CENTER or doctor/physician if exposed or you feel unwell Do NOT induce vomiting
- Skin contact : Remove affected clothing and wash all exposed skin area with soap and water, followed by warm water rinse. Obtain medical attention.
- Eye contact : Rinse immediately with plenty water. Immediately consult an eye specialist.
- Inhalation : Remove victim to fresh air. Keep victim warm and at rest. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Immediately get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

- Inhalation : Possible nasal irritation and discharge. No delayed effects expected.
- Ingestion : inhalation of vapors may cause respiratory irritation.
- Skin : Possible irritation and redness. May cause an allergic skin reaction following contact.
- Eye : Possible serious irritation, redness and blurred vision. No delayed effects expected.

4.3. Indication of any immediate medical attention and special treatment needed

- Note to physician : No specific antidote. Treat symptomatically (decontamination, vital functions). Call a Poison Centre immediately for treatment advice. In case of ingestion gastric lavage may be necessary (with proper laryngeal control). Before emptying the stomach, assess the potential danger arising from lung aspiration against the product toxicity. Report to Albaugh Europe Sàrl any unusual symptoms occurring after exposure by any route.

5. Fire-fighting measures

5.1. Extinguishing media



Extinguishing media : As aqueous suspension ignition and fire is not likely
For small fire : dry chemical, carbon dioxide (CO₂)
For large fire : water spray, alcohol resistant foam

5.2. Special hazards arising from the substance or mixture

Special exposure hazards : During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

5.3. Advice for fire-fighters

Protection against fire : Wear self-contained breathing apparatus, rubber boots and thick rubbers gloves.

Special procedures : Fight fires a protected location. Dike fire control water for later disposal. Keep container cool by spraying with water

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Use appropriate protection (see section 8)

6.2. Environmental precautions

Environmental precautions : Dispose of this material and its container at hazardous or special waste collection point, in accordance with national and regional regulations. If the product has contaminated surface water, inform the appropriate authorities. Contaminated soil layers have to be dug out.

6.3. Methods and material for containment and cleaning up

After spillage and/or leakage : In the event of minor spillage: Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Use appropriate container to avoid environmental contamination.
In the event of major spillage: Collect and contain as much free liquid as possible. Dike spills using absorbent or impervious material such as sand or clay for later disposal

6.4. Reference to other sections

7. Handling and storage

7.1. Precautions for safe handling



Handling : Provide adequate ventilation
Avoid contact with eyes
Ensure that eyewash stations and safety showers are close to the workstation location
Wear personal protective equipment: Half mask with a particle filter P2 (EN 143)

7.2. Conditions for safe storage, including any incompatibilities

Storage : store in original container only in cool, dry, well-ventilated, secure area out of reach of children and animals.
Packing : Resin-lined metal drums

7.3. Specific end use(s)

No information available.

8. Exposure controls personal protection

8.1. Control parameters

Industrial hygiene : Ensure adequate ventilation, especially in confined areas. Use good industrial hygiene. Wear face shield or goggles, elbow length PVC gloves, cotton overalls buttoned to the neck and wrist, washable hat and half face respirator with dust and vapor cartridge. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

-Respiratory protection : During sparing wear suitable respiratory equipment
-Skin protection : Wear suitable protective clothing
-Hand protection : Wear suitable gloves
-Eye protection : Chemical goggles or safety glasses

8.2. Occupational Exposure Limits

No occupational exposure limits have been established for Chlorothalonil.

9. Physical And Chemical Properties

9.1. Information on basic physical and chemical properties



Appearance

| | |
|------------------|---------------------------------|
| Physical state | : Powder |
| Colour | : White powder |
| Odor | : Odorless |
| pH | : 5.0-7.0 |
| Molecular weight | : 265.9 |
| Boiling point | : 350°C |
| Melting point | : 250-251°C |
| Vapour pressure | : 1.3Pa at 40°C |
| Refractive index | : 1.632 |
| Solubility | : 0.6 mg/L at 25°C in the water |
| Density | : 1.732g/cm ³ |

10. Stability And Reactivity

10.1. Reactivity

Hazardous reactions : This product is unlikely to react or decompose under normal storage conditions

10.2. Chemical stability

Physico-chemical stability : Stable under normal conditions

10.3. Possibility of hazardous reactions

Hazardous Polymerization : Will not occur

10.4. Conditions to avoid

Conditions to avoid : Containers should be kept dry. Protect this product from light. Store in the closed original container in a dry, cool, well-ventilated area out of direct sunlight.

10.5. Incompatible materials

Incompatible materials : strong acids, strong bases, strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products : Thermal decomposition can lead to release of irritating gases and vapors, nitrogen oxides (NO_x), hydrogen cyanide, and hydrogen chloride Carbon oxides



11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Acute oral LD₅₀ for rat : > 5000 mg/kg

Acute dermal LD₅₀ for rat : > 5000 mg/kg

rat

Inhalation LD₅₀ for rat : >0.1 mg/L

Skin irritation : Non- irritant

Eye irritation : Moderately irritant

Skin sensitization : Likely to be a skin sensitizer based on active ingredient(s)

Chronic toxicity : In a number of tests of varying lengths of time, rats fed a range of doses of chlorothalonil generally showed no effects on physical appearance, behavior, or survival. Skin contact with chlorothalonil may result in dermatitis or light sensitivity. Human eye and skin irritation is linked to chlorothalonil exposure; 14 of 20 workers exposed to 0.5% chlorothalonil in a wood preservative developed dermatitis. All workers showed swelling and inflammation of the upper eyelids. Allergic skin responses have also been noted in farm workers.

Reproductive effects : No evidence of adverse developmental effects in rabbit and rat studies

Teratogenic effects : Long-term studies indicate that high doses fed to rats caused reduced weight gains for males and females in each generation studied. Female rats given high doses of chlorothalonil through the stomach during the sensitive period of gestation had normal fetuses, even though that dose was toxic to the mothers . A study of birth defects in rabbits showed no effects. Chlorothalonil is not expected to produce birth defects in humans.

Mutagenic effects : Mutagenicity studies on various animals, bacteria, and plants indicate that chlorothalonil does not cause any genetic changes. The compound is not expected to pose mutagenic risks to humans.

Carcinogenic effects : No evidence of carcinogenicity in dogs after administration for up to one year. Treatment related increases in the incidence of renal tubular adenoma and carcinoma were observed in rats and male mice. Squamous cell adenomas and carcinomas were also observed in the forestomach of both species. The forestomach tumors seen in rodent studies are not relevant to human health, as humans do not possess an anatomical equivalent of the rodent forestomach. The relevance of renal tumors to human health is unclear, although metabolism data suggest that the dog, a species



Organ toxicity : that is resistant to chlorothalonil-induced renal injury, may be more representative of humans than the rat. IARC identifies chlorothalonil as a 2B carcinogen (possibly carcinogenic to humans).
: Chronic studies of rats and dogs fed high dietary levels show that chlorothalonil is toxic to the kidney. In addition to less urine output, changes in the kidney included enlargement, greenish-brown color, and development of small grains.

12. Ecological information

12.1. Toxicity

Effects on birds : Chlorothalonil is practically nontoxic to birds. The LD₅₀ in mallard ducks is 5000 mg/kg. Most avian wildlife are not significantly affected by this compound

Effects on aquatic organisms : Chlorothalonil and its metabolites are highly toxic to fish, aquatic invertebrates, and marine organisms. Fish, such as rainbow trout, bluegill, and channel catfish are noticeably affected even when chlorothalonil levels are low (less than 1 mg/L). The LC₅₀ is 0.25 mg/L in rainbow trout, 0.3 mg/L in bluegills, and 0.43 mg/L in channel catfish . Chlorothalonil does not store in fatty tissues and is rapidly excreted from the body. Its bioaccumulation factor is quite low.

Effects on other organisms : The compound is nontoxic to bees

12.2. Persistence -degradability

Persistence and degradability : Degradation half life: ca. 7 d Not persistent in soil

12.3. Bioaccumulative potential

Bioaccumulative potential : The bioaccumulation potential of chlorothalonil is low, although there is some potential for the bioaccumulation of chlorothalonil degradates in oysters.

12.4. Mobility in soil

Mobility : Low mobility

12.5. Results of PBT and vPvB assessment



This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

12.6. Other adverse effects

No information available.

13. Disposal Considerations

13.1. Waste treatment methods

Waste from Residues / : Dispose of in accordance with local regulations.

Unused Products

Contaminated packaging : Empty containers should be taken for local recycling, recovery or waste disposal.

EWC waste disposal No : 020108 - agrochemical waste containing dangerous substances.

OTHER : According to the European Waste Catalogue, Waste Codes are not
INFORMATION product specific, but application specific.

14. Transport Information

ADR/RID

-UN No. : 3802

-Proper shipping name : Environmental hazardous substance, solid , N.O.S
(Chlorothalonil)

-Packing group : III

-Class : 9

-Environmental Hazard : DANGEROUS FOR THE ENVIRONMENT

-Special Provisions : 274, 335, 601

IMDG/IMO

-UN No. : 3802

-Proper shipping name : Environmental hazardous substance, solid , N.O.S
(Chlorothalonil)

-Packing group : III

-Class : 9

-Environmental Hazard : Marine Pollutant

-Special Provisions : 274, 335

IATA/ICAO



-UN No. : 3802

-Proper shipping name : Environmental hazardous substance, solid , N.O.S
(Chlorothalonil)

-Packing group : III

-Class : 9

-Environmental Hazard : Marine Pollutant

-Special Provisions : A97, A158

15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Ensure all national/ local regulations were observed.

15.2. Chemical Safety Assessment

A chemical safety assessment has not been carried out.

16. Other Information

Full text of R-phrases referred to under sections 2 and 3

R20 - Harmful by inhalation

R22 - Harmful if swallowed

R26 - Very toxic by inhalation R34 - Causes burns

R37 - Irritating to respiratory system

R40 - Limited evidence of a carcinogenic effect

R41 - Risk of serious damage to eyes

R43 - May cause sensitization by skin contact

R50 - Very toxic to aquatic organisms

R36/37 - Irritating to eyes and respiratory system

R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Full text of H-Statements referred to under sections 2 and 3

H330 - Fatal if inhaled

H335 - May cause respiratory irritation

H318 - Causes serious eye damage

H317 - May cause an allergic skin reaction

H410 - Very toxic to aquatic life with long lasting effects

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information



ZHEJIANG RAYFULL HOLDING CO., LTD

Tel: +86-577-88905587,88908857

Fax: +86-577-88905567

EMAIL: //www.rayfull.com

applies to the PRODUCT AS SUCH. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.