**ORTHO DICHLOROBENZENE**

**PRODUCT IDENTIFICATION**

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>95-50-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS NO.</td>
<td>202-425-9</td>
</tr>
<tr>
<td>FORMULA</td>
<td>C₆H₄Cl₂</td>
</tr>
<tr>
<td>MOL WT.</td>
<td>147.00</td>
</tr>
<tr>
<td>HS CODE</td>
<td>2903.61</td>
</tr>
<tr>
<td>TOXICITY</td>
<td>Oral rat LD₅₀: 500 mg/kg</td>
</tr>
<tr>
<td>SYNONYMS</td>
<td>1,2-Dichlorobenzene; o-Dichlorobenzol; ODCB; Chloroden; 1,2-Dichloorbenzeen (Dutch); 1,2-Dichlor-benzol (German); 1,2-Dichlorobenzene (Italian); o-Phenylenedichloride; Dilantin DB; Dowtherm E; Dizene; DCB;</td>
</tr>
</tbody>
</table>

**DERIVATION AND CLASSIFICATION**

**PHYSICAL AND CHEMICAL PROPERTIES**

| PHYSICAL STATE | Colorless to yellowish liquid with Aromatic odor. |
| MELTING POINT  | -17.6 °C                                |
| BOILING POINT  | 180 °C                                  |
| SPECIFIC GRAVITY | 1.30                                   |
| SOLUBILITY IN WATER | Insoluble                         |
| SOLVENT SOLUBILITY | soluble in alcohol, benzene, diethyl ether |
| pH             | neutral                                 |
| VAPOR DENSITY  | 5.1                                     |
| AUTOIGNITION   | 640 °C                                  |
|NFPA RATINGS | Health: 2; Flammability: 2; Reactivity: 0 |
|REFRACTIVE INDEX | 1.5510                                |
|FLASH POINT     | 66 °C                                   |
|STABILITY       | Stable under ordinary conditions        |

**GENERAL DESCRIPTION & APPLICATIONS**

Dichlorobenzenes belong to the group of organic halogen compounds replacing two hydrogen atoms in benzene by chlorine atoms. There are three isomers; ortho-dichlorobenzene, colorless liquid boiling at 180 °C, used as a solvent and chemical intermediate for dyes, pigment, agrochemicals and wide range of organic synthesis; meta-, colorless liquid boiling at 172 °C, used as a solvent and chemical intermediate; para-, white solid with a characteristic penetrating odor. It is used mainly as an insecticidal fumigant against moths, a space deodorizer, as a general insecticide and fungicide on crops, and as a chemical intermediate for plastics, dyes, pharmaceuticals and other organic compounds. All are insoluble in water and denser than water. They are prepared by the chlorination reaction of benzene in the presence of iron(III) chloride. (the chlorination under strong illumination and without iron(III) chloride leads to benzene hexachloride instead of mono or polychlorobenzenes). The chlorination reaction leads to similar ratio of ortho- and para-dichlorobenzene, but small amount of the meta isomer is performed. The ortho and para isomers are separated by fractional freezing. While the para isomer crystallizes, the ortho isomer remains liquid. The meta-dichlorobenzene is prepared by heating and pressure with aluminum chloride. o-Dichlorobenzene is used as a solvent and as a degreasing agent. It is used in removing sulfur from illuminating gas. It is an insecticide and a fumigant. It is also used as a heat-transfer medium in extractive distillation process and solvent carrier in toluene diisocyanate manufacturing. It is also an chemical intermediate to manufacture dyes, agrochemicals, pharmaceuticals and other organic synthesis. It is used as an industrial odor controller, as a preservative for wood. Its application include formulations for motor oil additives, lubricants and paints.

**SALES SPECIFICATION**

**APPEARANCE**

Colorless to yellowish liquid with Aromatic odor.
PURITY 99.0% min
ISOMER IMPURITY 1.0% max
ORGANIC IMPURITY 0.5% max
MOISTURE 0.5% MAX
BOILING POINT 171 - 181 C
SET POINT -16 - -14 C
TRANSPORTATION PACKING 250kgs in Drum, Iso-Tank
HAZARD CLASS 6.1 (Packing group :III)
UN NO. 1591

GENERAL DESCRIPTION OF CHLOROBENENES
Chlorobenzenes are organic halogen compounds of cyclic aromatics formed by replacing hydrogen atoms in benzene by 1-6 atoms of chlorine. There are 12 compounds of chlorobenzenes of mono-, three isomeric substances each of di-, tri-, and tetra-, as well as penta- and hexachlorobenzene.

- Monochlorobenzene (MCB, CAS RN: 108-90-7)
- 1,2-Dichlorobenzene (1,2-DCB, CAS RN: 95-50-1)
- 1,3-Dichlorobenzene (1,3-DCB, CAS RN: 541-73-1)
- 1,4-Dichlorobenzene (1,4-DCB, CAS RN: 106-46-7)
- 1,2,3-Trichlorobenzene (1,2,3-TCB, CAS RN: 87-61-6)
- 1,2,4-Trichlorobenzene (1,2,4-TCB, CAS RN: 120-82-1)
- 1,3,5-Trichlorobenzene (1,3,5-TCB, CAS RN: 108-70-3)
- 1,2,3,4-Tetrachlorobenzene (1,2,3,4-TeCB, CAS RN: 634-66-2)
- 1,2,3,5-Tetrachlorobenzene (1,2,3,5-TeCB, CAS RN: 634-90-2)
- 1,2,4,5-Tetrachlorobenzene (1,2,4,5-TeCB, CAS RN: 95-94-3)
- Pentachlorobenzene (PeCB, CAS RN: 608-93-5)
- Hexachlorobenzene (HCB, CAS RN: 118-74-1)

Chlorobenzenes are white crystalline solids at room temperature while MCB, 1,2-DCB, 1,3-DCB, and 1,2,4-TCB are clear liquids. They are practically insoluble in water and denser than water. The water solubility is decreasing if more chlorinated. The flammability of chlorobenzenes is low, the octanol/water partition coefficients are moderate to high, increasing with more chlorinated, and vapour pressures are low to moderate, decreasing with more chlorinated. The taste and odour thresholds are low, decreasing with lower chlorinated. MCB (which makes up more than 50 % of total production of all chlorobenzenes) and DCBs (more than 40 %) are prepared by the chlorination reaction of benzene in the liquid phase in the presence of iron(III) chloride. The chlorination under strong illumination and without iron(III) chloride leads to benzene hexachloride instead of mono or polychlorobenzenes. The chlorination reaction for DCB leads to similar ratio of ortho- and para-dichlorobenzene, but small amount of the meta isomer is performed. The ortho and para isomers are separated by fractional freezing. While the para isomer crystallizes, the ortho isomer remains liquid. The meta dichlorobenzene is prepared by heating and pressure with aluminum chloride. TCBs are obtained from the chlorination of appropriate chlorobenzene isomers in the presence of a Lewis acid catalyst. TeCBs are achieved by the addition of chlorine to trichlorobenzenes in the presence of an aluminum catalyst. PCBs are produced by the denitification of pentachloronitrobenzene and the reductive dechlorination of HCB as well as by the addition of chlorine to TeCB. HCB is produced by the direct chlorination of benzene with ferric chloride catalyst at 150-200 C from the distillation of residues from the production of tetrachloroethylene. Chlorobenzenes are used mainly as process solvents and solvent carriers as well as parent compounds in the synthesis of pesticides (mainly), plastics, dyes, pharmaceuticals and other organic compounds. They are used as insecticidal fumigants against moths, as space deodorizers, as general insecticides and fungicides of crops. They are used in metal treatments; in industrial deodorants; in cleaners for drains. Higher chlorinated benzenes of TCBs, TeCBs are used in dielectric fluids.
## MONOCHLOROBENZENE

**CAS NUMBER:** 108-90-7  
**EINECS NUMBER:** 203-628-5

**OTHER NAME(S):**  
Benzene chloride; Benzene monochloride; Chloorbenzeen (Dutch); Chlorbenzol; Chlorobenzen (Polish); Chlorobenzenu; Clorobenzene (Italian); Mcb; Monochloorbenzeen (Dutch); Monochlorbenzol (German); Monoclorobenzene (Italian); Phenyl Chloride;

**MAJOR USES**  
Intermediate for the synthesis of phenol, aniline, chloronitrobenzenes, diphenyl oxide, DDT, and silicones; Process solvent for methylene diisocyanate, adhesives, polishes, waxes, pharmaceutical products, and natural rubber; Degrading solvent; Functional fluid in external combustion; Heat transfer fluids in solar energy collectors

**ADDITIONAL INFORMATION**  
Oral rat LD50: 1110 mg/kg  
UN Number: 1134 (Hazard Class: 3, Packing Group: III)  
Packing: 220kgs in drum

## 1,2-DICHLOROBENZENE

**CAS NUMBER:** 95-50-1  
**EINECS NUMBER:** 202-425-9

**OTHER NAME(S):**  
o-Dichloro-Benzene; 2-dichlorobenzene; Chloroben; Cloroben; DCB; o-Dichlor benzol; o-Dichlorbenzene; ODB; Orthodichlorobenzene; Termitkil ;

**MAJOR USES**  
Intermediate for the synthesis of dyes agrochemicals, pharmaceuticals, 3,4-dichloroaniline and other organic synthesis; solvent for organic materials and for oxides of non-ferrous metals; solvent carrier in the production of toluene diisocyanate; fumigant and insecticide; degreasing hides and wool; metal polishes; industrial odor controller; in cleaners for drains; preservative for wood. Formulations for motor oil additives, lubricants and paints.

**ADDITIONAL INFORMATION**  
Insoluble in water  
Vapor density 3.9  
Autoignition 640 °C  
Refractive index 1.524  
Flash point 29.5 °C  

**SALES SPECIFICATION**  
Purity 99.95% min  
Dichlorobenzene 0.15% max  
Benzene 0.05% max  
Acidity 0.001% max  
Moisture 0.5% max
### 1,3-DICHLOROBENZENE

**CAS NUMBER:** 541-73-1  
**EINECS NUMBER:** 208-792-1

**OTHER NAME(S):**  
- m-dichloro-Benzene; m-DCB; m-Dichlorobenzene; m-Phenylenedichloride; Meta-Dichlorobenzene;

**MAJOR USES**  
fumigant and insecticide; solvent; chemical intermediate to manufacture dyes, agrochemicals, pharmaceuticals and other organic synthesis.

**ADDITIONAL INFORMATION**  
Oral rat LD50: 500 mg/kg  
UN Number: 1591 (Hazard Class: 6.1, Packing Group: III)  
Packing: 250kgs in drum

### 1,4-DICHLOROBENZENE

**CAS NUMBER:** 106-46-7  
**EINECS NUMBER:** 203-400-5

**OTHER NAME(S):**  
- p-dichloro-benzene; 1,4-DCB; 1,4-Dichloorbenzeen (Dutch); 1,4-Dichlor-benzol (German); 1,4-Diclorobenzene (Italian); 4-dichlorobenzene; p-Chlorophenyl chloride; p-Dichloobenzeen (Dutch); p-Dichlorbenzol (German); p-Dichlorobenzene; p-Dichlorobenzol; p-Diclorobenzene (Italian); para-Chlorophenyl chloride; para-Dichlorobenzene; Paracide; Paradichlorbenzol; Paradichlorbenzen ; Paradichlorobenzol; PARAZENE; PDB; PDCB; PERSIA-PERAZOL; Santochlor;

**MAJOR USES**  
general insecticide, moth repellent, germicide, deodorant; chemical intermediate to manufacture dyes.
agrochemicals, pharmaceuticals, 2,5-dichloroaniline, plastics (e.g., polyphenylene sulfide resins used for surface coatings and molding resins), and other organic synthesis.

**ADDITIONAL INFORMATION**
- Oral rat LD50: 500 mg/kg
- UN Number: 3335 (Hazard Class: 9)
- Packing: 250kgs in drum

### 1,2,3-TRICHLOROBENZENE

| CAS NUMBER | 87-61-6 |
| EINECS NUMBER | 201-757-1 |
| OTHER NAME(S): | 1,2,3-TCB; 1,2,3-TrCB; 1,2,6-Trichlorobenzene; Trichlorobenzene; vic-Trichlorobenzene; |

**MAJOR USES**
- Chemical intermediate; heat transfer fluid; high boiling solvent; dielectric fluid, insecticide and fungicide; coolant in electrical installation; glass tempering; dye carrier; transformer oils; lubricants.

**ADDITIONAL INFORMATION**
- Oral rat LD50: 1830 mg/kg
- UN Number: 2811 (Hazard Class: 6.1, Packing Group: III)
- Packing: 300kgs in drum

### 1,2,4-TRICHLOROBENZENE

| CAS NUMBER | 120-82-1 |
| EINECS NUMBER | 204-428-0 |
| OTHER NAME(S): | 1,2,4-Trichlorobenzol; 1,2,5-Trichlorobenzene; 1,3,4-Trichlorobenzene; Trojchlorobenzen (Polish); Unsym-trichlorobenzene; |

**MAJOR USES**
- Chemical intermediate; heat transfer fluid; high boiling solvent; dielectric fluid, insecticide and fungicide; coolant in electrical installation; glass tempering; dye carrier;
### 1,3,5-Trichlorobenzene

**CAS Number:** 108-70-3  
**EINECS Number:** 203-608-6  
**Other Name(s):**  
- 1,3,5-trichloro-Benzene;  
- 1,3,5-Trichlorobenzene;  
- S-Trichlorobenzene;  
- Sym-trichlorobenzene;  
- Trichloro-1,3,5 benzene;  

**Major Uses:**  
- Chemical intermediate;  
- Heat transfer fluid;  
- High boiling solvent;  
- Dielectric fluid;  
- Insecticide and fungicide;  
- Coolant in electrical installation;  
- Glass tempering;  
- Dye carrier;  
- Transformer oils;  
- Lubricants  

**Additional Information:**  
- Oral rat LD₅₀: 756 mg/kg  
- UN Number: 2321 (Hazard Class: 6.1, Packing Group: III)  
- Packing: 300kgs in drum

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td><strong>Vapor Density</strong></td>
<td>6.2</td>
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<tr>
<td><strong>Autoignition</strong></td>
<td>571 °C</td>
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<tr>
<td><strong>Refractive Index</strong></td>
<td>1.454</td>
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<tr>
<td><strong>Flash Point</strong></td>
<td>110 °C</td>
</tr>
</tbody>
</table>

**Sales Specification:**  
- **Purity:** 98.0% min  
- **Moisture:** 0.5% max

### 1,2,3,4-Tetrachlorobenzene

**CAS Number:** 634-66-2  
**EINECS Number:** 211-214-0  
**Other Name(s):**  
- 1,2,3,4-TCB;  
- Tetrachlorobenzene;  

**Major Uses:**  
- Dielectric fluids;  
- In the synthesis of fungicides and other organic compounds  

**Additional Information:**  
- Oral rat LD₅₀: 1167 mg/kg  
- UN Number: 2811 (Hazard Class: 6.1, Packing Group: III)  
- Packing: 25kgs in bag

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td><strong>Vapor Density</strong></td>
<td>Insoluble in water</td>
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<tr>
<td><strong>Autoignition</strong></td>
<td></td>
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<tr>
<td><strong>Refractive Index</strong></td>
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<tr>
<td><strong>Flash Point</strong></td>
<td>126 °C</td>
</tr>
</tbody>
</table>

**Sales Specification:**  
- **Purity:** 98.0% min  
- **Isomer Impurity:** 1.0% max  
- **Organic Impurity:** 0.5% max  
- **Moisture:** 0.5% max
### 1,2,3,5-Tetrachlorobenzene

**CAS Number:** 634-90-2  
**EINECS Number:** 211-217-7  
**Other Name(s):**  
1,2,3,5-TCB; Benzene, 1,2,3,5-tetrachloro-; Tetrachloro 1,2,3,5-benzene;  

**Major Uses:**  
Intermediate for herbicides; defoliants  

**Additional Information:**  
Oral rat LD50:  
UN Number:  
Packing: 250kgs in drum

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>White flakes</td>
</tr>
<tr>
<td>Melting Point</td>
<td>54 - 55°C</td>
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<tr>
<td>Boiling Point</td>
<td>246°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
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</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in water</td>
</tr>
<tr>
<td>Vapor Density</td>
<td></td>
</tr>
<tr>
<td>Autoignition</td>
<td></td>
</tr>
<tr>
<td>Refractive Index</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td></td>
</tr>
</tbody>
</table>

**Sales Specification:**  
Purity: 98.0% min  
Isomer Impurity: 1.0% max  
Organic Impurity: 0.5% max  
Moisture: 0.5% max  

### 1,2,4,5-Tetrachlorobenzene

**CAS Number:** 95-94-3  
**EINECS Number:** 202-466-2  
**Other Name(s):**  
1,2,4,5-TCB; 1,2,4,5-Tetrachlorobenzol; Benzene tetrachloride; s-Tetrachlorobenzene;  

**Major Uses:**  
Intermediate for insecticide, herbicides and

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>White flakes</td>
</tr>
<tr>
<td>Melting Point</td>
<td>138 - 140°C</td>
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<tr>
<td>Boiling Point</td>
<td>240°C</td>
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</tbody>
</table>

**Sales Specification:**  
Purity: 99.0% min  
Melting Point: 51 - 55°C
PENTACHLOROBENZENE

CAS NUMBER: 608-93-5
EINECS NUMBER: 210-172-0

OTHER NAME(S):
1,2,3,4,5-PENTACHLOROBENZENE; PCB; QCB;

MAJOR USES
pesticide; chemical intermediate

ADDITIONAL INFORMATION
Oral rat LD50: 1500 mg/kg
UN Number: FS0001 (Hazard Class: 173)
Packing: 250kgs in drum

SPECIFIC GRAVITY: 1.734
SOLUBILITY: Insoluble in water
VAPOR DENSITY: 7.4
AUTOIGNITION: None
REFRACTIVE INDEX: 1.734
FLASH POINT: 112°C

SALES SPECIFICATION
PURITY: 99.0% min
ISOMER IMPURITY: 1.0% max
ORGANIC IMPURITY: 0.5% max
MOISTURE: 0.5% MAX

HEXACHLOROBENZENE

CAS NUMBER: 118-74-1
EINECS NUMBER: 204-273-9

OTHER NAME(S):
Amatin; Anticarie; Esaclorobenzene (Italian);
Hexachlorbenzol (German); Pentachlorophenyl chloride;

C₆Cl₆ (284.78)

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: white flakes
MELTING POINT: 84 - 87°C
BOILING POINT: 275 - 277°C
SPECIFIC GRAVITY: 1.61
SOLUBILITY: Insoluble in water
VAPOR DENSITY: 7.4
AUTOIGNITION: None
REFRACTIVE INDEX: 1.734
FLASH POINT: 112°C

SALES SPECIFICATION
PURITY: 99.0% min
ISOMER IMPURITY: 1.0% max
ORGANIC IMPURITY: 0.5% max
MOISTURE: 0.5% MAX
(German); Sanocid; Sanocide;

**MAJOR USES**

seed dressing; fungicide treating seed; in the manufacture of pyrotechnics, tracer bullets; fluxing agent in the manufacture of aluminum. wood-preserving agent; porosity-control agent in the manufacture of graphite anodes; peptizing agent in the production of nitroso and styrene rubber for tyres;

**ADDITIONAL INFORMATION**

Oral rat LD50: 3500 mg/kg
UN Number: 2729 (Hazard Class: 6.1, Packing Group: III)
Packing: 25kgs in bag

<table>
<thead>
<tr>
<th>PHYSICAL AND CHEMICAL PROPERTIES</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>PHYSICAL STATE</td>
<td>white flakes</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>227 - 229°C</td>
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<tr>
<td>BOILING POINT</td>
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<td>SPECIFIC GRAVITY</td>
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<tr>
<td>SOLUBILITY</td>
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<tr>
<td>FLASH POINT</td>
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<table>
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<tbody>
<tr>
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<tr>
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<tr>
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<td>MOISTURE</td>
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