CHLOROBENZENE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
CHLOROBENZENE

OTHER NAMES

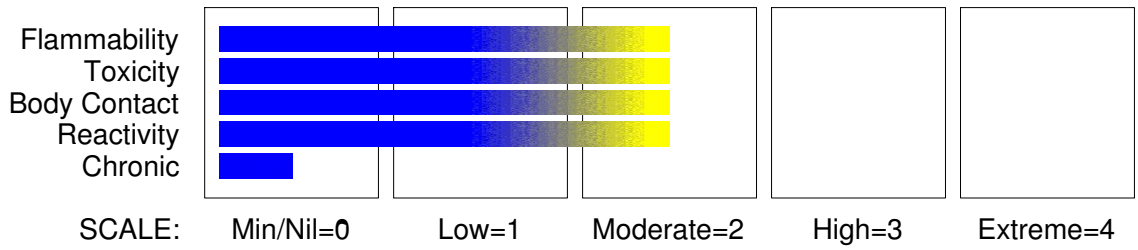
C6-H5-Cl, MCB, "benzene, chloro", "benzene chloride", chlorbenzol, chlorobenzol, chlorbenzene, monochlorbenzene, monochlorobenzene, monochlorobenzol, "phenyl chloride"

PROPER SHIPPING NAME
CHLOROBENZENE

PRODUCT USE
Used in textile processing as a fibre swelling agent and a dye carrier; as an extractant in the manufacture of diisocyanates, rubber, perfumes and pharmaceuticals; and in the manufacture of phenol, aniline and DDT. Also a tar and grease remover, a solvent for paints and a heat transfer medium.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,
MUMBAI- 400030.INDIA.
technical@sdfine.com
Telephone: 91- 22- 24959898
Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



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Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Inhalation) Category 4
Acute Toxicity (Oral) Category 4
Chronic Aquatic Hazard Category 2
Flammable Liquid Category 3

EMERGENCY OVERVIEW

HAZARD

WARNING
Determined by using GHS criteria:
H226 H332 H302 H411
Flammable liquid and vapour
Harmful if inhaled
Harmful if swallowed
Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Prevention

Use only non-sparking tools.
Take precautionary measures against static discharge
Use explosion-proof electrical/ventilating/lighting/equipment
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.
Ground/bond container and receiving equipment.
Keep away from heat/sparks/open flame - No smoking.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Use only outdoors or in a well ventilated area.
Wear protective gloves and eye/face protection.
Keep container tightly closed.

Response

Call a POISON CENTER or doctor/physician if you feel unwell.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
Specific treatment: refer to Label or MSDS.
If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.

Storage

Store locked up.

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Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
chlorobenzene	108-90-7	>95

Section 4 - FIRST AID MEASURES

SWALLOWED

· For advice, contact a Poisons Information Centre or a doctor at once.
· Urgent hospital treatment is likely to be needed.
· If swallowed do NOT induce vomiting.
· If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
· Observe the patient carefully.
· Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
· Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
· Transport to hospital or doctor without delay.

EYE

If this product comes in contact with the eyes:
· Immediately hold eyelids apart and flush the eye continuously with running water.
· Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
· Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
· Transport to hospital or doctor without delay.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:
· Immediately remove all contaminated clothing, including footwear.
· Flush skin and hair with running water (and soap if available).
· Seek medical attention in event of irritation.
In case of burns:
· Quickly immerse affected area in cold running water for 10 to 15 minutes.
· Bandage lightly with a sterile dressing. Treat for shock if required.
· Lay patient down. Keep warm and rested.
· Transport to hospital, or doctor.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· Apply artificial respiration if not breathing, preferably with a demand valve

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resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor.

NOTES TO PHYSICIAN

Treat symptomatically.
For ingestion, consider gastric lavage.
Chlorobenzene administered orally is mainly excreted in the urine with 32% appearing in the first 24 hours mostly as metabolites (4-chlorophenylmercaturic acid, chlorophenols, chlorocatechols and mandelic acid)
Periodic medical examinations are recommended for occupationally exposed workers. [I.L.O. Encyclopaedia]
Persons with pre-existing skin disorders or impaired liver, kidney or pulmonary function may be more susceptible to the effects of this substance. [CCINFO-MALLINCKRODT]

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

· Foam.
· Dry chemical powder.
· BCF (where regulations permit).
· Carbon dioxide.
· Water spray or fog - Large fires only.

FIRE FIGHTING

Alert Fire Brigade and tell them location and nature of hazard.
· May be violently or explosively reactive.
· Wear breathing apparatus plus protective gloves.
· Prevent, by any means available, spillage from entering drains or water courses.
Cool fire exposed containers with water spray from a protected location.
DO NOT approach cylinders suspected to be hot.
If safe to do so, switch off electrical equipment until vapour fire hazard is removed.
Fight fire from a safe distance, with adequate cover.

FIRE/EXPLOSION HAZARD

· Liquid and vapour are flammable.
· Moderate fire hazard when exposed to heat or flame.
· Vapour forms an explosive mixture with air.
· Moderate explosion hazard when exposed to heat or flame.
· Vapour may travel a considerable distance to source of ignition.
· Heating may cause expansion or decomposition leading to violent rupture of containers.
· On combustion, may emit toxic fumes of carbon monoxide (CO).
Other combustion products include:.
hydrogen chloride and phosgene.

FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

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Section 5 - FIRE FIGHTING MEASURES

Personal Protective Equipment
Breathing apparatus.
Chemical splash suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
Environmental hazard - contain spillage.
· Remove all ignition sources.
· Clean up all spills immediately.
· Avoid breathing vapours and contact with skin and eyes.
· Control personal contact by using protective equipment.
· Contain and absorb small quantities with vermiculite or other absorbent material.
· Wipe up.
· Collect residues in a flammable waste container.
Wash spill site with soda solution.

MAJOR SPILLS
Pollutant
· Clear area of personnel and move upwind.
· Alert Fire Brigade and tell them location and nature of hazard.
· May be violently or explosively reactive.
· Wear breathing apparatus plus protective gloves.
· Prevent by any means available, spillage from entering drains or water course.
· No smoking, naked lights or ignition sources.
· Increase ventilation.
· Stop leak if safe to do so.
· Water spray or fog may be used to disperse/absorb vapour.
· Contain spill with sand, earth or vermiculite.
· Use only spark-free shovels and explosion proof equipment.
· Collect recoverable product into labelled containers for recycling.
· Absorb remaining product with sand, earth or vermiculite.
· Collect solid residues and seal in labelled drums for disposal.
· Wash area and prevent runoff into drains.
· If contamination of drains or waterways occurs, advise emergency services.
After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)
The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
chlorobenzene 1000 ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
chlorobenzene 500 ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:

continued...

chlorobenzene 30 ppm

The threshold concentration below which most people will experience no appreciable risk of health effects:
chlorobenzene 30 ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

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SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

+	X	X	X	X	+

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

Use good occupational work practice.
Avoid breathing vapours and contact with skin and eyes.
Avoid contact with incompatible materials.
Avoid all ignition sources.
Avoid sources of heat.
Avoid physical damage to containers.
Keep containers securely sealed when not in use.
Use in a well-ventilated area.
Earth and secure containers when dispensing or pouring.
until atmosphere has been checked.
Vapour may travel a considerable distance to source of ignition.
Avoid generation of static electricity.
Always wash hands with soap and water after handling. Work clothes should be laundered separately.

SUITABLE CONTAINER

· Check that containers are clearly labelled.
Packaging as recommended by manufacturer.
Glass container.
Plastic containers may only be used if approved for flammable liquids.
Metal drum.

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Section 7 - HANDLING AND STORAGE

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.
Avoid dimethyl sulfoxide and silver perchlorate (forms shock-sensitive solvated salts). Also avoid extreme humidity.

STORAGE REQUIREMENTS

· Store in original containers in approved flame-proof area.
· No smoking, naked lights, heat or ignition sources.
· DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
· Keep containers securely sealed.
· Store away from incompatible materials in a cool, dry well ventilated area.
· Protect containers against physical damage and check regularly for leaks.
· Observe manufacturer's storing and handling recommendations.
Outside or detached storage is preferred.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records
• chlorobenzene: CAS:108- 90- 7 CAS:50717- 45- 8

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
chlorobenzene		1, 000

ODOUR SAFETY FACTOR (OSF)

OSF=15 (CHLOROBENZENE)
Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.
Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.
The Odour Safety Factor (OSF) is defined as:
OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm
Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	As " A" for 50- 90% of persons being distracted
C	1- 26	As " A" for less than 50% of persons being distracted
D	0.18- 1	10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As " D" for less than 10% of persons aware of being tested

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MATERIAL DATA

Odour Threshold Value: 1.3 ppm (detection)
NOTE: Detector tubes for chlorobenzene, measuring in excess of 5 ppm, are commercially available.
Subtle effects, particularly those in the liver, occur in rats exposed to 75 ppm and a slight increase in liver weight is seen in two generations of male rats exposed to 50 ppm. The TLV-TWA is thought to be protective against the development of such effects.

PERSONAL PROTECTION




EYE

· Chemical goggles.
· Safety glasses.
· Full face shield.
DO NOT wear contact lenses.
· Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Impervious gloves.
Viton gloves.
Neoprene gloves.
Protective footwear.
Safety footwear.

OTHER

Ensure there is ready access to a safety shower.
· Eyewash unit.
· Impervious apron.
Overalls.
Laboratory coat.
· Impervious protective clothing.
If gas concentrations are high:.
Full-face air supplied breathing apparatus.

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· Barrier cream.
· Skin cleansing cream.

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
" Forsberg Clothing Performance Index" .
The effect(s) of the following substance(s) are taken into account in the computer- generated selection: chlorobenzene

VITON	A
TEFLON	A
PVA	B
NITRILE	C

A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	A- AUS	-
1000	50	-	A- AUS
5000	50	Airline *	-
5000	100	-	A- 2
10000	100	-	A- 3
	100+		Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture

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velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

A clear, colourless, volatile, flammable liquid with a faint, almond-like, aromatic odour. It is a very refractive liquid (1.528); immiscible with water but freely miscible with in alcohol, benzene, chloroform and ether. Environmental pollutant.

PHYSICAL PROPERTIES

Liquid.
Does not mix with water.
Sinks in water.

Molecular Weight: 112.56

Boiling Range (°C): 131- 135

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Melting Range (°C): - 45.6
Solubility in water (g/L): Immiscible
pH (1% solution): Not applicable.
Volatile Component (%vol): approx. 100
Relative Vapour Density (air=1): 3.9
Lower Explosive Limit (%): 1.3
Autoignition Temp (°C): 638
State: Liquid

Specific Gravity (water=1): 1.11
pH (as supplied): Not applicable
Vapour Pressure (kPa): 1.2 @ 20 C
Evaporation Rate: Not available
Flash Point (°C): 29
Upper Explosive Limit (%): 7.1
Decomposition Temp (°C): Not available
Viscosity: Not available

log Kow (Prager 1995): 2.18- 2.84
log Kow (Sangster 1997): 2.84
log Kow: 2.13-3.0

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

Inadequate ventilation.
Presence of elevated temperatures.
Presence of heat source.
Presence of an ignition source.
Presence of incompatible materials.
Presence of extreme humidity.
Storage in unsealed containers.
Hazardous polymerisation will not occur.
Stable under normal storage conditions.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
Although ingestion is not thought to produce harmful effects (as classified under EC Directives), the material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE
Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN
Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

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The material is not thought to be a skin irritant (i.e. is unlikely to produce irritant dermatitis as described in EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
The liquid may produce skin discomfort following prolonged contact. Defatting and/or drying of the skin may lead to dermatitis.
Toxic effects may result from skin absorption.

INHALED
The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation, of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

CHRONIC HEALTH EFFECTS
Exposure to high levels or prolonged exposure may cause liver damage, chronic respiratory disease and changes to the kidney (urine may be burgundy red).
Workers exposed to chlorobenzene vapours from 1-2 years reported headache, dizziness, somnolence, and dyspeptic disorders. Other symptoms included acroparaesthesia, spastic contractions of the finger muscles, hypesthesia, spastic contractions of the gastocnemius muscle and vasovegetative instability.
Repeated exposure of rats, rabbits and guinea pigs to chlorobenzene at 1000 ppm, 7 hours/day, 5 days/week over 44 days resulted in lung, liver and kidney changes.
Male rats receiving high doses during chronic gavage studies showed an increase in the occurrence of neoplastic nodules of the liver.

TOXICITY AND IRRITATION

TOXICITY	IRRITATION
Oral (rat) LD50: >2290 mg/kg	Nil Reported
Oral (rat) LD50: 1100 mg/kg* *[Merck]	
Inhalation (rat) LCLo: 9000 ppm	

Mammalian somatic cell mutagen
NTP Carcinogenesis studies indicate some positive findings for rat following administration by gavage.

Section 12 - ECOLOGICAL INFORMATION

Hazardous Air Pollutant:	Yes
Fish LC50 (96hr.) (mg/l):	39- 73
BCF<100:	1, 3, 4
log Kow (Prager 1995):	2.18- 2.84
log Kow (Sangster 1997):	2.84
log Pow (Verschueren 1983):	2.84
COD:	0.041
Half- life Soil - High (hours):	3600
Half- life Soil - Low (hours):	1632
Half- life Air - High (hours):	729
Half- life Air - Low (hours):	72.9
Half- life Surface water - High (hours):	3600
Half- life Surface water - Low (hours):	1632
Half- life Ground water - High (hours):	7200

continued...

Section 12 - ECOLOGICAL INFORMATION

Half- life Ground water - Low (hours):	3264
Aqueous biodegradation - Aerobic - High (hours):	3600
Aqueous biodegradation - Aerobic - Low (hours):	1632
Aqueous biodegradation - Anaerobic - High (hours):	14400
Aqueous biodegradation - Anaerobic - Low (hours):	6528
Photolysis maximum light absorption - High (nano- m):	265
Photolysis maximum light absorption - Low (nano- m):	215.5
Photooxidation half- life water - High (hours):	62106
Photooxidation half- life water - Low (hours):	1553
Photooxidation half- life air - High (hours):	729
Photooxidation half- life air - Low (hours):	72.9
First order hydrolysis half- life (hours):	>879 YRS
Base rate constant [MOH)- HR]- 1:	<0.9

log Kow: 2.13-3.0
log Koc: 2.1-2.92
log Kom: 2.1-2.32
Half-life (hr) air: 72.9-729
Half-life (hr) H2O surface water: 8-3600
Half-life (hr) H2O ground: 3264-7200
Half-life (hr) soil: 50-3600
Half-life (hr) sediment: 1800
Henry's Pa m^3 /mol: 314-451
BOD 5 if unstated: 0.03
COD: 0.41
ThOD: 2.06
BCF: 645-4185
Log BCF: 1.08-3.23
Toxicity Fish: LD50(24-96)24-73mg/L
Toxicity invertebrate: cell mult. inhib.17->392mg/L
Bioacculmulation: little-none
Nitrif. inhib.: nil at 100mg/L
Effects on algae and plankton: cell mult. inhib. algae 120->390mg/L
Degradation Biological: slow
processes Abiotic: photol&hydrol not sig, some oxid

Section 13 - DISPOSAL CONSIDERATIONS

Recycle wherever possible.
Consult manufacturer for recycling options.
Consult State Land Waste Management Authority for disposal.
Bury or incinerate residue at an approved site.
Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

continued...

Section 14 - TRANSPORTATION INFORMATION

Labels Required: FLAMMABLE LIQUID
HAZCHEM: 2Y

UNDG:

Dangerous Goods Class:	3	Subrisk:	None
UN Number:	1134	Packing Group:	III

Shipping Name:CHLOROBENZENE

Air Transport IATA:

ICAO/IATA Class:	3	ICAO/IATA Subrisk:	None
UN/ID Number:	1134	Packing Group:	III
ERG Code:	3L		

Shipping name:CHLOROBENZENE

Maritime Transport IMDG:

IMDG Class:	3	IMDG Subrisk:	None
UN Number:	1134	Packing Group:	III
EMS Number:	F- E, S- D		

Shipping name:CHLOROBENZENE

Section 15 - REGULATORY INFORMATION

REGULATIONS

chlorobenzene (CAS: 108-90-7) is found on the following regulatory lists;
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Council of Chemical Associations (ICCA) - High Production Volume List
OECD Representative List of High Production Volume (HPV) Chemicals
WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

No data available for chlorobenzene as CAS: 50717-45-8.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
chlorobenzene	108- 90- 7, 50717- 45- 8

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REPRODUCTIVE HEALTH GUIDELINES

Established occupational exposure limits frequently do not take into consideration reproductive end points that are clearly below the thresholds for other toxic effects. Occupational reproductive guidelines (ORGs) have been suggested as an additional standard. These have been established after a literature search for the reproductive no -observed-adverse effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL). In addition the US EPA's procedures for risk assessment for hazard identification and dose-response assessment as applied by NIOSH were used in the creation of such limits. Uncertainty factors (UFs) have also been incorporated.

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
chlorobenzene	46 mg/m3	NA	NA	NA	Yes

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time -weighted average unless specified otherwise.
CR = Cancer Risk/10000; UF = Uncertainty factor:
TLV believed to be adequate to protect reproductive health:
LOD: Limit of detection
Toxic endpoints have also been identified as:
D = Developmental; R = Reproductive; TC = Transplacental carcinogen
Jankovic J., Drake F.: A Screening Method for Occupational Reproductive

The above information is believed to be accurate and represent the best information currently available to us but does not represent any warranty expressed or implied of the properties of the product. User should make thier own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 16-Aug-2017