IAL 2PENOL 5

INDO AMINES LIMITED

Chemwatch: **35152**
Version No: **6.1.1.1**
Safety Data Sheet

Revision No.: 03
Reviewed On: 08/01/2021
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SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	IAL 2PENOL 5
Chemical Name	ethylene glycol phenyl ether
Synonyms	2-Phenoxy ethanol, C8-H10-O2, ethylene glycol monophenyl ether, 2-fenoxyethanol, fenyl-cellosolve, glycol monophenyl ether beta-hydroxyethyl phenyl ether, 1-hydroxy-2-phenoxyethane, phenoxy ethanol, phenoxyethanol, phenoxyethyl alcohol, phenoxetol, phenoxytol, phenyl cellosolve, phenylmonoglycol ether, rose ether, ethylene phenoxtol, CoSept PHE, Dowanol Eph, Emeressence 1160, Igepal OD 410, Phenoxen, Polioxol F-01, Protacide P-OH, REWOPAL MPG 10, Sepicide LD, Phenoxytolarosol, Tri-K, Arosol, Dowanol EP, Emery 6705, fish anaesthetic, embalming aid, 2-phenoxyethyl-d4 alcohol CAS RN: 1219804-65-5, FEMA 4620
Chemical formula	C8-H10-O2|(C2H4O)nC6H6O
Other means of identification	Not Available
CAS number	122-99-6

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

Relevant identified uses	Solvent. In perfumery/ flavouring. Used as solvent, intermediate for plasticizers, bactericidal agents, and fixative for soaps and perfumes. Also as a fish anaesthetic and in the preparation of cadavers. In Japan and the EU, its concentration in cosmetics is restricted to 1%. [~Intermediate ~]

Details of the supplier of the safety data sheet

Registered company name	INDO AMINES LIMITED
Address	W-44, MIDC Phase II, Manpada Road, Dombivli (E) Maharashtra 421204 India
Telephone	+91 (0251) 2871354
Fax	+91 (0251) 2871635
Website	www.indoaminesltd.com
Email	clkadam@indoaminesltd.com

Emergency telephone number

Association / Organisation	Not Available
Emergency telephone numbers	+91 (0251) 2870941
Other emergency telephone numbers	+91 (0251) 2873052

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture
NFPA 704 diamond

Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Acute Toxicity (Oral) Category 4, Eye Irritation Category 2A

Label elements

GHS label elements	
SIGNAL WORD	**WARNING**

Hazard statement(s)

H302	Harmful if swallowed.
H319	Causes serious eye irritation.

Precautionary statement(s) Prevention

P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement(s) Response

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 advice/attention.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider/if you feel unwell.
P330	Rinse mouth.

Precautionary statement(s) Storage
Not Applicable

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

CAS No	%[weight]	Name	Classification
122-99-6	>98	2-Phenoxy ethanol	Acute Toxicity (Oral) Category 4, Eye Irritation Category 2A; H302, H319

Mixtures
See section above for composition of Substances

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: Wash out immediately with fresh 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. Seek medical attention without delay; if pain persists or recurs seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	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.
Inhalation	If fumes, aerosols or combustion products are inhaled remove from contaminated area. Other measures are usually unnecessary.
Ingestion	• **IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.** • For advice, contact a Poisons Information Centre or a doctor. Urgent hospital treatment is likely to be needed. • In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS. **Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:** • **INDUCE** vomiting with fingers down the back of the throat, **ONLY IF CONSCIOUS**. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. **NOTE:** Wear a protective glove when inducing vomiting by mechanical means.

Indication of any immediate medical attention and special treatment needed
As in all cases of suspected poisoning, follow the ABCDEs of emergency medicine (airway, breathing, circulation, disability, exposure), then the ABCDEs of toxicology (antidotes, basics, change absorption, change distribution, change elimination).
For poisons (where specific treatment regime is absent):

BASIC TREATMENT

- Establish a patent airway with suction where necessary.

- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 L/min.
- Monitor and treat, where necessary, for pulmonary oedema.
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994
Treat symptomatically.

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

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

Special hazards arising from the substrate or mixture

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

Advice for firefighters

Fire Fighting	• Alert Fire Brigade and tell them location and nature of hazard. Wear full body protective clothing with breathing apparatus. • Prevent, by any means available, spillage from entering drains or water course. Use water delivered as a fine spray to control fire and cool adjacent area. Avoid spraying water onto liquid pools. • **DO NOT** approach containers suspected to be hot. Cool fire exposed containers with water spray from a protected location. • If safe to do so, remove containers from path of fire.
Fire/Explosion Hazard	• Combustible. Slight fire hazard when exposed to heat or flame. Heating may cause expansion or decomposition leading to violent rupture of containers. On combustion, may emit toxic fumes of carbon monoxide (CO). • May emit acrid smoke. • Mists containing combustible materials may be explosive. Combustion products include: ,carbon dioxide (CO2) ,other pyrolysis products typical of burning organic material May emit poisonous fumes. May emit corrosive fumes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
See section 8

Environmental precautions
See section 12

Methods and material for containment and cleaning up

Minor Spills	• Remove all ignition sources. Clean up all spills immediately. Avoid breathing vapours and contact with skin and eyes. Control personal contact with the substance, by using protective equipment. Contain and absorb spill with sand, earth, inert material or vermiculite. Wipe up. Place in a suitable, labelled container for waste disposal.
Major Spills	Moderate hazard. Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. • 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. Contain spill with sand, earth or vermiculite. 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.

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	• **DO NOT** allow clothing wet with material to stay in contact with skin The substance accumulates peroxides which may become hazardous only if it evaporates or is distilled or otherwise treated to concentrate the peroxides. The substance may concentrate around the container opening for example. Purchases of peroxidisable chemicals should be restricted to ensure that the chemical is used completely before it can become peroxidised. • A responsible person should maintain an inventory of peroxidisable chemicals or annotate the general chemical inventory to indicate which chemicals are subject to peroxidation. An expiration date should be determined. The chemical should either be treated to remove peroxides or disposed of before this date. The person or laboratory receiving the chemical should record a receipt date on the bottle. The individual opening the container should add an opening date. Unopened containers received from the supplier should be safe to store for 18 months. Opened containers should not be stored for more than 12 months. • Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps. • **DO NOT** enter confined spaces until atmosphere has been checked. • Avoid smoking, naked lights or ignition sources. Avoid contact with incompatible materials. • When handling, **DO NOT** eat, drink or smoke. • Keep containers securely sealed when not in use. Avoid physical damage to containers. Always wash hands with soap and water after handling. Work clothes should be laundered separately. Use good occupational work practice. • Observe manufacturer's storage and handling recommendations contained within this SDS. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
Other information	• Store in original containers. Keep containers securely sealed. No smoking, naked lights or ignition sources. • Store in a cool, dry, well-ventilated area. Store away from incompatible materials and foodstuff containers. • Protect containers against physical damage and check regularly for leaks. Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	• Metal can or drum Packaging as recommended by manufacturer. Check all containers are clearly labelled and free from leaks.
Storage incompatibility	• Glycol ethers may form peroxides under certain conditions; the potential for peroxide formation is enhanced when these substances are used in processes such as distillation where they are concentrated or even evaporated to near-dryness or dryness; storage under a nitrogen atmosphere is recommended to minimise the possible formation of highly reactive peroxides Nitrogen blanketing is recommended if transported in containers at temperatures within 15 deg C of the flash-point and at or above the flash-point - large containers may first need to be purged and inerted with nitrogen prior to loading • In the presence of strong bases or the salts of strong bases, at elevated temperatures, the potential exists for runaway reactions. Contact with aluminium should be avoided; release of hydrogen gas may result- glycol ethers will corrode scratched aluminium surfaces. May discolour in mild steel/ copper; lined containers, glass or stainless steel is preferred • Glycols and their ethers undergo violent decomposition in contact with 70% perchloric acid. This seems likely to involve formation of the glycol perchlorate esters (after scission of ethers) which are explosive, those of ethylene glycol and 3-chloro-1,2-propanediol being more powerful than glyceryl nitrate, and the former so sensitive that it explodes on addition of water . Investigation of the hazards associated with use of 2-butoxyethanol for alloy electropolishing showed that mixtures with 50-95% of acid at 20 deg C, or 40-90% at 75 C, were explosive and initiable by sparks. Sparking caused mixtures with 40-50% of acid to become explosive, but 30% solutions appeared safe under static conditions of temperature and concentration. • Avoid strong bases. Avoid reaction with oxidising agents

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
ethylene glycol phenyl ether	Phenoxyethanol, 2-; (Phenyl cellosolve)	20 ppm	20 ppm	44 ppm
ethylene oxide	Ethylene oxide; (Oxirane)	5 ppm	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
ethylene glycol phenyl ether	Not Available	Not Available
ethylene oxide	800 ppm	800 [Unch] ppm

MATERIAL DATA

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require

that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.
OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

Exposure limits with "skin" notation indicate that vapour and liquid may be absorbed through intact skin. Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation. Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.
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

CEL TWA: 25 ppm, 140 mg/m3 (skin) [Dow] Odour Safety Factor(OSF) OSF=0.0023 (ETHYLENE OXIDE)

Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure. 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 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.
Personal protection	
Eye and face protection	• Safety glasses with side shields. • Chemical goggles. • Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses 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], [AS/NZS 1336 or national equivalent]
Skin protection	See Hand protection below
Hands/feet protection	• Wear chemical protective gloves, e.g. PVC. • Wear safety footwear or safety gumboots, e.g. Rubber The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and.has to be observed when making a final choice. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: · frequency and duration of contact, · chemical resistance of glove material, · glove thickness and · dexterity Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). · When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. · Contaminated gloves should be replaced. For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times. Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task. Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example: · Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. · Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Body protection	See Other protection below
Other protection	Overalls. P.V.C. apron. Barrier cream. Skin cleansing cream. Eye wash unit.
Thermal hazards	Not Available

Recommended material(s)
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:
ETHYLENE GLYCOL PHENYL ETHER

Material	CPI
NEOPRENE	C

NITRILE	C
SARANEX-23	C

* CPI - Chemwatch Performance Index
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.

Respiratory protection
Type AX-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)
Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.
Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AX-AUS P2	-	AX-PAPR-AUS / Class 1 P2
up to 50 x ES	-	AX-AUS / Class 1 P2	-
up to 100 x ES	-	AX-2 P2	AX-PAPR-2 P2 ^

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear, colourless to light yellow liquid with a mild, pleasant odour. Slightly miscible with water (28 g/l).

Physical state	Liquid	**Relative density (Water = 1)**	1.1
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not available.
pH (as supplied)	Not Applicable	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	11	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	246	**Molecular weight (g/mol)**	138.18
Flash point (°C)	121 (Setaflash)	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not available.	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not available.	**Volatile Component (%vol)**	Not available.
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water (g/L)	Miscible	**pH as a solution (1%)**	Not available.
Vapour density (Air = 1)	Not available.	**VOC g/L**	Not available.

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	• Unstable in the presence of incompatible materials. Product is considered stable. • Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Inhalation hazard is increased at higher temperatures. Not normally a hazard due to non-volatile nature of product
Ingestion	Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. At sufficiently high doses the material may be neurotoxic (i.e. poisonous to the nervous system).

Skin Contact

Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
The material may produce mild skin irritation; limited evidence or practical experience suggests, that the material either:

- produces mild inflammation of the skin in a substantial number of individuals following direct contact, and/or
- produces significant, but mild, inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period.

Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (non allergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.
Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. Repeated skin exposure to ethylene glycol phenyl ether may result in absorption of harmful amounts. Immediate symptoms may include, headache, lightheadedness, and a general feeling of intoxication. After several hours, diminished sensation, and reduced finger/ hand strength have been noted.

Eye

Evidence exists, or practical experience predicts, that the material may cause severe eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Eye contact may cause significant inflammation with pain. Corneal injury may occur; permanent impairment of vision may result unless treatment is prompt and adequate. Repeated or prolonged exposure to irritants may cause inflammation characterised by a temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

Chronic

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Exposure to the material may cause concerns for human fertility, on the basis that similar materials provide some evidence of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects, but which are not a secondary non-specific consequence of other toxic effects.Studies with some ethylene glycol ethers and their esters indicate reproductive changes, testicular atrophy, infertility and kidney function changes. The metabolic acetic acid derivatives of the glycol ethers (alkoxyacetic acids), not the ether itself, have been found to be the proximal reproductive toxin in animals. The potency of these metabolites decrease significantly as the chain length of the ether increases. Consequently glycol ethers with longer substituents (e.g diethylene glycols, triethylene glycols) have not generally been associated with reproductive effects. One of the most sensitive indicators of toxic effects observed from many of the glycol ethers is an increase in the erythrocytic osmotic fragility in rats. This appears to be related to the development of haemoglobinuria (blood in the urine) at higher exposure levels or as a result of chronic exposure. Ethylene glycol ethers and acetates are mainly metabolised to alkoxyacetic acids but there is also a minor pathway through ethylene glycol to oxalic acid. The main pathway of ethylene glycol ethers is associated with significant clinical or experimental health effects, but the minor pathway is also interesting because formation of urinary stones depends principally upon urinary concentration of oxalate and calcium. In one study (1) the tendency to form urinary stones was 2.4 times higher amongst silk-screen printers exposed to ethylene glycol ethers, than among office workers. (1) Laitinen J., et al: Occupational Environmental Medicine 1996, 53 595-600 Case studies indicate that ethylene glycol phenyl ether (EGPE), is responsible for acute neurotoxic effects as well as chronic solvent-induced brain syndrome with repeated exposure. Constant irritability, impaired memory and depression may occur after 1-2 yr occupational exposure to EGPE. Other symptoms include alcohol intolerance, episodes of tachycardia and dyspnea, problems with balance and rash. Woman fish hatchery workers, constantly exposed to EGPE, underwent neurophysiological testing and were found to have persistent focal cognitive impairment. [Yearbook of Occupational & Environmental Medicine 1991] Excessive exposure may cause haemolysis, thereby impairing the ability of blood to transport oxygen. Congeners are expected to exhibit similar behaviour.

ethylene glycol phenyl ether

TOXICITY	IRRITATION
dermal (rat) LD50: 14391 mg/kg[1]	Eye (rabbit): 250 ug/24h - SEVERE
Oral (rat) LD50: 1386 mg/kg[1]	Eye (rabbit): 6 mg - moderate
	Skin (rabbit): 500 mg/24h - mild

ethylene oxide

TOXICITY	IRRITATION
Inhalation (rat) LC50: 1460 ppm/4hr[2]	Eye (rabbit): 18 mg/6h - moderate
Inhalation (rat) LC50: 800 ppm/4hr[2]	Skin (human): 1%/7 sec - irritant
Oral (rat) LD50: 72 mg/kg[2]	

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

ETHYLENE GLYCOL PHENYL ETHER

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. The aryl alkyl alcohol (AAA) fragrance ingredients are a diverse group of chemical structures with similar metabolic and toxicity profiles. The AAA fragrances demonstrate low acute and subchronic dermal and oral toxicity.
At concentrations likely to be encountered by consumers, AAA fragrance ingredients are non-irritating to the skin.

The potential for eye irritation is minimal. With the exception of benzyl alcohol and to a lesser extent phenethyl and 2-phenoxyethyl AAA alcohols, human sensitization studies, diagnostic patch tests and human induction studies, indicate that AAA fragrance ingredients generally have no or low sensitization potential. Available data indicate that the potential for photosensitization is low. NOAELs for maternal and developmental toxicity are far in excess of current human exposure levels. No carcinogenicity in rats or mice was observed in 2-year chronic testing of benzyl alcohol or a-methylbenzyl alcohol; the latter did induce species and gender-specific renal adenomas in male rats at the high dose. There was no to little genotoxicity, mutagenicity, or clastogenicity in the mutagenicity in vitro bacterial assays, and in vitro mammalian cell assays. All in vivo micronucleus assays were negative. It is concluded that these materials would not present a safety concern at current levels of use as fragrance ingredients The Research Institute for Fragrance Materials (RIFM) Expert Panel
Bacterial cell mutagen

ETHYLENE OXIDE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
Oxiranes (including glycidyl ethers and alkyl oxides, and epoxides) exhibit many common characteristics with respect to animal toxicology. One such oxirane is ethyloxirane; data presented here may be taken as representative.
for 1,2-butylene oxide (ethyloxirane):
Ethyloxirane increased the incidence of tumours of the respiratory system in male and female rats exposed via inhalation. Significant increases in nasal papillary adenomas and combined alveolar/bronchiolar adenomas and carcinomas were observed in male rats exposed to 1200 mg/m3 ethyloxirane via inhalation for 103 weeks. There was also a significant positive trend in the incidence of combined alveolar/bronchiolar adenomas and carcinomas. Nasal papillary adenomas were also observed in 2/50 high-dose female rats with none occurring in control or low-dose animals. In mice exposed chronically via inhalation, one male mouse developed a squamous cell papilloma in the nasal cavity (300 mg/m3) but other tumours were not observed. Tumours were not observed in mice exposed chronically via dermal exposure. When trichloroethylene containing 0.8% ethyloxirane was administered orally to mice for up to 35 weeks, followed by 0.4% from weeks 40 to 69, squamous-cell carcinomas of the forestomach occurred in 3/49 males (p=0.029, age-adjusted) and 1/48 females at week 106.
Trichloroethylene administered alone did not induce these tumours and they were not observed in control animals . Two structurally related substances, oxirane (ethylene oxide) and methyloxirane (propylene oxide), which are also direct-acting alkylating agents, have been classified as carcinogenic
for ethylene oxide:
Ethylene oxide is very soluble in blood. Therefore, pulmonary uptake is expected to be fast and to depend only on the alveolar ventilation rate and the concentration of ethylene oxide in the inspired air. The rate of uptake of ethylene oxide in mice was 1.1 ug/kg body weight, per min, at an exposure level of 1 mg/m3. This corresponds to nearly 100% absorption of ethylene oxide from 1.1 litre of air per min and per kg body weight, which is the reported rate of alveolar ventilation in resting mice. No specific information pertaining to skin absorption is available, but accidental exposure of the skin of 3 industrial workers to 1% aqueous solution of ethylene oxide was reported to have resulted in marked nausea and profuse vomiting
Human exposure mainly occurs through inhalation in sterilisation facilities and in production plants. In sterilisation facilities, 8-h time-weighted average levels have usually been below 36 mg/m3, with short-term exposures of about 100 mg/m3, and peak levels of up to 1800 mg/m3. In production plants, the time-weighted average has usually been below 4 mg/m3. Ambient levels at a distance from point sources of emission have been estimated to be below the limit of detection. Exposure to residues of ethylene oxide or its reaction products, halohydrins and ethylene glycol, also occurs from fumigated foods, pharmaceutical products, and sterilised medical equipment. 2-Chloroethanol levels as high as several g/kg have been measured in food and levels of several hundred mg/kg in medical equipment.
When inhaled, ethylene oxide is readily absorbed, distributed throughout the body, and rapidly metabolized. Accordingly, most organs receive equivalent doses of the chemical and its metabolites. The degree of alkylation of proteins and DNA varies slightly between the different organs and blood. In man and rodents, the half-life of the compound in tissues has been estimated to be 9 - 10 min. Two metabolic pathways have been identified including hydrolysis to 1,2-ethanediol and conjugation with glutathione. Excretion is primarily via the urine. Ethylene oxide is moderately toxic for mammals (the LD50 for the rat is 280 - 365 mg/kg body weight; the 4-h LC50 is 2630 mg/m3). Both experimental animal and human data show that aqueous solutions of ethylene oxide are irritating for the skin and eyes; the irritant effects of ethylene oxide vapour or residues in medical equipment on the eyes and the respiratory tract have also been observed. These effects are often delayed. Severe skin irritation is characterized by the formation of vesicles. A concentration of 10 mg/litre produced mild irritation of the human skin; a concentration of 500 g/litre was most injurious to the human skin. Allergic contact dermatitis has been reported; systemic immunologically mediated allergy is considered rare. Respiratory tract irritation increases with inhaled vapour concentration and may result in severe life-threatening pulmonary disease. Repeated exposure (2 - 8 weeks) to ethylene oxide vapour at or above 900 mg/m3 produced sensory and motor neurological impairment and may result in a peripheral neuropathy. In animals, the latter was often accompanied by muscular atrophy. Lesions in the medulla oblongata of monkeys, following 2 years of intermittent exposure (7 h/day, 5 days/week) to 90 and 180 mg/m3 indicated neuropathy in the brain,

which may be related to the neuropathies observed in man and other animal species. Cardiovascular collapse and renal failure have been attributed to residues of ethylene oxide in medical equipment. Ethylene oxide alkylates DNA and is mutagenic for plants, microorganisms, insects, and mammals. Cytogenetic studies on man have shown dose-related increased frequencies of both sister chromatid exchanges (SCEs) and chromosomal aberrations; in one study, SCEs developed following daily exposure for less than 5 min per day.
The evidence that ethylene oxide is a reproductive toxin is less conclusive. Where foetal developmental effects have occurred, the doses of ethylene oxide approached or equalled those producing maternal toxicity. To date, impaired male reproductive function in animals has been demonstrated only at concentrations of 90 mg/m3 or more in long-term intermittent exposures or at higher air concentrations for brief exposures. In pregnant women, the results of one study suggest that occupational exposure estimated to be an 8-h time-weighted average of 0.18 - 0.90 mg/m3, with peak concentrations up to 450 mg/m3, was associated with spontaneous abortions. However, limited exposure data prevents the establishment of a relationship between abortion rates and exposure levels. Ethylene oxide is carcinogenic for animals when administered by the intragastric, subcutaneous injection, and inhalation routes of exposure. In man, 2 studies have shown an association between ethylene oxide exposure and an excess risk of cancer, but both studies have limitations. Airborne concentrations of ethylene oxide in the 2 studies were reported to be time-weighted averages of 36 +/-18 mg/m3 and 10 - 50 mg/m3, with occasional brief exposures in excess of the odour threshold (900 - 1260 mg/m3).
WARNING: This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**.
Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen
[*National Toxicology Program: U.S. Dep. of Health & Human Services 2002*]

Acute Toxicity	**Carcinogenicity**
Skin Irritation/Corrosion	**Reproductivity**
Serious Eye Damage/Irritation	**STOT - Single Exposure**
Respiratory or Skin sensitisation	**STOT - Repeated Exposure**
Mutagenicity	**Aspiration Hazard**

Legend: – Data available but does not fill the criteria for classification
– Data required to make classification available
– Data Not Available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
ethylene glycol phenyl ether	LC50	96	Fish	106.514mg/L	3
ethylene glycol phenyl ether	EC50	48	Crustacea	460mg/L	2
ethylene glycol phenyl ether	EC50	96	Algae or other aquatic plants	429.444mg/L	3
ethylene glycol phenyl ether	EC50	384	Crustacea	25.027mg/L	3
ethylene glycol phenyl ether	NOEC	24	Fish	5mg/L	2
ethylene oxide	LC50	96	Fish	23.609mg/L	3
ethylene oxide	EC50	96	Algae or other aquatic plants	240mg/L	2
ethylene oxide	EC50	24	Fish	90mg/L	5

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

For glycol ethers:
Environmental fate:
Ether groups are generally stable to hydrolysis in water under neutral conditions and ambient temperatures. OECD guideline studies indicate ready biodegradability for several glycol ethers although higher molecular weight species seem to biodegrade at a slower rate. No glycol ethers that have been tested demonstrate marked resistance to biodegradative processes. Upon release to the atmosphere by evaporation, high boiling glycol ethers are estimated to undergo photodegradation (atmospheric half lives = 2.4-2.5 hr). When released to water, glycol ethers undergo biodegradation (typically 47-92% after 8-21 days) and have a low potential for bioaccumulation (log Kow ranges from -1.73 to +0.51).
Ecotoxicity:
Aquatic toxicity data indicate that the tri- and tetra ethylene glycol ethers are "practically non-toxic" to aquatic species. No major differences are observed in the order of toxicity going from the methyl- to the butyl ethers.
Glycols exert a high oxygen demand for decomposition and once released to the environments cause the death of aquatic organisms if dissolved oxygen is depleted.
DO NOT discharge into sewer or waterways.
|log Kow : 1.16|Koc : 102|Henrys atm m3 /mol: 2.00E-07|BCF : 2-4.5|Toxicity Fish: LC50(96)22.85-30.99mg/L|Toxicity invertebrate: LC50(96)22.08mg/L|Bioacculmulation : not sig|Degradation Biological: v sig|processes Abiotic: RxnOH*

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
ethylene glycol phenyl ether	LOW	LOW
ethylene oxide	LOW (Half-life = 11.88 days)	HIGH (Half-life = 381.96 days)

Bioaccumulative potential

Ingredient	Bioaccumulation
ethylene glycol phenyl ether	LOW (LogKOW = 1.16)
ethylene oxide	LOW (BCF = 0.35)

Mobility in soil

Ingredient	Mobility
ethylene glycol phenyl ether	LOW (KOC = 12.12)
ethylene oxide	HIGH (KOC = 1.435)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	• Containers may still present a chemical hazard/ danger when empty. Return to supplier for reuse/ recycling if possible. Otherwise: If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. • Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: • Reduction Reuse Recycling Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. • **DO NOT** allow wash water from cleaning or process equipment to enter drains. • It may be necessary to collect all wash water for treatment before disposal. • In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. • Where in doubt contact the responsible authority. Recycle wherever possible or consult manufacturer for recycling options. • Consult State Land Waste Authority for disposal. Bury or incinerate residue at an approved site. Recycle containers if possible, or dispose of in an authorised landfill.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO

Land transport (UN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Source	Product name	Pollution Category	Ship Type
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk	Ethylene glycol phenyl ether	Z	3

SECTION 15 REGULATORY INFORMATION

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

ETHYLENE GLYCOL PHENYL ETHER(122-99-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

ETHYLENE OXIDE(75-21-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (ethylene oxide; ethylene glycol phenyl ether)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y

Philippines - PICCS	Y
USA - TSCA	Y
Legend:	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Revision Date	'08/01/2021
Expiry Date	'07/01/2024

CONTACT POINT

Disclaimer : While INDO AMINES LTD endeavor to ensure that all advice given relating to the use and / or application of our products (whether in this leaflet or otherwise) is both correct and useful, the information is base partly on data made available to us from other sources and is not intended in a way to able to us from other sources and is not intended in a way to exhaustive or as a substitute for the customers own product testing, evaluation and safety procedures. If you have any queries over this suitability or safety precautions required for you particular application, please contact us and we will endeavor to assist you further.

Other information

Ingredients with multiple cas numbers

Name	CAS No
ethylene glycol phenyl ether	122-99-6, 37220-49-8, 134367-25-2, 18249-17-7, 200260-63-5, 79586-53-1, 9004-78-8, 56257-90-0, 1219804-65-5

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC - TWA: Permissible Concentration-Time Weighted Average
PC - STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index