HOUSE OF KOLOR CATALYST KU-100

ChemWatch Material Safety Data Sheet
CHEMWATCH 5090-45
Date of Issue: Mon 11-Aug-2003

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS ACCORDING TO WORKSAFE AUSTRALIA CRITERIA.

SUPPLIER

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SYNONYMS

SHIPPING NAME

PAINT None

Product Name: House of Kolor Catalyst KU-100
Other Names: Product Code: KU-100

CAS RN No(s):	None None
UN Number:	1263
Packing Group:	II
Dangerous Goods Class:	3
Subsidiary Risk:	None, None
Hazchem Code:	3[Y]E
Poisons Schedule Number:	None

USE

Used according to manufacturers directions.
The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing
Before starting consider control of exposure by mechanical ventilation
For further information refer to the House of Kolor Technical Manual

PHYSICAL DESCRIPTION/PROPERTIES

APPEARANCE

Clear to pale yellow highly flammable liquid with a strong solvent odour; does not mix with water
Will react with hot water to release carbon dioxide.

Boiling Point (°C):	Not Available
Melting Point (°C):	Not Available
Vapour Pressure (kPa):	Not Available
Specific Gravity:	Not Available
Flash Point (°C):	15.6
Lower Explosive Limit (%):	Not Available
Upper Explosive Limit (%):	Not Available
Solubility in Water (g/L):	Immiscible

INGREDIENTS

NAME	CAS RN	%
hexamethylene diisocyanate polymer	28182-81-2	NotSpec
hexamethylene diisocyanate	822-06-0	<1
trishexamethylenetriisocyanate	3779-63-3	<1
methyl isobutyl ketone	108-10-1	10-30
hexyl acetate, branched and linear	88230-35-7	10-30
xylene	1330-20-7	10-30

HEALTH HAZARD

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the

individual; animal experiments indicate that ingestion of less than 150 gram may be fatal.
Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis

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 produce conjunctivitis.
The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
The liquid produces a high level of eye discomfort and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.

SKIN

The material produces moderate skin irritation; evidence exists, or practical experience predicts, that the material either

· produces moderate inflammation of the skin in a substantial number of individuals following direct contact, and/or
· produces significant, but moderate, 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 (nonallergic). 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 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.
Toxic effects may result from skin absorption.
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.
The material may produce severe 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) thickening of the epidermis.

Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.

INHALED

Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.
Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, drowsiness, reduced alertness, loss of reflexes, lack of coordination and vertigo.
Exposure to ketone vapours may produce nose, throat and mucous membrane irritation. High concentrations of vapour may produce central nervous system depression characterised by headache, vertigo, loss of coordination, narcosis and cardiorespiratory failure. Some ketones produce neurological disorders (polyneuropathy) characterised by bilateral symmetrical paresthesia and muscle weakness primarily in the legs and arms.
The main effects of simple aliphatic esters are narcosis and irritation and anaesthesia at higher concentrations. These effects become greater as the molecular weights and boiling points increase. Central nervous system depression , headache, drowsiness, dizziness, coma and neurobehavioral changes may also be symptomatic of overexposure. Respiratory tract involvement may produce mucous membrane irritation, dyspnea, and tachypnea, pharyngitis, bronchitis, pneumonitis and, in massive exposures, pulmonary oedema (which may be delayed). Gastrointestinal effects include nausea, vomiting, diarrhoea and abdominal cramps. Liver and kidney damage may result from massive exposures.
If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death.

CHRONIC HEALTH EFFECTS

Persons with a history of asthma or other respiratory problems or are known to be sensitised, should not be engaged in any work involving the handling of isocyanates. [CCTRADE-Bayer, APMF].
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
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 mucous production.
Practical evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a substantial number of individuals at a greater frequency than would be expected from the response of a normal population. Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking.
Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals.
Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).
Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping. Sensitisation may give severe responses to very low levels of exposure, in situations where exposure may occur.

FIRST AID

SWALLOWED

· 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.
· Seek medical advice.
Avoid giving milk or oils.
Avoid giving alcohol.

EYE

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.
· If pain persists or recurs seek medical attention.
· 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.

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 resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor, without delay.

ADVICE TO DOCTOR

Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.
for simple esters:

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.
· 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.
· Give activated charcoal.

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.

EMERGENCY DEPARTMENT

· Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
· Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
· Consult a toxicologist as necessary.
BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.
for simple ketones:

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.
· DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5mL/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
· Give activated charcoal.

ADVANCED TREATMENT

· Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
· Consider intubation at first sign of upper airway obstruction resulting from oedema.
· 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.

EMERGENCY DEPARTMENT

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BRONSTEIN, A.C. and CURRANCE, P.L.
EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.
For sub-chronic and chronic exposures to isocyanates:
· This material may be a potent pulmonary sensitiser which causes bronchospasm even in patients without prior airway hyperreactivity.
· Clinical symptoms of exposure involve mucosal irritation of respiratory and gastrointestinal tracts.
· Conjunctival irritation, skin inflammation (erythema, pain vesiculation) and gastrointestinal disturbances occur soon after exposure.
· Pulmonary symptoms include cough, burning, substernal pain and dyspnoea.
· Some cross-sensitivity occurs between different isocyanates.
· Noncardiogenic pulmonary edema and bronchospasm are the most serious consequences of exposure. Markedly symptomatic patients should receive oxygen, ventilatory support and an intravenous line.
· Treatment for asthma includes inhaled sympathomimetics (epinephrine [adrenalin], terbutaline) and steroids.
· Activated charcoal (1 g/kg) and a cathartic (sorbitol, magnesium citrate) may be useful for ingestion.
· Mydriatics, systemic analgesics and topical antibiotics (Sulamyd) may be used for corneal abrasions.
· There is no effective therapy for sensitised workers.
[Ellenhorn and Barceloux; Medical Toxicology]
NOTE: Isocyanates cause airway restriction in naive individuals with the degree of response dependant on the concentration and duration of exposure. They induce smooth muscle contraction which leads to bronchoconstrictive episodes. Acute changes in lung function, such as decreased FEV1, may not represent sensitivity.

[Karol & Jin, Frontiers in Molecular Toxicology, pp 56-61, 1992].
For acute or short term repeated exposures to xylene:
· Gastro-intestinal absorption is significant with ingestions. For ingestions exceeding 1-2 ml (xylene)/kg, intubation and lavage with cuffed endotracheal tube is recommended. The use of charcoal and cathartics is equivocal.
· Pulmonary absorption is rapid with about 60-65% retained at rest.
· Primary threat to life from ingestion and/or inhalation, is respiratory failure.
· Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO2 < 50 mm Hg or pCO2 > 50 mm Hg) should be intubated.
· Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
· A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
· Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
BIOLOGICAL EXPOSURE INDEX - BEI
These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
Methylhippu-ric acids in urine	1.5 gm/gm creatinine	End of shift	
	2 mg/min	Last 4 hrs of shift	

PRECAUTIONS FOR USE

EXPOSURE STANDARDS

No data for House of Kolor Catalyst KU-100.

EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of vapour components/concentrations:

Composite Exposure Standard for Mixture (TWA) (mg/m³): 2.0578 mg/m³
If the breathing zone concentration of ANY of the components listed below is exceeded, "Worst Case" considerations deem the individual to be overexposed.

Component	Breathing Zone ppm	Breathing Zone mg/m³	Mixture

Conc: (%)			
hexamethylene diisocyanate	0	0.0337	1
methyl isobutyl ketone	0.25	1.012	30
xylene	0.23	1.012	30

Operations which produce a spray/mist or fume/dust, introduce particulates to the breathing zone.
If the breathing zone concentration of ANY of the components listed below is exceeded, "Worst Case" considerations deem the individual to be overexposed.
At the "Composite Exposure Standard for Mixture" (TWA) (mg/m³): 61 mg/m³

Component	Breathing Zone ppm	Breathing Zone mg/m³	Mixture Conc (%)
trishexamethylenetriisocyanate	0.0337	1	0

INGREDIENT DATA

HEXAMETHYLENE DIISOCYANATE POLYMER:
No exposure limits set by NOHSC or ACGIH

HEXAMETHYLENE DIISOCYANATE:
TLV TWA: 0.005 ppm [ACGIH]
TLV TWA: 0.005 ppm [ACGIH]
isocyanates, all as NCO (Mol.Wt: 42.00)
ES TWA: 0.02 mg/m³; STEL: 0.07 mg/m³ sensitiser
MEL TWA: 0.02 mg/m³; STEL: 0.07 mg/m³ sensitiser
Some jurisdictions require that health surveillance be conducted on occupationally exposed workers. This should emphasise:
· demography, occupational and medical history and health advice
· completion of a standardised respiratory questionnaire
· physical examination of the respiratory system and skin
· standardised respiratory function tests such as FEV1, FVC and FEV1/FVC
TLV TWA: 0.005 ppm, 0.034 mg/m³
MAK value: 0.005 ppm, 0.035 mg/m³
MAK Category I Peak Limitation: For local irritants Allows excursions of twice the MAK value for 5 minutes at a time, 8 times per shift.
Designated S in List of MAK values: Danger of sensitization.
MAK Group IIc: Substances with MAK Values but no pregnancy risk group classification. These are substances which have been investigated but for which no information regarding possible damage to the foetus/embryo was found. Mention calls attention to the absence of adequate data.
MAK values, and categories and groups are those recommended within the Federal Republic of Germany
The toxicological action of HDI is similar to that of toluene diisocyanate and and the TLV-TWA is analogous. In light of reported asthmatic/ respiratory sensitisation-like responses in HDI exposed workers, individuals who may be hypersusceptible or otherwise unusually responsive may not be adequately protected at this limit.

TRISHEXAMETHYLENETRIISOCYANATE:
isocyanates, all as NCO (Mol.Wt: 42.00)

ES TWA: 0.02 mg/m³; STEL: 0.07 mg/m³ sensitiser
MEL TWA: 0.02 mg/m³; STEL: 0.07 mg/m³ sensitiser
Some jurisdictions require that health surveillance be conducted on occupationally exposed workers. This should emphasise:
· demography, occupational and medical history and health advice
· completion of a standardised respiratory questionnaire
· physical examination of the respiratory system and skin
· standardised respiratory function tests such as FEV1, FVC and FEV1/FVC

METHYL ISOBUTYL KETONE:
TLV TWA: 50 ppm BEI [ACGIH]
TLV STEL: 75 ppm BEI [ACGIH]
PEL TWA: 100 ppm, 410 mg/m³ [OSHA Z1]
TLV TWA: 50 ppm, 205 mg/m³; STEL: 75 ppm, 307 mg/m³
ES TWA: 50 ppm, 205 mg/m³; STEL: 75 ppm, 307 mg/m³ (Under review)
PROPOSED CHANGE - ADDITION
ES TWA 50 ppm, 205 mg/m³; STEL: 75 ppm, 307 mg/m³ SKIN
OES TWA: 50 ppm, 208 mg/m³; STEL: 100 ppm, 416 mg/m³ SKIN
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.
MAK value: 20 ppm, 83 mg/m³
Designated H in List of MAK values: Danger of cutaneous absorption.
Absorption of such substances through the skin can pose an incomparably larger danger of toxicity than their inhalation. To avoid health risks when handling such substances, meticulous cleaning of the skin, hair and clothing is imperative.
MAK Category I Peak Limitation: For local irritants Allows excursions of twice the MAK value for 5 minutes at a time, 8 times per shift.
MAK Group C: There is no reason to fear risk of damage to the developing embryo when MAK and BAT values are observed.
MAK values, and categories and groups are those recommended within the Federal Republic of Germany

IDLH Level: 500 ppm

Unfatigued, odour recognition threshold (100% test panel) is 0.3 - 0.5 ppm.
Distinct odour at 15 ppm.
Odour is objectionable and vapours are irritating to eyes at 200 ppm.
NOTE: Detector tubes for methyl isobutyl ketone, measuring in excess of 50 ppm, are commercially available.

Exposure at or below the recommended TLV-TWA should provide sufficient protection against the potential irritant effects, headache and nausea, neurasthemic symptoms and other systemic toxicities (including liver and kidney damage) produced by MIBK.

HEXYL ACETATE, BRANCHED AND LINEAR:
No data for hexyl acetate, branched and linear.

XYLENE:
TLV TWA: 100 ppm A4;BEI [ACGIH]

TLV STEL: 150 ppm A4;BEI [ACGIH]
PEL TWA: 100 ppm, 435 mg/m³ [OSHA Z1]
TLV TWA: 100 ppm, 434 mg/m³; STEL: 150 ppm, 651 mg/m³ A4
NOTE: This substance has been classified by the ACGIH as A4 NOT classifiable as causing Cancer in humans
ES TWA: 80 ppm, 350 mg/m³; STEL: 150 ppm, 655 mg/m³ (Under review)
OES TWA: 100 ppm, 441 mg/m³; STEL: 150 ppm, 662 mg/m³ skin
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.
IDLH Level: 900 ppm
Odour Threshold Value: 20 ppm (detection), 40 ppm (recognition)
NOTE: Detector tubes for o-xylene, measuring in excess of 10 ppm, are available commercially. (m-xylene and p-xylene give almost the same response)

Xylene vapour is an irritant to the eyes, mucous membranes and skin and causes narcosis at high concentrations. Exposure to doses sufficiently high to produce intoxication and unconsciousness also produces transient liver and kidney toxicity. Neurologic impairment is NOT evident amongst volunteers inhaling up to 400 ppm though complaints of ocular and upper respiratory tract irritation occur at 200 ppm for 3 to 5 minutes. Exposure to xylene at or below the recommended TLV-TWA and STEL is thought to minimise the risk of irritant effects and to produce neither significant narcosis or chronic injury. An earlier skin notation was deleted because percutaneous absorption is gradual and protracted and does not substantially contribute to the dose received by inhalation.

ENGINEERING CONTROLS

For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion-resistant.
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	1-2.5 m/s (200-500 f/min.)

booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)

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

Safety glasses with side shields.
Chemical goggles.
Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

HANDS/FEET

Wear chemical protective gloves, eg. PVC.
Wear safety footwear or safety gumboots, eg. Rubber.
NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

OTHER

Overalls.
PVC Apron.
PVC protective suit may be required if exposure severe.
Eyewash unit.
Ensure there is ready access to a safety shower.

RESPIRATOR

Respiratory protection is required when ANY "Worst Case" vapour-phase concentration is exceeded (see Computer Prediction in "Exposure Standards").

Protection Factor (Min)	Half-Face Respirator	Full-Face Respirator
10 x ES	A-AUS	-
	A-PAPR-AUS	-
50 x ES	-	A-AUS
	-	A-PAPR-AUS
100 x ES	-	A-2
	-	A-PAPR-2

^ - Full-face

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

SAFE HANDLING

STORAGE AND TRANSPORT

SUITABLE CONTAINER

Packing as supplied by manufacturer. Plastic containers may only be used if approved for flammable liquid. Check that containers are clearly labelled and free from leaks.
· For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure.
· For materials with a viscosity of at least 2680 cSt. (23 deg. C)
· For manufactured product having a viscosity of at least 250 cSt. (23 deg. C)
· Manufactured product that requires stirring before use and having a viscosity of at least 20 cSt (25 deg. C)
(i) : Removable head packaging;
(ii) : Cans with friction closures and
(iii) : low pressure tubes and cartridges may be used.

· Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages
· In addition, where inner packagings are glass and contain liquids of packing group I there must be sufficient inert absorbent to absorb any spillage, unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents

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.

TRANSPORTATION

Class 3 - Flammable liquids shall not be loaded in the same vehicle or packed in the same vehicle or packed in the same freight container with:
Class 1 - Explosives;
Class 2.1 - Flammable gases (where both flammable liquids and flammable gases are in bulk);
Class 2.3 - Poisonous gases;
Class 4.2 - Spontaneously combustible substances;
Class 5.1 - Oxidising agents;
Class 5.2 - Organic peroxides;
Class 7 - Radioactive substances.

SPILLS AND DISPOSAL

MINOR SPILLS

· 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.

MAJOR SPILLS

· 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.
· Consider evacuation (or protect in place).
· 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.

DISPOSAL

· Recycle wherever possible.
· Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
· Dispose of by: Burial in a licenced land-fill or Incineration in a licenced apparatus (after admixture with suitable combustible material)
· Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
Puncture containers to prevent re-use and bury at an authorised landfill.

FIRE FIGHTERS' REPORT

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 course.
· Consider evacuation (or protect in place).
· Fight fire from a safe distance, with adequate cover.
· If safe, switch off electrical equipment until vapour fire hazard removed.
· Use water delivered as a fine spray to control the 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.
When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 500 metres in all directions.

FIRE/EXPLOSION HAZARD

WARNING: In use may form flammable/ explosive vapour-air mixtures.
· Liquid and vapour are highly flammable.
· Severe fire hazard when exposed to heat, flame and/or oxidisers.
· 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).
Combustion products include.
carbon dioxide (CO_2).
isocyanates.
and minor amounts of.
hydrogen cyanide.
formaldehyde.
other pyrolysis products typical of burning organic material.
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

FIRE INCOMPATIBILITY

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

HAZCHEM

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CONTACT POINT

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End of Report

Issue Date: Mon 11-Aug-2003

Print Date: Mon 25-Aug-2003