

MATERIAL SAFETY DATA SHEET - MSDS

Product:
SDS No. : 003

VINYL CHLORIDE MONOMER

Version : 04

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Date : 19-10-2016

01 - IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

PRODUCT NAME VINYL CHLORIDE MONOMER
 SDS No. 003
 MANUFACTURER Qatar Vinyl Company Ltd.
 P. O. Box 24440, Doha, State of Qatar
 Tel : +974 44765888; Fax : +974 44765777
 Email : qvc@qvc.com.qa
 Emergency contact number: +974 44765800

02 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME OF THE SUBSTANCE VINYL CHLORIDE MONOMER (VCM)

| Chemical Name | Synonyms | EC-NO. | CAS-No. | Concentration | Classification Directive 67/548/EEC | Classification Regulation (EC) No 1272/2008 (GHS) |
|------------------------|----------------|-----------|---------|---------------|-------------------------------------|--|
| Vinyl Chloride Monomer | Chloroethylene | 200-831-0 | 75-01-4 | > 99.9% | F+; R12 Carc. Cat. 1; R45 | Flam. Gas 1; H220 Press. Gas LG; H280 Carc. IA; H350 |

03 - HAZARDS IDENTIFICATION

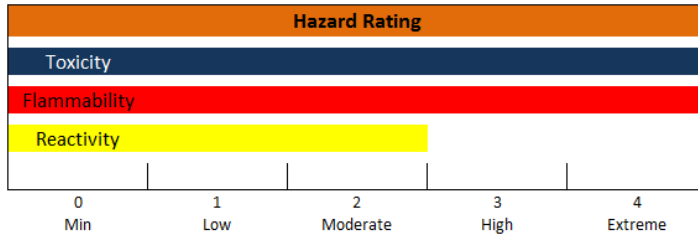
MOST IMPORTANT HAZARDS
 HEALTH EFFECTS
 PHYSICAL AND CHEMICAL HAZARDS

SAFETY INFORMATION : PLEASE READ THIS SHEET CAREFULLY
 Toxic; May cause cancer; Carcinogenicity, 1A, H350
 Extremely flammable, 1, H220
 Gases under pressure, LG, H280
 Thermal decomposition giving toxic and corrosive products

LABEL ELEMENTS (REGULATION (EC) NO 1272/2008) IN ACCORDANCE WITH GHS

Name:
Hazard pictograms:

Vinyl Chloride Monomer



Signal word:
Hazard statements:

Danger
 Extremely Flammable Gas
 Contains gas under pressure, may explode if heated (Liquefied Gas, (LG))
 May cause cancer

Precautionary statements:

Prevention: Do not handle until all safety precautions have been read and understood. Keep away from open flames/hot surfaces. - No smoking.
 Use personal protective equipment as required.
Response: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 IF exposed or concerned: Get medical advice/ attention.

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Special labeling

Storage: Protect from sunlight. Store in a well-ventilated place.
Restricted to professional users.

OTHER HAZARDS

Potential health effects:
Ejection of liquefied gas : frostbite possible
Overall genotoxic
At high vapor/fog concentrations: headache Vertigo Drowsiness
Inhalation: Irritating to respiratory system.

Environmental effects:
Not readily biodegradable. Slightly bioaccumulable.

Others:
Results of PBT and vPvB assessment: This substance is not considered to be persistent, bioaccumulating, toxic (PBT), nor very persistent, very bioaccumulating (vPvB).

EMERGENCY OVERVIEW

Colorless gas; pleasant ethereal odor. Compressed gas can cause frostbite. Toxic.
Other Acute Effects: CNS depression. Chronic Effects: reproductive effects, skin/blood changes, arthralgias, bone effects (hand), vascular disorder (finger/toes). Cancer Hazard. Flammable

04 - FIRST AID MEASURES

GENERAL ADVICE
INHALATION

Take off immediately all contaminated clothing (including shoes)
Move to fresh air, Oxygen or artificial respiration
If needed, hospitalize

SKIN CONTACT

Keep under neurological and hepatic surveillance
Wash immediately and abundantly with water
Frostbite : treat as thermal burns

EYE CONTACT

Wash immediately and abundantly with water for at least 15 minutes
If irritation persists, consult an ophthalmologist

PROTECTION OF FIRST-AIDERS
INFORMATION FOR DOCTORS

In case of insufficient ventilation, wear suitable respiratory equipment
Do not administer catecholamine because of the cardiac effect caused by the product

05 - FIRE-FIGHTING MEASURES

EXPLOSIVE LIMITS (vol. % in air)
FLASH POINT
AUTO - IGNITION TEMPERATURE
SUITABLE EXTINGUISHING MEDIA
UNSUITABLE EXTINGUISHING MEDIA
SPECIFIC HAZARDS

LEL: 3.6 % v/v ; UEL: 33 % v/v
-78 °C (-108.4 °F)
472 °C (882 °F)
Foam; Dry powder ; Carbon dioxide (CO2)
Water

SPECIFIC METHODS

Extremely flammable liquefied gas.
Vapors are heavier than air and may spread along floors.
A large amount of heat can be generated when monomers are exposed to a fire.
Thermal decomposition giving toxic and corrosive products:
Hydrogen chloride gas ; Carbon monoxide ; Phosgene
Prohibit all sources of sparks and ignition - Do not smoke
Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SPECIAL PROTECTIVE EQUIPMENT
FOR FIREFIGHTERS

Wear a self-contained breathing apparatus and protective suit

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06 - ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTION

Evacuate personnel to safe areas. If safe to do so, plug or seal off leak
In case of leak, wear a self-contained breathing apparatus
Prohibit contact with skin and eyes and inhalation of vapors
Prohibit all sources of sparks and ignition - Do not smoke
Do not release into the environment
Restrict evaporation of the product by using foam
Contain by damming

ENVIRONMENTAL PROTECTION

METHODS FOR CLEANING UP

Recovery

Pump into an inert labeled emergency container (if possible)

07 - HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

Technical measures/Precautions

Storage and handling precautions applicable to products :
**LIQUEFIED GAS, EXTREMELY FLAMMABLE, TOXIC WITH VAPOURS
EXPLOSIVE IN AIR**

Safe handling advice

Ensure appropriate exhaust and ventilation at machinery
Provide showers, eye-baths
Provide fire blanket nearby
Provide self-contained breathing apparatus nearby
Avoid exposure - obtain special instructions before use.
Take precautionary measures against static charges
Keep well away from naked flames
Use only explosion-proofed equipment
Use product only in a closed system

Hygiene measures

Prohibit sources of sparks and ignition - Do not smoke
Prohibit contact with skin and eyes and inhalation of vapors. When using, do not eat, drink or smoke. Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

STORAGE

Technical measures/Storage conditions

Keep away from heat and sources of ignition.
Do not smoke. Protect from heat.
Store under vinyl chloride monomer atmosphere. (1050 hPa(mbar) approximately)
Store between -16°C to -14°C (approximately)
Store in chilled steel containers.
Provide a catch-tank in a dyke area
Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres

Incompatible products

PACKAGING MATERIALS

Recommended

To be avoided

Oxidizing agents
Ordinary steel, Stainless steel
Aluminum, Copper and Copper alloys

08 - EXPOSURE CONTROLS / PERSONAL PROTECTION

PROTECTIVE PROVISIONS

Ensure sufficient air exchange and/or exhaust in work areas

CONTROL PARAMETERS

Exposure limits

PEL at QVC Site: 1 ppm for 8 hours (1991 OSHA PELs)
OSHA Ceiling: 5 ppm
Class C1 (confirmed human carcinogenic)
ACGIH (US) TWA: 1ppm (2007)
EU OEL III TWA: 3ppm; 7.77 mg/m³ (08 2007)

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Acute Toxicity: Vapor inhalation causes varying degrees of Central Nervous System depression with noticeable anesthetic effects at levels of 1% (10,000ppm)

PERSONAL PROTECTION EQUIPMENT

Respiratory protection

Low concentration or short term activity: Full mask;

Hand protection

High concentration or prolonged activity: Self contained breathing apparatus

Intermittent contact: PVC or other plastic material gloves, VITON is best selection

Eye/face protection

Prolonged contact: Fluorinated rubber

Skin and body protection

Safety glasses / face shield

At work place: Acid resistant clothing, Heavy duty work shoes

Specific hygiene measures

Intervention at incident: Complete chemical protection suits

Prohibit contact with skin and eyes and inhalation of vapors

Do not smoke

09 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE (20°C)

gaseous

FORM

Liquefied gas

COLOUR

colorless

ODOUR

ether-like

OLFACTORY THRESHOLD

3,000ppm

BOILING POINT/RANGE

-14 °C

MELTING POINT/RANGE

-153.7 °C

FLASH POINT

Closed cup : -78 °C

AUTOIGNITION TEMPERATURE

472 °C

EXPLOSIVE LIMITS

Lower

3.6% v/v

Higher

33% v/v

VAPOUR PRESSURE

(0°C) : 1750 hPa (mbar)

(20°C) : 3400 hPa (mbar)

(48°C) : 7600 hPa (mbar)

VAPOUR DENSITY

(15°C), (2900 hPa) : 8 kg/m³

DENSITY

liquid :

(20°C) : 910 kg/m³

(-14°C) : 970 kg/m³

SOLUBILITY

Water

9.15 g/l @ 20.5°C

Solvents

Soluble in most organic solvents

PARTITION COEFFICIENT (n-octanol/water)

log Kow = 1.58 @ 22°C

OTHER DATA

Relative vapor density/air : 2.15

Refractive index (20°C) : 1.37

Critical temperature: Tc=156°C

Critical pressure: Pc = 55900 hPa

Henry's constant : 2.82E+03 Pa.m³/mole @ 24.8°C

Viscosity (20°C) : 0.0011 mPa.s

10 - STABILITY AND REACTIVITY

REACTIVITY & CHEMICAL STABILITY

Stable under recommended storage condition.

Presence of a polymerization inhibitor (Inhibitor: p-Methoxyphenol (Hydroquinone monomethyl Ether))

CONDITIONS TO AVOID

Keep away from heat and sources of ignition

MATERIALS TO AVOID

Oxidizing agents (risk of exothermic polymerization)

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition giving toxic and corrosive products :

Hydrogen chloride gas

Carbon monoxide

Phosgene

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POSSIBILITY OF HAZARDOUS REACTIONS Polymerization is exothermic and can degenerate into an uncontrolled reaction.

11 - TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Inhalation

Effects of breathing high concentrations of vapor may include :
Headache, sleepiness
Dizziness

As with other volatile aliphatic halogenated compounds, through vapor accumulation and/or inhalation of large quantities, the product can cause :
Loss of consciousness and cardiac disorders aggravated by stress and lack of oxygen: risk of mortality

Reported in animals :
Slightly harmful by inhalation.
LC50/ 2h/rat = 390 mg/l.

Ingestion

Reported in animals :
Harmful if swallowed
LD50/oral/rat = 500 mg/kg

LOCAL EFFECTS

Inhalation

Vapor at high concentrations :
Irritating to respiratory system
Ejection of liquefied gas : frostbite possible

Skin-contact

Eye-contact

Ejection of liquefied gas. :
Superficial lesion of cornea
Effect reversible within a few days

CMR EFFECT

Mutagenicity

(carcinogenic, mutagenic, or toxic for reproduction)
According to available experimental data: **Overall genotoxic**
In Vitro

Ames test: positive; In vitro gene mutations test on mammalian cells: positive
In Vivo

Carcinogenicity

Micronucleus test: positive; Test for chromosome in vivo in germ cells: negative;
Chromosome aberration test in vivo: Overall genotoxic

Known human carcinogen

Effects related to past significant exposures, Target organs: angiosarcoma of the liver, other localized tumours not confirmed

In animal:

Target organs: Several localized tumours. (various animal species, 1 year, By inhalation) (0.13 mg/l)

Target organs: Several localized tumours. (rat, lifetime, dietary administration) (1.7 mg/kg of body weight)

Reproductive toxicity

Fertility: According to the available experimental data: Absence of toxic effects on Foetal development: Absence of toxic effects for foetal development (at non toxic concentration for the mothers)

Specific target organ toxicity

Single exposure

Inhalation:

Repeated exposure:

Irritating to respiratory system

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

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12 - ECOLOGICAL INFORMATION

| | |
|---------------------------|---|
| MOBILITY | Evaporation : t½ life = 0.8 h |
| PERSISTENCE/DEGRADABILITY | |
| In water | Not hydrolysable Not readily biodegradable: 100% after 108 d (Method: simulation study). Biodegradable under anaerobic conditions: 98% after 70 d (Method: simulation study). |
| In air | Degradation by OH radicals : t½ life = 1.5 d (calculated) |
| In soils and sediments | Slight adsorption : log Koc = 1.4 |
| BIOACCUMULATION | Low potential to bioaccumulable : log Kow = 1.58 @ 22°C (Method OECD guideline 107) Aquatic organisms : BCF (Bioconcentration factor) = 1.4-2.2 |
| ECOTOXICITY | |
| AQUATIC TOXICITY | |
| Acute toxicity (*) | Practically not harmful to fish : LC50 , 48 h (Leuciscus idus melanotus) = 356 mg/l Bacteria under anaerobic conditions : toxicity threshold, IC50 , 3.5 d = 40 mg/l |

13 - DISPOSAL CONSIDERATIONS

DISPOSAL OF PRODUCT If recycling is not possible, dispose of in compliance with local regulations.

14 - TRANSPORT INFORMATION

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

| | |
|----------------------|----------------------------|
| UN Number | 1086 |
| PROPER SHIPPING NAME | Vinyl Chloride, Stabilized |
| LABEL | |



| | |
|--------------------|--|
| Ship type: | NA (IGC) |
| Pollution Category | NA (IGC) |
| ADR | Class : 2; Label: 2.1; Environmentally hazardous: No |
| ADNR | Class : 2; Label: 2.1+INST; Environmentally hazardous: No |
| RID | Class : 2; Label: 2.1; Environmentally hazardous: No |
| IMDG | Class : 2.1; Label : 2.1 ; Environmentally hazardous: No; EmS Number: F-D, S-U |
| IATA | Not permitted for transport |

15 - REGULATORY INFORMATION

SAFETY DATA SHEETS According to Regulation (EC) No. 1907/2006

EC CLASSIFICATION / LABELLING (EC) No 1272/2008 (GHS)

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EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)
, Number 2
EU. REACH, Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC)
, Number 28
UK REGULATION Chip3: Chemical (Hazard Information and Packaging for Supply) Regulations 2002
UK Regulation Safety Data Sheet Supply
Chip3: Chemical (Hazard Information and Packaging for Supply) Regulations 2002
Major Accident Hazard Legislation Extremely flammable 8
UK Regulation Safety Data Sheet Supply
Chip3: Chemical (Hazard Information and Packaging for Supply) Regulations 2002

Nr in ANNEX
EC Nr (EINECS)
INVENTORIES

602-023-00-7
200-864-0
EINECS (EU) : Conforms to
TSCA (USA) : Conforms to
DSL (Canada) : All component of this product are on the Canadian DSL list
NZIOC : Conforms to
ENCS (JP) : Conforms to
KECI (KR) : Conforms to
AICS: Conforms to
PICCS (PH) : Conforms to
IECSC(CN): Conforms to

Safety, health and environment regulations/legislation specific for the substance of mixture

Additional regulations (European Union) :
The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996, Statutory Instruments number 192 of 1996.
Applies
Hazardous Waste Regulations 2005 Applies
Inventory of Sources and Releases Reporting Form, 1999. Environment Agency, United Kingdom. As amended by 2002 Pollution Inventory Substances Lists, 2002.
Applies
Young workers 94/33/EC Banned and/or restricted
Pregnant workers 92/85/EEC Banned and/or restricted

16 - OTHER INFORMATION

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

R12 Extremely flammable.
R45 May cause cancer.
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
H350 May cause cancer.

FURTHER INFORMATION

THIS PRODUCT MUST BE HANDLED ONLY BY PERSONNEL WELL INFORMED OF SAFETY CONDITIONS WHEN USED IN FORMULATIONS, CONTACT US FOR LABELLING.

This information applies to the PRODUCT AS SUCH and conforming to specifications of QVC.
In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear.

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The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress.

Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes.

The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive.

It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product.

It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes)

The totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.