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)

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<tr>
<td>Vinyl Chloride Monomer</td>
<td>Chloroethylene</td>
<td>200-831-0</td>
<td>75-01-4</td>
<td>&gt; 99.9% F+; R12 Carc. Cat. 1; R45</td>
<td>Flam. Gas 1; H220 Press. Gas LG; H280 Carc. 1A; H350</td>
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03 - HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS

SAFETY INFORMATION: PLEASE READ THIS SHEET CAREFULLY

HEALTH EFFECTS
Toxic; May cause cancer; Carcinogenicity, 1A, H350
Extremely flammable, 1, H220
Gases under pressure, LG, H280
Thermal decomposition giving toxic and corrosive products

PHYSICAL AND CHEMICAL HAZARDS

Signal word: Danger
Hazard statements: 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.
Product: VINYL CHLORIDE MONOMER
SDS No.: 003 Version: 04 Date: 19-10-2016

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
Take off immediately all contaminated clothing (including shoes)

INHALATION
Move to fresh air, Oxygen or artificial respiration
If needed, hospitalize
Keep under neurological and hepatic surveillance

SKIN CONTACT
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
In case of insufficient ventilation, wear suitable respiratory equipment

INFORMATION FOR DOCTORS
Do not administer catecholamine because of the cardiac effect caused by the product

05 - FIRE-FIGHTING MEASURES

EXPLOSIVE LIMITS (vol. % in air)
LEL: 3.6 % v/v; UEL: 33 % v/v

FLASH POINT
-78 °C (-108.4 °F)

AUTO - IGNITION TEMPERATURE
472 °C (882 °F)

SUITELE EXPUNGISHING MEDIA
Foam; Dry powder; Carbon dioxide (CO2)

UNSUITABLE EXTINGUISHING MEDIA
Water

SPECIFIC HAZARDS
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

SPECIFIC METHODS
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
Wear a self-contained breathing apparatus and protective suit
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

ENVIRONMENTAL PROTECTION
Do not release into the environment
Restrict evaporation of the product by using foam
Contain by damming

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
Ensure appropriate exhaust and ventilation at machinery
Provide showers, eye-baths
Provide fire blanket nearby
Provide self-contained breathing apparatus nearby
Safe handling advice
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
Prohibit sources of sparks and ignition - Do not smoke
Hygiene measures
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
Oxidizing agents
PACKAGING MATERIALS
Recommended
Ordinary steel, Stainless steel
To be avoided
Aluminum, Copper and Copper alloys

08 - EXPOSURE CONTROLS / PERSONAL PROTECTION
PROTECTIVE PROVISIONS
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)
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;
High concentration or prolonged activity: Self contained breathing apparatus

Hand protection
Intermittent contact: PVC or other plastic material gloves, VITON is best selection
Prolonged contact: Fluorinated rubber

Eye/face protection
Safety glasses / face shield

Skin and body protection
At work place: Acid resistant clothing, Heavy duty work shoes
Intervention at incident: Complete chemical protection suits

Specific hygiene measures
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
OLFACTORARY 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
((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
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

Skin-contact

Ejection of liquefied gas:
- Frostbite possible

Eye-contact

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

CMR EFFECT

Mutagenicity

According to available experimental data: **Overall genotoxic**

In Vitro
- Ames test: positive; In vitro gene mutations test on mammalian cells: positive
- Micronucleus test: positive; Test for chromosome in vivo in germ cells: negative;
- Chromosome aberration test in vivo: Overall genotoxic

Carcinogenicity

**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:

Irritating to respiratory system

Repeated exposure:

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

MOBILITY
Evaporation : t½ life = 0.8 h

PERSISTENCE/DEGRADABILITY
Not hydrolysable
Not readily biodegradable: 100% after 108 d (Method: simulation study).
Biodegradable under anaerobic conditions: 98% after 70 d (Method: simulation study).

In water
Degradation by OH radicals : t½ life = 1.5 d (calculated)

In soil and sediments
Slight adsorption : log Koc = 1.4

DEGRADABILITY
Low potential to bioaccumulable : log Kow = 1.58 @ 22°C (Method OECD guideline 107)

BIOACCUMULATION
Aquatic organisms : BCF (Bioconcentration factor) = 1.4-2.2

ECOTOXICITY

AQUATIC 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

Shiptype: NA (IGC)
Pollution Category
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

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

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 602-023-00-7
EC Nr (EINECS) 200-864-0

INVENTORIES

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 ) :
Hazardous Waste Regulations 2005 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.
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.