Ethyl Acetate
Safety Data Sheet
according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

PRODUCT NAME : Ethyl Acetate
CAS RN : 141-78-6
EC# : 205-500-4
SYNONYMS : Ethyl acetic ester, Ethyl ester, Ethyl ethanoate, Acetoxyethane.
SYSTEMATIC NAME : Acetic acid ethyl ester, Ethyl acetate
MOLECULAR FORMULA : \(C_4H_8O_2\)

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

1.2.1. Relevant identified uses
It is used in production of pharmaceuticals and foods, for contact lenses, Photographic films & plates, synthetic flavoring, chemical intermediate, perfumes, in leather processing industry, printing industry, absorbents and adsorbents, adhesives and binding agents, cosmetics, coloring agents etc.

Uses advised against: None

1.3. Details of the supplier of the safety data sheet
Jubilant Life Sciences India

FACTORY & REGISTERED OFFICE: Jubilant Life Sciences Ltd., Bhartiagram, Gajraula, District: Amroha, Uttar Pradesh-244223, India
HEAD OFFICE: Jubilant Life Sciences Ltd., Plot 1-A, Sector 16-A, Institutional Area, Noida, Uttar Pradesh, 201301 - India
T: FACTORY & REGISTERED OFFICE: T +91-5924-252353 to 252360  Contact Department-Safety: Ext. 7424 HEAD OFFICE: T +91-120-4361000
support@jubl.com

1.4. Emergency telephone number
Emergency number : +91-9997022412; +91-9359674864

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification
Flammable Liquids: Category 2
Specific Target Organ Toxicity: Category 3
(Single exposure)

2.2. Label Elements

Hazard Pictogram: GHS 02 and GHS 07
Signal Word: Danger!

HAZARD AND PRECAUTIONARY STATEMENTS:

HAZARD STATEMENTS
• H225: Highly flammable liquid and vapour
• H335: May cause respiratory irritation.
• H336: May cause drowsiness or dizziness

PRECAUTIONARY STATEMENTS
• P233: Keep container tightly closed.
• P240: Ground/bond container and receiving equipment.
• P241: Use explosion-proof electrical/ventilating/lighting/.../ equipment.
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- P242: Use only non-sparking tools.
- P243: Take precautionary measures against static discharge.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
- P271: Use only outdoors or in a well-ventilated area.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P370+P378: In case of fire: Use ... for extinguition.
- P312: Call a POISON CENTER or doctor/physician if you feel unwell.

SECTION 3: Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS #</th>
<th>Purity</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Acetate</td>
<td>141-78-6</td>
<td>~ 99.8%</td>
<td>Flammable Liquids: Category 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Specific Target Organ Toxicity:Category 3 (Single exposure)</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1. Description of first aid measures

Key symptoms

Acute effects:
- Inhalation results in drowsiness, cough, nausea and headache. Skin exposure can lead to dry skin. Eye exposure can lead to redness and possible irritation.

Chronic effects:
- After skin contact: Degreasing effect on the skin possibly followed by secondary inflammation. After long-term exposure to the chemical: Sensitization with allergic manifestations have been reported.

FIRST AID:

Eyes: If in eyes rinse cautiously with water for at least 15 minutes. Remove contact lenses if easy to do continue rinsing. Seek medical attention.

Skin: Immediately take off all contaminated clothing. Wash thoroughly with water for at least 15 minutes. Wash contaminated clothes before reuse. Seek immediate medical attention.

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if you feel unwell.

Ingestion: If swallowed call a poison center if you feel unwell. Rinse mouth. Do NOT induce vomiting by use of emetics. Seek medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media
- Appropriate extinguishing media: Dry chemical powder, carbon dioxide, and alcohol resistant foam. Avoid using water. In very large fires one may use water spray, fog or alcohol-resistant foam by directing streams to the periphery of the fires to prevent spread.

Special Protective Equipment and Precautions for Fire Fighter
- Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep the containers cool by spraying water if exposed to heat or fire. Move containers out of hazard area if safe to do so.

Unusual fire and explosion hazard
Flashback along vapor trail may occur. Closed container exposed to heat may explode. Contact with strong oxidizer may cause fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Minor Spills
- Clean up all spills immediately following relevant Standard Operating Procedures.
- Avoid breathing vapors and contact with skin and eyes.
- Shut off leak source if possible.
- Shut off all possible sources of ignition.
- Wear protective clothing, boots, impervious gloves and safety glasses.
- Wipe up.
- Decontaminate all equipment.

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according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

Major Spill
- Alert Emergency Responders and tell them location and nature of hazard.
- Shut off all possible sources of ignition and increase ventilation.
- Wear protective clothing, full boots, impervious gloves, safety glasses and Self Contained Breathing Apparatus (SCBA), as may be deemed appropriate.
- Clear area of personnel and move upwind.
- Stop leaks if possible.
- Prevent, by any means available, spillage from entering drains or water and watercourses.
- Collect recoverable product into labeled containers for recycling, recovery or disposal.
- Contain spill with sand, earth or vermiculite.
- Spread area with lime or absorbent material, and leave for at least 1 hour before washing.
- Clean up all tools and equipment.
- Inform authorities in event of contamination of any public sewers, drains or water bodies.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
- Do not breathe vapor or mist.
- Wear protective gloves/clothing and eye/face protection.
- Wash thoroughly after handling.
- Ground and secure containers when dispensing or pouring product.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Launder contaminated clothing before re-use.
- If on skin or hair, IMMEDIATELY remove all contaminated clothing and rinse/shower with plenty of water.
- Use in a well ventilated place/Use protective clothing commensurate with exposure levels.

Storage
- Store in a cool, well ventilated place.
- Store away from incompatible materials.
- Keep container tightly closed.
- Keep securely closed when not in use.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters
- Exposure Limits Values
  - NIOSH REL: TWA 400 ppm (1400 mg/m3)
  - OSHA PEL: TWA 400 ppm (1400 mg/m3)
  - ACGIH 1997: TLV: 400 ppm; 1440 mg/m3
  - IDLH 2000 ppm
  - OEL-AUSTRALIA: TWA 400 ppm (1400 mg/m3)
  - OEL-THE PHILIPPINES: TWA 400 ppm (1400 mg/m3)
  - NDS –POLAND: 200 mg/m3

DNELs/ PNECs

<table>
<thead>
<tr>
<th>PNEC</th>
<th>Water (Freshwater)</th>
<th>Sediment (Freshwater)</th>
<th>Soil</th>
<th>Sewage treatment plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>Dermal</td>
<td>Inhalation</td>
<td>Oral</td>
<td></td>
</tr>
<tr>
<td>Workers</td>
<td>63 mg/kg bw/day</td>
<td>734 mg/m³</td>
<td>4.5 mg/kg bw/d</td>
<td></td>
</tr>
<tr>
<td>General Population</td>
<td>37 mg/kg bw/day</td>
<td>734 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exposure Controls
- Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. Local ventilation is usually preferred. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protection
- Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.
  - Hands: Wear appropriate protective gloves to prevent skin exposure.
  - Eyes: Safety goggles/ Chemical Safety glasses and Face shield.
  - Clothing: Boots and clothing to prevent contact.
  - Respirator: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.
General industrial hygiene:
- Immediately change contaminated clothing
- Apply skin protective barrier cream
- Wash hands and face after working with the substance

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES
- Information on basic physical and chemical properties.

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Parameter</th>
<th>Typical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Appearance</td>
<td>Clear colourless liquid</td>
</tr>
<tr>
<td>2</td>
<td>Odor</td>
<td>Ether like fruity odour</td>
</tr>
<tr>
<td>3</td>
<td>Odor Threshold</td>
<td>0.96 - 176.9 ppm</td>
</tr>
<tr>
<td>4</td>
<td>pH</td>
<td>Not available</td>
</tr>
<tr>
<td>5</td>
<td>Melting point</td>
<td>(-) 84 °C</td>
</tr>
<tr>
<td>6</td>
<td>Boiling point/ Distillation range</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Flash point</td>
<td>(-) 4.4 °C closed cup</td>
</tr>
<tr>
<td>8</td>
<td>Evaporation rate (n-BuAc=1)</td>
<td>4.2</td>
</tr>
<tr>
<td>9</td>
<td>Explosive limits</td>
<td>2.1% - 11.5%</td>
</tr>
<tr>
<td>10</td>
<td>vapor pressure</td>
<td>124.79 hPa at 20 °C</td>
</tr>
<tr>
<td>11</td>
<td>Vapor density (air=1)</td>
<td>Not available</td>
</tr>
<tr>
<td>12</td>
<td>Relative density</td>
<td>0.902 @ 20 °C</td>
</tr>
<tr>
<td>13</td>
<td>Specific gravity at 20/20 °C</td>
<td>0.900 - 0.903</td>
</tr>
<tr>
<td>14</td>
<td>Solubility</td>
<td>83g/l at 20 °C, 80g/l at 25 °C</td>
</tr>
<tr>
<td>15</td>
<td>Log Pow (octanol/water)</td>
<td>0.60</td>
</tr>
<tr>
<td>16</td>
<td>Auto-ignition temperature</td>
<td>427 °C</td>
</tr>
<tr>
<td>17</td>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>18</td>
<td>Viscosity</td>
<td>0.44 Pas @ 25 °C</td>
</tr>
<tr>
<td>19</td>
<td>Molecular Weight</td>
<td>88.11</td>
</tr>
<tr>
<td>20</td>
<td>pKa @ (25 °C)</td>
<td>Not available</td>
</tr>
<tr>
<td>21</td>
<td>Koc</td>
<td>8.8</td>
</tr>
<tr>
<td>22</td>
<td>Flammable material</td>
<td>Yes</td>
</tr>
<tr>
<td>23</td>
<td>Oxidizer</td>
<td>No</td>
</tr>
<tr>
<td>24</td>
<td>Corrosive material</td>
<td>No</td>
</tr>
<tr>
<td>25</td>
<td>Explosive material</td>
<td>No</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY
- Stability: Stable under normal temperature and pressure. Heat will contribute to instability.
- Conditions to avoid: Avoid heat, flame and other sources of ignition. Contact with nitrates, strong oxidizers, strong alkalis, or strong acids may cause fire and explosions. Will attack some forms of plastic, rubber, and coatings.
- Incompatible chemicals: Strong acids, strong oxidizing agents and strong bases.
- Hazardous decomposition: Thermal decomposition may produce carbon monoxide, carbon dioxide, acetic acid, and ethyl alcohol.
- Hazardous Polymerization: Not reported.

SECTION 11: TOXICOLOGICAL INFORMATION
11.1. Information on toxicological effects
- Acute toxicity
  RTECS#: AH54250000
  ACUTE ORAL LD50 (Rat) = 5620 mg/kg
  ACUTE DERMAL LD50(Rabbit) = > 20 mL/kg
  ACUTE INHALATION LC50: = 200000mg/m3
  a) Skin irritation / corrosion
    Method: Rabbit (New Zealand): Slightly irritating
  b) Serious Eye damage / irritation
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Method: Rabbit (New Zealand) : Not irritating

Summary of irritation: In a briefly reported study carried out to a US Federal Register protocol, rabbits were dermally exposed to ethyl acetate under semi-occlusive conditions for a period of 4 hours. No signs of any irritation were observed during the 72 hour observation period after the exposure. Under the conditions of this study, ethyl acetate was clearly not a skin irritant

Ethyl acetate vapor is a weak sensory irritant at high concentrations. Liquid ethyl acetate is mildly irritating to the eye and is not a skin irritant.

c) Respiratory or skin sensitization

Skin
Method: Guinea Pig
Result: Not sensitizing

Respiratory system: No data available

Summary: The skin sensitization has been evaluated in humans using patch tests, although the original publications of these studies are not available. Ethyl acetate was tested at 10% in petrolatum on the skin of 25 volunteers. No sensitization reactions occurred.

There is no data available on respiratory sensitising properties. Ethyl acetate does not have any functional groups or structures that are associated with respiratory sensitisation.

d) Germ cell Mutagenicity

Method: bacterial reverse mutation assay (e.g. Ames test) (gene mutation) S. typhimurium TA 1535, TA 1537, TA 98 and TA 100 (met. act.: with and without)
Result: negative

Summary: There is clear evidence to indicate that ethyl acetate is not mutagenic in vitro bacterial or yeast test systems with or without metabolic activation and no evidence for mutagenicity results from in vivo assays.

e) Carcinogenicity

- Not listed by NTP, IARC and OSHA.
- Not present on the EU CMR list.
- According to information presently available, ethyl acetate is not found to be carcinogenic.

<table>
<thead>
<tr>
<th>Method</th>
<th>Result</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>mouse (A/He) male/female (intraperitoneal) 150 mg/kg bw/injection (total dose: 3600 mg/kg bw) and 750 mg/kgbw/injection (total dose: 18000 mg/kg bw) Exposure: 8 w (3 times/week) Mouse Pulmonary Tumour Test according to method of Andervant</td>
<td>Ethyl acetate did not produce an increase in mouse lung tumours compared with controls:</td>
<td>Stoner GD; Shimkin MB; Kniazeff AJ; Weisburger JH; Weisburger EK; Bori GB. (1973)</td>
</tr>
</tbody>
</table>

Summary: The potential for ethyl acetate to induce lung tumors in a mouse pulmonary tumor model was evaluated by Stoner (1973). A/He Mice received intraperitoneal injections of 150mg/kg or 750mg/kg three times weekly for eight weeks. The animals were sacrificed 24 weeks after the 1st injections and the lungs examined for lesions. Ethyl acetate did not produce an increase in mouse lung tumours compared with controls

f) Reproductive toxicity

<table>
<thead>
<tr>
<th>Method</th>
<th>Result</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>mouse (CD-1) male/female two-generation study oral: drinking water 5, 10 and 15% v/v in water (analytical conc.) 0.0 6900, 13800, and 20700 mg/kg/day. (actual ingested (based on water consumption values)) Exposure: Exposure period: 18 weeks Premating exposure period (males): Parental 7 days; F1 74 days Premating exposure period (females): Parental 7 days; F1 74 days (ad libitum)</td>
<td>NOAEL (P): 20700 mg/kg bw/day (actual dose received) (male/female) (No effects observed in parameters studied at all doses. Result for ethanol. Equivalent to 39600mg/kg/day for ethyl acetate on a molar basis.)</td>
<td>George, J., Myers, C., Reel, J. et al. (1985)</td>
</tr>
</tbody>
</table>

Summary: The evidence suggests that the potential for ethyl acetate to cause fertility effects is low. A two generation study on the surrogate substance shows no effects with oral doses up to 13800mg/kg/day for ethanol (equivalent to 26400mg/kg/day ethyl acetate). By inhalation, ethyl acetate itself produced no effects at exposures of 6000ppm (22mg/l). Effects were reported following acute exposures to 16000ppm ethyl acetate.

g) Aspiration hazard.

- No data available.
SECTION 12: ECOLOGICAL INFORMATION

Toxicity

- Ecotoxicity:
  - Aquatic LC50 (48h) Leuciscusidusmelanotus (fish, fresh water) = 270-333 mg/L
  - Aquatic LC50 (96h) oncorhyncusmykiss (fish, fresh water) = 484 mg/L
  - Aquatic EC50 (24h) Artemia Salina (Crustacea) = 644.8 mg/L
  - Aquatic EC50 (48h) Daphnia Cucullata (Crustacea) = 164mg/L
  - Aquatic EC50 (48h) Scenedesmusubspicatus (Algae) = 3300mg/L
  - Aquatic EC50 (15min) PhotobacteriumPhosphoreum (Bacteria) = 5870mg/L

Chronic Toxicity to Fish

Aquatic LOEC (32days) PimephalesPromelas (fish, fresh water) = 9.65mg/L (Embryo Larval test)

(a) Persistence and degradability
- It undergoes rapid biodegradation. Substance is biodegradable with low possibility of bioaccumulation.

(b) Bioaccumulative potential (Predicted)
- Log Pow = 0.6, this chemical is not likely to bioconcentrate

(c) Mobility in soil
- Log Koc =8.8(estimated).
- Log Koc=8.8(estimated), If released on land, Ethyl acetate will be lost by evaporation and leaching into groundwater. Biodegradation should also occur. It is very soluble in water and is not expected to absorb significantly to soil.
- Because of its high vapor pressure and low adsorption to soil, ethyl acetate would be expected to volatilize rapidly from soil and other surfaces.
- Solubility In Water: 83g/l at 200 C. This product is lighter than water and will float on the surface. The product is poorly absorbed onto soils or sediments.

(d) Environment Fate
- Koc=8.8. If released on land, Ethyl acetate will be lost by evaporation and leaching into groundwater. Biodegradation should also occur. It is very soluble in water and is not expected to absorb significantly to soil.
- Because of its high vapor pressure and low adsorption to soil, ethyl acetate would be expected to volatilize rapidly from soil and other surfaces.
- Solubility In Water: 83g/l at 200 C. This product is lighter than water and will float on the surface. The product is poorly absorbed onto soils or sediments.
- Henry’s Law constant: 1.5 10E-4 atm-m3/mole. From Henry’s Law constant one can calculate a half-life for volatilization from a river 1 m deep with a 1 m/sec current and 3 m/sec wind of 10.1 hour. Diffusions through the liquid and the vapor phase are an important element in the volatilization process so changes in current and wind will affect the rate.
- Log Pow =0.6. This chemical is not likely to bioconcentrate.
- It undergoes rapid biodegradation. Substance is biodegradable with low possibility of bioaccumulation.

SECTION 13: Disposal considerations

Waste treatment methods
- Burn in a chemical incinerator equipped with an afterburner and scrubber.
- Exert extra care in igniting, as this material is combustible.
- Dispose of this material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state or local laws. Note that disposal regulations may also apply to empty containers and equipment rinsates.

SECTION 14: Transport information

- This substance is considered to be Hazardous for transport by Air/Rail/Road and Sea and is regulated by IATA/ICAO/ARD/RID/IMO/IMDG.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Agency</th>
<th>UN Number</th>
<th>Proper Shipping name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Transport</td>
<td>ADR/ RID</td>
<td>UN 1173</td>
<td>Ethyl acetate</td>
<td>3 Flammable liquid.</td>
<td>II</td>
</tr>
<tr>
<td>Maritime Transport</td>
<td>IMDG</td>
<td>UN 1173</td>
<td>Ethyl acetate</td>
<td>3 Flammable liquid.</td>
<td>II</td>
</tr>
<tr>
<td>Air Transport</td>
<td>IATA</td>
<td>UN 1173</td>
<td>Ethyl acetate</td>
<td>3 Flammable liquid.</td>
<td>II</td>
</tr>
</tbody>
</table>
Ethyl Acetate
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<table>
<thead>
<tr>
<th>Hazard Label</th>
<th>Flammable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental hazards
- It is expected that this chemical is not a marine pollutant and is not Harmful to the Aquatic environment.

SECTION 15: REGULATORY INFORMATION

- European Union Information

Classification (as per Regulation (EC) No 1272/2008):
Hazards Class and Category: Flammable Liquid Cat.2, Eye Irritation Cat.2, STOT single exposure Cat.3
Hazard Statements: H225; H319; H336

US information:
- It is listed in EPA TSCA chemical inventory.
- CERCLA Section 103 ((40CFR302.4): 5000 LBS RQ
- None of the chemicals in this product have an TPQ under SARA Section 302 TPQ
- None of the chemicals in this product are reported under SARA Section 313
- None of the chemicals in this product contain any class1 & class2 ozone depletors, neither contain any hazardous air pollutants under ‘Clean Air Act’
- None of the chemicals in this product are listed as Hazardous substances or priority pollutants or Toxic substances list under ‘Clean Water Act
- NFPA Code: H1; F3; R0
- Transport Emergency Card: TEC (R)-76

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR.
- DSL: Yes
- NDSL: No

SECTION 16: OTHER INFORMATION

a) Compilation information of safety data sheet
Date of compilation: March 30, 2012
Chemical: Ethyl acetate
CAS #: 141-78-6
File Name: 0044Gj Ghs08 Div.1sdsEthyl acetate
Revision Number: 08
Date of Revision: January 06, 2016
Revision Due Date: December, 2017
Supersedes date: October 20, 2015

b) A key or legend to aberrations and acronyms used in the safety data sheet
- PBT = Persistent Bioaccumulative and Toxic.
- vPvB = Very Persistent and Very Bioaccumulative.
- SCBA = Self Contained Breathing Apparatus.
- NIOSH REL = National Institute for Occupational Safety and Health Recommended Exposure Limit. OSHA PEL = Occupational Safety and Health Administration Permissible Exposure Limit.
- OELTWA = Occupational Exposure Limit Time Weighted Averages.
- IDLH = Immediately Dangerous to Life or Health.
- UEL = Upper Explosive Limit.
- LEL = Lower Explosive Limit.
- RTECS = Registry of Toxic Effects of Chemical Substances.
- NTP = National Toxicology Program.
- IARC = International Agency for Research on Cancer.
- EPA = Environmental Protection Agency.
- TSCA = Toxic Substances Control Act.
c) Key Literature reference and sources for data

Biographical reference and data sources

- CLP REG (regulation) (EC) no. 1272/2008, last modification by regulation (EC) no. 790/2009
- DIR 67/548/EWG, last modification by DIR 2009/2/EC

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

(End of Safety Data Sheet)