

Safety data sheet

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

1.1. Product identifier

Code: TC23572
Product name: BUFFERED CONCENTRATED FORMALDEHYDE

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

Intended use: Reagent for laboratory and process control

1.3. Details of the supplier of the safety data sheet

Name: TITOLCHIMICA SPA
Full address: VIA SAN PIETRO MARTIRE, 1054
District and Country: 45030 PONTECCHIO POLESINE (RO)
ITALIA
Tel. +39 425 492644
Fax +39 425 492909

e-mail address of the competent person

responsible for the Safety Data Sheet: utecnico@titolchimica.it

1.4. Emergency telephone number

For urgent inquiries refer to:
Centri antiveleni (24/24h):
Pavia - 0382/24444; Milano - 02/66101029; Bergamo - 800/83300; Firenze - 055/7947819;
Roma - Gemelli 06/3054343; Roma - Umberto I 06/49978000; Roma - Bambino Gesù
06/68593726; Napoli - 081/7472870; Foggia - 0881/732326.

SECTION 2. Hazards identification.

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of EC Regulation 1907/2006 and subsequent amendments. Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Carcinogenicity, category 1B	H350	May cause cancer.
Germ cell mutagenicity, category 2	H341	Suspected of causing genetic defects.
Acute toxicity, category 4	H302	Harmful if swallowed.
Eye irritation, category 2	H319	Causes serious eye irritation.
Skin irritation, category 2	H315	Causes skin irritation.
Skin sensitization, category 1	H317	May cause an allergic skin reaction.

2.2. Label elements.

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: Danger

Hazard statements:

H350	May cause cancer.
H341	Suspected of causing genetic defects.
H302	Harmful if swallowed.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction. Restricted to professional users.

Precautionary statements:

P201	Obtain special instructions before use.
P280	Wear protective gloves / clothing and eye / face protection.
P301+P312	IF SWALLOWED: Call a POISON CENTER / doctor / . . . / if you feel unwell.
P308+P313	IF exposed or concerned: Get medical advice / attention.
P333+P313	If skin irritation or rash occurs: Get medical advice / attention.
P337+P313	If eye irritation persists: Get medical advice / attention.

Contains: FORMALDEHYDE
METHANOL

2.3. Other hazards.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients.**3.1. Substances.**

Information not relevant.

3.2. Mixtures.

Contains:

Identification.	Conc. %.	Classification 1272/2008 (CLP).
FORMALDEHYDE		
CAS. 50-00-0	5 - 9	Carc. 1B H350, Muta. 2 H341, Acute Tox. 3 H301, Acute Tox. 3 H311, Acute Tox. 3 H331, Skin Corr. 1B H314, Skin Sens. 1 H317, Note B D
EC. 200-001-8		
INDEX. 605-001-00-5		
Reg. no. 01-2119488953-20-XXXX		
METHANOL		
CAS. 67-56-1	0 - 0,5	Flam. Liq. 2 H225, Acute Tox. 3 H301, Acute Tox. 3 H311, Acute Tox. 3 H331, STOT SE 1 H370
EC. 200-659-6		
INDEX. 603-001-00-X		
Reg. no. 01-2119433307-44-XXXX		

Note: Upper limit is not included into the range.

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures.**4.1. Description of first aid measures.**

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. Get medical advice/attention.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice/attention.

INGESTION: Have the subject drink as much water as possible. Get medical advice/attention. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice/attention immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

4.2. Most important symptoms and effects, both acute and delayed.

For symptoms and effects caused by the contained substances, see chap. 11.

METHYL ALCOHOL: dose-dependent acute effects. Skin: irritation, delipidation. Nervous system: if ingested or inhaled at high doses depression, headache, intoxication, dizziness, coma. Eyes: irritation, if ingested serious campimetric alterations. Upper airways: irritation. Lungs: irritation. digestive system if ingested abdominal colic, vomiting. Urogenital: kidney damage. chronic effects. Skin: irritation, flaking. Nervous System: headache, insomnia, dizziness. Eyes: irritation, ocular sequelae (severe campimetric alterations).

FORMALDEHYDE: acute dose dependent effects: Skin: irritation, sensitization, burns, necrosis. Eyes: irritation, keratitis, conjunctivitis. Nose irritation, rhinitis. Upper airways: irritation. Lungs: irritation, sensitization, pneumonia, asthma. digestive system if ingested abdominal colic, diarrhea, vomiting. Chronic effects: Skin: allergic dermatitis, eczema. Upper airways: irritation, rhinitis. Lung: chronic bronchitis.

4.3. Indication of any immediate medical attention and special treatment needed.

Information not available.

SECTION 5. Firefighting measures.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING EQUIPMENT

Extinguishing substances are: carbon dioxide, foam, chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.

UNSUITABLE EXTINGUISHING EQUIPMENT

Do not use jets of water. Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixture.

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Excess pressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products.

5.3. Advice for firefighters.

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures.

Ventilate the room before intervening.

6.1. Personal precautions, protective equipment and emergency procedures.

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions.

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up.

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Check incompatibility for container material in section 7. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections.

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

Keep away from heat, sparks and naked flames; do not smoke or use matches or lighters. Vapours may catch fire and an explosion may occur; vapour accumulation is therefore to be avoided by leaving windows and doors open and ensuring good cross ventilation. Without adequate ventilation, vapours may accumulate at ground level and, if ignited, catch fire even at a distance, with the danger of backfire. Avoid bunching of electrostatic charges. When performing transfer operations involving large containers, connect to an earthing system and wear antistatic footwear. Vigorous stirring and flow through the tubes and equipment may cause the formation and accumulation of electrostatic charges. In order to avoid the risk of fires and explosions, never use compressed air when handling. Open containers with caution as they may be pressurised. Do not eat, drink or smoke during use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities.

Store only in the original container. Store the containers sealed, in a well ventilated place, away from direct sunlight. Store in a well ventilated place, keep far away from sources of heat, naked flames and sparks and other sources of ignition. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s).

Information not available.

SECTION 8. Exposure controls/personal protection.

Working under the hood or under local aspiration.

Against the hazardous properties of the product and according to the type of work, you need to use individual means of personal protection.

Necessary respiratory protections: mask with specific filters (A BROWN for organic gases and vapors)

- Protection of the hands: natural latex gloves, nitrile, neoprene, PVC

- Protection of the eyes: Safety goggles and / or visor

- Protection of the skin such as laboratory coats

Wash hands thoroughly with soap and water before meals and take a shower after work shift, the shower is recommended.

Make sure that all the operators follow the recommended precautions; attach a copy to the containers in which the product can be transferred and do not use the product if the working conditions do not correspond to the recommended precautions; avoid contact with eyes and skin and prolonged breathing of vapors; store the container sealed when not in use. Do not eat, drink or smoke while handling it.

Work clothes should be washed separately and stored in a separate place.

8.1. Control parameters.

Regulatory References:

GBR	United Kingdom	EH40/2005 Workplace exposure limits	
ITA	Italia	Decreto Legislativo 9 Aprile 2008, n.81	
EU	OEL EU	Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC.	
	TLV-ACGIH	ACGIH 2014	

FORMALDEHYDE %

Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
WEL	GBR	2,5	2	2,5	2
TLV-ACGIH				0,37 (C)	0,3 (C)

Predicted no-effect concentration - PNEC.

Normal value in fresh water	0,47	mg/l
Normal value in marine water	0,47	mg/l
Normal value for fresh water sediment	2,44	mg/l
Normal value for marine water sediment	2,44	mg/kg
Normal value for water, intermittent release	4,7	mg/l
Normal value of STP microorganisms	0,19	mg/l
Normal value for the terrestrial compartment	0,21	mg/kg

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers.			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral.			VND	4,1 mg/kg				
Inhalation.			0,1 mg/m3	3,2 mg/m3	1 mg/m3	VND	0,5 mg/m3	9 mg/m3
Skin.			12 mg/kg	102 mg/kg			37 mg/kg	240 mg/kg

METHANOL**Threshold Limit Value.**

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
WEL	GBR		200		250
TLV	ITA	260	200		SKIN.
OEL	EU	260	200		
TLV-ACGIH		262	200	328	250

Predicted no-effect concentration - PNEC.

Normal value in fresh water	154	mg/l
Normal value in marine water	15,4	mg/l
Normal value for fresh water sediment	570,4	mg/kg
Normal value for the terrestrial compartment	23,5	mg/kg

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers.			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral.	VND	8 mg/kg	VND	8 mg/kg				
Inhalation.	50 mg/m3	50 mg/m3	50 mg/m3	50 mg/m3	260 mg/m3	260 mg/m3	260 mg/m3	260 mg/m3
Skin.	VND	8 mg/kg	VND	8 mg/kg	VND	40 mg/kg	VND	40 mg/kg

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

Methanol : <http://amcaw.ifa.dguv.de/substance/methoden/065-L-Methanol.pdf>.

Formaldehyde: <http://amcaw.ifa.dguv.de/substance/methoden/057-L-Formaldehyde.pdf>.

8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration. Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

The product must be used inside a closed circuit, in a well-ventilated environment and with strong localised aspiration systems in place.

HAND PROTECTION

Protect hands with category III work gloves (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category II professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

EYE PROTECTION

Wear airtight protective goggles (see standard EN 166).

In the presence of risks of exposure to splashes or squirts during work, adequate mouth, nose and eye protection should be used to prevent accidental absorption.

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type A filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS.

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	liquid
Colour	colourless
Odour	pungent
Odour threshold.	Not available.
pH.	Not available.
Melting point / freezing point.	Not available.
Initial boiling point.	100 °C.
Boiling range.	Not available.
Flash point.	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	not applicable
Lower inflammability limit.	Not available.
Upper inflammability limit.	Not available.
Lower explosive limit.	Not applicable.
Upper explosive limit.	Not applicable.
Vapour pressure.	Not available.
Vapour density	Not available.
Relative density.	1,020 Kg/l
Solubility	partially soluble in water
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature.	Not available.
Decomposition temperature.	Not available.
Viscosity	Not available.
Explosive properties	not applicable
Oxidising properties	not applicable

9.2. Other information.

Danger of explosion)	no
Solubility in solvents	insoluble

SECTION 10. Stability and reactivity.

10.1. Reactivity.

There are no particular risks of reaction with other substances in normal conditions of use.

FORMALDEHYDE: the aqueous solutions are stabilized with methanol, but tend to polymerize with time. The storage temperature varies according to the concentration. Solutions > 25% are also corrosive. It decomposes due to heat.

10.2. Chemical stability.

The product is stable in normal conditions of use and storage.

METHANOL: In combustion develops formaldehyde.

10.3. Possibility of hazardous reactions.

No hazardous reactions are foreseeable in normal conditions of use and storage.

METHANOL: Polymerizes only if heated.

FORMALDEHYDE: risk of explosion on contact with: nitromethane, nitrogen dioxide (180 ° C), hydrogen peroxide, phenol, performic acid, nitric acid. May polymerize on contact with: strong oxidizing agents, alkalis. It can react dangerously with: hydrochloric acid, magnesium carbonate, sodium hydroxide, perchloric acid and aniline. Forms explosive mixtures with air.

10.4. Conditions to avoid.

None in particular. However the usual precautions used for chemical products should be respected.

10.5. Incompatible materials.

METHANOL: oxidizers.

FORMALDEHYDE: acids, alkalis, ammonia, tannin, strong oxidants, phenols and salts of copper, silver and iron.

10.6. Hazardous decomposition products.

METHANOL: Heated to thermal decomposition, develops fumes and pungent and irritant vapors.

FORMALDEHYDE: carbon oxides.

SECTION 11. Toxicological information.

11.1. Information on toxicological effects.

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification. It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

This product should be considered carcinogenic for human beings. Currently available data suggest that human exposure to the substance contained in this product may give rise to cancer development.

This product must be handled carefully because of its possible mutagenic effects. Anyway, currently available data are insufficient to definitively prove hereditary gene alterations.

Acute effects: ingestion of this product is harmful. Even small amounts of product may cause serious health problems (stomach pain, nausea, sickness, diarrhoea).

Acute effects: stinging eyes. Symptoms may include: rubescence, edema, pain and lachrymation. Ingestion may cause health problems, including stomach pain and sting, nausea and sickness.

Acute effects: contact with skin may cause: irritation, erythema, edema, dryness and chapped skin. Ingestion may cause health disorders, including stomach pain and sting, nausea and sickness.

Upon contact with skin, this product causes sensitization (dermatitis). Dermatitis derives from skin irritation on the areas which repeatedly come into contact with the sensitizing agent. Cutaneous lesions may include: erythemas, edemas, papules, vesicles, pustules, scurries, ulcerations and exudative phenomena, whose intensity varies according to illness seriousness and affected areas. Erythemas, edemas and exudative phenomena prevail during the acute phase. Scurfy skin, dryness, ulcerations and skin thickening prevail during the chronic phase.

METHANOL:

* Metabolism, kinetics, mechanism of action and other information: The substance can be absorbed by ingestion, inhalation or skin contact. Total is rapidly distributed in the water body. The half-life is about 24 hours. Metabolism occurs in the liver. The 1st stage involves the oxidation of methanol to formaldehyde to liver alcohol dehydrogenase-work, non-specific enzyme that also has affinity for ethanol and butanol. The relative affinity of alcohol dehydrogenase for ethanol and methanol is approximately 20: 1; ie this stage is limiting because it is linked to a process of saturation. In the 2nd stage the formaldehyde is oxidized to the aldehyde dehydrogenase or formate in formic acid, in relation to pH. The 3rd stage, which leads to the formation of carbon dioxide, is controlled by the metabolic pathway of the compounds to a carbon atom (system under the dependence of a derivative of folic acid); It is the limiting step of biotransformation. This explains the formate accumulation in the body in the event of massive or repeated administration of methanol. The elimination of the methanol and its metabolites occurs with the air exhaled (methanol and carbon dioxide) and the urine (methanol and formates). This process is slow, in particular if compared with the ethanol. In primates the metabolic process is about 50% slower than in rodents. The urinary concentration of methanol, well correlated with blood concentration is a good indicator of the spread of the substance. The existence of an earlier stage of latency to the appearance of specific toxic effects, suggests that these are not caused by the substance itself, but rather to its metabolites. It is not yet elucidated the mechanism of ocular toxicity, although it is likely to be due to the presence of formic acid and not of formaldehyde. The formic acid accumulation coincides with the metabolic acidosis and with the toxic effects on the central nervous system.

*

Corrosion / irritation: Repeated or prolonged contact with the substance in liquid form can cause skin irritation: dermatoses, erythema and flaking.

Corrosion to the respiratory tract The substance has irritancy inhaled. In case of severe or prolonged poisoning there may be tracheitis and bronchitis.

Serious damage / eye irritation: The substance if inhaled is irritant. In liquid form can cause conjunctivitis, superficial lesions of the cornea and chemosis.

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*

Germ cell mutagenicity: No human data is available.

Methanol negative results in the Ames test, with or without metabolic activation. In culture has induced point mutations of mouse lymphoma cells. In vivo increases the frequency of chromosomal aberrations in mice and grasshoppers. In mice, the response is dose-dependent and is accompanied by increased frequency of sister chromatid exchanges and micronuclei in bone marrow cells.

*

Reproductive toxicity: - Adverse effects on sexual function and fertility: Not available. - Adverse effects on development:

In pregnant rats exposed to 20000 ppm of the substance, 7h / day for the duration of gestation or even from the 7th to the 15th day of gestation, the substance has caused mild maternal toxicity and high incidence of congenital malformations (over numeraries or rudimentary ribs , malformations of the urinary or cardiovascular system). - Effects of nursing or through breast-feeding: Not available.

*

Specific target organ toxicity (STOT) - single exposure: The substance has action on the CNS where it causes initially syndrome of intoxication, then more or less profound disturbance of consciousness sometimes accompanied by seizures, respiratory depression and cardiovascular collapse.

*

Specific target organ toxicity (STOT) - repeated exposure: Epidemiological studies of workers exposed to vapors of substance for prolonged periods showed the presence of interesting visual disturbances the optic nerve and retina, tenacious and recurrent headaches. The repeated or prolonged contact with the substance in liquid form can cause skin irritation: dermatoses, erythema and flaking.

*

Probably routes of exposure: The main routes of potential exposure are inhalation, skin contact and ingestion. Worker exposure occurs by skin contact and inhalation.

The general population is exposed to the substance by inhalation, through the consumption of food and water, through skin contact with various consumer products such as paint thinners, paint removers, stain removers and inks. Immediate, delayed and chronic effects from short and long term exposure. In case of severe poisoning, either by the digestive system that inhaled, the latency time to onset of symptoms is variable, from 10 to 48 hours, depending also of the ingested dose. You have: - non-specific symptoms such as CNS depression with syndrome of intoxication, then disturbance of consciousness more or less deep at times accompanied by convulsions, respiratory depression and cardio-vascular collapse;

- Own intoxication from methanol symptoms: marked metabolic acidosis with wide-ranging and rapid type of Kussmaul. You can arrive to an arterial pH below 7, significant reduction of bicarbonates and increase of lactates; - Visual disturbances that can arise out of time, from 2nd to 4th day and are a manifestation of a retrobulbar optic neuritis. It has bilateral mydriasis with abolition of photomotor reflex, decreased vision that can progress to complete blindness and a concentric narrowing of the visual field. There is great variability between individuals for resistance to methanol. In more serious cases death can occur from respiratory failure, or even after severe poisoning, you can have a full recovery, but the ocular sequelae are relatively frequent (visual field cuts, complete blindness). Epidemiological studies of workers exposed to vapors of substance for prolonged periods showed the presence of interesting visual disturbances the optic nerve and retina, tenacious and recurrent headaches. The repeated or prolonged contact with the substance in liquid form can cause skin irritation: dermatoses, erythema and flaking. The substance inhaled has power irritates the eyes and the respiratory system.

FORMALDEHYDE:

* Metabolism, kinetics, mechanism of action and other information. Formaldehyde is a metabolic intermediate in all cells. Is produced during the metabolism of serine, glycine and choline and also for demethylation of the compounds N-, S- and O-methyl. It is rapidly absorbed by the respiratory and gastrointestinal tract, and poorly absorbed following dermal application. It is metabolised by the enzyme formate dehydrogenase, formaldehyde and subsequently the carbon atom is oxidized to carbon dioxide or incorporated in purines, thymidine and amino acids. Both the formaldehyde that the formate do not accumulate in the tissues. Is distributed in the highly vascularized organs, in quick cell renewal tissues (blood-forming organs, gastrointestinal mucosa) and in those with high protein synthesis (exocrine pancreas, salivary glands). After the absorption the bonds form formaldehyde with proteins and nucleic acids in the site of contact. Most is excreted in the expired air in the form of carbon dioxide, another portion is excreted in the urine.

*

LD50 (Oral).> 1187 mg / kg rat

LD50 (Dermal) .17100 mg / kg rabbit

LC50 (Inhalation) .128,2 g / m3 / 4h rat

*

Skin corrosion / irritation

It may cause damage irritative to caustic depending on the concentration. Formaldehyde is irritating to the skin of human.

Experimental studies confirm the irritating observed in human. Aqueous solutions of formaldehyde (0.1% to 20%) are irritating to the skin of rabbit. (OECD, 2002)

Corrosive to the respiratory system. Exposure to high concentrations of substance can cause severe caustic injuries.

Serious eye damage / eye irritation: May cause damage to irritative to caustic depending on the concentration. respiratory sensitization: The substance has sensitizing power. Skin sensitization: The substance has sensitizing power.

*

Respiratory sensitization

The exposure, even briefly, to an atmospheric concentration of 50 ppm of formaldehyde may be responsible for severe bronchospasm and caustic injury severe respiratory tract (acute pulmonary edema, ulceration tracheal and bronchial). The exposure of healthy volunteers, no smoking, 2 ppm for 40 minutes, at rest or during moderate exercise (10 minutes out of 40), did not affect the respiratory rate during the next 24 hours and did not induce bronchial hyperreactivity (INRS, 2011)

Studies specially designed (IgE tests, the lymph node cells cytokine secretion profiles) revealed no evidence of respiratory sensitization in mice. (OECD, 2002)

Skin sensitization

The substance has sensitizing power. In numerous studies on different models (Buehler test on mice and guinea-pig maximization test) indicate that formaldehyde is a skin sensitizer in animals in which induces a moderate response to strong non-irritating concentrations (INRS, 2011)

*

Germ cell mutagenicity: Formaldehyde is a direct genotoxic agent which has provided positive results on most tests of bacteria, yeasts, fungi, insects, nematodes and mammalian cells. In vivo genotoxic both humans and in experimental animals.

Carcinogenicity: Several epidemiological studies and meta-analyzes have shown a causal relationship between exposure to formaldehyde and cancer in humans. It has a large increase nell'incidenza nasopharyngeal cancer, nasal sinus cancer, and cancer of the lymphohematopoietic system, particularly myeloid leukemia (the substance at exposure followed inhaled, cause genetic damage in the nasal tissues both in humans experimental animals). - The

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International Agency for Research on Cancer (IARC) allocates formaldehyde in group 1 (carcinogenic proven to humans) based on sufficient evidence of carcinogenicity in humans (nasopharyngeal cancer and leukemia, and there is also a positive association for cancer sinus) and in animals (IARC, 2012). The US National Toxicology Program (NTP) lists formaldehyde in the Thirteenth Report on Carcinogens allocating it in the category of recognized human carcinogens (US DHHS, 2014). The US Environmental Protection Agency (EPA) is reviewing the assessment of formaldehyde (USEPA online file 2014).

* Reproductive toxicity: - Adverse effects on sexual function and fertility: There is no data on reproductive toxicity.

* - Adverse effects on development: The available epidemiological studies indicate an increase in miscarriages and a decrease in birth weight. These results are equivocal since it can not be ruled out the role of other risk factors.

* - Effects of nursing or through breast-feeding: There is no data on effects on or via lactation.

Specific target organ toxicity (STOT) - single exposure: It has action irritant to caustic for the respiratory system. Following acute inhalation exposure is observed dependent irritation of eyes, nose, throat and lungs, as well as cell changes, such as ciliary lesions and cellular swelling of the upper respiratory tract.

In human after ingestion were observed severe ulceration of the gastrointestinal tract. (OECD, 2002)

* Specific target organ toxicity (STOT) - repeated exposure: In the long exposures you may have irritation of the eyes and respiratory mucous membranes, symptoms of chronic bronchitis, impaired lung function tests, respiratory epithelial injury. Epidemiological studies also show manifestations of psycho-organic syndrome. It is also observed chronic skin irritation. Aspiration Hazard: Not available. likely routes of exposure: The main routes of potential exposure are expected to be dermal contact and inhalation in workers exposed to the production and use of the substance. Potential exposure of the general population can occur through ingestion of contaminated food or water, ambient air and by contact with products containing the substance.

* Immediate, delayed and chronic effects from short and long term exposure The olfactory perception and sensitivity to irritants effects vary from one individual to another. A following inhalation exposure to high concentrations of substance can cause bronchospasm with serious injuries caustic respiratory tract, acute pulmonary edema, tracheal and bronchial ulcers. Following ingestion of large quantities, at high concentrations, cause caustic injuries. These are likely to be underestimated because the mucosa is preserved intact. Systemic poisoning is responsible for damage polyvisceral manifested by convulsive coma, hepatic cytolysis and cardiovascular disorders, moderate hemolysis and tubular nephropathy. In severe cases it has intense metabolic acidosis and consumptive coagulopathy. In the short-term complications are perforations and bleeding associated with respiratory disorders for laryngeal edema, pulmonary inhalation or eso-tracheal fistula. Weather development can be a digestive stenosis. The substance has a high allergenic and can cause anaphylactic shock. In the long exposures you may have irritation of the eyes and respiratory mucous membranes, symptoms of chronic bronchitis, impaired lung function tests, respiratory epithelial injury. Epidemiological studies also show manifestations of psycho-organic syndrome. Interactive effects: Not available.

SECTION 12. Ecological information.

12.1. Toxicity.

METHANOL

LC50 - for Fish.	15,4 g/l <i>Lepomis macrochirus</i>
EC50 - for Crustacea.	> 10 g/l <i>Daphnia magna</i>
Chronic NOEC for Fish.	7,9 g/l <i>Oryzias latipes</i>

FORMALDEHYDE

EC50 - for Crustacea.	5,8 mg/l/48h
EC50 - for Algae / Aquatic Plants.	> 3,48 mg/l/72h
Chronic NOEC for Fish.	> 48 mg/l

12.2. Persistence and degradability.

METHANOL: It is expected to biodegrade.

FORMALDEHYDE

The gaseous formaldehyde released into the atmosphere degrades by reaction with hydroxyl radicals produced photochemically (half-life of about 41 hours of reaction).

Undergoes direct photolysis as it absorbs in the environmental UV spectrum (reaction half-life of about 6 hours) (HSDB, 2014).

Polymerizes rapidly in water. Biodegrades in both aerobic and anaerobic conditions in water and soil.

To slow oxidation forms formic acid; the complete oxidation leads to carbon dioxide and water.

12.3. Bioaccumulative potential.

METHANOL: Based on the log Kow is a BCF of 0.2 was estimated. Based on the BCF values estimated and reported is not expected that the substance bioconcentrate significantly in aquatic organisms.

Partition coefficient: n-octanol / water. <1

FORMALDEHYDE

Bioconcentration is not significant.

Experimental data with a variety of fish and invertebrate animals show that no bioconcentration (HSDB, 2014).
BCF 3.

12.4. Mobility in soil.

METHANOL: The volatilization from water and soil should be significant in normal environmental conditions.

FORMALDEHYDE: high mobility is expected to the ground on the basis of an estimated 37 Koc (HSDB, 2014).

It is essentially volatile.

It is not expected volatilization from moist soil surfaces (on the basis of the Henry's Law).

Formaldehyde volatilizes from dry soil surfaces.

In water, it does not adsorb to sediments and suspended solids.

12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects.

METHANOL: Some plants exposed to air containing methanol (conc. Between 0.4 and 2.5 mg / m³) for 14 days, they have been delayed in growth.

FORMALDEHYDE: The bean and barley plants can absorb formaldehyde foliar.

SECTION 13. Disposal considerations.

The waste originating from or contaminated by the preparation shall be classified, stored and sent to a suitable disposal facility and incineration in compliance with national and regional regulations in force.

The product itself, from laboratory work, can be classified as belonging to the "Liquid waste from laboratory CER2002: 16 05 09, Dangerous, pursuant to Decree 22/97 and EC Directive 2001/118. This classification must be verified with the overall management of waste, with a licensed contractor and in light of local regulations.

13.1. Waste treatment methods.

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information.**14.1. UN number.**

Not applicable.

14.2. Shipping Name dell'ONU.

Not applicable.

14.3. hazard class transport.

Not applicable.

14.4. d'imballaggio group.

Not applicable.

14.5. Hazards l'ambiente.

Not applicable.

14.6. Special precautions for user.

Not applicable.

14.7. Transport in bulk according l'allegato II of MARPOL 73/78 and the IBC Code.

Non relevant information.

SECTION 15. Regulatory information.**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture.**

Seveso category. None.

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006.

Product.

Point. 3

Substances in Candidate List (Art. 59 REACH).

None.

Substances subject to authorisation (Annex XIV REACH).

None.

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None.

Substances subject to the Rotterdam Convention:

None.

Substances subject to the Stockholm Convention:

None.

Healthcare controls.

Workers exposed to this health-dangerous chemical agent must undergo sanitary checks carried out in compliance with 2004/37/EC directive.

Product not intended for uses provided for by Dir. 2004/42/CE.

15.2. Chemical safety assessment.

A chemical safety assessment has been performed for the following contained substances.

FORMALDEHYDE

METHANOL

SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Flam. Liq. 2	Flammable liquid, category 2
Carc. 1B	Carcinogenicity, category 1B
Muta. 2	Germ cell mutagenicity, category 2
Acute Tox. 3	Acute toxicity, category 3
STOT SE 1	Specific target organ toxicity - single exposure, category 1

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Acute Tox. 4	Acute toxicity, category 4
Skin Corr. 1B	Skin corrosion, category 1B
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
Skin Sens. 1	Skin sensitization, category 1
H225	Highly flammable liquid and vapour.
H350	May cause cancer.
H341	Suspected of causing genetic defects.
H301	Toxic if swallowed.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.

LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY

1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
 2. Regulation (EU) 1272/2008 (CLP) of the European Parliament
 3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
 4. Regulation (EU) 2015/830 of the European Parliament
 5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
 6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
 7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
 8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
 9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
- The Merck Index. - 10th Edition
 - Handling Chemical Safety
 - INRS - Fiche Toxicologique (toxicological sheet)
 - Patty - Industrial Hygiene and Toxicology
 - N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition

- ECHA website

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

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