SAFETY DATA SHEET

Creation Date Oct-2013 **Revision Date** Oct-2018 **Revision Number** 2

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identification

Product Description: **Karl Fischer reagent**
Cat No. : Q35824, Q35834, Q35825

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

Recommended Use Laboratory chemicals.
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company Thermo Fisher Scientific India Pvt. Ltd
403-404, B-wing, Delphi, Hiranandani Business Park,
Powai, Mumbai 400076, INDIA.
E-mail address laboratorysolutions@thermofisher.com

1.4. Emergency telephone number

India Toll Free: 18 00 22 22 30
Chemtrec US: (800)424-9300
Chemtrec EU: 001(202)483-7616

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Flammable liquids	Category 2 (H225)

Health hazards

Acute oral toxicity	Category 3 (H301)
Acute dermal toxicity	Category 3 (H311)
Acute Inhalation Toxicity - Vapors	Category 3 (H331)
Specific target organ toxicity - (single exposure)	Category 1 (H370)
Specific target organ toxicity - (repeated exposure)	Category 1 (H372)

Environmental hazards
Based on available data, the classification criteria are not met

2.2. Label elements

Signal Word **Danger**

Hazard Statements

H225 - Highly flammable liquid and vapor
H301 - Toxic if swallowed
H311 - Toxic in contact with skin
H331 - Toxic if inhaled
H370 - Causes damage to organs
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary Statements

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P240 - Ground/bond container and receiving equipment
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician
P302 + P350 - IF ON SKIN: Gently wash with plenty of soap and water
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P307 + P311 - IF exposed: Call a POISON CENTER or doctor/ physician

2.3. Other hazards

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Component	CAS-No	EC-No.	Weight %	CLP Classification - Regulation (EC) No 1272/2008
Methyl alcohol	67-56-1	200-659-6	50 - 60	Flam. Liq. 2 (H225) Acute Tox. 3 (H301) Acute Tox. 3 (H311) Acute Tox. 3 (H331) STOT SE 1 (H370)
Pyridine	110-86-1	EEC No. 203-809-9	15 - 25	Flam. Liq. 2 (H225) Acute Tox. 4 (H302) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Eye Irrit. 2 (H319) Skin Irrit. 2 (H315)
Iodine	7553-56-2	EEC No. 231-442-4	10 - 15	Met. Corr. 1 (H290) Acute Tox. 4 (H302) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Acute 1 (H400)
Sulfur dioxide	7446-09-5	EEC No. 231-195-2	10 - 15	Acute Tox. 3 (H331)

				Skin Corr. 1B (H314) Eye Dam. 1 (H318)

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

Protection of First-aiders Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

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

Breathing difficulties. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

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

Notes to Physician Treat symptomatically. Symptoms may be delayed.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
CO_2, dry chemical, dry sand, alcohol-resistant foam. Cool closed containers exposed to fire with water spray.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Flammable. Thermal decomposition can lead to release of irritating gases and vapors. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Hazardous Combustion Products
Carbon monoxide (CO), Carbon dioxide (CO_2), Nitrogen oxides (NOx), Sulfur oxides.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas. Remove all sources of ignition. Take precautionary measures against static discharges.

6.2. Environmental precautions

Should not be released into the environment. Do not flush into surface water or sanitary sewer system.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Do not breathe vapors/dust. Do not ingest. Take precautionary measures against static discharges.

Hygiene Measures
When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Flammables area. Keep away from heat and sources of ignition.

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s): **EU** - Commission Directive 2006/15/EC of 7 February 2006 establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC on the protection of the health and safety of workers from the risks related to chemical agents at work. **UK** - EH40/2005 Containing the workplace exposure limits (WELs) for use with the Control of Substances Hazardous to Health Regulations (COSHH) 2002 (as amended). Updated by September 2006 official press release and October 2007 Supplement. **IRE -** 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority.

Component	European Union	The United Kingdom	France	Belgium	Spain
Methyl alcohol	TWA: 200 ppm 8 hr TWA: 260 mg/m³ 8 hr Skin	WEL - TWA: 200 ppm TWA; 266 mg/m³ TWA WEL - STEL: 250 ppm	TWA / VME: 200 ppm (8 heures). restrictive limit TWA / VME: 260 mg/m³	TWA: 200 ppm 8 uren TWA: 266 mg/m³ 8 uren STEL: 250 ppm 15	TWA / VLA-ED: 200 ppm (8 horas) TWA / VLA-ED: 266

		STEL; 333 mg/m³ STEL	(8 heures). restrictive limit STEL / VLCT: 1000 ppm. STEL / VLCT: 1300 mg/m³. Peau	minuten STEL: 333 mg/m³ 15 minuten Huid	mg/m³ (8 horas) Piel
Pyridine		STEL: 10 ppm 15 min STEL: 33 mg/m³ 15 min TWA: 5 ppm 8 hr TWA: 16 mg/m³ 8 hr	TWA / VME: 5 ppm (8 heures). TWA / VME: 15 mg/m³ (8 heures). STEL / VLCT: 10 ppm. STEL / VLCT: 30 mg/m³.	TWA: 1 ppm 8 uren TWA: 3.3 mg/m³ 8 uren	TWA / VLA-ED: 1 ppm (8 horas) TWA / VLA-ED: 3 mg/m³ (8 horas)
Iodine		STEL: 0.1 ppm 15 min STEL: 1.1 mg/m³ 15 min	STEL / VLCT: 0.1 ppm. STEL / VLCT: 1 mg/m³.	TWA: 0.01 ppm 8 uren TWA: 0.1 mg/m³ 8 uren STEL: 0.1 ppm 15 minuten STEL: 1 mg/m³ 15 minuten	STEL / VLA-EC: 0.1 ppm (15 minutos). STEL / VLA-EC: 1 mg/m³ (15 minutos).
Sulfur dioxide			TWA / VME: 2 ppm (8 heures). TWA / VME: 5 mg/m³ (8 heures). STEL / VLCT: 5 ppm. STEL / VLCT: 10 mg/m³.	TWA: 2 ppm 8 uren TWA: 5.3 mg/m³ 8 uren STEL: 5 ppm 15 minuten STEL: 13 mg/m³ 15 minuten	STEL / VLA-EC: 2 ppm (15 minutos). STEL / VLA-EC: 5.28 mg/m³ (15 minutos). TWA / VLA-ED: 0.5 ppm (8 horas) TWA / VLA-ED: 1.32 mg/m³ (8 horas)

Component	Italy	Germany	Portugal	The Netherlands	Finland
Methyl alcohol	TWA: 200 ppm 8 ore. Media Ponderata nel Tempo TWA: 260 mg/m³ 8 ore. Media Ponderata nel Tempo Pelle	200 ppm TWA; 270 mg/m³ TWA Skin absorber	STEL: 250 ppm 15 minutos TWA: 200 ppm 8 horas TWA: 260 mg/m³ 8 horas Pele	huid TWA: 133 mg/m³ 8 uren TWA: 100 ppm 8 uren	TWA: 200 ppm 8 tunteina TWA: 270 mg/m³ 8 tunteina STEL: 250 ppm 15 minuutteina STEL: 330 mg/m³ 15 minuutteina Iho
Pyridine		Haut	TWA: 5 ppm 8 horas TWA: 15 mg/m³ 8 horas	TWA: 0.9 mg/m³ 8 uren	TWA: 1 ppm 8 tunteina TWA: 3 mg/m³ 8 tunteina STEL: 5 ppm 15 minuutteina STEL: 16 mg/m³ 15 minuutteina Iho
Iodine		Haut			STEL: 0.1 ppm 15 minuutteina STEL: 1.1 mg/m³ 15 minuutteina Iho
Sulfur dioxide		TWA: 1 ppm TWA: 2.5 mg/m³	STEL: 5 ppm 15 minutos TWA: 2 ppm 8 horas	STEL: 0.7 mg/m³ MAC: 2 ppm MAC: 5 mg/m³	TWA: 1 ppm 8 tunteina TWA: 2.7 mg/m³ 8 tunteina STEL: 4 ppm 15 minuutteina STEL: 11 mg/m³ 15 minuutteina

Component	Austria	Denmark	Switzerland	Poland	Norway
Methyl alcohol	Haut MAK-KZW: 800 ppm 15 Minuten MAK-KZW: 1040 mg/m³ 15 Minuten MAK-TMW: 200 ppm 8 Stunden MAK-TMW: 260 mg/m³	TWA: 200 ppm 8 timer TWA: 260 mg/m³ 8 timer Hud	Haut/Peau STEL: 800 ppm 15 Minuten STEL: 1040 mg/m³ 15 Minuten TWA: 200 ppm 8 Stunden TWA: 260 mg/m³ 8	STEL: 300 mg/m³ 15 minutach TWA: 100 mg/m³ 8 godzinach	TWA: 100 ppm 8 timer TWA: 130 mg/m³ 8 timer STEL: 100 ppm 15 minutter. STEL: 130 mg/m³ 15 minutter. Hud

	8 Stunden		Stunden		
Pyridine	Haut MAK-KZW: 20 ppm 15 Minuten MAK-KZW: 60 mg/m³ 15 Minuten MAK-TMW: 5 ppm 8 Stunden MAK-TMW: 15 mg/m³ 8 Stunden	TWA: 5 ppm 8 timer TWA: 15 mg/m³ 8 timer	STEL: 10 ppm 15 Minuten STEL: 30 mg/m³ 15 Minuten TWA: 5 ppm 8 Stunden TWA: 15 mg/m³ 8 Stunden	TWA: 5 mg/m³ 8 godzinach	TWA: 5 ppm 8 timer TWA: 15 mg/m³ 8 timer STEL: 5 ppm 15 minutter. STEL: 15 mg/m³ 15 minutter.
Iodine	Haut MAK-KZW: 0.1 ppm 15 Minuten MAK-KZW: 1 mg/m³ 15 Minuten MAK-TMW: 0.1 ppm 8 Stunden MAK-TMW: 1 mg/m³ 8 Stunden Ceiling: 0.1 ppm Ceiling: 1 mg/m³	Ceiling: 0.1 ppm Ceiling: 1 mg/m³	Haut/Peau STEL: 0.1 ppm 15 Minuten STEL: 1 mg/m³ 15 Minuten TWA: 0.1 ppm 8 Stunden TWA: 1 mg/m³ 8 Stunden	STEL: 1 mg/m³ 15 minutach TWA: 0.5 mg/m³ 8 godzinach	Ceiling: 0.1 ppm Ceiling: 1 mg/m³
Sulfur dioxide	MAK-KZW: 4 ppm 15 Minuten MAK-KZW: 10 mg/m³ 15 Minuten MAK-TMW: 2 ppm 8 Stunden MAK-TMW: 5 mg/m³ 8 Stunden	TWA: 0.5 ppm 8 timer TWA: 1.3 mg/m³ 8 timer	STEL: 0.5 ppm 15 Minuten STEL: 1.3 mg/m³ 15 Minuten TWA: 0.5 ppm 8 Stunden TWA: 1.3 mg/m³ 8 Stunden	STEL: 2.7 mg/m³ 15 minutach TWA: 1.3 mg/m³ 8 godzinach	TWA: 0.8 ppm 8 timer TWA: 2 mg/m³ 8 timer STEL: 0.8 ppm 15 minutter. STEL: 2 mg/m³ 15 minutter.

Component	Bulgaria	Croatia	Ireland	Cyprus	Czech Republic
Methyl alcohol	TWA: 200 ppm TWA: 260.0 mg/m³ Skin notation	kože TWA-GVI: 200 ppm 8 satima. TWA-GVI: 260 mg/m³ 8 satima.	TWA: 200 ppm 8 hr. TWA: 260 mg/m³ 8 hr. STEL: 600 ppm 15 min STEL: 780 mg/m³ 15 min Skin	Skin-potential for cutaneous absorption TWA: 200 ppm TWA: 260 mg/m³	TWA: 250 mg/m³ 8 hodinách. Potential for cutaneous absorption Ceiling: 1000 mg/m³
Pyridine	TWA: 15.0 mg/m³	TWA-GVI: 5 ppm 8 satima. TWA-GVI: 15 mg/m³ 8 satima. STEL-KGVI: 10 ppm 15 minutama. STEL-KGVI: 33 mg/m³ 15 minutama.	TWA: 5 ppm 8 hr. TWA: 15 mg/m³ 8 hr. STEL: 10 ppm 15 min STEL: 30 mg/m³ 15 min	TWA: 5 ppm TWA: 15 mg/m³	TWA: 5 mg/m³ 8 hodinách. Potential for cutaneous absorption Ceiling: 10 mg/m³
Iodine	TWA: 3.0 mg/m³	STEL-KGVI: 0.1 ppm 15 minutama. STEL-KGVI: 1.1 mg/m³ 15 minutama.	STEL: 0.1 ppm 15 min STEL: 1 mg/m³ 15 min		TWA: 0.1 mg/m³ 8 hodinách. Ceiling: 1 mg/m³
Sulfur dioxide	TWA: 5.0 mg/m³ STEL : 10.0 mg/m³	TWA-GVI: 2 ppm 8 satima. TWA-GVI: 5 mg/m³ 8 satima. STEL-KGVI: 5 ppm 15 minutama. STEL-KGVI: 10 mg/m³ 15 minutama.	TWA: 0.5 ppm 8 hr. TWA: 1.3 mg/m³ 8 hr. STEL: 1 ppm 15 min STEL: 2.6 mg/m³ 15 min		TWA: 5 mg/m³ 8 hodinách. Ceiling: 5 mg/m³

Component	Estonia	Gibraltar	Greece	Hungary	Iceland
Methyl alcohol	Nahk TWA: 200 ppm 8 tundides. TWA: 260 mg/m³ 8 tundides. STEL: 250 ppm 15 minutites. STEL: 350 mg/m³ 15 minutites.	Skin notation TWA: 200 ppm 8 hr TWA: 260 mg/m³ 8 hr	skin - potential for cutaneous absorption STEL: 250 ppm STEL: 325 mg/m³ TWA: 200 ppm TWA: 260 mg/m³	TWA: 260 mg/m³ 8 órában. ÁK lehetséges borön keresztüli felszívódás	TWA: 200 ppm 8 klukkustundum. TWA: 260 mg/m³ 8 klukkustundum. Skin notation Ceiling: 400 ppm Ceiling: 520 mg/m³
Pyridine	TWA: 5 ppm 8 tundides.	TWA: 5 ppm 8 hr	STEL: 10 ppm	STEL: 60 mg/m³ 15	TWA: 5 ppm 8

	TWA: 15 mg/m³ 8 tundides.	existing scientific data on health effects appear to be particularly limited TWA: 15 mg/m³ 8 hr existing scientific data on health effects appear to be particularly limited	STEL: 30 mg/m³ TWA: 5 ppm TWA: 15 mg/m³	percekben. CK TWA: 15 mg/m³ 8 órában. AK lehetséges borön keresztüli felszívódás	klukkustundum. TWA: 15 mg/m³ 8 klukkustundum. Ceiling: 10 ppm Ceiling: 30 mg/m³
Iodine	Ceiling: 0.1 ppm Ceiling: 1 mg/m³		STEL: 0.1 ppm STEL: 1 mg/m³ TWA: 0.1 ppm TWA: 1 mg/m³	STEL: 1 mg/m³ 15 percekben. CK TWA: 1 mg/m³ 8 órában. AK lehetséges borön keresztüli felszívódás	STEL: 0.1 ppm STEL: 1 mg/m³
Sulfur dioxide	TWA: 2 ppm 8 tundides. TWA: 5 mg/m³ 8 tundides. Ceiling: 5 ppm Ceiling: 13 mg/m³		STEL: 5 ppm STEL: 13 mg/m³ TWA: 2 ppm TWA: 5 mg/m³	STEL: 5 mg/m³ 15 percekben. CK TWA: 5 mg/m³ 8 órában. AK	TWA: 0.5 ppm 8 klukkustundum. TWA: 1.3 mg/m³ 8 klukkustundum. Ceiling: 1 ppm Ceiling: 2.6 mg/m³

Component	Latvia	Lithuania	Luxembourg	Malta	Romania
Methyl alcohol	skin - potential for cutaneous exposure TWA: 200 ppm TWA: 260 mg/m³	TWA: 200 ppm IPRD TWA: 260 mg/m³ IPRD Oda	Possibility of significant uptake through the skin TWA: 200 ppm 8 Stunden TWA: 260 mg/m³ 8 Stunden	possibility of significant uptake through the skin TWA: 200 ppm TWA: 260 mg/m³	Skin notation TWA: 200 ppm 8 ore TWA: 260 mg/m³ 8 ore
Pyridine	TWA: 5 ppm TWA: 15 mg/m³	TWA: 5 ppm IPRD TWA: 15 mg/m³ IPRD	TWA: 5 ppm 8 Stunden TWA: 15 mg/m³ 8 Stunden	TWA: 5 ppm TWA: 15 mg/m³	TWA: 5 ppm 8 ore TWA: 15 mg/m³ 8 ore
Iodine	TWA: 1 mg/m³	Ceiling: 0.1 ppm Ceiling: 1 mg/m³			TWA: 0.09 ppm 8 ore TWA: 0.50 mg/m³ 8 ore STEL: 0.2 ppm 15 minute STEL: 1 mg/m³ 15 minute
Sulfur dioxide	TWA: 6 mg/m³	Ceiling: 5 ppm Ceiling: 13 mg/m³ TWA: 2 ppm IPRD TWA: 5 mg/m³ IPRD			TWA: 2 ppm 8 ore TWA: 5 mg/m³ 8 ore STEL: 4 ppm 15 minute STEL: 10 mg/m³ 15 minute

Component	Russia	Slovak Republic	Slovenia	Sweden	Turkey
Methyl alcohol	TWA: 5 mg/m³ 1211 Skin notation STEL: 15 mg/m³ 1211	Potential for cutaneous absorption TWA: 200 ppm TWA: 260 mg/m³	TWA: 200 ppm 8 urah TWA: 260 mg/m³ 8 urah Koža	Indicative STLV: 250 ppm 15 minuter Indicative STLV: 350 mg/m³ 15 minuter LLV: 200 ppm 8 timmar. LLV: 250 mg/m³ 8 timmar. Hud	Deri TWA: 200 ppm 8 saat TWA: 260 mg/m³ 8 saat
Pyridine	MAC: 5 mg/m³	TWA: 5 ppm TWA: 15 mg/m³	TWA: 5 ppm 8 urah TWA: 15 mg/m³ 8 urah	Indicative STLV: 3 ppm 15 minuter Indicative STLV: 10 mg/m³ 15 minuter LLV: 2 ppm 8 timmar. LLV: 7 mg/m³ 8 timmar.	TWA: 5 ppm 8 saat TWA: 15 mg/m³ 8 saat
Iodine	Skin notation MAC: 1 mg/m³	Ceiling: 1.1 mg/m³ TWA: 0.1 ppm TWA: 1.1 mg/m³	TWA: 0.1 ppm 8 urah TWA: 1.1 mg/m³ 8 urah Koža STEL: 0.1 ppm 15 minutah STEL: 1.1 mg/m³ 15 minutah	Binding STLV: 0.1 ppm 15 minuter Binding STLV: 1 mg/m³ 15 minuter	
Sulfur dioxide	Skin notation MAC: 10 mg/m³	Ceiling: 2.7 mg/m³ TWA: 0.5 ppm TWA: 1.3 mg/m³	TWA: 0.5 ppm 8 urah TWA: 1.3 mg/m³ 8 urah	Binding STLV: 5 ppm 15 minuter Binding STLV: 13 mg/m³ 15 minuter LLV: 2 ppm 8 timmar.	

				LLV: 5 mg/m³ 8 timmar.	

Biological limit values
List source(s):

Component	European Union	United Kingdom	France	Spain	Germany
Methyl alcohol			Methanol: 15 mg/L urine end of shift	Methanol: 15 mg/L urine end of shift	Methanol: 30 mg/L urine (end of shift) Methanol: 30 mg/L urine (end of several shifts for long-term exposures)

Component	Italy	Finland	Denmark	Bulgaria	Romania
Methyl alcohol					Methanol: 6 mg/L urine end of shift

Component	Gibraltar	Latvia	Slovak Republic	Luxembourg	Turkey
Methyl alcohol			Methanol: 30 mg/L urine end of exposure or work shift Methanol: 30 mg/L urine after all work shifts for long-term exposure		

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
MDHS70 General methods for sampling airborne gases and vapours

Derived No Effect Level (DNEL) No information available

Route of exposure	Acute effects (local)	Acute effects (systemic)	Chronic effects (local)	Chronic effects (systemic)
Oral				
Dermal				
Inhalation				

Predicted No Effect Concentration (PNEC) No information available.

8.2. Exposure controls

Engineering Measures
Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.
Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Tightly fitting safety goggles (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Viton (R)	< 120 minutes	0.70 mm	EN 374	(minimum requirement)
Butyl rubber	< 45 minutes	0.35 mm		

Skin and body protection Antistatic boots Wear fire/flame resistant/retardant clothing Impervious gloves

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

Respiratory Protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly
Large scale/emergency use	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced **Recommended Filter type:** low boiling organic solvent Type AX Brown conforming to EN371
Small scale/Laboratory use	Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. **Recommended half mask:-** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141 When RPE is used a face piece Fit Test should be conducted
Environmental exposure controls	Prevent product from entering drains. Do not allow material to contaminate ground water system.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Dark brown	
Physical State	Liquid	
Odor	pungent	
Odor Threshold	No data available	
pH	3.5 - 5.5	
Melting Point/Range	No data available	
Softening Point	No data available	
Boiling Point/Range	No information available	
Flash Point	12 °C / 53.6 °F	**Method -** No information available
Evaporation Rate	No data available	
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	No data available	
Vapor Pressure	No data available	
Vapor Density	No data available	(Air = 1.0)
Specific Gravity / Density	0.93	
Bulk Density	Not applicable	Liquid
Water Solubility	Miscible	
Solubility in other solvents	No information available	

Partition Coefficient (n-octanol/water)

Component	**log Pow**
Methyl alcohol	-0.74
Pyridine	0.65
Iodine	2.49

Autoignition Temperature	No data available	
Decomposition Temperature	No data available	
Viscosity	No data available	
Explosive Properties	No information available	Vapors may form explosive mixtures with air
Oxidizing Properties	No information available	

9.2. Other information

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization Hazardous polymerization does not occur.
Hazardous Reactions None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Powdered metals.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO_2). Nitrogen oxides (NOx). Sulfur oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Product Information

(a) acute toxicity;

Oral Category 3
Dermal Category 3
Inhalation Category 3

Toxicology data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methyl alcohol	**Calc. ATE 60 mg/kg** LD50 > 1187 – 2769 mg/kg (Rat)	**Calc. ATE 60 mg/kg** LD50 = 17100 mg/kg (Rabbit)	**Calc. ATE 0.6 mg/L (vapours) or 0.5 mg/L (mists)** LC50 = 128.2 mg/L (Rat) 4 h
Pyridine	LD50 = 891 mg/kg (Rat) LD50 = 866 mg/kg (Rat)	LD50 = 1121 mg/kg (Rabbit)	LC50 = 28500 mg/m³ (Rat) 1 h LC50 = 12.898 mg/L (Rat) 4 h
Iodine	315 mg/kg (Rat)	1425 mg/kg (Rabbit)	4.588 mg/L 4h (Rat)
Sulfur dioxide			Per CGA P-20: 2500 ppm/1hr (Rat)

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;

Respiratory No data available
Skin No data available

(e) germ cell mutagenicity; No data available
(f) carcinogenicity;

The table below indicates whether each agency has listed any ingredient as a carcinogen

Component	EU	UK	Germany	IARC
Pyridine			Cat. 3B	

(g) reproductive toxicity; No data available

(h) STOT-single exposure; Category 1

(i) STOT-repeated exposure; Category 1

Target Organs None known.

(j) aspiration hazard; No data available
Symptoms / effects,both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity
Ecotoxicity effects The product contains following substances which are hazardous for the environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Methyl alcohol	Pimephales promelas: LC50 > 10000 mg/L 96h	EC50 > 10000 mg/L 24h		EC50 = 39000 mg/L 25 min EC50 = 40000 mg/L 15 min EC50 = 43000 mg/L 5 min
Pyridine	LC50: = 4.6 mg/L, 96h static (Oncorhynchus mykiss) LC50: = 26 mg/L, 96h semi-static (Cyprinus carpio) LC50: 63.4 - 73.6 mg/L, 96h flow-through (Pimephales promelas)	EC50: = 520 mg/L, 24h (Daphnia magna)	EC50: = 520 mg/L, 24h (Tetrahymena pyriformis)	
Iodine	LC50 = 1.67 mg/L 96h	EC50 = 0.55 mg/L 48h		

12.2. Persistence and degradability
Persistence Soluble in water, Persistence is unlikely, based on information available.
Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)

Methyl alcohol	-0.74	10 (fish)
Pyridine	0.65	No data available
Iodine	2.49	No data available

12.4. Mobility in soil The product is water soluble, and may spread in water systems . Will likely be mobile in the environment due to its water solubility. Highly mobile in soils

12.5. Results of PBT and vPvB assessment No data available for assessment.

12.6. Other adverse effects

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

Persistent Organic Pollutant This product does not contain any known or suspected substance

Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues / Unused Products Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

European Waste Catalogue (EWC) According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.

Other Information Do not dispose of waste into sewer. Waste codes should be assigned by the user based on the application for which the product was used. Can be incinerated, when in compliance with local regulations.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number UN1992

14.2. UN proper shipping name FLAMMABLE LIQUID, TOXIC, N.O.S

Technical Shipping Name Contains Methanol

14.3. Transport hazard class(es) 3

Subsidiary Hazard Class 6.1

14.4. Packing group II

ADR

14.1. UN number UN1992

14.2. UN proper shipping name FLAMMABLE LIQUID, TOXIC, N.O.S

Technical Shipping Name Contains Methanol

14.3. Transport hazard class(es) 3

Subsidiary Hazard Class 6.1

14.4. Packing group II

IATA

14.1. UN number UN1992

14.2. UN proper shipping name FLAMMABLE LIQUID, TOXIC, N.O.S

Technical Shipping Name Contains Methanol

14.3. Transport hazard class(es) 3

Subsidiary Hazard Class 6.1

14.4. Packing group II

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories X = listed

Component	EINECS	ELINCS	NLP	TSCA	DSL	NDSL	PICCS	ENCS	IECSC	AICS	KECL
Methyl alcohol	200-659-6	-		X	X	-	X	X	X	X	X
Pyridine	203-809-9	-		X	X	-	X	X	X	X	X
Iodine	231-442-4	-		X	X	-	X	-	X	X	X
Sulfur dioxide	231-195-2	-		X	X	-	X	X	X	X	X

Component	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Methyl alcohol	500 tonne	5000 tonne

National Regulations

WGK Classification Water endangering class = 2 (self estimation)

Component	Germany - Water Classification (VwVwS)	Germany - TA-Luft Class
Methyl alcohol	WGK 1	
Pyridine	WGK 2	Class I : 20 mg/m³ (Massenkonzentration)
Iodine	WGK 1 WGK 2	
Sulfur dioxide	WGK 1	

Component	France - INRS (Tables of occupational diseases)
Methyl alcohol	Tableaux des maladies professionnelles (TMP) - RG 84
Pyridine	Tableaux des maladies professionnelles (TMP) - RG 84

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.

15.2. Chemical safety assessment

Chemical Safety Assessment/Reports (CSA/CSR) are not required for mixtures

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

H225 - Highly flammable liquid and vapor
H301 - Toxic if swallowed H302
- Harmful if swallowed H311 -
Toxic in contact with skin
H312 - Harmful in contact with skin
H314 - Causes severe skin burns and eye damage

H315 - Causes skin irritation
H318 - Causes serious eye damage
H319 - Causes serious eye irritation
H331 - Toxic if inhaled
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H370 - Causes damage to organs
H372 - Causes damage to organs through prolonged or repeated exposure
H400 - Very toxic to aquatic life

Legend

CAS - Chemical Abstracts Service
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
PICCS - Philippines Inventory of Chemicals and Chemical Substances
ENCS - Japanese Existing and New Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
AICS - Australian Inventory of Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
TWA - Time Weighted Average
ACGIH - American Conference of Governmental Industrial Hygienists
IARC - International Agency for Research on Cancer
DNEL - Derived No Effect Level
PNEC - Predicted No Effect Concentration
RPE - Respiratory Protective Equipment
LD50 - Lethal Dose 50%
LC50 - Lethal Concentration 50%
EC50 - Effective Concentration 50% **NOEC** - No Observed Effect Concentration
POW - Partition coefficient Octanol:Water **PBT** - Persistent, Bioaccumulative, Toxic
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
MARPOL - International Convention for the Prevention of Pollution from Ships
OECD - Organisation for Economic Co-operation and Development
ATE - Acute Toxicity Estimate
BCF - Bioconcentration factor
VOC - Volatile Organic Compounds

Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Physical hazards	On basis of test data
Health Hazards	Calculation method
Environmental hazards	Calculation method

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.
Chemical incident response training.
Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

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Revision Summary	SDS section 1 updated and update of Format.

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet