SAFETY DATA SHEET

1. Identification

Product Name: Methanol
Cat No.: A452-1; A452-4; A452-4LC; A452N1-19; A452N2-19; A452POP-50; A452POP-200; A452RS-19; A452RS-28; A452RS-50; A452RS-115; A452RS-200; A452SK-1; A452SK-4; A452SS-19; A452SS-28; A452SS-50; A452SS-200; XxA452U20LI; NC1270520; XxA452U200LI; NC1283758
CAS-No: 67-56-1
Synonyms: Methyl alcohol
Recommended Use: Laboratory chemicals.
Uses advised against: Not for food, drug, pesticide or biocidal product use

2. Hazard(s) identification

Classification: This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids Category 2
Acute oral toxicity Category 3
Acute dermal toxicity Category 3
Acute Inhalation Toxicity - Vapors Category 3
Specific target organ toxicity (single exposure) Category 1
Target Organs - Optic nerve.
Specific target organ toxicity - (repeated exposure) Category 1
Target Organs - Kidney, Liver, spleen, Blood.

Label Elements
Signal Word: Danger
Hazard Statements:
Highly flammable liquid and vapor
Toxic if swallowed
Methanol

Toxic in contact with skin
Toxic if inhaled
Causes damage to organs
Causes damage to organs through prolonged or repeated exposure

Precautionary Statements

Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Keep cool

Response
IF exposed: Call a POISON CENTER or doctor/physician

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician

Skin
Call a POISON CENTER or doctor/physician if you feel unwell
Wash contaminated clothing before reuse
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

Ingestion
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
Rinse mouth

Fire
In case of fire: Use CO2, dry chemical, or foam for extinction

Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Other hazards
Poison, may be fatal or cause blindness if swallowed. Vapor harmful. Cannot be made non-poisonous.
WARNING. Reproductive Harm - https://www.p65warnings.ca.gov/

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>67-56-1</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>
4. First-aid measures

General Advice
Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

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.

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.

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

Most important symptoms and effects
Breathing difficulties. May cause blindness: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

Notes to Physician
Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media
Water may be ineffective

Flash Point
12 °C / 53.6 °F

Method -
No information available

Autoignition Temperature
455 °C / 851 °F

Explosion Limits
Upper 31.00 vol %
Lower 6.0 vol %

Sensitivity to Mechanical Impact
No information available

Sensitivity to Static Discharge
No information available

Specific Hazards Arising from the Chemical
Flammable. Risk of ignition. Vapors may form explosive mixtures with air. 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) Formaldehyde

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. Accidental release measures

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

Environmental Precautions
Should not be released into the environment. See Section 12 for additional ecological
Methods for Containment and Clean-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.

7. Handling and storage
Handling
Wear personal protective equipment. Do not breathe vapors or spray mist. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not ingest. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges.

Storage
Keep container tightly closed in a dry and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Flammables area.

8. Exposure controls / personal protection
Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
<th>Mexico OEL (TWA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>TWA: 200 ppm</td>
<td>(Vacated) TWA: 200 ppm</td>
<td>IDLH: 6000 ppm</td>
<td>TWA: 200 ppm</td>
</tr>
<tr>
<td></td>
<td>STEL: 250 ppm</td>
<td>(Vacated) STEL: 250 ppm</td>
<td>TWA: 200 ppm</td>
<td>TWA: 260 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td>(Vacated) STEL: 325 mg/m³</td>
<td>TWA: 260 mg/m³</td>
<td>STEL: 250 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin TWA: 200 ppm</td>
<td>STEL: 325 mg/m³</td>
<td>STEL: 310 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 260 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures
Use only under a chemical fume hood. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment
Eye/face Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection
Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

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

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Appearance</th>
<th>Odor</th>
<th>Odor Threshold</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>Colorless</td>
<td>Alcohol-like</td>
<td>No information available</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Methanol

Revision Date 18-Jan-2018

Melting Point/Range -98 °C / -144.4 °F
Boiling Point/Range 64.7 °C / 148.5 °F @ 760 mmHg
Flash Point 12 °C / 53.6 °F
Evaporation Rate 5.2 (ether = 1)
Flammability (solid,gas) Not applicable
Flammability or explosive limits
  Upper 31.00 vol %
  Lower 6.0 vol %
Vapor Pressure 128 hPa @ 20 °C
Vapor Density 1.11
Specific Gravity 0.791
Solubility Miscible with water
Partition coefficient; n-octanol/water No data available
Autoignition Temperature 455 °C / 851 °F
Decomposition Temperature No information available
Viscosity 0.55 cP at 20 °C
Molecular Formula C H4 O
Molecular Weight 32.04
VOC Content(%) 100
Surface tension 0.02255 N/m @ 20°C

10. Stability and reactivity

Reactive Hazard None known, based on information available
Stability Stable under normal conditions.
Conditions to Avoid Incompatible products. Heat, flames and sparks. Keep away from open flames, hot surfaces and sources of ignition.
Incompatible Materials Strong oxidizing agents, Strong acids, Acid anhydrides, Acid chlorides, Strong bases, Metals, Peroxides
Hazardous Decomposition Products Carbon monoxide (CO), Formaldehyde
Hazardous Polymerization Hazardous polymerization does not occur.
Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity
Product Information Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>Calc. ATE 60 mg/kg</td>
<td>Calc. ATE 60 mg/kg</td>
<td>Calc. ATE 0.6 mg/L (vapours) or 0.5 mg/L (mists)</td>
</tr>
<tr>
<td></td>
<td>LD50 &gt; 1187 – 2769 mg/kg ( Rat )</td>
<td>LD50 = 17100 mg/kg ( Rabbit )</td>
<td>LC50 = 128.2 mg/L ( Rat ) 4 h</td>
</tr>
</tbody>
</table>

Toxicologically Synergistic Products Carbon tetrachloride

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation May cause skin and eye irritation
Sensitization No information available
Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>67-56-1</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>
Mutagenic Effects  No information available
Reproductive Effects  No information available.
Developmental Effects  Component substance is listed on California Proposition 65 as a developmental hazard.
Teratogenicity  No information available.
STOT - single exposure  Optic nerve
STOT - repeated exposure  Kidney Liver spleen Blood
Aspiration hazard  No information available
Symptoms / effects, both acute and delayed  May cause blindness: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
Endocrine Disruptor Information  No information available
Other Adverse Effects  The toxicological properties have not been fully investigated.

12. Ecological information

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
</table>
| Methyl alcohol| Not listed       | Pimephales promelas: LC50 > 10000 mg/L 96h | EC50 = 39000 mg/L 25 min  
|               |                  |                | EC50 = 40000 mg/L 15 min  
|               |                  |                | EC50 = 43000 mg/L 5 min  
|               |                  |                | EC50 > 10000 mg/L 24h    |

Persistence and Degradability  Persistence is unlikely based on information available.
Bioaccumulation/Accumulation  No information available.
Mobility  Will likely be mobile in the environment due to its volatility.

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>-0.74</td>
</tr>
</tbody>
</table>

13. Disposal considerations

Waste Disposal Methods  Should not be released into the environment.

<table>
<thead>
<tr>
<th>Component</th>
<th>RCRA - U Series Wastes</th>
<th>RCRA - P Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol - 67-56-1</td>
<td>U154</td>
<td>-</td>
</tr>
</tbody>
</table>

14. Transport information

DOT
UN-No  UN1230
Proper Shipping Name  METHANOL
Hazard Class  3
Packing Group  II

TDG
UN-No  UN1230
Proper Shipping Name  METHANOL
Hazard Class  3
Subsidiary Hazard Class  6.1
Packing Group  II

IATA
UN-No  UN1230
Proper Shipping Name  METHANOL
Hazard Class  3
Subsidiary Hazard Class: 6.1
Packing Group: II
IMDG/IMO
UN-No: UN1230
Proper Shipping Name: METHANOL
Hazard Class: 3
Subsidiary Hazard Class: 6.1
Packing Group: II

15. Regulatory information

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>200-659-6</td>
<td>-</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>67-56-1</td>
<td>&gt;95</td>
<td>1.0</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act

<table>
<thead>
<tr>
<th>Component</th>
<th>HAPS Data</th>
<th>Class 1 Ozone Depleters</th>
<th>Class 2 Ozone Depleters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>5000 lb</td>
<td>-</td>
</tr>
</tbody>
</table>

California Proposition 65 This product contains the following proposition 65 chemicals

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>California Prop. 65</th>
<th>Prop 65 NSRL</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>67-56-1</td>
<td>Developmental</td>
<td>-</td>
<td>Developmental</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know
Methanol

Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl alcohol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant: N
DOT Severe Marine Pollutant: N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade: Serious risk, Grade 3

16. Other information

Prepared By: Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date: 27-Apr-2009
Revision Date: 18-Jan-2018
Print Date: 18-Jan-2018
Revision Summary: This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

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 SDS