SAFETY DATA SHEET

According to US Regulation 29 CFR 1910.1200 (HazCom 2012)

1. Identification

Product identifier: Collodion, U. S. P.

Other means of identification
Product No.: 4560, 9202

Recommended restrictions
Recommended use: For Laboratory, Research or Manufacturing Use.
Restrictions on use: Not determined.

Details of the supplier of the safety data sheet

Company Name:	Avantor Performance Materials, LLC
Address:	100 Matsonford Rd, Suite 200 Radnor, PA 19087
Telephone:	Customer Service: 855-282-6867
Contact Person:	Product Information Compliance
E-mail:	info@avantormaterials.com

Emergency telephone number:
CHEMTREC: 1-800-424-9300 within US and Canada (24 hrs/day, 7 days/week)

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Flammable liquids	Category 2

Health Hazards

Carcinogenicity	Category 1A

Unknown toxicity - Health

Acute toxicity, oral	5 %
Acute toxicity, dermal	30 %
Acute toxicity, inhalation, vapor	100 %
Acute toxicity, inhalation, dust or mist	100 %

Label Elements

Hazard Symbol:

Signal Word: Danger

Hazard Statement: Highly flammable liquid and vapor.
May cause cancer.

Precautionary Statements

Prevention: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof [electrical/ventilating/lighting] equipment. Use non-sparking tools. Take action to prevent static discharges. Wear protective gloves/protective clothing/eye protection/face protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

Response: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. IF exposed or concerned: Get medical advice/attention.

Storage: Store in a well-ventilated place. Keep cool. Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Hazard(s) not otherwise classified (HNOC): Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

3. Composition/information on ingredients

Mixtures

Chemical Identity	CAS number	Content in percent (%)*
Diethyl ether	60-29-7	60 - 100%
Ethanol	64-17-5	15 - 40%
Nitrocellulose	9004-70-0	1 - 10%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion: Rinse mouth. Call a physician or poison control center immediately. Never give liquid to an unconscious person. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Inhalation: Move to fresh air.

Skin Contact:	Take off immediately all contaminated clothing. Wash skin thoroughly with soap and water. If skin irritation occurs: Get medical advice/attention.
Eye contact:	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.

Most important symptoms/effects, acute and delayed

Symptoms:	In high concentrations, vapors and aerosol mists have a narcotic effect and may cause headache, fatigue, dizziness and nausea.
Hazards:	Irritant.

Indication of immediate medical attention and special treatment needed

Treatment:	Symptoms may be delayed.

5. Fire-fighting measures

General Fire Hazards:	Highly flammable liquid and vapor.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.
Unsuitable extinguishing media:	Avoid water in straight hose stream; will scatter and spread fire.
Specific hazards arising from the chemical:	Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations.

Special protective equipment and precautions for firefighters

Special fire fighting procedures:	Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire. Fight fire from a protected location. Move containers from fire area if you can do so without risk.
Special protective equipment for fire-fighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Ventilate closed spaces before entering them. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Keep upwind.
Methods and material for containment and cleaning up:	Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Dike far ahead of larger spill for later recovery and disposal. In case of leakage, eliminate all ignition sources.
Notification Procedures:	Dike for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk.
Environmental Precautions:	Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid release to the environment.

7. Handling and storage

Precautions for safe handling: Do not taste or swallow. Wash hands thoroughly after handling. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Use personal protective equipment as required. Avoid contact with eyes. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground and bond container and receiving equipment. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities: Keep in a cool, well-ventilated place. Keep material from heat, light, sparks and flame. Keep containers tightly closed.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	Type	Exposure Limit Values	Source
Diethyl ether	TWA	400 ppm	US. ACGIH Threshold Limit Values (2011)
	STEL	500 ppm	US. ACGIH Threshold Limit Values (2011)
	PEL	400 ppm 1,200 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	400 ppm 1,200 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	STEL	500 ppm 1,500 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	400 ppm 1,200 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
	STEL	500 ppm 1,500 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	TWA PEL	400 ppm 1,200 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	STEL	500 ppm 1,500 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (01 2019)
	AN ESL	Health 1,200 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
	ST ESL	Health 4,000 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
	AN ESL	Health 400 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
	ST ESL	Health 12,000 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
Ethanol	STEL	1,000 ppm	US. ACGIH Threshold Limit Values (2011)
	REL	1,000 ppm 1,900 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	1,000 ppm 1,900 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	1,000 ppm 1,900 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	1,000 ppm 1,900 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
	AN ESL	1,000 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	ST ESL	1,010 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
	ST ESL	1,910 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (02 2013)
	AN ESL	1,880 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12

				2010)
	TWA PEL	1,000 ppm	1,900 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	AN ESL	Health	1,880 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
	AN ESL	Health	1,000 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
	ST ESL	Health	10,000 ppb	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)
	ST ESL	Health	18,800 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (06 2018)

Appropriate Engineering Controls Use explosion-proof ventilation equipment to stay below exposure limits.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof ventilation equipment.

Eye/face protection: Wear safety glasses with side shields (or goggles).

Skin Protection
Hand Protection: Chemical resistant gloves

Other: Use protective gloves, goggles and suitable protective clothing.

Respiratory Protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Hygiene measures: Do not eat, drink or smoke when using the product. Wash hands after handling. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Avoid contact with eyes. When using do not smoke. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use.

9. Physical and chemical properties

Appearance

Physical state: Liquid
Form: Liquid
Color: Colorless to slightly yellow
Odor: Ether odor
Odor threshold: No data available.
pH: Not applicable
Melting point/freezing point: -123 °C
Initial boiling point and boiling range: 36.1 °C
Flash Point: -45 °C (Closed Cup)

Evaporation rate:	37.5 (n-butyl acetate=1)
Flammability (solid, gas):	Flammable liquid.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	36.0 %(V)
Flammability limit - lower (%):	1.9 %(V)
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	57.2 kPa
Vapor density:	2.6 (Air=1)
Density:	0.77 g/ml (20 °C)
Relative density:	0.77 (20 °C)
Solubility(ies)	
Solubility in water:	Slightly soluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	180 - 190 °C
Decomposition temperature:	No data available.
Viscosity:	No data available.

Other information

Explosive properties:	Not explosive.
Oxidizing properties:	Not an oxidizer.

10. Stability and reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	Hazardous polymerization does not occur.
Conditions to avoid:	Heat, sparks, flames. Contact with air. Shocks and physical damage. Sunlight. Keep away from sources of ignition - No smoking.
Incompatible Materials:	Chlorine. Strong oxidizing agents. Strong acids. Strong bases. Amines.
Hazardous Decomposition Products:	Thermal decomposition may produce oxides of carbon and nitrogen. Cyanides.

11. Toxicological information

Information on likely routes of exposure

Inhalation:	May cause irritation to the respiratory system.
Skin Contact:	Prolonged skin contact may cause temporary irritation.
Eye contact:	May cause temporary eye irritation.
Ingestion:	Harmful if swallowed.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: No data available.

Dermal

Product: No data available.

Specified substance(s):

Diethyl ether	LD 50 (Rabbit): > 20,000 mg/kg
Ethanol	LDLo (Rabbit): 20,000 mg/kg

Inhalation

Product: No data available.

Specified substance(s):

Diethyl ether	LC 50 (Rat, 4 h): 32000 ppm
Ethanol	LC 50 (Rat, 4 h): 116.9 - 133.8 mg/l

Repeated dose toxicity

Product: No data available.

Specified substance(s):

Diethyl ether	LOAEL (Rat, Oral, 13 Weeks): 2,000 mg/kg NOAEL (Rat, Oral, 13 Weeks): 500 mg/kg NOAEL (Rat, Inhalation, 13 Weeks): 480 - 3,300 ppm(m) NOAEL (Rat, Inhalation, 30 Weeks): 20,000 ppm(m)
Ethanol	LOAEL (Rat, Inhalation, 1 - 6 Weeks): 13.3 mg/l NOAEL (Rat, Inhalation, 1 - 6 Weeks): 0.26 - 13.3 mg/l NOAEL (Rat, Oral, 90 d): 3,250 mg/kg NOAEL (Rat, Oral, 7 - 14 Weeks): 10 %(m)

Skin Corrosion/Irritation

Product: Prolonged skin contact may cause temporary irritation.

Serious Eye Damage/Eye Irritation

Product: May cause temporary eye irritation.

Respiratory or Skin Sensitization

Product: Not a skin nor a respiratory sensitizer.

Carcinogenicity

Product: May cause cancer.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro
Product: No mutagenic components identified

In vivo
Product: No mutagenic components identified

Reproductive toxicity
Product: May damage fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure
Product: None known.

Specific Target Organ Toxicity - Repeated Exposure
Product: None known.

Aspiration Hazard
Product: May be fatal if swallowed and enters airways.

Other effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Specified substance(s):

Diethyl ether	LC 50 (Fathead minnow (Pimephales promelas), 96 h): 2,560 mg/l LC 50 (Bluegill (Lepomis macrochirus), 96 h): > 10,000 mg/l LC 50 (Carp (Leuciscus idus melanotus), 48 h): 2,840 mg/l EC 50 (Fathead minnow (Pimephales promelas), 96 h): 2,260 mg/l
Ethanol	LC 50 (Rainbow trout,donaldson trout (Oncorhynchus mykiss), 96 h): 11,850 - 20,100 mg/l LC 50 (Fathead minnow (Pimephales promelas), 96 h): 13,480 - 29,400 mg/l LC 50 (Carp (Leuciscus idus melanotus), 48 h): 8,140 mg/l EC 50 (Fathead minnow (Pimephales promelas); Rainbow trout (Oncorhynchus mykiss), 96 h): 12,900 - 28,900 mg/l EC 50 (Rainbow trout,donaldson trout (Oncorhynchus mykiss), 96 h): 13,000 mg/l

Aquatic Invertebrates
Product: No data available.

Specified substance(s):

Diethyl ether	EC 50 (Daphnia magna, 24 h): 165 mg/l
Ethanol	EC 50 (Water flea (Daphnia obtusa), 48 h): 10,100 - 22,200 mg/l LC 50 (Water flea (Daphnia magna), 48 h): 7,560 - 15,386 mg/l LC 50 (Ceriodaphnia dubia, 48 h): 5,012 mg/l EC 50 (Water flea (Daphnia magna), 48 h): > 10,000 mg/l

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s):

Ethanol	EC 50 (Oryzias latipes, 200 h): 9,164 - 14,536 mg/l NOAEL (Oryzias latipes, 200 h): 7,900 - 15,800 mg/l LOAEL (Oryzias latipes, 200 h): 7,900 - 39,505 mg/l

Aquatic Invertebrates

Product: No data available.

Specified substance(s):

Diethyl ether	NOAEL (Daphnia magna, 21 d): 100 mg/l EC 50 (Daphnia magna, 21 d): > 100 mg/l
Ethanol	NOAEL (Daphnia magna, 21 d): > 10 mg/l LOAEL (Biomphalaria tenagophila, 8 Weeks): 19.8 mg/l NOAEL (Ceriodaphnia dubia, 10 d): 2 - 9.6 mg/l NOAEL (Biomphalaria tenagophila, 8 Weeks): 19.8 mg/l LC 50 (Ceriodaphnia dubia, 10 d): 1,806 mg/l

Toxicity to Aquatic Plants

Product: No data available.

Persistence and Degradability

Biodegradation

Product: There are no data on the degradability of this product.

BOD/COD Ratio

Product: Not determined.

Bioaccumulative potential

Bioconcentration Factor (BCF)

Product: No data available on bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Specified substance(s):

Diethyl ether	Log Kow: 0.89
Ethanol	Log Kow: -0.31

Mobility in soil: No data available.

Other adverse effects: Harmful to aquatic organisms.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated Packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN Number:	UN 1993
UN Proper Shipping Name:	Flammable liquids, n.o.s.(Diethyl ether, Ethyl alcohol)
Transport Hazard Class(es)	
Class:	3
Label(s):	3
Packing Group:	II
Marine Pollutant:	No
Special precautions for user:	Not determined.

IMDG

UN Number:	UN 1993
UN Proper Shipping Name:	FLAMMABLE LIQUID, N.O.S.(DIETHYL ETHER, ETHYL ALCOHOL)
Transport Hazard Class(es)	
Class:	3
Label(s):	3
EmS No.:	F-E, S-E
Packing Group:	II
Marine Pollutant:	No
Special precautions for user:	Not determined.

IATA

UN Number:	UN 1993
Proper Shipping Name:	Flammable liquid, n.o.s.(Diethyl ether, Ethyl alcohol)
Transport Hazard Class(es):	
Class:	3
Label(s):	3
Packing Group:	II
Marine Pollutant:	No
Special precautions for user:	Not determined.

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

None present or none present in regulated quantities.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

Chemical Identity	Reportable quantity
Diethyl ether	100 lbs.
Ethanol	100 lbs.
Nitrocellulose	100 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Flammable (gases, aerosols, liquids, or solids)
Carcinogenicity

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

None present or none present in regulated quantities.

SARA 311/312 Hazardous Chemical

Chemical Identity	Threshold Planning Quantity
Diethyl ether	10000 lbs.
Ethanol	10000 lbs.
Nitrocellulose	10000 lbs.

SARA 313 (TRI Reporting)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

Chemical Identity	Reportable quantity
Diethyl ether	10000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3):

None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65

No ingredient requiring a warning under CA Prop 65.

US. New Jersey Worker and Community Right-to-Know Act

Chemical Identity
Diethyl ether
Ethanol
Nitrocellulose

US. Massachusetts RTK - Substance List

Chemical Identity
Diethyl ether
Ethanol
Nitrocellulose

US. Pennsylvania RTK - Hazardous Substances

Chemical Identity
Diethyl ether
Ethanol
Nitrocellulose

US. Rhode Island RTK

Chemical Identity
Diethyl ether
Ethanol
Nitrocellulose

International regulations

Montreal protocol

Not applicable

Stockholm convention

Not applicable

Rotterdam convention

Not applicable

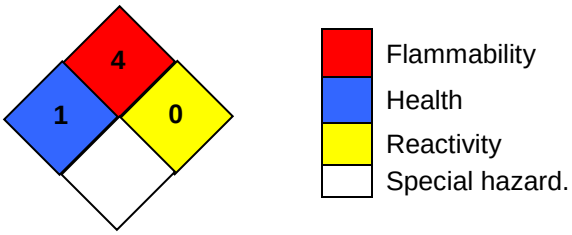
Kyoto protocol
Not applicable

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Japan (ENCS) List:	On or in compliance with the inventory
Japan ISHL Listing:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Mexico INSQ:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Philippines PICCS:	On or in compliance with the inventory
Taiwan Chemical Substance Inventory:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
EINECS, ELINCS or NLP:	Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible

Issue Date:	01-06-2020
Revision Information:	Not relevant.
Version #:	2.2
Source of information:	Sources of information used in preparing this SDS included one or more of the following: results from in house or supplier toxicology studies, information from the Toxicology Data Network (TOXNET), European Chemical Agency (ECHA) substance dossiers, IARC Monographs, US National Toxicology Program data, the Agency for Toxic Substances and Disease Registry, other manufacturer's SDSs and other sources, as appropriate.
Further Information:	No data available.

Disclaimer:

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