

SAFETY DATA SHEET

Creation Date 09-Jul-2009 Revision Date 18-Jan-2018 Revision Number 4

1. Identification

Product Name Ethanol, Anhydrous (Histological)

Cat No.: A405-20; A405F-1GAL; A405P-4

Synonyms Grain alcohol, denatured; Ethyl alcohol, denatured; Ethyl hydroxide, denatured.

Recommended Use Laboratory chemicals.

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Fisher Scientific One Reagent Lane Fair Lawn, NJ 07410 Tel: (201) 796-7100

Emergency Telephone Number

CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

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

Flammable liquids

Serious Eye Damage/Eye Irritation

Category 2

Specific target organ toxicity (single exposure)

Category 1

Target Organs - Central nervous system (CNS), Optic nerve, Respiratory system.

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 Causes serious eye irritation Causes damage to organs

Causes damage to organs through prolonged or repeated exposure



Precautionary Statements

Prevention

Obtain special instructions before use

Do not handle until all safety precautions have been read and understood

Use personal protective equipment as required

Wash face, hands and any exposed skin thoroughly after handling

Wear eye/face protection

Do not breathe dust/fume/gas/mist/vapors/spray

Do not eat, drink or smoke when using this product

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

Response

IF exposed: Call a POISON CENTER or doctor/physician

Skin

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

FVAS

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

If eye irritation persists: Get medical advice/attention

Fire

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

Storage

Store locked up

Store in a well-ventilated place. Keep cool

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Repeated exposure may cause skin dryness or cracking

Other hazards

Poison, may be fatal or cause blindness if swallowed. Vapor harmful. Cannot be made non-poisonous.

WARNING. Cancer and Reproductive Harm - https://www.p65warnings.ca.gov/.

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Ethyl alcohol	64-17-5	91-92
Methyl alcohol	67-56-1	<5
Methylisobutyl ketone	108-10-1	1.0 - 2.0
Ethyl acetate	141-78-6	1-2
Hexane	110-54-3	<1
Toluene	108-88-3	<0.1
Ligroine	8032-32-4	<0.1

4. First-aid measures

General Advice

If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get

medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists,

call a physician.

Inhalation Move to fresh air. If not breathing, give artificial respiration. Get medical attention if

symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and

effects

Notes to Physician

None reasonably foreseeable. Breathing difficulties. Inhalation of high vapor concentrations

may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media Water may be ineffective, Do not use a solid water stream as it may scatter and spread fire

Flash Point 13.9 °C / 57 °F

Method - No information available

Autoignition Temperature 362.8 °C / 685 °F

Explosion Limits

 Upper
 18.0 vol %

 Lower
 3.3 vol %

Sensitivity to Mechanical Impact No information available Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Flammable. 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) Carbon dioxide (CO2)

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.

NFPA

HealthFlammabilityInstabilityPhysical hazards330N/A

Accidental release measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions Should not be released into the environment. See Section 12 for additional ecological

information.

Methods for Containment and Clean Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. **Up**

7. Handling and storage

Handling Wear personal protective equipment. Ensure adequate ventilation. Do not get in eyes, on

skin, or on clothing. Avoid ingestion and inhalation.

Storage

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

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Ethyl alcohol	STEL: 1000 ppm	(Vacated) TWA: 1000 ppm	IDLH: 3300 ppm	TWA: 1000 ppm
	(Vacated) TWA: 1900 m		TWA: 1000 ppm	TWA: 1900 mg/m ³
		TWA: 1000 ppm	TWA: 1900 mg/m ³	
		TWA: 1900 mg/m ³		
Methyl alcohol	TWA: 200 ppm	(Vacated) TWA: 200 ppm	IDLH: 6000 ppm	TWA: 200 ppm
	STEL: 250 ppm	(Vacated) TWA: 260 mg/m ³	TWA: 200 ppm	TWA: 260 mg/m ³
	Skin	(Vacated) STEL: 250 ppm	TWA: 260 mg/m ³	STEL: 250 ppm
		(Vacated) STEL: 325 mg/m ³	STEL: 250 ppm	STEL: 310 mg/m ³
		Skin	STEL: 325 mg/m ³	
		TWA: 200 ppm		
		TWA: 260 mg/m ³		
Methylisobutyl ketone	TWA: 20 ppm	(Vacated) TWA: 50 ppm	IDLH: 500 ppm	TWA: 50 ppm
	STEL: 75 ppm	(Vacated) TWA: 205 mg/m ³	TWA: 50 ppm	TWA: 205 mg/m ³
		(Vacated) STEL: 75 ppm	TWA: 205 mg/m ³	STEL: 75 ppm
		(Vacated) STEL: 300 mg/m ³	STEL: 75 ppm	STEL: 307 mg/m ³
		TWA: 100 ppm	STEL: 300 mg/m ³	
		TWA: 410 mg/m ³		
Ethyl acetate	TWA: 400 ppm	(Vacated) TWA: 400 ppm	IDLH: 2000 ppm	TWA: 400 ppm
		(Vacated) TWA: 1400 mg/m ³	TWA: 400 ppm	TWA: 1400 mg/m ³
		TWA: 400 ppm	TWA: 1400 mg/m ³	
		TWA: 1400 mg/m ³		
Hexane	TWA: 50 ppm	(Vacated) TWA: 50 ppm	IDLH: 1100 ppm	TWA: 50 ppm
	Skin	(Vacated) TWA: 180 mg/m ³	TWA: 50 ppm	TWA: 176 mg/m ³
		TWA: 500 ppm	TWA: 180 mg/m ³	
		TWA: 1800 mg/m ³		
Toluene	TWA: 20 ppm	(Vacated) TWA: 100 ppm	IDLH: 500 ppm	TWA: 50 ppm
		(Vacated) TWA: 375 mg/m ³	TWA: 100 ppm	TWA: 188 mg/m ³
		Ceiling: 300 ppm	TWA: 375 mg/m ³	
		(Vacated) STEL: 150 ppm	STEL: 150 ppm	
		(Vacated) STEL: 560 mg/m ³	STEL: 560 mg/m ³	
		TWA: 200 ppm		
Ligroine		(Vacated) TWA: 300 ppm	TWA: 350 mg/m ³	TWA: 300 ppm
		(Vacated) TWA: 1350 mg/m ³	Ceiling: 1800 mg/m ³	TWA: 1350 mg/m ³
		(Vacated) STEL: 400 ppm		STEL: 400 ppm
		(Vacated) STEL: 1800		STEL: 1800 mg/m ³
		mg/m³		

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 Ensure adequate ventilation, especially in confined areas. 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 Long sleeved clothing.

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 Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical StateLiquidAppearanceClearOdorAlcohol-like

Odor Threshold

pH

No information available
No information available

pH No information available
Melting Point/Range < -90 °C / -130 °F

Boiling Point/Range No information available 77.1 °C / 170.8 °F

Flash Point 13.9 °C / 57 °F
Evaporation Rate 3.6 (Butyl acetate = 1.0)
Flammability (solid,gas) Not applicable

Flammability or explosive limits

 Upper
 18.0 vol %

 Lower
 3.3 vol %

 Vapor Pressure
 48 mmHg

 Vapor Density
 1.5

Specific Gravity0.785 - 0.792SolubilitySoluble in waterPartition coefficient; n-octanol/waterNo data availableAutoignition Temperature362.8 °C / 685 °F

Decomposition TemperatureNo information availableViscosityNo information available

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat. Keep away from open flames, hot surfaces and

sources of ignition.

Incompatible Materials Strong oxidizing agents, Acids, Acid anhydrides, Acid chlorides, Peroxides, Alkali metals

Hazardous Decomposition Products Carbon monoxide (CO), Carbon dioxide (CO2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Dermal LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Vapor LC50

Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethyl alcohol	3450 mg/kg (Mouse)	Not listed	20000 ppm/10H (Rat)
Methyl alcohol	Calc. ATE 60 mg/kg	Calc. ATE 60 mg/kg	Calc. ATE 0.6 mg/L (vapours) or
	LD50 > 1187 – 2769 mg/kg (Rat)	LD50 = 17100 mg/kg (Rabbit)	0.5 mg/L (mists)
			LC50 = 128.2 mg/L (Rat) 4 h

Methylisobutyl ketone	LD50 = 2080 mg/kg (Rat)	LD50 = 3000 mg/kg (Rabbit)	LC50 = 8.2 mg/L (Rat) 4 h	
Ethyl acetate	10,200 mg/kg (Rat)	> 20 mL/kg (Rabbit) > 18000 mg/kg (Rabbit)	58 mg/l (rat; 8 h)	
Hexane	Hexane LD50 = 25 g/kg (Rat)		LC50 = 48000 ppm (Rat) 4 h	
Toluene	> 5000 mg/kg (Rat)	LD50 = 12000 mg/kg (Rabbit)	26700 ppm (Rat) 1 h	
Ligroine	Not listed	Not listed	LC50 = 3400 ppm (Rat) 4 h	

Toxicologically Synergistic

No information available

Products

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

Irritation Severe eye irritant

Sensitization No information available

Carcinogenicity

Hygienists)

delayed

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

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Ethyl alcohol	64-17-5	Group 1	Known	A3	Х	Not listed
Methyl alcohol	67-56-1	Not listed				
Methylisobutyl ketone	108-10-1	Group 2B	Not listed	A3	Х	Not listed
Ethyl acetate	141-78-6	Not listed				
Hexane	110-54-3	Not listed				
Toluene	108-88-3	Not listed				
Ligroine	8032-32-4	Not listed	Not listed	Not listed	Not listed	A3

IARC: (International Agency for Research on Cancer)

ACGIH: (American Conference of Governmental Industrial

Mexico - Occupational Exposure Limits - Carcinogens

NTP: (National Toxicity Program)

IARC: (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program) Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human

Carcinogen

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

A1 - Confirmed Human Carcinogen A2 - Suspected Human Carcinogen

A3 - Confirmed Animal Carcinogen

A4 - Not Classifiable as a Human Carcinogen A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects Mutagenic effects have occurred in experimental animals.

Reproductive EffectsNo information available.Developmental EffectsNo information available.

Teratogenicity No information available.

STOT - single exposureCentral nervous system (CNS) Optic nerve Respiratory system
Kidney Liver spleen Blood

Aspiration hazard No information available

Symptoms / effects,both acute and 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

Ecotoxicity

Contains a substance which is:. Toxic to aquatic organisms. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Ethyl alcohol	EC50 (72h) = 275 mg/l (Chlorella vulgaris)			
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
Methylisobutyl ketone	EC50: 400 mg/L/96h	LC50: 496 - 514 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 79.6 mg/L 5 min	EC50: 4280.0 mg/L/24h EC50: 170 mg/L/48h EC50: 4280.0 mg/L/24h
Ethyl acetate	EC50 = 3300 mg/L/48h	Fathead minnow: LC50: 230 mg/l/ 96h Gold orfe: LC50: 270 mg/L/48h	EC50 = 1180 mg/L 5 min EC50 = 1500 mg/L 15 min EC50 = 5870 mg/L 15 min EC50 = 7400 mg/L 2 h	EC50 = 717 mg/L/48h
Hexane	Not listed	LC50: 2.1 - 2.98 mg/L, 96h flow-through (Pimephales promelas)	Not listed	EC50: 3.87 mg/L/48h
Toluene	EC50: = 12.5 mg/L, 72h static (Pseudokirchneriella subcapitata) EC50: > 433 mg/L, 96h (Pseudokirchneriella subcapitata)	50-70 mg/L LC50 96 h 5-7 mg/L LC50 96 h 15-19 mg/L LC50 96 h 28 mg/L LC50 96 h 12 mg/L LC50 96 h	EC50 = 19.7 mg/L 30 min	EC50: = 11.5 mg/L, 48h (Daphnia magna) EC50: 5.46 - 9.83 mg/L, 48h Static (Daphnia magna)
Ligroine	EC50: = 4700 mg/L, 72h (Pseudokirchneriella subcapitata)	Not listed	Not listed	Not listed

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.

Component	log Pow
Ethyl alcohol	-0.32
Methyl alcohol	-0.74
Methylisobutyl ketone	1.19
Ethyl acetate	0.6
Hexane	4.11
Toluene	2.7

13. Disposal considerations

Waste Disposal Methods

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component		RCRA - U Series Wastes	RCRA - P Series Wastes	
Γ	Methyl alcohol - 67-56-1	U154	-	
Γ	Methylisobutyl ketone - 108-10-1	U161	-	

Ethyl acetate - 141-78-6	U112	-
Toluene - 108-88-3	U220	-

14. Transport information

DOT

UN-No UN1170
Proper Shipping Name ETHANOL
Hazard Class 3

Ш

Packing Group

TDG

UN-No UN1170
Proper Shipping Name ETHANOL

Hazard Class 3
Packing Group ||

IATA

UN-No UN1170 Proper Shipping Name ETHANOL

Hazard Class 3
Packing Group ||

IMDG/IMO

UN-No UN1170
Proper Shipping Name ETHANOL

Hazard Class 3 Packing Group II

15. Regulatory information

All of the components in the product are on the following Inventory lists: Australia Complete Regulatory Information contained in following SDS's X = listed China Canada The product is classified and labeled according to EC directives or corresponding national laws The product is classified and labeled in accordance with Directive 1999/45/EC Europe TSCA Korea Philippines U.S.A. (TSCA) Canada (DSL/NDSL) Europe (EINECS/ELINCS/NLP) Australia (AICS) Korea (ECL) China (IECSC) Japan (ENCS) Philippines (PICCS)

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Ethyl alcohol	Х	Χ	-	200-578-6	-		Χ	Χ	Χ	Х	Χ
Methyl alcohol	Х	Х	-	200-659-6	-		Х	Χ	Х	Х	Χ
Methylisobutyl ketone	Х	Χ	-	203-550-1	-		Х	Χ	Х	Х	Χ
Ethyl acetate	Х	Х	-	205-500-4	-		Х	Χ	Х	Х	Χ
Hexane	Х	Х	-	203-777-6	438-390		Х	Χ	Х	Х	Χ
					-3						
Toluene	Х	Χ	-	203-625-9	-		Χ	Χ	Χ	Х	Χ
Ligroine	Х	Х	-	232-453-7	-		Х	-	Х	Х	Χ

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

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Methyl alcohol	67-56-1	<5	1.0
Methylisobutyl ketone	108-10-1	1.0 - 2.0	1.0
Hexane	110-54-3	<1	1.0
Toluene	108-88-3	<0.1	1.0

SARA 311/312 Hazard Categories

See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Toluene	X	1000 lb	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Methyl alcohol	X		-
Methylisobutyl ketone	X		-
Hexane	X		-
Toluene	X		-

OSHA Occupational Safety and Health Administration Not applicable

CERCLA

Component	Hazardous Substances RQs	CERCLA EHS RQs
Methyl alcohol	5000 lb	-
Methylisobutyl ketone	5000 lb	-
Ethyl acetate	5000 lb	-
Hexane	5000 lb	-
Toluene	1000 lb 1 lb	-

California Proposition 65

Ethyl alcohol is only a considered a Proposition 65 developmental hazard when it is ingested as an alcoholic beverage This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Ethyl alcohol	64-17-5	Development (alcoholic	Development (alcoholic -	
,		beverages only)		Carcinogen
Methyl alcohol	67-56-1	Developmental	-	Developmental
Methylisobutyl ketone	108-10-1	Carcinogen Developmental	-	Developmental Carcinogen
Toluene	108-88-3	Developmental	-	Developmental

U.S. State Right-to-Know Regulations

regulations							
Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island		
Ethyl alcohol	X	Χ	X	X	X		
Methyl alcohol	Х	Χ	Х	X	X		
Methylisobutyl ketone	X	Χ	X	X	Х		
Ethyl acetate	Х	Χ	X	-	X		
Hexane	Х	Х	X	X	Х		
Toluene	X	Х	Х	Х	Х		
Ligroine	-	Х	X	-	-		

U.S. Department of Transportation

Reportable Quantity (RQ): N
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

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Revision SummaryThis 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