



Scientific Documentation

ET105, Ethyl Acetate, NF

Not appropriate for regulatory submission.
Please visit www.spectrumchemical.com or
contact Tech Services for the most up-to-date
information contained in this information
package.

Spectrum Chemical Mfg Corp

769 Jersey Avenue
New Brunswick, NJ 08901
Phone 732.214.1300

Ver4.02 31.May.2016



Dear Customer,

Thank you for your interest in Spectrum's quality products and services.

Spectrum has been proudly serving our scientific community for over 45 years. It is our mission to manufacture and distribute fine chemicals and laboratory products with Quality and delivery you can count on every time.

To accomplish our mission, Spectrum utilizes our sourcing leverage and supplier qualification expertise in offering one of the industry's most comprehensive line of fine chemical products under one brand, in packaging configurations designed to meet your research and production requirements. Our product grades include: USP, NF, BP, EP, JP, FCC, ACS, KSA, Reagent grade, as well as DEA controlled substances. We operate facilities in the United States on the East Coast, West Coast, as well as in Shanghai, China in order to provide the best logistical support for our customers.

At Spectrum, Quality is priority number one. Suppliers with the best qualifications are preferred and we employ full-functioning in-house analytical laboratories at each of our facilities. Our facilities and systems are USFDA registered and ISO certified. We frequently host customer audits and cherish opportunities for improvements. Quality is engrained into our culture. Quality is priority number one.

In the following pages, we have designed and prepared documented scientific information to aid you in your initial qualification or your continual use of our products. Please do not hesitate to contact us if further information or the most up-to-date documentation is desired from any of the covered areas.

We appreciate your business and we look forward to hearing from you.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan Wang", with a large, sweeping flourish at the end.

Alan Wang, MSQA, ASQ CQA
Senior Manager of Technical Services
techservices@spectrumchemical.com

ET105, Ethyl Acetate, NF

Table of Contents

- Product Specification
- Safety Data Sheet (SDS)
- Manufacturer
- Certification of Quality Management System (QMS)
- Certification of current Good Manufacturing Practices (cGMP)
- Product BSE/TSE Statement
- Product Allergen Statement
- Product Aflatoxin Statement
- General Label Information – Sample Label
- Product Certificate of Analysis Sample(s)
- General Lot Numbering System Guidance
- Stability – Shelf Life Guidance

spectrum[®]
CHEMICAL MFG CORP

Item Number	ET105
Item	Ethyl Acetate, NF
CAS Number	141-78-6
Molecular Formula	C ₄ H ₈ O ₂
Molecular Weight	88.11
MDL Number	
Synonyms	Acetic Acid Ethyl Ester ; Acetic Ether

Test	Specification	
	Min	Max
ASSAY (CH ₃ COOC ₂ H ₅)	99.0	100.5 %
SPECIFIC GRAVITY @ 25°C	0.894	0.898
ACIDITY		TO PASS TEST
CHROMATOGRAPHIC PURITY	99.5 %	
NONVOLATILE RESIDUE		0.02 %
READILY CARBONIZABLE SUBSTANCES		TO PASS TEST
METHYL COMPOUNDS		TO PASS TEST
IDENTIFICATION		TO PASS TEST
RETEST DATE		
MANUFACTURE DATE		
APPEARANCE		
RESIDUAL SOLVENTS:		TO PASS TEST

Spectrum Chemical Mfg Corp

Corporate Headquarters:
769 Jersey Ave.
New Brunswick, NJ 08901
732.214.1300

West Coast Facility:
14422 S. San Pedro St.
Gardena, CA 90248
310.516.8000

SAFETY DATA SHEET

Preparation Date: 5/1/2014

Revision Date: 5/1/2014

Revision Number: G1

1. IDENTIFICATION

Product identifier

Product code: ET105
Product Name: ETHYL ACETATE, NF

Other means of identification

Synonyms: Acetic ether
Acetidin
Acetoxyethane
Ethyl acetic ester
Ethyl ethanoate
Vinegar naphtha
Ethyle (acetate d') (French)
Acétate d'éthyle (French)
Acétate éthylique (French)
Acetato de etilo (Spanish)

CAS #: 141-78-6
RTECS # AH5425000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Solvent. Perfuming agent. In photographic films and plates.
Uses advised against No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: <https://www.spectrumchemical.com>

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Regina Wachenheim (East Coast)

2. HAZARDS IDENTIFICATION

Classification

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

Serious eye damage/eye irritation	Category 2A
Specific target organ toxicity (single exposure)	Category 3
Flammable liquids	Category 2

Label elements

Danger

Hazard statements

Causes serious eye irritation
May cause respiratory irritation. May cause drowsiness or dizziness
Highly flammable liquid and vapor



Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

Not available

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
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
Wear protective gloves/protective clothing/eye protection/face protection
Keep cool

In case of fire: Use CO2, dry chemical, or foam to extinguish.

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.

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

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

Precautionary Statements - Storage

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

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %	Trade Secret
Ethyl Acetate 141-78-6	141-78-6	100	*

4. FIRST AID MEASURES

First aid measures

General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126).

Skin Contact:

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops.

Eye Contact:

Flush eye with water for 15 minutes. Get medical attention.

Inhalation:

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion:

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Most important symptoms and effects, both acute and delayed

Symptoms

Causes eye irritation. Coughing and wheezing. Dyspnea (Difficulty breathing and shortness of breath). Central nervous system effects. Dizziness. Drowsiness. Narcosis. May cause cardiovascular effects. Causes digestive (gastrointestinal) tract irritation. May cause nausea and vomiting. May cause metabolic acidosis. Sweating and flushing of skin.

Indication of any immediate medical attention and special treatment needed

Notes to Physician:

Treat symptomatically

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media:

Carbon dioxide (CO₂). Dry chemical. Alcohol-resistant foam. Water spray.

Unsuitable Extinguishing Media:

Do not use a solid (straight) water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Hazardous Combustion Products:

Carbon monoxide; Carbon dioxide

Specific hazards:

Flammable. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated. Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Actions for Firefighters

Specific Methods:

Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

Special Protective Equipment for Firefighters:

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth).

Methods for cleaning up Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use only non-sparking tools. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store in a segregated and approved area. Moisture sensitive. Protect from moisture. Store away from incompatible materials.

Incompatible Materials:

Oxidizing agents. Acids. Bases. Chlorosulfonic acid. Oleum. Potassium t-butoxide.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Ethyl Acetate - 141-78-6	400 ppm TWA 1400 mg/m ³ TWA	400 ppm TWA 1400 mg/m ³ TWA	400 ppm TWA	None

Canada

Components	Alberta	British Columbia	Ontario	Quebec
Ethyl Acetate - 141-78-6	400 ppm TWA 1440 mg/m ³ TWA	150 ppm TWA	400 ppm TWA	400 ppm TWAEV 1440 mg/m ³ TWAEV

Australia and Mexico

Components	Australia	Mexico
Ethyl Acetate 141-78-6	400 ppm STEL 1440 mg/m ³ STEL 200 ppm TWA 720 mg/m ³ TWA	400 ppm TWA 1400 mg/m ³ TWA

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

- Eye protection:** Goggles. Safety glasses with side-shields.
- Skin and body protection:** Chemical resistant apron. Long sleeved clothing. Gloves.
- Respiratory protection:** Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
- Hygiene measures:** Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.	Appearance: No information available	Color: Clear. Colorless.
Odor: Ether-like. Fruity.	Taste Bittersweet. Wine-like. Burning.	Formula: C4-H8-O2
Molecular/Formula weight: 88.11	Flash point (°C): -4.4	Flashpoint (°C/°F): -4.4 °C/24 °F 7.2 °C/44.96°F
Flash Point Tested according to: Closed cup Open cup	Lower Explosion Limit (%): 2-2.2%	Upper Explosion Limit (%): 9-11.5%
Autoignition Temperature (°C/°F): 426.6 °C/800 °F	pH: No information available	Melting point/range(°C/°F): -83 °C/-117.4 °F
Boiling point/range(°C/°F): 77 °C/170.6 °F	Decomposition temperature(°C/°F): No information available	Specific gravity: 9.02 @ 20 °C 0.894-0.898 @ 25 °C
Density (g/cm3): No information available	Bulk density: No information available	Vapor pressure @ 20°C (kPa): 9.71-10.11 (12.4 kPa @ 25 °C)
Evaporation rate: 6.2 (butyl acetate = 1)	Vapor density: 3.04	VOC content (g/L): No information available
Odor threshold (ppm): 1.0-4.0	Partition coefficient (n-octanol/water): 0.73	Viscosity: No information available
Miscibility: Miscible with Chloroform	Solubility: Soluble in Ether Soluble in alcohol Soluble in Acetone Soluble in Benzene Very soluble in water Solubility in Water: 64-80 g/L @ 25 °C; 83.1 g/L @ 20 °C	

10. STABILITY AND REACTIVITY

Reactivity

Reactive with oxidizing agents
Reacts with bases
Reactive with acids

Chemical stability

Stability:

Stable at normal conditions

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur

Conditions to avoid:

Heat. Incompatible materials. Moisture sensitive. Exposure to moist air. Slowly decomposed by moisture.

Incompatible Materials:

Oxidizing agents. Acids. Bases. Chlorosulfonic acid. Oleum. Potassium t-butoxide.

Hazardous decomposition products:

Carbon monoxide. Carbon dioxide. When heated to decomposition it emits acrid smoke and irritating fumes.

Other Information

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Skin. Eyes. Inhalation.

Acute Toxicity

Component Information

Ethyl Acetate - 141-78-6

LD50/oral/rat = 5620 mg/kg Oral LD50 Rat

LD50/oral/mouse = 4100 mg/kg

LD50/dermal/rabbit = 20 mL/kg Dermal LD50Rabbit
>18000 m/kg

LD50/dermal/rat = No information available

LC50/inhalation/rat = 16000 ppm 6 hr
4000 ppm 4 hr

LC50/inhalation/mouse = 45000 mg/m³ 2hr
1500 ppm 4hr

Other LD50 or LC50information = 4935 mg/kg LD50 Oral Rabbit
5500 mg/kg LD50 Oral Guinea Pig

Product Information

LD50/oral/rat =

VALUE- Acute Tox Oral = 5620mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 4100mg/kg

LD50/dermal/rabbit

VALUE-Acute Tox Dermal = >18000mg/kg

LD50/dermal/rat

VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat

VALUE-Vapor = No information available

VALUE-Gas = 4000ppm (4-hr)

VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available

VALUE - Gas = No information available

VALUE - Dust/Mist = No information available

Symptoms

Skin Contact:

May cause skin irritation. It may be absorbed through the skin. If absorbed through skin it may cause systemic effects.

Eye Contact: Causes eye irritation. Causes conjunctival irritation.

Inhalation Irritating to respiratory system. Inhalation of high concentrations of vapor may cause anesthetic effects. Inhalation of high concentrations of vapors may cause dizziness or suffocation. It may cause pulmonary edema. It may affect the liver. May affect the kidneys. Symptoms may include sore throat, shortness of breath, coughing, wheezing, inflammation of the nasal passages. May affect behavior/central nervous system (somnolence).

Ingestion Causes digestive (gastrointestinal) tract irritation. Ingestion may cause nausea, vomiting. May cause flushing and sweating. Aspiration hazard if swallowed. Aspiration into the lungs can cause chemical pneumonitis. May cause metabolic acidosis. May affect the cardiovascular system (tachycardia). May affect the cardiovascular system (hypotension). May affect behavior/central nervous system (somnolence, convulsions). May affect behavior/central nervous system (ataxia). It may affect behavior/central nervous system (boastfulness, talkativeness, belligerency, irritability, slurred speech, diplopia, vertigo, drowsiness, coma).

Aspiration hazard No information available

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

Chronic Toxicity Prolonged or repeated skin contact may cause dermatitis and defatting, dryness, and cracking of the skin. Prolonged or repeated ingestion may affect the liver. Prolonged or repeated inhalation may affect the kidneys. Prolonged or repeated inhalation may affect the liver. Prolonged or repeated inhalation may produce changes in pulmonary function and/or chronic bronchitis. Repeated exposure may cause bronchitis to develop with cough, phlegm, and /or shortness of breath. Prolonged or repeated inhalation may affect the blood (anemia, leukocytosis, reduced platelet count). Prolonged or repeated inhalation may affect the blood (changes in red blood cell count). Prolonged or repeated inhalation may cause central nervous system effects. Prolonged or repeated inhalation may cause loss of appetite. Prolonged or repeated exposure may affect the heart.

Sensitization: No information available

Mutagenic Effects: May affect genetic material
Experiments with bacteria and/or yeast have shown mutagenic effects
Animal experiments showed mutagenic effects

Carcinogenic effects: Not considered carcinogenic

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Ethyl Acetate	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure respiratory system. central nervous system.
STOT - repeated exposure No information available
Target Organs: Skin. Central nervous system. Liver. Kidneys. Lungs. Respiratory system. Heart.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

Ethyl Acetate - 141-78-6

Freshwater Algae Data: 3300 mg/L EC50 *Desmodesmus subspicatus* 48 h

Freshwater Fish Species Data: 220-250 mg/L LC50 *Pimephales promelas* 96 h flow-through 1
352-500 mg/L LC50 *Oncorhynchus mykiss* 96 h semi-static 1
484 mg/L LC50 *Oncorhynchus mykiss* 96 h flow-through 1

Water Flea Data: 560 mg/L EC50 *Daphnia magna* 48 h

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Mobility: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Ethyl Acetate	None	None	None	U112 Ignitable waste

14. TRANSPORT INFORMATION

DOT

UN-No: UN1173
Proper Shipping Name: Ethyl acetate
Hazard Class: 3
Subsidiary Risk: Not applicable
Packing Group: II
Marine Pollutant: No data available
ERG No: 129
DOT RQ (lbs): No information available
Symbol(s): R5

TDG (Canada)

UN-No: UN1173
Proper Shipping Name: Ethyl acetate
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

14. TRANSPORT INFORMATION

ADR

UN-No:	UN1173
Proper Shipping Name:	Ethyl acetate
Hazard Class:	3
Packing Group:	II
Subsidiary Risk:	No information available
Classification Code:	No information available
Description:	No information available
CEFIC Tremcard No:	No information available

IMO / IMDG

UN-No:	UN1173
Proper Shipping Name:	Ethyl acetate
Hazard Class:	3
Subsidiary Risk:	No information available
Packing Group:	II
Description:	No information available
IMDG Page:	No information available
Marine Pollutant	No information available
EMS:	F-E
MFAG:	No information available
Maximum Quantity:	No information available

RID

UN-No:	UN1173
Proper Shipping Name:	Ethyl acetate
Hazard Class:	3
Subsidiary Risk:	3
Packing Group:	II
Classification Code:	No information available
Description:	No information available

ICAO

UN-No:	UN1173
Proper Shipping Name:	Ethyl acetate
Hazard Class:	3
Subsidiary Risk:	No information available
Packing Group:	II
Description:	No information available

IATA

UN-No:	UN1173
Proper Shipping Name:	Ethyl acetate
Hazard Class:	3
Subsidiary Risk:	No information available
Packing Group:	II
ERG Code:	3L
Description:	No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Ethyl Acetate	Present	Present KE-00047	Present	Present (2)-726	Present	Present	Present 205-500-4

U.S. Regulations

Ethyl Acetate

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
RI RTK - Hazardous Substances List: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
 5000 lb RQ
 1 lb RQ
Louisiana Reportable Quantity List for Pollutants: 5000lbfinal RQ
 2270kgfinal RQ
California Directors List of Hazardous Substances: Present
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 182.60

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Ethyl Acetate	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
Ethyl Acetate	5000 lb final RQ 2270 kg final RQ	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Ethyl Acetate	Not Applicable	Not Applicable

Canada

WHMIS hazard class:

B2 Flammable liquid

Ethyl Acetate

B2

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Components	WHMIS Ingredient Disclosure List -
Ethyl Acetate	1 %

Inventory

Components	Canada (DSL)	Canada (NDSL)
Ethyl Acetate	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Ethyl Acetate	Not listed	Not listed

EU Classification

R-phrase(s)

R11 - Highly flammable.

R36 - Irritating to eyes.

R66 - Repeated exposure may cause skin dryness or cracking.

R67 - Vapors may cause drowsiness and dizziness.

S -phrase(s)

S16 - Keep away from sources of ignition - No smoking.

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S33 - Take precautionary measures against static discharges.

Components	Classification	Concentration Limits:	Safety Phrases
Ethyl Acetate	F; R11 Xi; R36 R66 R67	No information	S2 S16 S26 S33

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

F - Highly flammable.

Xi - Irritant.



16. OTHER INFORMATION

16. OTHER INFORMATION

NFPA	HMIS	Personal Protective Equipment
------	------	-------------------------------



Health Hazard	2
Fire Hazard	3
Reactivity	0



See Section 8.

Preparation Date: 5/1/2014
Revision Date: 5/1/2014
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet



Manufacturer

Product Covered: ET105, Ethyl Acetate, NF

Spectrum takes ownership as the manufacturer for the Spectrum product listed above and provides full quality assurance, customer service, and technical product support.

While information concerning the raw material manufacturer of our starting materials is considered proprietary, such information can be made available upon request contingent on demonstration of business volume justification and successful execution of confidential disclosure agreement (CDA).

Requests for disclosure of proprietary raw material manufacturer information may be submitted to the assigned account representative for consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan Wang", is written over a light gray rectangular background.

Alan Wang, MSQA, ASQ CQA
Senior Manager of Technical Services
techservices@spectrumchemical.com

31.May.2016

Certificate of Registration

Intertek

This is to certify that the quality management system of

Spectrum Chemicals and Laboratory Products, Inc

Main Site: 14422 South San Pedro Street, Gardena, California, 90248, USA

Additional Sites: 13915 South Main Street, Los Angeles, California, 90061, USA

755 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

769 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

7400 North Oracle Road, Suite 221, Tucson, Arizona, 85704, USA

has been assessed and registered by Intertek as conforming to the requirements of

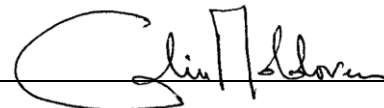
ISO 9001:2008

The quality management system is applicable to

California and New Jersey sites: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.

Arizona site: Supporting Spectrum's two manufacturing facilities by: selecting and qualifying distributors of Laboratory and Safety Equipment; processing bids and quotes to generate new sales opportunities; sourcing bulk chemicals in support of bulk bids and quotes; assisting production operations through order expediting and IT infrastructure support.

Certificate Number: 94-316m-01
Initial Certification Date: 27 December 1994
Certificate Issue Date: 29 January 2016
Certificate Expiry Date: 14 September 2018



Calin Moldovean, President
Intertek Testing Services NA, Inc.
900 Chelmsford Street, Suite 301-3, Lowell, MA, USA



In the issuance of this certificate, Intertek assumes no liability to any party other than to the Client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The certificate remains the property of Intertek, to whom it must be returned upon request.

CT-ISO 9001-2008-ANAB-EN-LT-L-26.jun.15

Certificate of Registration

Intertek

This is to certify that the quality management system of

Spectrum China Ltd.

Building A20, No. 3802, Shengang Road, Songjiang District, Shanghai, China

has been assessed and registered by Intertek as conforming to the requirements of

ISO 9001: 2008

The quality management system is applicable to:

Provision of service of purchase, testing and sales for chemical products, repacking of non-hazardous chemical products.

Organization Code: 77762704-8
Certificate Number: 111310001-01
Certificate Issue Date: 17 November 2015
Certificate Expiry Date: 14 September 2018



014

A handwritten signature in black ink, appearing to read 'Calin Moldovean'.

*Authorised Signature: Calin Moldovean – President, Business Assurance
Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom*
Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

In the issuance of this certificate, Intertek assumes no liability to any party other than to the client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.
The annual validity of the certificate can also be checked through the website <http://www.cnca.gov.cn> of CNCA in China.



The certificate remains the property of Intertek, to whom it must be returned upon request.



March 28, 2016

Certificate of cGMP

Dear Valued Customer:

Spectrum Chemicals and Laboratory Products certify that our USP, NF, FCC, EP, BP, JP, and food grade products are produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Spectrum is an FDA registered and inspected drug establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA:	<u>2020632</u>
Spectrum-New Brunswick, NJ:	<u>2246824</u>
Spectrum -Shanghai, China:	<u>3006174778</u>

Thank you for your interest with Spectrum products. Please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,

A handwritten signature in cursive script that reads "Michelle Weston".

Michelle Weston
Quality Assurance Specialist



May 23, 2016

Certificate of cGMP

Dear Valued Customer:

Spectrum Chemicals and Laboratory Products certify that the following product(s) is produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Catalog Number	Product Name
ET105	Ethyl Acetate, NF

Spectrum is an FDA registered and inspected drug establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA: 2020632
Spectrum-New Brunswick, NJ: 2246824
Spectrum-Shanghai, China: 3006174778

Thank you for your interest with Spectrum products. Please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,

Michelle Weston
Quality Assurance Specialist



May 25, 2016

Re: Ethyl Acetate, NF- ET105

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding Bovine Spongiform Encephalopathy (BSE). Please be assured that the chemical

Ethyl Acetate, NF- ET105

is BSE/TSE free.

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature



May 26, 2016

Re: Ethyl Acetate, NF-ET105

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding the presence of allergens in raw materials. Please be assured that the following chemical does not contain (Milk; Egg; Fish; Shellfish; Tree nuts; Wheat; Peanuts; Soy).

Ethyl Acetate, NF-ET105

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature



May 25, 2016

Re: Ethyl Acetate, NF- ET105

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfg. Corp. understand the concern regarding Aflatoxins in raw materials. To the best of our knowledge, the product listed below is not contaminated with Aflatoxins. Aflatoxins are not used in production. The following product does not come in contact with Aflatoxins at any stage of production.

Ethyl Acetate, NF- ET105

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature

Label Information

The Spectrum label presents technical and safety information in an easily understood format. Our technical specialists stay abreast of the latest requirements of the Globally Harmonized System for Classification and Labelling of Chemicals (GHS), as well as the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA) and other government regulatory agencies in order to ensure compliance, accuracy and concise hazard communication.

A **DANGER**

- Highly flammable liquid and vapor
- Causes serious eye irritation
- May cause respiratory irritation
- May cause drowsiness or dizziness.

• Keep away from heat, sparks, open flames, hot surfaces

• No smoking • Ground container and receiving equipment

• Use explosion-proof equipment • Use only non-sparking tools • Take precautionary measures against static discharge • Wear protective gloves, eye protection, face protection • Avoid breathing mist or vapors • Use only outdoors or in a well-ventilated area • Wash face, hands and any exposed skin thoroughly after handling.

FIRST AID: 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 attention. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IN CASE OF FIRE: Use dry chemical, water spray, alcohol-resistant foam or CO₂ to extinguish.

L Retest Date: 03-31-2025

J **KEEP FROM CHILDREN**

SPECTRUM[®]

ET105 **D** **F** **4 L**

E **Ethyl Acetate**

(Acetic Ether)

N.F.

G **CAS 141-78-6**

H **CAUTION:** For manufacturing, processing or repacking.
Read and understand the label and Safety Data Sheet (SDS) prior to use.

I DOT: UN1173, Ethyl acetate, 3, PG II

Chemical Emergency: (800)424-9300

www.SpectrumChemical.com

K **C₄H₈O₂** **F.W. 88.11**

Assay 99.0-100.5%

Specific Gravity @ 25°C 0.894-0.898

Acidity To pass test

Chromatographic Purity Min. 99.5%

MAXIMUM LIMITS

Nonvolatile Residue 0.02%

Readily Carbonizable Substances
..... To pass test

Methyl Compounds To pass test

Residual Solvents To pass test

M Lot No. 062233

R 10/E11GHS **A** **O**

SPECTRUM CHEMICAL MFG. CORP. Gardena, CA 90248 • New Brunswick, NJ 08901

- | | | |
|---|--|---|
| A Bar Code | F Size/Quantity | K Empirical Formula, Formula Weight and Technical Specifications Panel |
| B GHS Hazard Pictograms | G Chemical Abstracts Service (CAS) Registry Number | L Expiration Information |
| C Warning, Safety Data and Precautionary Information | H Caution Information | M Lot Number |
| D Product Catalog Number | I DOT Shipping Information | N Kosher Certified by Kosher Supervision of America (KSA). |
| E Item Name, Form, Grade | J Toll-Free 24-Hour Chemical Emergency Telephone Number | |
| O Storage Color Band | | |

This color-coded band indicates the hazard most likely to be posed by that material under storage conditions. The criteria used to assign band colors have been established by the Storage Code working group of the Society for Chemical Hazard Communication (SCHC). It is recommended that like colors be stored together, unless otherwise stated, based on the color codes indicated to the right. However, it is the responsibility of the customer to check with their local fire department for possible conflicts with our recommendations when storing hazardous chemicals.

- YELLOW:** Oxidizer
- RED:** Flammable
- GREEN:** General Storage
- BLUE:** Health Hazard
- WHITE:** Corrosive

Spectrum Chemical Mfg Corp

Corporate Headquarters:

769 Jersey Ave.
New Brunswick, NJ 08901

732.214.1300

West Coast Facility:

14422 S. San Pedro St.
Gardena, CA 90248

310.516.8000

Item Number	ET105	Lot Number	1EL0015
Item	Ethyl Acetate, NF		
CAS Number	141-78-6		
Molecular Formula	C ₄ H ₈ O ₂	Molecular Weight	88.11

Test	Specification		Result
	min	max	
ASSAY (CH ₃ COOC ₂ H ₅)	99.0	100.5 %	99.9 %
SPECIFIC GRAVITY @ 25 ^o C	0.894	0.898	0.897
ACIDITY		TO PASS TEST	PASSES TEST
CHROMATOGRAPHIC PURITY	99.5 %		99.94 %
NONVOLATILE RESIDUE		0.02 %	0.00 %
READILY CARBONIZABLE SUBSTANCES		TO PASS TEST	PASSES TEST
METHYL COMPOUNDS		TO PASS TEST	PASSES TEST
IDENTIFICATION		TO PASS TEST	PASSES TEST
RETEST DATE			20-NOV-2017
MANUFACTURE DATE			20-NOV-2015
APPEARANCE			CLEAR COLORLESS LIQUID
RESIDUAL SOLVENTS:		TO PASS TEST	.
CLASS 1 (solvent) / BENZENE			<2 ppm
CLASS 1 (solvent) / CARBON TETRACHLORIDE			<4 ppm
CLASS 1 (solvent) / 1,1-DICHLOROETHENE			<8 ppm
CLASS 1 (solvent) / 1,1,1-TRICHLOROETHANE			<1500 ppm
CLASS 2 (solvent) / ACETONITRILE			<410 ppm
CLASS 2 (solvent) / CHLOROBENZENE			<360 ppm
CLASS 2 (solvent) / CHLOROFORM			<60 ppm
CLASS 2 (solvent) / CYCLOHEXANE			<3880 ppm
CLASS 2 (solvent) / 2-ETHOXYETHANOL			<160 ppm
CLASS 2 (solvent) / HEXANE			<290 ppm
CLASS 2 (solvent) / 2-METHOXYETHANOL			<50 ppm
CLASS 2 (solvent) / METHYLCYCLOHEXANE			<1180 ppm
CLASS 2 (solvent) / METHYLENE CHLORIDE			<600 ppm
CLASS 2 (solvent) / NITROMETHANE			<50 ppm
CLASS 2 (solvent) / TETRAHYDROFURAN			<720 ppm
CLASS 2 (solvent) / TETRALIN			<100 ppm
CLASS 2 (solvent) / TOLUENE			<890 ppm
CLASS 2 (solvent) / TRICHLOROETHENE			<80 ppm
CLASS 2 (solvent) / XYLENE			<2170 ppm
CLASS 3 (solvent) / ETHANOL			<5000 ppm
CLASS 3 (solvent) / ETHYL ETHER			<5000 ppm
CLASS 3 (solvent) / HEPTANE			<5000 ppm
CLASS 3 (solvent) / ISOBUTYL ACETATE			<5000 ppm
CLASS 3 (solvent) / ISOPROPYL ACETATE			<5000 ppm
CLASS 3 (solvent) / 2-METHYL-1-PROPANOL			<5000 ppm
CLASS 3 (solvent) / 1-PROPANOL			<5000 ppm
CLASS 3 (solvent) / 2-PROPANOL			<5000 ppm

CLASS 3 (solvent) / PROPYL ACETATE			<5000 ppm
CLASS 3 (solvent) / ACETIC ACID			<5000 ppm

Spectrum Chemical Mfg Corp
14422 South San Pedro Street
Gardena 90248 CA

Certificate of Analysis Results Certified By:



Adan Hernandez
Quality Control Manager
Spectrum Chemicals & Laboratory Products



All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

Item Number	ET105	Lot Number	2FC0492
Item	Ethyl Acetate, NF		
CAS Number	141-78-6		
Molecular Formula	C ₄ H ₈ O ₂	Molecular Weight	88.11

Test	Specification		Result
	min	max	
ASSAY (CH ₃ COOC ₂ H ₅)	99.0	100.5 %	99.4 %
SPECIFIC GRAVITY @ 25°C	0.894	0.898	0.897
ACIDITY		TO PASS TEST	PASSES TEST
CHROMATOGRAPHIC PURITY	99.5 %		99.94 %
NONVOLATILE RESIDUE		0.02 %	0.00 %
READILY CARBONIZABLE SUBSTANCES		TO PASS TEST	PASSES TEST
METHYL COMPOUNDS		TO PASS TEST	PASSES TEST
IDENTIFICATION		TO PASS TEST	PASSES TEST
RETEST DATE			27-FEB-2018
MANUFACTURE DATE			27-FEB-2016
APPEARANCE			CLEAR COLORLESS LIQUID
RESIDUAL SOLVENTS:		TO PASS TEST	.
RESIDUAL SOLVENTS:			.
CLASS 1 (solvent) / BENZENE			<2 ppm
CLASS 1 (solvent) / CARBON TETRACHLORIDE			<4 ppm
CLASS 1 (solvent) / 1,1-DICHLOROETHENE			<8 ppm
CLASS 1 (solvent) / 1,1,1-TRICHLOROETHANE			<1500 ppm
CLASS 2 (solvent) / ACETONITRILE			<410 ppm
CLASS 2 (solvent) / CHLOROBENZENE			<360 ppm
CLASS 2 (solvent) / CHLOROFORM			<60 ppm
CLASS 2 (solvent) / CYCLOHEXANE			<3880 ppm
CLASS 2 (solvent) / 2-ETHOXYETHANOL			<160 ppm
CLASS 2 (solvent) / HEXANE			<290 ppm
CLASS 2 (solvent) / 2-METHOXYETHANOL			<50 ppm
CLASS 2 (solvent) / METHYLCYCLOHEXANE			<1180 ppm
CLASS 2 (solvent) / METHYLENE CHLORIDE			<600 ppm
CLASS 2 (solvent) / NITROMETHANE			<50 ppm
CLASS 2 (solvent) / TETRAHYDROFURAN			<720 ppm
CLASS 2 (solvent) / TETRALIN			<100 ppm
CLASS 2 (solvent) / TOLUENE			<890 ppm
CLASS 2 (solvent) / TRICHLOROETHENE			<80 ppm
CLASS 2 (solvent) / XYLENE			<2170 ppm
CLASS 3 (solvent) / ACETIC ACID			<5000 ppm
CLASS 3 (solvent) / ETHANOL			<5000 ppm
CLASS 3 (solvent) / ETHYL ETHER			<5000 ppm
CLASS 3 (solvent) / HEPTANE			<5000 ppm
CLASS 3 (solvent) / ISOBUTYL ACETATE			<5000 ppm
CLASS 3 (solvent) / ISOPROPYL ACETATE			<5000 ppm
CLASS 3 (solvent) / 2-METHYL-1-PROPANOL			<5000 ppm

CLASS 3 (solvent) / 1-PROPANOL			<5000 ppm
CLASS 3 (solvent) / 2-PROPANOL			<5000 ppm
CLASS 3 (solvent) / PROPYL ACETATE			<5000 ppm

Spectrum Chemical Mfg Corp
755 Jersey Avenue
New Brunswick 08901 NJ

Certificate of Analysis Results Certified By:



A handwritten signature in blue ink, appearing to read 'Mulbah F. Dwanah'.

Mulbah F. Dwanah
Laboratory Supervisor
Spectrum Chemicals & Laboratory Products

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

January 26, 2016

RE: Lot Numbering System

Dear Valued Customer:

This letter is to inform you of Spectrum Chemicals and Laboratory Products' Lot Numbering System. The system is based on an alpha-numerical sequence which provides the month, year and location of production.

The lot numbering system utilized until 2010 is a sequence of **six characters**, two letters followed by four numbers. The first letter represents the year, for example, Y denotes 2009 and Z denotes 2010. The second letter represents the month and site, for example, A-L denotes January through December at Spectrum's Gardena, CA facility, while M-X denotes January through December at the New Brunswick, NJ facility. The following four numbers are sequentially assigned.

Example: ZI0928 = The 928th material produced in California in September 2010

The lot numbering system utilized for 2011 and forward, is a sequence of **seven characters**. The first character, a number, represents the production facility:

- 1 = Gardena, CA Facility
- 2 = New Brunswick, NJ Facility
- 3 = China Facility

The second character, a letter, represents the year. For example, A denotes 2011 and B denotes 2012. The third character, a letter, represents the month, with A denoting January and L denoting December. The following four numbers are sequentially assigned.

Example: 2AA0706 = The 706th material produced in New Jersey in January 2011

Thank you for your interest with Spectrum products. Please feel free to contact us at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,



Michael Dang
Manager, GMP Compliance



Stability – Shelf Life Guidance

Product Covered: ET105, Ethyl Acetate, NF

Spectrum Chemical's manufacturing partner has assigned the following shelf life guidance for the product listed above.

The product, ET105, Ethyl Acetate, NF, is assigned a 24 months shelf life from date of manufacturing. The quality and integrity of the chemical depends on the handling and storage conditions. Please refer to the Safety Data Sheet for proper storage and handling procedures.

Adan R. Hernandez
Quality Control Manager

A handwritten signature in black ink that reads "Adan R. Hernandez".

Corporate Headquarters
769 Jersey Avenue
New Brunswick, NJ 08901-3605