

Material Safety Data Sheet

1. Product and Company Information

Product name	: Mixed Cellulose Esters Membrane Filter
Company	: Toyo Roshi Kaisha, Ltd.
Head office	: 1-18-10 Otowa, Bunkyo-ku, Tokyo, 112-0013 Japan
Section in charge	: Haga plant
Phone	: 81-(0)28-677-5245
Fax	: 81-(0)28-677-5248
Emergency contact number	: Same as above
Recommended application and limitation	: Membrane Filter
Reference No.	: ME-7001J-23

2. Hazard Summary

GHS Classification

Physical hazard

Flammable solids : Category 1

Human health hazard

Acute toxicity : (Oral) Not classified

Environmental hazard : Classification not possible

Label element

Pictograms or symbols :



Signal words : Danger

Hazard statements : Flammable solids

Precautionary statements : Easy to burn and fast burning speed. The handling place shall be well-ventilated place, and fire is banned.
Keep away from materials that induce mixed explosion, such as oxidant, acid, base, and combustible agent.
Avoid ignition source for decomposition explosion, such as a blow, static electricity, shock, and heat.
Do not crush the membrane filters into powder as there is a possibility to explode when the dust mixes with air.
Take appropriate measure for prevention of static electricity (earth, electrically-conducting material, inert gas, antistatic work clothes, etc.)
Direct sunlight and damp air stimulate spontaneous ignition.
Keep in airtight container. Keep in a cool and dry room.
Ideal to replace air in the container with inert gas.
Avoid long-term storage and strictly follow the expiration date.

3. Composition and Information on ingredients

Single substance/Mixtures	: Mixtures
Chemical name or general name	: Membrane Filter
Ingredients and content	: Cellulose nitrate (Filter) Cellulose acetate (Filter) Wetting agent (Wetting agent)
Chemical formula or structural formula	: Cellulose nitrate $[C_6H_7O_2(OH)_{3-X}(ONO_2)_X]_n$ Cellulose acetate $[C_6H_7O_2(OH)_{3-X}(CH_3COO)_X]_n$
Reference Number in Gazetted List in Japan	
Law Concerning the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.	: Cellulose nitrate (8)-176 Cellulose acetate (8)-165
CAS No.	: Cellulose nitrate 9004-70-0 Cellulose acetate 9004-35-7
UN Classification	: Class 4.1 UN packing group II
UN No.	: 3270 (NITROCELLULOSE MEMBRANE FILTERS, with not more than 12.6 % nitrogen, by dry mass)

4. First Aid Measures

Eye contact	: Immediately wash thoroughly with clean running water. In case of abnormality, see a doctor.
Skin contact	: Not applicable
Inhalation	: Not applicable
Ingestion	: Spit it out immediately being cautious to not suffocate due to throat blockage.

5. Fire Fighting Measures

Extinguishing procedure	: Possibility of rapid spreading of fire. Find a safe place. Spraying a copious amount of water is effective. When extinguishing fire, secure a safe place and wear self-contained-compressed air breathing apparatus and gas-preventive protective wear. If stopping fuel source supply to fire origin is unavailable, fire spreading may be prevented by cooling surrounding buildings with a copious amount of water and by letting the fire burnout. (Cellulose nitrate)
Unacceptable extinguishing media	: No data available.
Extinguishing media	: A copious amount of water (spray), foam fire-extinguisher, and sand.

6. Accidental Release Measures

Personal precautions	: No data available.
Protective equipment and emergency procedures	: No data available.
Precautions for environment	: No data available.
Collection/neutralization	: No data available.
Prepare fire extinguishing measure for prevention of fire breakout. Collect all materials while spraying mist water. In case of disposal, follow the instruction described under [Disposal Considerations].	

7. Handling and Storage

Follow corresponding regulations such as Industrial Safety and Health Law and Fire Defense Law.

Handling : Easy to burn and fast burning speed. The handling place shall be well-ventilated place, and fire is banned.

Keep away from materials that induce mixed explosion, such as oxidant, acid, base, and combustible agent.

Avoid ignition source for decomposition explosion, such as a blow, static electricity, shock, and heat.

Take appropriate measure for prevention of static electricity (earth, electrically-conducting material, inert gas, antistatic work clothes, etc.)

Storage : Direct sunlight and damp air stimulate spontaneous ignition. Keep in airtight container. Keep in a cool and dry room.

Ideal to replace air in the container with inert gas.

Avoid long-term storage and strictly follow the expiration date.

If a total stored amount exceeds 10 kg, follow Fire Defense Law
(hazardous material) (Cellulose nitrate)

8. Exposure controls / Personal protection

Administrative concentration : None.

Acceptable concentration	Japan Society for Occupational Health	:	_____
	ACGIH	:	_____

Facility provision : _____

Protective equipment : Use appropriate protective tools if necessary. (antistatic safety shoes, antistatic work clothes, etc.)

9. Physical and Chemical Properties

Appearance (Physical property, shape, color, etc.) : White porous film

Odour : None.

pH : No data available.

Melting point /Freezing point : No data available.

Flash point : No data available.

Explosive limit Upper limit : No data available.

Lower limit : No data available.

Relative density : 1.55-1.70 (Cellulose nitrate)

1.3 (Cellulose acetate)

Solubility : Insoluble to water (Wetting agent is soluble.)

Soluble to ester, ketone, and alcohol

(Cellulose nitrate)

Spontaneous ignition point : $\geq 180^{\circ}\text{C}$ (Cellulose nitrate)

340 - 390°C (Cellulose acetate)

Decomposition temperature : No data available.

Flammability (Solid, gas) : Yes.

Other : NO and NO₂ are generated during storage.

Generates NO_x during burning.

When wet material is dried, it may start burning. (Cellulose nitrate)

10. Stability and Reactivity

Stability, Reactivity	: If contacting to oxidant, acid, or base, reacts intensively and generates NOx.(Cellulose nitrate)
Possibility of hazardous reactions	: Easily ignite by catching a fire. It may suddenly ignite or explode by contacting oxidant, acid, base, or combustible agent. It may suddenly ignite or explode by a blow, static electricity, shock, or heat. Easy to oxidize under high temperature and high humidity environment, which induces higher possibility for spontaneous ignition. When wet material is dried, it may start burning.
Dust explosibility	:In powder foam, possibility of dust explosion by mixing with air. (Cellulose nitrate)
Conditions to avoid	: Fire, high temperature, high humidity, blow, electrostatic, shock, and/or heat. (Cellulose nitrate)
Incompatible materials	:Contacting to oxidant, acid, base, and/or combustible agent. (Cellulose nitrate)
Hazardous decomposition products	: If contacting to oxidant, acid, or base, reacts intensively and generates NOx. NO and NO ₂ are generated during storage. Generates NOx during burning. (Cellulose nitrate)

11. Toxicological Information

Acute toxicity	: (Oral) Not classified (as mixtures) (as a single substance) Not classified ORL-RAT,MUS LD ₅₀ >5,000 mg/kg (Cellulose nitrate, Cellulose acetate) : (Skin absorption) Classification not possible due to lack of data. : (Inhalation: gas) Classification not possible due to lack of data. (as mixtures) (as a single substance) Not classified (Cellulose nitrate) : (Inhalation: vapour) Classification not possible due to lack of data. : (Inhalation: dust, mist) Classification not possible due to lack of data.
Skin corrosion/ Irritation	: Classification not possible due to lack of data. (as mixtures) (as a single substance) Classification not possible due to lack of data. However there is a possibility of irritability when comes in contact with the skin. (Cellulose nitrate)

Serious eye damage and eye irritation	: Classification not possible due to lack of data. (as mixtures) (as a single substance) Classification not possible due to lack of data. However there is a possibility of irritability when comes in contact with eyes. (Cellulose nitrate)
Respiratory/ Skin sensitization	: Classification not possible due to lack of data.
Germ cell mutagenicity	: Classification not possible due to lack of data.
Carcinogenicity	: Classification not possible due to lack of data.
Reproductive toxicity	: Classification not possible due to lack of data.
Specific target organ toxicity - Single exposure	: Classification not possible due to lack of data. (as mixtures) (as a single substance) Category 3 Respiratory tract irritation, risk of irritation to respiratory Possibility of irritable throat, vertigo, breathing difficulties and loss of consciousness in high densities. There are currently no concrete reports.(Cellulose nitrate)
Specific target organ toxicity - Repeated exposure	: Classification not possible due to lack of data.
Aspiration hazard	: Classification not possible due to lack of data.
Other	: No data available.

12. Ecological Information

Ecotoxicity

Hazardous to the aquatic environment (acute)

: Classification not possible due to lack of data.(as mixtures)
 (as a single substance)
 Not classified Selenastrum 96H EC₅₀=579mg/L
 (Cellulose nitrate)

Hazardous to the aquatic environment (chronic)

: Classification not possible due to lack of data. (as mixtures)
 (as a single substance)
 Not classified (Cellulose nitrate)

Persistence and degradability	: No data available.
Bioaccumulative potential	: No data available.
Mobility in soil	: No data available.
Ozone layer hazard	: Classification not possible due to lack of data.
Others	:Do not dispose or release to ocean or any other water area preventing environmental contamination and intake by marine and bird life.

13. Disposal Considerations

For safety purposes have water at a close distance while incinerating small amounts at a time.
 (Cellulose nitrate)

Dispose in accordance with federal, state and local regulations.

Just like disposal of general industrial waste, ask for industrial waste disposer accepted by prefectural governors or for a local public agency for disposal.

When incinerating the material, use the specific incineration facility. Take appropriate procedure that satisfies Clean Air Act, Waste Disposal and Public Cleaning Law, and Clean Water Law. (We recommend disposing the material as industrial waste.)

14. Transport Information

UN Recommendation on the Transport of Dangerous Goods and Model Regulations

Material name : NITROCELLULOSE MEMBRANE FILTERS, with not more than
 12.6 % nitrogen, by dry mass

UN No. : 3270

Class : 4.1

UN packing group : II

Japanese regulations regarding transportation

: Follow Fire Defense Law, Aviation Law, and Ships Safety Law

15. Regulatory Information

Japan

Fire Defense Law : Article 9-4 (Standard for storage and handling of hazardous material with less than specified amount), Government ordinance regarding hazardous material regulations, Article 1-11, Attached table 3 and 5 (Class I self-reactive material, Fire Defense Law applicable for the material with 10 kg or more. If less than 10 kg, standards for storage and handling of the material are set by local authority.)(Cellulose nitrate)

Aviation Law : Article 194 hazardous material-flammable material(H-2)

Ships Safety Law : Regulations for the Carriage and Storage of Dangerous Goods in Ships
 Articles 2 Division 4.1 flammable material (4.1 packing group II)

Port Regulations Law : Article 12 hazardous material(flammable materials)

Industrial Safety and Health Law

: Enforcement order separate table Article 1 Section 1, Hazardous and explosive material (1 Nitrocellulose)

Article 57 Cabinet order 18, "Hazardous substances that names are to be displayed" (Cabinet order 25-3 cellulose nitrate)

Article 57-2 Cabinet order 18-2, Appendix 9 "Hazardous substances that names are to be reported" (Cabinet order 424 cellulose nitrate)

Other countries

Ensure that this product complies with federal, state and local regulations.

16. Other information

Handling of written contents

Contents of this data sheet are based on materials, information, and data acquirable at this point and are subject to revision due to new knowledge.

In addition, contents such as contained amount, physical and chemical properties, and hazards identification are not subject of any guarantee. These precautions are applied only during standard handling. If the material is used in a special way, take appropriate safety measures that correspond to actual applications and usages.

Each user is responsible to take appropriate measures with due consideration of contents in this sheet.

Please note that this Material Safety Data Sheet is created according to Japanese law.

List of references

- Material Safety Data Sheet – 1st edition: Order of contents and items (JIS Z 7250: 2010)
 - Globally Harmonized System of Classification and Labeling of Chemicals (GHS) 3rd revised edition (2009)
 - Globally Harmonized System Classification Manual [Oct. 20 2005 version] Editor by GHS-relevant ministries and conference
 - GHS-compliant labels and MSDS preparation manual by Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour & Welfare
 - GHS classification database by National Institute of Technology and Evaluation
 - Bretherick's Handbook of Reactive Chemical Hazards (Translated by Masamitsu Tamura, Maruzen)
 - Relational Information System for Chemical Accidents Database (<http://riodb.ibase.aist.go.jp/riscad/>)
 - Katsumi Katoh et al. "Study on the spontaneous ignition of cellulose nitrate-the effect of the type of the storage atmosphere (II)," Science and Technology of Energetic Materials, 65, Page 77 through 81, (2004)
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