SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision date 26-Feb-2024
Revision Number 3.05

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name	Ligroin
Product Code	124-05335,120-05337

Supplier
FUJIFILM Wako Pure Chemical Corporation
1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan
Phone: +81-6-6203-3741
Fax: +81-6-6203-2029

Emergency telephone number +81-6-6203-3741 / +81-3-3270-8571

Recommended uses For research use only

Restrictions on use Seek expert judgment when using for purposes other than those recommended.

Section 2: HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture

Flammable liquids	Category 2
Acute toxicity - Inhalation (Vapors)	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Specific target organ toxicity (single exposure)	Category 3
Category 3 Respiratory irritation, Narcotic effects	
Specific target organ toxicity (repeated exposure)	Category 1
Category 1 nervous system	
Aspiration hazard	Category 1

Pictograms

Signal word Danger

Hazard statements

H225 - Highly flammable liquid and vapor
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H336 - May cause drowsiness or dizziness
H304 - May be fatal if swallowed and enters airways
H372 - Causes damage to the following organs through prolonged or repeated exposure: nervous system

Precautionary statements-(Prevention)

- Use only outdoors or in a well-ventilated area
- Wash face, hands and any exposed skin thoroughly after handling
- Wear protective gloves/protective clothing/eye protection/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, hot surfaces, sparks, open flames and other ignition sources. No smoking
- Keep container tightly closed
- Ground/bond container and receiving equipment
- Use explosion-proof electrical/ ventilating / lighting / equipment
- Use only non-sparking tools
- Take precautionary measures against static discharge
- Keep cool

Precautionary statements-(Response)

- Get medical advice/attention if you feel unwell
- 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 skin irritation occurs: Get medical advice/attention
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- Wash contaminated clothing before reuse
- 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
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- Do NOT induce vomiting
- In case of fire: Use suitable extinguishing media for extinction

Precautionary statements-(Storage)

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

Precautionary statements-(Disposal)

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

Others

Other hazards Not available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Single Substance or Mixture Mixture

Chemical Name	Weight-%	Molecular weight	ENCS	ISHL No.	CAS RN
Ligroin	90	N/A	N/A	N/A	N/A-12-0533-12

Note on ISHL No.: * in the table means announced chemical substances.

Substances Remarks: Ligroin components:3-Methylpentane, n-Hexane, Methylcyclopentane, 2-Methylhexane, 3-Methylhexane, Cyclohexane, n-Heptane, Methylcyclohexane, Benzene, Toluene.

Section 4: FIRST AID MEASURES

Inhalation

Remove to fresh air. If symptoms persist, call a physician.

Skin contact

Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.

Eye contact

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

Ingestion

Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice.

Protection of first-aiders

Use personal protective equipment as required.

Section 5: FIRE FIGHTING MEASURES

Suitable extinguishing media

Carbon dioxide (CO2), Foam, Extinguishing powder, Sand

Unsuitable extinguishing media

No information available

Specific hazards arising from the chemical product

Thermal decomposition can lead to release of irritating and toxic gases and vapors. Vapors may form explosive mixtures with air

Special extinguishing method

No information available

Special protective actions for fire-fighters

Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind.

Environmental precautions

To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for contaminent and methods and materials for cleaning up

Absorb dry sand, earth, sawdust and the waste. Collect empty container that can be sealed.

Recoverly, neutralization

No information available

Secondary disaster prevention measures

Clean contaminated objects and areas thoroughly observing environmental regulations.

Section 7: HANDLING AND STORAGE

Handling

Technical measures

Highly flammable. Avoid contact with high temperature objects, spark, and strong oxidizing agents. Use with local exhaust ventilation.

Precautions

Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging. Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle. In places other than those specified, should not be smoking or eating and drinking. Should not be brought contaminated protective equipment and gloves to rest stops. Deny unnecessary entry of non-emergency personnel to the handling area.

Safety handling precautions

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

Storage

Safe storage conditions

Storage conditions	Keep container protect from light, store in well-ventilated place at room temperature (preferably cool). Keep container tightly closed.
Safe packaging material	Glass
Incompatible substances	Strong oxidizing agents

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand-

and eye-wash facility. And display their position clearly.

Exposure limits

Chemical Name	JSOH (Japan)	ISHL (Japan)	ACGIH
n-Heptane 142-82-5	TWA: 200 ppm OEL TWA: 820 mg/m³ OEL	N/A	STEL: 500 ppm TWA: 400 ppm
2-Methylhexane 591-76-4	N/A	N/A	STEL: 500 ppm TWA: 400 ppm
Methylcyclohexane 108-87-2	TWA: 400 ppm OEL TWA: 1600 mg/m³ OEL	N/A	TWA: 400 ppm
3-Methylhexane 589-34-4	N/A	N/A	STEL: 500 ppm TWA: 400 ppm
Hexane 110-54-3	TWA: 40 ppm OEL TWA: 140 mg/m³ OEL Skin ISHL/ACL: 40 ppm	ISHL/ACL: 40 ppm	TWA: 50 ppm Skin
Cyclohexane 110-82-7	TWA: 150 ppm OEL TWA: 520 mg/m³ OEL	N/A	TWA: 100 ppm
Toluene 108-88-3	TWA: 50 ppm OEL TWA: 188 mg/m³ OEL Skin ISHL/ACL: 20 ppm	ISHL/ACL: 20 ppm	TWA: 20 ppm
Benzene 71-43-2	Skin ISHL/ACL: 1 ppm	ISHL/ACL: 1 ppm	STEL: 2.5 ppm TWA: 0.5 ppm Skin
3-Methylpentane 96-14-0	N/A	N/A	TWA 500ppm, STEL 1000ppm

Personal protective equipment

Respiratory protection gas mask for organic gas (JIS T 8152)
Hand protection chemical protective gloves (JIS T 8116)
Eye protection protective eyeglasses or chemical safety goggles (JIS T 8147)
Skin and body protection Long-sleeved work clothes

General hygiene considerations

Handle in accordance with good industrial hygiene and safety practice.
If this product is classified as ”Chemical Substances Hazardous to Skin, etc.”, use appropriate protective equipment to them.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Form

Color colorless
Turbidity clear
Appearance liquid
Odor characteristic odor
Melting point/freezing point no data available
Boiling point, initial boiling point and boiling range 90 - 125 °C
Flammability Highly flammable liquid and vapor
Evaporation rate: no data available
Flammability (solid, gas): no data available
Upper/lower flammability or explosive limits
Upper： no data available
Lower： no data available
Flash point -20 °C
Auto-ignition temperature: no data available
Decomposition temperature: no data available
pH no data available
Viscosity (coefficient of viscosity) no data available
Dynamic viscosity no data available

Solubilities	Ethanol , Diethyl ether : Very soluble. water : practically insoluble,or insoluble .
n-Octanol/water partition coefficient:(log Pow)	no data available
Vapour pressure	no data available
Specific Gravity / Relative density	0.68 - 0.75 g/mL
Vapour density	no data available
Particle characteristics	no data available

Section 10: STABILITY AND REACTIVITY

Stability

Reactivity no data available
Chemical stability May be altered by light.

Hazardous reactions

None under normal processing

Conditions to avoid

Extremes of temperature and direct sunlight, Heat, flames and sparks, static electricity, spark

Incompatible materials

Strong oxidizing agents

Hazardous decomposition products

Carbon monooxide (CO), Carbon dioxide (CO2)

Section 11: TOXICOLOGICAL INFORMATION

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
n-Heptane	5,000 mg/kg (Mouse)	3,000 mg/kg (Rabbit)	103 g/m^3 (Rat)
Methylcyclohexane	> 1000 mg/kg (Rat)	>86,700 mg/kg (Rabbit)	7500 - 10000 ppm (Rat) 2 h 39.6 - 59.9 mg/L (Rabbit) 70 m
Hexane	15800 mg/kg (Rat)	3297 mg/kg (Rabbit)	48000 ppm (Rat) 4 h
Cyclohexane	> 5000 mg/kg (Rat)	2000 mg/kg (Rat)	>9500 ppmV (Rat) 4h
Toluene	5000 mg/kg (Rat)	12000 mg/kg (Rat)	7460 ppm (Rat) 4 h (vapor)
Benzene	3,400 - 5,600 mg/kg (Rat)	>8,200 mg/kg (Rabbit)	13,700 ppm (Rat)

Chemical Name	Acute toxicity -oral- source information	Acute toxicity -dermal- source information	Acute toxicity -inhalation gas- source information
n-Heptane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Chemical Name	Acute toxicity -inhalation vapor- source information	Acute toxicity -inhalation dust- source information	Acute toxicity -inhalation mist- source information
n-Heptane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Cyclohexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS Classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Skin irritation/corrosion

Chemical Name	Skin corrosion/irritation source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Serious eye damage/ irritation

Chemical Name	Serious eye damage/irritation source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Respiratory or skin sensitization

Chemical Name	Respiratory or Skin sensitization source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Reproductive cell mutagenicity

Chemical Name	germ cell mutagencity source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Carcinogenicity

Chemical Name	Carcinogenicity source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Chemical Name	NTP	IARC	ACGIH	JSOH (Japan)
Toluene 108-88-3	-	Group 3	-	-
Benzene 71-43-2	Known	Group 1	A1	Group 1

Reproductive toxicity

Chemical Name	Reproductive toxicity source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.

Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

STOT-single exposure

Chemical Name	STOT -single exposure- source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

STOT-repeated exposure

Chemical Name	STOT -repeated exposure- source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Aspiration hazard

Chemical Name	Aspiration Hazard source information
n-Heptane	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.
Cyclohexane	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

Chemical Name	Algae/aquatic plants	Fish	Crustacea
n-Heptane	*N/A*	*LC50 : Cichlid Fish 375.0 mg/L 96 h*	*LC50 : Mysidopsis bahia 0.1 mg/L 96 h*
Methylcyclohexane	*N/A*	*N/A*	*EC50 : Daphnia magna 0.33 mg/L 48 h*
Hexane	*N/A*	*LC50:Pimephales promelas 2.1 - 2.98 mg/L 96 h*	*LC50 : Daphnia magna 3.88 mg/L 48 h*
Cyclohexane	*EC50:Pseudokirchneriella subcapitata 0.94 mg/L 72 h*	*N/A*	*EC50: Daphinia magma 0.9 mg/mL 48 h*
Toluene	*EC50:Pseudokirchneriella subcapitata 433 mg/L 96 h*	*LC50:Pimephales promelas 15.22 - 19.05 mg/L 96 h*	*EC50:Ceriodaphnia dubia 3.78 mg/L 48 h*
Benzene	*EC50 : Pseudokirchneriella subcapitata 29 mg/L 72 h*	*LC50 : Oncorhynchus mykiss 5.3 mg/L 96 h* *EC50 : Fathead mino 0.8 mg/L 32 h*	*EC50 : Daphnia magna 8.76 - 15.6 mg/L 48 h*

Other data

Chemical Name	Short-term (acute) hazardous to the aquatic environment source information	Long-term (chronic) hazardous to the aquatic environment source information
n-Heptane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Methylcyclohexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Hexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Cyclohexane	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Toluene	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Benzene	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Persistence and degradability No information available
Bioaccumulative potential No information available
Mobility in soil No information available
Hazard to the ozone layer No information available

Section 13: DISPOSAL CONSIDERATIONS

Waste from residues
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated container and contaminated packaging
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14: TRANSPORT INFORMATION

ADR/RID
UN number UN1268
Proper shipping name: Petroleum distillates, n.o.s.
UN classfication 3
Subsidiary hazard class
Packing group II
Marine pollutant Not applicable

IMDG
UN number UN1268
Proper shipping name: Petroleum distillates, n.o.s.
UN classfication 3
Subsidiary hazard class
Packing group II
Marine pollutant (Sea) Not applicable
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No information available

IATA
UN number UN1268
Proper shipping name: Petroleum products, n.o.s.
UN classfication 3
Subsidiary hazard class
Packing group II
Environmentally Hazardous Substance Not applicable

Section 15: REGULATORY INFORMATION

Japanese regulations
Fire Service Act Category IV, Class I petroleums, dangerous grade 2
Poisonous and Deleterious Substances Control Law Not applicable
Industrial Safety and Health Act Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57)
Notifiable Substances (Law Art.57-2)
Group 2 Specified Chemical Substance
Dangerous Substances - Flammable Substance (Enforcement Order Attached Table 1

	Item 4) Class 2 Organic Solvents (Enforcement Order Attached Table No.6-2, Ordinance on Prevention of Organic Solvent Poisoning Art.1, Para.1, Item 5) Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1)
Industrial Safety and Health Act (2024~)	【2024.4.1~】Chemical Substances Hazardous to Skin, etc.(Regulations Article 594-2 Paragraph 1)
Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc	Priority Assessment Chemical Substances (Law Article 2, Para.5)
Regulations for the carriage and storage of dangerous goods in ship	Flammable Liquids (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1)
Civil Aeronautics Law	Flammable Liquids (Ordinance Art.194, MITL Nortification for Air Transportation of Explosives etc., Attached Table 1)
Marine Pollution Prevention Law	Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Y Dangerous Substances
Pollutant Release and Transfer Register Law (2023.4.1-)	Specified Class 1 No. Class 1
Specified Class 1-No.	400
Class 1 - No.	300, 392, 629, 731
Water Pollution Control Act	Harmful Substances (Law Art.2, Enforcement Order Art.2, Ordinace Designating Wastewater Standards Art.1) Specified substances(Law Art.2 Para.4, Enforcement Order Art.3-3)
Export Trade Control Order	Not applicable
Air Pollution Control Law	Priority Chemical Substances, Specified Substances, Designated Chemical Substances
Soil Contamination Control Law	Designated Hazardous Substances
Offensive Odor Control Law	Specified Offensive Odor Substances

Pollution Release and Transfer Registry (~2023.3.31)

Class	Chemical Name in Regulation	(Metal Name)	Control number	Content Rate
Specified Class 1	Benzene		400	>0.1
Class 1	Toluene		300	>5
Class 1	Hexane		392	>5
Class 1	Cyclohexane		629	>1
Class 1	Heptane		731	>1

Industrial Safety and Health Law

Law Name	Chemical Name in Regulation	Weight %	
Notifiable Substances (Law Art.57-2)	Cyclohexane	>1	
Notifiable Substances (Law Art.57-2)	Toluene	>5	
Notifiable Substances (Law Art.57-2)	Hexane	>5	
Notifiable Substances (Law Art.57-2)	Heptane	>1	
Notifiable Substances (Law Art.57-2)	Benzene	>0.1	
Notifiable Substances (Law Art.57-2)	Methylcyclohexane	>1	

Section 16: OTHER INFORMATION

Key literature references and sources for data etc.	NITE: National Institute of Technology and Evaluation (JAPAN) http://www.safe.nite.go.jp/japan/db.html IATA dangerous Goods Regulations RTECS:Registry of Toxic Effects of Chemical Substances Japan Industrial Safety and Health Association GHS Model SDS Dictionary of Synthetic Oraganic Chemistry , SSOCJ, Koudansha Scientific Co.Ltd. Chemical Dictionary, Kyouritsu Publishing Co., Ltd. etc
Record of SDS revisions	The following contents were revised. Regulatory information.
Disclaimer	

This SDS is according to JIS Z 7253: 2019. 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, 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.
GHS Classification is according to JIS Z 7252:2019. *JIS: Japanese Industrial Standards

End of Safety Data Sheet