

Material Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product name	HPF
Product code	SK3001-01
Company name	Goryo Chemical, Inc.
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2. HAZARDS IDENTIFICATION

(N,N-Dimethylformamide)

GHS classification

Classification of the substance or mixture
PHYSICAL HAZARDS

Flammable liquids Category 3 – (H226)

HEALTH HAZARDS

Acute toxicity (Inhalation: Vapours) Category 3 – (H331)

Serious eye damage / eye irritation Category 1 – (H318)

Germ cell mutagenicity Category 2 – (H341)

Carcinogenicity Category 1B – (H350)

Reproductive toxicity Category 1B – (H360)

Specific target organ toxicity

Single exposure Category 1 (liver) – (H370)

Category 2 (respiratory system) – (H371)

Repeated exposure Category 1 (liver) – (H372)

Hazardous/Non-hazardous Components

Nocuous Eyes, skin and mucous membranes are stimulated strongly.
May cause sore throat, nausea, vomiting and headache by inhalation or ingestion. And may cause hepatopathy through the skin.

Effect on environment Refractory, Low Accumulation Agent

Physically and chemical hazards Flammable Liquid
The vapor mixes with air and the explosive mixtures, causing fire and explosion hazard, are easily formed.
Because of its volatility, may cause fire and explosion hazard indoors, outdoors, or in a drain.

(HPF)

Hazardous/Non-hazardous Components

Nocuous No data available

Effect on environment No data available

Physically and chemical hazards No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Single or mixture	Mixture
Main Ingredients	See the table below

Chemical Name	CAS No.	Chemical Formula	Content per Vial
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<i>N,N</i> -Dimethylformamide	68-12-2	C ₂ H ₆ OS	0.47mL
HPF	—	—	1mg

4. FIRST AID MEASURES

Skin contact

- Wash off immediately with plenty of water. If symptoms persist, call a physician.
- If skin stimulates or rash appears, call a physician.

Eye contact

- Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, consult a physician.
- Take off your contact lens when wash with water.

Inhalation

- Move to fresh air. If symptoms persist, consult a physician.
- If feeling bad, call a physician.

Ingestion

- Rinse mouth and throat.
- Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

Notes to physician

- Treat symptomatically.

Protection of first-aiders

- A rescuer should wear personal protective equipment, such as rubber gloves and airtight goggles.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Water spray, Alcohol resistance, Powder, Carbon dioxide

Specifically dangerous hazards

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Extinguishing method

Fire-extinguishing work is done from the windward and the suitable fire-extinguishing method according to the surrounding situation is used. Uninvolved persons should evacuate to a safe place. In case of fire in the surroundings: Remove movable containers if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

- Use personal protective equipment. Keep people away from and upwind of spill/leak.
- Remove ignition source around product.

Environmental precautions

- Prevent product from entering drains.

Methods and materials for containment and cleaning up

- Do not touch spilled material without suitable protection. After material is completely picked up, wash the spill site with soap and water and ventilate the area. Put all wastes in a plastic bag for disposal and seal it tightly. Remove, clean, or dispose of contaminated clothing.

7. HANDLING AND STORAGE

Handling

Technical measures

- Handling is performed in a well-ventilated place.
- Avoid contact with skin, eyes and clothing.
- Wear suitable protective equipment.
- Wash hands and face thoroughly after handling.
- Use a local exhaust if dust or aerosol will be generated.

Advice on safe handling

- Handle in accordance with good industrial hygiene and safety practice.
- Vessel shouldn't be treated violently, such as rolling, shocking or dragging.

Storage

Storage conditions

- Keep container tightly closed. Store in a dark place under -20 degrees Celsius.
- Avoid long storage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures	Use exhaust ventilation to keep vapor concentrations below permissible exposure limits. Use only adequate ventilation.
Ventilation	Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.
Exposure Limits	
ACGIH	TWA 10 ppm, 30 mg/m ³ (skin)
OSHA	TWA 10 ppm, 30 mg/m ³ (skin)
Personal protective equipment	
Respiratory protection	Gas Mask for organic gas, Air Inhaler, Respirator
Hand protection	Protective Gloves (Impervious Gloves)
Eye protection	Protective Glasses (Safety Glasses, Goggles)
Skin and body protection	Protective Clothing and Boots

9. PHYSICAL AND CHEMICAL PROPERTIES

(N,N-Dimethylformamide)	
Physical state (color/form)	Light yellow / Liquid
Odor	Amine odor (N,N-Dimethylformamide)
pH	No data available
Melting point/freezing point	153 °C (N,N-Dimethylformamide)
Boiling Point/Range	-61 °C ((N,N-Dimethylformamide))
Flash Point	58 °C (N,N-Dimethylformamide)
Explosive limits	Upper : 15.2 vol% (N,N-Dimethylformamide) Lower : 2.2 vol% (N,N-Dimethylformamide)
Vapor pressure	356Pa (20 °C) (N,N-Dimethylformamide)
Vapor density	2.51 (air=1)
Density	0.952 g/mL (20 °C) (N,N-Dimethylformamide)
Decomposition temperature	Above 350 °C
Other Information	HPF forms a fluorescent compound with highly reactive oxygen species.

10. STABILITY AND REACTIVITY

(N,N-Dimethylformamide)	
Stability	Stable at normal temperatures and pressure.
Reactivity	Not available
Conditions to Avoid	Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

11. TOXICOLOGICAL INFORMATION

(Dimethyl sulfoxide)	
Acute Toxicity	
Oral LD50	2,800 mg/kg (Rat)
Dermal LD50	1,500 mg/kg (Rabbit)
Inhalation LC50	4 h 9-15 mg/l (Rat)
Skin corrosion/irritation	Human; Mild skin irritation – 24 h
Serious eye damage/irritation	Rabbit; Moderate eye irritation
Respiratory or skin sensitization	No data available
Reproductive cell mutagenicity	No data available
Carcinogenicity	IARC – group 3 This substance is not classifiable as a human.

Reproductive toxicity	ACGIH—A4
STOT-single exposure	May cause congenital malformation in the fetus.
STOT-repeated exposure	No data available
Aspiration hazard	No data available

12. ECOLOGICAL INFORMATION

Persistent /Resolvability	Degradation 4% (BOD)
Bioaccumulation	
Concentration Rate (BCF)	0.3~0.8 (concentration 20mg/L) 0.3~1.2 (concentration 2mg/L)
Ecotoxicity Data	
Fish Toxicity	
LC50 (Red-killifish)	9800mg/L/48 h

13. DISPOSAL CONSIDERATIONS

Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environmental agency for specific rules).

14. TRANSPORT INFORMATION

When aiming transporting on a vehicle, load into a container to prevent from falling, damaging or dismantling.

Shipping Information (<i>N,N</i> -Dimethylformamide)	
DOT (Department of transportation)	
Proper shipping name	<i>N,N</i> -Dimethylformamide
Hazard Class	Flammable Liquid (Class 3)
Packing group	III
Identification Number	UN2265
IATA	
Proper shipping name	<i>N,N</i> -Dimethylformamide
Hazard Class	Flammable Liquid (Class 3)
Packing group	III
UN-No	UN2265

15. REGULATORY INFORMATION

(*N,N*-Dimethylformamide)

U.S. REGULATIONS

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)
Not regulated

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)
Not regulated

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute	Yes
Chronic	Yes
Fire	Yes
Reactive	No
Sudden RELEASE	No

SARA Title III Section 313 (40 CFR 372.65)

N,N-Dimethylformamide

OSHA Process Safety (29CFR1910.119)

Not regulated

EC REGULATIONS

Symbol	T
R-Phase	61-20/21-36

May cause harm to the unborn child. Also harmful by inhalation and in contact with skin. Irritating to eyes.

S-Phase	53-45
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Avoid exposure- obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately.

Please follow laws and regulations of your own country.

16. OTHER INFORMATION

- International Chemical Safety Card (ICSC) database in Japanese (National Institute of Health Sciences)
 - This MSDS was prepared sincerely on the basis of the information we could obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity.
 - Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used.
 - Some new information or amendments may be added afterwards.
 - If the products are to be used far behind the expected time of use or if you have any questions, please feel free to contact us.
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