SOLVENT SYSTEMS International, Inc.
Environmental Services

Offer Sheet

Product	PVDF/NMP Solution (Polyvinylidene fluoride)
Quantity	10 drums x 200 kg
Net weight	4,409 lbs.
Manufacture date	March 2025
Availability	One time
Location	Greensboro, NC 27401
Date	10/31/25
COA & SDS	Attached below

Major Commercial Uses

1. **Lithium-ion battery electrode fabrication**
   - PVDF is a widely used binder for both cathode and anode materials. The PVDF/NMP solution enables a uniform slurry where active materials (e.g., lithium metal oxides, graphite) and conductive additives are dispersed and coated onto current collectors.
   - The NMP solvent dissolves PVDF effectively, provides appropriate viscosity and wetting onto foil substrates, and facilitates uniform film formation after evaporation of the solvent.
   - As battery demand (particularly for EVs and energy storage) grows, PVDF/NMP systems remain a standard in electrode manufacturing.
   - From a sales angle: you can position PVDF/NMP as a high-purity, high-performance binder system—highlighting processing stability, film integrity, compatibility with high-capacity chemistries, and overall battery performance impact.
2. **High performance coatings, films and specialty membranes**
   - PVDF (via a PVDF/NMP solution) is used in applications which demand chemical resistance, thermal stability, and durable film/coating performance (e.g., architectural coatings, chemical-processing equipment linings, membranes for water/wastewater treatment).
   - The NMP helps dissolve PVDF and enables formulation of solvent-based coatings or casting films/membranes with uniform microstructure.
   - In marketing, this gives an advantage for customers who need coatings or membranes with long-term chemical durability (e.g., in harsh industrial or wastewater environments) and can accept solvent-based processing.
3. **Membrane manufacturing for filtration/separation**
   - The PVDF/NMP system is used to cast porous PVDF membranes (microfiltration, ultrafiltration) and specialized nanofiber or hollow-fiber membranes. The solvent facilitates phase inversion or fiber spinning processes.
   - The result: membranes with controlled porosity, good chemical/thermal resistance, and long-service reliability.
   - Sales pitch: for customers in water treatment, chemical processing or environments with rigorous demands, PVDF/NMP-based membranes offer premium performance (e.g., higher chemical resistance, longer life) compared to lower-cost alternatives.
4. **Advanced electronic and insulation applications**
   - PVDF has piezoelectric, dielectric and sensor properties. The solution in NMP is used to cast films or coatings for sensors, actuators, insulating layers and specialty electronic components.
   - The solvent system supports precise film formation and substrate adhesion, enabling consistent electrical/functional performance.
   - From a chemical-sales perspective: you can position this application for niche, high-value markets (e.g., aerospace sensors, structural health monitoring) where performance justifies higher material cost.

If interested, please call or text:

Brian Svrusis
Solvent Systems International
70 King St.
Elk Grove Village, IL 60007
847-323-6718 call or text
Click here for: Surplus Inventory
Solvent-Systems.com

KISHIDA CHEMICAL CO., LTD.

HEAD OFFICE
3-1 HONMACHIBASHI, CHUO-KU
OSAKA, JAPAN
TEL: 06(6946)8061

BRANCH OFFICE
TOKYO TEL: 03(5625)5591
FUKUOKA TEL: 092(622)0422

Dated:2025.3.3

Certificate Of Analysis

Commodity : K-97-2.37

Grade :
Lot No. : 250219C1
Testing Result : Passed

Characteristics	Unit	Specifications	Results
Solid content	%	2.37±0.02	2.38
Viscosity at 30℃	mPa·s	55＋30/－45	62.4
Moisture	%	≦0.1	0.01

KISHIDA CHEMICAL CO., LTD.

S. Yokoi

Chief of Inspection Section

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Dated:2025.3.3

Certificate Of Analysis

Commodity : K-97-2.37

Grade :
Lot No. : 250225C1
Testing Result : Passed

Characteristics	Unit	Specifications	Results
Solid content	%	2.37±0.02	2.37
Viscosity at 30℃	mPa·s	55＋30/－45	61.8
Moisture	%	≦0.1	0.02

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Dated:2025.3.17

Certificate Of Analysis

Commodity : K-97-2.37

Lot No. : 250227C1
Testing Result : Passed

Characteristics	Unit	Specifications	Results
Solid content	%	2.37±0.02	2.38
Viscosity at 30℃	mPa·s	55＋30/－45	59.8
Moisture	%	≦0.1	0.01

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Dated:2025.3.3

Certificate Of Analysis

Commodity : K-97-2.37

Grade :
Lot No. : 250217C1
Testing Result : Passed

Characteristics	Unit	Specifications	Results
Solid content	%	2.37±0.02	2.36
Viscosity at 30℃	mPa·s	55＋30/－45	61.2
Moisture	%	≦0.1	0.04

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Dated:2025.3.17

Certificate Of Analysis

Commodity : K-97-2.37

Lot No. : 250303C1
Testing Result : Passed

Characteristics	Unit	Specifications	Results
Solid content	%	2.37±0.02	2.36
Viscosity at 30℃	mPa·s	55＋30/－45	58.3
Moisture	%	≦0.1	0.02

KISHIDA CHEMICAL CO., LTD.

S. Yokoi

Chief of Inspection Section

Date of issue: 2023/05/12

Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: K-97-2.37

SDS No. : T1736E-1

Relevant identified uses of the substance or mixture and uses advised against

Research and Development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Chemical Safety Management Department

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS

Flammable liquids: Category 4

HEALTH HAZARDS

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2

Reproductive toxicity: Category 1B

Specific target organ toxicity - single exposure: Category 3 (Narcotic effects)

Specific target organ toxicity - repeated exposure: Category 2 (bone marrow, liver, nervous system, lungs)

(Note) GHS classification without description: Not classified/Classification not possible

Label elements

Signal word: Danger

HAZARD STATEMENT

H227 Combustible liquid

H315 Causes skin irritation

H319 Causes serious eye irritation

H360 May damage fertility or the unborn child

H336 May cause drowsiness or dizziness

H373 May cause damage to organs through prolonged or repeated exposure (bone marrow, liver, nervous system, lungs)

PRECAUTIONARY STATEMENT

Prevention

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P271 Use only outdoors or in a well-ventilated area.
P264 Wash contaminated parts thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P280 Use personal protective equipment as required.

Response

P370 + P378 In case of fire: Use appropriate media to extinguish.
P314 Get medical advice/attention if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER/doctor/physician if you feel unwell.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/attention.

Storage

P403 Store in a well-ventilated place. P233 Keep container tightly closed.
P405 Store locked up.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

Specific adverse human health effects

See "11. Toxicological Information".

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Mixture

Ingredient name	Content (%)	CAS No.	Chemicals No, Japan	Chemical formula
Polyvinylidene fluoride	2.4	24937-79-9	6-933	(C2H2F2)x
N-Methyl-2-pyrrolidone	98	872-50-4	5-113	C5H9NO

Note : The figures shown above are not the specifications of the product.

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical advice/attention if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN

Take off immediately all contaminated clothing. Rinse skin with water or shower.
Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.

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 SWALLOWED

Rinse mouth.

Call a POISON CENTER/doctor/physician if you feel unwell.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use water mist, foam, dry powder, CO2 to extinguish.

Unsuitable extinguishing media

Indoor firefighting equipment or outdoor firefighting equipment

Sprinkler equipment

Dry-powder firefighting equipment - other (except for phosphate etc.,hydrogen carbonate etc.)

Straight stream water extinguisher

Water mist extinguisher

Reinforcing liquid jet extinguisher

Dry-powder extinguisher - other (except for phosphate etc.,hydrogen carbonate etc.)

Bucket of water or tank of water

Specific hazards arising from the substance or mixture

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

See "10.Stability and Reactivity".

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

Collect spillage.

Section 7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

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

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

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

Use only outdoors or in a well-ventilated area.

Recommend to use protective equipment in conformity with the standards.

Wear protective gloves/protective clothing/eye protection/face protection.

Wash hands et al thoroughly after handling.

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity".

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Take off contaminated clothing and wash it before reuse.

Storage

Conditions for safe storage

Keep container tightly closed.

Store locked up. (P405)

Store in a cool, dry place. Do not store in direct sunlight.

Storage in accordance with local/national regulation.

Container and packaging materials for safe handling

Polyethylene

etc.

Section 8. Exposure controls/personal protection

Control parameters

Adopted value

Adopted value in ACGIH is not available.

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.

Hand protection
Wear impervious protective glove.
Eye protection
Wear eye/face protection. Wear safety goggles in cases gas is generated.
Skin and body protection
Wear protective clothing.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties
Physical state: Liquid(20℃)
Color: Pale yellow to pale brown, Clear
Odor: Slightly Amine-like odor
Melting point/Freezing point data is not available.
Boiling point or initial boiling point data is not available.
Boiling range data is not available.
Flammability (gases, liquids and solids) data is not available.
Lower and upper explosion limit/flammability limit data is not available.
Flash point: (N-Methyl-2-pyrrolidone)86℃
Auto-ignition temperature data is not available.
Decomposition temperature data is not available.
pH data is not available.
Kinematic viscosity data is not available.
Solubility:
Solubility in water: Miscible (PVDF precipitate from solution)
Solubility in solvent data is not available.
n-Octanol/water partition coefficient data is not available.
Vapor pressure data is not available.
Density and/or relative density: 1.04g/cm3(20℃)
Relative vapor density (Air=1) data is not available.
Particle characteristics data is not available.
Other information
Other information is not available.

Section 10. Stability and Reactivity

Reactivity
Not available.
Chemical stability
Stable under normal storage/handling conditions.
Possibility of hazardous reactions
(N-Methyl-2-pyrrolidone)
Decomposes on heating and on burning. This produces toxic fumes including nitrogen oxides.
It reacts violently with strong acids and strong bases. Attacks copper and its alloys.
(ICSC 0513)
Conditions to avoid
Contact with incompatible materials.
Contact with fire source.
Incompatible materials
Strong acids, Strong bases, Silica, Boron, Titanium dioxides

Hazardous decomposition products
Carbon oxides, Nitrogen oxides, Hydrogen fluoride, Fluorophosgene

Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Data for components of the product]

[GHS Cat. Japan, base data]

(N-Methyl-2-pyrrolidone)

rat LD50=3500mg/kg (DFGOT vol.10, 1998)

Irritant properties

Skin corrosion/irritation

[Product]

Category 2, Causes skin irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

(N-Methyl-2-pyrrolidone)

human mild to moderate transient irritation (SIDS, 2009)

Serious eye damage/irritation

[Product]

Category 2, Causes serious eye irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

(N-Methyl-2-pyrrolidone)

rabbit moderate to severe irritation (DFGOT vol.10, 1998)

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

Carcinogenic effects data is not available.

Reproductive toxicity

[Product]

Category 1B, May damage fertility or the unborn child

[Data for components of the product]

[GHS Cat. Japan, base data]

(N-Methyl-2-pyrrolidone)

cat. 1B; SIDS, 2009

Specific target organ toxicity (STOT)

STOT-single exposure

[Product]

Category 3, May cause drowsiness or dizziness

[Data for components of the product]

[cat.3 (narcotic effects)]

[GHS Cat. Japan, base data]

(N-Methyl-2-pyrrolidone)

narcotic effect (CICAD 35, 2001)

STOT-repeated exposure

[Product]

Category 2, May cause damage to organs through prolonged or repeated exposure

[Data for components of the product]

[cat.2]
[GHS Cat. Japan, base data]
(N-Methyl-2-pyrrolidone)
bone marrow, liver, nervous system, lungs (CICAD 35, 2001)
Aspiration hazard data is not available.

Section 12. Ecological Information

Toxicity
Aquatic toxicity
[Data for components of the product]
Hazardous to the aquatic environment, short-term (acute)
[GHS Cat. Japan, base data]
(N-Methyl-2-pyrrolidone)
Algae (Scenedesmus) EC50 >500mg/L/72hr (SIDS, 2009)
Water solubility
(N-Methyl-2-pyrrolidone)
100 g/100 ml (SRC, 2005)
Persistence and degradability
[Data for components of the product]
(N-Methyl-2-pyrrolidone)
Rapidly degradable(BOD_NO2_Degradation : 73%/28 days; BOD_NH3_Degradation : 94%/28 days; TOC_Degradation: 96%/28 days; GC_Degradation : 100%/28 days (MITI official bulletin, 1989))
Bioaccumulative potential
[Data for components of the product]
(N-Methyl-2-pyrrolidone)
log Pow=-0.38 (ICSC, 2014)
Mobility in soil
Mobility in soil data is not available.
Other adverse effects
Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging
Waste treatment methods
Dispose of contents/container as industrial waste. Accordance with local/national regulation.

Section 14. Transport Information

UN Number or ID Number : Not applicable
IMDG Code (International Maritime Dangerous Goods Regulations)
UN Number or ID Number : Not applicable
IATA (Dangerous Goods Regulations)
UN Number or ID Number : Not applicable
Environmental hazards
Marine pollutants (yes/no) : no
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Noxious Liquid Substances ; Cat. Y
N-Methyl-2-pyrrolidone

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

N-Methyl-2-pyrrolidone; Polyvinylidene fluoride

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Section 16. Other information

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN
IMDG Code, 2020 Edition (Incorporating Amendment 40-20)
IATA Dangerous Goods Regulations (64th Edition) 2023
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2022 TLVs and BEIs. (ACGIH)
Supplier's data/information

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.
The GHS classification data given here is based on current Japan official data (NITE published in 2021).