SAFETY DATA SHEET

Published Date	Revision Date	Revision Number
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Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product code **PANDHRCF**

Product name **PAN DHR Fluid**

Product category **Ink Product**

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

Recommended use Printing operations

1.3 Details of the supplier of the safety data sheet

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Contact person Regulatory Compliance: Tel: +001-913-422-1888 (ext 2305)
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1.4 Emergency telephone number

USA: Chemtrec: +001-800-424-9300
Outside USA: Chemtrec: +001-703-527-3887
24 Hour Emergency Phone Number

Section 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

According to Regulation (EC) No 1272/2008

Serious eye damage/eye irritation	Category 1 - (H318)
Reproductive toxicity	Category 1B - (H360D)
Flammable liquids	Category 3 - (H226)

2.2 Label elements

Signal Word
Danger

Hazard Statements
H318 - Causes serious eye damage
H360D - May damage the unborn child
H226 - Flammable liquid and vapor
EUH208 - May produce an allergic reaction

Precautionary Statements
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P233 - Keep container tightly closed
P403 + P235 - Store in a well-ventilated place. Keep cool
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

2.3 Other Hazards

Other Hazards Causes mild skin irritation.
General Hazards No information available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Component	EC No.	CAS-No	Weight %	Classification according to Regulation (EC) No. 1272/2008 [CLP]	REACH No.	Note
N-Ethyl-2-pyrrolidone (NEP)	220-250-6	2687-91-4	1 - 5	Eye Dam. 1 (H318) Repr. 1B (H360Df)	01-2119472138-36-xxxx	1
Isopropyl alcohol	200-661-7	67-63-0	1 - 5	Eye Irrit. 2 (H319) STOT SE 3 (H336) Flam. Liq. 2 (H225)	01-2119457558-25-xxxx	1
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	204-809-1	126-86-3	< 0.5	Eye Dam. 1 (H318) Skin Sens. 1B (H317) Aquatic Chronic 3 (H412)	01-2119954390-39-xxxx	
Ammonium hydroxide	215-647-6	1336-21-6	< 0.5	Skin Corr. 1B (H314) Aquatic Acute 1 (H400)	01-2119982985-14-xxxx	1

Note
REACH No: Registration number(s) may not be provided because substance(s) are exempted or not yet required to be registered under REACH
1. Substance with a Community workplace exposure limit

Full text of H- and EUH-phrases: see section 16

Section 4: FIRST AID MEASURES

4.1 Description of first aid measures

General Advice Show this safety data sheet to the doctor in attendance.
Eye Contact Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Get medical attention if irritation develops and persists.
Skin Contact Wash off immediately with soap and plenty of water for at least 15 minutes. Remove contaminated clothing. If irritation (redness, rash, blistering) develops, get medical attention.
Inhalation Remove person to fresh air and keep comfortable for breathing. If breathing is irregular or stopped, administer artificial respiration. Get medical attention immediately.
Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

None under normal use conditions.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

Section 5: FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing Media

Foam. Carbon dioxide (CO2). Dry chemical. Water spray. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media

No information available.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. May emit toxic fumes under fire conditions.

5.3 Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Cool containers / tanks with water spray. Sealed containers may rupture when heated.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Remove all sources of ignition. Ventilate the area. Avoid contact with eyes, skin and clothing. Avoid breathing dust or vapor. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. Keep out of drains, sewers, ditches and waterways. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Use clean non-sparking tools to collect absorbed material.

6.4 Reference to other sections

See Section 12 for more information.

Section 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Use personal protective equipment as required. Do not eat, drink or smoke when using this product. Ensure adequate ventilation.

7.2 Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep container closed when not in use. Keep out of the reach of children. Do not freeze.

7.3 Specific end use(s)

Exposure scenario No information available.

Risk Management Methods (RMM) The information required is contained in this Safety Data Sheet.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limits

Component	**The United Kingdom**
Isopropyl alcohol 67-63-0	STEL: 500 ppm STEL: 1250 mg/m^3 TWA: 400 ppm TWA: 999 mg/m^3
Component	**France**
Isopropyl alcohol 67-63-0	STEL/VLCT: 400 ppm STEL/VLCT: 980 mg/m^3
Component	**Germany**
N-Ethyl-2-pyrrolidone (NEP) 2687-91-4	TWA/MAK: 5 ppm TWA/MAK: 23 mg/m^3 TWA/AGW: 5 ppm TWA/AGW: 23 mg/m^3 Peak: 10 ppm Peak: 46 mg/m^3 Skin
Isopropyl alcohol 67-63-0	TWA/MAK: 200 ppm TWA/MAK: 500 mg/m^3 TWA/AGW: 200 ppm TWA/AGW: 500 mg/m^3 Peak: 400 ppm Peak: 1000 mg/m^3
Component	**Spain**
Isopropyl alcohol 67-63-0	TWA/VLA-ED: 200 ppm TWA/VLA-ED: 500 mg/m^3 STEL/VLA-EC: 400 ppm STEL/VLA-EC: 1000 mg/m^3
Component	**Portugal**
Isopropyl alcohol 67-63-0	TWA/VLE-MP: 200 ppm STEL/VLE-CD: 400 ppm
Component	**Finland**
Isopropyl alcohol 67-63-0	TWA: 200 ppm TWA: 500 mg/m^3 STEL: 250 ppm STEL: 620 mg/m^3
Ammonium hydroxide 1336-21-6	TWA: 20 ppm TWA: 14 mg/m^3 STEL: 50 ppm STEL: 36 mg/m^3
Component	**Denmark**
Isopropyl alcohol 67-63-0	TWA: 200 ppm TWA: 490 mg/m^3
Component	**Austria**
Isopropyl alcohol 67-63-0	STEL/KZW: 800 ppm STEL/KZW: 2000 mg/m^3 TWA/TMW: 200 ppm TWA/TMW: 500 mg/m^3
Component	**Switzerland**
N-Ethyl-2-pyrrolidone (NEP) 2687-91-4	TWA/MAK: 2 ppm aerosol, vapour TWA/MAK: 9.4 mg/m^3 aerosol, vapour STEL/KZW: 4 ppm aerosol, vapour STEL/KZW: 18.8 mg/m^3 aerosol, vapour Skin
Isopropyl alcohol 67-63-0	TWA/MAK: 200 ppm TWA/MAK: 500 mg/m^3 STEL/KZW: 400 ppm STEL/KZW: 1000 mg/m^3
Component	**Poland**

Isopropyl alcohol 67-63-0	TWA/NDS: 900 mg/m^3 STEL/NDSCh : 1200 mg/m^3
Component	**Norway**
Isopropyl alcohol 67-63-0	TWA: 100 ppm TWA: 245 mg/m^3
Component	**Ireland**
Isopropyl alcohol 67-63-0	TWA: 200 ppm STEL: 400 ppm Skin

Component	**Australia TWA**
Isopropyl alcohol 67-63-0	TWA: 400 ppm TWA: 983 mg/m^3
Component	**Australia STEL**
Isopropyl alcohol 67-63-0	STEL: 500 ppm STEL: 1230 mg/m^3

Derived No Effect Level (DNEL) .

Component	**DNEL - Dermal (Workers)**	**DNEL - Inhalation (Workers)**
N-Ethyl-2-pyrrolidone (NEP) 2687-91-4	4 mg/kg (Systemic long term)	16.75 mg/m^3 (Systemic long term) 10.05 mg/m^3 (Local long term) 20.1 mg/m^3 (Local acute/short term)
Isopropyl alcohol 67-63-0	888 mg/kg (Systemic long term)	500 mg/m^3 (Systemic long term)
2,4,7,9-Tetramethyl-5-decyne-4,7-diol 126-86-3	0.5 mg/kg (Systemic long term) 1.5 mg/kg (Systemic acute/short term)	1.76 mg/m^3 (Systemic long term) 5.28 mg/m^3 (Systemic acute/short term)

Predicted No Effect Concentration (PNEC) No information available.

8.2 Exposure controls

Engineering Measures Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Users are advised to consider national Occupational Exposure Limits or other equivalent values. In case of insufficient ventilation, wear suitable respiratory equipment.

Personal protective equipment

Eye/Face Protection Wear safety glasses with side shields (or goggles). If splashes are likely to occur:. Wear suitable face shield. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye Protection Safety glasses with side-shields. Goggles. Face-shield. Avoid contact with eyes. Ensure that eyewash stations and safety showers are close to the workstation location.

Skin Protection Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Hand Protection Chemical resistant protective gloves.
Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding >480 minutes of permeation time): eg. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), polyvinylchloride (0.7 mm) and other
Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers. Taking into account the varying conditions, the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.
Due to different glove types, the manufacturer's directions for use should be observed.

Replace gloves immediately when torn or any change in appearance is noticed such as dimension, color, flexibility.

Respiratory Protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Respiratory protection must be provided in accordance with current local regulations. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice. Wash hands before eating, drinking or smoking. Wash contaminated clothing before reuse. Avoid contact with eyes, skin and clothing. Wear suitable gloves and eye/face protection. Regular cleaning of equipment, work area and clothing is recommended.

Environmental exposure controls No information available.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical State	Liquid	**Appearance**	Colored
Odor	No information available	**Odor Threshold**	No information available

Property	**Values**	**Remarks • Method**
pH		No data available
Melting Point / Freezing Point		No data available
Boiling Point / Boiling Range	> 100 °C / 212 °F	
Flash Point	53 °C / 127 °F	Setaflash closed cup
Evaporation rate		No data available
Flammability Limit in Air		
Upper flammability limit		No data available
Lower flammability limit		No data available
Vapor Pressure		No data available
Vapor Density		No data available
Specific Gravity	0.99	
Water Solubility		No data available
Solubility in other solvents		No data available
Partition coefficient: n-octanol/water		No data available
Autoignition Temperature		No data available
Decomposition temperature		No data available
Kinematic viscosity		No data available
Dynamic viscosity		No data available
Explosive Properties	No data available	
Oxidizing Properties	No data available	

9.2 Other information

Softening Point No data available

Section 10: STABILITY AND REACTIVITY

10.1 Reactivity

No information available.

10.2 Chemical Stability

Stable under normal conditions.

10.3 Possibility of Hazardous Reactions

None under normal processing.

10.4 Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition. Do not freeze.

10.5 Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents. Reducing agent.

10.6 Hazardous decomposition products

Thermal decomposition can lead to release of irritating gases and vapors. Carbon dioxide (CO2). Carbon monoxide.

Section 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute Toxicity

Inhalation	Specific test data for the substance or mixture is not available.
Eye Contact	Specific test data for the substance or mixture is not available.
Skin Contact	Specific test data for the substance or mixture is not available.
Ingestion	Specific test data for the substance or mixture is not available.

Unknown Acute Toxicity 0 % of the mixture consists of ingredient(s) of unknown toxicity.

The following values are calculated based on chapter 3.1 of the GHS document

Unknown Acute Toxicity

0 % of the mixture consists of ingredient(s) of unknown toxicity.
0 % of the mixture consists of ingredient(s) of unknown acute oral toxicity.
0 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity.
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas).
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor).
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist).

Component	Oral LD50
N-Ethyl-2-pyrrolidone (NEP) 2687-91-4	= 1350 mg/kg (Rat)
Isopropyl alcohol 67-63-0	= 1870 mg/kg (Rat)
2,4,7,9-Tetramethyl-5-decyne-4,7-diol 126-86-3	> 500 mg/kg (Rat)
Ammonium hydroxide 1336-21-6	= 350 mg/kg (Rat)

Component	Dermal LD50
Isopropyl alcohol 67-63-0	= 4059 mg/kg (Rabbit)
2,4,7,9-Tetramethyl-5-decyne-4,7-diol 126-86-3	> 1000 mg/kg (Rabbit)

Component	Inhalation LC50
Isopropyl alcohol 67-63-0	= 72600 mg/m^3 (Rat) 4 h
2,4,7,9-Tetramethyl-5-decyne-4,7-diol 126-86-3	> 20 mg/L (Rat) 1 h

Skin corrosion/irritation Specific test data for the substance or mixture is not available.

Eye damage/irritation	Specific test data for the substance or mixture is not available. Causes serious eye damage. (based on components).
Sensitization	Specific test data for the substance or mixture is not available.
Mutagenic Effects	Specific test data for the substance or mixture is not available.
Carcinogenic effects	Specific test data for the substance or mixture is not available.
Reproductive Effects	Specific test data for the substance or mixture is not available. May damage the unborn child. (based on components).
CMR, categories 1 and 2	This product contains one or more substances which are classified in the EU as carcinogenic, mutagenic and/or reprotoxic

Component	CMR, categories 1 and 2
N-Ethyl-2-pyrrolidone (NEP) 2687-91-4	Repr. 1B

STOT - single exposure	Specific test data for the substance or mixture is not available.
STOT - repeated exposure	Specific test data for the substance or mixture is not available.
Aspiration hazard	Specific test data for the substance or mixture is not available.

Section 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Specific test data for the substance or mixture is not available.

Unknown Aquatic Toxicity

0 % of the mixture consists of component(s) of unknown hazards to the aquatic environment

Component	Algae/aquatic plants
Isopropyl alcohol 67-63-0	72h EC50 Desmodesmus subspicatus: > 1000 mg/L 96h EC50 Desmodesmus subspicatus: > 1000 mg/L

Component	Fish
N-Ethyl-2-pyrrolidone (NEP) 2687-91-4	96h LC50 Danio rerio: 464 - 999 mg/L [static]
Isopropyl alcohol 67-63-0	96h LC50 Pimephales promelas: = 9640 mg/L (flow-through) 96h LC50 Lepomis macrochirus: > 1400000 µg/L 96h LC50 Pimephales promelas: = 11130 mg/L (static)
Ammonium hydroxide 1336-21-6	96h LC50 Pimephales promelas: = 8.2 mg/L

Component	Crustacea
Isopropyl alcohol 67-63-0	48h EC50 Daphnia magna: = 13299 mg/L
Ammonium hydroxide 1336-21-6	48h EC50 water flea: = 0.66 mg/L 48h EC50 Daphnia pulex: = 0.66 mg/L

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

No information available.

Component	Partition coefficient
Isopropyl alcohol 67-63-0	0.05

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no

substance considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects.

No information available.

Section 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste from residues/unused products Contain and dispose of waste according to local regulations.

Contaminated Packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

Section 14: TRANSPORT INFORMATION

Note: This information is not intended to convey all specific transportation requirements relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation information can be found in the specific regulations for your mode of transportation. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

ADR

Not Regulated
Exception: ADR Special Provision 144 - An aqueous solution containing not more than 24% alcohol by volume is not subject to the requirements of ADR

ICAO / IATA / IMDG / IMO

Not Regulated
Exception: IATA Special Provision A58 - Aqueous solutions containing 24% or less alcohol by volume is not subject to these regulations
Exception: IMDG Special Provision 144 - An aqueous solution containing not more than 24% alcohol by volume is not subject to the provisions of this Code

Section 15: REGULATORY INFORMATION

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

European Union

International Inventories

For further information, please contact: Supplier (manufacturer/importer/downstream user/distributor)

15.2 Chemical Safety Assessment

No information available.

Section 16: OTHER INFORMATION

Key or legend to abbreviations and acronyms used in the safety data sheet

Full text of H-Statements referred to under sections 2 and 3
H225 - Highly flammable liquid and vapor
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H319 - Causes serious eye irritation
H336 - May cause drowsiness or dizziness
H360Df - May damage the unborn child. Suspected of damaging fertility
H400 - Very toxic to aquatic life
H412 - Harmful to aquatic life with long lasting effects

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)
STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value

Revision Date May-14-2020

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer
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, use, processing, storage, transportation, disposal and release 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.

End of Safety Data Sheet