

## Global Product Strategy (GPS) Safety Summary

### N-Methyl-Pyrrolidone

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet and the Product Stewardship Bulletin (PSB).

#### Chemical Identity

**Name:** N-methyl-pyrrolidone

**Brand names:** NMP

**Chemical name (IUPAC):** 1-methylpyrrolidin-2-one

**CAS number:** 872-50-4

**EC number:** 212-828-1

**Molecular formula:** C<sub>5</sub>H<sub>9</sub>NO

#### Uses and Applications

NMP is used in a wide range of industrial and professional applications, including process chemicals, engineering plastics, coatings, agricultural chemicals, electronics, paint stripping and cleaning, adhesives and pigment dispersions.

In Europe, the only supported uses for NMP are in industrial and professional applications. Outside of Europe, NMP may also be used in products available on the consumer market, such as paint strippers and cleaners.

#### Physical / Chemical Properties

NMP is a colorless liquid, with a faint amine odor. It is soluble in water and most conventional organic solvents.

NMP is a considered combustible liquid with a flash point of 91°C (196°F). The boiling and freezing points of NMP are 204°C (399°F) and -24°C (-11°F) respectively.

#### Health Effects

NMP is of low acute toxicity. The compound has been found to cause irritation to the skin, eyes and respiratory tract. NMP has caused malformations and fetal effects in rats and rabbits, and is therefore considered a hazard to reproduction and development. NMP is readily absorbed through the skin and via oral exposure or respiration. Based on these health effects, NMP has been classified as hazardous under GHS (Globally Harmonized System on Classification and Labeling).

The table below gives an overview of the health effects assessment results for NMP.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low acute toxicity via all routes of exposure.
Irritation / corrosion Skin / eye/ respiratory tract	Can cause severe irritation to the eyes, irritation to the skin, and can be irritating to respiratory tract when inhaled.
Sensitisation	Not sensitizing.
Toxicity after repeated exposure Oral / dermal	Repeated inhalation exposure may cause reversible irritation at the site of initial contact.
Genotoxicity / Mutagenicity	Not mutagenic.
Carcinogenicity	Not considered as carcinogenic.
Toxicity for reproduction	Toxic to reproduction and development.

### **Environmental Effects**

NMP is a low ecotoxicity hazard based on short and long term test results in fish, aquatic invertebrates and plants.

The table below gives an overview of the environmental effects assessment results for NMP.

Effect Assessment	Result
Aquatic Toxicity	Low ecotoxicity hazard to aquatic organisms.

Fate and behaviour	Result
Biodegradation	Readily biodegradable.
Bioaccumulation potential	Not bioaccumulative.
PBT / vPvB conclusion	Not considered to be either PBT or vPvB.

### **Exposure**

#### **Human health**

Consumers in Europe generally will not come into contact with NMP as there are no supported uses in Europe of NMP in consumer products. Though the use of NMP in some consumer products is not regulated outside of Europe, prudent chemical hygiene practices and the use of appropriate Personal Protective Equipment are recommended.

Workers may be exposed to NMP during activities such as product transfer, packing and repacking, formulation, laboratory activities, or during use as a component in professional or industrial products like cleaning agents and agrochemicals. For such activities exposure should be controlled by selecting and applying the appropriate Risk Management Measures. Exposure to NMP in manufacturing facilities where NMP is used as a chemical intermediate is considered low because the process, storage and handling operations are usually enclosed. However, worker exposure can potentially occur during operations such as product transfer,

product sampling, or maintenance / repair activities on product-containing systems. The risk of accidental exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

#### Environment

Due to its many industrial and professional uses, NMP has widespread indoor and outdoor environmental release possibilities. As NMP is readily biodegradable and not bio-accumulative, it is not expected to be found in the environment.

#### **Risk Management Measures**

For detailed guidance on the use of NMP, the Safety Data Sheet should be consulted.

NMP should only be handled by knowledgeable and trained personnel.

#### Consumer use

When using a NMP-containing consumer product at home, all instructions and precautions should be read, understood and followed. Adequate ventilation should be provided, and NMP should never be used near open flames or other ignition sources.

#### Flammability

Equipment should be grounded to prevent build-up of static electricity.

#### Human health (industrial and professional use)

When using chemicals make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, always wear eye protection such as chemical goggles and always wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, always clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations at exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or a respirator.

#### Environmental

In case of accidental release or spill do not allow the product to enter sewers, surface or ground water.

#### **Regulatory Information / Classification and Labeling**

This substance has been registered under REACH by relevant companies of LyondellBasell in the European Union.

For a detailed overview of the regulatory status of this substance, please refer to the Product Stewardship Bulletin, which is available from the LyondellBasell corporate website.

Under GHS (Globally Harmonized System on Classification and Labeling) substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, please refer to the regional Safety Data Sheet, which can be found on the LyondellBasell corporate website.

### **Conclusion Statements**

- NMP is a versatile solvent with numerous applications in industrial applications, as well as several professional and consumer products including ink/toners, cleaning formulations, binders, and agrichemical formulations. It is also used in the production of polymers.
- NMP is of low acute toxicity. However, it is irritating to the skin and can cause severe irritation effects in case of eye contact and it can cause respiratory irritation. NMP is hazardous to reproduction and development. Appropriate Risk Management Measures should be selected and applied to control the risk of exposure.

### **Contact Information within Company**

For further information on this product in general, please consult the LyondellBasell corporate website ([www.lyb.com](http://www.lyb.com)).

### **Date of issue**

Date of issue: 4 June 2015.

### **Disclaimer**

Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.

SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

This product(s) may not be used in:

- (i) any U.S. FDA Class I, Health Canada Class I, and/or European Union Class I medical devices, without prior notification to Seller for each specific product and application; or
- (ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: U.S. FDA Class II Medical Devices; Health Canada Class II or Class III

Medical Devices; European Union Class II Medical Devices; film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned medical devices; packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration; tobacco related products and applications, electronic cigarettes and similar devices, and pressure pipe or fittings that are considered a part or component of a nuclear reactor. Additionally, the product(s) may not be used in: (i) U.S. FDA Class III Medical Devices; Health Canada Class IV Medical Devices; European Class III Medical Devices; (ii) applications involving permanent implantation into the body; (iii) life-sustaining medical applications; and (iv) lead, asbestos or MTBE related applications. All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.

Users should review the applicable Safety Data Sheet before handling the product.

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