



# **Ras Laffan Olefins Company Ltd.**

## **(RLOC)**

***SAFE HANDLING AND STORAGE GUIDELINES***

***RAW PYROLYSIS GAS***

***(RPG)***

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## **PRODUCT STEWARDSHIP**

Ras Laffan Olefins Company Ltd (RLOC) is committed to being a good product steward of the products we produce. We want anyone who comes in contact with one of our products to have access to information that will help them to understand its potential risk and how to use it safely. The thrust of our product stewardship program is the implementation of an Operation Excellence Management System (OEMS) initiative, which makes health, safety and environmental protection an integral part of our products. Successful implementation of this system must include a shared responsibility of all those who come in contact with a product throughout its life cycle. Ras Laffan Olefins Company Ltd will continue to work with customers and others to help ensure that all who use and handle our products follow safe and environmentally sound practices.

The information contained in this document is not intended to, nor does it, amend or replace the Ras Laffan Olefins Company Ltd Safety Data Sheet (SDS) for Raw Pyrolysis Gas (RPG). The most current SDS can be obtained from Ras Laffan Olefins Company Ltd at [www.rloc.com.qa](http://www.rloc.com.qa) and should be carefully examined prior to working with this product.

## **INTRODUCTION**

Raw Pyrolysis Gas (RPG) is produced as a by-product in RLOC operations generated during ethylene production from ethane cracking. It is a amber color liquid with an olefinic odor. It is highly flammable and carcinogenic with a flammable range of 1.3% -7.5% and Flash point of >-11°C. It's boiling point is 32-204°C (overpoint-endpoint) and Auto ignition is 348°C.

This document is intended to provide general information about safe handling and storage of Raw Pyrolysis Gas (RPG) in its liquid form. It is not intended to provide an in-depth discussion of all health and safety information. Additional information on the product is available through the applicable Safety Data Sheet which should be consulted before use of the product.

## **PYGAS SPECIFICATION**

| Characteristics          | Method           | Unit   | Typical | Specification |      |
|--------------------------|------------------|--------|---------|---------------|------|
|                          |                  |        |         | Min           | Max  |
| API Gravity @ 60 oF      | ASTM D4052       |        | 37.53   | 37            | 39   |
| Specific Gravity @ 60 oF | ASTM D4052       |        | 0.8372  | 0.83          | 0.84 |
| RVP                      | ASTM D6378       | Psi    | 6.61    | 5             | 13   |
| Color (Saybolt)          | ASTM D156        |        | -10     | -10           | 10   |
| Bromine Number           | ASTM D1159       | g/100g | 117.5   | 95            | 136  |
| Sulfur                   | ASTM D5453/D7041 | wt ppm | 41.18   | 40            | 100  |
| Water                    | ASTM E203        | wt ppm | <100    |               | 500  |
| Distillation 95 %        | ASTM D86/D5399   | °C     | 193.0   | 190           | 205  |
| C5 & Lighter             | ASTM D6729/30    | wt%    | 16.36   | 12            | 23   |
| Benzene                  | ASTM D6729/30    | wt%    | 42.91   | 35            | 49   |
| Toluene                  | ASTM D6729/30    | wt%    | 4.06    | 3.3           | 4.6  |
| Total Aromatics          | ASTM D6729/30    | wt%    | 49.26   | 40            | 60   |
| Diolefins                | ASTM D6729/30    | wt%    | 25.19   | 20            | 30   |
| Olefins                  | ASTM D6729/30    | wt%    | 19.40   | 15            | 22   |
| Chlorides                | ASTM D 5808      | wt ppm | < 1     |               | 1    |

## **SAFE HANDLING AND STORAGE GUIDELINES**

Raw Pyrolysis Gas (RPG) is amber color liquid with olefinic odor and is Highly flammable and carcinogenic. Good industrial hygiene practices should always be followed and personnel's handling it should be knowledgeable and trained. Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements. Following are some of the guidelines and mitigation measures which should be considered:

### Handling guidelines:

- Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions. Avoid all personal contact, including inhalation.
- Provide suitable ventilation in the areas where the product is stored and used.
- Wear protective clothing when risk of exposure occurs.
- Avoid physical damage to tanks or equipment used to store the product.
- Do NOT cut, drill, grind, weld or perform similar operations on or near tanks.
- When handling, DO NOT eat, drink, or smoke.
- Avoid naked lights, heat, or ignition sources.
- Ensure that there is no static electricity during transfer grounded boats/tankers and other equipment.
- Use spark-free tools when handling.
- Avoid contact with incompatible materials such as oxidizing agents and acids.
- Wear appropriate personal protective equipment (PPE).
- Avoid prolonged exposure and contact with the skin, eyes, and clothing.
- Always wash hands and exposed parts of body thoroughly with soap and water after handling.
- Take off contaminated clothing, including footwear. Work clothes should be laundered separately.
- Do not wear contaminated clothing, shoes, or protective equipment before entering eating area.
- Notify authorities if any exposure to the public or the environment occurs or is likely to occur.
- Local authorities should be advised if significant spillages cannot be contained. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Vapour may form an explosive mixture with air.
- The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways, or ditches with chemical or used container. Send to a licensed waste management company.

Storage guidelines:

- Storage space should be clearly defined and well lit.
- Store away from incompatible materials in a cool, dry well-ventilated area.
- Store in grounded and appropriately designed vessels of compatible materials.
- Store and use far from heat, sparks, open flame, or other ignition sources.
- Closed containers may explode or rupture when exposed to extreme heat (fire).
- Electrical installations/working materials must comply with the technological safety standards.
- Provide appropriate conditions and fire extinguishing in storage space (dry powder, foam, or carbon dioxide) and detectors for flammable gases.
- Electrostatic charges will be generated during pumping. Electrostatic discharge may cause fire.
- Ensure electrical continuity by bonding and grounding (earthing) all equipment to

reduce the risk.

- The vapors in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.

#### **ENVIRONMENTAL INFORMATION:**

Raw Pyrolysis Gas (RPG) is expected to be toxic to aquatic organisms but is not expected to bioaccumulate. Since RPG is manufactured and handled in closed systems, and is transported a short distance in closed systems, environmental exposure to RPG is expected to be low. If RPG is accidentally released into the environment, it is expected to primarily evaporate to air, where it will rapidly degrade (hours to days). The RPG components that do not evaporate quickly are expected to be highly mobile in soil and may reach ground water. Degradation of some components in soil and groundwater is expected to occur within a period of days, and other components are likely to degrade over extended periods of time. It is not expected to accumulate to present an environmental hazard. For additional details please consult the Safety Data Sheet (SDS).

#### **REGULATORY INFORMATION:**

Regulations exist that govern the manufacture, sale, transportation, use and/or disposal of products of the sulfur category. These regulations may vary by city, state, country, or geographic region. Additional helpful information may be found by consulting the relevant product Safety Data Sheet along with Local and Federal regulations.

#### **SOURCES OF ADDITIONAL INFORMATION:**

- Safety Data Sheet Information [Ras Laffan Olefins Company Ltd \(rloc.com.qa\)](http://rloc.com.qa)
- The National Institute for Occupational Safety and Health (NIOSH) <https://www.cdc.gov/niosh/>

#### **CONCLUSION:**

RPG is primarily used to produce other products. RPG is flammable. Exposure at high levels may cause central nervous system effects. RPG is classified as human carcinogen based on the presence of benzene, a major component of RPG. Benzene is classified as a known human carcinogen by various regulatory agencies worldwide. Appropriate personal protective equipment practices and labeling, storage, and transportation procedures must be followed. Further, the relevant product Material Safety Data Sheets and applicable regulatory guidelines and requirements, including, but not limited to, Occupational Health and Safety Administration (OSHA) guidelines, should be consulted prior to the use or handling of RPG.

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