

## Product Stewardship Summary MINING SPECIALTY PRODUCTS



The product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of all health and safety information. Additional information is available through the applicable Material Safety Data Sheet (MSDS) which should be consulted before use of any chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

### Chemical Identity:

The Mining Specialty Group is comprised of sulfur, petroleum hydrocarbon, and tannin based chemicals. These products are categorized by their designated mining applications, which include: 1) Flotation and Extender Oils; 2) Frothers; 3) Depressants; 4) Collectors; 5) Solvent Extraction Diluents; and 6) Tannins (also referred to as Quebrachos). The Mining Product Line is currently comprised of 22 products that are listed below based on their designated application.

- **Flotation and Extender Oils**
  - Molyflo<sup>®</sup>
  - Orfom<sup>®</sup> MCX
  - Philflo<sup>®</sup>
  - Philflo<sup>®</sup> HV
- **Orfom<sup>®</sup> Frothers**
  - Orfom<sup>®</sup> F2 Frother
  - Orfom<sup>®</sup> F8 Frother
- **Orfom<sup>®</sup> Depressants**
  - Orfom<sup>®</sup> D8
- **Orfom<sup>®</sup> Collectors**
  - Orfom<sup>®</sup> C 100 (NDDM)
  - Orfom<sup>®</sup> C 200 (TDM)
  - Orfom<sup>®</sup> MCO,
  - Orfom<sup>®</sup> MC37
  - Orfom<sup>®</sup> MC47
- **Orfom<sup>®</sup> Solvent Extraction Diluents**
  - Orfom<sup>®</sup> SX7
  - Orfom<sup>®</sup> SX10
  - Orfom<sup>®</sup> SX11
  - Orfom<sup>®</sup> SX12
  - Orfom<sup>®</sup> SX18
  - Orfom<sup>®</sup> SX80
- **Orfom<sup>®</sup> Tannins**
  - D-2 Brick Additive
  - D-3 Brick Additive
  - Grade 2 Tannin
  - Grade 3 Tannin

### Category Justification:

All of the products in this group are marketed for use in mining applications. These products are differentiated by their designated mining applications (e.g., flotation and extender oils). They have diverse physical and chemical characteristics, and exhibit varied physical, human health, environmental hazards and fates.

### Product Uses:

The Mining Products are used in various mining applications as depressants, frothers, flotation and extender oils, collectors, thinners, and extraction diluents. Products in this group are commercially available to industrial customers only.

### Physical/Chemical Properties:

Most of these products are combustible liquids, with the exception of the Tannins, which are non-combustible and non-flammable solids. Combustible liquids have the potential to cause fires if they are exposed to an ignitable source. In the event of a fire, the formation of decomposition byproducts, such as sulfur and carbon oxides, is possible. Elevated dust levels of the Tannins

may cause a dust explosion hazard within an enclosed space; care should be taken to avoid substantial dust formation, and appropriate exhaust ventilation should be used to mitigate this potential hazard. These products should be kept in tightly closed containers, and stored in a cool and well ventilated environment, away from ignitable sources.

### **Health Information:**

Overall, the Mining Products may cause varying degrees of acute and chronic toxicity effects in humans. Dermal contact with these products may cause mild to severe skin irritation and defatting of the skin; a few of these products may also cause caustic burns and skin sensitization (allergic reaction). Eye effects range from mild to severe irritation to corrosive and permanent (irreversible) damage. Some of the petroleum hydrocarbon-based products may be harmful following inhalation exposures to high vapor concentrations; symptoms of over exposure to high vapor concentrations may include respiratory irritation and central nervous system (CNS) effects such as dizziness, headache, nausea, and loss of coordination. If ingested, most of these products, except the Tannins, may cause an aspiration hazard, which can result in severe pulmonary damage (e.g., pneumonitis or inflammation) or may be fatal. The kidney and liver were indicated as potential target organs in chronic inhalation toxicity studies conducted in animals at high vapor concentrations. Some of the kidney toxicity effects (i.e., hydrocarbon nephropathy) observed are specific to animal species and are considered not relevant to humans. The liver, blood, and thymus were indicated as target organs in animal studies following repeated dermal exposures to some of the petroleum-based products. Nasal toxicity effects may occur following chronic inhalation exposures to petroleum hydrocarbon-based products containing naphthalene. Potential carcinogenic effects (via the dermal exposure route) are indicated for a few of the petroleum hydrocarbon-based products and organosulfur-based Orfom<sup>®</sup> MC37. Available data show no evidence that the Mining Products are reproductive, teratogenic or developmental toxicants.

### **Environmental Information:**

The environmental hazard potential for the Mining Products is varied, ranging from low to high. Some of these products may cause acute and chronic toxicity to aquatic life, with effects ranging from harmful to highly toxic. Some of the products may persist in the environment (i.e., not expected to be readily biodegradable). However, most of the products demonstrate a low potential to accumulate in aquatic life. Due to their potential to cause significant harm to aquatic environments, care should be taken to avoid releases of these products to sewage, drainage systems, and water bodies. Spillage should be quickly collected and properly disposed of to minimize harm to the environment.

### **Exposure Potential:**

The most likely routes of exposure to the Mining Products are skin and eye contact, and inhalation exposures.

Workplace Use: The potentially exposed populations include: (1) workers who manufacture these products; (2) quality assurance workers who sample and analyze the products to ensure that they meet specifications; (3) workers involved in distribution and storage of these products; and (4) commercial consumers, in occupational settings, that use these products in intended applications. The probability of exposure to manufacturing, quality assurance, and transportation workers is expected to be low because these products are manufactured and tested in controlled environments and are transported in tightly sealed containers. These products are sold to Mining industrial customers that are familiar with their intended applications, safe handling, storage, and disposal requirements. Manufacturing, quality assurance, and transportation workers will likely adhere to safe handling practices and wear appropriate personal protective equipment (PPE), and have access to exposure prevention measures (e.g., engineering controls). Customers are also

likely to use appropriate PPE during use, and to have risk mitigation measures in place to address potential accidental spills.

Consumer Use: Potential exposure to the general public is not anticipated for these products as they are not sold to the general population. If a large scale spill occurred in a residential setting, the potential for odor complaints is possible for some of the sulfur-based products. In the event of a fire, inhalation exposure to hazardous combustion byproducts could be a potential concern for nearby residents.

Potential Environmental Release: The potential for significant accidental releases of these products to the environment is possible during transportation of large quantities over long distances via truck trailers, rail cars, or container ships; however, available data indicate that the frequency of distribution incidents involving significant releases of these products has been minimal. Chevron Phillips Chemical Company LP is committed to operating in an environmentally responsible manner and has adopted the American Chemical Council's Responsible Care® initiative.

### **Risk Management:**

Chevron Phillips Chemical Company LP is committed to Product Stewardship and doing business responsibly. We endeavor to provide sufficient information for the safe use and handling of all our products. We begin by ensuring that all of our customers, distributors, carriers, and users of these products are well informed about the properties of each product. To that end, a Material Safety Data Sheet and a certificate of analysis accompany each shipment from our manufacturing plant. In addition, Hazard and Exposure Risk Characterizations (HERCs) have been completed for the Mining Products to evaluate the potential risks associated with their distribution and use.

### **Regulatory Information:**

Regulations exist that govern the manufacture, sale, transportation, use, and disposal of these Mining Products. These regulations may vary by city, state, country or geographic region. Additional relevant information may be found by consulting the applicable product Material Safety Data Sheets.

### **Sources of Additional Information:**

Chevron Phillips Chemical LP (CPCChem). 2005. D-2 Brick Additive Solution. *MSDS # CPC00346*. Revision 0. Dated 02/01.

[http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPCChem. 2008a. Orfom® SX-7 Solvent Extraction Diluent. *MSDS # 59470*. Revision # 3.03, 5/27. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPCChem. 2008b. Orfom® F8 Frother. *MSDS # CPC00176*. Revision # 2.00, 10/23.

[http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPCChem. 2008c. Orfom® MCX Flotation Oil. *MSDS # 250860*. Revision # 4.01, 12/29.

[http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPCChem. 2009a. Orfom® SX12 Solvent Extraction Diluent. *MSDS # 98120*. Revision # 2.00, 6/11. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPCChem. 2009b. Orfom® MC 37 Collector. *MSDS # CPC00568*. Revision # 4.04, 8/31.

[http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPCChem, 2010a. Chemical Safety Report: Hydrocarbons, C<sub>9</sub>-C<sub>11</sub>, Isoalkanes, Cyclics, <2% Aromatics. Internal Document. 04/08.

CPChem, 2010b. Chemical Safety Report: Hydrocarbons, C<sub>11</sub>-C<sub>14</sub>, Isoalkanes, Cyclics, <2% Aromatics. Internal Document. 04/09.

CPChem, 2010c. Chemical Safety Report: Hydrocarbons, C<sub>13</sub>-C<sub>16</sub>, Isoalkanes, Cyclics, <2% Aromatics. Internal Document. 06/24.

CPChem, 2010d. Chemical Safety Report: Cracked Gas Oils. Internal Document. 07/30.

CPChem. 2010e. D-3 Brick Additive. *MSDS # 100000063810 (Legacy MSDS # 401360)*. Version 1.1, 11/03. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010f. Orfom<sup>®</sup> SX-10 Solvent Extraction Diluent. *MSDS # 100000068457 (Legacy MSDS # 98100)*. Version 1.2, 11/10. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010g. Orfom<sup>®</sup> SX-11 Solvent Extraction Diluent. *MSDS Number 100000067799 (Legacy MSDS # 98110)*. Version 1.2, 11/10. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010h. Orfom<sup>®</sup> SX-18 Solvent Extraction Diluent. *MSDS # 100000066335 (Legacy MSDS # CPC00050)*. Version 2.1, 11/10. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010i. Orfom<sup>®</sup> Grade 2 Tannin. *MSDS # 100000063806 (Legacy MSDS # 417620)*. Version 1.4, 11/30. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010j. Orfom<sup>®</sup> Grade 3 Tannin. *MSDS # 100000066335 (Legacy MSDS # CPC00050)*. Version 1.3, 11/30. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010k. Orfom<sup>®</sup> F2 Frother. *MSDS # 100000014076 (Legacy MSDS # 73240)*. Version 2.2, 11/30. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010l. Orfom<sup>®</sup> D8 Depressant. *MSDS # 100000013321 (Legacy MSDS # 59700)*. Version 2.3, 12/14. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2010m. Orfom<sup>®</sup> CO 200. *MSDS # 100000068801 (Legacy MSDS # 98030)*. Version 2.1, 12/20. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011a. Orfom<sup>®</sup> MCO Collector. *MSDS # 100000013323 (Legacy MSDS # 59730)*. Version 1.1, 01/25. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011b. Philflo<sup>®</sup> Flotation Oil. *MSDS # 100000013493 (Legacy MSDS # 59530)*. Version 1.1, 02/18. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011c. Philflo<sup>®</sup> High Viscosity (HV). *MSDS # 100000014971 (Legacy MSDS # CPC00570)*. Version 2.4, 02/02. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011d. Molyflo<sup>®</sup> Flotation Oil. *MSDS # 100000013412 (Legacy MSDS # 59560)*. Version 1.4, 03/23. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011e. Orfom<sup>®</sup> SX 80 Solvent Extraction Diluent. *MSDS # 100000067977 (Legacy MSDS # CPC00250)*. Version 1.4, 04/26. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011f. Orfom<sup>®</sup> CO 100. *MSDS # 100000068623 (Legacy MSDS # 98010)*. Version 4.2. Dated 05/10. [http://www.cpchem.com/enu/products\\_product\\_index.asp](http://www.cpchem.com/enu/products_product_index.asp)

CPChem. 2011g. Data Review and Test Plan for Tannins, Sulfomethylated (CAS RN 68201-64-9). High Production Volume (HPV) Chemical Challenge Program. 05/13/11. DRAFT

CPChem. 2011h. Thinners Drilling Mud Additives and Mining Chemicals Hazard and Exposure Characterization. 06/30. Internal Document. DRAFT

CPChem. 2011i. Soltrol Hazard and Exposure Characterization. 07/22. Internal Document.  
DRAFT

Organization for Economic Co-Operation and Development (OCED). 2011. SIDS Initial  
Assessment Report for SIAM 31. C<sub>8</sub>-C<sub>12</sub> Aliphatic Thiols. 6/11. DRAFT

**Conclusion:**

The Mining Products are classified as hazardous chemicals. Efforts should be taken to minimize eye, dermal and inhalation exposures to these products by adhering to safe handling procedures, designated applications and uses, appropriate personal protective equipment practices, and labeling, storage, and transportation procedures and requirements. 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 these products.

**Contact Information:**

<http://www.cpchem.com/>

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