1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Product name: Marathon Molten Maleic Anhydride
Synonym: Maleic Anhydride; Maleic Anyhdride Molten; 2,5-Furandione
Chemical Family: Anhydride
Formula: C4H2O3

Manufacturer:
Marathon Petroleum Company LLC
539 South Main Street
Findlay OH 45840

Other information: 419-421-3070
Emergency telephone number: 877-627-5463

2. COMPOSITION/ INFORMATION ON INGREDIENTS

Maleic Anhydride (MA) is a white solid or clear molten liquid. MA is produced by the catalytic reaction of butane with air in the presence of a catalyst. During loading and unloading activities, it is handled as a molten liquid material.

Product information:

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS Number</th>
<th>Weight %</th>
<th>ACGIH Exposure Limits:</th>
<th>OSHA - Vacated PELs - Time Weighted Ave</th>
<th>Other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marathon Maleic Anhydride</td>
<td>108-31-6</td>
<td>100</td>
<td>= 0.1 ppm TWA</td>
<td>= 0.25 ppm TWA</td>
<td>= 1 mg/m³ TWA</td>
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Component Information:

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</tbody>
</table>

Notes: The manufacturer has voluntarily elected to reflect exposure limits contained in OSHA's 1989 air contaminants standard in its MSDS's, even though certain of those exposure limits were vacated in 1992.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
MALEIC ANHYDRIDE (MA) IS A WHITE SOLID OR CLEAR MOLTEN LIQUID WITH A SHARP ACRID ODOR. MA IS USUALLY HEATED DURING LOADING AND UNLOADING TO PREVENT SOLIDIFICATION, AND THEREFORE, HAS THE POTENTIAL TO CAUSE SKIN BURNS. MA LIQUID AND VAPOR CAN CAUSE SEVERE IRRITATION AND BURNS TO NOSE, THROAT AND RESPIRATORY TRACT.

OSHA WARNING LABEL:
CONSUMER WARNING LABEL:

A CONSUMER WARNING LABEL IS NOT APPLICABLE FOR THIS PRODUCT.

Inhalation: Inhalation of significant amounts of dust, vapor or fume can cause severe irritation and burns to the nose, throat and respiratory tract. Exposure to this product could cause an allergic reaction (narrowing of the air passages resulting in difficulty in breathing, tightness in the chest, coughing and wheezing) in some sensitive individuals. Other allergic symptoms could include itchy and watery eyes, runny and stuffy nose, sweating, flushing, hives, rapid heart rate and lowered blood pressure.

Ingestion: Ingestion may cause chemical burns of the mouth, throat, esophagus and stomach. Additional symptoms would include nausea, abdominal pain, diarrhea and vomiting of blood.

Skin contact: Skin contact with hot product can cause skin burns. Additional symptoms from exposure may include an allergic skin reaction or rash followed by blistering, scaling or other skin effects.

Eye contact: Hot product causes severe burns. This product is an eye irritant. Significant exposure to dust or vapors can produce severe irritation and burning sensations in the eyes and fibrous deposits (keratinization) on the cornea. Additional symptoms may include painful sensitivity to strong light, double vision and blurred vision around lights (halo vision).

Carcinogenic Evaluation:

Product information:

<table>
<thead>
<tr>
<th>Name</th>
<th>IARC Carcinogens:</th>
<th>NTP Carcinogens:</th>
<th>ACGIH - Carcinogens:</th>
<th>OSHA - Select Carcinogens:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marathon Maleic Anhydride</td>
<td>NE</td>
<td></td>
<td>A4 - Not Classifiable as a Human Carcinogen</td>
<td></td>
</tr>
<tr>
<td>108-31-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Notes: The International Agency for Research on Cancer (IARC) has not evaluated this product.

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<td></td>
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</tbody>
</table>

4. FIRST AID MEASURES

Inhalation: If affected, move person to fresh air. If breathing is difficult, administer oxygen. If not breathing or if no heartbeat, give artificial respiration or cardiopulmonary resuscitation (CPR). Immediately call a physician.

Skin contact: For contact with hot molten material, immerse or flush skin with cold water for at least 15 minutes. Call a physician.

Remove dust by washing with soap and large amounts of water. If symptoms or irritation occur, call a physician.
Ingestion: Ingestion not likely. Give water or milk to dilute the solution. Flush mouth out thoroughly to remove residual material. Do not induce vomiting. If large amounts are swallowed, immediately call a physician.

Eye contact: For contact with hot molten material, flush with large amounts of tepid water for at least 15 minutes. Immediately call a physician.

For contact with vapors or dust, flush with large amounts of tepid water for at least 15 minutes. If symptoms or irritation occur, call a physician.

Medical conditions aggravated by exposure: Pre-existing eye, skin, respiratory, liver and/or kidney disorders may be aggravated by exposure to components of this product.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Class B fire extinguishing media such as CO2, foam (AFFF/ATC) or water spray can be used. Dry chemical extinguishing media should not be used. These extinguishers contain sodium carbonate which will catalyze the decomposition of maleic anhydride. Fire fighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Specific hazards: This product is not a combustible liquid per the OSHA Hazard Communication Standard, but will ignite and burn at temperatures exceeding the flash point.

Special protective equipment for firefighters:

Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Use water spray to cool exposed surfaces from as far a distance as possible. Keep run-off water out of sewers and water sources.

Flash point: 215 F; 101.6 C
Autoignition temperature: No data available.
Flammable limits in air - lower (%): 1.4
Flammable limits in air - upper (%): No data available.

NFPA rating: Health: 3
Flammability: 1
Reactivity: 1
Other: -

HMIS classification: Health: 3
Flammability: 1
Reactivity: 1
Special: *See Section 8 for guidance in selection of personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. Advise authorities and National Response Center (800-424-8802) if the product has entered a water course or sewer. Notify local health and pollution control agencies, if appropriate. Contain liquid with sand or soil. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids.

7. HANDLING AND STORAGE

Handling:
Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements. Use appropriate grounding and bonding practices. Store in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues.

Avoid repeated and prolonged skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

## 8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

### PERSONAL PROTECTIVE EQUIPMENT

**Engineering measures:** Local or general exhaust required in an enclosed area or when there is inadequate ventilation.

**Respiratory protection:** Approved full face organic vapor chemical cartridge or supplied air respirators when vapors or dust exceed established limits. Observe respirator protection factor criteria cited in ANSI Z88.2. Self-contained breathing apparatus should be used for fire fighting.

**Skin and body protection:** Impermeable gloves to prevent skin contact. Natural rubber, neoprene or nitrile gloves to prevent skin contact.

**Eye protection:** Approved full face respirator should be used for product loading/unloading and gauging activities. Goggles and faceshield can be used for brief grab analysis sampling.

**Hygiene measures:** Use mechanical ventilation equipment that is explosion-proof.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- **Appearance:** Clear Liquid
- **Physical state (Solid/Liquid/Gas):** Liquid
- **Substance type (Pure/Mixture):** Pure
- **Color:** Clear
- **Odor:** Acrid
- **Molecular weight:** 98
- **pH:** No data available.
- **Boiling point/range (5-95%):** 395 F
- **Melting point/range:** Not determined.
- **Decomposition temperature:** Not applicable.
- **Specific gravity:** 1.29 @ 158 F.
- **Density:** 10.8 lbs/gal
  
  1.29 kg/l @ 70 C.
- **Bulk density:** No data available.
- **Vapor density:** 3.38
- **Vapor pressure:** 6.2 mm Hg @ 171 F.
- **Evaporation rate:** No data available.
- **Solubility:** Not determined
- **Solubility in other solvents:** No data available.
- **Partition coefficient (n-octanol/water):** No data available.
- **VOC content(%):** No data available.
- **Viscosity:** No data available.

## 10. STABILITY AND REACTIVITY

**Stability:** The material is stable at 70 F, 760 mm pressure.

**Polymerization:** Will not occur.
Hazardous decomposition products: Carbon monoxide and carbon dioxide

Materials to avoid: Strong oxidizers such as nitrates, chlorates, peroxides. Amines, alkali metals and alkaline earth metals (potassium, sodium, lithium) may cause fires or explosions.

Conditions to avoid: Sources of heat or ignition.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Product information:

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS Number</th>
<th>Inhalation:</th>
<th>Dermal:</th>
<th>Oral:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marathon Maleic Anhydride</td>
<td>108-31-6</td>
<td>No data available</td>
<td>LD50 is 2.6 gm/kg [Rabbit]</td>
<td>LD50 is 481-850 mg/kg [Rat]</td>
</tr>
</tbody>
</table>

Maleic Anhydride (MA) produced respiratory irritation and nasal and lung lesions in rats, monkeys and hamsters repeatedly exposed to significant MA vapors. Oral ingestion of MA produced significant kidney damage and slight liver effects in rats in oral feeding studies. Maleic anhydride (MA) was not observed to be carcinogenic to rats given 10, 32 or 100 mg/kg/day MA in the diet for 2 years. MA did not induce mutations in the Ames Salmonella assay with or without metabolic activation. MA produced chromosomal aberrations in Chinese hamster cells (in vitro) but did not affect chromosomes in the bone marrow of rats exposed for 6 hours of up to 100 mg/m³ MA or produce genotoxicity in an in vivo bone marrow cell clastogenesis assay. No teratogenic or fetotoxic effects were observed in the offspring of pregnant female rats administered up to 140 mg/kg/day MA during gestation even though maternal toxicity was noted in exposed animals.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects: This product does not concentrate or accumulate in the food chain. The 96 hour TLM for maleic anhydride is 75 mg/l in bluegill and rainbow trout and 230 mg/l in mosquito fish. The EC50 of MA is 88 - 5600 mg/l in Daphnia.

13. DISPOSAL CONSIDERATIONS

Cleanup Considerations: This product as produced is specifically listed as an EPA RCRA hazardous waste (U147) according to federal regulations (40 CFR 261.33). This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations.

14. TRANSPORT INFORMATION

49 CFR 172.101:

DOT: This material when transported via US commerce would be regulated by DOT Regulations.

Proper shipping name: Maleic Anhydride
UN/identification No: UN 2215
Hazard Class: 8
Packing group: III
DOT reportable quantity (lbs): 5000 pounds
TDG (Canada):

Proper shipping name: Maleic Anhydride
UN/Identification No: UN 2215
Hazard Class: 8
Packing group: III
Regulated substances: 5000 pounds.

15. REGULATORY INFORMATION

US Federal Regulatory Information:

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

OSHA Hazard Communication Standard: This product has been evaluated and determined to be hazardous as defined in OSHA's Hazard Communication Standard.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302: This product contains the following component(s) that have been listed on EPA's Extremely Hazardous Substance (EHS) List:

<table>
<thead>
<tr>
<th>Name</th>
<th>CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maleic Anhydride</td>
<td>NA</td>
</tr>
</tbody>
</table>

SARA Section 304: This product contains the following component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

<table>
<thead>
<tr>
<th>Name</th>
<th>CERCLA/SARA - Hazardous Substances and their Reportable Quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maleic Anhydride</td>
<td>= 2270 kg final RQ = 5000 lb final RQ</td>
</tr>
</tbody>
</table>

SARA Section 311/312: The following EPA hazard categories apply to this product:

- Acute Health Hazard
- Chronic Health Hazard

SARA Section 313: This product contains the following component(s) that may be subject to reporting on the Toxic Release Inventory (TRI) From R:

<table>
<thead>
<tr>
<th>Name</th>
<th>CERCLA/SARA 313 Emission reporting:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maleic Anhydride</td>
<td>= 1.0 % de minimis concentration</td>
</tr>
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</table>

State and Community Right-To-Know Regulations:
The following component(s) of this material are identified on the regulatory lists below:

- Maleic Anhydride
  - Louisiana Right-To-Know: Not Listed
  - California Proposition 65: Not Listed
  - New Jersey Right-To-Know: Listed
  - Pennsylvania Right-To-Know: Listed
  - Massachusetts Right-To-Know: Listed
  - Florida substance List: Not Listed.
  - Rhode Island Right-To-Know: Listed
  - Michigan critical materials register list: Not Listed.
  - Massachusetts Extraordinarily Hazardous Substances: Not Listed

MSDS ID NO.: 0288MAR019
Product name: Marathon Molten Maleic Anhydride
Canadian Regulatory Information:

Canada DSL/NDSL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

<table>
<thead>
<tr>
<th>Name</th>
<th>Canada - WHMIS: Classifications of Substances:</th>
<th>Canada - WHMIS: Ingredient Disclosure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maleic Anhydride</td>
<td>D1B, D2A, D2B, E</td>
<td>0.1 %</td>
</tr>
</tbody>
</table>

16 OTHER INFORMATION

Additional Information: No data available.

Prepared by: Craig M. Parker Manager, Toxicology and Product Safety

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End of Safety Data Sheet