SAFETY DATA SHEET

Emerald® JRHZ

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Emerald® JRHZ
Product code: 900015452
Product Use: Acid Fountain Solution for Offset Printing.

Manufactured by:
FUJIFILM Hunt Chemicals U.S.A., Inc.
40 Boroline Road
Allendale, NJ 07401-0320

Distributed in the USA by:
FUJIFILM North American Corporation,
Graphic Systems Division
200 Summit Lake Drive
Valhalla, NY 10595-1356

Distributed in Canada by:
FUJIFILM Canada, Inc.
600 Suffolk Ct.
Mississauga, Ontario L5R 4G4

Distributed Internationally by:
FUJIFILM Hunt Chemicals U.S.A., Inc.
40 Boroline Road
Allendale, NJ 07401-0320

SDSs are available at the following website(s):
http://www.fujifilmusa.com/msds

Company Phone Number
U.S.A: 800-473-3854 Canada: 800-263-5018

Emergency Telephone
Transport-CHEMTREC Inside NA: 800-424-9300
Transport CHEMTREC Outside NA: 703-527-3887
Transport-CANUTEC Inside Canada: 613-996-6666
Medical Emergency (24 hour): 877-935-7387

E-mail
EHS@fujifilm.com

2. HAZARDS IDENTIFICATION

Classification

Skin corrosion/irritation: Category 2
Serious eye damage/eye irritation: Category 2

GHS Label elements, including precautionary statements

Warning
Hazard Statements
Causes skin irritation
Causes serious eye irritation

Precautionary Statements
Prevention
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Response
IF exposed or concerned: Get medical advice/attention
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse

Storage
Not applicable

Disposal
Not applicable

Hazards not otherwise classified (HNOC)
Not classified

Other hazards
May be harmful if swallowed
Harmful to aquatic life with long lasting effects
Harmful to aquatic life

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>111-76-2</td>
<td>5-10%</td>
</tr>
<tr>
<td>AMMONIUM NITRATE</td>
<td>6484-52-2</td>
<td>1-5%</td>
</tr>
<tr>
<td>ACETIC ACID</td>
<td>64-19-7</td>
<td>1-5%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid measures for different exposure routes

General advice
If symptoms persist, call a physician.

Eye contact
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/
Skin contact
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation
Move to fresh air. If symptoms persist, call a physician.

Ingestion
If swallowed, do not induce vomiting - seek medical advice.

Most important symptoms/effects, acute and delayed
May cause redness, itching, and pain.

Indication of immediate medical attention and special treatment needed, if necessary
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media
None known.

Specific hazards arising from the chemical
None known.

Explosion Data
Sensitivity to Mechanical Impact  none
Sensitivity to Static Discharge  none

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid contact with skin, eyes or clothing. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions
Prevent entry into waterways, sewers, basements or confined areas. Do not flush into surface water or sanitary sewer system. Prevent product from entering drains.

Methods and materials for containment and cleaning up
Methods for Containment  Prevent further leakage or spillage if safe to do so.
Methods for cleaning up  Use personal protective equipment. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly. After cleaning, flush away traces with water.
7. HANDLING AND STORAGE

Precautions for safe handling

Wear personal protective equipment. Avoid contact with skin, eyes or clothing. Avoid breathing vapors or mists. Ensure adequate ventilation.

Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
<th>AIHA - Workplace Environmental Exposure Levels (WEELs) - TWAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>TWA: 20 ppm</td>
<td>TWA: 50 ppm (vacated) TWA: 25 ppm (vacated) TWA: 120 mg/m³ (vacated) S*</td>
<td>IDLH: 700 ppm TWA: 5 ppm TWA: 24 mg/m³</td>
<td></td>
</tr>
<tr>
<td>ACETIC ACID</td>
<td>STEL: 15 ppm TWA: 10 ppm</td>
<td>TWA: 10 ppm (vacated) TWA: 10 ppm (vacated) TWA: 25 mg/m³</td>
<td>IDLH: 50 ppm TWA: 10 ppm TWA: 25 mg/m³ STEL: 15 ppm STEL: 37 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Exposure controls

Engineering Measures

Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection

Tightly fitting safety goggles.

Skin and body protection

Wear protective gloves/clothing.

Respiratory protection

If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations

When using do not eat, drink or smoke. Take off contaminated clothing and wash before reuse. Regular cleaning of equipment, work area and clothing is recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear, Green</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>3.25 - 3.40</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.064 - 1.069</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 201 °F / &gt; 94 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting point / melting range</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td>Not available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Miscible with water</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild</td>
</tr>
<tr>
<td>Physical State @20°C</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>&gt; 212 °F / &gt; 100 °C</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>Not available</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not available</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
Stable under recommended storage conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Conditions to Avoid
Excessive heat. Freezing. This product contains an ammonia compound. Do not allow this solution to come in contact with household or industrial bleaches (Sodium Hypochlorite). Mixing of these chemicals can result in the release of hazardous or toxic gases. Inhalation of these gases may cause severe respiratory irritation.

Incompatible Materials

Hazardous Decomposition Products
None known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Acute toxicity

Inhalation
Inhalation of vapors in high concentration may cause irritation of respiratory system.

Eyes
Irritating to eyes. May cause redness and tearing.

Skin
Irritating to skin.

Ingestion
May be harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>LC50 (lethal concentration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>= 470 mg/kg (Rat)</td>
<td>400 mg/kg (Rabbit)</td>
<td>= 450 ppm (Rat) 4 h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2270 mg/kg (Rat)</td>
<td></td>
</tr>
<tr>
<td>AMMONIUM NITRATE</td>
<td>= 2217 mg/kg (Rat)</td>
<td></td>
<td>&gt; 88.8 mg/L (Rat) 4 h</td>
</tr>
<tr>
<td>ACETIC ACID</td>
<td>600 mg/kg (Rabbit) [NZ CCID]</td>
<td>1060 mg/kg (Rabbit)</td>
<td>11.4 mg/L (Rat) 4 h</td>
</tr>
</tbody>
</table>

Information on toxicological effects
No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure
Irritation: Irritating to eyes. Irritating to skin.
Corrosivity: No information available.
Sensitization: No information available.
Mutagenic Effects: No information available.
Reproductive Toxicity: No information available.
Carcinogenicity: None known.

STOT - single exposure: No information available.
STOT - repeated exposure: No information available.
Target Organ Effects: Blood, Central nervous system (CNS), Eyes, Hematopoietic System, Kidney, Liver, Respiratory system, Skin, Teeth.
Aspiration hazard: No information available.

Numerical measures of toxicity - Product Information

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae toxicity</th>
<th>Toxicity to fish</th>
<th>Toxicity to microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETIC ACID</td>
<td></td>
<td>Pimephales promelas: 79 mg/L at 96 h</td>
<td>65: 48 h Daphnia magna mg/L EC50 Static</td>
<td></td>
</tr>
</tbody>
</table>

Ecotoxicity
Harmful to aquatic life with long lasting effects.

Persistence and degradability
No information available.

Bioaccumulation

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Octanol Water Partition Coefficient (log pow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>0.81</td>
</tr>
<tr>
<td>AMMONIUM NITRATE</td>
<td>-3.1</td>
</tr>
<tr>
<td>ACETIC ACID</td>
<td>-0.31</td>
</tr>
</tbody>
</table>

Mobility
No information available.

Other adverse effects
No information available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods
Dispose of in accordance with local regulations.
Contaminated packaging

Do not re-use empty containers.

14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Regulation Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td>Not regulated</td>
</tr>
<tr>
<td>TDG</td>
<td>Not regulated</td>
</tr>
<tr>
<td>MEX</td>
<td>Not regulated</td>
</tr>
<tr>
<td>ICAO</td>
<td>Not regulated</td>
</tr>
<tr>
<td>IATA</td>
<td>Not regulated</td>
</tr>
<tr>
<td>IMDG</td>
<td>Not regulated</td>
</tr>
<tr>
<td>ADR/RID</td>
<td>Not regulated</td>
</tr>
<tr>
<td>ADN</td>
<td>Not regulated</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Yes</td>
</tr>
<tr>
<td>DSL/NDSL</td>
<td>No</td>
</tr>
<tr>
<td>PICCS</td>
<td>No</td>
</tr>
<tr>
<td>EINECS/ELINCS</td>
<td>No</td>
</tr>
<tr>
<td>ENCS</td>
<td>No</td>
</tr>
<tr>
<td>IECSC</td>
<td>No</td>
</tr>
<tr>
<td>KECL</td>
<td>No</td>
</tr>
<tr>
<td>AICS</td>
<td>No</td>
</tr>
</tbody>
</table>

*Yes - All component(s) of this product are included or are exempt from listing on the inventory.

*No - Indicates the component(s) of this product are either not listed or have not been determined to be listed on the inventory.

U.S. Federal Regulations

TSCA Sections 4, 5 and 12(b)
This product does not contain any chemicals regulated by TSCA Sections 4, 5 or 12(b).

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>SARA 313 - Threshold Values %</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>111-76-2</td>
<td>1.0</td>
<td>5-10%</td>
</tr>
<tr>
<td>AMMONIUM NITRATE</td>
<td>6484-52-2</td>
<td>1.0</td>
<td>1-5%</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

- **Acute Health Hazard**: Yes
- **Chronic Health Hazard**: no
- **Fire Hazard**: no
- **Sudden Release of Pressure Hazard**: no
- **Reactive Hazard**: no

Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
<th>CWA - Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETIC ACID</td>
<td>5000 lb</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Hazardous Substances RQs</th>
<th>Extremely Hazardous Substances RQs</th>
<th>RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETIC ACID</td>
<td>5000</td>
<td></td>
<td>RQ 5000 lb final RQ RQ 2270 kg final RQ</td>
</tr>
</tbody>
</table>

U.S. State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AMMONIUM NITRATE</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>ACETIC ACID</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

International Regulations

Canada - NDSL

This product does not contain any NDSL chemicals.

Mexico - Grade

Slight risk, Grade 1

Mexico - Carcinogen Status and Exposure Limits

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogen Status</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL MONOBUTYL ETHER</td>
<td></td>
<td>Mexico: TWA 26 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 120 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: STEL 75 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: STEL 360 mg/m³</td>
</tr>
<tr>
<td>ACETIC ACID</td>
<td></td>
<td>Mexico: TWA 19 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: TWA 25 mg/m³</td>
</tr>
</tbody>
</table>

Page 8 / 9
Other Regulations
No information available

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical and chemical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>Personal protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>B</td>
</tr>
</tbody>
</table>

Prepared By
FUJIFILM Environment, Health and Safety, phone: 800-473-3854

Revision Date
01-Dec-2015

Revision Note
No information available

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