1. PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>TRADE NAME (AS LABELED):</th>
<th>Gallium 69 &amp; Mixed Isotope</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL NAME:</td>
<td>Gallium</td>
</tr>
<tr>
<td>CHEMICAL FAMILY:</td>
<td>(Non-radioactive) isotope of Gallium</td>
</tr>
<tr>
<td>U.S. SUPPLIER'S NAME:</td>
<td>FEI Company</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>5350 NE Dawson Creek Dr., Hillsboro, OR 97124 USA</td>
</tr>
<tr>
<td>BUSINESS PHONE#:</td>
<td>503 726-7500</td>
</tr>
<tr>
<td>FAX NUMBER:</td>
<td>503 726-2850</td>
</tr>
<tr>
<td>WEB SITE:</td>
<td><a href="http://www.fei.com">www.fei.com</a></td>
</tr>
<tr>
<td>SUPPLIER 1:</td>
<td>FEI Electron Optics b.v.</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>Achtesweg Noord 5, P.O.Box 80066</td>
</tr>
<tr>
<td>BUSINESS PHONE#:</td>
<td>5600 KA Eindhoven, The Netherlands</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>+31 40 23 56008</td>
</tr>
<tr>
<td>SUPPLIER 2:</td>
<td>FEI Czech Republic, s.r.o.</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>Podnikatelská 6, 612 00 Brno, Czech Republic</td>
</tr>
<tr>
<td>BUSINESS PHONE#:</td>
<td>+420.533.311.111</td>
</tr>
<tr>
<td>DATE OF ORIGINAL PREPARATION:</td>
<td>October 14, 2010</td>
</tr>
<tr>
<td>DATE OF LAST REVISION:</td>
<td>December 9, 2013</td>
</tr>
</tbody>
</table>

2. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Product Description: This product is a silver colored liquid or solid, with no odor. Health Hazards: This material can cause irritation to skin and eyes. Flammability Hazards: This product is Non-Flammable. Reactivity Hazards: Corrosive to light, alloys especially aluminum alloys. Environmental Hazards: There is no information available on the environmental hazards associated with this product. Emergency Considerations: Emergency responders must wear the proper personal protective equipment (and have appropriate fire-suppression equipment) suitable for the situation to which they are responding.

EU LABELING AND CLASSIFICATION:
Classification of the substance or mixture according to Regulation (EC) No1272/2008
This product meets the definition of a hazardous substance or preparation according to EU Regulations (EC) No 1272/2008
Index Number:
EC# 231-163-8 This substance is not classified in the Annex I of Directive 67/548/EEC
Substances not listed either individually or In group entries must be self-classified.
Component(s) Determining Hazard:
Gallium

GHS Classification:
Skin Irritant Category 2
Eye Irritant Category 2B

Label Elements:
Pictogram

Signal Word: Warning!
Hazard Statement(s):
H315 Causes skin irritation
H320 Causes eye irritation
Precautionary Statement(s):
P264 Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing.
P302 + P360 IF ON SKIN: Gently wash with plenty of soap and water.

EU Hazard Classification Per Directive 1999/45/EC: [X] Irritant
Risk Phrases: R36/37/38: Irritating to eyes, respiratory and skin
Safety Phrases: S24/25: Avoid contact with skin and eyes; S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice; S37/39: Wear suitable gloves and eye/face protection.

HEALTH HAZARDS OR RISKS FROM EXPOSURE:
Primary Routes(s) Of Entry: Eye Contact, Inhalation, Ingestion
EYE HAZARDS: May cause eye irritation.
SKIN HAZARDS: May cause skin irritation.
INGESTION HAZARDS: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
INHALATION HAZARDS: Causes respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.
CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing skin, eye or respiratory problems may be more susceptible to hazards associated with this product.
CONDITIONS AGGRAVATED BY OVEREXPOSURE: None known

### 3. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Ingredients</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>ICCS #</th>
<th>WT %</th>
<th>Hazard Symbol</th>
<th>Risk Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallium 69 &amp; 71</td>
<td>7440-55-3</td>
<td>231-163-8</td>
<td>Not Listed</td>
<td>100</td>
<td>HAZARD CLASSIFICATION: [X] IRRITANT</td>
<td>R36/37/38</td>
</tr>
</tbody>
</table>

*Balance of other components. Each of the other components is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens)*

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard JIS Z 7250: 2000. This material is classified as hazardous under OSHA regulations 29 CFR 1910.1200.

### 4. FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Recueres should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with contaminated individual.

SKIN EXPOSURE: Immediately wash with soap and copious amounts of water. If discomfort occurs or persists, contact a physician immediately.

EYE EXPOSURE: Flush for 15 minutes with plenty of water. If discomfort occurs or persists, contact a physician immediately.

INHALATION: If breathing becomes difficult remove contaminated individual to fresh air. Seek immediate medical attention if breathing difficulties continue.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

CONDITIONS AGGRAVATED BY OVEREXPOSURE: Material may cause irritation to respiratory tract, eyes and skin. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
5. FIRE-FIGHTING MEASURES

FLASH POINT: Not Available
AUTOIGNITION TEMPERATURE: Not Available
FLAMMABLE LIMITS (in air by volume, %): Lower NA Upper NA
FIRE EXTINGUISHING MATERIALS: Suitable: Water spray, Dry chemical powder, carbon dioxide or appropriate foam.
UNUSUAL FIRE AND EXPLOSION HAZARDS: This product can decompose to emit toxic, irritating fumes of carbon monoxide, carbon dioxide and metal oxide.
   Explosion Sensitivity to Mechanical Impact: Not Sensitive
   Explosion Sensitivity to Static Discharge: Not Sensitive
SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations. Wear appropriate protective equipment such as rubber gloves, safety glasses, and appropriate body protection. Stop discharge if safe to do so.
SPILL: Sweep solid into appropriate container and hold for recycling. If possible, freeze liquid gallium with CO2 and place in container for recycling. Ventilate area. Wash spill area after material pickup is complete.
DISPOSAL: Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations). Dispose of recovered material and report spill per regulatory requirements. It is recommended you contact local authorities to determine if there may be other local reporting requirements.

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing mists or sprays generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.
STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid contact with eyes, skin and clothing. Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Use local exhaust ventilation, and process enclosure if necessary, to control airborne dust. Ensure eyewash/safety shower stations are available near areas where this product is used.

EXPOSURE LIMITS/GUIDELINES:

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS#</th>
<th>ACGIH-TLV's</th>
<th>OSHA PEL's</th>
<th>NIOSH-TLV's</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallium 68 &amp; 71</td>
<td>7440-55-3</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Check specific local requirements</td>
</tr>
</tbody>
</table>

International exposure limits may be established for the components of this product. Please check with competent authority in each country for the most recent limits in place.
SAFETY DATA SHEET

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: NIOSH approved chemical cartridge respirator for particulates and dust or self-contained breathing apparatus with full face shield. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. Federal OSHA’s Respiratory Protection Standard (1910.134-1998) or the regulations of various U.S. States, Canada, EU Member States, or those of Japan. Air-purifying respirators with dust/mist/ground filters are recommended if operations may produce mists or sprays from this product.

EYE PROTECTION: Safety glasses and/or face shield to prevent contact. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, and the European Standard EN 166, Australian Standards, or relevant Japanese Standards.

HAND PROTECTION: Wear rubber (neoprene) chemical resistant gloves to prevent skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138, the European Standard DIN EN 374, the appropriate Standards of Canada, Australian Standards, or relevant Japanese Standards.

BODY PROTECTION: Wear appropriate clothing sufficient to prevent skin contact. If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: NA
SPECIFIC GRAVITY @ 20°C: 5.904 (Solid) 6.905 (Liquid)
VAPOR PRESSURE, mm Hg @ 100°C: 0.004 mmHg
MELTING POINT: 86°F
ODOR THRESHOLD: None
APPEARANCE, ODOR and COLOR: This product is a silver colored liquid or solid, with no odor.

EVAPORATION RATE (n-BuAc=1): Not applicable
SOLUBILITY IN WATER: Insoluble
pH: Not Available
BOILING POINT: 435°F

10. STABILITY and REACTIVITY

STABILITY: Stable.
DECOMPOSITION PRODUCTS: Toxic fumes
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids, strong bases, strong oxidizing materials, halogens, moisture.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: None listed

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: To the best of our knowledge the chemical, physical, and toxicological properties of this compound have not been thoroughly investigated.

SUSPECTED CANCER AGENT: The components of this product are not listed by agencies tracking the carcinogenic potential of chemical compounds as follows:

Carcinogenicity
NTP Regulated No
IARC Regulated No
OSHA Regulated No

IRRITANCY OF PRODUCT: This product can cause skin and eye irritation.

SENSITIZATION TO THE PRODUCT: These products are not known to cause human skin or respiratory sensitization.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: The components of this product are not reported to produce mutagenic effects in humans.
Embryotoxicity: The components of this product are not reported to produce embryotoxic effects in humans.
Teratogenicity: The components of this product are not reported to produce teratogenicity effects in humans.
Reproductive Toxicity: The components of this product are not reported to produce reproductive effects in humans.
12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY IN SOIL: No Data
PERSISTENCE/DEGRADABILITY: No Data
ENVIRONMENTAL STABILITY: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways
BIOACCUMULATION/ACCUMULATION: These products have not been tested for bio-accumulation potential.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

14. TRANSPORTATION INFORMATION

US DOT, IATA, IMO, ADR:
DOT (US)
UN-Number: 2803 Class: 8, Packing group: III
Proper shipping name: Gallium
Marine pollutant: No
Poison Inhalation Hazard: No
IMDG
UN-Number: 2803 Class: 8, Packing group: III
Proper shipping name: Gallium
Marine pollutant: No
Poison Inhalation Hazard: No
IATA
UN-Number: 2803 Class: 8, Packing group: III
Proper shipping name: Gallium
Marine pollutant: No
Poison Inhalation Hazard: No

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS: This product is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: These products are classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): These products are classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION: These products are classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): These products are classified by the United Nations Economic Commission for Europe to be dangerous goods.

15. REGULATORY INFORMATION

UNITED STATES REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this product are not subject to the reporting requirements of Sections 802, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for any component of these products. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: The components of this product are listed in the TSCA Inventory.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): This product does not contain any component above the 0.1% level which is listed as a California Proposition 65 chemical.
12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY IN SOIL: No Data
PERSISTENCE/DEGRADABILITY: No Data
ENVIRONMENTAL STABILITY: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways
BIOACCUMULATION/ACCUMULATION: These products have not been tested for bio-accumulation potential.

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Proper shipping name: Gallium
Marine pollutant: No
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UN-Number: 2803 Class: 8, Packing group: III
Proper shipping name: Gallium
Marine pollutant: No
Poison Inhalation Hazard: No
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UN-Number: 2803 Class: 8, Packing group: III
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Marine pollutant: No
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15. REGULATORY INFORMATION

UNITED STATES REGULATIONS:
U.S. SARA REPORTING REQUIREMENTS: The components of this product is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.
U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for any component of these products. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) therefore applies, per 40 CFR 370.20.
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CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): This product does not contain any component above the 0.1% level which is listed as a California Proposition 65 chemical.
SAFETY DATA SHEET

CANADIAN REGULATIONS:
CANADIAN DSL/NDNL INVENTORY STATUS: The components of this product are on the DSL Inventory, or are exempted from listing.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.
CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS). Class E Corrosive material.

EUROPEAN ECONOMIC COMMUNITY INFORMATION:
See Section 2 for Details

AUSTRALIAN INFORMATION FOR PRODUCT:
AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: The components of this product are listed on the AICS
STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:
JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:
Listing of the components on individual country Chemical Inventories is as follows:
Asia-Pac: Listed
Australian Inventory of Chemical Substances (AICS): Listed
Korean Existing Chemicals List (ECL): Listed
Japanese Existing National Inventory of Chemical Substances (ENCS): Listed
Philippines Inventory of Chemicals and Chemical Substances (PICCS): Listed
Swiss Gifiltere List of Toxic Substances: Listed
U.S. TSCA: Listed

16. OTHER INFORMATION

PREPARED BY: Paul Eigrett
DATE OF PRINTING: December 9, 2013

GHS MSDS Compliance PLUS
(585) 490-9079

Although the information set forth herein is presented in good faith and believed to be correct as of the date of issuance, it has been furnished by our suppliers; consequently, FEI Company makes no representations or warranties, express or implied, with respect to information herein presented. The information set forth herein is supplied upon the condition that the persons receiving same will make their own determination as to suitability for their purposes prior to use and relates only to the specific product described and not to such product in combination with any other product. In no event will FEI Company be responsible for damages of any nature resulting from the use of or reliance upon this information.

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