Section 1: Company and Product Identification

**Product Name:** Bis(2-Methylallyl)(1,5-cyclooctadiene) Ruthenium (II)
**Product Code:** 8055

**Company:** Colonial Metals, Inc.
Building 20
505 Blue Ball Road
Elkton, MD 21921 United States
Company Contact: EHS Director
Telephone Number: 410-398-7200
FAX Number: 410-398-2918
E-Mail: info@colonialmetals.com
Web Site: www.colonialmetals.com

**Emergency Supplier Emergency Contacts & Phone Number**
**Response:** Chemtrec: 800-424-9300
World Wide - Call COLLECT to U.S: 703-527-3887

Section 2: Hazards Identification

**Hazard Pictograms:**

**Signal Word:** Warning

**Hazard Category:**
- Acute tox, oral Cat 5
- Skin corrosion/irritation Cat 2
- Serious eye damage/eye irritation Cat 3
- Acute tox, inh. Cat 5

**Hazard Statements:**
- H303: May be harmful if swallowed
- H315: Causes skin irritation
- H320: Causes eye irritation
- H333: May be harmful if inhaled

**Precautionary Statements:**
- P260: Do not breathe dust/fume/gas/mist/vapors/spray
- P264: Wash thoroughly after handling
- P270: Do not eat, drink or smoke when using this product
- P271: Use only outdoors or in a well-ventilated area
- P272: Contaminated work clothing should not be allowed out of the workplace
- P280: Wear protective gloves/protective clothing/eye protection/face protection
- P284: Wear respiratory protection

**Chronic/Carcinogenicity Effects:**
No information on long-term chronic effects.

**Conditions Aggravated By Exposure:**
- Irritating to skin, eyes, and respiratory tract.

**Conditions Aggravated By Overexposure:**
To the best of our knowledge, the chemical, the physical, and toxicological properties have not been thoroughly investigated.

Section 3: Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous substance (name)</th>
<th>Hazard Category</th>
<th>CAS#</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis (2-Methylallyl)(1,5-cyclooctadiene) Ruthenium (II)</td>
<td>Irritant</td>
<td>12289-94-0</td>
<td>100</td>
</tr>
<tr>
<td>Chemical Family: Organometallic Complex Chemical Formula: (C4H7)2(C8H12)Ru</td>
<td>Irritating to the respiratory tract, skin, and eyes. May be harmful if swallowed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bis(2-methylallyl)(COD)ruthenium (II)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section 4: First Aid Measures

**General Info:** Consult a Physician. Show this safety data sheet to the doctor in attendance.

**Notable Exposure** Irritation to skin, eyes and areas of contact.

**symptoms:**
- **If ingested:** Rinse mouth. Seek immediate medical attention. Clear the airway and administer artificial respiration if not breathing.
  - If swallowed, do not induce vomiting unless directed to do so by medical personnel.
- **If inhaled:** Remove the victim from the contaminated area while protecting yourself from exposure by wearing an appropriate respirator. Put a similar respirator on the victim if possible. Get medical attention.
- **Eye contact:** Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do. Get medical attention.
- **Skin contact:** Flush area for 15 minutes with water and wash with soap and water. If discomfort occurs or persists, contact a physician. Remove contaminated clothing and shoes and wash before reuse.

Section 5: Fire Fighting Measures

**General Info:** Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.

- Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.

**Extinguishing Method / Equipment:**

- Carbon dioxide, dry powder, or foam.

**Hazardous Decomposition Info:** Not known, May decompose to emit toxic fumes

Section 6: Accidental Release Measures

**Personal precautions, protective equipment and procedures:** Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment during clean-up. Avoid breathing dust. Ventilate area if easy to do so. Contact local authorities if significant spillages cannot be contained. For personal protective equipment, see section 8 of the SDS.

**Containment Large Spills:** Contain actively spilling material if safe and easy to do so. Do not let product enter drains. Sweep up and placed in a proper vessel for recovery or disposal. Avoid raising dust. Ventilate and wash spill site after cleanup is complete.

**Small Spills:** Sweep or soak up and place in sealed container. Taking care to avoid dusting.

**Cleanup Procedures:** Contain spillage and then collect with an electrically protected vacuum cleaner or by wet brushing and place in container for disposal according to local regulations.

Section 7: Handling and Storage

**Safe Handling** Do not handle until all safety precautions have been read and understood. Keep containers tightly closed. Ensure adequate ventilation. Avoid breathing dust/vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment and wash thoroughly after handling. Keep away from ignition sources. Keep away from heat and direct sunlight.

**Recommendations** Store in cold, dry area in a tightly closed product container away from sources of ignition or flame, under an inert atmosphere of nitrogen or argon. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

**Incompatibilities:** Heat Sensitive

Section 8: Exposure Control / Personal Protection

**General / Ventilation:** Local Exhaust: Required in handling area

**Engineering Controls:** Mechanical: Desirable to insure concentration of material below TLV/TWA levels

**Engineering Controls:** Other: Closed Ventilation system - Dust (Laboratory Fume Hood)

**Work Clothing:** Protective work clothing which covers skin and prevents exposures.

**Eye/face protection:** Wear safety glasses with side shields or goggles or face shield.

**Skin Protection:** Wear chemical resistant gloves.

**Respiratory Protection:** NIOSH approved chemical cartridge respirator for particulates and dust or self-contained breathing apparatus with full face shield.

**Additional Information:** Observe good chemical hygiene practices. Do not smoke or eat while using this product. Wash hands or exposed skin after using the product. Lab coat/apron, flame and chemical resistant protective clothing, eye wash, safety shower, and hygiene facilities for washing.
Section 9: Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Solid</td>
</tr>
<tr>
<td>Melting Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Color</td>
<td>Tan to Brown</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>N/A</td>
</tr>
<tr>
<td>Odor</td>
<td>N/A</td>
</tr>
<tr>
<td>Molecular Wt.</td>
<td>319.45</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>N/A</td>
</tr>
<tr>
<td>Flash Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Part. Coeff (n-octanol/water)</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper Flam Limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Lower Flam Limits</td>
<td>N/A</td>
</tr>
<tr>
<td>VOC Content</td>
<td>N/A</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>Autoignition Temp</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Section 10: Stability and Reactivity

**General:** This product is stable and non-reactive under normal conditions of use. Product is not subject to hazardous polymerization. Avoid open flame and ignition sources.

**Stability:** Stable

**Conditions to Avoid:** Heat sources

**Incompatible** materials: Strong oxidizing agents

**Decomposition** products: Carbon monoxide, carbon dioxide, ruthenium oxides, and organic fumes

Section 11: Toxicological Information

**General Information:** To the best of our knowledge the chemical, physical, and toxicological effects of this compound have not been thoroughly investigated.

**Toxicological Information (product):**

- **Likely Routes of Exposure:**
  - Eye Contact
  - Skin Contact
  - Inhalation
  - Ingestion - possible, but considered unlikely.

**Toxicological Information (contained substances):**

- **Carcinogenicity or** not available.
- **Mutagenicity:** not available.
- **Sensitization:** Product is not expected to be a sensitizer.

Section 12: Ecological Information

**General information:** No data available

**Aquatic toxicity:** No specific data available.

**Degradation / Mobility info:** No specific data available.

**Bioaccumulative potential:** No specific data available.

Section 13: Disposal Information

**Product disposal:** Place in a sealed container. Consult Federal EPA, State and local regulations for proper disposal/recycle/reclamation

**Container disposal:** Treat empty containers with extra care. Consult waste contractor.

**Other considerations:** No further information.
Section 14: Transport Information

DOT: Proper Shipping Name:
Non-Hazardous

IMO/IMDG: No data available

IATA: Same as DOT 49 CFR regulations. Consult IATA before shipping

Comments: None

Section 15: Regulatory Information

TSCA: Not listed in the TSCA

SARA: SARA Section 313 Notification:
This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

Canadian DSL: 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.

Indication of Danger: Irritant
Symbol of Danger: Xi
Risk Phrase: Harmful by inhalation. Irritating to the skin.
Si: 24/25, 36/37/39
Safety Phrase: Avoid contact with skin and eyes. Wear suitable protective clothing, gloves, and eye face protection.

Other International Regulations:
None

Section 16: Other Information

NFPA Rating
Health: 2
Fire: 0
Reactivity: 0

HMIS Rating
Health: 2
Fire: 0
Reactivity: 0

Precautionary Label
Irritant

Disclaimer: In compliance with the OSHA Hazard communication Standard, 29 C.F.R 1910.1200, we are providing you with a Materials Safety Data Sheet (MSDS) for the hazardous material you are purchasing.

It is your responsibility to educate your employees on the safe use of the hazardous material. With this in mind, a copy should be forwarded to the supervisor of the user or to the user themselves, and copy should be retained in your files for future reference.

Colonial Metals, Inc. makes no presentation as to the accuracy of the information in the MSDS. The information is believe to be correct; however, you (the customer), should perform your own investigation and independent verification. If you resell the product, you are responsible to forward the information in the MSDS to your customer.

Colonial Metals, Inc.

SDS Author: John Kerchner
Version Date: 7/30/2015