

## Safety Data Sheet

### 29 CFR 1910.1200

#### Section 1: Company and Product Identification

**Product Name:** Bis(cyclopentadienyl)ruthenium

**Product Code:** 8034

**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



www.colonialmetals.com

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

#### Section 2: Hazards Identification

**Hazard Pictograms:**



**Signal Word:** Warning

**Hazard Category:** Serious eye damage/eye irritation Cat 3  
 Skin corrosion/irritation Cat 3  
 Acute tox, inh. Cat 5  
 Acute tox, dermal Cat 5  
 Acute tox, oral Cat 4  
 Specific target organ tox, single exp. Cat 3 (resp irrit)

**Hazard Statements:** H320: Causes eye irritation  
 H316: Causes mild skin irritation  
 H333: May be harmful if inhaled  
 H313: May be harmful in contact with skin  
 H302: Harmful if swallowed  
 H335: May cause respiratory irritation

**Precautionary Statements:** P261: Avoid breathing 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  
 P280: Wear protective gloves/protective clothing/eye protection/face protection  
 P301+312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel  
 P302+352: IF ON SKIN: Wash with soap and water  
 P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position  
 P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove  
 P312: Call a POISON CENTER or doctor/physician if you feel unwell  
 P322: Specific measures (see First Aid Supplement on this label)  
 P330: Rinse mouth  
 P332+313: If skin irritation occurs: Get medical advice/attention  
 P337+313: If eye irritation persists get medical advice/attention  
 P362: Take off contaminated clothing and wash before reuse  
 P403+233: Store in a well ventilated place. Keep container tightly closed  
 P405: Store locked up  
 P501: Dispose of contents/container in accordance with

**Hazards not otherwise classified:**

**Conditions Aggravated By Exposure**

May cause irritation of the respiratory system. Maintain housekeeping and personal hygiene to minimize exposure and prevent sensitization.

**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**

Hazardous substance (name)	Hazard Category	CAS#	Weight %
Bis(cyclopentadienyl)ruthenium	Irritant	1287-13-4	99
<b>Product Name:</b> Bis(cyclopentadienyl)ruthenium			
<b>Chemical Name:</b> Bis(cyclopentadienyl)ruthenium			
<b>Chemical Family:</b> Metallocene			
<b>Chemical Formula:</b> (C <sub>5</sub> H <sub>5</sub> ) <sub>2</sub> Ru			
<b>Synonyms:</b> Ruthenocene			

**Section 4: First Aid Measures**

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

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

**symptoms:**

**If ingested:** Not expected to be a problem in industry. However if swallowed and discomfort occurs, contact a physician.

**If inhaled:** Remove to fresh air immediately. If discomfort occurs or persists, contact a physician.

**Eye contact:** Flush for 15 minutes with plenty of water. If discomfort occurs or persists, contact a physician.

**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.

**Additional Info:** None

**Section 5: Fire Fighting Measures**

**General Info:** Use proper safety equipment. Can decompose to emit toxic carbon monoxide, carbon dioxide, and ruthenium tetroxide vapors.

**Extinguishing Method / Equipment:** Use water spray, foam, carbon dioxide (CO<sub>2</sub>) or medium for primary source.

**Method / Equipment:**

**Hazardous Decomposition Info:** Firefighters should wear self-contained breathing apparatus and full protective gear. Hazardous decomposition products formed under fire conditions. Carbon dioxide, carbon monoxide, organic fumes, and ruthenium oxide

**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 respiratory protective equipment and clothing during clean-up. Avoid breathing dust. Ventilate area if easy to do so. Contact local authorities if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Containment Equipment and** Large Spills: Contain actively spilling material if safe and easy to do so. Do not let product enter drains.

**Procedures:** Small spills can be mixed with vermiculite, sodium carbonate or other suitable non-combustible adsorbent and swept up.

**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 Precautions:** Do not handle until all safety precautions have been read and understood. Keep containers tightly closed. Ensure adequate ventilation. Avoid breathing dust. 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.

**Recommendations for Storage:** Keep material in a tightly sealed container. Prolonged exposure to air and moisture will result in degradation of the product.

**Incompatibilities:** Oxidizing agents, halogens and active metals

**Section 8: Exposure Control / Personal Protection**

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**General / Engineering** Ventilation: Local Exhaust: Required in handling area**Controls:** Mechanical: Desirable to insure concentration of material below TLV/TWA levels  
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** Utilize organic vapor respirator if airborne levels are not maintained or if ventilation is inadequate.**Protection:** Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN(EU).**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.**Section 9: Physical and Chemical Properties**

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<b>State:</b> Solid	<b>Melting Point:</b> : 6 °C	<b>Freezing Point:</b> N/A
<b>Color:</b> Yellow Crystal	<b>Boiling Point/Range:</b> N/A	<b>pH:</b> N/A
<b>Molecular Wt.</b> 231.26	<b>Odor:</b> N/A	<b>Water Solubility:</b> N/A
<b>Evaporation rate:</b> N/A	<b>Flash Point:</b> N/A	<b>Part. Coeff (n-octanol/water):</b> N/A
<b>Upper Flam Limits:</b> N/A	<b>Lower Flam Limits:</b> N/A	<b>Vapor Pressure:</b> N/A
<b>VOC Content (lbs/gal):</b> N/A	<b>Specific Gravity:</b> N/A	<b>Autoignition Temp:</b> N/A

**Section 10: Stability and Reactivity**

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**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.**Incompatible materials:** Oxidizing agents, halogens and active metals**Decomposition products:** Carbon dioxide, carbon monoxide, nitrogen oxides, organic fumes, and ruthenium oxide**Section 11: Toxicological Information**

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**General Information:** To the best of our knowledge, the chemical, the physical, and toxicological properties of this compound have not been thoroughly investigated**Toxicological Information (product):** No data available**Likely Routes of Exposure:** Eye Contact  
Skin Contact  
Inhalation  
Ingestion - possible, but considered unlikely.**Toxicological Information (contained substances)****Sensitization:** Product is not expected to be a sensitizer.**Section 12: Ecological Information**

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**General information:** No data available**Aquatic toxicity:** No data available**Degradation / Mobility info:** No specific data available.**Bioaccumulative potential:** No specific data available.

**Section 13: Disposal Information**

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

NOTE: Chemical additions, processing, or otherwise altering this material may make the waste management information presented above incomplete, inaccurate, or otherwise inappropriate.

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

**Other considerations:** No further information.

**Section 14: Transport Information**

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**DOT:** Proper Shipping Name:

Not Dangerous Goods

Hazard Class:

Non-hazardous for shipping

**IMO/IMDG:** No data available

**IATA:** IATA: Non-hazardous for shipping. Consult IATA regulations before shipping.

**Comments:** US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Irritant.

Risk Statements: Irritating to eyes, respiratory system and skin.

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Wear suitable protective clothing.

**Section 15: Regulatory Information**

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**TSCA:** All ingredients of this product are excluded from listing under the U.S. Toxic Substances Control Act

**SARA SARA 302:** No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313:** This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**Canadian DSL:** All ingredients of this product comply with the New Substances Notification requirements of the Canadian Environmental Protection Act (CEPA).

**European Union (EU)** Symbol of Danger: Xi

**Regulatory** Indication of Danger: Irritant.

**Information** R: 36/37/38

Risk Statements: Irritating to eyes, respiratory system and skin.

S: 26-36

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Wear suitable protective clothing.

**Section 16: Other Information**

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**NFPA Rating**

Health: 2

Fire: 0

Reactivity: 0

**HMIS Rating**

Health: 2

Fire: 0

Reactivity: 0

Personal

Protection: C

**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 believed 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