1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION:
   Product Name: Nickel – Cobalt Alloy
   Date of Prep: 15 November 2011
   MSDS #: 901135.001
   Revision: C

2. COMPOSITION/INFORMATION ON INGREDIENTS:

<table>
<thead>
<tr>
<th>CHEMICAL INGREDIENT NAME</th>
<th>CAS NUMBER</th>
<th>EC NUMBER</th>
<th>% BY WT.</th>
<th>OSHA</th>
<th>ACGIH</th>
<th>HAZARD SYMBOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>231114</td>
<td>37-83%</td>
<td>PEL = 1mg/m³ for 8 hrs</td>
<td>TWA = 0.015 mg/m³</td>
<td>None</td>
</tr>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>2311580</td>
<td>17-63%</td>
<td>PEL = 0.1mg/m³ for 8 hrs</td>
<td>TWA = 0.02 mg/m³</td>
<td>None</td>
</tr>
</tbody>
</table>

   Notes:

3. HAZARDS IDENTIFICATION: Harmful – limited evidence of a carcinogenic effect

4. FIRST AID MEASURES:

   Inhalation: Remove to fresh air.
   Skin Contact: Wash with soap and water.
   Eye Contact: Immediately flush with water for a minimum of 15 minutes.
   Ingestion: Get medical attention.

   After following first aid measures, seek medical attention.

5. FIRE-FIGHTING MEASURES:

   Flammable Properties: Not applicable
   Extinguishing Media: Carbon Dioxide – do not use water
   Unique Aspects Contributing To a Fire: Not Applicable
   Special Fire Fighting Procedures: Not applicable

   Note: As in any fire, wear self-contained breathing apparatus, and full protective gear.

6. ACCIDENTAL RELEASE MEASURES: Sweep up, place in bag and hold for waste disposal.

7. HANDLING AND STORAGE: Keep tightly sealed, store in a cool, dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION:

   Handle in accordance with good laboratory practices.

   Respiratory Protection: Not normally needed. If exposure limits are exceeded, use approved respirator.
   Eye Protection: Safety glasses with side shields.
   Skin Protection: Neoprene or other chemical resistant gloves. Disposable nitrile are acceptable for light intermittent exposure.
   Engineering Controls: No special requirements. Handle in an area with good general room ventilation.
9. PHYSICAL AND CHEMICAL PROPERTIES:

Appearance: Gray Metallic
Physical State: Solid
Flash Point: Not applicable
Vapor Pressure: Not available
Odor: Not available
Explosion Limits: Not applicable
pH: Not available
Boiling Point: 2730 °C
Vapor Dens (air=1): Not available
pH: Not available
Specific Gravity: 8.9 g/mL
Melting Point: 1453 °C
Other: NA

10. STABILITY AND REACTIVITY:

Hazardous Polymerization: ☒ Will Not Occur ☐ May Occur
Stability: Stable

Hazardous Decomposition/Combustion Products: Not established
Conditions & Materials to Avoid: Oxidizing agents, strong mineral acids

11. TOXICOLOGICAL INFORMATION:

Primary Route(s) of Exposure Under Normal Use:

Target Organ(s): Eyes, kidneys

Acute Effects: Cobalt LD₅₀ (rat) = 6171 mg/kg (oral)
Cobalt LD₅₀ (rat) = 110 mg/kg (interperitoneal)

Chronic Effects: Carcinogen (rat) = 126 mg/kg (intramuscular)
Carcinogen (rabbit) = 75 mg/kg (implant)

Other Information: Chemical Ingredient(s) not classified as carcinogen(s) by OSHA, IARC, NTP, ACGIH, or California.

12. ECOLOGICAL INFORMATION: No data available

13. DISPOSAL CONSIDERATIONS: Contact a licensed waste disposal service

14. TRANSPORT INFORMATION:

U.S. DOT: Shipping Name: None
Hazard Class: Non-hazardous for transport
UN/NA #: Non-hazardous for air transport
Packing Group #: Rats Group 2B

IATA/ICAO:

15. REGULATORY INFORMATION:

EU Risk/Safety Phrases: Harmful

U.S. TOSCA: Yes

Canada: This product has been classified according to the hazard criteria of the CPR and this MSDS contains all the information required by the CPR.

16. OTHER INFORMATION:

U.S. EPA SARA

313 Chemicals Yes
CERCLA RQ

National Fire Protection Association Rating

4= Severe Hazard
3= Serious Hazard
2= Moderate Hazard
1= Slight Hazard
0= Minimal Hazard

Notes: Not Established (NE) means a value has not been set or there is no information available. Not Applicable (NA) means that the topic is not pertinent.

The information contained herein has been compiled from data presented in various technical sources believed to be accurate. Waters makes no warranties and assumes no liability in connection with the use of this information. It is the user’s responsibility to determine the suitability of this information and to assure the adoption of necessary precautions.