1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

GHS product identifier

Product Name Tungsten Carbide button for percussive drilling

Other means of identification

Synonyms Percussive Carbide Bit

Recommended use of the chemical and restrictions on use

Recommended Use Drilling tool

Uses advised against No information available

Supplier's details

Initial Supplier Boart Longyear Canada
2442 South Sheridan Way
Mississauga, Ontario
L5J 2M7
TEL: 905-822-7922

Supplier Address Boart Longyear Ltd.
2640 W. 1700 S.
Salt Lake City, UT 84104
TEL: 801-952-8464

Emergency telephone number

Chemical Emergency Phone Number 801-972-6430

2. HAZARDS IDENTIFICATION

Classification

This product is considered hazardous according to the criteria set within the US OSHA Hazard Communication Standard (29 CFR 1910.1200), Canada WHMIS 2015 which includes the amended Hazardous Products Act (HPA) and the Hazardous Products Regulation (HPR), and Mexico’s NMX-R-019-SC-2011. Downstream use of this product, results in hazardous elements being emitted under certain processing conditions such as but not limited to: abrading, cutting, welding, sanding, burning, milling or grinding. The classifications given below pertains to when used during these processes.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Skin Sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Category 1A</td>
</tr>
<tr>
<td>Specific Target Organ Toxicity (Repeated Exposure)</td>
<td>Category 1</td>
</tr>
</tbody>
</table>

Label Elements

Signal Word Danger
Hazard Statements
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
May cause cancer
Causes damage to organs through prolonged or repeated exposure

Physical and Health Hazards Not Otherwise Classified
Not applicable.

Precautionary Statements
Prevention
• Obtain special instructions before use.
• Do not handle until all safety precautions have been read and understood.
• Use personal protective equipment as required.
• In case of inadequate ventilation wear respiratory protection.
• Contaminated work clothing should not be allowed out of the workplace.
• Wear protective gloves.
• Do not breathe dust/fume/gas/mist/vapors/spray.
• Wash face, hands and any exposed skin thoroughly after handling.
• Do not eat, drink or smoke when using this product.

General Advice
• If exposed or concerned: Get medical attention/advice

Skin
• IF ON SKIN: Wash with plenty of soap and water.
• If skin irritation or rash occurs: Get medical advice/attention.
• Wash contaminated clothing before reuse.

Inhalation
• IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing
• If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

Storage
• Store locked up.

Disposal
• Dispose of contents/container to an approved waste disposal plant.

Other Information
No information available.

90% of the mixture consists of ingredient(s) of unknown toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>Hazardous Material Information Review Act registry number (HMIRA registry #)</th>
<th>Date HMIRA filed and date exemption granted (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide</td>
<td>12070-12-1</td>
<td>&gt;50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>&lt;=3</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Description of necessary first-aid measures

General Advice
The guidance below is for certain processing conditions that may occur to the product. These include but are not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact
Wash skin with soap and water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Inhalation
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

Ingestion
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

Most important symptoms/effects, acute and delayed

Most Important Symptoms/Effects
Rashes. Itching.

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

Notes to Physician
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
No information available.

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

Personal Precautions
Avoid contact with skin, eyes and clothing. Use personal protective equipment.

Environmental Precautions

Environmental Precautions
Avoid release to the environment. Collect spillage. See Section 12 for additional Ecological Information.

Methods and materials for containment and cleaning up

Methods for Containment
None required.

Methods for Cleaning Up
Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE
Precautions for safe handling

Handling
None required under normal usage.

Conditions for safe storage, including any incompatibilities

Storage
None normally required.

Incompatible Products
None known based on information supplied.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Exposure Guidelines
Occupational exposure limits apply to some of the components resulting from abrading, cutting or grinding producing dust or fumes.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide 12070-12-1</td>
<td>STEL: 10 mg/m³ W TWA: 5 mg/m³ W TWA: 0.005 mg/m³ Co thoracic particulate matter</td>
<td>(vacated) TWA: 5 mg/m³ W (vacated) STEL: 10 mg/m³ W</td>
<td>TWA: 5 mg/m³ W STEL: 10 mg/m³ W</td>
</tr>
<tr>
<td>Cobalt 7440-48-4</td>
<td>TWA: 0.02 mg/m³</td>
<td>TWA: 0.1 mg/m³ dust and fume (vacated) TWA: 0.05 mg/m³ dust and fume</td>
<td>IDLH: 20 mg/m³ dust and fume TWA: 0.05 mg/m³ dust and fume</td>
</tr>
<tr>
<td>Nickel 7440-02-0</td>
<td>TWA: 1.5 mg/m³</td>
<td>TWA: 1 mg/m³ (vacated) TWA: 1 mg/m³</td>
<td>IDLH: 10 mg/m³</td>
</tr>
</tbody>
</table>

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health.

Appropriate engineering controls

Engineering Measures
Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection
Safety glasses with side-shields.

Skin and Body Protection
Wear protective gloves

Respiratory Protection
No protective equipment is needed under normal use conditions.

Hygiene Measures
When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks/ - Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Boiling Point/Boiling Range</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>upper flammability limit</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>lower flammability limit</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
<td>None known</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
No data available.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization
Hazardous polymerization does not occur.

Conditions to avoid
None known based on information supplied.

Incompatible materials
None known based on information supplied.

Hazardous decomposition products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information
Product does not present an acute toxicity hazard based on known information

Inhalation
None under normal use conditions

Eye Contact
None under normal use.

Skin Contact
Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Ingestion
Not an expected route of exposure.

Numerical measures of toxicity - Product

Unknown acute toxicity
90% of the mixture consists of ingredient(s) of unknown toxicity.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 Oral (mg/kg)</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt</td>
<td>6171 Rat</td>
<td>-</td>
<td>&gt; 10 Rat 1h</td>
</tr>
<tr>
<td>Nickel</td>
<td>&gt; 9000 Rat</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms
rash

Delayed and immediate effects and also chronic effects from short and long term exposure

Respiratory or Skin Sensitization
No information available.

Germ Cell Mutagenicity
No information available.
Carcinogenicity

Contains no ingredients above reportable quantities listed as a carcinogen.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide</td>
<td>A2</td>
<td>Group 2A</td>
<td>Reasonably Anticipated</td>
<td>X</td>
</tr>
<tr>
<td>Cobalt</td>
<td>A3</td>
<td>Group 2B</td>
<td>Reasonably Anticipated</td>
<td>X</td>
</tr>
<tr>
<td>Nickel</td>
<td></td>
<td>Group 2B</td>
<td>Reasonably Anticipated</td>
<td>X</td>
</tr>
</tbody>
</table>

ACGIH: (American Conference of Governmental Industrial Hygienists)
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen

IARC: (International Agency for Research on Cancer)
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA: (Occupational Safety & Health Administration)
X - Present

Reproductive Toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure No information available.
Aspiration Hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Product in its current form (solid) is not likely to be a hazard to the environment.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Daphnia Magna (Water Flea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt 7440-48-4</td>
<td>-</td>
<td>LC50 96 h: &gt; 100 mg/L static (Brachydanio rerio)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel 7440-02-0</td>
<td>0.174 - 0.311 mg/L static (Pseudokirchneriella subcapitata)</td>
<td>LC50 96 h: = 1.3 mg/L semi-static (Cyprinus carpio) LC50 96 h: = 10.4 mg/L static (Cyprinus carpio) LC50 96 h: &gt; 100 mg/L (Brachydanio rerio)</td>
<td>-</td>
<td>EC50 48 h: = 1 mg/L Static (Daphnia magna) EC50 48 h: &gt; 100 mg/L (Daphnia magna)</td>
</tr>
</tbody>
</table>

Persistence and Degradability No information available.
Bioaccumulation No information available.
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 Where possible recycling is preferred to disposal or incineration.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>RCRA</th>
<th>RCRA - Basis for Listing</th>
<th>RCRA - D Series Wastes</th>
<th>RCRA - U Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel - 7440-02-0</td>
<td>(hazardous constituent - no waste number)</td>
<td>Included in waste streams: F006, F039</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION
WPS-BOA-002 - Tungsten Carbide button for percussive drilling

Revision Date 11-Jul-2017

DOT
Not regulated

TDG
Not regulated

MEX
Not regulated

15. REGULATORY INFORMATION

International Regulations

Ozone depleting substances Not applicable
Persistent Organic Pollutants Not applicable
Hazardous Waste Not applicable
The Rotterdam Convention (Prior Informed Consent) Not applicable
International Convention for the Prevention of Pollution from Ships (MARPOL) Not applicable

International Inventories

TSCA Complies
DSL Complies

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

U.S. Federal Regulations

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>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>3</td>
<td>0.1</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>2.99</td>
<td>0.1</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

Acute Health Hazard No
Chronic Health Hazard No
Fire Hazard No
Sudden Release of Pressure Hazard No
Reactive Hazard No

Clean Water Act
This product does not contain any substances regulated as 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>Nickel</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></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>Nickel</td>
<td>100 lb</td>
<td>RQ 100 lb final RQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RQ 45.4 kg final RQ</td>
<td></td>
</tr>
</tbody>
</table>

U.S. State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>California Prop. 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>Carcinogen</td>
</tr>
</tbody>
</table>

**U.S. State Right-to-Know Regulations**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten carbide</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cobalt</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Nickel</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**U.S. EPA Label Information**

EPA Pesticide Registration Number: Not applicable

**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>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**HMIS**

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>X</td>
</tr>
</tbody>
</table>

Prepared By: Product Stewardship
23 British American Blvd.
Latham, NY 12110
1-800-572-6501

Issuing Date: draft
Revision Date: 11-Jul-2017
Revision Note: No information available.

**General Disclaimer**

The information provided on this SDS 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of Safety Data Sheet