1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: TUNGSTEN 2% THORIATED
Recommended use: Welding
Information on Manufacturer:
X-ERGON by Partsmaster, Div of NCH Corp.
P.O. Box 655326
Dallas, TX 75265-5326

Product Code: 65042000
Chemical nature: Inorganic solid blend
Emergency Telephone Number: CHEMTREC® 800-424-9300

2. HAZARDS IDENTIFICATION

Emergency Overview
WARNING
Electric shock can kill
Arc Rays can injure and burn eyes and skin
Causes eye irritation
May be harmful if inhaled
Keep out of reach of children

Color: silver- gray
Physical State: Solid
Odor: No information available

Potential Health Effects

Principle Route of Exposure: Inhalation
Primary Routes of Entry: Inhalation

Acute Effects

Eyes
Causes eye irritation. Welding arc may damage eyes.

Skin
Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. May cause eye/skin irritation.

Inhalation
Welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Fumes can aggravate asthma, bronchial conditions, or allergies. Individuals with allergies or impaired respiratory function may have symptoms worsened by exposure to welding fumes.

Inhalation of Tungsten dust may cause irritation of the respiratory tract. Skin or eye contact could cause abrasion or irritation. Thorium is a naturally occurring radioactive element. Its primary hazard lies in inhalation of dust/fumes. Normal handling of these electrodes is not expected to result in any significant radiation exposure. Considerable experience in refining and use of thorium has not revealed any adverse effects from industrial exposure.

Ingestion
May be harmful if swallowed.

Chronic Toxicity
Prolonged exposure may cause chronic effects. No hazards have been identified for tungsten fume except that it may aggravate an existing chronic respiratory disease. Thorium dioxide has been identified as a carcinogen. Evidence for its ability to cause cancer has come solely from its internal medicine use.

Target Organ Effects
Eyes, Skin, Respiratory system, Blood.

Aggravated Medical Conditions
No information available

Potential Environmental Effects
See Section 12 for additional Ecological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten</td>
<td>7440-33-7</td>
<td>98</td>
</tr>
<tr>
<td>Thorium</td>
<td>7440-29-1</td>
<td>2</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Skin Contact
In case of contact, immediately flush skin with soap and plenty of water. If skin irritation persists, call a physician.

Inhalation
Remove person to fresh air. If signs/symptoms continue, get medical attention.

Ingestion
If swallowed, do not induce vomiting - seek medical advice.

Notes to physician
Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flash Point
The product is not flammable
Method
Not applicable

Autoignition Temperature
No data available

Upper
No data available
Lower
No data available
Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards arising from the chemical
Arcs and sparks can ignite combustibles and flammable products. See American National Standard Z49.1; Safety in Welding and Cutting published by The American Welding Society.

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.

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

HMIS
<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Wear appropriate protective clothing. Avoid creating dusty conditions. Transfer solid into a properly labeled container for re-use or disposal. If necessary, wash area with water and pick up wash water for disposal.

Environmental Precautions
Prevent product from contaminating soil or from entering sewage, drainage systems, and bodies of water.

Methods for Containment
Pick up and arrange disposal without creating dust.

Methods for Cleaning Up
Shovel or vacuum any spilled material into a suitable container. Alloy wastes are normally collected to recover metal value. Avoid dust formation.

Neutralizing Agent
Not applicable.

7. HANDLING AND STORAGE

Handling
Do not eat, drink or smoke when using this product. Ensure adequate ventilation.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place.

<table>
<thead>
<tr>
<th>Storage Temperature</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35 °F / 2 °C</td>
<td>100 °F / 38 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage Conditions</th>
<th>Indoor</th>
<th>Outdoor</th>
<th>Heated</th>
<th>Refrigerated</th>
</tr>
</thead>
</table>

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten</td>
<td>TWA: 5 mg/m³</td>
<td>No data available</td>
<td>STEL 10 mg/m³</td>
</tr>
<tr>
<td></td>
<td>STEL: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

| Thorium  | TWA: Not data available | STEL: Not data available | No data available |

Engineering Measures
Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gasses below the TLV's in the workers' breathing zone and the general area. Train the worker to keep his head out of the fumes. Use MSHA/NIOSH approved or equivalent fume respirator or air supplied respirator when welding in a confined space or when local exhaust or ventilation does not keep exposure below TLV.

Personal Protective Equipment

Eye/Face Protection
Wear a helmet or use face shield with filter lens of appropriate shade number (SEE ANSI/ASCZ49.1) provide protective screen and flash goggles, if necessary, to shield others. As a rule of thumb, start a shade that is too dark to see the weld zone. Then go next lighter shade which gives sufficient view of the weld zone.

Skin Protection
Welder's leather gloves. Wear fire/flame resistant/retardant clothing.

Respiratory Protection
Use enough ventilation, local exhaust at the arc, or both to keep the fumes and gasses below the TLV's in the workers' breathing zone and the general area. Train the worker to keep his head out of the fumes. Use MSHA/NIOSH approved or equivalent fume respirator or air supplied respirator when welding in a confined space or when local exhaust or ventilation does not keep exposure below TLV.

General Hygiene Considerations
Do not eat, drink or smoke when using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Solid</th>
<th>Viscosity</th>
<th>Not applicable</th>
</tr>
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<tbody>
<tr>
<td>Color</td>
<td>silver - gray</td>
<td>Odor</td>
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</tr>
<tr>
<td>Appearance</td>
<td>Textured black paste</td>
<td>pH</td>
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</tr>
<tr>
<td>Specific Gravity</td>
<td>19.3</td>
<td>Evaporation Rate</td>
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</tr>
<tr>
<td>Percent Volatile (Volume)</td>
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<td>VOC Content (%)</td>
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<tr>
<td>Vapor Pressure</td>
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<td>Vapor Density</td>
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</tr>
<tr>
<td>Solubility</td>
<td>Insoluble</td>
<td>Boiling Point/Range</td>
<td>10652 °F / 5900 °C</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Chemical Stability
Stable under normal conditions

Conditions to Avoid
None known
Incompatible Products
Hazardous Decomposition Products

Strong acids, Incompatible with oxidizing agents.
Fumes and gasses produced by welding, brazing and similar processes cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, the procedures and the filler metal being used. Other conditions which also influence the composition and quantity of fumes and gasses to which the worker may be exposed include: coatings on the metal being welded, the number of welders and the volume of the work space, the quality and amount of ventilation used, the position of the welder's head in relation to the fume plume, as well as the presence of contaminants in the atmosphere when the filler metal is consumed. The fume and gas decomposition products generated are different in percent and form the product ingredients listed in Section III. The products formed in normal operation include those originating from the volatilization, reaction and oxidation of the filler metal, the metal being welded, the coatings, etc. as noted above. One recommended way to determine the composition and quality of fumes and gases to which workers are exposed is to take an air sample inside the welder’s helmet if worn or in the workers breathing zone. See ANSI/AWS F1.1 “Method For Sampling Airborne Particles Generated By Welding And Allied Processes” available from the American Welding Society, P.O. Box 35140, Miami, FL 33135

Possibility of Hazardous Reactions

11. TOXICOLOGICAL INFORMATION

Product Information
No information available.

Component Information
Acute Toxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
<th>Draize Test</th>
<th>Other</th>
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<tbody>
<tr>
<td>Tungsten</td>
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Chronic Toxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>Mutagenicity</th>
<th>Sensitization</th>
<th>Developmental Toxicity</th>
<th>Reproductive Toxicity</th>
<th>Target Organ Effects</th>
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<tbody>
<tr>
<td>Tungsten</td>
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<td>no data available</td>
<td>no data available</td>
<td>no data available</td>
<td>eyes, skin, respiratory system, blood</td>
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<tr>
<td>Thorium</td>
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<td>no data available</td>
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Carcinogenicity

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Tungsten</td>
<td>not applicable</td>
<td>not applicable</td>
<td>not applicable</td>
<td>not applicable</td>
<td>not applicable</td>
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<tr>
<td>Thorium</td>
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12. ECOLOGICAL INFORMATION

Product Information
No information available.

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
<th>log Pow</th>
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<tbody>
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<td>no data available</td>
<td>no data available</td>
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</tr>
<tr>
<td>Thorium</td>
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<td>no data available</td>
<td>no data available</td>
<td>no data available</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Persistence and Degradability
No information available.
Bioaccumulation
No information available.
Mobility
No information available.

13. DISPOSAL CONSIDERATIONS

Product Disposal
Dispose of in accordance with local regulations.
Container Disposal
Empty containers should be taken for local recycling, recovery, or waste disposal

14. TRANSPORT INFORMATION

DOT
Not regulated
15. REGULATORY INFORMATION

Inventories
TSCA Complies
DSL Complies

U.S. Federal Regulations
SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Chronic Health Hazard</th>
<th>Fire Hazard</th>
<th>Sudden Release of Pressure Hazard</th>
<th>Reactive Hazard</th>
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<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>No</td>
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</table>

CERCLA

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
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<tbody>
<tr>
<td>Tungsten</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Thorium</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

U.S. State Regulations
California Proposition 65
This product does not contain any Proposition 65 chemicals.

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
D2B Toxic materials, D2A Very toxic materials.

16. OTHER INFORMATION

Prepared By Christopher Drogin
Supercedes Date 06/23/2011
Issuing Date 06/20/2013
Reason for Revision No information available.
Glossary No information available.
List of References.

X-ERGON by Partsmaster, Div of NCH Corp assumes no responsibility for personal injury or property damage caused by the use, storage, or disposal of the product in a manner not recommended on the product label. Users assume all risks associated with such unrecommended use, storage or disposal of the product. The information provided on this MSDS 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.