NRC Renewal License Application for Distribution of Exempt Thorium Welding Rods

1. NRC Form 313 Item 5. Radioactive Material
   1.1. Thoriated Tungsten Welding Rods (Electrodes)
   Each thoriated tungsten welding rod consists of a nominal 2% (1.7% - 2.2%) solid mixture of natural ThO2 in tungsten.

   It is natural thorium which was in secular equilibrium prior to chemical separation refinement at some unknown time in the past which broke the secular equilibrium.

   The quantity of natural thorium in each welding rod is dependent on its diameter and length and will vary from 0.05 to 2 grams in each thoriated tungsten welding rod.

   Thoriated tungsten welding rods are produced by uniformly mixing 2% natural thorium dioxide powder and tungsten metal powder to form a rod under intense heat and pressure to the specified length and diameter. The rod is ground and polished to produce a smooth surface and tipped in red at least 3 mm in length to denote that it is a thoriated tungsten welding rod.

   1.2. Maximum amount to be possessed at any one time
   51 kgs natural Thorium total at all Weldcote Metal warehouses.

2. NRC Form 313 Item 6. Purpose(s) for Which License Material Will Be Used
   This is a license application for initial distribution of thoriated welding rods which are exempt for possession and use under 10 CFR 40.13(c)(1) and equivalent agreement state regulations.

   Thoriated tungsten welding rods are manufactured in China, imported in sealed retailed type packages to the Weldcote Metals, Inc. warehouse in Kings Mountain, North Carolina from which the thoriated tungsten welding rods are transferred to exempt users and two other Weldcote Metals, Inc. warehouses through the country, who transfer to exempt users.

3. NRC Form 313 Item 7. Individual(s) Responsible for Radiation Safety Program and Their Training Experience
   The possession and use of thoriated welding rods are exempt under 10 CFR 40.13(c)(l) and equivalent agreement state regulations. The radiation safety program will consist solely of (a) proper labeling of the thoriated welding rods; (b) providing to the initial recipient radiation safety precautions and instructions relating to handling, use, and storage of products; and (c) submission of annual reports providing the total quantity of thorium in exempt thoriated tungsten welding rods transferred in the preceding calendar year. No radiation training experience is necessary to conduct these functions under a distribution license.

John Pandorf-CFO, Weldcote Metals, Inc., is responsible for the above functions.

4. NRC Form 313 Item 8. Training for Individuals Working In or Frequenting Restricted Areas

Radiological training is not applicable under the distribution license since the use and possession of thoriated tungsten welding rods are exempt pursuant to 10 CFR 40.13(c)(1) and equivalent agreement state regulations.

5. NRC Form 313 Item 9. Facilities and equipment

No special facilities and equipment for radiation safety are applicable under a distribution license since the use and possession of thoriated tungsten welding rods are exempt pursuant to 10 CFR 40.l 3(c)(l) and equivalent agreement state regulations.

6. NRC Form 313 Item 10. Radiation safety program

6.1. Labeling of Thoriated Tungsten Welding Rods

It is not feasible to label a thoriated tungsten welding rod per se, since it is subject to intense heat during use. The welding rod is tipped in red to indicate that it contains thorium in accordance with industry standards. AWS AS.12M/A5.12:2009 (ISO 6848:2004 Mod) and DRAFT: ISO TC 44SC 3 Nl010 (Draft ISO/DIS 6848). The red tip will not remain during use.

Thoriated tungsten welding rods are manufactured in China, and imported in sealed retailed type package, typically three or ten welding rods of a given length, usually 3 inches or 7 inches, per packet. Weldcote Metals, Inc. does not open the packets and does not handle the welding rods.

Each package contain thoriated welding rods is marked, 2% Thoriated and the name of the manufacturer or initial distributor. See Appendix A.

6.2. Radiation Safety Precautions and Instructions

For uniformity in the welding industry each shipment of thoriated tungsten welding rods will include a notice that the American Welding Society, Safety and Health Fact Sheet No. 27, March 2014, Thoriated Tungsten Electrodes, is available at http://www.aws.org/technical/facts/, or a copy will be included in the shipment. See Appendix B for a copy of AWS Fact Sheet No. 27.

6.3. Transfer Records

By January l of each calendar year a report will be submitted to Director, Office of Federal and State Materials and Environmental Management Programs, Attn: Document Control Desk/Exempt Distributions providing the total quantity of thorium in thoriated tungsten welding rods transferred in the preceding calendar year.

Records wi II be maintained for at least one year after each transfer.

6.4. Transportation

Thoriated tungsten welding rods will be shipped in accordance with the U.S. Department of Transportation, Hazardous Material Regulations, 49 CFR Parts 171-185, or the US Postal Service Publication 52.

Where applicable small numbers of thoriated tungsten welding rods may be shipped as exempt consignment ofradioactive material.

Otherwise thoriated tungsten welding rods will be shipped as UN2910, Radioactive Material, Excepted Package - Limited Quantity of Material.

7. NRC Form 313 Item 11. Waste Management

Waste disposal is not applicable under the distribution since the use and possession of thoriated tungsten welding rods is exempt pursuant to 10 CFR 40.13(c)(1) and equivalent agreement state regulations.

Appendix A
Thoriated Welding Rod Packet Labeling

weldcote'>
metals

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2% Thoriated
Ground Tungsten

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www.weldcotemetals.

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PACK

Appendix B
American Welding Society
Safety and Health Fact Sheet No. 27
Thoriated Tungsten Electrodes

Safety and Health
Fact Sheet No. 27

October 2024

Thoriated Tungsten Electrodes

INTRODUCTION

Thoriated tungsten electrodes contain thorium, a radioactive material that can pose health and environmental risks at elevated exposure levels. The use of these electrodes is exempt from Nuclear Regulatory Commission (NRC) regulations.

Effective August 27, 2014, electrode manufacturers and importers will need to possess a specific NRC license to distribute these electrodes. The license will impose requirements for labeling, quality control, reporting, and record keeping.

All persons shipping thoriated tungsten electrodes in the United States need to comply with Department of Transportation (DOT) regulations. DOT requires the thoriated tungsten electrodes to be properly packaged and labeled. The surface of the package must be monitored for radioactivity. For example, the US Postal Service requires the following label on the address side of the package:

> "This package conforms to the conditions and limitations specified in 49 CFR 173.426 for radioactive material, excepted package-articles manufactured from natural uranium (or natural thorium), UN2909 and is within Postal Service activity limits for mailing."

NATURE OF THE HAZARD

Thorium is a low-level radioactive material that primarily emits alpha particles as well as some beta and gamma radiation. These electrodes are normally sharpened by grinding as part of the standard procedure while preparing to perform gas tungsten arc welding (GTAW). Dust particles from this grinding process can cause internal radiation exposure if the dust is accidentally ingested or inhaled, so precaution is necessary. Concern regarding radiation exposure to the external body from these electrodes is minimal.

The risk of internal exposure during welding is negligible in most circumstances since the thoriated electrode is consumed at a very slow rate.

During the grinding of the thoriated tungsten electrodes, radioactive dust is created, posing the potential hazard of internal radiation exposure by inhalation or ingestion unless care is taken to control the dust.

HOW TO REDUCE EXPOSURE

- Choose thorium-free tungsten electrodes such as those containing cerium, lanthanum, yttrium, or zirconium.

American Welding Society
8669 Doral Blvd.
Doral, Florida 33166
E-mail: info@aws.org
http://www.aws.org

- Read, understand, and follow all information in the Safety Data Sheet (SOS) for the selected tungsten electrode.

- Use a high-efficiency dust collection system to capture particles created during the grinding of electrodes or disturbed during housekeeping.

- Evaluate the ventilation system before acceptance and periodically thereafter to minimize personnel and environmental contamination.

- Develop and implement standard operating procedures for the use of thoriated tungsten electrodes, including proper procedures for storage, grinding, use, housekeeping and disposal.

- Provide training in the operation of the welding and grinding equipment, personal hygiene, and safety.

WHAT TO DO WITH THE COLLECTED DUST PARTICLES

- Regularly remove the dust generated by grinding.

- Properly dispose of the dust and spent electrodes in accordance with federal, state, and local regulations.

SUMMARY

Several of the information sources listed indicate that the risk of occupational exposure to radiation during storage, handling, and welding with thoriated tungsten electrodes is negligible where simple precautions are taken. Special care should be taken to control and collect dust from grinding these electrodes in order to prevent a potential ingestion and inhalation exposure to radioactive dust particles resulting from this operation.

INFORMATION SOURCES

Nuclear Regulatory Commission (NRC). Code of Federal Regulations, Title 1O Energy, Part 40.13, available from the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401; telephone: 800-368-5642; web site: www.nrc.gov.

Department of Transportation (DOT), 49 Code of Federal Regulations, Title 49 Transportation, Part 173, available from the U.S. Government Printing Office, 732 North Capitol Street NW, Washington, DC 20401; telephone: 855-368-4200; web site: www.dot.gov.

United States Postal Service (USPS). Publication 52, Hazardous, Restricted, and Perishable Mail, Instruction 7A, Radioactive Materials, available from the USPS web site: www.usps.com.

Jankovic, J. T., W. S. Underwood, and G. M. Goodwin. 1999. Exposures from Thorium Contained in Thoriated Tungsten Electrodes. *American Industrial Hygiene Journal* 60: 384 - 389.

Oak Ridge National Laboratory (ORNL): Estimated Radiation Doses from Thorium and Daughters Contained in Thoriated Welding Electrodes, by L. M. McDowell-Boyer (ORNL/NUREG/TM-344). Oak Ridge, TN: ORNL, 1979.

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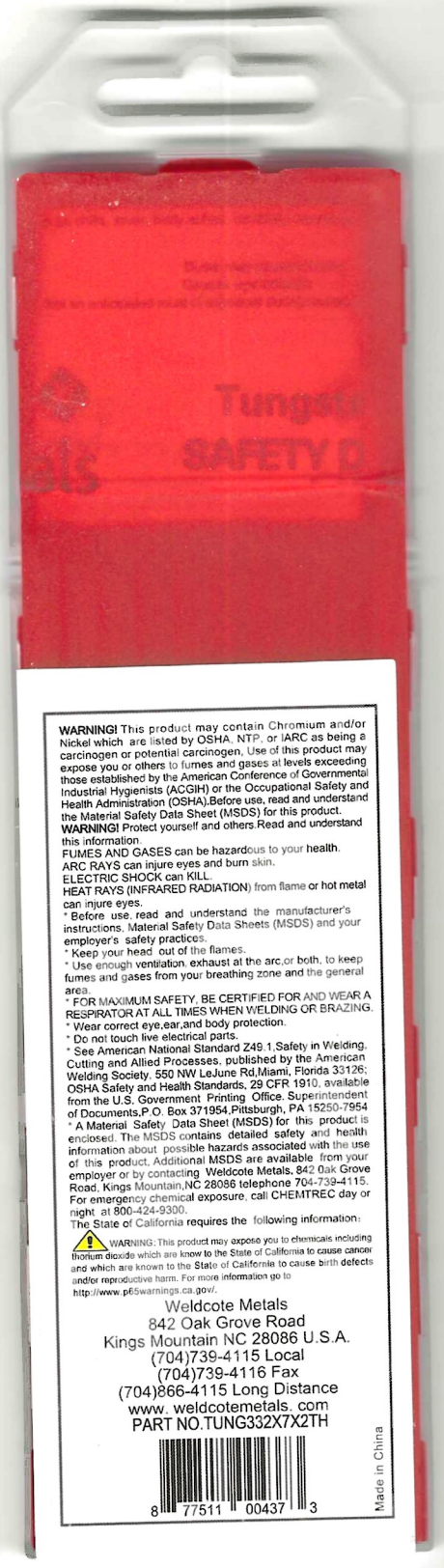
weldcote metals
Tungsten Electrodes
2% Thoriated Ground Tungsten
Size
2.4x175MM/3/32"x7"
Control No.
C10569
AWS/SFA A5.12
EWTH-2
ISO 6848 EWTH-2
Finish Ground
Quantity 10
UN2910/RQ/Radioactive
SEE WARNING ON REVERSE SIDE



WARNING! This product may contain Chromium and/or Nickel which are listed by OSHA, NTP, or IARC as being a carcinogen or potential carcinogen. Use of this product may expose you or others to fumes and gases at levels exceeding those established by the American Conference of Governmental Industrial Hygienists (ACGIH) or the Occupational Safety and Health Administration (OSHA).Before use, read and understand the Material Safety Data Sheet (MSDS) for this product.

WARNING! Protect yourself and others.Read and understand this information.

FUMES AND GASES can be hazardous to your health.

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can KILL.

HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure eyes.

* Before use, read and understand the manufacturer's instructions, Material Safety Data Sheets (MSDS) and your employer's safety practices.
* Keep your head out of the flames.
* Use enough ventilation, exhaust at the arc,or both, to keep fumes and gases from your breathing zone and the general area.
* FOR MAXIMUM SAFETY, BE CERTIFIED FOR AND WEAR A RESPIRATOR AT ALL TIMES WHEN WELDING OR BRAZING.
* Wear correct eye,ear,and body protection.
* Do not touch live electrical parts.
* See American National Standard Z49.1,Safety in Welding, Cutting and Allied Processes, published by the American Welding Society, 550 NW LeJune Rd,Miami, Florida 33126; OSHA Safety and Health Standards, 29 CFR 1910, available from the U.S. Government Printing Office, Superintendent of Documents,P.O. Box 371954,Pittsburgh, PA 15250-7954
* A Material Safety Data Sheet (MSDS) for this product is enclosed. The MSDS contains detailed safety and health information about possible hazards associated with the use of this product. Additional MSDS are available from your employer or by contacting Weldcote Metals, 842 Oak Grove Road, Kings Mountain,NC 28086 telephone 704-739-4115. For emergency chemical exposure, call CHEMTREC day or night at 800-424-9300.

The State of California requires the following information:

WARNING: This product may expose you to chemicals including thorium dioxide which are know to the State of California to cause cancer and which are known to the State of California to cause birth defects and/or reproductive harm. For more information go to http://www.p65warnings.ca.gov/.

Weldcote Metals
842 Oak Grove Road
Kings Mountain NC 28086 U.S.A.
(704)739-4115 Local
(704)739-4116 Fax
(704)866-4115 Long Distance
www. weldcotemetals. com

PART NO.TUNG332X7X2TH

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