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SAFETY DATA SHEET

Section 1- IDENTIFICATION

COMPOSITION	PRODUCT NAME	
WO3	**Tungsten Oxide**	
SUPPLIER: **Plasmaterials, Inc.** **2268 Research Drive** **Livermore, CA 94550** **Ph: 925-447-4030**	RECOMMENDED USE: **Laboratory Chemicals** **Scientific Research**	EMERGENCY TELEPHONE NUMBERS **US: 001-800-424-9300** **Europe: 001-703-527-3887**

Section 2- HAZARD(S) IDENTIFICATION

Physical Hazards: Not Classified	**Environmental Hazards:** Not Classified
Acute Toxicity, Oral: Category 4 (H302)	**OSHA Defined Hazards:** Not Classified

LABEL ELEMENTS: Signal Word: Warning

HAZARD STATEMENTS

-H302: Harmful, if swallowed

PRECAUTIONARY STATEMENTS

-P264: Wash face, hands and any exposed skin thoroughly after handling
-P270: Do not eat, drink or smoke when using this product
-P280: Wear protective gloves, protective clothing, eye protection and face protection
-P301+P312+P330: IF SWALLOWED: Call a poison center/doctor if you feel unwell. Rinse mouth
-P501: Dispose of contents/container in accordance with local/regional/national/international regulations

Hazards not otherwise classified (HNOC):

-None identified

Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Weight %
Tungsten Oxide	**1314-35-8**	**<=100**

Section 4- FIRST AID MEASURES

GENERAL ADVICE: If exposed or concerned, get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
INHALATION: Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. Seek immediate medical advice.
SKIN CONTACT: Remove contaminated clothing. Wash with plenty of soap and water. Seek immediate medical advice. Wash contaminated clothing before reuse.
EYE CONTACT: Flush eyes with lukewarm water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Get medical attention if irritation

develops and persists.
INGESTION: Rinse mouth with water. Never give anything by mouth to an unconscious person. Seek medical treatment.
MOST IMPORTANT SYMPTOMS/EFFECTS: The most important known symptoms and effects are described in the labeling (see section 2).
INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: No data available

Section 5- FIREFIGHTING MEASURES

Suitable Extinguishing Media:	**Unsuitable Extinguishing Media:**
Water spray, Alcohol-Resistant Foam, Dry Chemical Powder, Carbon Dioxide (CO2)	No data available

Specific Hazards Arising from the Chemical:
Tungsten Oxide, Metal Oxide Fumes

Protective Equipment & Precautions for Firefighters:
As in any fire, Firefighters must wear full face, self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective clothing to prevent contact with skin and eyes.

Firefighting Instructions/Specific Methods:
Use standard firefighting procedures and consider the hazards of other involved materials. Use fire-extinguishing media appropriate for surrounding materials.

General Fire Hazards:
No unusual fire or explosion hazards noted.

Section 6- ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep unnecessary personnel away. Wear appropriate protective equipment and clothing. Avoid dust formation. Avoid breathing dust, vapors, mist or gas. Ensure adequate ventilation. For personal protection see Section 8.

Environmental Precautions: Avoid discharge into drains, water courses or onto the ground.

Methods for Containment & Clean Up: Sweep up or vacuum up spillage and collect in suitable container for disposal.
-Never return spills to original containers for re-use.
-For waste disposal see Section 13.

Section 7- HANDLING AND STORAGE

Handling: Minimize dust generation and accumulation. Avoid breathing dust. Ensure adequate exhaust ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Wash contaminated clothing before reuse.

Storage: Store in original tightly closed container. Store in cool, dry place in tightly closed containers. Store away from oxidizing agents. Store away from incompatible materials (see Section 10).

Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Component	CAS-No.	Value	Control Parameters	Basis
Tungsten Oxide	1314-35-8	TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

		STEL	10 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological Limit Values: No biological exposure limits noted for the ingredient(s)

Appropriate Engineering Controls: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

Personal Protective Equipment:

Eye/Face Protection: Wear safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin and Body Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Wear suitable protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dusk masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Thermal Hazards: Wear appropriate thermal protective clothing when necessary.

General Hygiene: When using, do not eat, drink or smoke. Always observe good personal hygiene measures such as washing after handling the material and before eating, drinking and/or smoking. Wash hands before breaks and at the end of the workday. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

Control of Environmental Exposure: No information available

Section 9- PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid
Odor: No data available
Odor Threshold: No data available
pH: No data available
Melting Point/Range: 1,473°C / 2,683°F
Boiling Point/Range: 1,837°C / 3,339°F
Flash Point: No data available
Evaporation Rate: No data available
Flammability (solid,gas): No data available
Flammability or Exposure Limits:
- **Upper:** No data available
- **Lower:** No data available

Vapor Pressure: No data available
Vapor Density: No data available
Relative Density: 7.160 g/cm3
Solubility: No data available
Partition coefficient; n-octanol/water: No data available
Auto Ignition Temperature: No data available
Decomposition Temperature: No data available
Viscosity: No data available
Explosive Properties: No data available
Oxidizing Properties: No data available
Molecular Weight: 231.85 g/mol

Section 10- STABILITY AND REACTIVITY

Reactive Hazard: No data available.

Stability: Stable under recommended storage conditions.

Conditions to Avoid: Contact with incompatible materials

Incompatible Materials: Strong acids, strong oxidizing agents

Hazardous Decomposition Products:
Hazardous decomposition products formed under fire conditions – Tungsten Oxide
Other decomposition products - No data available

Hazardous Polymerization: No data available

Hazardous Reactions: No data available

Section 11- TOXICOLOGICAL INFORMATION

Information on likely Routes of Exposure:

Inhalation: No data available
Skin Contact: No data available
Eye Contact: No data available
Ingestion: Harmful if swallowed

Symptoms related to the physical, chemical and toxicological characteristics: Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling and blurred vision. May cause respiratory irritation. Skin irritation. May cause redness and pain.

Information on Toxicological Effects:

Acute Toxicity: Harmful if swallowed.
-LD50 Oral – Rat – male and female - >2,000 mg/kg (OECD Test Guideline 423)
-LC50 Inhalation – Rat – male and female – 4 h - >5.36 mg/l (OECD Test Guideline 403)
Skin Corrosion/Irritation: May cause irritation
Serious eye damage/irritation: May cause irritation
Respiratory or Skin Sensitization: Due to lack of data the classification is not possible
Carcinogenicity: This product is not considered to be a carcinogen by IARC, EPA, ACGIH, NTP or OSHA
Germ Cell Mutagenicity: Due to lack of data the classification is not possible
Reproductive Effects: Due to lack of data the classification is not possible
Development Effects: Due to lack of data the classification is not possible
Specific Target Organ Toxicity – single exposure: Due to lack of data the classification is not possible
Specific Target Organ Toxicity – repeated exposure: Due to lack of data the classification is not possible
Aspiration Hazard: Due to lack of data the classification is not possible
Additional Information: RTECS: YO7760000
-To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Section 12- ECOLOGICAL INFORMATION

Toxicity: No information available
Persistence and Degradability: No information available
Bioaccumulation/Accumulation: No information available
Mobility in Soil: No information available
Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.
Other Adverse Effects: No information available

Section 13- DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Offer surplus and non-recyclable solutions to a licensed disposal company. Dispose of empty containers and contaminated packaging as unused product. Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14- TRANSPORT INFORMATION

DOT: Not regulated as dangerous goods

IATA: Not regulated as dangerous goods

IMDG/IMO: Not regulated as dangerous goods

Section 15- REGULATORY INFORMATION

US Federal Regulations:

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

SARA 311/312 Hazards: Chronic Health Hazard

US Massachusetts Right to Know: No information available

US New Jersey Right to Know: Tungsten Oxide (CAS No. 1314-35-8)

US Pennsylvania Right to Know: Tungsten Oxide (CAS No. 1314-35-8)

US California Proposition 65: This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

Section 16- OTHER INFORMATION

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulations are subject to change, the conditions of handling and use, or misuse are beyond our control, Plasmaterials, Inc. makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

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