

MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
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SRM Number: 276b
MSDS Number: 276b
SRM Name: Tungsten Carbide

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Description: This Standard Reference Material (SRM) is intended for use in the determination of total carbon by combustion-thermal conductivity, combustion-infrared, and combustion-gravimetric methods of analysis. A unit of SRM 276 consists of 75 g of tungsten carbide in the form of a fine powder.

Substance: Tungsten Carbide.

Other Designations: Tungsten Monocarbide.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component: Tungsten Carbide

CAS Number: 12070-12-1

EC Number (EINECS): 235-123-0

Nominal Mass Fraction (%): 100

EC Classification: Not classified.

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0-4): Health = 1 Fire = 3 Reactivity = 0

Major Health Hazards: This material can irritate the respiratory tract, skin, and eyes.

Physical Hazards: Dust/air mixtures may explode when exposed to heat.

Potential Health Effects

Inhalation: Inhalation of tungsten carbide dust can irritate the throat and upper respiratory tract. Symptoms may include a dry cough. Pneumoconiosis (a lung disease) and memory deficits have occurred in persons exposed to tungsten compounds.

Skin Contact: This material may cause skin irritation by mechanical abrasion. Symptoms may include dry, itching skin in exposed areas.

Eye Contact: This material can cause eye irritation by mechanical abrasion.

Ingestion: This material can irritate the GI tract, causing abdominal pain and nausea.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u> X </u>
In the International Agency for Research on Cancer (IARC) Monographs	_____	<u> X </u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u> X </u>

4. FIRST AID MEASURES

Inhalation: Move the person to fresh air. Qualified medical personnel may start Artificial Respiration or give oxygen if necessary. Seek medical aid at once, and bring the container or label.

Skin Contact: Remove contaminated clothing and shoes. Wash affected skin with soap and water. If skin irritation persists, seek medical aid and bring the container or label. Wash contaminated clothing before reusing.

Eye Contact: Remove contact lenses (if any). Do not allow victim to rub eyes or keep eyes closed. Flush eyes with large amounts of running water for at least 15 minutes, keeping eyelids open and raising lids to remove all chemical. Seek medical aid, and bring the container or label.

Ingestion: Contact a poison control center. Wash out mouth with water, but do not induce vomiting unless instructed to do so. Seek medical aid if necessary, and bring the container or label.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Tungsten carbide is not combustible in most forms, but dust-air mixtures may ignite or explode.

Extinguishing Media: Use extinguishing media appropriate to the surrounding fire: water spray, dry chemical, carbon dioxide, or foam. Use a water spray to cool containers.

Fire Fighting: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): Not applicable.

Method Used: Not applicable.

Autoignition Temp. (°C): Not applicable.

Flammability Limits in Air

UPPER (Volume %): Not applicable.

LOWER (Volume %): Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Isolate the spill area. Cleanup personnel must wear personal protective equipment. Sweep up material and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

Disposal: Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store this material in the original bottle. Protect from moisture, heat, and physical damage, and isolate from incompatible materials.

Safe Handling Precautions: Wear a dust mask or respirator. Avoid contact or wash after handling.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Tungsten Carbide:

ACGIH: 5 mg/m³ TWA

UK WEL: 5 mg/m³ TWA

Ventilation: Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

Respirator: Refer to the *NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

Eye Protection: Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

Personal Protection: Do not inhale dust. Wear appropriate protective clothing to minimize contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Component: Tungsten Carbide.

Appearance and Odor: Gray to black hygroscopic powder, odorless.

Molar Mass (g/mol): 195.9

Molecular Formula: WC

Density (g/cm³): 15.6

Solvent Solubility: Soluble in aqua regia, nitric/hydrofluoric acid, and fluorine.

Water Solubility: Insoluble.

Melting Point (°C): Not applicable.

10. STABILITY AND REACTIVITY

Stability: Stable Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Moisture, dusting, heat, incompatible materials.

Incompatible Materials: Fluorine, chlorine, strong oxidizers, strong acids; iodine pentafluoride, lead oxide (reacts violently); chlorine trifluoride (reacts with a flame); nitrogen dioxide, nitrous oxide (burns with incandescence).

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition of this material may produce carbon monoxide, carbon dioxide, tungsten oxides, and other irritating gases or fumes.

Hazardous Polymerization: Will Occur Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: Inhalation Skin Ingestion

Tungsten Carbide Toxicity Data: Acute exposure by inhalation or ingestion may cause irritation to the respiratory track and the gastrointestinal system.

Health Effects: See Section 3, "Hazards Identification" for potential health effects.

Target Organ(s): Respiratory tract, skin, eyes, GI tract.

Medical Conditions Aggravated by Exposure: Pre-existing conditions affecting the lungs, skin, or other target organs.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data were found for tungsten or its compounds.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302: Not regulated.

SARA Title III Section 304: Not regulated.

SARA Title III Section 313: Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:	No
CHRONIC:	No
FIRE:	Yes
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not determined.

EUROPEAN REGULATIONS

EC Classification: Not determined.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed.

TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources:

Hazardous Substances Data Bank (HSDB): Tungsten Compounds.

IUCLID Chemical Data Sheet: Tungsten Carbide. European Chemicals Bureau, 19 February 2000.

U.S. Agency for Toxic Substances and Disease Registry (ATSDR), Draft Toxicological Profile for Tungsten. August 2005.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, June 1990 edition. DHHS (NIOSH) Publication No. 90-117.

World Health Organization, International Chemical Safety Card: *Tungsten Carbide*; 26 November 1998 (partly updated April 2005).

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.