



# MATERIAL SAFETY DATA SHEET

Wilwood Engineering

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

Effective Date: 6 February 2018

Publication Date: 6 February 2018

## 1. PRODUCT AND COMPANY IDENTIFICATION:

**Trade Name:** Wilwood CM Brake Pad Friction Material  
**Products:** Non-asbestos organic brake lining/pad  
**CAS:** Not applicable  
**Category:** 5661 Friction Product  
**Recommended use:** Clutch and Brake Assemblies

### Company Identification:

Wilwood Engineering  
4700 Calle Bolero  
Camarillo, CA 93012, USA

### Emergency Telephone Number:

(805) 388-1188. Hours 7:30 am - 5:00 pm Monday - Friday PST, After Hours, N/A

**Product Use Overview:** This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). These products are intended for use as automotive or truck friction components and are not considered to be hazardous. The ingredients listed are bound in a non-friable resin matrix, therefore, personal exposure during the normal handling and use is considered minimal. The warnings expressed on this MSDS have been provided to communicate the hazardous nature associated with exposure to the individual components. We have provided this information regardless of the risk of exposure and have considered this during both normal use and foreseeable misuse. Using good work practices will minimize the risk of adverse health effects from overexposure to the hazardous components. As supplied, this friction material does not require sanding, drilling or other machining operations. In addition, other substances not "Hazardous" per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

## 2. HAZARDS IDENTIFICATION:

**Appearance** - Solid, Black, Hard

**Odor** - No Odor

**Classification(s)** - Carcinogen Category 1, Specific Target Organ Toxicity - Repeat Exposure Category 1 (lungs and respiratory system), Skin Sensitizer Category 1

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

**Target organs -** None

**Symbol(s) -**



**Signal Word -** Danger

**Hazard Statements (GHS-US)**

- H302 - Harmful if swallowed
- H317 - May cause an allergic skin reaction
- H350 - May cause cancer
- H372 - Causes damage to organs through prolonged or repeated exposure

**Precautionary Statements (GHS-US)**

- P201 - Obtain special instructions before use
- P202 - Do not handle until all safety precautions have been read and understood
- P260 - Do not breathe dust/fume/gas/mist/vapors/spray
- P264 - Wash thoroughly after handling
- P270 - Do not eat, drink or smoke when using this product
- P272 - Contaminated work clothing must not be allowed out of the workplace
- P280 - Wear protective gloves/protective clothing/eye protection/face protection
- P301+P312 - If swallowed: Call a poison center/doctor if you feel unwell
- P302+P352 - If on skin: Wash with plenty of water
- P308+P313 - If exposed or concerned: Get medical advice/attention
- P314 - Get medical advice/attention if you feel unwell
- P330 - Rinse mouth
- P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
- P363 - Wash contaminated clothing before reuse
- P405 - Store locked up
- P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.

**Other Hazards**

No additional information available

**Unknown Acute Toxicity (GHS US)**

Not applicable

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

### 3. COMPOSITION INFORMATION:

**Substance** - Not applicable

**Mixture:**

<b>Component</b>	<b>Identifier</b>	<b>%</b>	<b>GHS-US Classification</b>
Iron	(CAS No) 7439-89-6	50-65	Acute Tox. 4 (Oral), H302
Graphite	(CAS No) 7782-42-5	10-30	Not classified
Nickel	(CAS No) 7440-02-0	3- 10	Skin Sens. 1, H317 Care. 1B. H350 STOT RE 1, H372
Copper	(CAS No) 7440-50-8	3 - 10	Not classified
Ceramic materials and wares chemicals	(CAS No) 66402-68-4	1-7	Not classified
Aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )	(CAS No) 1344-28-1	1-7	Not classified
Boron	(CAS No) 7440-42-8	1-7	Not classified
Zirconium oxide (ZrO <sub>2</sub> )	(CAS No) 1314-23-4	1-7	Not classified
Tin	(CAS No) 7440-31-5	1 - 7	Not classified
Hafnium oxide (HfO <sub>2</sub> )	(CAS No) 12055-23-1	0-1	Not classified

Full text of classification categories and H statements, see section 16.

Product does not contain asbestos

### 4 FIRST AID MEASURES:

**Eyes** - If dusts or particulates from these products enter the eyes. Open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek immediate medical attention if any adverse effect occurs.

**Skin** - Skin exposure to individual components is unlikely. After handling product wash hands. If skin is abraded, wash affected area and cover with loose dressing and antibiotic or other medication to avoid infection.

**Inhalation** - If dust, powders, or particulates from these products are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if any adverse effect occurs.

**Ingestion** - Not an anticipated route of exposure. If swallowed, drink one or two glasses of water to dilute. Never give anything by mouth to an unconscious or convulsing person. Get medical attention.

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

**5. FIRE FIGHTING MEASURES:**

**Flash Point** - Not applicable

**Extinguishing Media** - Use water spray, carbon dioxide, foam, dry chemical or halon.

**Firefighting Procedures** - Wear a self-container breathing apparatus if necessary based on concentrations of smoke and full protective clothing for fires involving chemicals. Evacuate in accordance with emergency planning.

**Fire Hazard** - Not flammable. When involved in a fire and if heated to above 1093°C (2000°F), this material may decompose and produce irritating vapors and toxic gases, including oxides of carbon and copper

**Explosion Hazards** - None known.

**Unusual Hazards** - Not Determined.

**6. ACCIDENTAL RELEASE MEASURES:**

**Personal Precautions, Protective Equipment and Emergency Procedures** - Wear appropriate protective clothing and equipment to avoid eye and skin contact.

**Emergency and/or Non-emergency Responders** - No additional information available.

**Environmental Precautions** - Avoid release to the environment. Prevent from entering into soil, ditches, sewers, waterways or groundwater. Report spills as required by local and federal regulations.

**Methods and Materials for Containment and Cleaning Up** - Pick up large pieces. Use HEPA vacuum to clean up any dust. Wet dust with water when sweeping is necessary. Personal safety and exposure recommendations described elsewhere in this document apply to exposure during clean-up of spilled material. Reference Section 13 for disposal considerations.

**7. HANDLING AND STORAGE:**

**Max. Handling Temp** - Not determined.

**Precautions for Safe Handling** - Avoid generating dust. Do not breathe dust. Do not grind, sand or machine these parts. Follow good housekeeping to prevent accumulation of dust on floors, machinery and equipment. Do not dry-sweep. Wet dust with water before sweeping or use a HEPA vacuum to collect dust and clean equipment. Do not use compressed air for cleaning. Wash thoroughly after work using soap and water.

**Conditions for Safe Storage** - Store these products in a cool, dry location, away from sources of intense heat. Store away from incompatible materials.

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION:  
Control Parameters**

Copper (7440-50-8)

ACGIH	ACGIH TWA (mg/m')	0.2 mg/m <sup>3</sup> (fume)
OSHA	OSHA PEL (TWA) (mg/m' )	0.1 mg/m'(fume) 1 mg/m <sup>3</sup> (dust and mist)
IDLH	US IDLH (mg/m <sup>3</sup> )	100 mg/m <sup>3</sup> (dust, fume and mist)
NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> (dust and mist) 0.1 mg/m <sup>3</sup> (fume)

Iron (7439-89-6)

Not applicable

Graphite (7782-42-5)

ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup> (all forms except graphite fibers-respirable particulate matter)
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	15 mg/m <sup>3</sup> (synthetic-total dust) 5 mg/m <sup>3</sup> (synthetic-respirable fraction)
IDLH	US IDLH (mg/m <sup>3</sup> )	1250 mg/m <sup>3</sup>
NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	2.5 mg/m <sup>3</sup> (natural-respirable dust)

Aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) (1344-28-1)

OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	15 mg/m'(total dust) 5 mg/m <sup>3</sup> (respirable fraction)
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Zirconium oxide (ZrO<sub>2</sub>) (1314-23-4)

Not applicable

Hafnium oxide (HfO<sub>2</sub>) (12055-23-1)

Not applicable

Tin (7440-31-5)

ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup>
IDLH	US IDLH (mg/m <sup>3</sup> )	100 mg/m <sup>3</sup>
NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	2 mg/m <sup>3</sup>

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

Ceramic materials and wares, chemicals (66402-68-4)

Not applicable

Boron (7440-42-8)

Not applicable

Nickel(7440-02-0)

ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	1.5 mg/m <sup>3</sup> (inhalable particulate matter)
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup>
IDLH	US IDLH (mg/m <sup>3</sup> )	10 mg/m <sup>3</sup>
NIOSH	NIOSH REL (TWA) (mg/m <sup>3</sup> )	0.015 mg/m <sup>3</sup>

**Exposure Controls**

**Engineering Controls** - Use with adequate local exhaust ventilation and dust collection as necessary to maintain the concentrations of airborne dust below the exposure limits.

**Personal Protective Equipment**

**Respiratory** - None required under normal product handling conditions

**Eye Protection** - Safety glasses recommended.

**Gloves** - Suggested for sensitive people and long time contact.

**Clothing** - Long sleeve shirts for skin sensitive people.

**Hygiene** - Wash thoroughly after handling this product.

9. **PHYSICAL AND CHEMICAL PROPERTIES:**

**Physical state**

Solid

**Appearance**

These products are a sintered mixture of metal and non-metallic particles that is either metallurgically bonded to a formed copper-plated steel base or has no base.

**Odor**

No data available

**Odor threshold pH**

No data available

**Melting point**

No data available

**Freezing point**

No data available

**Boiling point**

No data available

**Flash point**

No data available

**Relative evaporation rate (butyl acetate=1)**

No data available

**Flammability (solid, gas)**

No data available

**Vapor pressure**

No data available

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

<b>Relative vapor density at 20° C</b>	No data available
<b>Relative density</b>	No data available
<b>Solubility</b>	No data available
<b>Log Pow</b>	No data available
<b>Auto-ignition temperature</b>	No data available
<b>Decomposition temperature</b>	No data available
<b>Viscosity, kinematic</b>	No data available
<b>Viscosity, dynamic</b>	No data available
<b>Explosion limits</b>	No data available
<b>Explosive properties</b>	No data available
<b>Oxidizing properties</b>	No data available

**Other information** - No additional information available

#### 10. **STABILITY AND REACTIVITY:**

**Chemical Stability** - The product is stable at normal handling and storage conditions.

**Reactivity** - No additional information available

**Incompatibility** - None known.

**Possibility of Hazardous Reactions** - Will not occur.

**Conditions to Avoid** - Air contact.

**Hazardous Decomposition** - Products of thermal decomposition can include oxides of carbon and copper.

#### 11. **TOXICOLOGICAL INFORMATION:**

Acute toxicity Oral:Harmful if swallowed.

##### 5661 Friction Product

ATE US (oral) 1668.079 mg/kg body weight

##### Iron (7439-89-6)

LD50 oral rat 984 mg/kg

ATE US (oral) 984.000 mg/kg

##### Aluminum oxide (A1203) (1344-28 1)

LD50 oral rat > 5000 mg/kg

##### Tin (7440-31-5)

LD50 oral rat 700 mg/kg

##### Boron (7440-42-8)

LD50 oral rat 650 mg/kg

##### Nickel(7440-02-0)

LD50 oral rat > 9000 mg/kg

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

Skin corrosion/irritation serious	Not classified
Eye damage/irritation	Not classified
Respiratory or skin sensitization	May cause an allergic skin reaction
Germ cell mutagenicity	Not classified
Carcinogenicity	May cause cancer
<u>Nickel(7440-02 0)</u> IARC group	28 - Possibly carcinogenic to humans
National Toxicology Program (NTP) Status	3 - Reasonably anticipated to be Human Carcinogen
In OSHA Hazard Communication Carcinogen list	Yes
Reproductive toxicity	Not classified
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Causes damage to organs through prolonged or repeated exposure
Aspiration hazard	Not classified

## 12. ECOLOGICAL INFORMATION:

### Toxicity

#### Copper (7440-50-8)

LC50 fish 1 0.0068-0.0156 mg/1 (Exposure time: 96 h-Species:Pimephales promelas)

EC50 Daphnia 1 0.03 mg/1 (Exposure time: 48 h-Species: Daphnia magna [Static])

LC50 fish 2 < 0.3 mg/1 (Exposure time: 96 h-Species: Pimephales promelas [static])

#### Nickel(7440-02-0)

LC50 fish 1 > 100 mg/1 (Exposure time: 96 h-Species: Brachydanio rerio)

EC50 Daphnia 1 > 100 mg/1 (Exposure time: 48 h-Species: Daphnia magna)

LC50 fish 2 1.3 mg/1 (Exposure time: 96 h-Species: Cyprinus carpio [semi-static])



**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

EC50 Daphnia 2      1 mg/1 (Exposure time: 48 h-Species: Daphnia magna [Static])

**Persistence and Degradability** - No additional information available

**Bioaccumulative Potential**

Zirconium oxide (ZrO<sub>2</sub>) (1314-23-4)

BCF fish 1      No bioaccumulation

**Mobility in Soil** - No additional information available

**Other Adverse Effects**

Effect on ozone layer - No additional information available

Effect on the global warming - No known effects from this product

**13. DISPOSAL CONSIDERATIONS:**

**Disposal Considerations**

All disposal practices must be in accordance with local, regional, national, and international regulations. Review applicable regulations or regulatory bodies before making disposal decisions.

**14. TRANSPORT INFORMATION:**

Description shown may not apply to all shipping situations. Consult applicable shipping codes to determine any additional shipping requirements.

**US DOT** - Not regulated

**TDG** - Not regulated

**IMDG** - Not regulated

**IATA** - Not regulated

**15. REGULATORY INFORMATION:**

Not meant to be all-inclusive; selected regulations represented.

**U.S FEDERAL REGULATIONS:**

Copper (7440-50-8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Subject to reporting requirements of United States SARA Section 313

CERCLA RQ

5000 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 J.Jm

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

SARA Section 313 - Emission Reporting 1%

Iron (7439-89-6)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Graphite (7782-42-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) (1344-28-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Subject to reporting requirements of United States SARA Section 313

SARA Section 313 - Emission Reporting 1% (fibrous forms)

Zirconium oxide (ZrO<sub>2</sub>) (1314-23-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Hafnium oxide (HfO<sub>2</sub>) (12055-23-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Tin (7440 31·5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ceramic materials and wares, chemicals (66402-68·4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Boron (7440-42·8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Nickel (7440·02·0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Subject to reporting requirements of United States SARA Section 313

CERCLA RQ

100 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 IJm

SARA Section 313 - Emission Reporting 0.1%

**U.S. STATE REGULATIONS:**

Nickel(7440-02·0)

California - Proposition 65 - Carcinogens List, Yes

California - Proposition 65 - Developmental Toxicity, No

California - Proposition 65 - Reproductive Toxicity - Female, No

California - Proposition 65 - Reproductive Toxicity - Male, No

No significant risk level (NSRL)

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

Copper (7440-50-8)

Massachusetts - Right To Know List

Minnesota - Hazardous Substance List

New Jersey - Right to Know Hazardous Substance List

Pennsylvania - RTK (Right to Know) List

Graphite (7782-42-5)

Massachusetts - Right To Know List

Minnesota - Hazardous Substance List

New Jersey - Right to Know Hazardous Substance List

Pennsylvania - RTK (Right to Know) List

Aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) (1344-28-1)

Massachusetts - Right To Know List

Minnesota - Hazardous Substance List

New Jersey - Right to Know Hazardous Substance List

Pennsylvania - RTK (Right to Know) List

Zirconium oxide (ZrO<sub>2</sub>) (1314-23-4)

Massachusetts - Right To Know List

Tin (7440-31-5)

Massachusetts- Right To Know List

Minnesota - Hazardous Substance List

New Jersey - Right to Know Hazardous Substance List

Pennsylvania - RTK (Right to Know) List

Boron (7440-42-8)

New Jersey - Right to Know Hazardous Substance List

Nickel (7440-02-0)

Massachusetts - Right To Know List

Minnesota - Hazardous Substance List

New Jersey - Right to Know Hazardous Substance List

Pennsylvania - RTK (Right to Know) List

**INTERNATIONAL REGULATIONS:**

**CANADIAN ENVIRONMENTAL PROTECTION ACT:**

Manufactured articles are exempt from notification requirements under CEPA.

**CANADIAN WHMIS CLASSIFICATION:**

Manufactured articles are not subject to WHMIS.

**EUROPEAN INVENTORY OF COMMERCIAL CHEMICAL SUBSTANCES:**

Manufactured articles are exempt from notification requirements.

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)

**EUROPEAN COMMUNITY LABELING CLASSIFICATION:**

Not applicable.

**EUROPEAN COMMUNITY RISK AND SAFETY PHRASES:**

None.

**16. OTHER INFORMATION:**

**FULL TEXT OF H-PHRASES**

Acute Tox. 4 (Oral)      Acute toxicity (oral) Category 4

Care. 18                      Carcinogenicity Category 1B

Skin Sens. 1                Skin sensitization Category 1

STOT RE 1                Specific target organ toxicity (repeated exposure) Category 1

H302                        Harmful if swallowed

H317                        May cause an allergic skin reaction

H350                        May cause cancer

H372                        Causes damage to organs through prolonged or repeated exposure

**DOCUMENT PREPARATION:**

Prepared according to the UN Globally Harmonized System for the Classification and Labeling of Chemicals (GHS) by Wilwood Engineering, 4700 Calle Bolero, Camarillo CA 93012.

**REVISIONS:**

Because of the major changes, this data sheet should be read as entirely new (Rev A 02/06/18). Updated all sections to comply with GHS.

**REFERENCE STANDARDS:**

OSHA's Hazard Communication Standard 29 CFR1910.1200 (USA)  
Labor Safe Hygiene Rules Provision 5 and 13 (TWN, R.O.C.)

**NOTICE:**

The information herein is presented in good faith and believed to be accurate as of the effective date shown on the first page of this document. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. Specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

**Product Name:** Wilwood Composite Metallic Brake Pad Friction Material, NAO (Non-Asbestos Organic)