PHOENIX

SAFETY DATA SHEET

Complies with OSHA Standard 29 CFR 910.1200

Stainless Steel Arch Wire and Springs

1. Product and Company Identification

Product Name: Stainless Steel Products, Arch Wires and Springs
Product Use: Dental Applications
Manufacturer Name: Phoenix Orthodontics
Manufacturer Address: 3250 Palladian Village Drive
Marietta, GA 30066
Business Phone: 770-643-8896
Emergency Phone: 770-643-8896
Revision Date: December 22, 2019

2. Hazards Identification

GHS (Globally Harmonized System) Classification: In its present form, the material is not considered hazardous according to the OSHA Hazard Communication Standard 2012 (29 CFR 1910.1200). Metal products are generally classified as "articles" and do not constitute hazardous materials in solid form.

GHS Signal Word: None

GHS HAZARD PICTOGRAMS	GHS HAZARD	GHS CLASSIFICATION	GHS HAZARD STATEMENTS
None	None	None	None

Hazards Not Otherwise Classified (HNOC): Processes such as burning, melting, welding, cutting, sawing, brazing, grinding, machining, milling, etching, oxidizing, electro polishing, etc. can generate hazardouse metal powders, fumes, and/or ions. The powders, fumes and/or ions can present hazards such as acute and chronic toxicity, flammability, pryophoricity, self-heating capabilities, cardinogenicity, and water reactivity.

- Avoid breathing dust/fume/gas/mist/vapors/spray.
- Wash contacted skin thoroughly after handling.
- Do not eat, drink, or smoke when using this product.
- Wear protective gloves/protective clothing/eye protection/face protection if dust or fume particulate.

GHS Response Precautionary Statements during processing of solid form:

- If skin irritation or a rash occurs: Get medical advice/attention.
- IF IN EYES: Rinse cautiously with water for several minutes.
  Remove contact lenses if present and easy to do – continue rinsing.
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- Get medical advice/attention if you feel unwell.
- Wash contaminated clothing before reuse.

GHS Storage Precautionary Statements:

- STORE: Away from incompatible materials in accordance with federal/provincial/state or local regulations.

3. Composition/Information on Ingredients

CHEMICAL	CAS/EC NUMBER	WT%	GHS Hazard Codes
Chromium, CR	7440-47-3 231-157-5	10.5-30	HNOS Combustible Dust
Cobalt, CO	7440-48-4 231-158-0	0-1	 GHS07 Skin Sensitizer = Cat#1, H317  GHS08 Respiratory Sens. = Cat#1, H334 HNOS Combustible Dust

CHEMICAL	CAS/EC NUMBER	WT%	GHS Hazard Codes
Iron, FE	7439-89-6 231-096-4	40-90	None
Manganese, Mn	7439-96-5 231-105-1	0-15	HNOS Combustible Dust
Nickel, Ni	7439-96-5 231-105-1	0-40	 GHS07 Skin Sensitizer = Cat#1, H317  GHS08 Carcinogen = Cat#2, H351 STOT RE = Cat#1, H372 (inhalation) (lung, kidneys, liver)  GHS09 Aquatic Acute Hazard = Cat#1, H400 Aquatic Chronic Hazard = Cat#3, H412

Components may be regulated, have exposure limits, and/or other regulatory requirements.

4. First Aid Measures

Eye Contact: Gently flush particulate with copious amounts of water for 15 minutes to ensure that no articles remain in eye. Avoid rubbing that might scratch the eye. Seek medical attention if irritation persists.

Skin Contact: If irritation develops, wash skin thoroughly with soap and water. Seek medical attention if necessary.

Inhalation: Remove from exposure to fresh air. If discomfort persists, consult physician.

Ingestion: If significant amounts of dust are ingested, consult a physician. Do not induce vomiting.

Most Important Symptoms/Effects (acute and delayed): Can cause allergic skin reactions. Can cause gastrointestinal effects if swallowed. During processing (cutting, milling, grinding, melting, or welding), emitted byproducts can cause irritations, difficulty in breathing, coughing, and wheezing.

Indication of Immediate Medical Attention and Special Treatment:
Notes to physician: May cause sensitization by skin contact or inhalation. Treat symptomatically.

5. Fire Fighting Measures

Not flammable in the product form as distributed, but processing can create dust and/or finely divided particles that are flammable.

Suitable Extinguishing Media: Treat as a Class D Combustible metal fire or smother with sodium choride salt. Do not use water on molten metals as an explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material.

Specific Hazards Arising From the Material: Intense heat. Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature and/or form combustible dust-air mixtures. Keep particles away from all ignition sources, including heat, sparks, and flames. Prevent dust accumulations to minimize combustible dust hazard. See “Section 2. Hazards Identification.”

Hazardous Combustion Products: Toxic metal and metallic oxide fumes may be evolved from fires involving finely divided alloy. Particle size and dispersion in air determine reactivity.

Special Firefighting Instructions: Firefighters should wear self-contained MSHA/NIOSH-approved (or equivalent) breathing apparatus and full protective gear.

6. Accidental Release

Environmental Precautions: Prevent entry of material into soil, waterways, drains, and sewers. Prevent exposure of material to weather (snow, rain) to avoid leaching dissolved metals and/or residuals into the environment.

Cleanup: Collect by vacuuming, by sweeping or by wet mopping to prevent spreading of dust. Avoid inhalation of dusts. Do not allow entry to sewers.

7. Handling and Storage

Handling: Handle in accordance with good industrial hygiene and safety practice. Do not get in eyes. Avoid contact with skin and clothing for long periods of time. See “Section 8. Exposure Controls/Personal Protection” for recommended

personal protective equipment. Wash and rinse after handling and before eating, drinking, chewing gum, or using tobacco. Remove and was contaminated clothing before reuse, particularly after processing.

Storage: Keep dust and/or small particles away from heat, sparks, and flame that are capable of ignition. Close containers and/or maintain adequate distance from all ignition sources. Depending on particle size, ignition sources can include pilog lights, electric motors, and static electricity. Prevent dust accumulation to minimize combustible dust hazard. Properly label container.

8. Exposure Controls/Personal Protection

EXPOSURE LIMITS FOR INDIVIDUAL COMPONENTS

CHEMICAL	CAS NUMBER	OSHA PEL 8hr TWA (mg/m^3)	NIOSH (mg/m^3)		ACGIH TLV 8 hr TWA (mg/m^3)
			REL 8hr TWA	IDLH	
Chromium, Cr	7440-47-3	Cr Metal=10.5 Insoluble Cr salts=1 Cr+2 compounds=0.5, Cr+3 compounds=0.5, CR+6 compounds=0.005 CR+6 action level=0.0025	0.5	Cr^{+2}=250 Cr =250 Cr^{+3} = 25	Cr Metal=0.5 Cr^{+3} = 0.5 Soluble Cr^{+6}=0.05 Insol. Cr^{+6}+0.01
Cobalt, Co	7440-48-4	Metal/Dust/Fume=0.1	0.05	20	0.05
Iron, Fe	7439-92-1	—	Fe salts=1	–	–
Manganese, Mn	7439-96-5	Ceiling=5 (proposed)	1	500	0.2 as Mn
Nickel, Ni & Ni inorganic compounds	7440-02-0	Metal & Insoluble=1 Soluble=0.1(proposed)	0.015	10	Metal=1.5 Soluble=0.1 Insoluble=0.2

Exposure Guidelines: Follow all applicable exposure limits. Keep formation of airborne particulate and fumes to a minimum. Exposure controls and personal protection can vary depending on process and/or application.

Engineering Controls: Local and/or general exhaust ventilation should be used to keep worker exposure below applicable exposure limits during welding, burning, grinding, melting, sawing, brazing, buffing, polishing, or other similar heat-generating processes which may generate airborne contaminants. Prevent accumulation of small particulate that might ignite. Collect chips and grinds for recycling where feasible.

Personal Protective Equipment: Processes performed on material should be evaluated (risk assessment) to establish need for suitable equipment to protect worker from exposure to hazards above stated limits.

Skin & Body Protection: Suitable for protection against physical injury and skin contact during handling and processing. For example, fire resistant clothing may be appropriate during hot work with product. Cut-resistant gloves and/or protective clothing may be appropriate when sharp surfaces are present. Chemical-resistant, impervious gloves may be appropriate if material is wet.

Eye/Face Protection: Safety glasses or goggles should be worn when there is a probability of airborne particles and/or elevated levels or dust or fume.

Respiratory Protection: Use NIOSH/MSHA approved respirators when particulates, fumes, and/or gasses are generated and if exposure limits are exceeded or irritation is experienced.

9. Physical and Chemical Properties

Physical State:	Solid
Color:	Metallic gray or silver gray
Appearance:	Various product forms (wire, billet, rod, cores, ingot, etc.)
Odor:	Odorless
Solubility in Water:	Not water soluble.
pH:	Not applicable.
Flash Point:	Not applicable
Boiling Point: *(°C @ 760 mm Hg):	Not applicable
Melting Point (varies with composition)	1310°C (2390°F) for binary nitinol
Decomposition Temp (°C):	Not applicable
Evaporation Rate:	Not applicable
Vapor Density (air=1, @20°C):	Not applicable
Vapor Pressure (mmHG @20°C):	Not applicable
Density (varies with composition):	Not available
Percent Volatile Organic Compound (VOC):	None

10. Stability and Reactivity

Stability: Stable under ordinary conditions of storage and transport.

Conditions to Avoid: Dust formation and dust accumulation during various processing.

Hazardous Decomposition Products: Reacts with mineral acid, inorganic acids and oxidizers to form hydrogen gas (flammable) and to form dissolved metal ions that are to be prohibited from waterways. Melting and/or burning can produce toxic metal fumes.

Hazardous Polymerization: Will not occur.

Incompatible Materials: May react with acids like hydrofluoric acid and oxidizers. Reaction will vary with specific alloy composition when in the presence of chlorine, bromine, halocarbons, carbon tetrachloride, and Freon when heated above 200-deg.

11. Toxicological Information

Likely Routes of Exposure:

Eyes:	High concentration of dust may cause irritation to the eyes.
Skin:	Prolonged skin contact with dust may cause skin irritation to sensitive individuals.
Inhalation:	Inhalation of metal particulate or elemental oxide fumes generated during welding, burning, grinding, machining, melting, sawing, brazing, buffing, polishing, or sweeping may pose acute or chronic health effects.
Ingestion:	Ingestion of metal particulate may cause acute gastrointestinal effects.

LETHAL DOSE TOXICITY BY INDIVIDUAL COMPONENT

Oral & Inhalation tests refer rat. Dermal test prefers prefer rat or rabbit.)

Chemical	CAS Number	LD_{50} Oral (mg/Kg bw)	LD50 Dermal (mg/Kg bw)	LC_{50} Inhalation (mg/l)
Aluminum, Al	7429-90-5	—	—	—
Carbon, C	7440-44-0	–	–	–
Chromium, Cr	7440-47-3	–	–	–
Cobalt, Co	7440-48-4	–	–	–
Iron, Fe	7439-89-6	98,600	–	> 0.25
Iron Oxide, Fe203	1309-37-1	Ferric oxide black=10000 (rat)	– –	– –
Manganese, Mn	7439-96-5	–	–	–
Nickel & compounds (inorganic Ni)	7440-02-0	Both values found > 9000 (rat) or 105 (rat)	–	–

12. Ecological Information

Enviromental Ecotoxicity: No data available on this material in its solid state, however, individual components of the material have been found to be toxic to the environment.

Physical:	No information found.
Persistence and Degradability:	No data available
Bio accumulative Potential:	No data available
Mobility in Soil:	No data available
Other Adverse Effects:	Dissolved metals can be dangerous to drinking water aquifer even in small qualities.

Ecotoxicty Effects listed below by individual component.

CHEMICAL	AQUATIC PLANTS	FISH	MICRO ORGANISMS	OTHER (Crustacea, Water Flea)
Chromium, Cr	—	LC50 (Goldfish [Carassius auratus], 7d): 0.66 mg/L Mortality LC 50 (Carp [Cyprinus carpio], 96 h): 14.3 mg/l Mortality	—	EC 50 (Water flea flea [Daphnia magna], 72 h): 5.2 mg/l Intoxication

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CHEMICAL	AQUATIC PLANTS	FISH	MICRO ORGANISMS	OTHER (Crustacea, Water Flea)
Chromium (hexavalent), Cr+6	—	96h LC50: > 139 mg/L (Cyprinus carpio) 96h LC50: 113.6-155.7 mg/L (Lepomis machochirus) 96h LC50: = 320 mg/L (Lepomis machochirus) 96h LC50: 65.6-137.6 mg/L (Lepomis machochirus) 96h LC50: = 12.3 mg/L (Oncorhynchus mykiss) 96h LC50: 21.209-30.046 mg/L (Oryzias latipes) 96h LC50: 15.41-30.36 mg/L (Pimephales promelas) 96h LC50: 14-20.9 mg/L (Pimephales promelas) 96h LC50: 24.81-34.55 mg/L (Poecilia reticulata) 96h LC50: = 23-41.2 mg/L (Poecilia reticulata) 96h LC50: = 26 mg/L (Morone saxatilis)	—	—
Cobalt, Co	—	LC50 (6hr: >100mt/L static (Brachydanio rerio)	—	—
Iron, Fe	—	LC50 96 h: = 0.56 mg/L semi-static (Cyprinus carpio) LC50 96 h: = 13.6 mg/L static (Morone saxatilis)	—	—
Manganese, MN	—	—	—	—
Nickel, Ni	EC50 96 h: 0.174-0.311 mg/L static (Pseudokirchneriella subcapitata) EC50 72 h: = 0.18 mg/L (Pseudokirchneriella subcapitata) NOEC/EC10 values range from 12.3 μg/L for Scenedesmu accuminatus to 425 μg/L for Pseudokirchneriella subcapitata.	LC50 96 h: = 0.56 mg/L semi-static (Cyprinus carpio) LC50 96 h: = 13.6 mg/L (Morone saxatilis) The 96th LC50s values range from 0.5 mg Ni/L for Pimephales promelas to 320 mg Ni/L for Brachydanio rerio.	- The 30 min EC50 of nickel for activated sludge was 33mg Ni/L EC50 Freshwater Algae 72hr-0.18mg/L	C50 48 h: =1 mg/L Static (Daphnia magna) EC50 48 h: > 100 mg/L (Daphnia magna) The 48h LC50s values range from 0.013 mg Ni/L for Ceriodaphnia dubia to 4970 mg Ni/L for Daphnia magna

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13. Disposal Considerations

Waste Disposal Methods: Recycle when possible. When disposed of as a waste, it would be considered hazardous waste when chromium constituent is present. It is the generator's responsibility to determine if the waste meets applicable definitions of hazardous wastes. Dispose of waste material according to Local, State, Federal and Provincial Environmental Regulations.

Packaging Disposal: Dispose of containers in compliance with local, state, and federal regulations. When possible, use metal containers and recycle along with metal material.

14. Transportation Information

DOT Hazardous Materials Description: Not Regulated

15. Regulatory Information

SARA Section 313: This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 (Toxic Chemical Release Reporting):

Chemical Name	CAS No.	Weight - %	SARA 313 - Threshold Values %
Nickel	7440-02-0	1 - 10	0.1
Chromium	7440-47-3	10 - < 25	1.0
Manganese	7439-96-5	0.1 - < 2.5	1.0
Cobalt	7440-48-4	0.1 - 1	0.1

SARA 311/312 Hazard Categories

Acute Health Hazard	**Yes**
Chronic Health Hazard	**Yes**
Fire Hazard	**No**
Sudden Release of Pressure Hazard	**No**
Reactive Hazard	**No**

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Nickel CAS# 7440-02-0
Chromium CAS# 7440-47-3

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

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The information provided in this safety data sheet 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 guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered 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 materials or in any process, unless specified in the text.