Section 1: Identification

Product Name **Branched Nickel Strands (BNS)**
Grades: 3AX125, 3AA150, 3FF200

Manufacturer Conductive Composites
830 E. South Flat Rd
Cleveland, UT 84518
https://www.conductive.com
Telephone (General) (435) 654-3683 USA

Section 2: Hazard(s) Identification

APPEARANCE: Silvery, odorless, free flowing powder

GHS CLASSIFICATION (29 CFR 1910.1200): Not classified as hazardous

PRECAUTIONS: Do not handle until all safety precautions have been read and understood. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with skin and clothing. Keep any product containers tightly closed. Use personal protective equipment as required. Wash thoroughly after handling.

Processing may create a combustible dust and could results in a fire and/or explosion should the necessary dust concentration in air and ignition source be present.

Prolonged or repeated contact may cause allergic skin reaction and possible sensitization. Dust or particulates formed by machining, cutting, or grinding may cause skin, eye, and upper respiratory tract irritation, allergic skin reaction, and possible sensitization.

Fibers, dust, or particulate are electrically conductive and may create electrical short circuits that could result in damage to and malfunction of electrical equipment and/or personal injury.

EYE: Contact may cause redness and irritation. Dust or particulate from machining, grinding, or cutting may cause mechanical irritation.

SKIN: Contact may cause mechanical irritation, redness, itching, and drying of the skin. Prolonged or repeated contact may cause allergic skin reaction, dermatitis, and possible sensitization. Dust or particulate from machining, grinding, or cutting may cause mechanical irritation. Metallic nickel may cause irritation to the skin and nickel sensitivity which may result in allergic skin rashes.

INHALATION: May cause mechanical irritation to the mucus membranes and the upper respiratory tract. Dust or particulate from machining, grinding, or cutting may cause irritation to the upper respiratory tract. Inhalation of nickel may induce asthma. This effect is rare; it has been reported in welders where exposures to nickel are often mixed with metals, oxides, and other chemical substances. Persons with a known history of nickel sensitive asthma should avoid inhalation.

INGESTION: Very unlikely route of exposure. Dust or particulate from machining, grinding, or cutting may be a stomach (gastric) irritant, but is not expected to cause any significant adverse effects. The U.S. National Institute for Occupational Safety and Health (NIOSH) concluded there is no evidence that nickel and its inorganic compounds are carcinogenic when ingested. The U.S. Food and Drug Administration has affirmed that nickel is generally recognized as safe (GRAS) as a direct human food ingredient.

PREEXISTING CONDITIONS: Prolonged and intimate skin contact can cause an allergic skin rash in previously sensitized individuals.

Section 3: Composition/Information on Ingredients

Constituent	Typical Composition	C.A.S. Number	EINECS Number
Nickel (Ni)	100 %	7440-02-0	2311114

Section 4: First-Aid Measures

General Measures: No special requirements.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Qualified personnel may give oxygen if breathing is difficult. Seek medical attention.

INGESTION: Rinse mouth with water. Do not induce vomiting. Seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

SKIN: Remove contaminated clothing, brush material off skin, wash affected area with soap and warm water. To avoid further irritation, do not rub or scratch the irritated areas, as this may also force dust, fibers, or particulate into the skin. Seek medical attention if symptoms develop or persist.

EYES: Immediately flush eyes with lukewarm water, including under upper and lower eyelids, for at least 15 minutes. Seek medical attention.

MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE AND DELAYED: May cause irritation. See section 11 for more information.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT: No other relevant information available

American Association of Poison Control Centers: 1-800-222-1222

Section 5: Fire-Fighting Measures

FLAMMABILITY OF THE PRODUCT: No specific fire or explosion hazard.

EXTINGUISHING MEDIA: Use extinguishing agent suitable for surrounding material and type of fire.

UNSUITABLE EXTINGUISHING MEDIA: No information available.

SPECIFIC HAZARDS ARISING FROM THE MATERIAL: May emit toxic metal oxide fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS: Warning! Processing may create a combustible dust and could result in a fire and/or explosion should the necessary dust concentration in air and ignition source be present. Use full face, self-contained breathing apparatus and full protective clothing when necessary.

Section 6: Accidental Release Measures

Avoid contact with skin, eyes, or clothing. If fiber, dust, or particulate accumulates where material is handled, collect it by wet sweeping or by vacuuming with the vacuum exhaust, passing through a high efficiency particulate arresting (HEPA) filter if the exhaust is discharged into the workplace. Wear appropriate NIOSH-approved respirators if collection and disposal of dust is likely to cause the concentration of airborne contaminants to exceed the exposure limits. Clean up material and put into a suitable container and dispose in accordance with any applicable regulations.

Section 7: Handling and Storage

This material is electrically conductive. User generated airborne fibers, dust, or particulate are electrically conductive and may create electrical short circuits that could result in damage to and malfunction of electrical equipment and/or personal injury.

Keep in the container supplied and keep container closed when not in use. Do not store near acids.

If user operations generate dust, mist or fume, use ventilation to keep exposure to airborne nickel below the exposure limit. If ventilation alone cannot so control exposure, use NIOSH-approved respirators selected according to OSHA 29 CFR 1910.134. Maintain airborne levels as low as possible. Do not inhale fibers. Ventilation is normally required when handling or using this product to keep airborne nickel and/or fibers below the nationally authorized limits. If ventilation alone cannot control exposure, use respirators nationally approved for the purpose.

Avoid repeated skin contact. Wear suitable gloves. Wash skin thoroughly after handling. Launder clothing and gloves as needed. Do not store near acids. Like other metals, nickel can react with acids to liberate hydrogen gas which can form explosive mixtures in air.

Finely-divided nickel metal may react explosively or incandescently with substances such as ammonium nitrate, perchlorates, phosphorous, etc. Under special conditions nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl ($Ni(CO)_4$), a toxic gas.

Section 8: Exposure Controls/Personal Protection

	Typical Composition	OSHA/PEL mg/m3	ACGIH/TLV mg/m3	OSHA TWA MCCPF
Nickel (Ni)	100 %	1	1.5	

EYE/FACE PROTECTION: Avoid eye contact. Wear coverall goggles, as necessary, if airborne dust, fiber or particulate are present. Wear safety glasses with side shields when machining, grinding, or cutting.

SKIN PROTECTION: Wear protective clothing such as a loose fitting long sleeved shirt that covers to the base of the neck, long pants and gloves made or impervious materials, as appropriate, to cover skin areas and prevent irritation. Skin irritation is known to occur primarily at pressure points such as around the neck, wrist or waist and between the fingers.

RESPIRATORY PROTECTION: Not ordinarily required. If sufficient vapor or fumes are being generated during heating or curing or the product, use a NIOSH approved organic vapor respirator. If sufficient dust, fibers or particulate are generated during use or during machining, grinding or cutting, use a NIOSH approved dust respirator.

VENTILATION: Use local exhaust sufficient to control dust, fibers or particulate, vapor or fumes generated to below acceptable exposure limits. If an exhaust ventilation is not available or is inadequate, use a NIOSH approved respirator, as appropriate. Discharge from the ventilation system should comply with applicable air pollution control regulations. Electrical systems, in areas where the product is handled, must be suitable for operation in an environment containing electrically conductive dust, fibers or particulate.

GENERAL HYGIENE RECOMMENDATIONS: Before eating, drinking, smoking or using toilet facilities, wash face and hands thoroughly with soap and water. Use vacuum equipment to remove product and product dust, fibers or particulate from clothing and work areas. Compressed air is not recommended.

Section 9: Physical and Chemical Properties

A silvery, odorless, powder material. Typically supplied in polyethylene bags or in steel cans.

Ingredient	Mol. Wt.	Magnetic Properties
Ni	58.71	Ferromagnetic

Viscosity	N/A
Melting point Ni	1453 C
Boiling point Ni	2732 C
Flash Point	N/A
Auto flammability	N/A
Explosive properties	N/A
Vapor pressure	N/A
Density Ni	8.9 g/cm^3
Solubility in Water	N/A
Partition coefficient	N/A

N/A: Not Applicable

Section 10: Stability and Reactivity

This product is Stable.

This product can react vigorously with acids to liberate hydrogen which can form explosive mixtures with air.

The products of combustion and decomposition depend on other materials present in the fire and the actual conditions of the fire. Burning will produce oxides and other unidentified gases and vapors that may be toxic. Avoid inhalation.

Under special conditions nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, $Ni(CO)_4$, a toxic gas.

Section 11: Toxicological Information

Nickel LD50 ORAL RAT >9000 mg/kg

Finely-divided nickel metal may react explosively or incandescently with substances such as ammonium nitrate, perchlorates, phosphorous, etc. Under special conditions nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, $Ni(CO)_4$, a toxic gas. If exposure to nickel carbonyl is suspected, seek medical attention immediately.

Nickel metal powder has caused tumors at the site of injection in rodents. However, studies do not suggest a significant risk for humans from nickel-containing prostheses. The National Toxicology Program has listed nickel as reasonably anticipated to be a carcinogen based on the production of injection site tumors. The International Agency for Research on Cancer (IARC) found there was inadequate evidence that metallic nickel is carcinogenic to humans but since there was sufficient evidence that it is carcinogenic to animals, IARC concluded that metallic nickel is possibly carcinogenic to humans. In 1997, the ACGIH categorized elemental nickel as: A5 "Not Suspected as a Human Carcinogen". Epidemiological studies of workers exposed to nickel powder and to dust and fume generated in the production of nickel alloys and of stainless steel have not indicated the presence of a significant respiratory cancer hazard.

Evidence for the association of nickel compound exposures and cancer risk comes mainly from workers in now obsolete nickel refining operations where very high concentrations of airborne nickel, mostly present as oxidic or sub-sulphidic species at up to 100 mg/m3 or more, were associated with excess nasal and lung cancers. The

inhalation of nickel powder has not resulted in an increased incidence of malignant lung tumors in rodents. Repeated intratracheal instillation of nickel powder produced an increased incidence of malignant lung tumors in rats. Repeated intratracheal instillation of nickel powder did not produce an increased incidence of malignant lung tumors in hamsters when administered at the maximum tolerated dose. Single intratracheal instillations of nickel powder in hamsters at doses near the LD50 produced an increased incidence of fibrosarcomas, mesotheliomas and rhabdomyosarcomas. Inhalation of nickel powder at concentrations 15 times the TLV irritated the respiratory tract in rodents.

Animal experiments indicate that soluble nickel ingestion causes adverse effects on fetal development at a threshold oral exposure of 2.2 mg/ Ni/kg/day by pregnant rats. Data are insufficient to determine if this effect occurs in humans and no regulatory agency has classified soluble forms of nickel as reproductive risks for humans.

Section 12: Ecological Information

No ecological data has been determined on the total product.

Section 13: Disposal Considerations

Material for disposal should be placed in appropriate sealed containers to avoid potential human and environmental exposure. It is the responsibility of the generator to comply with all federal, state, provincial and local laws and regulations. We recommend that you contact an appropriate waste disposal contractor and environmental agency for relevant laws and regulations. Under the U.S., Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

Nickel-containing waste can be collected to recover nickel value. Should nickel recovery be implemented, follow EPA and local regulations.

Section 14: Transport Information

International Maritime Dangerous Goods Code
Not regulated.
International Civil Aviation Organization Technical Instructions for the Carriage of Dangerous Goods by Air
Not regulated.
U.S. Dept. of Transportation Regulations
Not regulated.
Canadian Transportation of Dangerous Goods Act
Not regulated.
European Agreement Concerning the International Carriage of Dangerous Goods by Road
Not regulated.

Section 15: Regulatory Information

TSCA Listed: Nickel is listed on the TSCA inventory.

HMIS Ratings: **Health**: 1 **Flammability**: 1 **Physical**: 0

This product contains the following chemical(s) subject to the reporting requirements of SARA Title III Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

Nickel

Refer to the Composition section (Section 3) of this SDS for appropriate CAS numbers and percent by weight.

California Proposition 65: Metallic Nickel is listed. As indicated in Title 22 of the California Code of Regulations Section 12707(b)(5), for purposes of Proposition 65, nickel and nickel compounds present no significant risk of cancer by the route of ingestion

Section 16: Other Information

Explanation and Disclaimer: Wherever such words or phrases as "hazardous," "toxic," "carcinogen," etc. appear herein, they are used as defined or described under state employee right-to-know laws, Federal OSHA laws or the direct sources for these laws such as the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), etc. The use of such words or phrases should not be taken to mean that we deem or imply any substance or exposure to be toxic, hazardous or otherwise harmful. Any exposure can only be understood within the entire context of its occurrence, which includes such factors as the substance's characteristics as defined in the SDS, amount and duration of exposures, other chemicals present and preexisting individual differences in response to the exposure.

The data provided in this SDS is based on the information received from our raw material suppliers and other sources believed to be reliable. We are supplying you this data solely in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other Federal and state laws as described in Section 15: Regulatory Information. This SDS and the information in it are not to be used for purposes other than compliance with the Federal OSHA Hazard Communication Standard.

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Revision History – Q013 - Nickel CVD Coated Carbon Fiber Safety Data Sheet		
Revision	Effective Date	Summary of Changes
0	9/21/2017	Initial version
1.0	2/19/2020	Updated formatting
1.1	2/20/2023	Updated address
1.2	7/13/2023	Updated naming – editorial updates