

Section 1: Identification

1.1 Product Identifier

Product Name NiShield coated cellulose broadgood

Applicable to Ni coated nonwoven broadgood product

1.2 Relevant Identified Uses of the substance or mixture and uses advised against

Identified uses Conductive composites and compounds

1.3 Details of the supplier of the safety data sheet

Manufacturer Conductive Composites
830 E. South Flat Rd
Cleveland, UT 84518
<https://www.conductive.com>
Tel: +1 435 654 3683

Contact Person sales@conductive.com

1.4 Emergency telephone number

Emergency Medical To be used only for chemical emergencies
US/Canada +1 (800) 222-1222 USA (24-hour availability)

Section 2: Hazard(s) Identification

2.1 Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards Not classified

Health hazards Not classified

Environmental hazards Not classified

2.2 Label elements

Hazard statements Not classified

2.3 Other hazards

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

APPEARANCE: Silvery colored fiber tow, woven fabric, nonwoven sheet, or converted short fiber.

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 result 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.

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 metallic nickel may induce asthma.

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

3.2 Mixtures

| Constituent | Typical Composition | C.A.S. Number | EINECS Number |
|----------------|---------------------|---------------|---------------|
| Nickel (Ni) | 15-55% | 7440-02-0 | 2311114 |
| Cellulose Pulp | 45-85% | 65996-61-4 | |
| | | | |

Section 4: First-Aid Measures

4.1 Description of 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.

4.2 Most important symptoms / effects, acute and delayed

GENERAL INFORMATION: May cause irritation. See section 11 for more information.

4.3 Indication of immediate medical attention and special treatment

NOTES FOR THE DOCTOR: No other relevant information available.

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

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

UNSUITABLE EXTINGUISHING MEDIA: No information available.

5.2 Specific hazards arising from the material

SPECIFIC HAZARDS: May emit toxic metal oxide fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS: The processing of this material 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

6.1 Personal precautions, protective equipment, and emergency procedures

PERSONAL PRECAUTIONS: Avoid contact with skin, eyes, or clothing. 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.

6.2 Environmental precautions

ENVIRONMENTAL PRECAUTIONS: The physical characteristics of this product prevent it from release into drains and water courses.

6.3 Methods and material for containment and cleaning up

METHODS FOR CLEANING UP: 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. Clean up material and put into a suitable container and dispose in accordance with applicable regulations. Be aware that carbon fibers and nickel coated carbon fibers are electrically conductive and if they are allowed into electronic devices they may cause electrical shorts.

Section 7: Handling and Storage

7.1 Precautions for safe handling

USAGE PRECAUTIONS: This material is fibrous and 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 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.

7.2 Conditions for safe storage, including any incompatibilities

STORAGE PRECAUTIONS: Store in original container or a suitable dry and tightly closed container. Keep dry.

Section 8: Exposure Controls/Personal Protection

8.1 Control parameters

| | Typical Composition | OSHA/PEL mg/m3 | ACGIH/TLV mg/m3 | OSHA TWA MCCPF |
|-------------|---------------------|------------------------------|----------------------------------|----------------|
| Nickel (Ni) | 15-55% | 1 | 1.5 | |
| Carbon (C) | 45-85% | 15 (total) 5 (respirable) | 10 (inhalable) 3 (respirable) | 15 |

8.2 Exposure controls

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 of 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 of 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

9.1 Information on basic physical and chemical properties

| Ingredient | Mol. Wt. | Magnetic Properties |
|-------------------|-----------------|----------------------------|
| Ni | 58.71 | Ferromagnetic |
| C | 12.01 | None |

| | |
|----------------------|--|
| Appearance | Silvery metal over dark fiber; filament or chopped fiber |
| Color | Silvery metallic over dark / black fiber |
| Odor | Odorless |
| Odor threshold | N/A |
| pH | N/A |
| Viscosity | N/A |
| Melting point Ni | 1453 C |
| Melting point C | 3652 C |
| Boiling point | N/A |
| Flash Point | N/A |
| Auto-flammability | N/A |
| Explosive properties | N/A |
| Vapor pressure | N/A |
| Density Ni | 8.9 g/cm ³ |
| Density C | 1.8 g/cm ³ |
| Solubility | N/A |

9.2 Other information

OTHER INFORMATION: No other information available or required.

Section 10: Stability and Reactivity

10.1 Reactivity

REACTIVITY: 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.

10.2 Chemical stability

STABILITY: This product is considered stable.

10.3 Possibility of hazardous reactions

POSSIBILITY OF HAZARDOUS REACTIONS: Under normal conditions of use no hazardous reactions will occur. Under special conditions nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, Ni(CO)₄, which is a toxic gas.

10.4 Conditions to avoid

CONDITIONS TO AVOID: Avoid heat, flame, and other sources of ignition.

10.5 Incompatible materials

MATERIALS TO AVOID: Carbon monoxide, concentrated nitric acid.

10.6 Hazardous decomposition products

HAZARDOUS DECOMPOSITION PRODUCTS: This material does not decompose when used and stored as recommended. In an emergency situation leading to elevated temperature, there may be release of toxic gases and vapors. The products of combustion and decomposition will depend on other materials present in the fire and the actual conditions of the fire.

Section 11: Toxicological Information

11.1 Information on toxicological effects

TOXICOLOGICAL EFFECTS: Not regarded as a health hazard under current legislation. Carbon fiber with a filament diameter $> 4\mu\text{m}$ is not considered respirable. World Health Organization defines a respirable fiber as a fiber with a diameter (d) $< 3\mu\text{m}$, a length (l) $> 5\mu\text{m}$ and an l/d-ratio ≥ 3 . Carbon fiber is not considered a dangerous substance according to Regulation (EC) No 1272/2008 (CLP). There is no evidence that carbon fibers are mutagenic, genotoxic or carcinogenic.

The major routes of toxicological relevance in the workplace are inhalation and skin contact.

INHALATION:

A 2008 regulatory compliant study on the inhalation of metallic nickel powder was negative for respiratory carcinogenicity in rats. However, at levels at or above 0.1 mg Ni/m³ (respirable aerosol fraction), chronic respiratory toxicity was observed in the animals. There are no clear, definite reports of asthma associated with metallic nickel exposure. Special precautions to reduce inhalation exposure to fine and ultrafine Ni-containing powders should be taken (Nickelinstitute.org).

SKIN CONTACT:

Skin sensitization to metallic nickel (as nickel metal powder and alloys) can occur wherever there is leaching of a sufficient amount (above threshold) of nickel ions from articles containing nickel onto exposed skin. Occupational exposures involving direct and prolonged skin contact with pure nickel metal powders may elicit cutaneous allergy (allergic contact dermatitis) in nickel-sensitized workers, but these exposures are rare. Nickel dermatitis occurs mainly as the result of non-occupational exposures, with direct and prolonged skin exposure to items such as rings, necklaces, earrings, watches, and clothing fasteners when they are made of high nickel-releasing materials (Nickelinstitute.org).

Section 12: Ecological Information

12.1. Toxicity

TOXICITY: Not regarded as dangerous for the environment.

12.2. Persistence and degradability

PERSISTENCE AND DEGRADABILITY: This is not relevant due to the physical form of this product.

12.3. Bioaccumulative potential

BIOACCUMULATIVE POTENTIAL: Not relevant due to the physical form of this product.

12.4. Mobility in soil

MOBILITY: Not relevant due to the physical form of this product.

12.5 Results of PBT and vPvB assessment

RESULTS OF PBT AND vPvB ASSESSMENT: This product is not susceptible to PBT or vPvB conditions.

Section 13: Disposal Considerations

13.1 Waste treatment methods

DISPOSAL METHODS: 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. 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 values. Should nickel recovery be implemented, follow local government regulations.

Section 14: Transport Information

14.1 UN number

This product is not dangerous to transport.

14.2 UN proper shipping name

This product is not dangerous to transport.

14.3 Transport hazard class(es)

This product is not dangerous to transport.

14.4 Packing group

This product is not dangerous to transport.

14.5 Environmental hazards

This product is not dangerous to transport.

14.6 Special precautions for users

This product is not dangerous to transport.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

This product is not dangerous to transport.

Section 15: Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations

This product and its components are considered an "Article" with no intentional release in accordance with EC No. 1907/2006, REACH Regulation.

European Union: Carbon fiber is not considered a dangerous substance according to Regulation (EC) No 1272/2008 (CLP).

This product does not contain Annex XIV substances subject to Authorization according to Regulation (EC) No. 1907/2006 (REACH) or substances of very high concern published in accordance with Article 59(10) above 0.1 % (w/w).

US, EPA, TSCA: This product contains nickel which 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

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

Abbreviations and acronyms which may be used in the safety data sheet:

ATE Acute Toxicity Estimate
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
CLP Classification, Labelling and Packaging Regulation; Regulation (EC) No 1272/2008
CAS# Chemical Abstracts Service number
DNEL Derived No Effect Level
EC# EINECS and ELINCS Number
EINECS European Inventory of Existing Commercial Substances
ELINCS European List of Notified Chemical Substances
EmS Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA Environmental Protection Agency
EU European Union
GHS Globally Harmonized System
IATA International Air Transport Association
ICAO International Civil Aviation Organization
IMDG International Maritime Dangerous Goods
Kow octanol-water partition coefficient
LC50 Lethal concentration to 50% of a test population
LD50 Lethal dose to 50% of a test population (Median Lethal Dose)
N/A Not Applicable
n.o.s. Not otherwise specified
PBT Persistent, Bioaccumulative and Toxic substance
PNEC Predicted No Effect Concentration
PPE Personal Protection Equipment
REACH Registration, Evaluation, Authorization and Restriction of Chemicals Regulation (EC) No 1907/2006
SADT Self-accelerating decomposition temperature
SCBA Self-Contained Breathing Apparatus
STOT Specific Target Organ Toxicity
(STOT) RE Repeated Exposure
(STOT) SE Single Exposure
SVHC Substance of Very High Concern
TSCA Toxic Substances Control Act
UN United Nations
VOC Volatile Organic Compound
vPvB Very Persistent and very Bioaccumulative

General information: This safety data sheet has been written in accordance with the requirements of the Commission Regulation (EC) No 1907/2006, Annex II, as amended.

Issued by Conductive Composites
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| Revision History – SDS001 - Nickel Coated Carbon Fiber Safety Data Sheet | | |
|---|----------------|--------------------|
| Revision | Effective Date | Summary of Changes |
| 0.0 | 26 July 2023 | Initial release |
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