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MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Carbon band saw blades, hole saws, jig saws and recip. Blades (SP 248 PinPoint Carbon)

Date of Preparation: December 1998

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2. COMPOSITION, INFORMATION ON INGREDIENTS

Alloy Elements	CAS NO.	Pin Point Carbon (percent weight)	OSHA PEL	ACGIH TLV
Carbon	7440-44-0	1.20-1.35	3.5 mg/m ³ (as carbon black)	3.5 mg/m ³ (as carbon black)
Chromium	7440-47-3	.10-.35	1 mg/m ³	0.5 mg/m ³
Iron	7439-89-6	Balance	10 mg/m ³ (as iron oxide)	5 mg/m ³ (as iron oxide)
Manganese	7439-95-4	.10-.40	5 mg/m ³ (ceiling limit)	0.2 mg/m ³
Nickel	7440-02-0	.25 Max	1 mg/m ³ (metal & insoluble compounds)	1.5 mg/m ³ (metal)
Phosphorus	7723-14-0	.025 Max	0.1 mg/m ³ (yellow)	0.02 ppm (yellow)
Silicon	7440-21-3	.10-.035	15 mg/m ³ (total)	10 mg/m ³
Sulfur	7704-34-9	.025 Max	not available	not available

3. HAZARDS IDENTIFICATION

Emergency overview

The cutting tools (in the form of a cutting blade) listed in section 1, in their usual, unaltered, physical state pose little or no immediate health hazard. When subjected to cutting, burning, grinding, sawing, brazing, welding, etc. there may some generation of hazardous fumes, and or dusts. Proper industrial hygiene practices such as the use of engineering control (i.e. local exhaust ventilation) and or administrative controls (applicable respiratory and other types of protective equipment) should be utilized to control exposure.

Potential health effects

Primary Route of Exposure: Inhalation of dusts from grinding or cutting.

Routes of Entry: Inhalation: Yes Skin: No Ingestion: No Eyes: Yes

It should be noted that the cutting tools (in the form of a cutting blade) listed in section 1, in their usual, unaltered, physical state pose little or no immediate health hazard. When subjected to cutting, burning, grinding, sawing, brazing, welding, etc. there may some generation of hazardous fumes, and or dusts. An evaluation as needed by and industrial hygiene professional to assess the feasibility of the use of engineering controls (i.e. local exhaust ventilation) and or administrative controls (applicable respiratory and other types of protective equipment) should be undertaken.

Acute effects:

Excessive inhalation of metallic fumes and dusts may cause irritation to the respiratory system. In some instance, excessive inhalation may result in a condition known as "metal fume fever". Some symptoms of metal fume fever include metallic taste in the mouth, dry throat, coughing, dyspnea, rales and flu-like fever. Onset of symptoms may begin as soon as a few hours after exposure and last from 12 to 48 hours.

Excessive exposure to metallic fume and dust may also result in physical irritation of the skin and other mucous membranes.

Chronic Effects:

The following is an outline of the chronic effects of the individual components (representing $\geq 1\%$ or $\geq .1\%$ for carcinogens or potential carcinogens) listed in section 1 of this material safety data sheet:

Carbon: Elemental carbon is of low toxicity. Epidemiological information on Carbon black indicates that chronic exposure may result to lung and heart damage.

Chromium: The metal form of chromium (found in these products) is of very little toxicity. Health hazard issues arise from hexavalent chromium generated from welding fume. Health effects include respiratory irritation, edema, ulcers of the mucous membranes and nasal itch. The NTP lists hexavalent chromium as known to be human carcinogen. Chromium metal is listed as not classifiable as to carcinogenicity to humans.

Iron: Chronic exposure to iron oxide fume (generated during welding) and dust may result in benign pneumoconiosis and can be identified with x-rays. The x-ray shadows are indistinguishable from siderosis. Excessive concentrations may also cause respiratory system irritation.

Nickel: Nickel fumes have been a cause of respiratory irritation, pulmonary edema and pulmonary fibrosis in welders utilizing nickel alloys. Potential symptoms of overexposure also include sensitization dermatitis. This substance and certain nickel compounds may reasonably be anticipated to be carcinogens as listed in the NTP.

4. FIRST AID MEASURES

Inhalation: If a person breathes large amounts of this substance, move the exposed person to fresh air at once. If breathing has stopped perform mouth to mouth resuscitation (trained personnel only). Keep the affected person warm and at rest. Get medical attention as soon as possible.

Skin: Immediately flush with large amounts of water. Use soap if available.

Ingestion: Get medical attention immediately. Take MSDS sheet to medical facility.

Eye: If this substance contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this substance.

5. FIRE FIGHTING MEASURES

Flash Point: N/A

Flammable limits: N/A

Unusual fire and explosion hazards: N/A
(N/A – Not Applicable)

Special fire fighting procedures: N/A

LEL/UEL: N/A

Extinguishing media: N/A

6. ACCIDENTAL RELEASE MEASURES

No special instructions are necessary.

7. HANDLING AND STORAGE

Utilize good housekeeping practices and prevent accumulations of dusts to aid in the control of airborne concentrations.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Eye Protection Requirements: Safety glasses should be worn when grinding or cutting. Face shields and safety glasses should be worn during welding or burning. Contact lenses should not be worn.

Skin Protection Requirements: Gloves and barrier creams may be used to prevent cuts, skin sensitization and dermatitis.

Respiratory/ Ventilation Requirements: In the event of exposure to dusts, fumes or misting, a health hazard survey by an industrial hygienist or related health and safety professional should be undertaken. Provide a NIOSH approved respirator.

Use local (preferred) or general exhaust ventilation to control airborne concentrations of dust and fumes below the Threshold Limit Value (TLV). Seek advice from a safety professional and or industrial hygienist.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, Odor and Physical state: Solid, odorless, metal
pH: N/A Vapor Pressure (mm Hg): N/A
Vapor Density (Air = 1): N/A Boiling point: 2664°F
Melting Point: N/A Solubility in Water: Insoluble
Specific Gravity (H₂O = 1.0): 1.8-5.24

(N/A – not applicable)

Above represents available property ranges for materials (representing ≥ 1%) listed in section 1 of this material safety data sheet.

10. STABILITY AND REACTIVITY

Stability: Chemically stable.

Conditions to avoid: Avoid exposure to dust and or fume.

Incompatibility (Specific materials to avoid): Reacts with strong acids to generate hydrogen gas.

Hazardous Decomposition or byproducts: Metallic oxides.

Hazardous polymerization: Will not occur.

11. OTHER INFORMATION

Coatings may be applied to some of the blades for protective purposes. While this constitutes a minor component of the product, it should be considered when evaluating health hazards during any potential dust/fume generating operations. Applicable coating/ pigment MSDS's are available upon request.

To the best of our knowledge, the information contained herein is accurate. However, Greenfield Industries assumes no liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.