



MATERIAL SAFETY DATA SHEET

SECTION 1 IDENTITY

NAME OF PRODUCT:

Honing Mandrel or Guide Shoe with carbide inserts.

MANUFACTURER'S NAME AND ADDRESS:

SUNNEN PRODUCTS COMPANY
7910 MANCHESTER
ST. LOUIS, MO 63143

CONTACT:

CHUCK KORN

DATE:

NOVEMBER 28, 1996

EMERGENCY TELEPHONE NUMBER:

314-781-2105

SECTION 2 INGREDIENTS/IDENTITY (PER 29 CFR 1910.1200(g))

CHEMICAL NAME CARCINOGENIC	CAS NO.	MAX Wt.% GUIDE SHOE	MAX Wt.% MANDREL	OSHA	OSHA	OSHA	ACGIH	
				TWA Z1-A	SHORT Z-4 mg./cu. m.	CEIL Z-4	TWA	
Tungsten Carbide	12070-12-1	38	10	5 (as W)	10	NONE	5.0 (as W)	N
Cobalt	7440-48-4	8	5	0.05	NONE	NONE	.05	N
Tantalum Carbide	12070-06-3	1	1	5.0 (as Ta)	10	NONE	5.0 (as Ta)	N
Copper	7440-50-8	85	99	1.0 (dust)	NONE	NONE	1.0 (dust)	N
				0.1 (fume)	NONE	NONE	0.2 (fume)	
Aluminum	7429-90-5	12	15	15 Total Dust 5 Respirable	NONE	NONE	10	N
Nickel	7440-02-0	12	15	1.0	NONE	NONE	.05	N(1)
Silicon	7440-21-3	4	5	10 Total Dust 5 Respirable	NONE	NONE	10(total dust)	N
Manganese	7439-96-5	4	5	1.0 (fume)	3	5 (dust)	5.0 (dust)	
N							1.0 (fume)	

(1)I.A.R.C. & N.T.P. REPORT THAT ALL COMPOUNDS CONTAINING NICKEL ARE POTENTIALLY CARCINOGENIC. FOR FURTHER SAFETY AND HEALTH INFORMATION REGARDING THE COMPOSITION OF THIS MATERIAL CONTACT SUNNEN PRODUCTS. This mixture contains 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.

These mixture ingredients are cited on the following lists:

NAME	CAS	CITATIONS
Tungsten Carbide	12070-12-1	4,13,16,17,22
Cobalt	7440-48-4	2,4,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23
Tantalum Carbide	12070-06-3	2,13,16,17
Copper	7440-50-8	2,4,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23
Aluminum	7429-90-5	4,5,8,10,11,12,13,14,15,17,18,21,22,23
Nickel	7440-02-0	1,2,3,4,5,7,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23
Manganese	7439-96-5	2,4,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23
Silicon	7440-21-3	16,17,21,22,23

1=IARC 2=OSHA 3=NTP 4=ACGIH 5=NTPA49 6=NTPA325M 7=DOT HMT 49CFR172.101 8=EPA 9=RTECS
10=MA RTK 11=AK RTK 12=CA RTK 13=FL RTK 14=IL RTK 15=ME RTK 16=MN RTK 17=NH RTK 18=NJ
RTK 19=Cincinnati, OH RTK 20=Norwood, OH RTK 21=PA RTK 22=RI RTK 23=WV RTK

SECTION 3 PHYSICAL & CHEMICAL CHARACTERISTICS

SPECIFIC GRAVITY (WATER=1)9.5 to 15.5
PERCENT VOLATILE BY WEIGHT.....Not applicable
BOILING POINT5198 F (2870 C)
VAPOR PRESSURE (mm Hg).....Not applicable
REACTIVITY IN WATERNot reactive
VAPOR DENSITY (Air=1).....Not applicable
APPEARANCE AND ODOR.....Gray Solid Object
EVAPORATION RATENot applicable
SOLUBILITY IN WATER.....Practically Insoluble

SECTION 4 SPECIAL PRECAUTIONS

None for solid object. If dust is present, avoid dispersion of dust in air. Finely divided particles, dust, or fumes may be flammable or explosive. Keep away from sparks or ignition sources. Contents should be stored in a clean, dry, cool area. OTHER PRECAUTIONS: If exposed to dust or mist wash hands thoroughly after handling, before eating or smoking. Do not shake clothing, rags or other items to remove dust. Dust should be removed by washing or vacuuming. Periodic medical examinations are recommended for individuals regularly exposed to dust or mist.

SECTION 5 CORROSIVELY AND REACTIVITY DATA

STABILITY: Material in solid form is stable under normal conditions of transport and storage. POLYMERIZATION: Hazardous polymerization will not occur. INCOMPATIBILITY (MATERIALS TO AVOID): Fluorine, Ammonium Nitrite, Hydrazine, Ammonia, Performic Acid, Oxidants, and strong acids: May react violently. NICKEL WITH: Aluminum: May react explosively upon heating. Aluminum Trichloride and Ethylene: Explode with nickel catalyst upon heating. Hydrogen: Exothermic above 150 C. Titanium and Potassium Chlorate: May explode due to friction. Selenium, Sulfur, and Sulfur Compounds: Incandescent upon heating. COBALT WITH: Ammonium Nitrate + Metals or Bromine Pentafluoride: Reacts violently and sometimes explosively. Hydrazinium Nitrate: Decomposes explosively upon rapid heating. Nitryl Fluoride: Reacts Incandescently. Acetylene: Reacts incandescently. TUNGSTEN CARBIDE WITH: Chlorine Trifluoride: Reacts with a flame. Fluorine: Incandesces. Nitrogen Dioxide: Burns with incandescence if heated to dull red. Nitrous Oxide: Burns with incandescence if heated to dull red. Iodine Pentafluoride: Violent reaction. Lead Oxide: Violent reaction. CONDITIONS TO BE AVOIDED: Heating over 250 F or contact with incompatible materials (see above). HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may release toxic fumes.

SECTION 6 HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY ARE: INHALATION AND SKIN ABSORPTION. ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE - THE INFORMATION PRESENTED AND THE CONCLUSIONS DRAWN ARE FROM OTHER THAN DIRECT TEST DATA. ABBREVIATIONS USED IN THE FOLLOWING SECTION: NAIF= NO APPLICABLE INFORMATION FOUND, SKIN= SKIN ABSORPTION, EYE= EYE CONTACT, INHAL= INHALATION, INGEST= INGESTION

WARNING: Overexposure to this material in the form of metallurgical powder, dust or mist from grinding or sweeping is hazardous to health. May cause eye, skin, and mucous membrane irritation. May cause temporary or permanent respiratory (breathing) disease. Permanent respiratory (breathing) disease can lead to disability or death. Certain pulmonary (breathing) and skin conditions may be aggravated (made worse) by exposure.

COBALT: ACUTE SKIN: Cobalt is an allergen. Sensitization dermatitis may occur in persons who are previously exposed. A rash may develop, usually in the areas of folded skin of the elbow, neck, and face. Cross sensitization can occur between cobalt and nickel and cobalt and chromium. Some cobalt salts are photosensitizers. Cobalt insoluble salts can form soluble complexes with body fluid on eczematous skin and sensitizes the skin. Cobalt in ionized form is known to react with proteins. EYE: May cause irritation with redness, pain, and itching. May cause lesions similar to contact dermatitis. INHAL: May cause shortness of breath, asthma, difficult breathing during

exertion, wheezing, interstitial pneumonitis (inflammation of lung), and/or lung densities. Loss of sense of smell. Headaches, weakness, irritability, and changes to the electrical activity of the brain. INGEST: May cause hypotension (low blood pressure), pain, vomiting, weight loss, inflammation of nerves, nerve deafness, and sensations of hotness or nausea. Severe exposure may cause pericardial effusion (heart problem), convulsions, or enlargement of the thyroid. Cobalt reacts with alcohol to produce severe cardiac effects. CHRONIC SKIN: May cause contact

dermatitis. Sensitization dermatitis may follow inhalation or prolonged contact. EYE: May cause inflammation. See acute effects. INHAL: May cause pneumoconiosis (a progressive lung disease), sensitization of the respiratory tract, obstructed airways syndrome (difficult breathing), interstitial lung disease (a disease affecting the connecting tissue between cells), and density of the lung with symptoms as described in acute exposure. Produces gastric disturbances and blood in the urine. INGEST: May adversely affect the pancreas, thyroid gland (goiter), heart (enlarged), or bone marrow. Increased red blood cell count.

NICKEL: ACUTE: SKIN: May cause swelling and irritation. Skin sensitization may occur upon repeated exposure. "nickel itch", a type of dermatitis resulting from sensitization to nickel may begin with a sensation of burning and itching at the place of contact and usually occurs seven days before the characteristic skin eruptions appear. The primary skin eruption is erythematous (red spots) or follicular (cavity); it may be followed by superficial discrete ulcers which discharge and become crusted. The eruption may spread to areas related to the activity of the primary site. Pigmented or de-pigmented plaques may be formed. This sensitization reaction may be accompanied by fever, inflammation of the mouth (stomatitis), gums (gingivitis), eyes (conjunctivitis), sudden asthmatic attacks and eosinophilic pneumonitis (inflammation of lungs). Recovery usually occurs within 7 days after exposure. Eczema was more severe in individuals with simultaneous sensitivity to nickel and cobalt than to a single metal. Nickel is not absorbed through the unbroken skin in amounts sufficient to cause intoxication. Metal may be affected by cutting oils or coolants and converted to a form that can penetrate the skin. EYE: May cause inflammation and irritation. Shown to be toxic to rabbit eye. INHAL: May cause respiratory irritation, cough, pneumonitis (inflammation of lung), and fever. Pulmonary edema (fluid in lungs) may be a delayed symptom. Pulmonary sensitization reaction or anaphylaxis (allergic shock) may occur causing eosinophilic pneumonitis (inflammation of lungs), asthma and host rejection of nickel. INGEST: Literature reports ingested nickel is eliminated and not absorbed to any great extent. CHRONIC SKIN: May cause sensitization dermatitis. EYE: May cause inflammation. INHAL: May cause mucous membrane irritation and pulmonary sensitization. Carcinogenic. INGEST: None reported in humans.

COPPER: ACUTE: SKIN: Changes causing hard or horny skin located on the hands and the soles of the feet has been reported. Copper salts may cause skin irritation (itching, redness and dermatitis). EYE: Copper salts may cause swelling, ulceration and cloudy cornea. INHAL: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present health hazards. Fumes of copper may cause "Metal Fume Fever" with flu-like symptoms and skin and hair discoloration. Copper dust and fume may cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea. INGEST: Salts of copper act as irritants producing salivation, nausea, vomiting, stomach pain, bleeding stomach inflammation and diarrhea. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: Ulceration with perforation of the nasal septum. INGEST: Individuals with Wilson's disease (hepatolenticular degeneration) can experience fatal intoxication.

TITANIUM CARBIDE: ACUTE: SKIN: None reported in humans. EYE: May cause irritation. INHAL: May be considered a nuisance dust and may result in dust accumulation in the lungs. INGEST: Systemic poisoning not known to occur. CHRONIC: SKIN: None reported in humans. EYE: May cause inflammation. INHAL: May cause fibrosis (scar tissue) or pneumoconiosis (a progressive lung disease). INGEST: None reported in humans.

TUNGSTEN CARBIDE: ACUTE SKIN: May cause irritation with dermatitis, eczema, and itching. May also cause sensitization dermatitis if previously exposed. EYE: May cause irritation with redness, pain, and itching. INHAL: May cause coughing, dyspnea, soreness in the chest, weight loss, hemoptysis (spitting blood), bronchitis, and asthma. May also cause pulmonary fibrosis (scar tissue) and radiological changes may be noticed in the lung. INGEST: Systemic poisoning not known to occur. CHRONIC SKIN: May cause contact dermatitis. EYE: May cause inflammation. INHAL: May cause "hard metal lung" with symptoms as described in acute exposure. Previously exposed individuals may be at increased risk. INGEST: None reported in humans.

SILICON: ACUTE: SKIN: Physical damage to the skin caused by dust or by cleaning procedures used to remove it. EYE: Dust may irritate eyes. INHA: Dust may cause physical damage to the mucous membranes or nasal

passages. INGEST: NAIF CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May produce x-ray changes in the lungs without disability. INGEST: NAIF.

MANGANESE: ACUTE: SKIN: NAIF. EYE: May cause slight eye irritation. INHAL: Can cause bronchitis and inflammation of lung. Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. Freshly formed fumes can cause fever and chills similar to the flu. INGEST: Early symptoms of Manganese poisoning include lack of coordination, apathy, anorexia, headache and spasms. CHRONIC: SKIN:

NAIF. EYE: NAIF. INHAL/INGEST: Manganese poisoning is not fatal but may present a large range of nervous system disorders that vary among individuals. Advanced symptoms are similar to classical Parkinson's disease.

ALUMINUM: ACUTE: SKIN: May cause skin irritation. EYE: Dust may cause swelling and injury to the eye. INHAL: Nuisance dust. INGEST: NAIF. CHRONIC: SKIN: NAIF. EYE: NAIF. INHAL: May cause irritation of the mucous membranes of the upper respiratory system. INGEST: NAIF.

EMERGENCY FIRST AID FOR DUST EXPOSURE

INHALATION: Remove to fresh air. If not breathing, begin mouth to mouth resuscitation. Keep affected person warm and at rest. Seek medical attention immediately. EYE CONTACT: Remove contact lenses (if wearing) and wash eyes with large amounts of water, occasionally lifting upper and lower lids, until no evidence of material remains (approximately 15-20 minutes). Get medical attention immediately. SKIN CONTACT: If irritation or rash occurs, remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of material remains (approximately 15-20 minutes). Get medical attention. INGESTION: If swallowed and person is awake, give large amounts of water. After water has been swallowed, induce vomiting. Do not attempt to make an unconscious person vomit. Seek medical attention immediately.

SECTION 7 HANDLING, STORAGE AND USE PROCEDURES

NORMAL STORAGE AND HANDLING: No special procedures. NORMAL USE: Practice good personal hygiene while honing. Wash hands thoroughly to remove honing oil and microscopic particles of metal debris (suspended in the oil) before touching other parts of the body, food, drinks or smoking to avoid exposure to metal fines. Refer to acute health effects-Section 6. STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS: Solid object: None. Dust: Pick up with a high-efficiency particulate filter vacuum or wet clean up. Avoid spreading dust. Use appropriate respiratory protection. WASTE DISPOSAL METHOD: Used mandrels and guide shoes are classified by the EPA as "scrap metal" and are not subject to regulation under 40 CFR parts 262-266 or part 270 or part 124 and are not subject to the notification requirements of Section 3010 of RCRA. Dispose of in accordance with applicable federal, state and local laws, regulations, rules, orders and ordinances. Ref. 40 CFR 261.6 (a)(3)(iv).

SECTION 8 PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not normally required when honing with oil. If conditions of use (by abrading, melting, welding, cutting or processing in any other fashion that creates potentially hazardous dust or fumes) use NIOSH approved respirator rated for metal dust to maintain levels of dust below ACGIH TLV and OSHA PEL/TLV levels.

0.5 mg(Co)/cu m: Dust mask, except single-use respirator.

1.0 mg(Co)/cu m: Dust mask, except single-use and quarter-mask respirators. Fume or high-efficiency particulate respirator.

5.0 mg(Co)/cu m: High-efficiency particulate respirator with a full facepiece. Supplied-air respirator with a full facepiece, helmet or hood. Self-contained breathing apparatus with a full facepiece.

20.0 mg(Co)/cu m: Powered air-purifying respirator with a high-efficiency filter with a full facepiece. Type "C" supplied-air respirator with a full facepiece operated in pressure-demand or other positive-pressure mode.

Normal honing operations using honing oil does not generate harmful levels of mists or fumes in the operators breathing zone. If unusual honing conditions generate any strong odor or detectable oil mist use NIOSH approved respirator rated for mineral oil mist to maintain oil mist levels below ACGIH TLV and OSHA PEL/TLV levels.

VENTILATION: Normal ventilation is required. Do not operate honing machine within a closed un-ventilated space. If conditions of use (by abrading, melting, welding, cutting or processing in any other fashion that creates potentially hazardous dust or fumes) or if any strong odors or oil mist is detected, use forced ventilation to maintain levels of fumes or mists below ACGIH TLV and OSHA PEL/TLV levels. SKIN PROTECTION: Not required when handling

solid material. Gloves and protective clothes if any operation generates dust. Skin protection is not normally required for short exposures while honing with oil. Oil impervious

gloves should be worn while honing in the event any symptoms of skin distress appear. Note that some barrier creams have been shown to increase skin absorption of metallic compounds and also that many people are allergic to chemicals used in protective gloves. EYE PROTECTION: Safety glasses with side shields or goggles are recommended. Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye-wash fountain within the immediate work area for emergency use. OTHER

PROTECTION: Apron if desired. Do not wear oil soaked or dust soiled clothing as it may cause skin irritation. MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL: Remove traces of material dust if soldering, welding, brazing, cutting or other process involving ignition sources by cleaning with a high-efficiency particulate filter vacuum or wet clean up. Avoid spreading dust. Use appropriate respiratory protection if dust is present.

SECTION 9 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Solid object does not present a fire hazard. Dust created by grinding or otherwise abrading the mandrel or carbide insert is expected to be a fire and explosive hazard when exposed to ignition source.

FLAMMABLE LIMITS: Not established. EXTINGUISHING MEDIA: For dust or powder, smother with dry sand, dry dolomite, sodium chloride or soda ash. SPECIAL FIRE FIGHTING PROCEDURES: Firefighters must use self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive-pressure mode.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Dust may explode under favorable conditions of particle size and ignition source.

NOTICE

THIS MATERIAL SAFETY DATA SHEET ("MSDS") IS SUPPLIED PURSUANT TO THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S HAZARD COMMUNICATION RULE (THE "RULE"), 29 CFR 1910.1200. THIS MSDS IS BEING FURNISHED TO THE IMMEDIATE PURCHASER OF THE MATERIAL TO WHICH IT REFERS WITHOUT REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS OR ACCURACY OF ANY INFORMATION OR RECOMMENDATIONS CONTAINED HEREIN.

THIS MSDS IS OFFERED SOLELY TO COMPLY WITH THE RULE AND IS NOT INTENDED TO CREATE ANY LIABILITY OF ANY KIND ON THE PART OF SUNNEN PRODUCTS COMPANY ("SUNNEN"). IN NO EVENT WILL SUNNEN BE RESPONSIBLE FOR ANY DEATH, INJURY OR DAMAGE OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF, RELIANCE UPON, OR MISUSE OF THE MSDS. NO REPRESENTATIONS OR WARRANTIES, WHETHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER NATURE, ARE MADE HEREUNDER. THIS MSDS IS NOT INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR EXTEND LICENSES UNDER VALID PATENTS.

THIS MSDS IS FURNISHED UPON THE EXPRESS CONDITION THAT ALL PERSONS RECEIVING IT WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSED PRIOR TO USE. RESPONSIBILITY FOR COMPLIANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS CONCERNING DISSEMINATION OF THE MSDS AND SALE AND USE OF THE MATERIAL TO WHICH IT REFERS RESTS SOLELY UPON THE PURCHASER.