LOVEJOY TOOL COMPANY, INC.
133 MAIN STREET
SPRINGFIELD, VT 05156

SAFETY DATA SHEET (SDS)

Alloy & Carbon Steel

DOCUMENT I.D.: OS-4000

Section 1: Identification of the substance/mixture and of the company/undertaking:

1.1 Product

1.1.1 Chemical Names: Alloy Steels, Carbon Steels
1.1.2 Synonyms: 1018, 1020, 4140, 4150, 6150, 8620.
1.1.3 Chemical Family: AISI/SAE 10XX – 93XX
1.1.4 **Chemical use:** Cutting tools, component parts, arbors

1.2 Manufacturer

1.2.1 Manufacturer Name:
Lovejoy Tool Company, Inc.
PO Box 949
133 Main St.
Springfield, VT 05156-0949
USA
www.lovejoytool.com
(802) 885-2194

1.2.2 Emergency Phone Number:
(800) 843-8376

Section 2: Hazards Identification:

2.1 Classification

2.1.1 Symbol: None required.
2.1.2 Signal Word: None required.
2.1.3 Hazard Statement (finished goods): As defined in the OSHA Hazard Communication Standard, 29 CFR 1910.1200, these products do not have physical hazards that are classified. All components listed for this product are bound within the product. When handled as intended and under normal conditions of use, there is no evidence that any of the ingredients are released in amounts that pose a significant health risk. Although these products are not subject to the OSHA Standard or GHS labeling elements, Lovejoy Tool Co., Inc. would like to disclose as much health and safety information as possible to ensure that this product is handled and used properly. This SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and be made available for employees and other users of this product. In addition, the

recommendations for handling and use of these products should be included in worker training programs.

2.1.4 Hazard Statement (rough mold): No Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL) exists for steel. Steel products in the natural state do not present an inhalation, ingestion or contact hazard. However, operations such as burning, welding, sawing, brazing, and grinding may result in the following effects if exposures exceed permissible limits as listed in Section 2 of the individual constituents.

2.2 OSHA Regulatory Status

Grinding this material will generate dusts and mists that are considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

2.3 Potential Effects of Exposure

2.1.5 Inhalation: Acute-Dust or fume may cause irritation to the eyes, nose, or throat; leave a metallic taste in the mouth; result in metal fume fever; or produce flu-like symptoms.

2.3.1 Can cause irritation of the respiratory organs of a small percentage of sensitive persons, resulting in obstruction of respiratory ways with breathing difficulties: occupational asthma and interstitial fibrosis.

2.3.2 Skin Contact: Can cause irritation or an allergic skin rash due to cobalt or nickel sensitization. Certain skin conditions, such as dry skin, may be aggravated by exposure.

2.3.3 Eye Contact: Can cause irritation.

2.3.4 Ingestion: Reports outside the industry suggest that ingestion of significant amounts of cobalt has the potential to cause blood, heart and other organ problems.

2.4 Environmental Effects: No data is available at this time.

2. Hazard(s) identification

Physical hazards Not classified.
Health hazards Sensitization, respiratory Category 1
Sensitization, skin Category 1
Carcinogenicity Category 2
Specific target organ toxicity, repeated Category 1
exposure
OSHA defined hazards Not classified.
Label elements
Signal word Danger
Hazard statement May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes damage to organs () through prolonged or repeated exposure.
Precautionary statement
Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves/protective clothing/eye

protection/face protection. In case of inadequate ventilation wear respiratory protection.
Response If on skin: Wash with plenty of water. If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If exposed or concerned: Get medical advice/attention. Specific treatment (see this label). If skin irritation or rash occurs: Get medical advice/attention. If experiencing respiratory symptoms: Call a poison center/doctor. Wash contaminated clothing before reuse.
Storage Store locked up.
Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)
None known.
Supplemental information
In its manufactured and shipped state, this product is considered to present a low hazard. Processing may generate hazardous fumes and dusts.
Alloy Steel SDS US

Section 3: Hazard Ingredients:

Material	Weight Percent*	CAS Number
Tungsten Carbide (Tungsten Insoluble Compounds as W)	50-98 %	7440-33-7
Tungsten Carbide (Tungsten Soluble Compounds as W)	50-98 %	7440-33-7
Cobalt Metal, Dust, and Fume (as Co)	1-30 %	7440-48-4
Tantalum Carbide (Tantalum Metal and Oxide Dust as Ta)	0-15 %	-
Chromium (II+III Compounds as Cr+3)	0-5 %	7440-25-7
Chromium Metal (as Cr+3)	0-5 %	7440-47-3
Nickel (Metal and Insoluble Compounds as Ni)	0-5 %	7440-47-3
Nickel (Soluble Compounds as Ni)	0-5 %	7440-02-0

*Varies depending on grade

3. Composition/information on ingredients
Mixtures
Chromium 7440-47-3 <7
Chemical name CAS number %
Molybdenum 7439-98-7 <6
Nickel 7440-02-0 <4.5
Manganese 7439-96-5 <3
Silicon 7440-21-3 <2.5
Aluminium 7429-90-5 < 1
Carbon 7440-44-0 < 1
Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 4: First Aid Measures:

4.1 First-aid and Emergency Measures

4.1.1. Overexposure: If overexposure to dusts and mists from grinding occurs, have SDS and label information available and contact a poison control center or seek medical attention immediately.

4.1.2. Inhalation: If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.) remove from exposure and seek medical attention.

4.1.3. Skin Contact: If irritation or rash occurs, thoroughly wash affected area with soap and water and isolate from exposure. If irritation or rash persists, seek medical attention.

4.1.4. Eye Contact: If irritation occurs, flush with large amounts of water. If irritation persists, seek medical attention.

4.1.5. Ingestion: If substantial quantities are swallowed, dilute with a large amount of water, induce vomiting and seek medical attention.

4.2 Carcinogenic Assessment

ACGIH, NTP, IARC and OSHA have identified nickel as a confirmed carcinogen. IARC and NIOSH have indicated that cobalt is a suspected human carcinogen.

4. First-aid measures

Inhalation If inhalation of gas/fume/vapor/dust/mist from the material is excessive (air concentration is greater than the TLV or health effects are noticed), immediately remove the affected person(s) to fresh air. Call a physician if symptoms develop or persist.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

Eye contact Do not rub eye. Rinse with water. Get medical attention if irritation develops and persists.

Ingestion Rinse mouth thoroughly if dust is ingested. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Rash. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information Processing may generate hazardous fumes and dusts. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

Section 5: Firefighting Measures:

5.1. Flammable properties

5.1.1. End products made from (sintered) cemented carbide are not flammable. However, dusts generated from, and/or during, machining operations may ignite if allowed to accumulate when exposed to an ignition source.

5.1.2. Flashpoint: None

5.1.3. Auto-ignition: Not applicable

5.1.4. Lower Flammable Limit (LFL): Not applicable

5.1.5. Upper Flammable Limit (UFL): Not applicable

5.2. Extinguishing Media

5.2.1. Suitable Extinguishing Media: For powder fires, smother with dry sand, dry dolomite, ABC type fire extinguisher, or flood with water. Move container from fire area if possible. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, or else withdraw and let fire burn out.

5.2.2. Non-suitable Extinguishing Media: Not applicable

5.3. Specific Hazards

5.3.1. Dusts may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion and strong ignition source.

5.3.2. May generate toxic metal fumes when heated.

5.3.3. Precautions for Firefighters: For a powder fire confined to a small area, use a respirator approved for toxic dusts and fumes. For a large fire, firefighters should use self-contained breathing apparatus.

5. Fire-fighting measures

Suitable extinguishing media Special powder against metal fires. Dust: Extinguish with foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions

Move containers from fire area if you can do so without risk. Cool material exposed to heat with water spray and remove it if no risk is involved.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards Fine particles may form explosive mixtures with air.

Section 6: Accidental Release Measures:

6.1 Precautions

6.1.1. Personal: If airborne dust is present, use personal protection recommended in Section 8.

6.1.2. Environmental: Material is not hazardous to the environment.

6.2. Spills: In Event that Dust or Sludge is Released or Spilled:

6.2.1. Ventilate the area.

6.2.2. Clean up using methods that avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean up.

6.2.3. If airborne dust is generated, use an appropriate NIOSH approved respirator.

6.2.4. Place reclaimed material in a suitable clean, dry container for recycling.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid generation and spreading of dust. Avoid inhalation of dust and contact with skin and eyes. Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Collect dust using a vacuum cleaner equipped with HEPA filter. If not possible, gently moisten dust with water fog before it is collected with shovel, broom or the like. Collect in containers and seal securely. Containers must be labeled. For waste disposal, see Section 13 of the SDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

Section 7: Handling and Storage:

7.1. Handling

7.1.1. Avoid dispersion of grinding dust and mist into the air.

7.1.2. If airborne dust is generated, use an appropriate NIOSH approved respirator.

7.1.3. Avoid contact with skin, eyes, or clothing.

7.1.4. Wash hands thoroughly after handling, before eating or smoking.

7.1.5. Do not shake clothing, rags, or other items to remove dust instead removed dust by washing or vacuuming.

7.2. Storage

7.2.1. There are no specific storage requirements for end products.

7.2.2. Keep any dust and accumulated powders away from sparks and ignition sources.

7. Handling and storage

Precautions for safe handling Welding, burning, sawing, brazing, grinding or machining operations may generate fumes and dusts. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use work methods which minimize dust production. Avoid inhalation of dust. Take precautionary measures against static discharges when there is a risk of dust explosion. Use explosion-proof electrical equipment if airborne dust levels are high. Keep away from open flames,

hot surfaces and sources of ignition. Keep the workplace clean. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. When using, do not eat, drink or smoke. Provide adequate ventilation. In case of inhalation of dust or fumes: Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

Section 8: Exposure Controls/Personal Protection:

8.1 Permissible Exposure Limits (PEL)

Material	OSHA PEL: TWA	CGIH TLV
Tungsten Carbide (Tungsten Insoluble Compounds as W)	5.00 mg/m^3	5.00 mg/m^3
Tungsten Carbide (Tungsten Soluble Compounds as W)	1.00 mg/m^3	0.02 mg/m^3
Cobalt Metal, Dust, and Fume (as Co)	0.05 mg/m^3**	0.02 mg/m^3
Tantalum Carbide (Tantalum Metal and Oxide Dust as Ta)	5.00 mg/m^3	5.00 mg/m^3
Chromium (II+III Compounds as Cr+3)	0.50 mg/m^3	0.50 mg/m^3
Chromium Metal (as Cr+3)	1.00 mg/m^3	1.50 mg/m^3
Nickel (Metal and Insoluble Compounds as Ni)	1.00 mg/m^3	1.50 mg/m^3
Nickel (Soluble Compounds as Ni)	0.10 mg/m^3	0.10 mg/m^3

**MIOSHA 0.05 mg/m3, OSHA 0.1 mg/m^3

8.2. Engineering Controls

8.2.1. Dust Control: Use local exhaust ventilation that is adequate to limit personal exposure to respirable airborne dust to levels that do not exceed the PEL or TLV.

8.2.2. Respirators: If adequate control equipment is not available, use a respirator as specified below.

8.3. Personal Protection Equipment (PPE)

8.3.1. Respiratory: Use the appropriate NIOSH approved respirator if airborne dust concentrations exceed the appropriate PEL or TLV. All appropriate requirements set forth in 29 CFR 1910.134 should be met.

8.3.2. Skin: Protective gloves or barrier cream are recommended when contact with dust or mist is likely. Prior to applying the barrier cream or use of protective gloves, wash thoroughly.

8.3.3. Eyes and Face: Safety glasses with side shields or goggles are recommended.

8.4. Individual Protection Measures

8.4.1. When using wet grinding equipment with closed water circuit, a suitable additive should be used to prevent cobalt from accumulating in the water. A recommended additive is CASTROL PE 425/6.

8.4.2. Clean equipment using methods that avoid dust generation such as vacuum (with appropriate filter to prevent airborne dust levels which exceed the PEL or TLV), wet dust mop or wet clean up. If airborne dust is generated, use an appropriate NIOSH approved respirator.

8.4.3. Wash hands thoroughly after handling dust or sludge, before eating or smoking.

8.4.4. Wash exposed skin at the end of work shift.

8.4.5. Do not shake clothing, rags, or other items to remove dust.

8.4.6. Dust should be removed from contaminated items by washing or vacuuming using the appropriate filters and precautions.

8.4.7. Allergic persons sensitive to cobalt or nickel must not be involved in activities where exposure to cobalt or nickel occurs.

8.4.8. Periodic medical examinations are recommended for individuals regularly working in the vicinity of dust and/or mist and for those who voluntarily or are required to wear respirators.

8. Exposure controls/personal protection
Occupational exposure limits
U.S. - OSHA
Components Type Value
Carbon (CAS 7440-44-0) TWA 15 mppcf
US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Components Type Value Form
Aluminium (CAS 7429-90-5) PEL 5 mg/m3 Respirable dust.
15 mg/m3 Total dust.
Chromium (CAS 7440-47-3) PEL 1 mg/m3
Manganese (CAS Ceiling 5 mg/m3 Fume.
7439-96-5)
Molybdenum (CAS PEL 15 mg/m3 Total dust.
7439-98-7)
Nickel (CAS 7440-02-0) PEL 1 mg/m3
Silicon (CAS 7440-21-3) PEL 5 mg/m3 Respirable fraction.
15 mg/m3 Total dust.
US. OSHA Table Z-3 (29 CFR 1910.1000)
Components Type Value Form
Carbon (CAS 7440-44-0) TWA 5 mg/m3 Respirable fraction.
15 mg/m3 Total dust.
US. ACGIH Threshold Limit Values
Components Type Value Form
Aluminium (CAS 7429-90-5) TWA 1 mg/m3 Respirable fraction.
Carbon (CAS 7440-44-0) TWA 2 mg/m3 Respirable fraction.
Chromium (CAS 7440-47-3) TWA 0.5 mg/m3
Nickel (CAS 7440-02-0) TWA 1.5 mg/m3 Inhalable fraction.
US. NIOSH: Pocket Guide to Chemical Hazards

Components Type Value Form
TWA 5 mg/m3 Welding fume or
pyrophoric powder.
Aluminium (CAS 7429-90-5)
5 mg/m3 Respirable.
10 mg/m3 Total
Carbon (CAS 7440-44-0) TWA 2.5 mg/m3 Respirable.
Chromium (CAS 7440-47-3) TWA 0.5 mg/m3
Manganese (CAS STEL 3 mg/m3 Fume.
7439-96-5)
TWA 1 mg/m3 Fume.
Nickel (CAS 7440-02-0) TWA 0.015 mg/m3
Silicon (CAS 7440-21-3) TWA 5 mg/m3 Respirable.
10 mg/m3 Total

Biological limit values No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide explosion-proof ventilation for high dust concentrations.
Individual protection measures, such as personal protective equipment
Eye/face protection If contact is likely, safety glasses with side shields are recommended.
Skin protection
Hand protection Wear suitable protective gloves to prevent contact, cuts and abrasions. Suitable gloves can be recommended by the glove supplier.
Other Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.
Respiratory protection In case of inadequate ventilation, use MSHA/NIOSH approved dust respirator.
Thermal hazards Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations
Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace. Follow up on any medical surveillance requirements.

Section 9: Physical and Chemical Properties:

9.1 Physical Properties

Appearance and Odor: Dark Grey Metal / Odorless	Specific Gravity (H20=1) 10 to 15
Boiling point: N/A	Percent Volatile by Volume: 0
Vapor Pressure (mm Hg): N/A	Evaporation Rate: N/A
Vapor Density (Air=1) N/A	Best Monitored: Air Sample
Solubility in Water: Insoluble	Freezing Point:
Melting Point:	Viscosity:
Flashpoint: None	
Evaporation rate:	

9.2 Chemical Properties

pH:	Not applicable
Flammability :	Not applicable
Explosive limits:	Not applicable
Auto-ignition temperature:	Not applicable
Decomposition Temperature:	Not applicable
Partition coefficient: n-octanol/water:	Not applicable

9. Physical and chemical properties

Appearance
Physical state Solid.
Form Solid.
Color Silver to gray.
Odor Odorless.
Odor threshold Not available.
pH Not available.
Melting point/freezing point 2795 °F (1535 °C) (Approximate)
Initial boiling point and boiling range
5432 °F (3000 °C) (Approximate)
Flash point Not available.
Evaporation rate Not applicable.
Flammability (solid, gas) Not available.
Upper/lower flammability or explosive limits
Flammability limit - lower (%)
Not available.
Flammability limit - upper (%)
Not available.
Explosive limit - lower (%) Not available.
Explosive limit - upper (%) Not available.
Vapor pressure Not available.
Vapor density Not available.
Relative density ~7.9
Solubility(ies)
Solubility (water) Insoluble in water.
Partition coefficient (n-octanol/water)
Not available.
Auto-ignition temperature Not available.
Decomposition temperature Not available.
Viscosity Not applicable.

Section 10: Stability and Reactivity:

10.1. Stability

10.1.1. Stable under normal conditions of pressure and temperature.

10.1.2. Non-reactive

10.1.3. No known conditions to avoid

10.1.4. No hazardous decomposition products

10.2. Incompatible Materials

10.2.1. Acids, strong oxidizers

10.3. Possibility of Hazardous Reactions

10.3.1. Not under normal circumstances

10. Stability and reactivity

Reactivity Massive metal is stable and non reactive under normal conditions of use, storage and transport.
Chemical stability Material is stable under normal conditions.

Possibility of hazardous reactions
No dangerous reaction known under conditions of normal use.
Conditions to avoid Contact with incompatible materials.
Incompatible materials Strong oxidizing agents.
Hazardous decomposition products
Welding, burning, sawing, brazing, grinding or machining operations may generate dusts and fumes of metal oxides.

Section 11: Toxicological Information:

11.1. Routes of Exposure

11.1.1. Inhalation: Dust, mist or fumes from grinding or heating of the sintered product can cause irritation of the respiratory organs of a small percentage of sensitive persons, resulting in obstruction of respiratory ways with breathing difficulties: occupational asthma and interstitial fibrosis. It is reported that workers that have been exposed to air-borne cemented carbide dust have a higher risk of contracting lung cancer.

11.1.2. Skin Contact: Can cause irritation or an allergic skin rash due to cobalt or nickel sensitization. Certain skin conditions, such as dry skin, may be aggravated by exposure.

11.1.3. Eye Contact: Can cause irritation.

11.1.4. Ingestion: Reports outside the industry suggest that ingestion of significant amounts of cobalt has the potential for causing bleed, heart and other organ problems.

11. Toxicological information

Information on likely routes of exposure
Inhalation No inhalation hazard in manufactured and shipped state. Dust and fumes generated from the material can enter the body by inhalation. High concentrations of dust and fumes may irritate the throat and respiratory system and cause coughing. Frequent inhalation of fume/dust over a long period of time increases the risk of developing lung diseases.
Skin contact Under normal conditions of intended use, this material does not pose a risk to health. Dust may irritate skin.

Eye contact Dust in the eyes may cause irritation.
Ingestion Not relevant, due to the form of the product in its manufactured and shipped state. However, ingestion of dusts generated during working operations may cause nausea and vomiting.
Symptoms related to the physical, chemical and toxicological characteristics
Rash. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis.
Information on toxicological effects
Acute toxicity Not classified.
Components Species Test Results
Carbon (CAS 7440-44-0)
LC50 Rat
Inhalation
Acute
> 2000 mg/m3, 4 hours
Manganese (CAS 7439-96-5)
LD50 Rat
Oral
Acute
9000 mg/kg
Silicon (CAS 7440-21-3)
LC50 Rat
Inhalation
Acute
> 2.08 mg/l, 4 hours
LD50 Rat
Oral
3160 mg/kg
Skin corrosion/irritation Dust may irritate skin.
Serious eye damage/eye irritation
Dust may irritate the eyes.
Respiratory or skin sensitization
Respiratory sensitization May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitization Some chromium compounds (primarily hexavalent chromium) can cause sensitization (chrome allergy).
Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity Contains nickel, which can cause lung or nasal cancer. Long-term breathing of this material may cause chronic lung disease. The product contains nickel which is listed by IARC and NTP as a possible human carcinogen and anticipated human carcinogen repectively.
IARC Monographs. Overall Evaluation of Carcinogenicity
Chromium (CAS 7440-47-3) 3 Not classifiable as to carcinogenicity to humans.
Nickel (CAS 7440-02-0) 2B Possibly carcinogenic to humans.
NTP Report on Carcinogens
Nickel (CAS 7440-02-0) Known To Be Human Carcinogen.

Reasonably Anticipated to be a Human Carcinogen.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.
Reproductive toxicity This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure
Not classified.
Specific target organ toxicity - repeated exposure
Causes damage to organs (Respiratory system, lungs) through prolonged or repeated exposure.
Welding or plasma arc cutting of aluminum alloys can generate ozone, nitric oxides and ultraviolet

radiation. Ozone overexposure may result in mucous membrane irritation or pulmonary discomfort. UV radiation can cause skin erythema and welders flash.
Aspiration hazard Not classified.
Chronic effects Frequent inhalation of fume/dust over a long period of time increases the risk of developing lung diseases. Prolonged and repeated overexposure to dust can lead to pneumoconiosis.

Section 12: Ecological Information:

12.1. Threat to the environment: None

12. Ecological information
Ecotoxicity Metals in massive forms presents a limited hazard for the environment.
Persistence and degradability No data is available on the degradability of this product.
Bioaccumulative potential No data available.
Mobility in soil Not relevant, due to the form of the product.
Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

Section 13: Disposal Considerations:

13.1. Dispose of any waste in accordance with appropriate government regulations.

13.2. May be sold for recycling.

13. Disposal considerations
Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations Dispose in accordance with all applicable regulations.
Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Section 14: Transportation:

14.1. Transport material in accordance with appropriate government regulations.

14. Transport information
DOT
Not regulated as dangerous goods.
IATA
Not regulated as dangerous goods.
IMDG
Not regulated as dangerous goods.
Not applicable. This product is a solid and when transported in bulk it is covered under Appendix I

of the IMSBC Code.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Section 15: Regulatory Information:

15.1. None

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.
CERCLA Hazardous Substance List (40 CFR 302.4)
Chromium (CAS 7440-47-3) LISTED
Manganese (CAS 7439-96-5) LISTED
Nickel (CAS 7440-02-0) LISTED
Alloy Steel SDS US
922174 Version #: 01 Revision date: - Issue date: 09-April-2015 6 / 8
Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No
SARA 302 Extremely hazardous substance
Not listed.
SARA 311/312 Hazardous chemical
Yes
SARA 313 (TRI reporting)
Chemical name CAS number % by wt.
Chromium 7440-47-3 <7
Nickel 7440-02-0 <4.5
Manganese 7439-96-5 <3
Aluminium 7429-90-5 < 1
Other federal regulations
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Chromium (CAS 7440-47-3)
Manganese (CAS 7439-96-5)
Nickel (CAS 7440-02-0)
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Not regulated.
Safe Drinking Water Act (SDWA)
Not regulated.
US state regulations
US. Massachusetts RTK - Substance List
Aluminium (CAS 7429-90-5)
Chromium (CAS 7440-47-3)
Manganese (CAS 7439-96-5)
Molybdenum (CAS 7439-98-7)
Nickel (CAS 7440-02-0)

Silicon (CAS 7440-21-3)
US. New Jersey Worker and Community Right-to-Know Act
Aluminium (CAS 7429-90-5)
Carbon (CAS 7440-44-0)
Chromium (CAS 7440-47-3)
Manganese (CAS 7439-96-5)
Molybdenum (CAS 7439-98-7)
Nickel (CAS 7440-02-0)
Silicon (CAS 7440-21-3)
US. Pennsylvania Worker and Community Right-to-Know Law
Aluminium (CAS 7429-90-5)
Chromium (CAS 7440-47-3)
Manganese (CAS 7439-96-5)
Molybdenum (CAS 7439-98-7)
Nickel (CAS 7440-02-0)
Silicon (CAS 7440-21-3)
US. Rhode Island RTK
Aluminium (CAS 7429-90-5)
Chromium (CAS 7440-47-3)
Manganese (CAS 7439-96-5)
Nickel (CAS 7440-02-0)
US. California Proposition 65
WARNING: This product contains a chemical known to the State of California to cause cancer.
US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance
Nickel (CAS 7440-02-0)

International Inventories
Country(s) or region Inventory name On inventory (yes/no)*
*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).
United States & Puerto Rico Toxic Substances Control Act (TSCA) Inventory Yes

Section 16: Other Information:

16.1. Original Date of Preparation: 1/29/97

16.2. Replaces prior "OS-4020, MATERIAL SAFETY DATA SHEET (MSDS)"

16. Other information, including date of preparation or last revision

Issue date 09-April-2015
Revision date -
Version # 01
Further information NFPA Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
NFPA ratings
0

Disclaimer TimkenSteel Corporation cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.
Alloy