

SAFETY DATA SHEET

1. Identification

Product identifier	Alloy Steel
Other means of identification	
SDS number	11459B
Recommended use	Manufacture steel articles.
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Company name	Metallus Inc.
Address	1835 Dueber Avenue SW Canton, OH 44706 US US
Telephone (330) 471-3360	E-mail Not available.
Contact person	Metallus Inc. Security Department
Emergency phone number	(330) 471-3360

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 exposure	Category 1



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 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. None known.

Hazard(s) not otherwise classified (HNOC)

Supplemental information In its manufactured and shipped state, this product is considered to present a low hazard. Processing may generate hazardous fumes and dusts.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Chromium	7440-47-3	<7
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.

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

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

delayed

Indication of immediate attention and special Provide general supportive measures and treat symptomatically. Keep victim under observation. **medical attention and special** Symptoms may be delayed. **treatment needed**

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.

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

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

Specific hazards arising from chemical

During fire, gases hazardous to health may be formed. **the**

Special protective equipment precautions for firefighters

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

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.

6. Accidental release measures

Personal precautions, equipment and emergency procedures

Avoid generation and spreading of dust. Avoid inhalation of dust and contact with skin and eyes. **protective** 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.

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

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 7439-96-5)	Ceiling	5 mg/m3	Fume.
Molybdenum (CAS 7439-98-7)	PEL	15 mg/m3	Total dust.
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
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Aluminium (CAS 7429-90-5)	TWA	5 mg/m3	Welding fume or pyrophoric powder.
		5 mg/m3	Respirable. Total
		10 mg/m3	Respirable.
Carbon (CAS 7440-44-0)	TWA	2.5 mg/m3	
Chromium (CAS 7440-47-3)	TWA	0.5 mg/m3	Fume.
Manganese (CAS 7439-96-5)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	
Nickel (CAS 7440-02-0)	TWA	0.015 mg/m3	Respirable.
Silicon (CAS 7440-21-3)	TWA	5 mg/m3	
		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.

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.

(%) Not available.

Flammability limit - upper

(%)

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure Not available.

Vapor density Not available.

Relative density Solubility(ies) ~7.9

Solubility (water) Insoluble in water.

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Not applicable.

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.
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	Rash. Difficulty in breathing. May cause an allergic skin reaction. Dermatitis.

11. Toxicological information

Information on likely routes of exposure

physical, chemical and toxicological characteristics

Respiratory or skin sensitization

Information on toxicological effects

Acute toxicity

Not classified.

Test Results

Components

Species

Carbon (CAS 7440-44-0)

Acute

Inhalation

LC50

Rat

> 2000 mg/m³, 4 hours

Manganese (CAS 7439-96-5)

Acute

Oral

LD50

Rat

9000 mg/kg

Silicon (CAS 7440-21-3)

Acute

Inhalation

LC50

Rat

> 2.08 mg/l, 4 hours

Oral

LD50

Rat

3160 mg/kg

Skin corrosion/irritation

Dust may irritate skin.

Serious eye damage/eye irritation

Dust may irritate the eyes.

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 respectively.
IARC Monographs. Overall Evaluation of Carcinogenicity	
Chromium (CAS 7440-47-3)	3 Not classifiable as to carcinogenicity to humans.
Nickel (CAS 7440-02-0) NTP	2B Possibly carcinogenic to humans.
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
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 welder's flash.
Aspiration hazard	Not classified.
Chronic effects	Frequent inhalation of fumes/dust over a long period of time increases the risk of developing lung diseases. Prolonged and repeated overexposure to dust can lead to pneumoconiosis.

12. Ecological information

Ecotoxicity	Metals in massive forms present 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.

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.

14. Transport information

DOT	Not regulated as dangerous goods.
IATA	Not regulated as dangerous goods.
IMDG	Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and Not applicable. This product is a solid and when transported in bulk it is covered under Appendix I of the IMSBC Code. **the IBC Code**

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 **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		<7
Nickel	7440-47-3	<4.5
Manganese	7440-02-0	<3
Aluminium	7439-96-5 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 can expose you to chemicals including Chromium (Hexavalent) and Nickel which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*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).

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	



Disclaimer

Metallus Inc. 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.