Safety Data Sheet

Issue Date: 06-Apr-2010 **Revision Date:** 11-Sep-2020 **Version** 1

1. IDENTIFICATION

Product identifier
Product Name 316L Stainless Steel Iron Chrome Aluminum (FeCrAl)

Other means of identification
SDS # INTRA-010

Recommended use of the chemical and restrictions on use
Recommended Use For industrial use.

Details of the supplier of the safety data sheet
Supplier Address
IntraMicron, Inc.
368 Industry Dr.
Auburn, AL 36832

Emergency telephone number
Company Phone Number 334-502-2973
Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Metallic fiber **Physical state** Solid **Odor** None

Classification

Acute toxicity - Oral	Category 4
Respiratory sensitization	Category 1
Skin sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (repeated exposure)	Category 1

Signal Word
Danger

Hazard statements
Harmful if swallowed
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
May cause cancer
Causes damage to organs through prolonged or repeated exposure

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing must not be allowed out of the workplace
Wear protective gloves
Do not breathe dust/fume/gas/mist/vapors/spray

Precautionary Statements - Response
If exposed or concerned: Get medical advice/attention
IF ON SKIN: Wash with plenty of water and soap
Wash contaminated clothing before reuse
If skin irritation or rash occurs: Get medical advice/attention
IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Other hazards
Very toxic to aquatic life with long lasting effects

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No	Weight-%
Iron	7439-89-6	60-88
Chromium	7440-47-3	10-30
Nickel	7440-02-0	0-27
Aluminum	7429-90-5	<10
Yttrium	7440-65-5	<8
Molybdenum	7439-98-7	<6
Manganese	7439-96-5	<6
Copper	7440-50-8	<6
Sulfur	7704-34-9	<2
Silicon	7440-21-3	<1
Phosphorus	7723-14-0	<2
Cobalt	7440-48-4	<1

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

General Advice — If exposed or concerned: Get medical advice/attention.

Eye Contact — Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin Contact — Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call Poison Control or doctor/physician.

Ingestion Call a poison center or doctor/physician if you feel unwell. Rinse mouth.

Most important symptoms and effects, both acute and delayed

Symptoms Causes mild skin irritation. Harmful if swallowed. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause cancer. Causes damage to organs through prolonged or repeated exposure.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water, carbon dioxide or dry chemical ('D' type Extinguisher).

Unsuitable Extinguishing Media ABC type extinguishers will NOT WORK (fire is too hot).

Specific Hazards Arising from the Chemical
May burn (hot) if ignited, highly dependent on fiber diameter.

Hazardous combustion products Thermal decomposition or combustion may produce oxides of Nickel, Iron, Copper, Molybdenum and Manganese.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Environmental precautions

Environmental precautions See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Clean-Up Sweep up spills and place in a waste disposal container. Flush area with water.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. In case of inadequate ventilation wear respiratory protection. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves. Do not breathe dust/fume/gas/mist/vapors/spray.

Conditions for safe storage, including any incompatibilities

Storage Conditions Store locked up.

Incompatible Materials Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Chromium 7440-47-3	TWA: 0.5 mg/m^3 inhalable particulate matter	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3	IDLH: 250 mg/m^3 TWA: 0.5 mg/m^3
Nickel 7440-02-0	TWA: 1.5 mg/m^3 inhalable particulate matter	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3	IDLH: 10 mg/m^3 IDLH: 10 mg/m^3 Ni TWA: 0.015 mg/m^3 TWA: 0.015 mg/m^3 except Nickel carbonyl Ni
Aluminum 7429-90-5	TWA: 1 mg/m^3 respirable particulate matter	TWA: 15 mg/m^3 total dust TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 15 mg/m^3 total dust (vacated) TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 5 mg/m^3 Al Aluminum	TWA: 10 mg/m^3 total dust TWA: 5 mg/m^3 respirable dust TWA: 5 mg/m^3 Al
Yttrium 7440-65-5	TWA: 1 mg/m^3	TWA: 1 mg/m^3 (vacated) TWA: 1 mg/m^3	IDLH: 500 mg/m^3 TWA: 1 mg/m^3
Manganese 7439-96-5	TWA: 0.02 mg/m^3 respirable particulate matter TWA: 0.1 mg/m^3 inhalable particulate matter TWA: 0.02 mg/m^3 Mn respirable particulate matter TWA: 0.1 mg/m^3 Mn inhalable particulate matter	(vacated) TWA: 1 mg/m^3 fume (vacated) STEL: 3 mg/m^3 fume (vacated) Ceiling: 5 mg/m^3 Ceiling: 5 mg/m^3 fume Ceiling: 5 mg/m^3 Mn	IDLH: 500 mg/m^3 IDLH: 500 mg/m^3 Mn TWA: 1 mg/m^3 fume TWA: 1 mg/m^3 Mn STEL: 3 mg/m^3 STEL: 3 mg/m^3 Mn
Molybdenum 7439-98-7	TWA: 10 mg/m^3 inhalable particulate matter TWA: 3 mg/m^3 respirable particulate matter TWA: 10 mg/m^3 Mo inhalable particulate matter TWA: 3 mg/m^3 Mo respirable particulate matter	TWA: 15 mg/m^3 total dust (vacated) TWA: 10 mg/m^3 (vacated) TWA: 10 mg/m^3 Mo	IDLH: 5000 mg/m^3 IDLH: 5000 mg/m^3 Mo
Copper 7440-50-8	TWA: 0.2 mg/m^3 fume TWA: 1 mg/m^3 Cu dust and mist	TWA: 0.1 mg/m^3 fume TWA: 1 mg/m^3 dust and mist (vacated) TWA: 0.1 mg/m^3 Cu dust, fume, mist	IDLH: 100 mg/m^3 dust, fume and mist IDLH: 100 mg/m^3 Cu dust and mist TWA: 1 mg/m^3 dust and mist TWA: 0.1 mg/m^3 fume TWA: 1 mg/m^3 Cu dust and mist
Silicon 7440-21-3	-	TWA: 15 mg/m^3 total dust TWA: 5 mg/m^3 respirable fraction (vacated) TWA: 10 mg/m^3 total dust (vacated) TWA: 5 mg/m^3 respirable fraction	TWA: 10 mg/m^3 total dust TWA: 5 mg/m^3 respirable dust
Phosphorus 7723-14-0	-	(vacated) TWA: 0.1 mg/m^3 Phosphorus (yellow)	-
Cobalt 7440-48-4	TWA: 0.02 mg/m^3 inhalable particulate matter TWA: 0.02 mg/m^3 Co inhalable particulate matter	TWA: 0.1 mg/m^3 dust and fume (vacated) TWA: 0.05 mg/m^3 dust and fume	IDLH: 20 mg/m^3 dust and fume TWA: 0.05 mg/m^3 dust and fume

Appropriate engineering controls

Engineering Controls Showers. Eyewash stations. Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/Face Protection	Wear safety glasses with side shields when a potential for dust is present.
Skin and Body Protection	Thin or thick Nitrile, Latex or leather gloves should be worn when handling fiber.
Respiratory Protection	Dust mask should be worn when fiber may become airborne.
General Hygiene Considerations	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid		
Appearance	Metallic fiber	**Odor**	None
Color	Not determined	**Odor Threshold**	Not determined

Property	**Values**	**Remarks • Method**
pH	Not determined	
Melting point / freezing point	>1370 °C / >2500 °F	
Boiling point / boiling range	Not determined	
Flash point	>260 °C / >500 °F	
Evaporation Rate	Will not evaporate	
Flammability (Solid, Gas)	Not determined	
Flammability Limit in Air		
Upper flammability or explosive limits	Not determined	
Lower flammability or explosive limits	Not determined	
Vapor Pressure	Not determined	
Vapor Density	Not determined	
Relative Density	7.0-8.1 grams/ cubic centimeter	
Water Solubility	Not determined	
Solubility in other solvents	Not determined	
Partition Coefficient	Not determined	
Autoignition temperature	Not determined	
Decomposition temperature	Not determined	
Kinematic viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization Will not occur.

Conditions to Avoid
Heat, flames and sparks.

Incompatible materials
Strong acids.

Hazardous decomposition products
Thermal decomposition or combustion may produce oxides of Nickel, Iron, Copper, Molybdenum and Manganese.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact Avoid contact with eyes.

Skin Contact Avoid contact with skin.

Inhalation Do not inhale.

Ingestion Harmful if swallowed.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Iron 7439-89-6	= 30 g/kg (Rat)	-	-
Nickel 7440-02-0	> 9000 mg/kg (Rat)	-	> 10.2 mg/L (Rat) 1 h
Manganese 7439-96-5	= 9 g/kg (Rat)	-	-
Silicon 7440-21-3	= 3160 mg/kg (Rat)	-	-
Carbon 7440-44-0	> 10000 mg/kg (Rat)	-	-
Cobalt 7440-48-4	= 6171 mg/kg (Rat)	-	> 10 mg/L (Rat) 1 h
Sulfur 7704-34-9	> 3000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 9.23 mg/L (Rat) 4 h
Phosphorus 7723-14-0	= 3030 µg/kg (Rat)	= 100 mg/kg (Rat)	= 4.3 mg/L (Rat) 1 h

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Please see section 4 of this SDS for symptoms.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Causes mild skin irritation.

Sensitization May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Carcinogenicity May cause cancer.

Chemical name	ACGIH	IARC	NTP	OSHA
Nickel 7440-02-0		Group 2B	Known	X
Cobalt 7440-48-4	A3	Group 2B	Reasonably Anticipated	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)
A3 - Animal Carcinogen
IARC (International Agency for Research on Cancer)
Group 2B - Possibly Carcinogenic to Humans
NTP (National Toxicology Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)
X - Present

STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Numerical measures of toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

Oral LD50 301 mg/kg
Dermal LD50 5,524.10 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Iron 7439-89-6		13.6: 96 h Morone saxatilis mg/L LC50 static	
Nickel 7440-02-0	0.18: 72 h Pseudokirchneriella subcapitata mg/L EC50 0.174 - 0.311: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	1.3: 96 h Cyprinus carpio mg/L LC50 semi-static 10.4: 96 h Cyprinus carpio mg/L LC50 static 100: 96 h Brachydanio rerio mg/L LC50	100: 48 h Daphnia magna mg/L EC50 1: 48 h Daphnia magna mg/L EC50 Static
Copper 7440-50-8	0.0426 - 0.0535: 72 h Pseudokirchneriella subcapitata mg/L EC50 static 0.031 - 0.054: 96 h Pseudokirchneriella subcapitata mg/L EC50 static	1.25: 96 h Lepomis macrochirus mg/L LC50 static 0.8: 96 h Cyprinus carpio mg/L LC50 static 0.3: 96 h Cyprinus carpio mg/L LC50 semi-static 0.052: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 0.0068 - 0.0156: 96 h Pimephales promelas mg/L LC50 0.2: 96 h Pimephales promelas mg/L LC50 flow-through 0.112: 96 h Poecilia reticulata mg/L LC50 flow-through 0.3: 96 h Pimephales promelas mg/L LC50 static	0.03: 48 h Daphnia magna mg/L EC50 Static
Manganese 7439-96-5		3.6: 96 h Oncorhynchus mykiss mg/L LC50 semi-static	
Cobalt 7440-48-4		100: 96 h Brachydanio rerio mg/L LC50 static	
Sulfur 7704-34-9		14: 96 h Lepomis macrochirus mg/L LC50 static 866: 96 h Brachydanio rerio mg/L LC50 static 180: 96 h Oncorhynchus mykiss mg/L LC50 static	
Chemical name	**Algae/aquatic plants**	**Fish**	**Crustacea**
Phosphorus		0.011 - 0.028: 96 h Pimephales	0.025 - 0.037: 48 h Daphnia magna

7723-14-0		promelas mg/L LC50 static 0.015 - 0.032: 96 h Oncorhynchus mykiss mg/L LC50 static 100: 96 h Brachydanio rerio mg/L LC50 static 0.0017 - 0.0035: 96 h Lepomis macrochirus mg/L LC50 flow-through 0.001 - 0.004: 96 h Lepomis macrochirus mg/L LC50 static	mg/L EC50 Static 0.03: 48 h Daphnia magna mg/L EC50

Persistence/Degradability
Not determined.

Bioaccumulation
There is no data for this product.

Mobility
Not determined

Other Adverse Effects
Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

US EPA Waste Number

Chemical name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Chromium 7440-47-3		Included in waste streams: F032, F034, F035, F037, F038, F039	5.0 mg/L regulatory level	
Nickel 7440-02-0		Included in waste streams: F006, F039		

California Hazardous Waste Status

Chemical name	California Hazardous Waste Status
Chromium 7440-47-3	Toxic Corrosive Ignitable
Nickel 7440-02-0	Toxic powder Ignitable powder
Aluminum 7429-90-5	Ignitable powder
Molybdenum 7439-98-7	Ignitable powder
Manganese 7439-96-5	Ignitable powder
Copper 7440-50-8	Toxic
Phosphorus 7723-14-0	Toxic Ignitable Reactive
Cobalt 7440-48-4	Toxic powder Ignitable powder Toxic

14. TRANSPORT INFORMATION

Note Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT Not regulated

IATA Not regulated

IMDG

Marine Pollutant This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Iron	X	ACTIVE	X	X	X	X	X	X	X
Chromium	X	ACTIVE	X	X	X	X	X	X	X
Nickel	X	ACTIVE	X	X	X	X	X	X	X
Aluminum	X	ACTIVE	X	X	X	X	X	X	X
Yttrium	X	ACTIVE	X	X	X	X	X		
Copper	X	ACTIVE	X	X	X	X	X	X	X
Manganese	X	ACTIVE	X	X	X	X	X	X	X
Molybdenum	X	ACTIVE	X	X	X	X	X	X	X
Titanium	X	ACTIVE	X	X	X	X	X	X	X
Carbon	X	ACTIVE	X	X	X	X	X	X	X
Cobalt	X	ACTIVE	X	X	X	X	X	X	X
Silicon	X	ACTIVE	X	X	X	X	X	X	X
Sulfur	X	ACTIVE	X	X	X	X	X	X	X
Phosphorus	X	ACTIVE	X	X	X	X	X	X	X

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

ENCS *- Japan Existing and New Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

KECL *- Korean Existing and Evaluated Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

AICS *- Australian Inventory of Chemical Substances*

US Federal Regulations

CERCLA

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Chromium 7440-47-3	5000 lb 10 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ RQ 10 lb final RQ RQ 4.54 kg final RQ
Nickel 7440-02-0	100 lb		RQ 100 lb final RQ RQ 45.4 kg final RQ
Copper 7440-50-8	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ
Phosphorus 7723-14-0	1 lb	1 lb	RQ 1 lb final RQ RQ 0.454 kg final RQ

SARA 313

Chemical name	CAS No	Weight-%	SARA 313 - Threshold

			Values %
Chromium - 7440-47-3	7440-47-3	10-30	1.0
Nickel - 7440-02-0	7440-02-0	0-27	0.1
Aluminum - 7429-90-5	7429-90-5	<10	1.0
Copper - 7440-50-8	7440-50-8	<6	1.0
Manganese - 7439-96-5	7439-96-5	<6	1.0
Cobalt - 7440-48-4	7440-48-4	<1	0.1
Phosphorus - 7723-14-0	7723-14-0	<2	1.0

CWA (Clean Water Act)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Chromium		X	X	
Nickel		X	X	
Copper		X	X	
Phosphorus	1 lb			X

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical name	California Proposition 65
Nickel - 7440-02-0	Carcinogen
Cobalt - 7440-48-4	Carcinogen

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Chromium 7440-47-3	X	X	X
Nickel 7440-02-0	X	X	X
Aluminum 7429-90-5	X	X	X
Yttrium 7440-65-5	X	X	X
Copper 7440-50-8	X	X	X
Manganese 7439-96-5	X	X	X
Molybdenum 7439-98-7	X	X	X
Titanium 7440-32-6	X		
Cobalt 7440-48-4	X	X	X
Silicon 7440-21-3	X	X	X
Sulfur 7704-34-9	X	X	X
Phosphorus 7723-14-0	X	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	Not determined	Not determined	Not determined	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical hazards**	**Personal Protection**
	1	1	1	Not determined

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Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet