

# SAFETY DATA SHEET

	ON OF T	HE SUBSTA	NCE/PREF	PARATION			IPANY/U	NDERTA	KING
<u></u>									
GHS product identifier	1.51		t i st						
Product Name		Chromium-	Nickel Alloy	ed Stainless	Steel grad	es			
Other means of identif	ication								. ::
Synonyms		301, 302, 30							
		153MA®, 25 and suffixes							
		S30430, 310		},	4 h h h			5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
Recommended use of	the chemic	cal and restriction	ons on use						
Recommended Use		Solid stainles	s steel prod	ucts, various	forms, and	uses	1 N 14 1		
Uses advised against		No information	on available						
Supplier's details							1 10 10		. 1
Stanford Advanced M E-mail : sales@sama									
Tel:: (949) 407-8904				5 5 1	5 5 5 5		5 5		
Address : 23661 Birto	ner Dr., La	ke Foresi, CA 92	030 U.S.A.						
	1.51			1 N 1 1					
								-	
Emergency telephone	number								
Emergency Telephone Number		(949) 407-89	04				2.		· .
Classification		2. HA		DENTIFIC	ATION				
<u>classification</u>			nd to the OSI	JA Hazard C	communicat	ion Stand	lard 2012	(29 CFR 19	110 1200
This chemical is not cor									
This chemical is not cor Solid metallic products downstream use of the	are general article coul	lly classified as "a d result in some l	articles" and on azardous el	do not consti ements cont	tute hazard ained in the	ous mate se produ	rials in solic cts to be en	d form. How	wever, r certain
This chemical is not cor Solid metallic products	are general article coul	lly classified as "a d result in some l	articles" and on azardous el	do not consti ements cont	tute hazard ained in the	ous mate se produ	rials in solic cts to be en	d form. How	wever, r certain
This chemical is not cor Solid metallic products downstream use of the processing conditions s welding.	are general article coul uch as but	lly classified as "a d result in some l not limited to : bu	articles" and o nazardous el irning, meltin	do not consti ements cont	tute hazard ained in the	ous mate se produ	rials in solic cts to be en	d form. How	wever, r certain
This chemical is not cor Solid metallic products downstream use of the processing conditions s welding. GHS Label elements. in	are general article coul uch as but ncluding p	lly classified as "a d result in some l not limited to : bu	articles" and o nazardous el irning, meltin	do not consti ements cont	tute hazard ained in the	ous mate se produ	rials in solic cts to be en	d form. How	wever, r certain
This chemical is not cor Solid metallic products downstream use of the processing conditions s welding. <u>GHS Label elements. in</u> No labeling applicable	are géneral article coul uch as but ncluding p	Ily classified as "a d result in some I not limited to : bu recautionary sta	articles" and e nazardous el irning, meltin i <b>tements</b>	do not consti ements cont	tute hazard ained in the awing, brazi	ous mate se produ ng, grindi	rials in solic cts to be en	d form. Hov nitted under ing, milling,	wever, r certain
This chemical is not cor Solid metallic products downstream use of the processing conditions s welding. GHS Label elements. in No labeling applicable Hazard Not Otherwise	are géneral article coul uch as but ncluding p	Ily classified as "a d result in some l not limited to : bu <b>recautionary sta</b>	articles" and e nazardous el irning, meltin i <b>tements</b>	do not consti ements cont	tute hazard ained in the	ous mate se produ	rials in solic cts to be en	d form. How	wever, r certain
This chemical is not cor Solid metallic products downstream use of the processing conditions s welding. GHS Label elements. in No labeling applicable Hazard Not Otherwise Not applicable	are general article coul uch as but ncluding p Classified	Ily classified as "a d result in some I not limited to : bu recautionary sta (HNOC)	articles" and e nazardous el irning, meltin itements	do not consti ements cont g, cutting, sa	tute hazardı ained in the awing, brazi	ous mate se produ ng, grindi	rials in solid cts to be en ng, machin	d form. Hov nitted under ing, milling,	wever, r certain
This chemical is not cor Solid metallic products downstream use of the processing conditions s welding. GHS Label elements. in No labeling applicable Hazard Not Otherwise	are general article coul uch as but ncluding p Classified	Ily classified as "a d result in some I not limited to : bu recautionary sta	articles" and e nazardous el irning, meltin itements	do not consti ements cont	tute hazardı ained in the awing, brazi	ous mate se produ ng, grindi	rials in solic cts to be en	d form. Hov nitted under ing, milling,	wever, r certain

# **3. COMPOSITION/INFORMATION ON INGREDIENTS**

# Synonyms

en en en en en

301, 302, 303, 304(L), 305, 308, 309, 310, 314, 321, 347, 415, F6NM, UNS S41003, 1.4306, 153MA®, 253MA® and Outokumpu 2304. This includes all listed grades with letter prefixes and suffixes as well as PRODEC® suffix, with the exception of 303Cu, 304Cu, UNS S30430, 310MoLN.

Chemical Name	CAS-No	Weight %	Trade secret
Iron	7439-89-6	Balance	*
Nickel	7440-02-0	1.5-37	*
Chromium	7440-47-3	11.5-26	*
Silicon	7440-21-3	0-2	*
Manganese	7439-96-5	0-2	*
Molybdenum	7439-98-7	0-1	*
Titanium	7440-32-6	0-0.7	*
Copper	7440-50-8	0-0.6	*
Cobalt	7440-48-4	0-0.6	*

\*The exact percentage (concentration) of composition has been withheld as a trade secret.

# 4. FIRST AID MEASURES

	General Advice	e ''		hazar weldii (spine	d. Grinding ng may pro els) of its co	, polishing duce stair mponents	g, abrasive nless steel o s. Metal dus	blasting, ho dust or fume st particles i	et rolling, h es contain may cause	not forging,t ing comple e eye, skin	ion, or inges hermal cutti x or mixed o and/or resp	ng, or oxides	,
: 1		: • •		syste	m irritation.	The belo	w informatio	on is for the	se instand	ces.	: ' '		
	Eye Contact			Rinse	e thoroughly	/ with pler	nty of water	for at least	15 minute	es and cons	ult a physic	ian.	
	Skin Contact	· ; i	· ; i		off immed ons see a p			plenty of wa	iter. In the	case of sk	in irritation o	or allergic	
	Inhalation			Move	to fresh ai	r. If breath	ing is diffic	ult, give oxy	gen. Con	sult a physi	cian.		
	Ingestion			Not a	n expected	route of e	exposure. If	swallowed:	Get med	ical attentic	n.		
	Most importan	t sympto	oms/effe	cts, acute a	ind delaye	<u>d</u>							
: .	Most Importan	t Sympto	oms/Effe		g processir ic skin read		ing and/ or	wheezing. I	Difficulty i	n breathing	. Irritation. N	lay cause	
: 1	Indication of in	nmediate	e medica	l attention	and specia	al treatme	ent needed	. if necess	ary i				
	Notes to Physi	cian		Mayo	cause sens	itization b	y inhalation	and skin co	ontact. Tre	eat symptor	natically.		
		: • •											
: . · ·													
:.													
						. ; :							
	 					41		· ; :					
	  						· · ·						· · ·
		ні П								::: :••		·::	

Use extinguis Unsuitab Specific Haza Avoid dust for Explosion Sensitivit Sensitivit	ty to Mechanical ty to Static Disch quipment and Pr wear self-contair	at are approp Media: Non- <u>n the Chemi</u> form an expl Impact narge ecautions fo	e <u>cal</u> losive mixture	e in air. M		:			n contact.	ai :
Unsuitab Specific Haza Avoid dust for Explosion Sensitivit Sensitivit Protective Ec As in any fire,	le Extinguishing ards Arising fror mation. Dust can n Data ty to Mechanical ty to Static Disch quipment and Pr wear self-contair	Media Non n the Chemi form an expl Impact narge ecautions fo	e <u>cal</u> losive mixture	e in air. M	lay cause s	:			n contact.	·::
Avoid dust for Explosion Sensitivit Sensitivit Protective Ec As in any fire,	mation. Dust can <u>n Data</u> ty to Mechanical ty to Static Discl quipment and Pr wear self-contair	form an expl Impact harge ecautions fo	losive mixture			sensitization	by inhala	ion and skir	n contact.	:
Explosion Sensitivit Sensitivit Protective Ec As in any fire,	<u>n Data</u> ty to Mechanical ty to Static Disch quipment and Pr wear self-contair	Impact harge ecautions fo				, on on a part of the second	by initiala		r oontqott	
Sensitivit Sensitivit Protective Ec As in any fire,	ty to Mechanical ty to Static Disch quipment and Pr wear self-contair	ecautions fo			None					
As in any fire,	wear self-contair		r Eirofiahta		None		.11		11	.11
		nea preathing					/	-1		
			) apparatus p	oressure-o	demand, M	SHA/NIOSH	(approve	a or equiva	ent) and fu	. <b>H</b>
		6. /		TAL RE	LEASE	MEASURE	S			
Personal nr	ecautions. pro	tective equ	inment		encyaro	coduros				
Personal Pre	-	Avoi insu	d dust forma fficient ventila pment. Avoic	tion. Avoi	id inhalatio Ir suitable r	n of dust. En espiratory e	quipment.			
Environmer	ntal Precaution	<u>s</u>								
Environment	al Precautions	Not	applicable to	steel in s	solid state.	Follow app	icable feo	leral, state a	and local re	gulations
<u>Methods an</u>	d materials for	containme	ent and clea	aning u	<u>o</u>					
			· ; :			· ; i			11	
Methods for	Containment		ent further le		spillage if	safe to do so	. Cover c	ust spill witl	n plastic sh	eet or tarp
Methods for	Cleaning Up	Take	e up mechan in contamina	ically and			ainer for c	lisposal. Av	oid dust for	mation.
1			7. HAND	DLING /	AND STO	RAGE			1.1.1	
Precautions	for safe handling	3								
Handling		Han	dle in accord ation. Avoid active equipn	breathing	j dust. Avoi	d contact wi	h skin, ey	es and clot	hing. Wear	
Conditions fe	or safe storage.	including an	v incompati	<u>bilities</u>	200			1.00		.11
Storage		Stor	e in accordai	nce with I	ocal regula	tions.				
ncompatible	Products	hydr caus	react in cont ogen, oxides se Cr(VI) com erated during	of nitrog	en. Use of to form at a	strong oxidiz mbient temp	ers (high eratures.	pH) on stai Decomposit	nless steel ion: Fume	may es
		inclu	iding hexaval pounds.							
				.81			.11			.81

Chromium-Nickel Alloyed Stainless Steel grades

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# 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

## **Control parameters**

#### Exposure Guidelines

.

There are no occupational exposure limits for stainless steels. Occupational exposure limits apply to some components resulting from grinding, polishing, abrasive blasting, hot rolling, hot forging, thermal cutting, or welding which may produce stainless steel dust or fumes.

	Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
	Nickel 7440-02-0	TWA: 1.5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> (vacated) TWA: 1 mg/m <sup>3</sup>	IDLH: 10 mg/m <sup>3</sup> TWA: 0.015 mg/m <sup>3</sup>
	Silicon 7440-21-3	<u> </u>	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction	TWA: 10 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable dust
	111 - LEL	14 191 191	(vacated) TWA: 10 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction	14 18 .R.
÷.	Manganese 7439-96-5	TWA: 0.2 mg/m³	(vacated) TWA: 1 mg/m <sup>3</sup> fume (vacated) STEL: 3 mg/m <sup>3</sup> fume (vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> fume	IDLH: 500 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> fume STEL: 3 mg/m <sup>3</sup>
	Molybdenum 7439-98-7	TWA: 10 mg/m <sup>3</sup> inhalable fraction TWA: 3 mg/m <sup>3</sup> respirable fraction	(vacated) TWA: 10 mg/m <sup>3</sup>	IDLH: 5000 mg/m <sup>3</sup>
1	Copper 7440-50-8	TWA: 0.2 mg/m³ fume	TWA: 0.1 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> dust and mist (vacated) TWA: 0.1 mg/m <sup>3</sup> Cu dust, fume, mist	IDLH: 100 mg/m° dust, fume and mist TWA: 1 mg/m <sup>3</sup> dust and mist TWA: 0.1 mg/m <sup>3</sup> fume
	Cobalt 7440-48-4	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup> dust and fume (vacated) TWA: 0.05 mg/m <sup>3</sup> dust and fume	IDLH: 20 mg/m <sup>3</sup> dust and fume TWA: 0.05 mg/m <sup>3</sup> dust and fume
Appropria	te engineering contro	<u>s</u>		
Engineeri	ng Measures	Ensure adequate ventilation etc.).	, especially in confined area (i.e.	showers, eyewash stations,
Individual	protection measures.	such as personal protective eq	uipment	
Skin and I	Protection Body Protection ry Protection	When processing the metal If exposure limits are exceed respiratory protection should	alloy wear: Tightly fitting safety g alloy: Wear protective gloves/clo led or irritation is experienced, N I be worn. Positive-pressure su	thing. IIOSH/MSHA approved

**Hygiene Measures** 

# 9. PHYSICAL AND CHEMICAL PROPERTIES

Handle in accordance with good industrial hygiene and safety practice.

provided in accordance with current local regulations.

required for high airborne contaminant concentrations. Respiratory protection must be

## Information on basic physical and chemical properties

Physical State	Solid	Appearance	се		om dull very li etallic light gr		. '
Odor	Odorless	Odor Thre	shold	bright mirr No informa	or-finish ation available	Э	
Property_ pH	<b>Values</b> No data available		<u>Remarks/ - Met</u> None known	thod		11.	
Melting Point/Range Boiling Point/Boiling Range Flash Point Evaporation rate	1370-1520 °C No data available No data available No data available	/ 2498-2768, °F	None known None known None known None known		41	·;;	
Flammability (solid, gas)	No data available		None known	<u></u>			÷.

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	lower flammability limit Vapor Pressure	No data available No data available No data available No data available No data available	.::		None known				.8	
	Relative Density Specific Gravity Water Solubility	No data available No data available. No data available No data available	ai -	ł.	None known None known None known None known None known None known			:	ul.	
: -	Autoignition Temperature Decomposition Temperature	No data available No data available No data available			None known None known None known	;				
	Flammable Properties	Not flammable	.::	<u>.</u>					.11	
	• •	No data available No data available								
: .	Other information			1.		::		:	·::	:.
: -	VOC Content (%)	No data available			ųł.					
		10. STABIL	ity an	ID REA	CTIVITY					
	Reactivity									
	No data available. Chemical stability									
	Stable under recommended storage co	nditions.								
	Possibility of hazardous reactions		:					· ; :		
	None under normal processing.									
	Conditions to avoid		. 11							
	Dust formation.									
: .	Incompatible materials						1.	:	•••!	
	May react in contact with strong acids to strong oxidizers (high pH) on stainless Fumes generated during welding, brazi Cr(VI); nickel; manganese; iron; molybo	steel may cause Cr( ng, or thermal cuttin	(VI) com Ig may c	pounds to ontain: cl	o form at ambier	nt tempe	ratures.Decc	mposi	ition:	
	Hazardous decomposition products			·			·	• : •		·
	None known based on information supp									
		11. TOXICOL	OGICA	L INFO	RMATION					
	Information on likely routes of expos	ure	1			:		:		
		In its solid form stai hazard. Grinding, po welding may produc (spinels) of its comp	olishing, ce stainle	abrasive ess steel	blasting, hot rol dust or fumes c	ling, hot ontaining	forging,therr complex or	nal cu mixed	tting, or l oxides	
		system irritation. Th							piratory	

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Inhalation	 May cause irritation of respiratory tract. Inhalation of fumes may cause metal fume fever,
	 which is characterized by flu-like symptoms with metallic taste, fever, chills, cough,
	 weakness, chest pain, muscle pain and increased white blood cell count. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Eye Contact	Contact with eyes may cause irritation.
Skin Contact	Contact with dust can cause mechanical irritation or drying of the skin. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.
Ingestion	May cause irritation

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Iron	= 984 mg/kg (Rat)	-	-
Nickel	> 9000 mg/kg (Rat)		
Silicon	= 3160 mg/kg (Rat)		
Manganese	= 9 g/kg (Rat)	-	-
Cobalt	= 6170 mg/kg (Rat)	-	> 10 mg/L (Rat)1 h
O		I alcana danlatian	

Symptoms related to the physical, chemical and toxicological characteristics

#### Symptoms

No information available.

## Delayed and immediate effects and also chronic effects from short and long term exposure

Sensitization

During processing: May cause sensitization by inhalation and skin contact No information available.

Mutagenic Effects Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel		Group 2B Group 1	Reasonably Anticipated	Х
Chromium		Group 3		
Cobalt	A3	Group 2A Group 2B		X
eproductive Toxicity	No informat	ion available.		
TOT - single exposure	No informat	ion available.		
STOT - repeated exposur			rolonged or repeated exposure.	itting may release

Chronic Toxicity

Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemaglobinemia. May also cause pulmonary fibrosis and lung cancer. Chronic exposure to manganese may cause impairment to the central nervous system including sluggishness, sleepiness, muscle weakness, loss of facial muscle control, edema, emotional disturbances, spastic gait, and falling.

Target Organ Effects Aspiration Hazard

# Numerical measures of toxicity • - Product

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

Respiratory system. Skin.

No information available.

LD50 Oral 389 mg/kg; Acute toxicity estimate 7500

# **12. ECOLOGICAL INFORMATION**

#### **Ecotoxicity**

The environmental impact of this product has not been fully investigated.

	Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to	Daphnia Magna (Water
		1	· ·	Microorganisms	Flea)
1	Iron	-	LC50 96 h: = 0.56 mg/L		
			semi-static (Cyprinus carpio)		
			LC50 96 h: = 13.6 mg/L		
:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.1.1 · · · · · · · · · · · · · · · · ·	static (Morone saxatilis)		

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Cohall         EC50 96 hr > 100 mpL state (Brachydnoir origi)         EC50 46 hr > 0.03 mpL (Brachydnoir origi)           Copper         EC50 46 hr > 0.03 mpL (Brachydnoir origi)         State (Daphna magna) (Daphna magna)         State (Daphna magna) (Daphna magna)           EC50 76 hr > 0.0426 - 0.03 mpL state (Depted/origine/state)         Cop 86 hr > 0.058 - 0.0156 mpL state (Depted/origine/state)         State (Daphna magna) (Daphna magna)           EC50 76 hr > 0.0426 - 0.037 mpL state         (Perceptates prometas) (Daphna magna)         State (Daphna magna)           (Daphna magna)         EC50 76 hr > 0.0426 - 0.037 mpL state (Depted/origine/state)         State (Daphna magna)           (Daphna magna)         (Perceptates prometas) (Daphna magna)         State (Daphna magna)           (Daphna magna)         (Daphna magna)         EC50 46 hr = 0.03 mpL (Dophna magna)           (Daphna magna)         (Daphna magna)         EC50 46 hr = 0.03 mpL (Dophna magna)           (Daphna magna)         (Daphna magna)         EC50 46 hr = 0.03 mpL (Dophna magna)           (Daphna magna)         (Daphna magna)         EC50 46 hr = 0.03 mpL (Dophna magna)           (Daphna magna)         (Daphna magna)         EC50 46 hr = 0.03 mpL (Dophna magna)           ersistence and Degradability         No information available.         EC50 46 hr = 0.03 mpL (Dophna magna)           ioaccumulation         No information available.         Information available.<	Ni 	ckel	mg/L (Pseudoki subca EC50 72 h: (Pseudoki	0.174 - 0.311 static irchneriella upitata) = 0.18 mg/L irchneriella upitata)	static (Cyprinu 96 h: > 1 (Brachyda	yprinus carpio) = 10.4 mg/L s carpio) LC50 00 mg/L anio rerio)	)			EC50 48 h: = <sup>-</sup> (Daphnia ma 48 h: > 10 (Daphnia	gna) EC50 00 mg/L
Copper         EC60 96 h: 0.031 + 0.054         LC50 96 h: -0.033 + 0.056         EC50 48 h: = 0.03 mg/t mg/t, state porceasily to the porceasily porceasily to the porceasily to	Co	obalt						-		· · · · -	· · · :
(Pseudokirchneriells DC60 07 h: 0.0422 - 0.053 mgl, state (Pseudokirchneriells Subcepitati)       (C50 07 h: 0.032 mgl, (Pseudokirchneriells Subcepitati)         (C50 07 h: 0.042 - 0.053 Subcepitati)       (C50 07 h: 0.032 mgl, flow-through (Pseulia Informations of the sol 32 mgl, flow-through (Pseulia Informations of the sol 32 mgl, flow-through (Pseulia Informations of the sol 32 mgl, flow-through (Pseulia Information available.         ersistence and Degradability information available.       No information available.         there Alersis Effects information available.       No information available.         there Alersis Effects information available.       Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulation.         there Alersis Effects information available.       Dispose of in accordance with federal, state, and local regulation.         there Alersis Fifted information available.       Dispose of in accordance with federal, state, and local regulation.         there Alersis for Listing Chemical Name Nickel - 7440-02-0 Nickel - Nickel - Coost - Toxic Corrosive (ginitable powder (ginitable powder (	Co	pper			LC50 96 h: 0	.0068 - 0.0156	6	-		EC50 48 h: =	= 0.03 mg/L
(Pseudokinchnerielli subcapitata)       flow-through (Oncontynchus recuculata)         (CS0 96 h: = 0.12 ngL recuculata)       flow-through (Poecinia recuculata)         (LS0 96 h: = 0.2 ngL to the through (Poecinia recuculata)       flow-through (Poecinia recuculata)         ersistence and Degradability       No information available.         (CS0 96 h: = 0.2 ngL to the through (Poecinia recuculata)       No information available.         incorrection       No information available.         information available.       No information available.         information available.       Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulations         maninated Packaging       Dispose of in accordance with federal, state, and local regulations.         Therefield Name       RCRA - Basis for Listing       RCRA - D Series Wastes         Nickel - 7440/02-0       Interview in waste streams: 1002, F033, F035, F037, F033, F035, F037, F034, F035, F037, F036, F0	1 I	4	(Pseudoki subca EC50 72 h: 0	rchneriella pitata) ).0426 - 0.0535	prom LC50 96 h: < 0 (Pimephale	elas) ).3 mg/L static s promelas)	:			Static (Daphr	nia magna)
Iterative prometases       Iterative prometases         UCS0 96 hr = 0.3 mgl, static prometases       Iteratic prometases         UCS0 96 hr = 0.3 mgl, static (Cyprinus carpio) LCS0 96 hr = 1.2 5 mgl, lattic (Lepomis macrochirus)         ersistence and Degradability       No information available.         idex computation       No information available.         idex Adverse Efficits onformation available.       No information available.         information available.       Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulations         onformation available.       Included in waste streams: Fo3, F03       5.0 mgL regulatory level Toxic powder         Nickel       Toxic powder       Included in waste streams: Fo3, F03       5.0 mgL regulatory level Installe powder         Nickel       Toxic powder       Included in waste streams: Fo3, F03       5.0 mgL regulatory level Installe powder         Nickel       Toxic powder Infrainum       Inglitable powder <td></td> <td></td> <td>(Pseudoki</td> <td>irchneriella</td> <td>flow-through ( myk LC50 96 h: = flow-throug</td> <td>Oncorhynchus kiss) = 0.112 mg/L gh (Poecilia</td> <td></td> <td></td> <td><u>.</u></td> <td></td> <td></td>			(Pseudoki	irchneriella	flow-through ( myk LC50 96 h: = flow-throug	Oncorhynchus kiss) = 0.112 mg/L gh (Poecilia			<u>.</u>		
96 hr = 0.8 mg/L static (Cryprinus carryi) LCS 09 (hr = 1.25 mg/L static (Leponis macrochirus)         erristence and Degradability       No information available.         ioaccumulation       No information available.         ther Adverse Effects o information available.       Ioaccumulation         ther Adverse Effects o information available.       Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulations         ontaminated Packaging       Dispose of in accordance with federal, state, and local regulations         ontaminated Packaging       Dispose of in accordance with federal, state, and local regulations         Othermical Name       RCRA - Basis for Listing F006, F038, F039, F038, F039       CongL regulatory level         Chemical Name       Included in waste streams F032, F034, F038, F039, F038, F039       5.0 mg/L regulatory level         Chemical Name       California Hazardous Waste Included in waste streams F032, F034, F034, F034, F034, F034, Included in waste streams F032, F034, F034, F034, F034, Iotal I					LC50 96 h: flow-through prom LC50 96 h: = 0	= 0.2 mg/L (Pimephales elas) ).3 mg/L semi-			1.	;	
ersistence and Degradability No information available. ther Adverse Effects o information available. ther Adverse Effects o information available. 13. DISPOSAL CONSIDERATIONS Asste Disposal Methods Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulations ontaminated Packaging Dispose of in accordance with federal, state, and local regulations. Chemical Name RCRA RCRA - Basis for Listing RCRA - D Series Wastes RCRA - U Series Waste Nickel - 7440-02-0 (hazardous constituent - no included in waste streams: F006, F039 Included in waste streams: F032, F034, F035, F037, F038, F039 California Hazardous Waste Nickel - Toxic Device - Toxic - Corrosive Ignitable powder Idnalude in waste - Toxic - Corrosive Ignitable powder Titanium Ignitable powder Titanium Ignitable powder Titanium Ignitable powder Titanium Ignitable powder Titanium Ignitable powder Titanium Ignitable powder Toxic - Copper - Toxic - Copper Toxic - Cobalt - Toxic - Copper - Toxic - Copper Toxic - Cobalt - Toxic - Copper - Copper - Toxic - Copper - C	н н 1 н	4		:	96 h: = 0.8 (Cyprinu LC50 96 h:	mg/L static s carpio) = 1.25 mg/L	· ; :				ųł.
ther Adverse Effects         o information available.         Arase Disposal Methods       Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulations.         ontaminated Packaging       Dispose of in accordance with federal, state, and local regulations. <u>Chemical Name</u> RCRA - Basis for Listing F002, F039 <u>Chemical Name</u> RCRA - Basis for Listing F002, F039, F039 <u>Chemical Name</u> 5.0 mg/L regulatory level Included in waste streams: F032, F035, F037, F038, F039 <u>Chemical Name</u> California Hazardous Waste <u>Chemical Name</u> Toxic powder Ignitable powder <u>Nickel</u> Toxic <u>Corrosive</u> Ignitable powder <u>Tianium</u> Ignitable powder <u>Colabit</u> Toxic powder <u>Copper</u> Toxic <u>Cobalt</u> Toxic powder <u>Cobalt</u> Toxic powder <u>Toxic</u> Toxic <u>Cobalt</u> Toxic powder <u>Manganese</u> Ignitable powder <u>Tianium</u> Ignitable powder <u>Tianium</u> Toxic powder <u>Cobalt</u> Toxic powder <u>Cobalt</u> Toxic powder	ersistence	e and Degra	dability	No information		,					
ther Adverse Effects         o information available.         Arase Disposal Methods       Recover or recycle if possible. Dispose of in accordance with federal, state, and local regulations.         ontaminated Packaging       Dispose of in accordance with federal, state, and local regulations. <u>Chemical Name</u> RCRA - Basis for Listing F002, F039 <u>Chemical Name</u> RCRA - Basis for Listing F002, F039, F039 <u>Chemical Name</u> 5.0 mg/L regulatory level Included in waste streams: F032, F035, F037, F038, F039 <u>Chemical Name</u> California Hazardous Waste <u>Chemical Name</u> Toxic powder Ignitable powder <u>Nickel</u> Toxic <u>Corrosive</u> Ignitable powder <u>Tianium</u> Ignitable powder <u>Colabit</u> Toxic powder <u>Copper</u> Toxic <u>Cobalt</u> Toxic powder <u>Cobalt</u> Toxic powder <u>Toxic</u> Toxic <u>Cobalt</u> Toxic powder <u>Manganese</u> Ignitable powder <u>Tianium</u> Ignitable powder <u>Tianium</u> Toxic powder <u>Cobalt</u> Toxic powder <u>Cobalt</u> Toxic powder	ioaccumu	lation		No informatio	on available						
Ontaminated Packaging       Dispose of in accordance with federal, state, and local regulations.         Chemical Name       RCRA       RCRA - D Series Wastes       RCRA - U Series Waste         Nickel - 7440-02-0       (hazardous constituent - no waste number)       Included in waste streams: F006, F039, F038, F039       5.0 mg/L regulatory level         Chemical Name       California Hazardous Waste         Nickel       Toxic powder         Nickel       Toxic Corrosive         Unitable       Ugnitable powder         Off       Gorper         Manganese       Ignitable powder         Molybdenum       Ignitable powder         Cobalt       Toxic         Copper       Toxic         Cobalt       Toxic powder         Ignitable powder       Ignitable powder         Not regulated       Toxic         Page 7/9       Page 7/9			• • • • • • • • • •		· · · · · ·					1	1.1
Nickel - 7440-02-0       (hazardous constituent - no waste number)       Included in waste streams: F006, F039       5.0 mg/L regulatory level         Chrömium - 7440-47-3       Included in waste streams: F032, F034, F035, F037, F038, F039       5.0 mg/L regulatory level         Chemical Name       Toxic powder Ignitable powder         Chrömium       Toxic Corrosive         Manganese       Ignitable powder         Molybdenum       Ignitable powder         Toxic Copper       Toxic         Cobalt       Toxic         Cobalt       Toxic         Not regulated       Included	aste Disp	oosal Methoo		·				ordance w	ith fede	ral, state, and	llocal
waste number)     F006, F039       Chrömium - 7440-47-3     Included in waste streams: F032, F034, F035, F037, F038, F039     5.0 mg/L regulatory level       Chemical Name     California Hazardous Waste       Nickel     Toxic powder       Included in waste streams: F032, F034, F035, F037, F038, F039     Toxic powder       Chrömium     Toxic powder       Included in waste streams: F032, F034, F035, F037, F038, F039     Toxic powder       Chrömium     Toxic powder       Included in waste streams: Nickel     Included in waste streams: Inglitable powder       Manganese     Inglitable powder       Manganese     Inglitable powder       Manganese     Inglitable powder       Inglitable powder     Inglitable powder       Copper     Toxic       Copper     Toxic       Cobalt     Toxic powder       Inglitable powder     Inglitable powder       Inglitable powder     Inglitable powder       Inglitable powder     Inglitable powder       Not regulated     Not regulated			te t	Recover or regulations	ecycle if poss	ible. Dispose	e of in acco				l local
F032, F034, F035, F037, F038, F039     California Hazardous Waste       Chemical Name     California Hazardous Waste       Nickel     Toxic powder       Ignitable powder     Ignitable       Manganese     Ignitable powder       Molybdenum     Ignitable powder       Toxic     Corrosive       Ignitable powder     Ignitable powder       Manganese     Ignitable powder       Molybdenum     Ignitable powder       Toxic     Toxic       Copper     Toxic       Cobalt     Toxic powder       Ignitable powder     Ignitable powder       Not regulated     Toxic powder       Page     7/9	ontamina Chemic	ted Packagiı cal Name	ds ng	Recover or regulations Dispose of in	ecycle if poss accordance RCRA - Basi	ible. Dispose with federal, s for Listing	e of in acco state, and	local reg	ulations		
Nickel     Toxic powder Ignitable powder       Chromium     Toxic       Corrosive     Ignitable powder       Ignitable powder     Ignitable powder       Molybdenum     Ignitable powder       Titanium     Ignitable powder       Copper     Toxic       Cobalt     Toxic       OT     Not regulated	ontamina Chemic Nickel -	ted Packagii cal Name 7440-02-0	ds ng (hazardous co	Recover or regulations Dispose of in <b>RA</b>	ecycle if poss accordance RCRA - Basi Included in w	ible. Dispose with federal, <b>s for Listing</b> aste streams:	e of in acco state, and RCRA-D	local regi Series W	ulations astes		
Chromium     Toxic Corrosive       Manganese     Ignitable powder       Molybdenum     Ignitable powder       Titanium     Ignitable powder       Copper     Toxic       Cobalt     Toxic       Ignitable powder     Ignitable powder	ontamina Chemic Nickel -	ted Packagiı cal Name 7440-02-0 - 7440-47-3	ds ng (hazardous co waste n	Recover or regulations Dispose of in <b>RA</b> onstituent - no humber)	ecycle if poss accordance RCRA - Basi Included in w F006, Included in w F032, F034,	ible. Dispose with federal, <b>s for Listing</b> aste streams: F039 aste streams: F035, F037,	e of in acco state, and RCRA-D 5.0 mg/L	local regi Series W regulatory	ulations astes	RCRA - U Ser	ies Wastes
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Manganese     Ignitable powder       Molybdenum     Ignitable powder       Titanium     Ignitable powder       Copper     Toxic       Cobalt     Toxic powder       Ignitable powder     Ignitable powder	ontamina Chemic Nickel - Chromium	ted Packagin cal Name 7440-02-0 - 7440-47-3	ds ng (hazardous co waste n Chemical Name Nickel	Recover or regulations Dispose of in <b>RA</b> Distituent - no number)	ecycle if poss accordance RCRA - Basi Included in w F006, Included in w F032, F034, F038,	ible. Dispose with federal, s for Listing aste streams: F039 aste streams: F035, F037, F039	e of in acco state, and RCRA-D 5.0 mg/L	local reg Series W regulatory fornia Haz Toxic p Ignitable	astes level ardous powder powder	RCRA - U Ser	ies Wastes
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Copper     Toxic       Cobalt     Toxic powder       Ignitable powder       Ignitable powder         OT   Not regulated Page 7/9	ontamina Chemic Nickel - Chromium	ted Packagir cal Name 7440-02-0 - 7440-47-3	ds ng Chemical Name Nickel Chromium	Recover or regulations Dispose of in <b>RA</b> Distituent - no number)	ecycle if poss accordance RCRA - Basi Included in w F006, Included in w F032, F034, F038,	ible. Dispose with féderal, s for Listing aste streams: F039 aste streams: F035, F037, F039	e of in acco state, and RCRA-D 5.0 mg/L	local regu Series W regulatory fornia Haz Toxic p Ignitable To Corr Ignitable	astes astes level bowder powder powder able powder	RCRA - U Ser	ies Wastes
OT     Not regulated       Page 7/9	ontamina Chemic Nickel - Chromium	ted Packagir cal Name 7440-02-0 - 7440-47-3	ds ng Chazardous co waste n Chemical Name Nickel Chromium Manganese Molybdenum	Recover or regulations Dispose of in <b>RA</b> Distituent - no number)	ecycle if poss accordance RCRA - Basi Included in w F006, Included in w F032, F034, F038,	ible. Dispose with féderal, s for Listing aste streams: F039 aste streams: F035, F037, F039	e of in acco state, and RCRA-D 5.0 mg/L	Iocal regi Series W regulatory fornia Haz Toxic p Ignitable Ignitable Ignitable	astes astes level powder powder able powder able powder able	RCRA - U Ser	ies Wastes
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Page 7/9	ontamina Chemic Nickel - Chromium	ted Packagin cal Name 7440-02-0 - 7440-47-3	ds ng Chazardous co waste n Chemical Name Nickel Chromium Manganese Molybdenum Titanium Copper	Recover or regulations Dispose of in RA onstituent - no number)	ecycle if poss n accordance <b>RCRA - Basi</b> Included in w F006, Included in w F032, F034, F038,	ible. Dispose with féderal, s for Listing aste streams: F039 aste streams: F035, F037, F039	e of in acco state, and RCRA-D 5.0 mg/L Cali	Iocal regi Series W regulatory fornia Haz Toxic j Ignitable To Corr Ignitable Ignitable Ignitable Ignitable Ignitable To Toxic j	astes astes level level ardous convder powder p	RCRA - U Ser	ies Wastes
Page 7/9	ontamina Chemic Nickel - Chromium	ted Packagin cal Name 7440-02-0 - 7440-47-3	ds ng (hazardous cc waste n Chemical Name Nickel Chromium Manganese Molybdenum Titanium Copper Cobalt	Recover or regulations Dispose of in RA onstituent - no humber) e e 14. TF	ecycle if poss n accordance <b>RCRA - Basi</b> Included in w F006, Included in w F032, F034, F038,	ible. Dispose with féderal, s for Listing aste streams: F039 aste streams: F035, F037, F039	e of in acco state, and RCRA-D 5.0 mg/L Cali	Iocal regi Series W regulatory fornia Haz Toxic j Ignitable To Corr Ignitable Ignitable Ignitable Ignitable Ignitable To Toxic j	astes astes level level ardous convder powder p	RCRA - U Ser	ies Wastes
-	ontamina Chemic Nickel - Chromium	ted Packagin cal Name 7440-02-0 - 7440-47-3	ds ng RC (hazardous cc waste n Chemical Name Nickel Chromium Manganese Molybdenum Titanium Copper Cobalt	Recover or regulations Dispose of in RA onstituent - no humber) e e 14. TF	ecycle if poss n accordance RCRA - Basi Included in w F006, Included in w F032, F034, F038,	ible. Dispose with féderal, s for Listing aste streams: F039 aste streams: F035, F037, F039 F039	e of in acco state, and RCRA-D 5.0 mg/L Cali	Iocal regi Series W regulatory fornia Haz Toxic j Ignitable To Corr Ignitable Ignitable Ignitable Ignitable Ignitable To Toxic j	astes astes level level ardous convder powder p	RCRA - U Ser	ies Wastes
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# **15. REGULATORY INFORMATION**

International Inventories		
TSCA	Complies	
DSL	Complies	

#### Leaend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

#### **U.S. Federal Regulations**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name		CAS-No	Weight %	SAR A 313 - Thresh Values %	old
Nickel		7440-02-0	1.5-37	0.1	
Chromium		7440-47-3	11.5-26	1.0	
Manganese		7439-96-5	0-2	 1.0	
Cobalt		7440-48-4	0-0.6	0.1	
SARA 311/312 Hazard Categories			•		
Acute Health Hazard		No	and the second sec	 	
Chronic Health Hazard		No			
Fire Hazard		No			
Sudden Release of Pressure Hazard		No			
Reactive Hazard	. :	No		 	

#### Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nickel		X	·;· X·;· , ,	
Copper		Х	Х	

# CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

ſ	С	hemical Name		Hazardo	ous Substance	es RQs	Extremely H	lazardous Sເ RQs	ubstances	RQ
ſ		Nickel	· : :		100 lb	· · : ]	÷			RQ 100 lb final RQ RQ 45.4 kg final RQ
ſ		Chromium								RQ 5000 lb final RQ RQ 2270 kg final RQ
		Copper	· ; :		5000 lb			1		RQ 5000 lb final RQ RQ 2270 kg final RQ

## U.S. State Regulations

#### California Proposition 65

This product contains the following Proposition 65 chemicals:

		Chem	ical Name	•			CAS-No			Ca	lifornia Prop. 65	j	
		١	Nickel				7440-02-0				Carcinogen		
· : .		(	Cobalt			1	7440-48-4	1			Carcinogen		
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# U.S. State Right-to-Know Regulations

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Chemical Name	New Jersey	Massachusetts	Pennsylvania	Illinois	Rhode Island
Nickel	Х	Х	Х	Х	Х
Chromium		Х			Х
Silicon	X	: X . ; ;	: X :''		// X
Manganese	Х	Х	Х	Х	Х
Molybdenum	Х	Х	Х		Х
Titanium	, ; X · /		- 1 - 1	1. A.	
Cobalt	X	Х	X	Х	Х
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## U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

				16. OTI	HER IN	FORMA	TION				
NFPA HMIS	111	- C.	Hazard Hazard	111	mability mability		Instability Physical I		; Ha	nysical and C azards ; ersonal Prote	
Prepared By			Stanfo Mater	ord Advanced ials	чi	· / / ·	el.	чi	· 7 7 ·		чi
Issuing Date Revision Date Revision Note			09-Ju	n-2015 n-2015 Release.	ЭĽ.	20	11		22		ця. П
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