

Ulbrich Stainless Steels & Special Metals, Inc.

Material Safety Data Sheet

Stainless & Related Alloys Group I Sheet 2

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ALLOY	UNS No.	CONSTITUENT(S)		% Maximum unless otherwise shown.											DENSITY lbs/cu in	MELTING PT. degree (F) (approx.)				
		C	Mn	Si	Cr	Ni	Mo	Fe	Cb + Ta	Cu	Ti	Al	W	Se			V	Other		
330	N08330	.08	2.0	0.75/1.5	17.0/20.0	34.0/37.0		BAL										.289	2550	
347	S34700	.08	2.0	1.0	17.0/19.0	9.0/13.0		BAL	10XC min									.290	2550	
384	S38400	.08	2.0	1.0	15.0/17.0	17.0/19.0		BAL										.290	2550	
405	S40500	.08	1.0	1.0	11.5/14.5			BAL				.10/.30						.280	2700	
409	S40900	.08	1.0	1.0	10.5/11.75			BAL			6XCmin/0.75							.276	2600	
410	S41000	.15	1.0	1.0	11.5/13.5			BAL										.280	2700	
414	S41400	.15	1.0	1.0	11.5/13.5	1.25/2.5		BAL										.280	2700	
416	S41600	.15	1.25	1.0	12.0/14.0			BAL								S.15 min		.280	2700	
416 SE	S41623	.15	1.25	1.0	12.0/14.0			BAL					0.15 min					.280	2700	
420	S42000	over .15	1.0	1.0	12.0/14.0			BAL										.280	2650	
430	S43000	.12	1.0	1.0	16.0/18.0			BAL										.280	2600	
434	S43400	.12	1.0	1.0	16.0/18.0		.75/1.25	BAL										.280	2600	
436	S43600	.12	1.0	1.0	16.0/18.0		.75/1.25	BAL	5XCmin/0.70									.280	2600	
440 A	S44002	.60/.75	1.0	1.0	16.0/18.0		0.75	BAL										.280	2500	
442	S44200	.20	1.0	1.0	18.0/23.0			BAL										.280	2600	
446	S44600	.20	1.50	1.0	23.0/27.0			BAL								N.25		.280	2600	
18 SR ¹	N/L	.20	.50	1.0	17.0/19.0	.50		BAL			3.0/6.0	1.50/2.50						.280	2600	
CARPENTER 20 CB3 ²	N08020	.06	2.0	1.0	19.0/21.0	32.5/35.0	2.0/3.0	BAL	8XCmin/1.0	3.0/4.0								.292	2600	
18-3LW ³	N/L	.10	2.0	1.0	17.0/19.0	8.0/10.0		BAL		3.0/4.0								.290	2600	
19-9DL ⁴	K63198	.28/.35	.75/1.5	.3/.8	18.0/21.0	8.0/11.0	1.0/1.75	BAL	.25/.60	.50	.10/.35		1.0/1.75					.286	2600	
GREEK ASCOLLOY	F41800	.15/.20	.50	.50	12.0/14.0		.50	BAL					2.5/3.5		1.8/2.2			.286	2700	
CAS Number		7440-44-0	7439-96-5	7740-21-3	7740-47-3	7740-02-0	7439-98-7	7439-89-6	Cb7440-25-7 Ta7440-03-1	7440-50-8	7440-32-6	7429-90-5	7440-33-7	7782-49-2	V 7440-62-2 1313-62-1	S 7446-09-5 N 7727-37-9				
Contaminant & Exposure Limits		Not Listed	As Dust As Fume	As Dust	As Soluble Sals As Insoluble Sals	As Metal Ni As Soluble Ni	As Soluble Mo As Insoluble Mo	As FeO Fume As Fe	Cb Not Listed As Metal Ta	As Dust As Fume	As TiO ₂	As Dust As Fume	As Dust	As Dust As Fume	As Dust V ₂ O ₅ As Fume V ₂ O ₅	As SO ₂ Not Listed				
(mg/m3) PEL TLV			5(c) 5(c) 5(c) 1	15 10	0.5 0.5(VI) 1 0.5	1 1 1 1	5 5 15 10	10 5		1 1 0.1 0.2	15 10	10 5	5	0.2 0.2 0.2 0.2	.5(c) .5 .1(c) .5	13 5				

Ulbrich Stainless Steels & Special Metals, Inc.
Material Safety Data Sheets
 Stainless & Related Alloys Group I Sheet 1

ALLOY	UNS No.	CONSTITUENT(S) C					% Maximum unless otherwise shown.					Other	DENSITY lbs/cu in	(approx.) MELTING PT. degree (F)
		Mn	Si	Cr	Ni	Mo	Fe	Cb + Ta	Ti	Se				
201	S20100	.15	5.5/7.5	1.0	16.0/18.0	3.5/5.5	BAL					N .25	.280	2550
301	S30100	.15	2.0	1.0	16.0/18.0	6.0/8.0	BAL						.290	2550
302	S30200	.15	2.0	1.0	17.0/19.0	8.0/10.0	BAL						.290	2550
303	S30300	.15	2.0	1.0	17.0/19.0	8.0/10.0	BAL					S .15	.290	2550
303 SE	S30323	.15	2.0	1.0	17.0/19.0	8.0/10.0	BAL				.15min		.290	2550
304	S30400	.08	2.0	1.0	18.0/20.0	8.0/10.5	BAL						.290	2550
304 L	S30403	.03	2.0	1.0	18.0/20.0	8.0/12.0	BAL						.290	2550
305	S30500	.12	2.0	1.0	17.0/19.0	10.5/13.0	BAL						.290	2550
308	S30800	.08	2.0	1.0	19.0/21.0	10.0/12.0	BAL						.290	2550
309	S30900	.20	2.0	1.0	22.0/24.0	12.0/15.0	BAL						.290	2550
309 S	S30908	.08	2.0	1.0	22.0/24.0	12.0/15.0	BAL						.290	2550
309 SCB	N/L	.08	2.0	.75	22.0/24.0	12.0/16.0	BAL	10XCmin/1.10					.290	2550
310	S31000	.25	2.0	1.5	24.0/26.0	19.0/22.0	BAL						.290	2550
310 S	S31008	.08	2.0	1.5	24.0/26.0	19.0/22.0	BAL						.290	2550
316	S31600	.08	2.0	1.0	16.0/18.0	10.0/14.0	2.0/3.0	BAL					.290	2550
316 L	S31603	.30	2.0	1.0	16.0/18.0	10.0/14.0	2.0/3.0	BAL					.290	2550
317	S31700	.08	2.0	1.0	18.0/20.0	11.0/15.0	3.0/4.0	BAL					.290	2550
317 L	S31703	.30	2.0	1.0	18.0/20.0	11.0/15.0	3.0/4.0	BAL					.290	2550
321	S32100	.08	2.0	1.0	17.0/19.0	9.0/12.0	BAL			Ti 5XC min			.290	2550
CAS Number		7440-44-0	7439-96-5	7740-21-3	7740-47-3	7740-02-0	7439-98-7	7439-89-6	Cb7440-25-7 Ta7440-03-1	7440-32-6	7782-49-2	S 7446-09-5 N 7727-37-9		
Contaminant & Exposure Limits		Not Listed	As Dust As Fume	As Dust	As Soluble Salts As Insoluble Salts	As Metal Ni As Soluble Ni	As Soluble Mo As Insoluble Mo	As FeO Fume As Fe	Cb Not Listed As Metal Ta	As TiO ₂	As Dust As Fume	As SO ₂ Not Listed		
(mg/m ³) PEL TLV			5(c) 5(c) 5(c) 1	15 10	0.5 0.5(VI) 1 0.5	1 1 1 1	5 5 15 10	10 5	5	15 10	0.2 0.2 0.2 0.2	13 5		

MSDS IDENTIFICATION NUMBER	DATE ISSUED	ISSUED BY	EMERGENCY PHONE NUMBER
SS-001	March 1, 1989	Environmental Engineering Department	Ulbrich 203-239-4481 Chemtrec 800-424-9300
TRADE NAME: High performance, heat resistant alloys		FORMULA: Alloy composed of varying concentrations of elements listed in Section II.	
I. PRODUCT IDENTIFICATION CHEMICAL NAME: See Section II for Alloy Designations		CHEMICAL FAMILY: Alloy	

II. HAZARDOUS CONSTITUENTS

STAINLESS AND RELATED ALLOYS GROUP I

201; 301; 302, 303; 303SE; 304; 304L; 305; 308; 309; 309S; 309SCB; 310; 310S; 316; 316L; 317; 317L; 321; 330; 347; 384; 405; 409; 410; 414; 416; 416SE; 420; 430; 434; 436; 440A; 442; 446; 18 SR¹; Carpenter 20 CB3²; 18-9LW¹; 19-9DL⁴; Greek Ascoloy².

DANGER

INHALATION OF DUST OR FUME MAY CAUSE SERIOUS LUNG INJURY. SKIN, EYE AND MUCOUS MEMBRANE IRRITATION MAY OCCUR.

- The stainless and related alloy products identified above may contain in varying concentrations, the following elemental constituents aluminum, chromium, copper, iron, manganese, molybdenum, nickel and tungsten. For specific concentrations of these and other elements present, refer to the Material Safety Data Sheet (MSDS) for this product.
- Inhalation of metal dust or fume generated by the use of these alloys may cause adverse health effects such as reduced lung function, nasal and mucous membrane irritation. Exposure to dust or fume generated by the use of these alloys may also cause eye irritation, skin rash and effects on other organ systems.
- Chrome, nickel and some of their compounds are listed in the 3rd Annual Report on Carcinogens as prepared by the National Toxicology Program (NTP) as well as the International Agency for Research on Cancer (IARC) Monograph Series. The following information is a summary of findings reported to date:

Determination/Evaluation Evidence of carcinogenicity to humans: Evidence of carcinogenicity to animals:	Element or Certain Compounds Evaluated or Both (Identified by Element Shown)	
	CHROME	NICKEL
	Sufficient	Limited
	Sufficient	Sufficient

- Avoid breathing dust or fume. If the use of this material produces dust or fume, use appropriate ventilation controls, personal protective equipment or both. For additional information refer to the Material Safety Data Sheet (MSDS) for this product.

NOTICE: SECTION 313

Some of the previously listed chemicals are subject to annual reporting of releases into the environment under Section 313 of the Emergency Planning and Community Right-To-Know-Act of 1986. It is the responsibility of the user to verify whether or not his or her facility is in compliance with all Federal and State Environmental regulations.

NOTICE: CALIFORNIA LIST

Our Material Safety Data Sheets (MSDS) have been reviewed for inclusion of any chemicals listed under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Proposition 65). We at this time do not report any of the "listed" chemicals as constituent components in any alloys currently processed by our company.