

# CASTING ALLOY DATA

## WEAR/CORROSION RESISTANT ALLOYS

Casting Specifications		Nominal Chemical Composition					Average Rockwell Hardness	Heat Treatment
Alloy Designation	AMS	C	Mn	Co	Cr	W		
WS6	5373C	1.10	.30	61.00	23.00	4.00	40RC	Stress Relieved

## ABRASION RESISTANT ALLOY

Casting Specifications		Nominal Chemical Composition				Average Rockwell Hardness	Heat Treatment
Alloy Designation	ASTM	C	Mn	Si	Cr		
HC-250	A-532, IIIA	2.20	.90	.50	26.0	40RC 58RC	Annealed Hardened

## ANTI-GALLING ALLOYS

Casting Specifications		Nominal Chemical Composition								Minimum Mechanical Properties				Average Brinell Hardness
Alloy Designation	ASTM	Sn	Fe	Bi	Cu	Cr	Ni	Mo	Other	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %	
<b>NICKEL BASE</b>														
WM88	A-494	4.00	1.00	4.50		12.00		2.50		44	32	8	8	140
WM23BI		8.00		4.00			BALANCE		Zn 7.00 Mn 2.00	50	45	4.5	5	200
WM54C		8.00							Zn 8.00 Mn 2.00 Ag 6.00	75	56	7	9	220
<b>COPPER BASE</b>														
WM119		4.00	1.00	4.50			20.00		Zn 4.00	26	25	2.00		120
WM126				3.50	BALANCE		20.00		Al 1.00 Zn 20.00 Mn 20.00	50	39	4.00		150

## ALLOY STEEL – ELEVATED TEMPERATURE

Casting Specifications		Nominal Chemical Composition					Minimum Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	C	Mn	Si	Cr	Mo	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %		
WC-6	A-217	.17	.60	.50	1.25	.55	70	40	20	35	179	Normalized & Tempered
WC-9	A-217	.07	.55	.40	2.25	1.00	70	40	20	35	179	
C-5	A-217	.07	.55	.50	4.80	.55	90	60	18	35	201	
C-12	A-217	.11	.50	.65	9.00	1.00	90	60	18	35	229	

# CASTING ALLOY DATA

## CORROSION RESISTANT – HIGH ALLOY – AUSTENITIC STAINLESS

Casting Specifications		Nominal Chemical Composition								Minimum Mechanical Properties			Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	UNS	C	Mn	Si	Cr	Ni	Mo	Other	Tensile KSI	Yield KSI	Elongation in 2"-%		
CF-3	A-351 A-743 A-744		.02	.30	1.00	18.5	9.0			70	30	35	150	SOLUTION ANNEALED
CF-3M	A-351 A-743 A-744		.02	.30	1.00	18.5	9.5	2.4		70	30	30	150	
CF-3MA	A-351		.03	.70	1.30	20.0	9.5	2.4		80	37	30	170	
CF-8	A-351 A-743 A-744		.05	.30	1.00	19.5	9.0			70	30	35	150	
CF-8C	A-351 A-743 A-744		.05	.30	1.00	19.5	9.5		Cb & Ta .80	70	30	30	150	
CF-8M	A-351 A-743 A-744		.05	.30	1.00	19.5	9.5	2.4		70	30	30	150	
CF-16F	A-743		.05	.30	1.00	19.5	9.5		Se .25	70	30	25	150	
CF-20	A-743		.10	.30	1.00	19.5	9.0			70	30	30	150	
CG-8M	A-351 A-743 A-744		.05	.30	1.00	19.5	9.5	3.5		75	35	25	160	
CH-20	A-351 A-743 A-744		.12	.50	1.00	23.0	13.0			70	30	30	150	
CK-20	A-351 A-743 A-744		.15	.30	1.00	24.0	21.0			65	28	30	140	
CN-7M	A-351 A-743 A-744		.04	.30	1.00	20.5	28.5	2.4	Cu 3.3	62	25	35	130	
CF-3MN	A-351 A-743		.02	.30	1.00	19.5	9.5	2.5	N .12	75	37	35	165	
		S31726	.02	.30	1.00	19.0	15.0	4.5	N .12	75	37	35	165	

## ALLOY STEEL – LOW TEMPERATURE

Casting Specifications		Nominal Chemical Composition			Minimum Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	C	Mn	Si	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %		
LCA	A-352	.20	.55	.40	60	30	24	35	150	Normalized Quenched Tempered
LCB	A-352	.23	.85	.40	65	35	24	35	160	
LCC	A-352	.23	.85	.40	70	40	22	35	160	

## CARBON AND LOW ALLOY STEEL

Casting Specifications		Nominal Chemical Composition			Minimum Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	C	Mn	Si	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %		
WCA	A-216	.21	.55	.50	60	30	24	35	137	Normalized & Tempered
WCB	A-216	.22	.65	.35	70	36	22	35	152	
WCC	A-216	.22	1.00	.50	70	40	22	35	169	

# CASTING ALLOY DATA

CORROSION RESISTANT – HIGH ALLOY																
Casting Specifications				Nominal Chemical Composition							Minimum Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	AISI	Other Similar Designations	C	Mn	Si	Cr	Ni	Mo	Other	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %		
<b>MARTENSITIC HARDENABLE STAINLESS</b>																
CA6NM	A-487 A-743			.04	.30	.70	12.5	4.0	.60		110	80	15	35	240	Normalized Tempered
CA-15	A-217 A-487 A-743	410		.08	.30	.70	12.5				90	65	18	30	210	Normalized Tempered
CA-40	A-743	420		.35	.36	.65	12.5				100	70	15	25	240	Normalized Tempered
CD4MCU	A-351			.02	.80	.60	25.5	5.25	2.0	Cu 3.00	100	70	16		240	Solution Annealed
<b>PRECIPITATION HARDENABLE STAINLESS</b>																
CB7CU1	A-747	17-4PH		.04	.30	.70	16.0	4.10		Cu 2.70 Cb .18	175	145	5		400	Solution Annealed Age Hardened 900 °F
CB7CU2	A-747	15-5PH		.04	.30	.70	15.0	5.00		Cu 2.70 Cb .18	175	145	5		400	Solution Annealed Age Hardened 900 °F
<b>FERRITIC STAINLESS NON-HARDENABLE</b>																
CC50	A-743	446		.30	.75	.75	28.0	3.0			55				195	Annealed
<b>SPECIAL ALLOY GRADES</b>																
WB	A-494	N-12MV	Hastelloy® B	.05	.40	.40		66.0	27.0	V .35 Fe 5	76	40	6		190	Solution Annealed
WC	A-494	CW-12MW	Hastelloy® C	.05	.40	.40	16.5	57.0	17.0	W 4.25 V .30 Fe 5	72	40	4		200	Solution Annealed
PN	A-494	CZ100	Nickel 210	.15	1.0	1.0		97.0			50	18	10		120	
WML	A-494	M35-2 R Monel®	Monel® 410	.15	.50	1.5		66.0		Cu 30.0	65	30	25		135	
WMLC	A-494	M30C		.10	.50	1.3		66.0		Cu 30.0 Cb 1.50	65	32	25		135	
W610	A-494	CY-40	Inconel® 610	.02	.40	.75	15.5	75.0			70	28	30		140	Solution Annealed
W625	A-494	CW6-MC	Inconel® 625	.02	.40	.75	20.5	65.0	9.0	Cb 4.0	70	40	25			Solution Annealed

TOOL STEELS															
Casting Specifications			Nominal Chemical Composition							Minimum Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	Other Similar Designations	C	Mn	Si	Cr	Ni	Mo	Other	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %		
H13			.36	.30	1.00	5.25		1.50	V 1.00					230	Annealed
L6			.70	.60	.40	.90	1.60							230	Normalized Tempered
M2			.85	.40	.70	4.25		5.00	V 1.85 W 6.30					262	Annealed
CA40	A-743	420	.35	.35	.65	12.50				100	70	15	25	240	Normalized Tempered

# CASTING ALLOY DATA

## HEAT RESISTANT – HIGH ALLOY

Casting Specifications			Nominal Chemical Composition						Minimum Mechanical Properties		
Alloy Designation	ASTM	Other Similar Designations	C	Mn	Si	Cr	Ni	Cb	Tensile KSI	Yield KSI	Elongation in 2"-%
CT15C	A-351	IN-800H	0.10	1.0	1.0	20.00	32.00	1.0	63	25	20
HD	A-297		.25	.30	1.1	27.5	5.5		75	35	8
HF	A-297		.25	.30	1.0	21.0	9.0		70	35	25
HH	A-297 A-447		.30	.30	.70	25.0	12.0		75	35	10
HK	A-297 A-351		.40	.80	1.2	25.0	20.0		65	35	10
HN	A-297		.40	.30	1.0	20.0	25.0		63	–	8
HP	A-297		.40	1.2	1.5	26.0	36.0		62.5	34	4.50
HT	A-297		.40	.30	1.0	16.0	34.0		65	–	4
HU	A-297		.40	.30	1.0	19.0	39.0		65	–	4
HX	A-297		.40	.30	1.0	17.0	66.0		60	–	–
50/50	A-560	IN-657	.02	.10	.30	48-50	49-50	1.50	80	50	5

## LOW THERMAL EXPANSION ALLOYS

Casting Specifications			Nominal Chemical Composition				Typical Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASTM	Other Similar Designations	C	Mn	Ni	Other	Tensile KSI	Yield KSI	Elongation in 2"-%	CTE PPM/°F		
W-36	B-388	Invar® 36	.02	.30	36.0		55	35	25	1.4	120	Annealed
W-42	B-388	Invar® 42	.02	.30	42.0		55	30	25	2.4	120	Annealed
W-29	F-15	Kovar®	.02	.30	29.0	Co 17	60	35	20	2.7	130	Annealed
W-36H			.02	.204	1.5	Hardening Agent	100	70	10	2.0	220	Annealed & Aged

## SUPER ALLOYS

Casting Specifications			Nominal Chemical Composition								Minimum Mechanical Properties				Average Brinell Hardness	Heat Treatment
Alloy Designation	ASM	UNS	Co	C	Al	Ti	Cr	Ni	Mo	V	Tensile KSI	Yield KSI	Elongation in 2"-%	Reduction of Area %		
WASPALOY		N-07001	13.0	0.04	1.5	3.0	19.0	50.0	4.3		120	90	5	10	325	Solutionized Stabilized Aged
IN-100	5397-A		14.0	0.16	5.9	4.75	9.5	56.0	3.0	.80	115	95	5		335	
IN-718	5383-A			.05	.60	.95	18.5	53.0	3.0		125	110	5	10	340	Homogenized Solution-Annealed Aged



### WUKESHA FOUNDRY, INC.

1300 Lincoln Avenue • Waukesha, WI 53186 USA

Tel + 1 800 727 0741 or + 1 262 542 0741

Fax + 1 262 549 8440

E-Mail [info@waukeshafoundry.com](mailto:info@waukeshafoundry.com)

[www.waukeshafoundry.com](http://www.waukeshafoundry.com)

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