



# Stainless Steel Alloy Guide

Note: Information provided is for reference only

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	Martensitic Alloy		Ferritic Stainless Steel	Precipitation Hardening	Low Carbon Steel			Magnetic
Alloy Name	410	420	430	17-7 PH	1006	1008	1010	MAG MET
ASTM	A240	A176	A240 I	A693 Type 631	A109	A109	A109	A753 GR 4

## ALLOY COMPOSITION %

Carbon	max	C	0.15	0.15 min	0.12	<0.09	0.1	0.1	0.1	<0.05
Managnese	max	Mn	1	1	1	<1	0.15	0.15	0.15	<0.8
Sulfur	max	S	0.03	0.03	0.03	<0.03	0.035	0.035	0.035	<0.01
Phosphorus	max	P	0.04	0.04	0.04	<0.04	0.03	0.03	0.03	<0.02
Silicon	max	Si	1	1	1	<1				<0.5
Chromium		Cr	11.5-13.5	12-14	16-18	16-18				<0.3
Nickel		Ni				6.5-7.7				79-82
Molybdenum		Mo								3.5-6
Iron		Fe					Bal	Bal	Bal	
Other						Al 0.75-1.5				Co <0.5
Other										Cu <.03

## PHYSICAL PROPERTIES

DENSITY	A	0.28	0.28	0.278	0.282	0.284	0.284	0.284	0.316
MOD. OF ELAST.	B			29		29	29	29	
	C			360		78	78	78	
THERMAL COND.	D			181		250	250	250	
COEF OF THERM. EXP.	E			6.6		8.8	8.8	8.8	

## MECHANICAL PROPERTIES

ANNEALED	TENSILE	F	75	90	65 min	130	35-50	35-50	35-50	90
	YIELD	G	45	50	30 min	50				40
	ELONG.	H	20	25	20 min		35 min	35 min	35 min	30
1/4 HARD	TENSILE				78-90		45-65	45-65	45-65	
	YIELD				60-78					
	ELONG.						13-27	13-27	13-27	
1/2 HARD	TENSILE				90-100		55-75	55-75	55-75	
	YIELD				75-95					
	ELONG.						4-16	4-16	4-16	
FULL HARD	TENSILE				107 min	220	80 min	80 min	80 min	160
	YIELD				100 min	190				150
	ELONG.				1 min					1

A Lbs. per cu. In. at 68 °F (annealed) (x27.68 gms./cu. Cm. at 20 ° C)

B x 10<sup>6</sup> PSI, tension

C OHM/CMF as annealed at 68°F(20°C)

D BTU per sq. ft. per ft. per hr. per F ° at 68° F(20°C)

E mean from 68°F to 1200 °F (20°C to 649°C)

F X 1000 = PSI

G x 1000 = PSI (0.2% offset)

H % in 2 inches

I Annealed only spec Temper Reference only

## CAPABILITIES

Gauge Range .0005" - .040"

Width Range .031" - 14.000"

All Tempers Annealed DDQ to High Yield

Edges: #3 slit, Deburred, Round

Toll Processing: Rolling, Annealing, Leveling, Multicoil, Slitting, Traverse Winding, Cut to Length

Traverse Winding 250, 500, 1000, 2000 lb. Traverse Wound Reels

Multicoil

mw91906 rev 5



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		Nickel	Austenitic Stainless Steel								
Alloy Name		200/201	301	302	304	304L	305	316	316L	321	
ASTM		B162	A666	A666	A666	A666	A240	A666	A666	A240	
ALLOY COMPOSITION %											
Carbon	max	C	0.07	0.15	0.15	0.08	0.03	0.12	0.08	0.03	0.08
Managnese	max	Mn	0.35	2	2	2	2	2	2	2	2
Sulfur	max	S	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Phosphorus	max	P		0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
Silicon	max	Si		1	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Chromium		Cr		16-18	17-19	18-20	18-20	17-19	16-18	16-18	17-19
Nickel		Ni	Bal	6-8	8-10	8-10.5	8-12	10.5-13	10-14	10-14	9-12
Molybdenum		Mo							2-3	2-3	
Iron		Fe	.25 max								
Other											Ti <0.7
Other											N <0.1

## PHYSICAL PROPERTIES

DENSITY	A	0.321	0.285	0.285	0.285	0.285	0.286	0.286	0.286	0.29
MOD. OF ELAST.	B	30	28	28	28	28	28	28	28	
	C	57	432	432	432	432	455	445	445	
THERMAL COND.	D	306	113	113	113	113	107	110	110	
COEF OF THERM. EXP.	E	8.9	10.4	10.4	10.4	10.4	10.5	10.3	10.3	

## MECHANICAL PROPERTIES

ANNEALED	TENSILE	F	55 min	75 min	75 min	75 min	70 min	70 min	75 min	70 min	100
	YIELD	G		30 min	30 min	30 min	25 min	25 min	30 min	25 min	45
ELONG.	H	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40 min	40	
1/8 HARD	TENSILE		52-65	100 min	100 min	100 min	100 min		100 min	100 min	
	YIELD			55 min	55 min	55 min	55 min		55 min	55 min	
	ELONG.		30-40	40 min	35 min	35 min	35 min		30 min	30 min	
1/4 HARD	TENSILE		55-70	125 min	125 min	125 min	125 min	125 min	125 min	125 min	
	YIELD			75 min	75 min	75 min	75 min	75 min	75 min	75 min	
	ELONG.		20-35	25 min	10 min	10 min	10 min	6 min	10 min	10 min	
1/2 HARD	TENSILE		60-90	150 min	150 min	150 min	150 min	150 min	150 min	150 min	
	YIELD			110 min	110 min	110 min	110 min	110 min	110 min	110 min	
	ELONG.		15-25	15 min	9 min	6 min	6 min	6 min	6 min	6 min	
3/4 HARD	TENSILE		70-90	175 min	175 min	175 min	175 min		175 min	175 min	
	YIELD			135 min	135 min	135 min	135 min		135 min	135 min	
	ELONG.		5-10	10 min	5 min						
FULL HARD	TENSILE		90 min	185 min	185 min	185 min	185 min		185 min	185 min	
	YIELD			140 min	140 min	140 min	140 min		140 min	140 min	
	ELONG.			8 min	3 min	1 min	1 min		1 min	1 min	

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