



North American Stainless

Long Products





North American Stainless

North American Stainless is part of the most competitive stainless steel manufacturing group in the world, Acerinox, S.A. The development of our state of the art long products facility was created using the expertise of our sister company, Roldan, S.A. This experience, along with the most modern equipment, allows us to provide you, our customer, with the finest stainless steel long products.

In today's competitive marketplace, our people, processes, and technology are essential for providing our customers with the highest standards of quality and services within the stainless industry. These elements also allow us to continue our advancement in being the finest stainless steel mill in the western hemisphere.



MELT SHOP



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North American Stainless has a fully integrated manufacturing process for long products. The process begins at our Melt Shop which includes the following process equipment: electric arc furnace (EAF), argon oxygen decarburization (AOD) converter, ladle stir & treatment station (LSS), and the billet caster (BC).

Using heats that are approximately 150 metric tons, the billet caster can produce billets that are up to 200mm x 200mm (8") thick and 3.6m (11-3/4') to 12m (39') long. This capability will allow NAS to produce wire rod coils that weigh up to 5,000#.

HOT MILL



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The hot rolling mill consists of the following equipment: billet grinder, billet reheat furnace, rolling stands, cooling bed, wire rod block, garret coiler, and a compactor. With this equipment, the mill has an annual capacity of 200,000 tons.

Depending on the steel grade, the process begins with the billets running through the billet grinder to remove any imperfections. Next, the billet is placed in our reheat furnace. Once the material is reheated to the appropriate temperature, it will pass through our roughing mill and then through our rolling stands. The final size of the material that is being produced will determine how many of our rolling stands are used. At the end of the rolling stands, there are three different exit areas, each of which are designed to produce a different product mix.

The first exit area is the garret coiler. The material at this line will range from .594"(15.0mm) to 1.65"(42.0mm) rounds. The material will run through this exit area at a speed of 2.4 to 14 meters per second.

The second exit area is the wire rod block. Material that is processed at this line will range from .2165"(5.5mm) to .610"(15.5mm) rounds. The wire rod block processes the material at a speed of 12.0 to 80.0 meters per second depending on the size and steel type.

The third and final exit area is the cooling bed. Stainless steel rounds that are currently processed at this line range from 1.625" (42.5mm) to 5" (130.0mm) rounds. This exit area is also where we roll equal leg angles that range from 3/4" x 3/4" to 4" x 4".

Once the material passes through one of these three exit areas, it will be transported to our finishing mill to be processed into one of our many finished products.

WIRE ROD



Wire rod is a product that can be used in a variety of ways. We will sell this material as finished hot rolled, annealed and pickled wire rod coils, or we will finish the material into cold drawn or peeled bars.

The process begins with the billet passing through rolling stands. After this, it will exit through the wire rod block, or the garret coiler depending on the size. The material then will be transported to our finishing shop. At the entrance of the finishing shop, the wire rod coil will be placed into an annealing furnace that will hold up to 17 coils. After exiting the annealing furnace, the coil will move through our pickling tanks to remove any unwanted scale. At the

exit of the pickling tanks, North American Stainless has the ability to provide the customer with an APEX coating if desired. Next, the material will be transported to the inspection station where inspectors will carefully analyze the material to ensure that we are providing the finest quality possible. Finally, the inspected material will be compacted and banded together for shipment.

We can provide you with a variety of diameters, steel grades, and coil sizes. Our material will range from 5.5mm (.21654") to 42mm (1.654") with coil sizes up to approximately 5,000#.

WIRE ROD

AISI	NAS	C	Si	Mn	P	S	Cr	Ni	N (ppm)	Ti	Mo	Cu	Sn	Pb (ppm)	B	Fe σ
302	112	.09-.11	.25-.45	.6-1.00	<=.04	<=.003	18.20-18.60	8.05-8.25	<=500		<=.30	<=.30	<=.025	<=10		
302	113	.065-.080	.45-.65	1.00-1.40	<=.04	<=.003	17.85-18.20	8.60-8.80	450-650		<=.70	<=.50	<=.025	<=10	<=.005	3.60
302	114	.065-.080	.40-.60	1.00-1.40	<=.04	<=.003	18.00-18.50	8.50-8.80	200-500		<=.50	<=.50	<=.025	<=10	<=.005	
304	115	.07-.08	.25-.45	1.00-1.40	<=.04	<=.003	18.00-18.40	8.05-8.25	700-900		<=.60	<=.50	<=.025	<=10		.75
304	116	.06-.075	.25-.45	.45-.75	<=.04	<=.003	18.00-18.30	8.00-8.30	.045-.065		<=.05	<=.50	<=.025	<=10		3.65
304	130	.05-.07	.25-.45	1.30-1.70	<=.04	<=.003	18.10-18.50	8.05-8.25	<=700		<=.60	<=.50	<=.025	<=10		3.20
304	134	.04-.06	.25-.45	1.30-1.70	<=.04	.02-.03	18.10-18.50	8.05-8.25	700-900		.25-.45	<=.50	<=.025	<=10		2.63
304	141	.035-.055	.25-.45	1.00-1.40	<=.04	<=.003	18.00-18.30	8.60-8.80	<=500		<=.60	<=.50	<=.025	<=10		4.00
304L	142	<=.030	.25-.45	1.30-1.70	<=.04	<=.003	18.10-18.40	8.60-8.80	<=600		<=.60	.40-.60	<=.025	<=10		3.50
304L	143	<=.030	.25-.45	1.30-1.70	<=.04	.02-.03	18.10-18.40	8.60-8.80	700-900		.25-.45	<=.50	<=.025	<=10		3.12
304	144	.06-.075	.25-.45	.50-1.00	<=.04	<=.003	18.00-18.30	8.50-8.80	.03-.05		<=.50	<=.50	<=.025	<=10		3.50
302	145	.060-.075	.25-.45	1.00-1.40	<=.04	<=.003	18.00-18.30	8.70-8.90	<=400		<=.50	<=.50	<=.025	<=10		3.00
302	146	.09-.11	.80-1.0	1.00-1.50	<.04	<.003	17.00-17.50	8.00-8.40	.01-.04		<=.50	<=.50	<=.025	<=10		4.30
302	147	.050-.075	.20-.60	.90-1.50	<.03	<.003	18.00-18.80	8.30-8.80	.015-.045		<=.50	<=.50	<=.025	<=10		
303	155	.045-.055	.30-.50	1.80-2.00	<=.04	.32-.36	17.40-17.80	8.55-8.75	<=500	.01	.25-.45	<=.50	<=.025	<=10	.001-.003	1.25
303	156	.045-.055	.30-.50	1.80-2.00	<=.04	.30-.35	17.40-17.80	8.55-8.75	<=500	.01	.25-.45	<=.50	<=.025	<=10	.001-.003	1.25
304L	180	<=.020	.25-.45	1.35-1.65	<=.04	<=.003	18.10-18.50	9.10-9.30	<=500		<=.60	.40-.60	<=.025	<=10		
304	183	.040-.060	.30-.70	1.50-2.00	<=.03	<=.003	18.00-18.50	9.15-9.50	.02-.04		<=.50	<=.50	<=.025	<=10		3.00
304	184	.040-.060	.30-.60	1.00-1.30	<=.03	<=.003	18.10-18.50	9.00-9.30	.02-.04		<=.50	<=.50	<=.025	<=10		3.70
304L	200	<=.020	.30-.75	1.40-1.80	<=.03	<=.003	18.10-18.15	9.50-9.80	<=.040		<=.50	<=.50	<=.025	<=10		4.00
304L	201	<=.025	.10-.50	.80-1.40	<=.03	<=.003	18.30-18.70	9.80-10.20	<=0.040		<=.50	<=0.50	<=.025	<=10		4.40
304L	205	<=.020	.25-.45	1.30-1.70	<=.04	<=.003	18.10-18.50	10.10-10.40	<=300		<=.60	.40-.60	<=.025	<=10		3.70
305	215	.01-.03	.30-.70	1.00-1.60	<=.03	<=.003	18.50-19.00	11.25-11.75	.02-.05		<=.50	<=.50	<=.025	<=10		2.20
310S	220	.040-.060	.25-.45	1.40-1.80	<=.03	<=.003	25.00-25.60	19.20-19.60	<=300	.060-.080	<=.50	<=.50	<=.025	<=10	.002-.004	2.20
316	250	.040-.060	.25-.45	1.30-1.70	<=.04	<=.003	16.80-17.20	10.10-10.40	<=500		2.05-2.25	<=.50	<=.025	<=10		
316	254	.04-.06	.25-.45	1.30-1.70	<=.04	.02-.03	16.80-17.20	10.10-10.40	<=500		2.05-2.25	<=.50	<=.025	<=10	.003-.005	
316L	264	<=.030	.25-.45	1.30-1.70	<=.04	.02-.03	16.70-17.10	10.55-10.75	<=500		2.05-2.25	<=.50	<=.025	<=10	.003-.005	2.60
316L	273	<=.030	.25-.45	1.50-1.80	<=.04	<=.003	16.80-17.20	10.10-10.40	<=500		2.05-2.25	<=.50	<=.025	<=10	.003-.005	3.60
316L	277	<=.03	.25-.45	1.50-1.90	<=.04	.02-.03	16.60-17.00	11.10-11.40	<=500		2.55-2.75	<=.50	<=.025	<=10	.003-.005	
316LN	279	<=.03	.25-.45	1.30-1.70	<=.04	<=.015	17.50-17.90	11.55-11.85	1600-2200		2.70-2.90	<=.50	<=.025	<=10	.003-.005	
316	290	.05-.07	.30-.60	.85-1.15	<=.035	<=.003	17.20-17.50	10.50-10.75	300-500		2.0-2.25					2.30
314	300	.03-.05	2.10-2.50	1.50-1.90	<=.03	<=.003	24.00-24.60	20.50-21.00	<=400		<=.30	<=.50	.025	<=10		3.60
321	315	.02-.04	.30-.60	1.50-1.90	<=.04	<=.005	17.10-17.50	9.60-9.80	<=250	.20-.35	<=.60	<=.50	.025	<=10		3.00
416	455	.08-.10	.20-.50	.60-.90	<=.035	.32-.37	12.75-13.25	.20-.40	.02-.05		.02-.04					5.65
304Cu	494	<=.020	.20-.60	1.00-1.50	<=.03	<=.003	17.50-18.00	9.40-10.00	<=.030		<=.50	3.30-3.80	<=.025	<=10		
304Cu	495	<=.025	.20-.60	.40-.90	<=.03	<=.003	17.50-18.00	9.40-10.00	<=.030		<=.50	3.30-3.80	<=.025	<=10		
430	500	.015-.03	.20-.50	.30-.60	<=.04	<=.003	16.50-17.00	<=.050	<=500		<=.25	<=.30	<=.025	<=10		.95
409	803	<=.01	.30-.72	<.50	<.03	<=.003	11.00-11.50	.20-.50	<100	.18-.40	<=.25	<=.30	.025	<=10		
409M	804	<=.01	.30-.72	<.50	<.03	<=.003	11.00-11.50	.75-1.00	<100	.20-.80	<=.25	<=.30	<=.025	<=10		
2205	900	<=.020	.25-.45	1.55-1.95	<=.03	<=.001	22.10-22.70	4.60-4.90	1600-2200	.02-.06	3.20-3.40	<=.30	<=.025	<=10	.002-.004	30



COLD DRAWN BAR



Cold drawn bar is another of our premier products at North American Stainless. Our cold drawn material is processed using technologically advanced combined lines. Since initial start up, we have installed 4 additional lines that allow us to process a wide variety of sizes.

Those sizes range from .1875 up to 1.1875 depending on the steel grade. In 303 we produce material that will range from .207 to .875. In 304, 304L, and 316L we produce material that will range from .1875 to 1.1875. As this material is produced, it passes through an in line Eddy-Current test which enables us to provide the finest quality possible.

At the exit of the combined lines, we have installed four centerless grinders. At your request, this equipment allows us to provide you with a top of the line finish, as well as the tight tolerance (+/- .0005) that you sometimes need.

Depending on your needs, we can package our cold drawn material in a variety of ways. You can order as bare bars, bars with paper wrapping, or bars that are protected in a wooden box.

PEELED BAR



North American Stainless uses state of the art equipment to provide you the customer with top of the line peeled bar. After annealing, the process starts by the material going through the coil to bar or the bar to bar straightener depending on the size of the material. The material will then move through the peeler and burnisher which will provide the cold finished product that is needed.

We produce cold finished bar in a variety of sizes. If the material is 303, we can provide material that ranges from

anything greater than 1/2" up to 5". If the material is 304/304L or 316/316L, we can provide material that ranges from 1-1/4" up to 5".

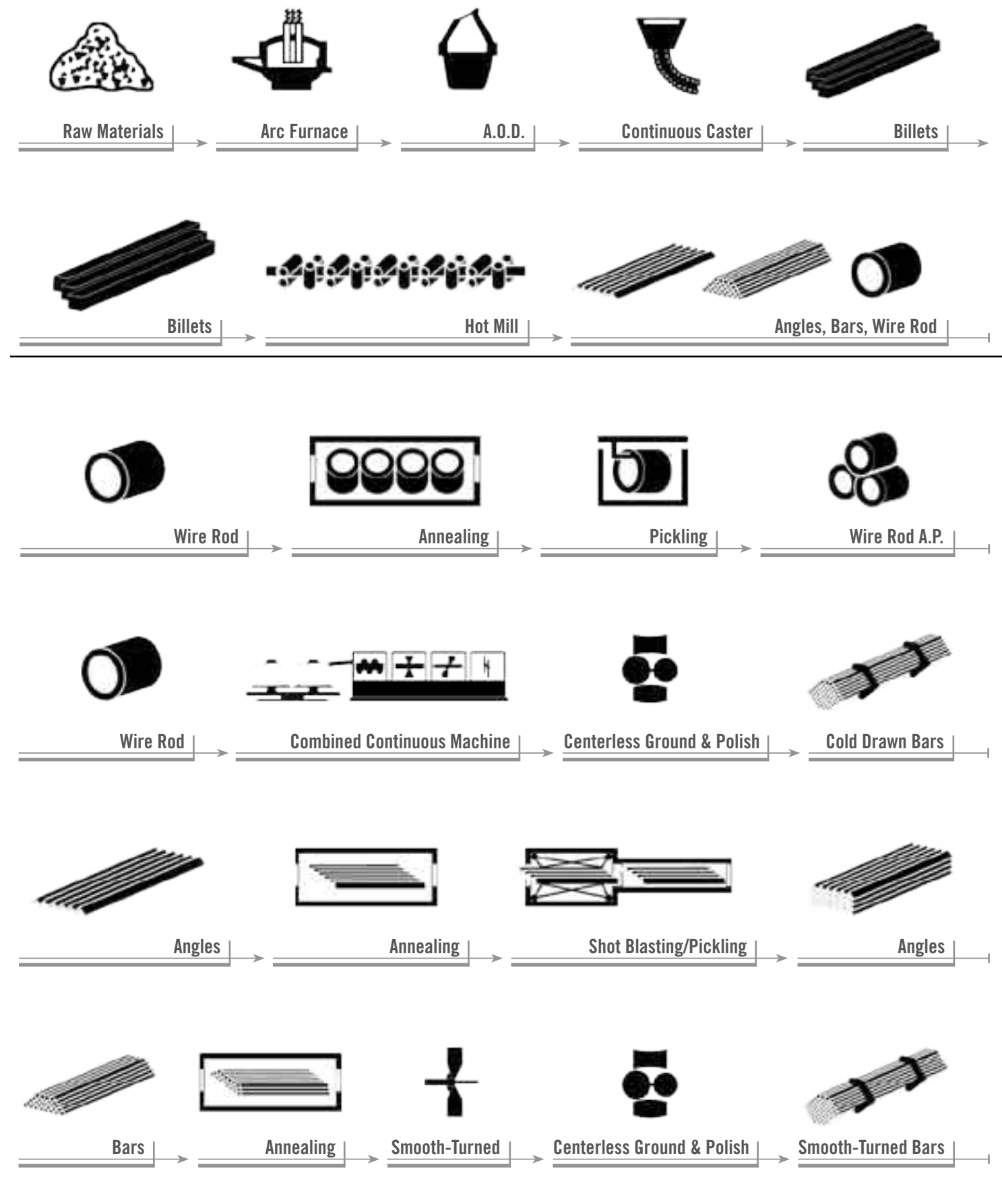
Along with the variety of size ranges we can provide you with a cold finished bar that has a very tight tolerance of +/- .0005. This is accomplished by processing the material through our centerless grinder. We can also provide a cold finished bar that is chamfered on one end.

BAR

AISI	NAS	C	Si	Mn	P	S	Cr	Ni	N (ppm)	Ti	Mo	Cu	Sn	Pb (ppm)
303	155	.045-.055	.30-.50	1.80-2.00	<=.040	.32-.36	17.40-17.80	8.55-8.75	<=500	.01	.25-.45	<=.5	<=.025	<=10
304	134	.04-.06	.25-.45	1.30-1.70	<=.040	.02-.03	18.10-18.50	8.05-8.25	700-900		.25-.45	<=.5	<=.025	<=10
304L	143	<=.030	.25-.45	1.30-1.70	<=.040	.02-.03	18.10-18.40	8.60-8.80	700-900		.25-.45	<=.5	<=.025	<=10
316L	264	<=.030	.25-.45	1.30-1.70	<=.040	.02-.03	16.70-17.10	10.55-10.75	<=500		2.05-2.25	<=.5	<=.025	<=10
416	455	.08-.10	.20-.50	.60-.90	<=.035	.32-.37	12.75-13.25	.20-.40	.02-.05		.02-.04			

SPECIFICATIONS	FINISH	SIZE	UTS (KSI)	YS (KSI)	EI (%)	RA (%)	HARDNESS
303							
QQ-S-764B Condition A AMS 5640 ASTM A582	HOT						150 MIN 220 MAX
	COLD						255 MAX
304							
QQ-S-763A Condition A AMS 5639 ASTM A276 ASTM 479	HOT	1/2" & LESS OVER 1.2"	115 MAX 75 MIN	30 MIN	40 MIN	50 MIN	140 MIN 241 MAX
	COLD	1/2 & LESS OVER 1/2"	125 MAX 75 MIN	30 MIN	30 MIN	50 MIN	
304L							
Condition A AMS 5639 ASTM A276 ASTM 479	HOT	1/2" & LESS OVER 1.2"	115 MAX 70 MIN	25 MIN	40 MIN	50 MIN	140 MIN 241 MAX
	COLD	1/2 & LESS OVER 1/2"	155 MAX 70 MIN	25 MIN	30 MIN	40 MIN	
316L							
Condition A AMS 5647 ASTM A276 ASTM 479	HOT	1/2" & LESS OVER 1.2"	115 MAX 70 MIN	25 MIN	40 MIN	50 MIN	140 MIN 255 MA
	COLD	1/2 & LESS OVER 1/2"	155 MAX 70 MIN	25 MIN	30 MIN	40 MIN	
416							
ASTMA 582	HOT		70 MIN	40 MIN	15 MIN	45 MIN	241 MAX
	COLD		70 MIN	40 MIN	15 MIN	45 MIN	

PROCESS FLOW CHART



ANGLE



Our finishing angle bay consists of the following: angle straightener, shot-blast machine, and a tunnel pickling line. Once the angle is rolled at our hot mill, it will be transported to the angle straightener. It will pass through the straightener into a shot-blast machine which will remove any scale that is remaining on the material. The final step is to run the angle through a tunnel pickling line. Once the material exits the pickling line, it will be inspected, stenciled, and packaged.

Currently, North American Stainless is producing a variety of angle sizes. We can provide you with material that ranges from 1/8" to 1/2" thick while having equal legs of 3/4" to 4". Currently, we are producing angle in lengths up to 24ft +/- 1 foot. By having this wide range of sizes we are able to provide you with the wide range of material that you need.

ANGLE

AISI	NAS	C	Si	Mn	P	S	Cr	Ni	N (ppm)	Ti	Mo	Cu	Sn	Pb (ppm)
304L	142	<=.03	.25-.45	1.30-1.70	<=.04	<=.003	18.10-18.40	8.60-8.80	<=600		<=.60	.40-.60	<=.025	<=10
316L	273	<=.03	.25-.45	1.50-1.80	<=.04	<=.003	16.80-17.20	10.10-10.40	<=500		2.05-2.25	<=.50	<=.025	<=10

GRADE	WIDTH	ELONG	YEILD	BHN	RA	TENSILE
304L	All	30 MIN	30 MIN	140-255	50 MIN	75 MIN
316L	All	30 MIN	30 MIN	140-255	50 MIN	75 MIN



REBAR



NAS offers stainless reinforcement bar in the grades and sizes listed. Stainless is used for concrete reinforcement in applications requiring resistance to corrosion or controlled magnetic permeability. Possible applications are highway bridges, parking garages, coastal facilities, and other structures.

The non magnetic condition is desirable in certain military, medical and scientific applications. When one looks at the life cycle costs of stainless reinforcement bar compared with ordinary reinforcement bar stainless can be more economical.

REBAR

ASTM-A 955 Designation	US Common Designation	SIZE			Canada Common Designation	SIZE	
		mm	Aprox Inch	Aprox Inch		mm	Aprox Inch
10	#3	9.5 mm	.375"	3/8"	10 M	11.3mm	.394"
13	#4	12.7 mm	.500"	1/2"			
16	#5	15.9 mm	.625"	5/8"	15 M	16 mm	.630"
19	#6	19.1 mm	.750"	3/4"	20 M	19.5 mm	.787"
22	#7	22.2 mm	.875"	7/8"			
25	#8	25.4 mm	1.000"	1"	25 M	25.2 mm	.984"
29	#9	28.7 mm	1.128"	1 1/8"	30 M	29.9 mm	1.180"
32	#10	32.3 mm	1.270"	1 1/4"			
36	#11	35.8 mm	1.410"	1 3/8"	35 M	35.7 mm	1.380"
43	#14	43.0 mm	1.693"	1 11/16"	45M	43.7 mm	1.772"

Bar Designation	Nominal Mass lbs/ft 300 Series	Diameter Inch.	Nominal Dimensions (Cross-Sectional) Area Inch 2	Perimeter Inch.	Max Avg Spacing Inch.	Min Avg Height Inch	Max Gap (Chord of 21.5% of Nom. perimeter) Inch
10 #3	.378	.375	.110	1.178	.262	.015	.143
13 #4	.686	.500	.200	1.571	.350	.020	.191
16 #5	1.058	.625	.310	1.963	.437	.028	.239
19 #6	1.511	.750	.440	2.356	.525	.038	.286
22 #7	2.059	.875	.600	2.749	.612	.044	.334
25 #8	2.713	1	.790	3.142	.700	.050	.383
29 #9	3.441	1.128	1	3.544	.790	.056	.431
32 #10	4.358	1.270	1.270	3.990	.889	.064	.487
36 #11	5.352	1.410	1.560	4.430	.978	.071	.540
43 #14	7.720	1.693	2.250	5.319	1.185	.085	.648

Tensile Requirements	Grade 40 (300)	Grade 60 (420)	Grade 75 (520)	
Tensile Strength, Min, KSI	70 KSI	90 KSI	100 KSI	
Yield Strength, Min, KSI	40 KSI	60 KSI	75 KSI	
Bar Elongation Elongation in 8 in. min%	Grade 300	Grade 420	Grade 520	
ASTM A-955				Common Designation
10	11	9		3
13,16	12	9		4, 5
19	12	9	7	6
22, 25		9	7	7, 8
29, 32, 36		8	6	9, 10, 11
43		7	6	14





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