

# Stainless Steel Alloys

Gas Metal Arc Welding  
(GMAW) MIG Wires

Gas Tungsten Arc Welding  
(GTAW) TIG Alloys

Shielded Metal Arc Welding  
(SMAW) Stick Electrode



"The Royal Line"

**CROWN ALLOYS COMPANY**

30105 Stephenson Hwy, Madison Heights, MI 48071  
(248) 588-3790 (800) 521-7878 [www.crownalloys.com](http://www.crownalloys.com)

## Cut length - (TIG) or (GTAW) Spooled Wire - (MIG) or (GMAW) AWS A5.9/A5.9M

### ER 316L

TIG Diameter	Part Numbers	
	1# Package	10# Package
.030 x 36"	ST316/TXE-BP	ST316/TXE
.035 x 36"	ST316/TFX-BP	ST316/TFX
.045 x 36"	ST316/TXG-BP	ST316/TXG
1/16 x 36"	ST316/TXL-BP	ST316/TXL
3/32 x 36"	ST316/TXN-BP	ST316/TXN
1/8 x 36"	ST316/TXO-BP	ST316/TXO
5/32 x 36"	ST316/TXP-BP	ST316/TXP

MIG Diameter	Part Numbers		
	2 lb Spools	8" Spools	33 lb Spools
.035	SS316/1XF	SS316/2XF	SS316/3XF
.045	SS316/1XG	SS316/2XG	SS316/3XG

## Coated Electrodes (SMAW) AWS A5.4/A5.4M

### E 316L-16

Electrode Diameter	Part Numbers	
	1# Package	5# Package* or 10# Package
3/32	SE316/EXN-BP	SE316/EXN*
1/8	SE316/EXO-BP	SE316/EXO
5/32	SE316/EXP-BP	SE316/EXP
3/16	SE316/EXQ-BP	SE316/EXQ

See next page for Stick Electrode (SMAW) welding procedures.

## TYPICAL APPLICATIONS

Used for welding 316L wrought alloys & CF-8M cast alloys & other low-carbon molybdenum bearing austenitic alloys. The presence of molybdenum provides creep resistance at elevated temperatures. The low carbon content increases the resistance to intergranular corrosion and helps to inhibit weld cracking.

Tensile strength:  
70,000 psi (min.)

## ER 316LSi

TIG Diameter	Part Numbers	
	1# Package	10# Package
.030 x 36"	ST316/TZE-BP	ST316/TZE
.035 x 36"	ST316/TZF-BP	ST316/TZF
.045 x 36"	ST316/TZG-BP	ST316/TZG
1/16 x 36"	ST316/TZL-BP	ST316/TZL
3/32 x 36"	ST316/TZN-BP	ST316/TZN
1/8 x 36"	ST316/TZO-BP	ST316/TZO

MIG Diameter	Part Numbers		
	2 lb Spools	8" Spools	33 lb Spools
.023	SS316/1ZD	SS316/2ZD	SS316/3ZD
.030	SS316/1ZE	SS316/2ZE	SS316/3ZE
.035	SS316/1ZF	SS316/2ZF	SS316/3ZF
.045	SS316/1ZG	SS316/2ZG	SS316/3ZG

Similar usage as above,† except the higher silicon content (0.65 – 1.00%) improves wash and wetting behavior.

Tensile strength:  
79,000 psi (min.)

## ER 317L

MIG Diameter	Part Numbers		
	2 lb Spools	8" Spools	33 lb Spools
.035	SS317/1XF	SS317/2XF	SS317/3XF
.045	SS317/1XG	SS317/2XG	SS317/3XG

317L is used to weld alloys of similar composition. It is utilized in severely corrosive environments where crevice and pitting corrosion are of concern. The low carbon content reduces the possibility of intergranular carbide precipitation. This increases the resistance to intergranular corrosion.

Tensile strength:  
75,000 psi (min.)

# Stainless Steel Electrode (SMAW) Welding Procedure



## Welding Parameters for 300 and 400 series Stainless Steel Covered Electrodes

### Specifications

- **SMAW (Shielded Metal Arc Welding) – Crown Alloys stainless steel covered stick electrodes** are exactly manufactured to conform to the requirements of **American Welding Society (AWS) Filler Metal Specification A5.4/A5.4M**.

Most of the **Crown Alloys stainless electrodes** have a titania coating (-16 suffix). Titania-covered electrodes are very popular because they are designed to work with AC or DC machines *and* they operate in all positions. The **Crown stainless covered electrodes** exhibit smooth arc action, low amount of fine spatter and easy slag removal.

### Precautions

- **Crown Alloys stainless steel coated electrodes** should be treated and stored as low hydrogen electrodes. They should not be exposed to damp air, and once a sealed bag is opened, the electrodes should be used entirely or stored in a warm, dry and sealed container.

### Procedure

- For high quality welds, joints must be clean and dry. Welding current can be either DC reverse polarity (DCEP) or AC. However, DCEP always ensures the best weldability and penetration. Use a short arc, but keep the coating (flux) from touching the puddle. Try to run these **stainless steel electrodes** as cool as possible. Start welding at the low end of the amp range and increase amps until a smooth and stable arc is established. Fill each crater before breaking the arc to avoid crater cracks. On deep groove butt joints, the root pass should penetrate only enough to fuse to both plates and seal the opening. More penetration may cause cracks.

### Recommended Welding Parameters for Stainless Steel Stick Electrodes Direct Current Electrode Positive\* (DCEP)

Wire Diameter (inches)	Welding Current (amperage)						Arc Voltage (volts)
	300 Series			400 Series			
	Flat	Vertical	Overhead	Flat	Vertical	Overhead	
1/16	20 – 45	15 – 35	20 - 40	N/A	N/A	N/A	21 - 26
5/64	30 – 50	25 – 40	30 – 45	N/A	N/A	N/A	22 – 26
3/32	45 – 80	35 – 60	40 – 65	50 - 75	40 – 55	45 – 65	22 - 26
1/8	70 – 110	60 - 75	65 – 90	80 – 115	65 – 80	75 – 100	22 - 26
5/32	100 – 145	85 – 100	95 – 120	115 – 160	95 – 110	105 – 130	23 – 26
3/16	130 – 190	100 – 115	125 – 150	150 – 210	115 – 130	145 – 170	22 - 25
1/4	175 – 270	Not Recommended	Not Recommended	235 – 310	Not Recommended	Not Recommended	22 - 25

\*When the welder is in the AC position, use an amp range that is 10% to 20% greater than that of the DCEP position.

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## Filler Metal Selector Guide for Stainless Steels *(page 1)*

Stainless Steel or Steel Base Alloy	442	430F	430	501	416	403	321	317	316L	316	314	310	309	304L	303	201	MILD STEEL				
	446	430FSE	431	502	416SE	405	348					310S	309S		303SE	202		301	302	302B	304
201-202	310	310	310	310	309	309	347	308	308	308	308,	308	308	308	308	308	312				
301-302	312	312	312	312	310	310	308	316	316	316	309					310					
302B-304	309	309	309	309	312	312		317			310					309					
305-308																					
303	310	310	310	310	309	309	347	308	308	308	308,	308	308	308	308-15	308	312				
303SE	309	309	309	309	310	310	308	316	316	316	309					310					
	312	312	312	312	312	312	317	317			310					309					
304L	310	310	310	310	309	309	347	308	308L	308	308,	308	309	308L	308	308	312				
	309	309	309	309	310	310	308L	316		316	309		308			310					
	312	312	312	312	312	312	317	317		310	310		308			309					
309	310	310	310	310	309	309	347	317	316	316	309	309	309	309	308	308	309				
309S	309	309	309	309	310	310	308	316	309	309	310	310	310	308		310					
	312	312	312	312	312	312	309	309		310						312					
310	310	310	310	310	310	310	347	317	310	316	310	310	309	308	308	308	310				
310S	309	309	309	309	309	309	308	316	316	310			310			309					
	312	312	312	312	312	312	309	309	309	309						312					
314	310	310	310	310	310	310	309	309	309	309	310-15	310	309	308,	308,	308,	310				
	312	312	312	312	312	309	310	310	310	310			310	309	309	309					
	309	309	309	309	309	312	347	317	316	316				310	310	310					
316	310	310	310	310	309	309	347	316	316	316	309	316	316	308	308	308	309				
	309	309	309	309	310	310	308	308			310	310	309	316	316	316					
	312	312	312	312	312	312					316	309	310			312					
316L	310	310	310	310	309	309	347	316	316L	316	309	310	316	308L	308	308	309				
	309	309	309	309	310	310	308	317			310	316	309		316	316					
	312	312	312	312	312	312	308	308			316	309				312					

Bold numbers indicate first choice, light numbers indicate second and third choice. This choice can vary with specific applications and individual job requirements.

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## Filler Metal Selector Guide for Stainless Steels *(page 2)*

Stainless Steel or Steel Base Alloy	442	430F 430FSE	430 431	501 502	416 416SE	403 405 410 420 414	321 348 347	317	316L	316	314	310 310S	309 309S	304L	303 303SE	201 202 301 302 302B 304 305 308	MILD STEEL
317	310 309 312	310 309 312	310 309 312	310 309 312	309 310 312	309 310 312	308 347	317	316 317 308	316 308	309 310 317	317 316 309	317 316 309	308 316 317	308 316 317	308 316 317	309 310 312
321 348 347	310 309 312	310 309 312	310 309 312	310 309 312	309 310 312	309 310 312	347	308 347	347 308	347 308	309 310 347	347 308	347 308	347 308L 308	347 308	347 308	309 310 312
403-405 410-420 414	310 309 312	310 309 312	310 309 312	310 309 312	410-15* 309** 310**	410* 309**	309 310 312	309 310 312	309 310 312	309 310 312	310 309 312	310 309 312	309 310 312	309 310 312	309 310 312	309 310 312	309 310 312
416 416SE	310 309	310 309	310 309	310	410-15*	410-15* 309** 310**	309 310 312	309 310 312	309 310 312	309 310 312	310 312 309	310 309 312	309 310 312	309 310 312	309 310 312	309 310 312	309 310 312
501 502	310	310	310	502* 310**	310	310 309 312	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 312 309
430 431	310 309	310 309	430-15* 310** 309**	310	310 309	310 309 312	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312
430F 430FSE	310 309	410-15*	310 309	310	310 309	310 309 312	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312
442 446	309 310	310 309	310 309	310	310 309	310 309 312	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312	310 309 312	310 309 312	310 309 312	310 312 309	310 309 312

\*Preheat    \*\*No Preheat Necessary    Bold numbers indicate first choice, light numbers indicate second and third choice. This choice can vary with specific applications and individual job requirements.



**!!!! WARNING !!!!**



**WELDING FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH.**

**BEFORE USING THIS PRODUCT THE WELDER (END-USER) MUST READ AND UNDERSTAND THE COMPLETE PRODUCT WARNING LABEL AND THE NEW 16 SECTION SAFETY DATA SHEET (SDS).**

**THE SAFETY DATA SHEET (SDS) WHICH OUTLINES THE POTENTIAL HEALTH HAZARDS AND SAFETY INFORMATION RELATED TO THIS PRODUCT CAN BE DOWNLOADED FROM THE SDS PORTION OF THIS WEBSITE. IT IS ALSO AVAILABLE FROM YOUR EMPLOYER AND WELDING SUPPLY DISTRIBUTOR.**

**DO NOT PROCEED WITH USE OF THIS PRODUCT UNTIL YOU READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) AND PRODUCT WARNING STATEMENT.**

**BE SURE TO CONSULT THE LATEST VERSION OF THE SDS.**

**SEE THE PRODUCT WARNING LABEL AND SDS FOR COMPLETE WARNING INFORMATION.**

