

## Carbon Steel Solid Wires for MIG/MAG

### ER70S-3

A deoxidized wire used for mild and low alloy steel general purpose fabrication. Good for out-of-position welding using short circuiting transfer with 75% Ar +25% CO<sub>2</sub> or CO<sub>2</sub> shielding gases. Good performance over mill scale and rust.

### ER70S-6

The high silicon content increases the fluidity of the weld pool, creating a smoother bead appearance and resulting in minimal post-weld grinding.

AWS Classification	Chemical Composition (as percentages)					Typical Mechanical Properties			
	C	Mn	Si	P	S	TS (PSI)	YS (PSI)	ELONG %	ft. lbs.@-20°F
ER70S-3	0.06 – 0.15	0.90 – 1.40	0.45 – 0.70	0.025	0.035	78,000	63,000	25	32
ER70S-6	0.07 – 0.15	1.40 – 1.85	0.80 – 1.15	0.025	0.035	84,000	71,000	26	43

**Note:** Single values shown are maximum. Ni, Cr, Mo and V maybe present but are not intentionally added. The maximum weight of copper due to any coating plus the residual copper content in the steel shall be .50.



AWS Classification	Size (inch)	Part No.		
		2 lb. Spool	11 lb. Spool	33 lb. Spool
ER70S-3	.030	S3-030-2		
	.035	S3-035-2		
	.045	S3-045-2		
ER70S-6	.023	S6-023-2	S6-023-11	
	.030	S6-030-2	S6-030-11	S6-030-33
	.035	S6-035-2	S6-035-11	S6-035-33
	.045	S6-045-2	S6-045-11	S6-045-33

## Aluminum Solid Wires

### ER4043

5% Si bare Aluminum welding wire, flows freely at 1155°F. Recommended for welding 3003, 3004, 5052, 6061, 6063, casting alloys 43, 355, 356, 214.

### ER5356

5356, 5% Mg bare Aluminum welding wire, flows freely at 1180°F. Recommended for joining 5050, 5052, 5083, 5454, and 5456.

AWS Classification	Chemical Composition (as percentages)									
	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Others	Al
ER4043	4.5 – 6.0	0.80	0.30	0.05	0.05		0.10	0.20	0.15	Rem
ER5356	0.25	0.50	0.10	0.05 – 0.20	4.5 – 5.5	0.05 – 0.20	0.10	0.06 – 0.20	0.15	Rem

**Note:** Single values shown are maximum percentages, unless otherwise specified.

### Spools

AWS Classification	Size (inch)	Part No.		
		1 lb. Spool	12 lb. Spool	16 lb. Spool
ER4043	.030	4043-030-1	4043-030-12	
	.035	4043-035-1		4043-035-16
	3/64	4043-364-1		4043-364-16
	1/16			4043-116-16
ER5356	.030	5356-030-1		
	.035	5356-035-1		5356-035-16
	3/64	5356-364-1		5356-364-16
	1/16	5356-116-1		5356-116-16

### Cut Lengths

AWS Classification	Size (inch)	Part No.
		10 lb. Tube/40 lb. Box
ER4043	1/16	4043-116-36
	3/32	4043-332-36
	1/8	4043-18-36
ER5356	1/16	5356-116-36
	3/32	5356-332-36
	1/8	5356-18-36

#### Helpful Hint

An increase in wire feed speed will increase your amperage.

## Welding Rods

### Gas Welding Rods

#### RG45

This is a copper coated, iron based low alloy steel rod, predominately used for torch welding mild steel alloys. This alloy offers very good machinability and ductility for ordinary purposes, where a minimum tensile strength is often used for gas fusion welding of plate, sheet, structural shapes, pipe and castings.

#### RG60

This is a steel rod used for torch welding of various carbon steels. These rods consistently produce medium to high quality welds.

#### Silicon Bronze

A copper alloy, suitable for welding copper and other copper alloys, and for many sheet metal applications employing plain and galvanized steel. Melting point 1866°F.

#### Low Fuming Bronze

A low-fuming oxy-acetylene brazing rod extensively used for joining of steels and overlaying of cast iron. The fuming qualities and good mechanical properties make this a widely used general purpose rod. Melting point 1620°F.

AWS Classification/ Description	Chemical Composition (as percentages)									
	C	Cu	Zn	Sn	Mn	Fe	Si	P	Al	Pb
RG45	0.08	0.30		0.04	0.50	Rem	0.10	0.035	0.02	
RG60	0.16	0.30		0.35	0.90 - 1.40	Rem	0.10 - 0.35	0.035		
Silicon Bronze Bare		94.0 min.	1.50	1.50	1.50	0.05	2.8 - 4.0		0.01	0.02
Low Fuming Bronze Bare		56.60	Bal	0.80 - 1.10	0.01 - 0.50	0.25 - 1.20	0.04 - 0.15		0.01	0.05
Low Fuming Bronze Flux Coated		56.60	Bal	0.80 - 1.10	0.01 - 0.50	0.25 - 1.20	0.04 - 0.15		0.01	0.05

AWS Classification	Size (inch)	Part No.		
		50 lb. Box	1 lb. Tube	5 lb. Tube
R45 (RG45)	1/16	45-116-36		45-116-36-5
	3/32	45-332-36	45-332-36-1	45-332-36-5
	1/8	45-18-36		45-18-36-5
	5/32	45-532-36		
	3/16	45-316-36		
R60 (RG60)	1/16	60-116-36		
	3/32	60-332-36		
	1/8	60-18-36		
	5/32	60-532-36		
	3/16	60-316-36		

Description	Size (inch)	Part No.		
		10 lb. Tube 40 lb. Box	1 lb. Tube	5 lb. Tube
Silicon Bronze	1/16	656-116-36		
	3/32	656-332-36		
	1/8	656-18-36		
		<b>50 lb. Bulk</b>	<b>1 lb. Tube</b>	<b>5 lb. Tube</b>
Low Fuming Bronze Bare	1/16	681-116-36		
	3/32	681-332-36		
	1/8	681-18-36		681-18-36-5
	5/32	681-532-36		
	3/16	681-316-36		
		<b>10 lb. Tube 50 lb. Box</b>	<b>1 lb. Tube</b>	
Low Fuming Bronze (Flux Coated)	1/16		681C-116-18-1	
	1/8	681C-18-36		
	3/32	681C-332-36		

### TIG Wire and Rod

#### ER70S2

This is a premium TIG wire for welding on all grades of mild and carbon steels, producing quality welds with minimal porosity. It contains 5 deoxidizers (Manganese, Silicon, Zirconium, Titanium and Aluminum) which make it an excellent choice for welding over rust and mill scale. No flux required. This product is embossed on both ends for easy identification.

#### ER70S6

This is a mild steel welding wire that contains higher levels of manganese and silicon than other standard grades of MIG wire to produce high quality welds when used on dirty, oily or rusty steel. A higher silicon content increases the fluidity of the weld pool, creating a smoother bead resulting in minimal post-weld grinding. This wire is engineered to provide porosity-free, x-ray quality welds at the highest tensile strength (as welded) of all the plain carbon steel wires.

**Note:** This product requires the use of CO<sub>2</sub> as a shielding gas.

AWS Classification	Size (inch)	Part No.	
		10 lb. Tube/30 lb. Box	1 lb. Tube
ER70S-2	.035	S2-035-36	
	1/16	S2-116-36	
	3/32	S2-332-36	
	1/8	S2-18-36	S2-18-36-1
ER70S-6	1/16	S6-116-36	
	3/32	S6-332-36	
	1/8	S6-18-36	

## Stainless Steel Solid Wires

### 308L

308L contains an average .03% carbon, producing a weld deposit with good resistance against intergranular corrosion caused by carbide precipitation. 308L is commonly used for welding AISI types 304L, 308L, 321, and 347.

### 308LSi

308LSi has a higher silicon content along with a low carbon content. The increased silicon level provides better arc stability and a smoother bead appearance while an average .03% carbon level reduces carbide precipitation. 308LSi produces excellent quality fillet and butt welds. Typical applications would include those of 308 and 308L welding wires.

### 309L

309L contains an average .03% carbon to provide a weld deposit that will offer good resistance against intergranular corrosion caused by carbide precipitation. 309L is excellent for buttering passes and overlay work. Typical applications include those of 309 welding wire.

### 316L

316L is used for welding AISI 316L stainless that may be exposed to organic and inorganic acids. The addition of .03% carbon produces a weld deposit with excellent resistance against intergranular corrosion caused by carbide precipitation.

### 316LSi

316LSi has a higher silicon content along with a low carbon content, producing better arc stability, smoother bead appearance and excellent resistance to carbide precipitation. 316LSi is used for welding austenitic acid-resistant steels such as those containing 18% Cr, 8% Ni, 2-3% Mo.

AWS Classification	Chemical Composition (as percentages)									
	C	Cr	Ni	Mo	Mn	Si	P	S	Fe	Cu
ER308L	0.03	19.5 - 22.0	9.0 - 11.0	0.75	1.0 - 2.5	0.30 - 0.65	0.03	0.03	Rem	0.75
ER308LSi	0.03	19.5 - 22.0	9.0 - 11.0	0.75	1.0 - 2.5	0.65 - 1.00	0.03	0.03	Rem	0.75
ER309L	0.03	23.0 - 25.0	12.0 - 14.0	0.75	1.0 - 2.5	0.30 - 0.65	0.03	0.03	Rem	0.75
ER316L	0.03	18.0 - 20.0	11.0 - 14.0	2.0 - 3.0	1.0 - 2.5	0.30 - 0.65	0.03	0.03	Rem	0.75
ER316LSi	0.03	18.0 - 20.0	11.0 - 14.0	2.0 - 3.0	1.0 - 2.5	0.65 - 1.00	0.03	0.03	Rem	0.75

Single values shown are maximum percentages, unless otherwise specified.

### Spools

AWS Classification	Size (inch)	Part No.		
		2 lb. Spool	10 lb. Spool	30 lb. Spool
ER308L	.023		308L-023-10	
	.030	308L-030-2	308L-030-10	308L-030-30
	.035	308L-035-2	308L-035-10	308L-035-30
	.045			308L-045-30
ER308LSi	.030			308LHS-030-30
	.035			308LHS-035-30
ER309L	.023		309L-023-10	
	.030		309L-030-10	
	.035			309L-035-30
	.045			309L-045-30
ER316L	.023		316L-023-10	
	.030		316L-030-10	
	.035		316L-035-10	316L-035-30
	.045			316L-045-30

### Cut Lengths

AWS Classification	Size (inch)	Part No.	
		10 lb. TB/40 lb. Box	1 lb. TB
ER308L	1/16	308L-116-36	308L-116-36-1
	3/32	308L-332-36	308L-332-36-1
	1/8	308L-18-36	
ER309L	1/16	309L-116-36	
	3/32	309L-332-36	
	1/8	309L-18-36	
ER316L	1/16	316L-116-36	
	3/32	316L-332-36	
	1/8	316L-18-36	

Stainless Steel Rods are 36" cut lengths/10 lbs. per box; 30 lbs. per master.

## Self-Shielded Flux Cored Wires

This flux cored wire is for single pass welding of mild and low alloy steels in all positions. Travel speed is rapid and weld edges are smooth.



AWS Classification	Size (inch)	Part No.		
		2 lb. Spool	10 lb. Spool	25 lb. Spool
E71T-GS	.030	71-030-2	71-030-10	
	.035	71-035-2	71-035-10	71-035-25
	.045	71-045-2	71-045-10	71-045-25

## Electrodes

### Packaged Stick Electrodes

#### E6011

Steel electrode offering excellent mechanical properties in the welding of mild steels, galvanized, and some low alloy steels. The coating produces a forceful, spray-type arc, resulting in deeply penetrating welds in all positions. The slag is thin and readily removable. Operates on AC or DCEP.

#### E6013

Establishes a smooth, quiet, medium penetrating arc that is readily maintained with minimal spatter loss. The slag lifts easily, revealing a finely rippled bead contour. This quick freezing slag gives optimum performance in vertical-down welding. E6013 is ideally suited for general purpose welding, even with small AC and power sources having low open-circuit voltage. Works well on AC and DC.

#### E7014

Has an iron powder covering. The iron powder content yields a high deposition rate in all positions. The welds reflect smooth beads with fine ripples. E7014 is particularly advantageous when poor fit-up exists. The slag is easily removed, often self lifting. E7014 operates on AC, DCEN or DCEP.

#### E7018

Is an efficient, all position, iron powder, low hydrogen type electrode which exhibits excellent mechanical properties, crack resistance, and X-ray quality welds. This electrode offers a quiet, stable, low penetration, spatter-free arc. The moderately heavy slag is remarkably easy to remove, revealing a bead with distinct ripples. Operator appeal is a plus factor. Operates on AC or DCEP.

#### E7018AC

This low-hydrogen type welding electrode is a version of E7018 specifically designed to have optimum characteristics when used with an AC power source. It is very easy to strike and has an extremely stable arc giving it excellent operator appeal. It welds exceptionally well on small, utility-type welders.

#### E7024

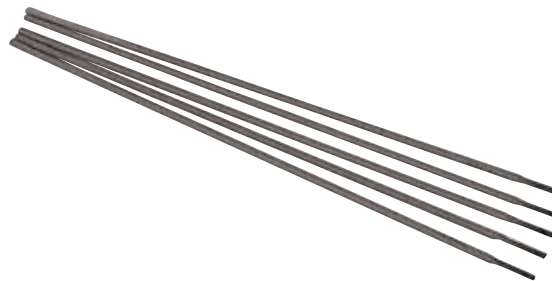
Is a high speed, iron powder, heavy coated electrode for high deposition rates on horizontal and down hand welding. Excellent bead appearance and self-cleaning slag give it operator appeal. This electrode has good weldability and superior mechanical properties and is particularly useful in obtaining increased penetration with little or no root porosity in horizontal or positioned fillets.

#### NI-55

Nickel iron electrode for repairing large defects in cast iron, joining sections over 1/4" thick. For welding modular, malleable and alloy cast irons; high-phosphorus castings.

#### NI-99

Nickel electrode for repairing small defects in cast iron, welding thin cast iron sections together or to steel. Machinability and color match excellent.



AWS Classification	Size (inch)	Part No.	
		1 lb. Box	5 lb. Box
E6011	3/32		6011-332-5
	1/8		6011-18-5
	5/32		6011-532-5
E6013	3/32		6013-332-5
	1/8		6013-18-5
	5/32		6013-532-5
E7014	3/32		7014-332-5
	1/8		7014-18-5
	5/32		7014-532-5
E7018	3/32		7018-332-5
	1/8		7018-18-5
	5/32		7018-532-5
E7018AC	3/32		7018AC-332-5
	1/8		7018AC-18-5
	5/32		7018AC-532-5
E7024	3/32		7024-332-5
	1/8		7024-18-5
	5/32		7024-532-5
NI-55	3/32	NI55-332-1	
ENiFeCl	1/8	NI55-18-1	
NI-99	3/32	NI99-332-1	
ENiCl	1/8	NI99-18-1	

Single values shown are maximum percentages, unless otherwise specified.

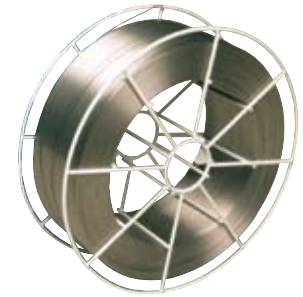
AWS Classification	Chemical Composition (as percentages)				
	C	Mn	Si	P	S
E6011	0.08	0.45	0.18	0.014	0.015
E6013	0.08	0.45	0.18	0.014	0.012
E7014	0.12	0.68	0.33	0.021	0.012
E7018	0.08	1.0	0.6	0.012	0.011
E7024	0.06	.81	0.43	0.018	0.019
E316L-16	0.04	0.5 - 2.5	0.90	0.04	0.03

## Alloys

Avesta Welding LLC offers you the broadest range of stainless steel welding consumables in the industry. They are the ideal choice for products used in extremely corrosive, high stress, and high temperature environments. The following is a list of available alloys.

### Stainless Steel Alloys

- ER 308L Si
- ER 307 Si
- ER 316
- ER 308
- ER 308H
- ER 309L Mo
- 310L
- ER 309
- ER 308L
- ER 309L
- ER 309L Si
- ER317L
- ER 318
- ER 312
- ER 316
- ER 316H
- ER 316L Si
- ER 409
- ER 409 Cb
- ER 310
- ER 347
- ER 347 Si
- ER 385 (904L)
- ER 410
- ER 410 Ni Mo
- ER 420
- ER 318 Si



### High Alloys - Corrosion Resistant

- ER NiCrMo-3
- ER NiCu-7
- ER Ni-1
- P 16
- P 100
- 253 MA
- 353 MA

## Covered Electrodes

Avesta Welding manufactures a wide range of specialized alloys to meet stringent operating conditions. Avesta Welding LLC supplies covered electrodes for welding all of the more common ferritic, martensitic, duplex and austenitic stainless steels as well as nickel-based alloys. The product range also encompasses electrodes for dissimilar welds between, for example, stainless steel and mild steel, or stainless steel and nickel-based alloys. All electrodes are available manufactured to the requirements set forth by the nuclear power industry in ASME code section III and KTA 1408.

Alloy	Size				Applications
	3/32"	1/8"	5/32"	3/16"	
P 100*	59735	59736	59738		For welding SAF 2507® and similar type alloys.
P 16	59776	59777	59778		A nickel base electrode for welding Avesta Sheffield 654 SMO® also suitable for nickel-based C-type alloys.
253 MA	59664	59666	59667	59668	For welding Avesta Sheffield 253 MA, a high temperature alloy typically used for furnaces, combustion chambers, etc.
353 MA	60410	59669	59670		For welding Avesta Sheffield 353 MA, a high temperature alloy typically used in carburizing and nitriding atmospheres.

\*Call or request special ordered items.

## Covered Electrodes

### Stainless Steel, Duplex & Nickel Alloys

Avesta covered electrodes are manufactured in strict accordance to the relevant specification and in full compliance with ISO 9001:2000 Quality System requirements. On-going research and development insures that the product line evolves to meet the needs of today's changing technical requirements, while continuing to provide to the welder uncompromising ease of use.

#### Special Purpose

Special purpose electrodes allow you to choose the easy to use, versatile electrode best suited to your application, resulting in improvements in productivity, weld appearance, and overall costs.

#### VDX-AC/DC

Developed for vertical-down applications, these electrodes are well suited for welding thin gauge material and duct work, plus offer substantial cost savings over TIG welding. The high speed of welding they provide gives time and cost savings when welding root beads in vertical positions. They also allow carefully controlled penetration, thereby minimizing root grinding costs.

#### HX-AC/DC

A high recovery - high deposition rate electrode that reduces the risk of heat distortion, reduces changeover time and the number of passes required. Fewer starts and stops means fewer defects, lower re-work costs and greater production output.

#### 3D

Avesta 3D electrodes have been specially developed for flexible welding in all common welding positions. 3D electrodes have extremely good weldability and give a stable arc. The slag and weld pool are both easy to control.



Alloy	Diameter (in.)					
	1/16	5/64	3/32	1/8	5/32	3/16
E 308H-17	59639	59640	59642	59644	59646	59648
E 308L-15 Basic			59603	59604	59605	
E 308L-16			60745	60746	60747	64001
E 308L-17	60211	64007	64008	64009	64010	64011
E 309-17			59635	59637	60245	59638
E 309L-15 Basic			59631	59632	59633	
E 316L-16			60751	60752	60753	64002
E 309L-17	60218	64019	61909	61910	64017	64018
E 309MoL-17		64028	64027	64029	64030	64031
E 310-17			59657	59658	59661	59663
E 312-17			59764	59766	59767	59768
E 316H-17			59678	59680	59681	59682
E 316L-15 Basic			60449	59671	59672	66786
E 316L-16			60748	60749	60750	64003
E 316L-17	60264	64012	64013	64014	64015	64016
E 317L-17		59721	59722	59724	59726	59728
E 347-17		64964	64965	64966	64967	64968
E 385-17 (904L)			59730	59732	59733	59734
E 2209-15 Basic			59758	59760	59762	
E 2209-17			64032	64033	64034	64035
E NiCrMo-12 (P12R)			59773	59774	59775	
E NiCrFe-3			59779	59780	59781	59782
E 308L-17 VDX			59606	59607		
E 308L-17 (HX)					59609	59610
E 309MoL-17 VDX			59684	59718		
E 316L-17 VDX		59676	59694	59696		
E 316L-17 (HX)			59687	59689	59609	59691

Note: Custom weights of reel & drum products are also available.

## Flux Cored Wire

Avesta flux cored wire is available in a wide selection of alloys. For use in flat and horizontal as well as all-position applications. Designed for use with 100% CO<sub>2</sub> or a 75% Argon 25% CO<sub>2</sub> shielding gas, they offer excellent economy in all applications. All alloys and sizes are formulated for flat and vertical up use with some out-of-position capability. Some alloys and sizes are also available in all position and high deposition (HD) formats which provide for even greater economies of use.



Part No.	Alloy	Description (Welding Position)	Diameter (in.)	Spool Weight (lbs.)	Applications
<b>E308</b>					
59526	E308TO-1	Flat & horizontal	.045	25	For welding austenitic stainless steel type 19 Cr10Ni and titanium and niobium stabilized steels like ASTM 321 and ASTM 347
59501	E308LTO-1	Flat & horizontal	.035	25	
59527	E308LTO-1	Flat & horizontal	.045	25	
59486	E308LTO-1	Flat & horizontal	.063	25	
59528	E308LT1-1	All position	.045	25	
<b>E309</b>					
59502	E309LTO-1	Flat & horizontal	.035	25	High alloyed 23 Cr13Ni wire primarily intended for surfacing low alloyed steels and for dissimilar welding between mild steel and stainless steels
59542	E309LTO-1	Flat & horizontal	.045	25	
59487	E309LTO-1	Flat & horizontal	.063	25	
59530	E309LT1-1	All position	.045	25	Molybdenum-alloyed wire for dissimilar joints between stainless steels and low-alloyed steels
59537	E309LMoTO-1	Flat & horizontal	.045	25	
59491	E309LMoTO-1	Flat & horizontal	.063	25	
<b>E316</b>					
59532	E316TO-1	Flat & horizontal	.045	25	For welding austenitic stainless steel type 17 Cr12Ni 2.5 Mo and welding titanium and niobium stabilized steels such as ASTM 316Ti
59503	E316LTO-1	Flat & horizontal	.035	25	
59533	E316LTO-1	Flat & horizontal	.045	25	
59488	E316LTO-1	Flat & horizontal	.063	25	
59534	E316LT1-1	All position	.045	25	
<b>E317</b>					
59504	E317LTO-1	Flat & horizontal	.035	25	For welding austenitic stainless steel type 18 Cr14Ni3Mo and similar.
59535	E317LTO-1	Flat & horizontal	.045	25	
59489	E317LTO-1	Flat & horizontal	.063	25	
<b>E347</b>					
59505	E347TO-4	Flat & horizontal	.035	25	Columbium stabilized alloy is generally used to weld AISI 321 and 347 materials.
59536	E347TO-4	Flat & horizontal	.045	25	
59490	E347TO-4	Flat & horizontal	.063	25	
<b>E2209</b>					
59524	E2209TO-1	Flat & horizontal	.045	25	For welding of ferritic-austenitic (duplex) stainless steels such as Outokumpu 2205 (ASTM S32205/S31803) and similar
59525	E2209TO-1 PW	All position	.045	25	



## Soldering & Brazing Fluxes

Filler Metals  
4

Alloy	Silver %	Copper %	Zinc %	Nickel %	Tin %	Melting Range °F/°C		Specifications	
						Solidus	Liquidus	AWS A5.8	FED QQB650C
Safety-Silv® 30	30	38	32			1250 / 677	1410 / 766	BAG-20	BAG-20
Safety-Silv® 35	35	32	33			1250 / 677	1350 / 732	BAG-35	
Safety-Silv® 45	45	30	25			1225 / 663	1370 / 743	BAG-5	BAG-5
Safety-Silv® 45T	45	27	25		3	1195 / 646	1265 / 685	BAG-36	
Safety-Silv® 50	50	34	16			1270 / 688	1425 / 774	BAG-6	
Safety-Silv® 50N	50	20	28	2		1220 / 660	1305 / 707	BAG-24	
Safety-Silv® 56	56	22	17		5	1145 / 618	1205 / 652	BAG-7	BAG-7



### Safety-Silv® 30

A moderate temperature filler metal with flow characteristics useful for wider gaps.

### Safety-Silv® 35

A good selection for replacing the cadmium alloys. Safety Silv® 35 joints are strong, ductile and the brazing temperature is only slightly higher than cadmium-bearing 30% and 35% silver alloys.

### Safety-Silv® 45

Excellent general-purpose brazing alloy. Often specified in government use. Good ductility and capillary flow. Color is silver to light yellow.

### Safety-Silv® 50

Useful in brazing electrical connections and as a cadmium-free replacement for 50% silver alloys. It has a wide melting range suitable for bridging gaps where poor fit-ups are encountered.

### Safety-Silv® 50N

This 50% silver alloy is a good replacement for the 3% nickel, cadmium alloy (AWS BAG3). It is especially helpful where low brazing temperature must be maintained. It can be used to braze tungsten carbide, stainless steel, as well as other steel, copper, and nickel alloys.

### Safety-Silv® 56

High silver content alloy; makes premium-quality brazes. Free-flowing with unsurpassed capillary attraction and deep penetration. Ductility is high, and corrosion-resistance is suitable for all but strong chemical applications. Offers highest elongation of silver brazing alloys. Suitable for use in the food-processing industry. Silver color is excellent match for stainless steel and silverware applications. NSF Certified to NSF C2.

Alloy	Part No.	Mfg. No.	Packaging (Troy oz.)
Safety-Silv® 30	30350	30350	1/16 x 50
Safety-Silv® 35	74310	3531	1/16 x 1
	3533	3533	1/16 x 5
	74315	3535	1/16 x 5
	74317	35350	1/16 x 50
Safety-Silv® 45	76310	4531	1/16 x 1
	76313	4533	1/16 x 3
	76315	4535	1/16 x 5
	76316	45325	1/16 x 25
	76317	45350	1/16 x 50
	76217	45550	3/32 x 50
Safety-Silv® 50	70310	5031	1/16 x 1
	70315	5035	1/16 x 5
Safety-Silv® 50N	80310	50N31	1/16 x 1
	80315	50N35	1/16 x 5
	80317	50N350	1/16 x 50
Safety-Silv® 56	75310	5631	1/16 x 1
	75313	5633	1/16 x 3
	75315	5635	1/16 x 5
	56350	56350	1/16 x 50
	75217	56550	3/32 x 50



Part No.10001

Alloy	Melting Range °F/°C		Specifications / Certifications
	Solidus	Liquidus	
40/60	360 / 182	460 / 238	ASTM B32 Sn40A
50/50	360 / 182	420 / 216	ASTM B32 Sn50, J-STD 006, Sn50Pb50A
60/40	360 / 182	375 / 191	ASTM B32 Sn60
95/5	452 / 233	464 / 240	ASTM B32 Sb5, J-STD 006, Sn95Sb5A
Stay-Brite®	430 / 221	430 / 221	J-STD 006, Sn96Ag04A, ASTM B32, Sn96
Stay-Brite® 8	430 / 221	535 / 279	NSF certified to NSF 51
Alsolder® 500	391 / 199	482 / 250	QQ-S-571E, class Sn96
Bridgit®	460 / 238	630 / 332	ASTM B32, HB; NSF certified to ANSI / NSF 61
Al-Braze® 1070	1070 / 577	1080 / 582	AWS A5.8 BAL Si4

### 40/60, 50/50, 60/40

These tin/lead solders can be used, with some exceptions, to join copper and most copper alloys, lead, nickel alloys and steel. Tin/lead solders are not recommended for joints subject to high stress or vibration in the cooling industry due to lack of sufficient elongation properties. These solders are also available with rosin or acid core.

**Note:** It is illegal to use lead solders in both public and private potable water systems.

### 95/5

Tin/antimony solder well suited for applications where moderately elevated temperature is a factor. With higher electrical conductivity and high fluidity, 95/5 is recommended for lead free installations of small diameter, tight fitting connections. Not recommended for use on brass or HVAC connections.

### Stay-Brite® and Stay-Brite® 8

Silver-bearing solders often used throughout the refrigeration/air conditioning industry instead of brazing alloys. Both Stay-Brite® and Stay-Brite® 8 produce an overall component with greater strength than a brazed component whose base metals are weakened by annealment from high brazing heat. Stay-Brite® solders bond with all of the ferrous and nonferrous alloys. Joints soldered with Stay-Brite® solders exhibit considerably higher than necessary elongation for sound, dissimilar metal joints and vibration applications. Stay-Brite® 8 is especially effective in filling loosely fitted couplings.

### Alsolder® 500

Forms excellent, corrosion resistant joints on the tough to solder aluminum alloys. Joins all solderable aluminum alloys to each other and to dissimilar metals, both ferrous and nonferrous. Also beneficial as a high temperature solder on most other metals.

### Bridgit®

Lead-free solder widely used in plumbing applications where lead-bearing solders are prohibited. Contains nickel, making joints tremendously strong. Wide plastic range makes Bridgit® an excellent alloy for large diameter fittings and ill-fitted or non-concentric pipes. Fills gaps and caps off easily and effectively.

### Al-Braze® 1070

Superior brazing alloy for joining aluminum to aluminum. Not recommended for brazing aluminum directly to non-aluminum alloys, as the joint may be brittle. Al-Braze® is free flowing with excellent capillary attraction, ductility and penetration. Corrosion resistant.

Solder	Part No.	Mfg. No.	Description	Diameter	Spool
40/60	10035	406061	Solid wire	1/8	1 lb.
	12016	406065	Solid wire	1/8	5 lbs.
	10037	40A61	Acid core	1/8	1 lb.
	12100	40A65	Acid core	1/8	5 lbs.
	12237	40R61	Rosin core	1/8	1 lb.
	12202	40R51	Rosin core	3/32	1 lb.
50/50	12006	505031	Solid wire	1/16	1 lb.
	10028	505061	Solid wire	1/8	1 lb.
	12001	505065	Solid wire	1/8	5 lbs.
	10051	50501B	50/50 SWS tinker	N/A	Bar
	10038	50A61	Acid core	1/8	1 lb.
	12107	50A65	Acid core	1/8	5 lbs.
	12213	50R31	Rosin core	1/16	1 lb.
	12238	50R61	Rosin core	1/8	1 lb.
60/40	12023	604031	Solid wire	1/16	1 lb.
	10036	604061	Solid wire	1/8	1 lb.
	10039	60A61	Acid core	1/8	1 lb.
	12221	60R31	Rosin core	1/16	1 lb.
	12239	60R61	Rosin core	1/8	1 lb.
	12218	60R51	Rosin core	3/32	1 lb.
95/5	12013	95531	Solid wire	1/16	1 lb.
	10030	95561	Solid wire	1/8	1 lb.
	95565	95565	Solid wire	1/8	5 lbs.
	12011	95551	Solid wire	3/32	1 lb.
Stay-Brite®	10001	SB61	Stay-Brite®	1/8	1 lb.
	10004	SB31	Stay-Brite®	1/16	1 lb.
	10009	SB861	Stay-Brite® 8	1/8	1 lb.
	10010	SB831	Stay-Brite® 8	1/16	1 lb.
	11000	SBSK	Stay-Brite®	3/64	KIT
Al-Braze®	10022	500K	Aluminum brazing	3/64	KIT
	10023	1070K	Aluminum brazing	1/16	KIT
Alsolder®	10024	50061	Alsolder® 500	1/8	1 lb.
Bridgit®	16000	BRGT61	Stay-Safe Bridgit®	1/8	1 lb.

= National Sanitation Federation



## Phosphorus / Copper Brazing Alloys

These brazing filler metals are primarily used to braze copper to copper and copper to brass. The phosphorus content in these alloys makes them self-fluxing on copper. When brazing brass or copper to brass, use Stay-Silv® white brazing flux. These alloys are not recommended for brazing steel or other ferrous metals.

Alloy	Silver %	Phos %	Melting Range °F/°C		Fluidity Rating*	Specifications			Recommended Joint Clearance
			Solidus	Liquidus		AWS A5.8	FED QQB650C	DIN	
Harris 0	0	7.1	1310 / 710	1475 / 802	5	BCuP-2	BCuP-2	L-CuP7	.002 / .007"
Blockade™	0	4.0 - 8.0	1178 / 637	1247 / 674	9	BCuP-9	BCuP-9		.003 / .006"
Stay-Silv® 2	2	7.0	1190 / 643	1450 / 788	4	BCuP-6			.002 / .005"
Stay-Silv® 5	5	6.0	1190 / 643	1500 / 816	3	BCuP-3	BCuP-3		.002 / .006"
Stay-Silv® 6	6	6.5	1190 / 643	1425 / 774	5				.002 / .005"
Dynaflow®	6	6.1	1190 / 643	1465 / 796	3				.002 / .006"
Stay-Silv® 15	15	5.0	1190 / 643	1480 / 804	3	BCuP-5	BCuP-5		.002 / .006"

\*The higher the fluidity rating, the faster the alloy flows within the melting range.

### Harris 0

Low-cost alloy for many copper-to-copper applications where good fit-up can be maintained and brazing temperature is not critical.

### Blockade™

Phosphorus/copper brazing alloy available with silicon. Faster brazing—228°F lower than phos/copper 0. Highly visible fillet which provides instant, visual confirmation of a leak-free seal. Improved ductility over BCuP-2 (phos/copper 0) brazing alloys. Flux-coated—can join copper to brass and brass to brass in one easy step.

### Stay-Silv® 5 and Stay-Silv® 6

Medium-range alloys; Stay-Silv® 5 is useful primarily where fit-up cannot be tightly controlled. Stay-Silv® 6 is slightly more fluid and can be used where closer tolerances are available. Both alloys are somewhat more ductile than Harris 0.

### Stay-Silv® 15

For many years, Stay-Silv® 15 has been the industry standard for air conditioning/refrigeration applications. Still widely used but now often replaced by Dynaflow® in many AC/R applications.

### Dynaflow®

Premium, medium-range silver alloy, formulated to even tighter specifications than the Stay-Silv® alloys to mirror the performance characteristics of the 15% silver brazing filler metals. Excellent for brazing both tight and poorly-fitted connections, Dynaflow®'s proven reliability and acceptance by field service engineers has made it the leading choice of brazing operators.

Alloy	Part No.	Mfg. No.	Silver	Package
Harris 0	20235	0620R1	0%	Round 1/8 - 14 stick tube
	21035	0620F1	0%	.050 x 1/8 - 28 stick tube
	22235	0520R1	0%	Round 3/32 - 24 stick tube
	23235	0320R1	0%	Round 1/16 - 51 stick tube
Blockade™	BK220R1			2 mm 20 stick tube
	BKFC2500R1			2 mm 20 stick tube (flux coated)
Stay-Silv®	40235	5620R1	5%	Round 1/8 - 14 stick tube
	41035	5620F1	5%	.050 x 1/8 - 28 stick tube
	51035	6620F1	6%	.050 x 1/8 - 28 stick tube
	60135	15620S1	15%	Square 1/8 - 11 stick tube
	60235	15620R1	15%	Round 1/8 - 14 stick tube
	61035	15620F1	15%	.050 x 1/8 - 28 stick tube
	61038	15620F	15%	.050 x 1/8 - bulk 25lb pkg.
	62135	15520S1	15%	Square 3/32 - 20 stick tube
Dynaflow®	66000	0620F1	6%	.050 x 1/8 - 28 stick tube

### Stay-Clean®

**Paste Soldering Flux:** Excellent flux for joining copper to copper and copper to brass. Not recommended for electrical or electronic applications.

- Meets Commercial Spec. A-A-51145C, Form A

**Liquid Soldering Flux:** Liquid soldering flux for almost all metals other than aluminum, magnesium or titanium. Use with Stay-Brite® solders or practically any other solder with a liquidus temperature below 700°F. Not recommended for electrical or electronic applications.

- Meets Commercial Spec. A-A-51145C, Form B

**Aluminum Flux:** Use with Stay-Brite® solders or Alsolder® 500 to join aluminum to aluminum and to most other metals, including stainless.

### Stay-Silv® White

**White Brazing Flux:** For use with silver brazing alloys on all metals other than aluminum, magnesium or titanium. Effective to 1600°F.

- Meets Fed. Spec. 0-F-499, Type B; AWS A5.31, Class FB3A; AMS 3410.

**Black Brazing Flux:** For use with silver or other brazing alloys with liquidus temperature below 1800°F. Recommended for stainless steel, heavy parts, and whenever heating cycle is prolonged. For all metals other than aluminum, magnesium or titanium.

- Meets AWS A5.31, Class FB3C; AMS 3411; Fed. Spec. 0-F-499, Type B.

Fluxes	Part No.	Mfg. No.	Description
Stay-Clean®	40002	SCLF4	Liquid 4 oz. squeeze bottle
	40003	SCLF16	Liquid 16 oz.
	40004	SCLF32	Liquid 32 oz.
	40005	SCLF1G	Liquid 1 gal.
	40006	SCAF4	Alum Flux 4 oz. brush cap
	40027	SCPF4	Paste 4 oz. brush cap
	40028	SCLF1	Paste 1 lb. jar
Stay-Silv® White	40016	SSWF5	5 lb. jar
	40017	SSWF25	25 lb. pail
	40018	SSWF60	60 lb. pail
	40020	SSWF1/4	1/4 lb. jar
	40021	SSWF1/2	1/2 lb. jar
	40022	SSWF7	7 oz. brush cap
Stay-Silv® Black	40023	SSWF1	1 lb. jar
	40050	SSBF1/2	High Temp 1/2 lb. jar
	40051	SSBF1	High Temp 1 lb. jar
	40052	SSBF5	High Temp 5 lb. jar
	40053	SSBF30	High Temp 30 lb. pail

## Group 1: Build-up and Joining Alloys

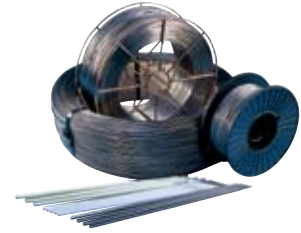
### A. Build-up of Carbon Steels

#### Stoody® Build-up® LH Coated

A solid core electrode with a special low hydrogen coating to provide a high strength fusion bond on carbon and low alloy steels. As a base alloy for hard surfacing overlays, or for restoring parts to original dimensions, it provides a weld deposit with excellent compressive strength and ductility capable of absorbing heavy impact and/or compressive loads. Can be applied in multiple layers without cracking, spalling or mushrooming. It is machinable in the "as welded" condition with reasonable procedural care and can be forged at red heat. It is not recommended for manganese steel or cast iron and will work harden under high impact loads.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred) in stringer or weave beads. Preheat and slow cool prior to machining; carbide tools are recommended. Strongly magnetic on carbon and low alloy steel. This electrode is an all-position electrode. **NOTE:** Should not be used for joining.

**Applications:** Tractor Rollers, Steel Shovel Pads, Tractor and Shovel Idlers, Gear Teeth, Sprockets and Shafts.



**Typical Chemical Composition:**

- **Alloy Content - 4.5%** (Chromium, Molybdenum, Manganese, Silicon, Carbon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:

- 1 Layer (weave beads) - Med. Carbon Steel.....27 HRC
- 2 Layers (weave beads) - Med. Carbon Steel.....29 HRC
- 3 Layers (weave beads) - Med. Carbon Steel.....31 HRC

Tensile Strength.....118 KSI  
Yield Strength.....113 KSI  
Elongation.....6%

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11412900	5/32" (4.0 mm) x 14"	140-250	10
11413000	3/16" (4.8 mm) x 14"	180-310	10

### B. Build-up and Joining of Manganese Steel

#### NICRO-MANG® Coated

NICRO-MANG® is an out of position extruded electrode with excellent impact strength. It work hardens under impact. Deposits can be flame cut. NICRO-MANG® has a high deposition rate. Designed for build-up, and joining of manganese steels. No limit to deposit thickness.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred). Use straight polarity for fastest deposition. Minimum spatter loss. Produces a thin, non-popping slag that is easily removed. Weave beads 2 - 3x electrode diameter are preferred. Deposits are non-magnetic and machinability is poor. Interpass temperature should not exceed 500° F maximum. Not recommended for build-up of carbon steel.

**Applications:** Dipper and Tooth Build-up, Crusher Rolls, Dredge Pump Parts, Rolling Mill Couplers, Rolling Mill Spindles, Crusher Jaws, Impact Breaker Bars, Hammer Mill, Shovel Pads, Railroad Frogs (Manganese).

**Typical Chemical Composition:**

- **Alloy Content - 23%** (Manganese, Chromium, Nickel, Carbon, Silicon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:

- 2 Layers.....200 BHN
- Workhardened.....500 BHN

Tensile Strength .....120 KSI  
Yield Strength.....70 KSI  
Elongation.....42%

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
45150810	1/8" (3.2 mm) x 14"	100-160	10
45151010	5/32" (4.0 mm) x 14"	140-200	10
45151210	3/16" (4.8 mm) x 14"	170-225	10

### C. Build-up and Joining of both Manganese Steel and Carbon Steels

#### Stoody® 2110 Coated

Stoody® 2110 is a solid core extruded electrode with alloys in the coating designed for build-up of austenitic manganese steel parts subject to high impact loading without limitations to deposit thickness. It is a modified high chromium-high manganese steel that combines toughness and wear resistance.

**Welding Procedures/Characteristics:** Can be applied AC or DC, reverse polarity. Weldability is excellent with low spatter. Build-up is superior to other electrodes of this type. Use stringer or weave beads. Deposits are dense, porosity-free, extremely tough and workhardens rapidly. Cannot be flame cut; machinable with carbide tools, non-magnetic. Not recommended for cast iron.

**Applications:** Shovel Pads, Roll Crushers, Hammers, Shovel Teeth, Grate Bars, Carbon, Steel Frogs, Switch Points, Manganese Rail, Components.

**Typical Chemical Composition:**

- **Alloy Content - 31%** (Manganese, Chromium, Nickel, Carbon, Silicon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:

- 2 Layers - 1020 Steel .....200 BHN
- Workhardened.....48-53 HRC
- 2 Layers - Mang. Steel.....210 BHN
- Workhardened.....50-55 HRC
- 5 Layers - Mang. Steel.....220 BHN
- Workhardened.....50-55 HRC

Tensile Strength.....119 KSI  
Yield Strength.....76.4 KSI  
Elongation .....40%

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
11431300	1/8" (3.2 mm) x 14"	100-130	10
10202800	5/32" (4.0 mm) x 14"	125-190	10
10202900	3/16" (4.8 mm) x 14"	150-260	10
10203000	1/4" (6.4 mm) x 18"	240-325	10

## Coated Electrodes

### VERSALLOY™ PLUS Coated

VERSALLOY™ PLUS is a modified austenitic stainless steel recommended for joining, rebuilding or cushion-overlaying on applications involving high strength, heat and corrosion resistance. It is frequently used to join metals in dissimilar applications involving stainless steels and low carbon steels.

**Welding Procedures/Characteristics:** Can be applied AC or DC, reverse polarity using a short to medium arc length. Apply in stringer or slight weave beads. Easy slag removal.

**Applications:** General purpose electrode used for joining stainless steels to other alloys; also a good cushioning layer for hardfacing.

**Typical Chemical Composition:**

- **Alloy Content - 40%** (Chromium, Nickel, Silicon, Manganese, Carbon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
As welded .....230 BHN  
Workhardened .....340 BHN  
Tensile Strength .....116 KS1

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
11820700	5/32" (4.0 mm) x 14"	90-150	10

### D. Build-up and Joining of Cast Irons

#### CASTWELD™ 55\* (55% Nickel Type) Coated

CASTWELD™ 55 is for worn cast iron parts requiring build-up or joining. CASTWELD™ 55 has good strength and tolerance to the high phosphorus often found in cast irons. It is used as a general purpose rod especially when welding thick sections. CASTWELD™ 55 is also recommended for joining cast iron to dissimilar metals.

**Welding Procedures/Characteristics:** Must be applied with DC reverse polarity. When welding cast iron always clean the part, preheat and slow cool. Use stringer bead technique (limit weave width to 3 - 4x electrode diameter). It's preferable to run short (approx. 2") weld beads and to use a skip welding technique. Peen immediately after each weld. Short arc is recommended. Remove slag before restriking electrode on previous weld bead.

**Applications:** Joining or build-up on cast iron parts, i.e. Pump Housings, Engine Blocks, Assorted Castings.

\*Nickel content percentage can vary slightly.

**Typical Chemical Composition:**

- **Nickel**
- **Iron**

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
11369500	1/8" (3.2 mm) x 14"	70-110	10

#### CASTWELD™ 99\* (99% Nickel Type) Coated

CASTWELD™ 99 makes a softer deposit than CASTWELD™ 55 and is preferred if machining of the deposit is required following welding of cast iron parts.

**Welding Procedures/Characteristics:** Must be applied with DC reverse polarity. When welding cast iron always clean the part, preheat and slow cool. Use stringer bead technique (limit weave width to 3 - 4x electrode diameter). It's preferable to run short (approx. 2") weld beads and to use a skip welding technique. Peen immediately after each weld. Short arc is recommended. Remove slag before restriking electrode on previous weld bead.

**Applications:** Repair of cast iron, particularly hairline cracks and casting defects.

\*Nickel content percentage can vary slightly.

**Typical Chemical Composition:**

- **Nickel**
- **Iron**

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
11375100	3/32" (2.4 mm) x 14"	40-80	5
11375200	1/8" (3.2 mm) x 14"	70-110	10

## Group 2: Metal to Metal Wear

### Low Alloy-Iron Based Stoody® 1105 Coated

Stoody® 1105 is a solid core electrode with an extruded coating containing the alloying elements. It provides good weldability and a high deposition rate. It bonds readily to carbon and low alloy steels. Deposit properties are the same as those of Stoody® 105 wire.

**Welding Procedures/Characteristics:** Can be applied in stringer or weave beads. Runs well on DC, either polarity; highest deposition rate with DC straight polarity. Limit layers to four. Forgeable at red heat. Machinable with carbide tools. Not recommended for manganese steels or cast iron. Deposit is magnetic on carbon and low alloy steels.

**Applications:** Tractor Rollers, Tractor Idlers, Arch Wheels, Shovel Rollers and Idlers Sprockets, Drive Tumblers, Churn Drills, Charging Car Wheels, Wobblers, Coupling Boxes.

**Typical Chemical Composition:**

- **Alloy Content - 5%** (Chromium, Manganese, Silicon, Molybdenum, Vanadium, Carbon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
(1/2" weave beads - air cooled)  
2 Layers - 1045 steel.....38-42 HRC  
For hot wear applications up to 600° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11345100	1/8" (3.2 mm) x 14"	80-150	10
11173800	5/32" (4.0 mm) x 14"	140-210	10
11173900	3/16" (4.8 mm) x 14"	165-250	10

## Group 3: Metal to Earth for Moderate to Severe Impact and Moderate to Severe Abrasion

### Stoody® Self-Hardening Coated

Stoody® Self-Hardening is a solid core electrode with an extruded coating containing the alloying elements. It is magnetic on carbon or low alloy steels.

**Welding Procedures/Characteristics:** Can be applied AC or DC, reverse polarity. Out of position characteristics are limited. Limit weave beads to 3/4" or use stringers. Maximum of three layers if a crack free deposit is desired. Can be applied to plain or alloy steels; magnetic on carbon or low alloy steels. Can be forged at red heat; not readily machinable.

**Applications:** Churn Drills, Trailer Hitch, Machine Components, Bearings, Sliding Metal Parts.

**Typical Chemical Composition:**

- **Alloy Content - 12%** (Chromium, Manganese, Silicon, Carbon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
All Weld Metal.....52-58 HRC  
2 Layers (weave beads) - Mild Steel.....52-56 HRC  
Water-quenched from 1700° F .....56-59 HRC  
Furnace-cooled from 1700° F.....19-22 HRC  
2 Layers (weave beads) - 1045 Steel .....54-58 HRC  
Water-quenched from 1700° F.....56-60 HRC  
Furnace-cooled from 1700° F.....19-23 HRC

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
11172400	1/8" (3.2 mm) x 14"	110-150	10
11172500	5/32" (4.0 mm) x 14"	150-200	10
11172600	3/16" (4.8 mm) x 14"	175-275	10

### Stoody® 19 Coated

Stoody® 19 is a solid core electrode with an extruded coating containing the alloying elements. This electrode has excellent welder appeal. It bonds well with carbon or alloy steel including manganese.

**Welding Procedures/Characteristics:** Apply in weave beads using AC or DC, either polarity (reverse preferred). Limit to two layers. A severe water quench should be avoided. Easy slag removal with excellent out of position characteristics. Deposits are slightly magnetic on carbon and low alloy steels. Not machinable or forgeable. Deposits will develop cross checks.

**Applications:** Crusher Rolls, Dredge Pump Shells Impellers, Impact Breaker Bars, Scrapers.

**Typical Chemical Composition:**

- **Alloy Content - 26%** (Chromium, Carbon, Molybdenum, Manganese, Silicon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
2 Layers - Mang. Steel.....45-49 HRC  
2 Layers - Med. Carbon .....51-55 HRC

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11360000	1/8" (3.2 mm) x 14"	90-130	10
11356700	5/32" (4.0 mm) x 14"	120-160	10
11356800	3/16" (4.8 mm) x 14"	140-220	10

## Coated Electrodes

### Stoody® 21 Coated

Stoody® 21 is a tubular electrode with a graphitic coating. It bonds well with cast iron, carbon or low alloy steel. It is slightly magnetic on carbon and low alloy steels, non magnetic on manganese. It has good impact and abrasion characteristics.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred). Limit to two layers. A severe water quench should be avoided. No slag interference. Limited to download welding only. Deposits will cross check. Stringer beads recommended. Deposits are not machinable or forgeable.

**Applications:** Compactor, Buckets, Mill Hammers, Bucket Teeth, Dredge Pump.

**Typical Chemical Composition:**

- **Alloy Content - 23%** (Chromium, Carbon, Silicon, Manganese, Molybdenum)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
2 Layers - Mang. Steel .....46-50 HRC  
2 Layers - Med. Carbon .....52-56 HRC

For hot wear applications up to 800° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11172700	1/8" (3.2 mm) x 14"	90-130	10
11172900	5/32" (4.0 mm) x 14"	120-160	10
11173000	3/16" (4.8 mm) x 14"	140-220	10
10205200	1/4" (6.4 mm) x 18"	175-300	50

### Stoody® 31 Coated

Stoody® 31 is a tubular electrode containing the alloying elements and has an extruded coating. Welding characteristics are excellent. Deposits have a low coefficient of friction and provide good resistance to corrosion and heat. Can be applied to carbon alloy and manganese steels. It offers an outstanding balance of abrasion resistance and impact strength.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred) using either stringer beads or weave beads. Weldability is excellent for out of position work with complete slag coverage that is virtually self-removing. Deposits are not machinable or forgeable.

**Applications:** Bucket Arms, Chain Links, Rolling Mill Guides, Pulleys, Scrapers, Buckets, Blades.

**Typical Chemical Composition:**

- **Alloy Content - 34%** (Chromium, Molybdenum, Carbon, Silicon, Manganese)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
2 Layers - Mang. Steel.....47-49 HRC  
2 Layers - Carbon Steel .....45-48 HRC

For hot wear applications up to 950° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
10206300	1/8" (3.2 mm) x 14"	100-120	10
10206400	5/32" (4.0 mm) x 14"	120-180	10
10206500	3/16" (4.8 mm) x 14"	170-240	10
10206600	1/4" (6.4 mm) x 18"	250-325	10

### Stoody® 35 Coated

Stoody® 35 is a solid core electrode with a heavy extruded coating containing the alloy elements. Weldability is excellent with good out of position characteristics. Can be applied to carbon alloy and manganese steels.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred). Use straight polarity to increase deposition rate. Can be applied in stringer or weave beads. A two layer deposit should be made to assure proper chemistry for best wear results. Deposits are not machinable or forgeable.

**Applications:** Teeth, Screws, Tile Mixer Paddles, Crushing Equipment.

**Typical Chemical Composition:**

- **Alloy Content - 38%** (Chromium, Carbon, Silicon, Manganese)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
2 Layers - 1045 plate as welded .....53-57 HRC  
2 Layers (weave beads) - Mang. Steel .....50-53 HRC  
Deposits may workharden to .....58-60 HRC

For hot wear applications up to 950° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11322900	1/8" (3.2 mm) x 14"	125-175	10
11318200	5/32" (4.0 mm) x 14"	175-250	10
11318300	3/16" (4.8 mm) x 14"	225-300	10
11318400	1/4" (6.4 mm) x 18"	275-350	10

**CTS**

CTS is a tubular electrode containing granular alloying elements. It has a dipped graphitic coating. Because of its high manganese content, deposits offer good resistance to impact as well as abrasion resistance. It is an excellent choice for hardfacing on cast iron.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred) using either stringer beads or weave beads (wide beads preferred). Limit deposits to two layers. Recommended for downhand welding only. Can be applied to carbon, low alloy and austenitic manganese steels. Deposits are not machinable or forgeable.

**Applications:** Crushing Applications, Pug Mill Paddles, Sintering Mill Breakers/Bars, Cement Mill Die Rings, Railroad Tie Tamper Tips.

**Typical Chemical Composition:**

- **Alloy Content - 38%** (Chromium, Manganese, Carbon, Silicon, Molybdenum)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
2 Layers (weave beads) - Med. Carbon.....57-61 HRC  
2 Layers (weave beads) - Mang. Steel.....47-51 HRC

For hot wear applications up to 900° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box Quantity
10207300	1/4" (6.4 mm) x 18"	275-350	60/box

**Stoody® 2134 Coated**

Stoody® 2134 is a tubular electrode containing granular alloying elements. The coating is graphitic. Exhibits excellent abrasion resistance in fine, sandy soils. Also, it is the best choice for high abrasion accompanied by high impact. It is a good choice for hardfacing on cast iron parts.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred). For AC applications welding machines with minimum of 70 volts OCV recommended. Limit deposits to two layers. Welds extremely well at low amperages. Recommended for download welding only. Weldability is very good when proper procedures are followed. Easy slag removal. For use on carbon, low alloy, and manganese steels. Deposits are not machinable or forgeable.

**Applications:** Crusher Rolls, Pit Scrapper, Mill Hammers, Bucket Teeth, Impactor Bars (final pass).

**Typical Chemical Composition:**

- **Alloy Content - 36%** (Chromium, Carbon, Molybdenum, Manganese, Silicon)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
2 Layers (weave beads) - 1045 Plate  
as welded .....56-60 HRC  
Line-cooled from 117507.....48-51 HRC  
Water-quenched from 1750° F.....63-65 HRC  
2 Layers (weave beads) - Mang. Steel.....45-50 HRC  
Deposits may workharden 5 to 6 points

For hot wear applications up to 950° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11276800	5/32" (4.0 mm) x 14"	100-155	10
11276700	3/16" (4.8 mm) x 14"	150-210	10
10208500	1/4" (6.4 mm) x 18"	180-300	60

**Stoody® XHC Coated**

XHC is a solid core electrode with an extruded graphitic coating containing the alloying elements. Deposits are highly resistant to both sliding and grinding abrasion. A very good choice for hardfacing on cast iron.

**Welding Procedures/Characteristics:** Can be AC or DC, either polarity (reverse preferred) using either stringer or weave beads (11" wide beads preferred). Limit deposits to two layers. Considerable cross checking is normal. Bonds well to manganese, carbon and alloy steels. In addition to its excellent weldability it has a very high deposition rate and good out of position characteristics. Deposits are not machinable or forgeable.

**Applications:** Grader Blades, Harrow Plows, Slurry Pipe.

**Typical Chemical Composition:**

- **Alloy Content - 35%** (Chromium, Carbon, Manganese, Silicon, Molybdenum)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
1 Layer (weave beads)  
Med. Carbon Steel .....60-66 HRC  
1 Layers (weave beads) - Mang. Steel.....50-55 HRC

For hot wear applications up to 1000° F

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC±)	Box (lbs.)
11383000	1/8" (3.2 mm) x 14"	100-150	10
11382700	5/32" (4.0 mm) x 14"	125-250	10
11382500	3/16" (4.8 mm) x 14"	150-300	10

## Coated Electrodes and Bare Rods

### Super 20 Coated

Super 20 is a solid core electrode with a heavy extruded coating containing the alloying elements. Its extremely good wear resistance is attributed to the addition of molybdenum, tungsten and chromium.

**Welding Procedures/Characteristics:** Can be applied DC reverse polarity. Weld with a short arc. Can be applied either as stringer or weave beads. Limit to one layer. Deposits will exhibit cross checking patterns normal for high alloys. At amperages above 150 (5/32" electrodes) Super 20 exhibits good out of position characteristics. Deposits are not machinable or forgeable.

**Applications:** Crusher Parts, Coke Pusher Shoes, Ash Fan Blade, Hot Slag Dipper Teeth, Spiral Conveyors, Pug Mill Paddles, Feed Mill Hammers, Sintering Plant Parts, Anhydrous Ammonia Plows.

**Typical Chemical Composition:**

- **Alloy Content - 39%** (Chromium, Molybdenum, Carbon, Tungsten, Silicon, Manganese)
- **Iron Base**

**Typical Mechanical Properties:**

Hardness:  
1 Layer - Mang. Steel.....58-63 HRC  
1 Layer - Carbon Steel .....60-65 HRC

For hot wear applications up to 1100° F.

Part No.	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
46520810	1/8" (3.2 mm) x 14"	70-160	10
46521010	5/32" (4.0 mm) x 14"	130-250	10

## Group 4: Metal to Earth for Extreme Abrasion and Low Impact

### AC-DC BOROD® Coated

BOROD® is similar to Tube Borium in all respects except particle mesh size, which is finer (40 down) to provide deposits resembling a fine grit sandpaper. Its deposit is heterogeneous consisting of tungsten carbide particles suspended in a tungsten steel matrix. BOROD® deposits generally provide slightly increased abrasion protection.

**Welding Procedures/Characteristics:** For AC-DC BOROD®, use minimum amperage to minimize dilution. Use AC or reverse polarity with DC current. Avoid multiple layers; use stringer beads. For hot wear application up to 900° F.

**Applications:** Log Grapplers, Concrete Pug Mill Paddles, Ash Plows, Ore Chutes, Sand Slinger Buckets.

**Typical Chemical Composition:**

- **Alloy Content - 60%** - Tungsten Carbide
- **Iron Base**

Part No.	Mesh	Dimensions (Diameter x Length)	AMP (AC, DC+)	Box (lbs.)
10234400	40-down	1/8" (3.2 mm) x 14"	80-100	10
10234600		5/32" (4.0 mm) x 14"	100-120	10
10234800		3/16" (4.8 mm) x 14"	120-150	10

### Acetylene Tube Borium Bare

Bare Acetylene Tube Borium is manufactured by metering crushed tungsten carbide particles of controlled mesh size into steel tubes. Borium is available in a variety of particle sizes; fine mesh sizes increase wear resistance, coarse sizes improve cuffing efficiency. Borium deposits absorb more impact than the finer BOROD® overlays because more matrix is exposed.

**Welding Procedures/Characteristics:** For ATB, adjust excess acetylene flame 3x length of inner core. Use torch tip size larger than normally used to weld same diameter mild steel rod. Sweat deposits to parent metal with minimum dilution. Limit to one layer. Maximum working temperature is 900° F.

**Applications:** Plow Shares, Cane Knives, Teeth, Tool Drill Bits.

**Typical Chemical Composition:**

- **Alloy Content - 60%** - Tungsten Carbide
- **Iron Base**

Part No.	Mesh	Dimensions (Diameter x Length)	Box (lbs.)
10227100	30-40	1/8" (3.2 mm) x 14"	10
11429000	30-40	5/32" (4.0 mm) x 28"	10
10228100	20-30	3/16" (4.8 mm) x 14"	10

### Tube Borium S & H

Tube Borium S & H were developed for special applications. Percentage of tungsten carbide has been reduced in these products, making them more impact resistant allowing the material to be used in multiple layer applications.

**Welding Procedures/Characteristics:** Designed for multiple layers. Adjust excess acetylene flame 3x length of inner core. Use torch tip size larger than normally used to weld same diameter mild steel rod. Sweat deposits to parent metal with minimum dilution. For hot wear applications up to 900° F.

**Applications:** Churn Drills, Cable Tools, Rotary Drill Bits.

**Typical Chemical Composition:**

- **Alloy Content:** Tungsten Carbide H (40%), S (35%)
- **Iron Base**

Part No.	Mesh	Dimensions (Diameter x Length)	Box (lbs.)
10229300	Special	5/32" (4.0 mm) x 18"	10
10229500	Mesh sizes	3/16" (4.8 mm) x 18"	10

**VANCAR E Coated**

VANCAR E deposits contain specially formulated vanadium tungsten carbide particles approximately equal to tungsten carbide in hardness but only half as heavy. VANCAR's advantage over tungsten carbide is that it can be applied in multiple layers and still retain its original hardness due to uniform distribution of the carbide particles. This provides wear rates that remain very uniform throughout the life of the deposit. VANCAR E is a fabricated electrode with a dipped coating.

**Welding Procedures/Characteristics:** For DC straight polarity application. Use lowest practical amperage that will assure a good bond to minimize dilution with the base metal. Use mid-range amperage for best possible coverage and best surface appearance. Can be applied up to three layers. For hot wear applications up to 900° F.

**Applications:** Farm Drill Points, Dry Cement Pump Screw, Drill Pipe Stabilizer Wings, Ammonia Injector Wings, Pug Mill Knives, Chisels.

**Typical Chemical Composition:**

- **Alloy Content - 37%** (Vanadium, Tungsten, Carbon, Silicon, Molybdenum, Manganese, Nickel)
- **Iron Base**

Part No.	Dimensions (Diameter x Length)	AMP (DC±)	Box (lbs.)
11327600	5/32" (4.0 mm) x 14"	80-130	10
11296500	3/16" (4.8 mm) x 14"	130-165	10

**Group 5: Abrasion Accompanied by Corrosion and/or High Temperatures**

**STOODITE 6 Bare And Coated**

The most generally used cobalt alloy, having excellent resistance to many forms of mechanical and chemical degradation over a wide temperature range. Particular attributes are its outstanding self-mated anti-galling properties, high temperature hardness, and a high resistance to cavitation erosion, which result in its wide use as a valve seat material. The alloy is ideally suited to a variety of hardfacing processes. Machinable with carbide tools. Bonds well with weldable alloy steels, including stainless. Certification to AWS-A5.13, Type RCoCr-A (Bare) and ECoCr-A (Coated); MIL R-17131, Type MIL-RCoCr-A-1 (Bare) and AMS 5788 must be requested at time of order.

**Welding Procedures/Characteristics:** Weld DC reverse polarity. Use minimum amperage; apply weave bead 3/4" to 1-1/2" wide. For check-free deposits, preheat and slow cool. In applying bare rod, use a larger torch tip than is generally used for same diameter mild steel. Use excess acetylene feather 3x length of inner cone. With the gas tungsten arc process, use 100% Argon. Generally a 2 layer deposit.

**Applications:** Sintering Machine Seat, Covers, Flapper Gates, Valves and Seats, Coke Pusher Shoes, Cooling Bed Rolls, Hot Trimming Dies, Forging Die Blocks, Chain Saw Guide Bars, Blow Valves, Pulp Digester, Plastic Extrusion Screws.

**Typical Chemical Composition;**

- **Alloy Content:** C 1.1, Cr 28, W 4
- **Cobalt Base**

**Average Hardness, Rockwell C:**

Tungsten Arc, Two Layer Deposit:.....40  
Oxy Acetylene, One Layer Deposit:.....42  
Shielded Metal Arc, Two Layer Deposit:.....39

Part No.	Bare Cast Rod	Covered Electrodes	AMP (DC±)	lbs./box
10243100	5/32" (4.0 mm)	5/32" (4.0 mm)	135-160	10

**Stoodite 21 Bare and Coated**

A low carbon, molybdenum strengthened cobalt-chromium alloy. Its excellent high temperature strength and stability are responsible for its use as a hot die material, while its inherent resistance to galling (under self-mated conditions), cavitation erosion, and corrosion have made it a popular fluid valve seat facing alloy.

**Welding Procedures/Characteristics:** Weld DC reverse polarity. Use minimum amperage; apply weave bead 3/4" to 1-1/2" wide. For check-free deposits, preheat and slow cool. In applying bare rod, use gas tungsten arc process with 100% Argon as the shielding gas. Can be machining. Bonds well with weldable alloy steels, including stainless.

**Applications:** Hot Forming Dies, Valves And Seats, Turbine Runners.

**Typical Chemical Composition:**

- **Alloy Content:** C 0.25, Cr 27, Mo 5, Ni 2.8
- **Cobalt Base**

**Average Hardness, Rockwell C:**

Tungsten Arc, Two Layer Deposit:.....24 (45 Workhardened)  
Shielded Metal Arc, Two Layer Deposit:.....26 (45 Workhardened)

Part No.	Bare Cast Rod	Covered Electrodes	AMP (DC±)	lbs./box
812101205135	1/8" (3.2 mm)	1/8" (3.2 mm)	90-120	10
812101205156	5/32" (4.0 mm)	5/32" (4.0 mm)	135-160	10
812101205250	1/4" (6.4 mm)	1/4" (6.4 mm)	220-270	10

**Semi-Automatic Wires**

**Group 1: Build-up and Joining Alloys**

**A. Build-up of Carbon Steels**

**Stoody® Build-Up**

A low alloy fabricated wire that has excellent compressive strength and resistance to plastic deformation. This is an excellent alloy for use as an underbase for subsequent hardfacing. Several diameters are available for use both with and without shielding gases. This material has good machinability in the "as welded" condition using carbide tools. It is not recommended for manganese steel or cast iron and will workharden under impact.

**Welding Procedures/Characteristics:** Can be applied AC or DC, either polarity (reverse preferred) in either stringer or weave beads 1/2" to 3/4" wide. Can be applied out of position with proper welding techniques. Slag removal is very good. This wire is not recommended for joining applications. Vertical welding can be done by welding a horizontal shelve approximately 2" wide and then going up.

**Applications:** Hammers, Wheels Burns, Repairing Battered Rail, Steel Mill Wobblers And Pods, Carbon Steel Shovel Pads, Shafting, Rolls, Pump Parts.

**Nominal Composition:**

- **Alloy Content - 4%** (Manganese, Chromium, Silicon, Molybdenum, Carbon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metal	Layers	HRC
0.10% C	2	24-28
0.40% C	2	30-35
0.80% C	2	38-42

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11258300	1/16" (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2"-3/4"	250-300	23-26	50 (polypak)
11183600	3/32" (2.4 mm)	Open-arc	1"-1-1/2"	150-500	26-29	60 (coil)

**B. Build-up and Joining of Manganese Steel  
FOUNDRY CO-MANG-O**

FOUNDRY CO-MANG-O is a manganese steel wire. It is suitable for multi-layer buildup and has excellent work hardening characteristics. It is usable for austenitic manganese steel repair, buildup and joining.

**Welding Procedures/Characteristics:** DC reverse polarity recommended, using either stringer or weave beads 1/2" to 3/4" wide. Wire extension (arc length) is very important. If it becomes too long, excessive spatter results; if too short, "stubbying" will occur. Limit interpass temperature to 500° F maximum.

**Applications:** Rock Crushing and Mining, Dredge Pump Parts, Hammer Mill Hammers, Shovel Pads, Crusher Rolls, Jaws, Grizzly Bars, Screens, Grates, Impactor Bars, Manganese Railroad Frogs, Latch Pins.

**Nominal Composition:**

- **Alloy Content - 18%** (Carbon, Manganese, Molybdenum)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Tensile Strength .....	128 KSI
Yield Strength .....	71 KSI
Elongation in 2".....	42%
Hardness:	
As Deposited .....	170-210 BHN
Workhardened to .....	350-450 BHN

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11863600	1/16" (1.6 mm)	Open-arc	1/2"-1"	200-250	25-27	50
11847800	1/16" (1.6 mm)	Open-arc	1/2"-1"	200-250	25-27	33

**C. Build-up and Joining of Both Carbon and Manganese Steels**

**Stoody® 110**

Stoody® 110 is a modified high chromium high manganese steel widely used in the rebuilding of manganese steel parts subject to severe impact loading. This material offers excellent cavitation resistance; good toughness and wear resistance; is sometimes used as the final handfacing layer in extreme impact situations.

**Welding Procedures/Characteristics:** DC reverse polarity recommended, using either stringer or weave beads 1/2" to 3/4" wide. Deposits cannot be flame cut, are machinable with carbide tools, are non-magnetic and are not recommended for cast iron. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability.

**Applications:** Drive Tumblers, Shovel Pads, Shovel Teeth, Turbine Cone, Wobbler Feeder, Manganese Frogs, Crusher Rolls.

**Nominal Composition:**

- **Alloy Content - 35%** (Chromium, Manganese, Nickel, Silicon, Carbon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Tensile Strength.....	119 KSI
Yield Strength .....	76.4 KSI
Elongation in 2".....	40%
Hardness:	
All Weld Metal .....	17 BHN
Workhardened to .....	55 BHN

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11452600	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	135-185	18-24	33
11345000	1/16" (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2"-1"	150-210	22-26	50

**Stoody® 120**

Stoody® 120 is a high manganese wire recommended for applications involving severe wear and impact. Deposits are austenitic whether applied to manganese steel or carbon steel. This is an excellent alloy for the rebuilding of crusher rolls, hammers, impactor nuts, cone crusher nuts and railroad track components.

**Welding Procedures/Characteristics:** DC reverse polarity recommended, using either stringer or weave beads. Welding can be done out-of-position with the smaller diameter wires; vertical up requires a wide weave technique. Deposits are non-magnetic, machinable with carbide tools and can be flame cut. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability.

**Applications:** Crusher Hammers Rolls, Impactor Bars and Rotors, Crusher Cone Nuts and Mantles, Track Components.

**Nominal Composition:**

- **Alloy Content - 25%** (Manganese, Chromium, Carbon, Silicon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Tensile Strength.....133 KSI  
Yield Strength.....91.5 KSI  
Elongation in 2 in .....29%  
Hardness:  
All Weld Metal.....18 BHN  
Workhardened to.....55 BHN

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11420400	1/16" (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2"-1"	150-250	22-26	50 (polypak)

**Group 2: Metal to Metal Wear (Low-Alloy Iron-Based)**

**Stoody® Super Build-Up**

Stoody® Super Build-Up is used both as a build-up and hardfacing material because it has good compressive strength, hardness, and wear resistance. It is not intended to be used as an underbase for subsequent hardfacing. When a shielding gas is used, machinability is very good with carbide tools.

**Welding Procedures/Characteristics:** DC reverse polarity recommended, using either stringer or weave beads. Weldability is very good and can be applied out of position. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability. Multiple layers can be applied without difficulty when proper preheat and interpass temperatures are maintained.

**Applications:** Gear Teeth, Sprockets, Steel Shovel Pads, Overlaying Carbon Steel Shafts.

**Nominal Composition:**

- **Alloy Content - 5%** (Chromium, Manganese, Molybdenum, Silicon, Carbon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metals.....0.20% C  
Layers.....2  
HRC.....35-40

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11426400	1/16" (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2"-1"	140-260	23-26	50

**Stoody® 105-G**

Stoody® 105-G (GMAW) is a low alloy wire developed for the rebuilding of carbon and low alloy parts used in applications involving metal-to-metal wear. Requires carbide tools for machining. Good for hot wear application up to 600° F.

**Welding Procedures/Characteristics:** DC reverse polarity recommended, using either stringer or weave beads. Weldability is very good and can be applied out of position. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability. Multiple layers can be applied without difficulty when proper preheat and interpass temperatures are maintained.

**Applications:** Tractor Rollers, Undercarriage parts, Shovel Idlers and Rollers, Shovel House Rolls (Hook Rolls), Top Carrier Rolls, Crane Wheels, Mine Car Wheels.

**Nominal Composition:**

- **Alloy Content - 7%** (Chromium, Molybdenum, Silicon, Manganese, Carbon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metals.....0.20% C  
Layers.....2  
HRC.....41-46

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11441100	1/16" (1.6 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	3/4" -1"	250-300	25-26	50

**Semi-Automatic Wires**

**Stoody® 102**

Stoody® 102 has an all weld metal composition and physical properties that are very similar to those of H-12 tool steel. Good for hot wear application up to 1000° F. Has very good compressive strength and abrasion resistance. Requires carbide tools for machining.

**Welding Procedures/Characteristics:** DC reverse polarity recommended, using either stringer or weave beads. Weldability is very good and can be applied out of position. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability. Multiple layers can be applied without difficulty when proper preheat and interpass temperatures are maintained.

**Applications:** Cable Sheaves, Hot and Cold Shear Blades, Forging Dies, Drillpipe Hardbanding, Crane Wheels, Hot Work Extrusion Rolls.

**Nominal Composition:**

- **Alloy Content - 14%** (Chromium, Manganese, Molybdenum, Tungsten, Carbon, Vanadium)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metals.....0.20% C  
Layers.....2  
HRC.....48-53

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11422300	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2" - 3/4"	135-185	18-24	33

**Group 3: Metal to Earth for Moderate to Severe Impact and Moderate to Severe Abrasion**

**Stoody® 965-G**

Stoody® 965-G can be categorized as a general purpose hardfacing alloy that offers a good balance of impact and abrasion resistance. Analysis and properties are very similar to Stoody® self-hardening. Applications would include both metal-to-metal and metal-to-earth. Deposits are martensitic, forgeable, and are not readily machinable. Can be applied to carbon, low alloy and manganese steel.

**Welding Procedures/Characteristics:** DC reverse polarity recommended using either stringer or weave beads. Weldability is very good in flat and horizontal applications. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability.

**Applications:** Tillage Tools, Drag Line Bucket Lips, Tamper Feet, Chisel Plows, Dredge Parts, Extruded Screws, Muller Tires.

**Nominal Composition:**

- **Alloy Content - 10%** (Carbon, Manganese, Molybdenum, Silicon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metals.....0.20% C  
Layers.....2  
HRC.....56-60

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11423000	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	150-200	25-29	10
11423100	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	150-200	25-29	33
11427000	1/16 (1.6 mm)	Open-arc or CO <sub>2</sub>	3/4" -1"	200-250	27-31	50
11427100	1/16 (1.6 mm)	Open-arc or CO <sub>2</sub>	3/4" -1"	200-250	27-31	33

**Stoody® 965 AP-G**

Stoody® 965 AP-G is a gas-shielded, flux cored, all position, general purpose hardfacing alloy which offers a good balance of impact and abrasion resistance. It can be used in both metal-to-metal and metal-to-earth applications. Deposits are forgeable but not readily machinable. Stoody 965 AP-G has a smooth semi-spray transfer and can be applied to carbon, low alloy, and manganese steels. It is magnetic on carbon and low alloy steels but not on manganese steels. Analysis and properties are similar to Stoody Self Hardening covered electrodes.

**Welding Procedures/Characteristics:** DC reverse polarity recommended using 75 Argon/25 CO<sub>2</sub> shielding gas, this wire has excellent out of position characteristics in the vertical, overhead and horizontal positions. It has a smooth semi-spray transfer and can be applied to carbon and low alloy steels.

**Applications:** Tillage Tools, Dredge Parts, Sliding Metal Parts, Tire Shredder Knives, Drag Line Bucket Lips, Extruder Screws, Tamper Feet, Churn Drills, Muller Tires.

**Nominal Composition:**

- **Alloy Content - 11%** (Carbon, Chromium, Manganese, Molybdenum, Silicon)
- **Iron Base**

**Deposit Characteristics:**

Abrasion Resistance.....Good  
Impact Resistance.....Good  
2 Layer Hardness.....57-62 HRC  
Deposit Layers.....2 Normal, 3 Max.

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11807800	.045" (1.2 mm)	75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	200-250	27-31	33

**Stoody® 117**

Stoody® 117 gives a semi-austenitic matrix with uniformly dispersed chromium carbides that provides a deposit with very good impact, abrasion and antigalling properties. Frequently used as both a build-up and hardfacing alloy on manganese and low alloy materials.

**Welding Procedures/Characteristics:** DC reverse polarity recommended using stringer beads and fast travel. Light cross-checking pattern develops which allows this material to be applied in multiple layers without difficulty. Weldability is very good and deposits are not machinable.

**Applications:** Crusher Rolls, Hammers, Bell Type Gyrotory Cones, Bucket Lips, Mantles.

**Nominal Composition:**

- **Alloy Content - 17%** (Carbon, Chromium, Manganese, Copper, Molybdenum, Silicon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Hardness:  
Nominal Hardness.....43-45 HRC  
3 Layers on Mild Steel.....43-45 HRC  
2 Layers on Mang. Steel.....38-40 HRC

**Workhardens.....55-**

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11320600	7/16 (2.8 mm)	Open-arc	1" -1-1/2"	300-600	31-35	110 QP

**Stoody® 121**

Stoody® 121 gives a semi-austenitic matrix with uniformly dispersed chromium carbides and is recommended for applications where abrasion is severe and impact is only moderate. Provides excellent service on a wide variety of heavy equipment and earth engaging tools. Typically cross-checks when applied and is not machinable. Can be applied to carbon, low alloy and manganese steels

**Welding Procedures/Characteristics:** DC reverse polarity recommends using either stringer or weave beads. The addition of CO, shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves the weldability. Limit deposits to 2 layers maximum in the downhand position only.

**Applications:** Scraper Sides, Scraper Cutters, Vibrator Ditcher Shank, Post Hole Augers, Pug Mill Paddles, Tamper Tools

**Nominal Composition:**

- **Alloy Content - 21%** (Chromium, Carbon, Manganese, Silicon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metal	Layers	HRC
.20%	1	40-43
.20%	2	48-50
Mang. Steel	1	40-44
Mang. Steel	2	47-51

On Carbon Steel or Low Alloy Steel: Slightly Magnetic  
On Mang. Steel: Non-Magnetic Not Forgeable or Machinable

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11408300	1/16" (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2" -1"	205-255	24-28	33
<b>Stoody 121-G</b>						
11423200	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	175-200	22-26	33

**Stoody® 101HC**

Stoody® 101HC is a high chromium-iron alloy recommended for applications subject to severe abrasion and moderate impact and heat. Develops very tight cross checking pattern and is frequently used for applications involving severe metal-to-earth abrasion. Generally limited to 2 layers. Deposits are not machinable or forgeable and can be used in hot wear applications up to 900° F.

**Welding Procedures/Characteristics:** DC reverse polarity recommended using either stringer or weave beads. Can be applied to carbon, low alloy, and manganese steels. The small diameter (.045" and 1/16") wires can be run out of position using relatively fast travel speeds and no oscillation. The addition of CO<sub>2</sub> shielding gas with the 1/16" diameter wire reduces the amount of spatter and improves its weldability for out of position work.

**Applications:** Scraper Sides, Cutters, Blades, Ripper Shanks and Teeth, Shovel Bucket Tooth Adapters, Clam Shell Bucket, Bucket Sides and Lips, Tillage Tools, Augers and Auger Flights, Conveyor Screws.

**Nominal Composition:**

- **Alloy Content - 26%** (Chromium, Carbon, Manganese, Silicon)
- **Iron Base**

**Mechanical Properties Typical Rockwell Hardness:**

Base Metal	Layers	HFIC
.20% C	1	55-58
.20% C	2	62-64

Hardness:  
1 Pass on mild steel .....55-64 HRC  
2 Passes on mild steel .....59-64 HRC

On Mild Steel: Slightly Magnetic  
On Mang. Steel: Magnetic

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11874600	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	150-200	22-26	50
11304700	1/16 (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2" -1"	200-260	24-28	33
11436300	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	150-200	22-26	33
11440300	.045" (1.2 mm)	98% Ar/2% O <sub>2</sub> , or 75% Ar/25% CO <sub>2</sub>	1/2"-3/4"	150-200	22-26	10
11304800	1/16 (1.6 mm)	Open-arc or CO <sub>2</sub>	1/2" -1"	200-260	24-28	50

**Semi-Automatic Wires**

**Group 4: Metal to Earth for Extreme Abrasion and Low Impact**

**Stoody® 130**

Stoody® 130 wire provides the ultimate wear resistance and the ability to cut earth formations because of the tungsten carbide particles contained in the wire.

**Welding Procedures/Characteristics:** To maximize the benefits of this open arc wire, the welding current should be kept to an absolute minimum. DC reverse (18-24 volts) polarity is recommended using stringer beads in a single layer; relief checks. Bonds readily to carbon and low alloy steels.

**Applications:** Scoop Lips and Teeth, Ripper, Muller Plows Augers, Pug Mill Knives, Chisel Plow, Ammonia Injectors, Auger Flights, Cultivator Chisels, Ditcher Teeth, Swing Hammers, Ensilage Knife, Raymond Mill Plows, Tillage Tools of All Types.

**Nominal Composition:**

- Alloy Content - 60% (Tungsten Carbide)
- Iron Base

**Mechanical Properties Typical Rockwell Hardness:**

Hardness of Borium  
Particles .....9.9 on Moh's Scale

On carbon or low alloy steel: magnetic  
Not recommended for Mang. steel.  
Not forgeable or machinable.

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11413200	1/16" (1.6 mm)	Open-arc	1/2"	90-120	18-24	33

**Group 5: Abrasion Accompanied by Corrosion and/or High Temperatures (Cobalt and Nickel)**

**STOODITE 6**

STOODITE 6 is the most widely used cobalt alloy having excellent resistance to many forms of mechanical and chemical degradation over a wide temperature range. Particular attributes are its outstanding self mated anti-galling properties, high temperature hardness and high resistance to cavitation erosion. Certification to AWS-A5.13, Type ECoCr-A (Coated), but with exceptions.

**Welding Procedures/Characteristics:** A gas metal arc wire (DC reverse polarity) requiring proper preheat, controlled interpass temperatures and cooling rates. Special power supplies (i.e. pulsed arc, etc.) are used to reduce penetration and base metal dilution. Crack free deposits up to 2 layers.

**Applications:** Flights of Extrusion Screws, Sinker Roll Bushings in Steel Mill, Soaking Pit Tong Bit, Shafts.

**Nominal Composition:**

- Alloy Content - 96% (Chromium, Tungsten, Iron, Carbon, Manganese, Silicon, Nickel, Molybdenum)
- Cobalt Base

**Mechanical Properties Typical Rockwell Hardness:**

1 Layer 27-33 HIFIC  
2 Layers 36-39 HRC

Part No.	Wire Diameter	Shielding Gas	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
810722182045	.045 (1.2 mm)	Argon or 98%/Ar/2% O <sub>2</sub>	1/2"-5/8"	180-200	25-27	25

**Group 2: Metal to Metal Wear (Low-Alloy Iron-Based)**

**Stoody® 420**

Stoody® 420 is a 420 stainless steel submerged arc wire with very good abrasion resistance and good impact resistance. Deposits polish in service to reduce friction and minimize wear of a mating part. It is readily machinable. Check-free deposits can be made up to 3/4" thick.

**Applications:** Brake Drums, Coiler Rolls, Rams, Pinch Rolls, Packing Glands.

**Nominal Composition:**

- Alloy Content - 14% (Carbon, Chromium, Manganese, Silicon)
- Iron Base

Part No.	Wire Diameter	Flux	Wire Ext.	AMPS	Volts	Spool Size (lbs.)
11407500	1/8" (3.2 mm)	Stoody® S	1"-1-1/2"	350-400	28-30	100