



ALL-STATE PRODUCT SELECTION GUIDE

WELDING, BRAZING AND SOLDERING SOLUTIONS
FOR MAINTENAINCE, REPAIR AND FABRICATION



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All-State Product Summary

Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
RUBBON 55	•					Aluminum Alloys	Aluminum solder for joining aluminum at low temperatures without flux (All-State 53 flux will improve flow) for high strength and long service without galvanic action between base metal and solder.
SEALCOR		•				Aluminum Alloys	A special aluminum flux cored brazing alloy for fabrication and repair of all weldable grades of aluminum cast, sheet and wrought. Ideal for out of position work, build up and joining dissimilar gauges of aluminum.
SMOOTHCOTE 34			•			Aluminum Alloys	A premium DC Reverse all position aluminum electrode with an extruded coating. For aluminum sheets, plates and castings of 1/8 in. (3.2 mm) thickness or heavier. Deposits are dense, smooth and provide a good color.
STRONGSET 509 KIT	•					Aluminum Alloys	Cadmium Zinc solder with high strength corrosion resistance including galvanic corrosion. For joining aluminum to itself, ferrous and non-ferrous metals (except magnesium). Use with All-State 509 flux.
SUPER 31		•				Aluminum Alloys	A special brazing alloy for joining light gauge aluminum. Used extensively in production and maintenance brazing of aluminum except 2011, 2014, 2017, 2024 and 7075 types. Alloy is very fluid and has capillary action similar to silver brazing alloys. Use with All-State Brazaloy No 31 flux.
SUPER 31 FC		•				Aluminum Alloys	Non-corrosive, non-hygroscopic flux cored rod; no separate flux required. For joining light gauge aluminum as in furniture, truck and tractor bodies, window frames, and aircraft instruments. Excellent color match but will darken if anodized. Very fluid.
4-60T				•		Cast Iron Alloy	Top quality, most machinable bare rod for TIG welding of thin sections of cast iron up to 3/8 in. (9.5 mm). Also joins cast iron to mild steel.
8-60			•			Cast Iron Alloy	All position AC/DC reverse nickel electrode for heavy sections of cast iron and ductile iron. For production welding requiring machinable deposits with high strength and good ductility. Meets AWS A5.15 Class ENiFe-CI-A.
SUPER 4-60			•			Cast Iron Alloy	Premium AC/DC reverse all position electrode for heavy sections of cast iron and ductile iron. For general maintenance welding requiring high strength, a machinable deposits. Excellent for ferrous metals high in phosphorous content.
No 3		•				Cast Iron Alloy	High quality general purpose cast iron torch alloy that alloys flow at lower temperatures without melting base metal. Used for maintenance and repair of heavy and light castings. Use with All-State Brazaloy No 5 Flux.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
4 IMP			•			Cast Iron Alloy	Premium AC/DC reverse all position electrode for thin sections of cast iron. Provides dense machinable non-cracking porosity free welds. For filling defects, repairing cracks and build up. All-State 4-T is a All-State IMP GTAW equivalent.
41FC		•				Copper Alloys	A premium general purpose flux-coated brazing rod for joining or overlay of steel, cast iron, brass, bronze, galvanized and malleable irons or any combination of these metals.
LFB FC		•				Copper Alloys	A bare of flux coated torch rod for fabricating or repairing steels, cast iron, copper base metals, galvanized and malleable irons or any combinations of these metals. Use All-State Brazaloy No1, No 5, Brazo Flux or All-State Jet Flux when using bare rod.
SILICON BRONZE				•	•	Copper Alloys	A bare metal for fabricating and joining silicon bronze, copper alloys and some iron based metals and thin gauge galvanized steel. Deposits are high strength, ductile and crack resistant. Use with 100% Argon or 25% Argon/75% Helium shielding gas.
DEOXIDIZED COPPER				•		Copper Alloys	A bare filler metal rod that produces high purity deposits for fabricating deoxidized copper. Also used to join copper to steel or overlay them. Provides high electrical conductivity and excellent corrosion resistance. Use with 100% Argon or 25% Argon/75% Helium shielding gas mixture.
SILFLO 0		•				Copper Alloys	A self-fluxing brazing alloy for copper to copper joining in a tight fitting, 0.001-0.002 in. (0.03-0.05 mm) areas. Use All-State S-200 Flux when joining brass to bronze metals. Tip of rod colored grey.
SILFLO 5		•				Copper Alloys	A self-fluxing brazing alloy for copper to copper joining. Use where close fit up cannot be maintained Use All-State S-200 Flux when joining brass to bronze metals (5% Silver).
SILFLO 15		•				Copper Alloys	A self-fluxing brazing alloy for copper to copper joining. Use for higher ductility in joints where close fit-up is impossible. Use All-State S-200 Flux when joining brass to bronze metals (15% Silver).
No. 21		•				Copper Alloys	Brazing rod for joining copper to copper or copper to brass and bronze. Will join copper-nickel alloys with less than 30% nickel. Not recommended for ferrous metals. Fast capillary action high electrical and heat conductivity, high fatigue resistance and tensile strength. Use All-State 21, 110 or S200 Flux when joining brass to bronze.
24 AC/DC			•			Copper Alloys	An AC all position electrode that produces sound porosity free deposits on bronze, brass, copper, cast iron and steel. Use as an overlay on cast iron or steel and to join dissimilar metals.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
24 DC			•			Copper Alloys	A DC reverse phosphor bronze electrode for welding bronze, brass, copper, cast iron, steel and dissimilar metals. Smooth high strength deposits can be made in all positions.
No 11 and No. 11 Flux Coated		•				Copper Alloys	A high strength brazing alloy for joining ferrous and non-ferrous metals (except white metal) and carbon and low alloy steels. Higher strength than ordinary bronze rods can replace many higher cost silver alloys. Use with All-State No 1113 Flux or Jet Flux.
BRAZALOY NO 1		•				Fluxes	A blue general purpose brazing flux for cast iron, brass, bronze and copper brazing. Active from 1400°F - 2000°F (760°C - 1093°C). Performs to AWS A5.32 Type FB3-F.
BRAZALOY NO 1113		•				Fluxes	Grey paste for welding and brazing on cast iron, mild steel, nickel silvers and copper. Active from 1400°F (760°C) and protects to 2200°F (1093°C). Performs to AWS A5.31 Type FB3-G.
BRAZALOY No 110		•				Fluxes	Blue paste brazing for stainless steel, nickel, monel, copper alloys and silver alloys Active at 1000°F (538°C) protects up to 1600°F (871°C). Performs to AWS A5.31, type FB3-A, AMS 3410F, Mil F-4483 and Fed OF499D.
BRAZALOY No 31 FLUX		•				Fluxes	Light blue powder flux for sheet metal and extruded aluminum. Removes oxides at just below welding temperatures. Active from 1080°F (582°C) to 1350°F (732°C). Performs to AWS A 5.31 Type FB1-A and AMS 3412D.
BRAZALOY NO 5		•				Fluxes	Red powder welding flux for cast iron, cast steels, mild and low alloy and stainless steel joining to cast iron. Active from 1400°F - 2000°F (760°C - 1093°C). Performs to AWA A5.31 toe FB3-F.
BRAZALOY NO.110 FLUX		•				Fluxes	Blue paste flux for stainless steel, nickel, monel, copper alloys and silver alloys. Active at 1000oF, protects to 1600°F (871°C). Performs to AWS A5.31 Type FB3-A AMS 3410F, Mil F-4483 and Fed O499D.
BRAZO FLUX 1		•				Fluxes	White powder flux for brazing on steel, cast iron, copper and brass. Active from 1400°F - 2000°F (760°C - 1093°C). Performs to AWS A5.31 FB3-F.
DUZALL FLUX		•				Fluxes	Clear liquid general purpose soldering flux for use with all soft solders on stainless steels, copper alloys, gold, silver and galvanized steel. Active at 430°F (221°C). Performs to Fed AA51145 Type 1 Form B.
FERRO FLUX 1		•				Fluxes	Red powder for cast iron welding. Combines with iron and silicon oxides to form slag to the top of molten weld puddle. Active from 1400°F - 2000°F (760°C - 1093°C). Performs to Mil F 16135B.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
S-200 FLUX		●				Fluxes	White paste brazing flux for stainless steels, monel, copper alloys and silver alloys. Active at 1000°F (538°C) and protects to 1800°F (982°C). Performs to AWS A5.31 Type FB3-A, AMS 3401F Mill 4483 and Fed OF499D.
S-300 FLUX		●				Fluxes	Black paste brazing flux for stainless steels, copper alloys and silver alloys. Active at 1000°F (538°C) and protects to 1800°F (982°C). Performs to AWS A 5.31 Type FB3-A, AMS 3401F, Mil F 4483 and Fed OF499D
Brazaloy No 53	●					Fluxes	White powder for removing oxides of aluminum and zinc based alloys. Active to 700°F (371°C). Performs to AWS A5.32 Type FB1-A.
DYNAGRIP 430 ACID FLUX	●					Fluxes	Clear liquid soldering flux particularly suited for corrosion resistant steels such as 316, 347 and 430. Active to 430°F (221°C). Performs to Fed AA51145 Type II, Form B.
STRONGSET 509	●					Fluxes	Golden viscous aluminum and copper soldering flux active at 350°F - 550°F (177°C - 288°C).
HS-2C			●			Hardfacing/ Wearfacing Electrodes	An all-position AC/DC reverse electrode for severe abrasion and moderate impact. Hardness to 58 - 62 Rockwell C
HARD TUFF 56			●			Hardfacing/ Wearfacing Electrodes	An AC/DC electrode for heavy impact and abrasion on carbon and manganese steels. Hardness up to 63 - 67 Rockwell C.
RUF-KUT			●			Hardfacing/ Wearfacing Electrodes	Deposits hard tungsten carbides in a tough nickel silver matrix for maximum abrasion resistance and superior cutting action.
CHAMFER ROD			●			Metal Removal	An AC/DC straight all position electrode for chamfering and gouging both ferrous and non ferrous metals.
GREEN BLASTER			●			Metal Removal	Green Blaster™ 1/8 in. (3.2 mm) unique Chamfering/Cutting Metal Removal Maintenance Electrode comes in a 5 lb. tube and is designed ideally for AC welding machines. Electrode is generally used to remove existing cracks or defects prior to welding with electrodes like All-State Super 4-60 or Super 275. A unique chamfering/cutting electrode with 25% more arc blast force.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
CUTTING			•			Metal Removal	An AC/DC straight all position electrode for cutting and piercing of all metals.
STUD PLUS			•			Metal Removal	AC/DC reverse electrode specially formulated for the easy removal of broken studs and bolts.
50/50 PASTE SOLDER	•					Misc. Alloys	A 50/50 lead/tin solder for sealing, joining or tinning most common metals except aluminum. Can be used with a soldering iron or torch. Working temperature is 360°F - 375°F (182°C - 190.5°C).
AQUASAFE 100	•					Misc. Alloys	Lead-free, cadmium-free solder and flux kit for joining dissimilar metals in drinking water lines. Works, melts and solders better than 50/50 lead /tin solder. Meets all Government and Plumbing Codes/ Specs. Flux performs to Fed - O 506 Form A.
GALVOVER	•					Misc. Alloys	Special low temperature alloy used to restore and protect galvanized area of sheet metal and angle iron Smooth firm bond that resists corrosion.
11FC		•				Nickel Silver	A high strength brazing alloy for joining non-ferrous metals, carbon and low alloy steels. Higher strength than ordinary bronze rods can replace many higher cost silver alloys. Use with All-State No 1113 Flux or Jet Flux.
OVERLAY NI-MATRIX CR "SELF SHIELDED"					•	Overlay Alloys	Work-hardening austenitic manganese steel flux cored wire designed for all position build up of wear plates, blades, hammers, crusher liners, dipper teeth and lips, dragline buckets, railroad frogs and switches. Excellent weldability. Can be flame cut and can be welded using multiple passes without de-slagging. Non-machinable. Deposit hardness AW 15-20 Rc.
Overlay 3038					•	Overlay Alloys	A strong tough low alloy build up wire for carbon and low alloys. Weld deposits are exceptionally sound and dense. Heavy thicknesses are possible without danger of cracking. Machinable with hardness of 33 - 38 Rc. For parts that must be rebuilt prior to hard facing or back to originals dimensions. Shield Gas 75% Ar/ 25% CO ₂ .
OVERLAY 5659					•	Overlay Alloys	General purpose hard facing metal cored gas shielded overlay with excellent abrasion and impact resistance. Can be applied to carbon, alloy, and manganese steels as well as cast iron on plowing tools, augers, bucket teeth, screw conveyers, dozer blades and coal chutes. Best with Ar / CO ₂ mixes, okay with 100% CO ₂ . Deposit hardness 55 - 59 Rc.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
Overlay 5759 W					●	Overlay Alloys	Excellent toughness metal cored hard overlay with good abrasion resistance and heat resistance up to 100°F (599°C) and still maintains a good cutting edge. Typical applications: hot working shear blades, forging dies, damaged or hot working punches, headers, trimmers, shear knives in hot work applications, mandrels, piercers, ejecting rods, augers, dozer blades and earth moving tools. Use CO ₂ , but best results are obtained with Argon / CO ₂ mixtures. Deposit hardness 57 - 59 Rc.
Overlay 6065					●	Overlay Alloys	Provides extremely good earth abrasion resistance. May be applied to steel, stainless steels, manganese steels and cast iron. Wire runs through rust and other surface contaminants and will operate in conditions where wind may blow shielding away. Non-Machinable with hardness of 60 - 65 Rc. Heat resistant to 1000°F (538°C). Shielding gas 75% Ar / 25% CO ₂ .
101FC CD FR		●				Silver	A cadmium-free nickel bearing food grade silver brazing alloy for stainless, carbide tools, and joining ferrous and nonferrous materials 40% Silver.
155		●				Silver	A cadmium-free food grade brazing alloy with low melting temperature. For joining and repair of steels, stainless steel, nickel, copper and high speed steels. Use with All-State No 110 Flux or All-State S-200 Flux - 56% Silver.
155FC		●				Silver	A cadmium-free food grade brazing alloy with low melting temperature. For joining and repair of steels, stainless steel, nickel, copper and high speed steels. Use with All-State No 110 Flux or All State S-200 Flux - 56% Silver.
DYNAGRIP 430 SLDR	●					Silver	A cadmium-free, low temperature food grade silver brazing alloy for high strength on stainless steels and dissimilar metals. Deposits closely match stainless and stay bright after prolonged service. Use with All-State Duzall Flux or All-State 430 Flux.
No 100		●				Silver	A cadmium-free nickel bearing food grade silver brazing alloy for stainless steel, carbide tools and joining ferrous and non-ferrous metals (except white metals). 40% silver. Kit contains 2 oz. coil of No 100 and 1 oz. of Brazaloy 110 Flux.
TRI-Metal		●				Silver	Special purpose intermediate temperature silver brazing alloy with long melting range that has a strong tendency to liquidate. Specially formulated for the brazing of carbides. An effective alloy for the brazing of stainless steels. Absorbs shock and stress. Use with All-State Brazaloy No 110 or S-200 Flux.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
FLUX COATED STAINLESS TIG				●		Stainless Steel	Especially designed for pipe welding applications. Flux coating eliminates the need for purging. Available in 316L alloy.
GLIDEARC			●			Stainless Steel	Special vertical up, vertical down and overhead stainless steel for maintenance applications.
SHIELD FREE					●	Steel Alloys	Self-shielding flux cored wire. No gas required. All position DC Straight polarity. Ideal for thin gauge galvanized and mild steel. Welds over oil, grease and mill scale. Single pass only.
70S-6					●	Steel and Steel Alloys	Copper coated wire for all thin gauge mild steel welding. Produces a quiet, highly stable arc, even on steels having moderate rust or mill scale. Runs best on DC Reverse with CO ₂ at a gas flow of 20-30 cubic feet per hour.
70S-2				●		Steel and Steel Alloys	Triple deoxidized wire for welding over rust and mill scale. For all position welding of small diameter pipe. Ideal for out of position puddle control. Copper coated.
RG 65		●				Steel and Steel Alloys	Copper finished for oxy-fuel welding of tubes, pipes, sheets pressure vessels and tanks in the 65-75 ksi range. Higher strengths on low alloy steels. Meets AWS A5.2 Class R65.
RG-45	●					Steel and Steel Alloys	Copper finished for oxy-fuel welding on steel plates, sheet and pipe wrought iron where strength to 45 ksi is required. Meets AWS A 5.2 R45.
252		●				Steel and Steel Alloys	This AC/DC reverse all position electrode is used for welding 310 and 314 stainless subjected to corrosion and elevated temperatures as well as dissimilar steels and stainless of unknown analysis.
275		●				Steel and Steel Alloys	An AC/DC reverse all position electrode that will produce highest tensile and yield strengths on tool, high alloy, spring, stainless (including 330 stainless) nickel clad and dissimilar steels. Machinable.
275 SUPER		●				Steel and Steel Alloys	An AC/DC reverse all position electrode producing an outstanding bead appearance. Use on tool, high alloy aircraft, spring, nickel clad, stainless and dissimilar steels. Excellent for dirty, greasy and rusty metals. Machinable.
4130-T			●			Steel and Steel Alloys	Low alloy TIG rod for medium and high carbon steels where complete heat treatment is desired such as SAE 4130,4140,4330,4340, 8620 and 8630 steels. Hardness from Rockwell 36 to 38 C. Copper coated.

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Product	Flame		Arc Welding			Category	Description
	Soldering	Brazing Oxy-Fuel	SMAW	GTAW	GMAW FCAW		
STEELARC 80LV		•				Steel and Steel Alloys	This AC/DC straight or reverse all position electrode can be used with low voltage machines for short intermittent tack welds on thin, medium and heavy sections of mild steel.
AIRHARD-T			•			Tool Steel TIG	Designed for repairs to high chromium type tool steels. Deposits are wear resistant and porous free. May be annealed, reheat treated, drawn or tempered.

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Chart 1 - Quick Selection Guide

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Arc →	Copper Alloys	Nickel Alloys	Cast Iron	Wrought Iron	Mild Steel	High Strength Steel	Manganese Steel	Galvanized Coated Steel	Tool Steel	Stainless Steel (see note 1)	Aluminum Plate	Aluminum Cast	Zinc Based Metals
↓ Flame													
Copper Alloys	No. 24DC ▶ SilBrnz ◀◀ SS 509 ▲ DG 430 ▲▲ AS 100 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲ Sil-Flo 15 ▼	No. 24DC ▶ SilBrnz ◀◀	No. 24DC ▶ SilBrnz ◀◀	No. 24DC ▶ SilBrnz ◀◀	No. 24DC ▶ SilBrnz ◀◀			SilBrnz ◀◀		No. 24DC ▶			
Nickel Alloys	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲ No. 41FC ▼	No. 4-60T ◀ No. 252 ▶◀ CC 8600 ◆ SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲ No. 41FC ▼	Su 4-60 ▶ No. 4-60T ◀	Su 275 ▶	Su 275 ▶	Su 275 ▶	Su 275 ▶	SilBrnz ◀◀	Su 275 ▶	GlideArc ▶ Su 275 ▶			
Cast Iron	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 4-60 ▶ No. 8-60 ▶ No. 4IMP ▶ No. 4-60T ◀ SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 4-60 ▶ No. 4IMP ▶ No. 4-60T ◀	Su 4-60 ▶ No. 4-60T ◀	Su 4-60 ▶ No. 4-60T ◀	No. 4-60T ◀	SilBrnz ◀◀	Su 4-60 ▶ No. 8-60 ▶ No. 4-60T ◀	Su 4-60 ▶			

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Arc →	Copper Alloys	Nickel Alloys	Cast Iron	Wrought Iron	Mild Steel	High Strength Steel	Manganese Steel	Galvanized Coated Steel	Tool Steel	Stainless Steel (see note 1)	Aluminum Plate	Aluminum Cast	Zinc Based Metals
↓ Flame													
Wrought Iron	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	No. 4IMP ▶ No. 8-60 ▶ Su 275 ▶ No. 101 ▼†▲ No. 155 ▼†▲	Su 275 ▶	Su 275 ▶	Su 275 ▶	SilBrnz ◀◀	Su 275 ▶	Su 275 ▶			
Mild Steel	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SA 80LV ▶ Su 4-60 ▶ ShldFree ◆ SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 4-60 ▶ No. 4130-T ◀	Su 4-60 ▶	SA 80LV ▶ SilBrnz ◀◀ ShldFree ◆	Su 275 ▶	Su 275 ▶ No. 252 ▶▶			
High Strength Steel	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 4-60 ▶ SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 4-60 ▶	SilBrnz ◀◀	Su 4-60 ▶ No. 4130-T ◀				
Manganese Steel	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 275 ▶ SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SilBrnz ◀◀	Su 275 ▶	Su 275 ▶ GlideArc ▶ No. 252 ▶▶			
Galvanized Coated Steel	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SA 80LV ▶ SilBrnz ◀◀ No. 101 ▼†▲ No. 155 ▼†▲ Galvover ▲				

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Arc →	Copper Alloys	Nickel Alloys	Cast Iron	Wrought Iron	Mild Steel	High Strength Steel	Manganese Steel	Galvanized Coated Steel	Tool Steel	Stainless Steel (see note 1)	Aluminum Plate	Aluminum Cast	Zinc Based Metals
↓ Flame													
Tool Steel	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	AirHard ▶▶ No. 101 ▼†▲ No. 155 ▼†▲	Su 275 ▶ No. 252 ▶▶			
Stainless Steel (see note 1)	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲	Su 275 ▶ GlideArc ▶ No. 252 ▶▶ SS 509 ▲ DG 430 ▲▲ No. 101 ▼†▲ No. 155 ▼†▲			
Aluminum Plate	SS 509 ▲	SmCt 34 ▶ SS 509 ▲ Rubbon55 ▲ Su 31 ▼‡	SmCt 34 ▶ Su 31Tig ◀ Su 31Mig ◆										
Aluminum Cast	SS 509 ▲	SS 509 ▲ Rubbon55 ▲ Su 31 ▼‡	SmCt 34 ▶ SS 509 ▲ Rubbon55 ▲ Su 31 ▼‡										
Zinc Based Metals	SS 509 ▲	SS 509 ▲ Rubbon55 ▲	SS 509 ▲ Rubbon55 ▲	SS 509 ▲ No. 53 ▲ Rubbon55 ▲									

Product Abbreviations:	
AS 100	AquaSafe 100
DeoxCu	Deoxidized Copper
DG 430	DynaGrip 430
LFB	Low Fuming Bronze
No. 101	No. 101 & 101FC
No. 11	No. 11 & 11FC
No. 13	No. 13 & 13FC
No. 155	No. 155 & 155FC
SA 80LV	SteelArc 80LV
SC 34	SmoothCote 34
ShldFree	Shield-Free Plus
SilBrnz	Silicon Bronze
SS 509	Strongset 509
Su 275	Super 275
Su 31	Super 31 & 31FC
Su 4-60	Super 4-60

For joining Magnesium to Magnesium, use All-State No. 61T.

FLAME	ARC WELDING
- Soldering -	- Stick -
- Brazing -	- TIG -
	- MIG -

Key:	
▲	Soldering Product (flame- fuel gas and air)
▼	Brazing & Gas Welding Product (flame - fuel gas and oxygen)
▶	Arc Welding - Manual "Stick" Electrode Product
◀	Arc Welding - TIG Product
◆	Arc Welding - MIG "Wire Welding" Product - solid or flux cored wires
†	Bare and Flux Coated Products Available
‡	Bare and Flux Cored Products Available
^	Lead and Cadmium Free. Safe to use with potable water, beverage and food handling applications.
1	Refer to the All-State Selection Guide Chart 2 for more selection for the most common types of stainless steel.

Chart 2 - General Product Selection Guide

All-State

Metal Type →	Copper Alloys					Nickel Alloys		Cast Iron		Steel Alloys				Tools Steel	Stainless Steel		Aluminum Alloys		Zinc Based Metals		Magnesium
	Process & Product ↓	Copper	Brass	Bronze	Silicon Bronze	Monel	Nickel Alloys	Inconel	Cast Iron	Wrought Iron	Mild Steel	High Strength	Manganese Steel		Galvanized Coated Steel	Stainless Steel	See Note 1	Aluminum	Cast Aluminum	Zinc Based Metals	
Soldering Products																					
Rubbon 55																	★	★	★	★	
Strongset 509	✓	✓	✓	✓	✓	•	•	•		•	•	•	✓		•		★	★	•	•	
50/50 Paste Solder	★	★	★	★	★	•	•	•		•	•	•	✓		•		★	★	★	★	
Galvoer	✓	✓	✓	✓			✓			✓	✓	✓	★		✓				✓		
AquaSafe 100^	★	★	★	✓	✓	✓	✓	✓		✓	✓	✓			✓						
DynaGrip 430^	★	★	★	★	★	★	★	★	★	★	★	★			★						
Brazing Products																					
Super 31 & 31 FC																	★	★			
Sealcor																	★	★			
No. 11 & 11 FC	★	★	★	★	★	★	★	★	★	★	★	★	✓	•	★						
No. 41 FC	★	★	★	★	★		✓	★	★	★	★	★	★	•							
No. 101 & 101 FC	★	★	★	★	★	★	★	★	★	★	★	★		•	★						
No. 155 & 155 FC	★	★	★	★	★	★	★	★	★	★	★	★	✓	•	★						
Sil-Flo 15	★	★	★	★	★																

Chart 2 - General Product Selection Guide

All-State

Metal Type →	Copper Alloys					Nickel Alloys		Cast Iron		Steel Alloys				Tools Steel	Stainless Steel		Aluminum Alloys		Zinc Based Metals		Magnesium
	Process & Product ↓	Copper	Brass	Bronze	Silicon Bronze	Monel	Nickel Alloys	Inconel	Cast Iron	Wrought Iron	Mild Steel	High Strength	Manganese Steel		Galvanized Coated Steel	Stainless Steel	See Note 1	Aluminum	Cast Aluminum	Zinc Based Metals	
Sil-Flo 5 & 0	✓	✓	✓	✓	✓																
Low Fuming Bronze	★	★	★	★	★	✓	★	★	★	★	★	★									
RG 45								★	★												
RG 65								✓	✓	★											
Arc Welding - Manual Stick Electrode Products																					
SmoothCote 34																	★	★			
Super 4-60						★	★	★		•	•			•							
No. 8-60 (55% Ni)						•	•	★	✓	•				•							
No. 24 DC	★	★	★	★	★	•	✓	✓	✓	•				•							
Super 275						✓	✓		✓	★	★	★		✓	★						
SteelArc 80LV							✓			★			✓								
No. 252						✓			✓	✓		✓		✓	★						
GlideArc						✓	✓					✓		★							
Air Hardening										•	•			★							

Chart 2 - General Product Selection Guide

All-State

Metal Type →	Copper Alloys					Nickel Alloys		Cast Iron		Steel Alloys				Tools Steel	Stainless Steel		Aluminum Alloys		Zinc Based Metals		Magnesium
	Process & Product ↓	Copper	Brass	Bronze	Silicon Bronze	Monel	Nickel Alloys	Inconel	Cast Iron	Wrought Iron	Mild Steel	High Strength	Manganese Steel		Galvanized Coated Steel	Stainless Steel	See Note 1	Aluminum	Cast Aluminum	Zinc Based Metals	
Arc Welding - TIG Products																					
No. 4-60T						✓	✓	★	✓	✓	✓	✓									
Deoxidized Copper	★	✓	✓	✓	✓					•	•	•	✓								
Silicon Bronze	✓	✓	✓	★	✓	✓	✓	✓	✓	★	•	•	★								
AS 70S-2										★	•										
No. 252-T						✓			✓	✓		✓		✓	★						
Air Hardening										•				★							
Arc Welding - MIG Products																					
Deoxidized Copper	★	✓	✓	✓	✓					•	•	•	✓								
Silicon Bronze	✓	✓	✓	★	✓	✓	✓	✓	✓	★	•	•	★								
AS 70S-6										★											

★ Best Choice ✓ Good Choice • Can be used when welding to other metals listed as "Best Choice" or "Good Choice" for this product.

1 Refers to Stainless Steel Product Selection - Chart 2 for more detailed product selection choices.

^ Lead and Cadmium free. Safe to use on potable water, beverage and food handling applications.

Chart 3 - Overlay Product Selection Guide

All-State Product	Base Metal	Hardness	Tensile Strength	Impact	Abrasion	Metal to Metal	Corrosion	Joining	Weld Method	Product Description
HS-2C	Steel	Rc 58-62		✓	✓				arc ¹	Smooth running electrode that lays a beautiful bead composed of complex carbides for long lasting protection against wear. Designed for severe abrasion and light impact. Deposits have low coefficient of friction. Ideal for severe wear caused by sand and other abrasive minerals. Good hot hardness at 1100°F (593°C). Build-up: 2 to 3 passes.
Hard-Tuf 56	Steel Mn Steel	Rc 54-56		✓	✓				arc ¹	For heavy impact and abrasion on carbon and manganese steels. Build-up: 2 passes [1/4 in. (6.35 mm) max.].
Overlay Ni-Matrix CR	Mn Steel	Rc 15-20	up to 120 ksi	✓	✓				arc ²	Work-hardening, austenitic, manganese steel flux cored wire for all-position build-up and fabricating of wear plates, blades, hammers, crusher liners, dipper teeth and lips, dragline buckets, railroad frogs and switches. Can be flame cut. Non-machinable. Work hardens Rc 50-55. Can weld multipass without deslagging.
Overlay 3038	Steel	up to Rc 38			✓				arc ²	Iron based flux cored alloy containing chromium, molybdenum, manganese and silicon. Deposits are machinable, tough, sound and dense. Use for under-layment for harder overlays on carbon and low alloy steels. Build-up: unlimited.
Overlay 5659	Steel Mn Steel Cast Iron	Rc 55-59		✓	✓				arc ²	General purpose flux cored hardfacing overlay with excellent abrasion and impact resistance. Use on carbon steel, alloy steel, manganese steel and cast iron. Build-up: 2 to 3 passes.
Overlay 5759 HW	Steel Mn Steel Cast Iron	Rc 55-59		✓	✓				arc ²	A versatile flux cored wire that is ideal for maintenance and repair applications. It is resistant to both heat and corrosion. Overlay 5759 HW is an excellent choice to use as an overlay as well as for abrasion and impact. Use on carbon steel, alloy steel, manganese steel and cast iron. Build-up: 2 to 3 passes.
Overlay 6065	Steel Mn Steel SS	Rc 65		✓					arc ²	Extremely good wear characteristics. Heat resistant to 1000°F (538°C). Use on carbon steel, manganese steel, low alloy steel and stainless steel. Build-up: 2 passes.
Ruf-Kut	Steel Cast Iron	-		✓	✓				flame ¹	Deposits hard tungsten carbides in a tough nickel-silver matrix for maximum abrasion resistance and superior cutting action. Use No. 1113 flux. Build-up: unlimited.
Ni-Matrix	Mn Steel	BHN 89 to 510	116 ksi	✓	✓			✓	arc ¹ arc ³	For fabrication and build-up of Hadfield manganese steel. Withstands constant, heavy impact, abrasion and compression. Use for attaching wear plates, blades or teeth. Can be cut with oxy-fuel. Work hardens to BHN 15 Build-up: unlimited.

arc¹ - Manual electrode: SMAW (shielded metal arc welding). Also called stick welding. An arc welding process that requires a DC CC (constant current) power source.

arc² - Flux cored wire: FCAW (flux cored arc welding). Also called cored wire welding. Uses the same type of equipment as MIG solid wire welding.

arc³ - MIG solid wire: GMAW (gas metal arc welding). Also called wire welding. An arc welding process that requires a DC CV (constant voltage) power source and wire feeder.

flame¹ - Oxy-fuel brazing: a joining process using a filler metal with a working temperature above 800°F (427°C), but below the melting point of the metals being joined.

Mn - Manganese

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