



A LINCOLN ELECTRIC COMPANY

# HVAC/R & PLUMBING CATALOG



## About The Harris Products Group

The Harris Products Group is an American based company with quality expectations that are the highest in the industry. We provide our customers with competitive prices and on-time deliveries. With an average of over 30 years experience, our sales and technical representatives are product application experts. Harris products are recognized in the industry as world-class brands. No other manufacturer brings the breadth and depth of products that Harris does. Our products are 100% tested to ensure we meet and/or exceed industry specifications. Behind the Harris Products Group is the financial strength and resources of The Lincoln Electric Company, one of the most respected companies in the industry today.



# A WORLD CLASS LEADER

For over 100 years

## COMPANY HISTORY

The Harris Products Group was officially formed on May 1, 2006, with the combination of Gainesville, Georgia-based Harris Calorific, Inc. and Mason, Ohio-based J.W. Harris Company.

Harris Calorific is a manufacturer of gas welding and cutting equipment, industrial and specialty gas regulation equipment, and gas distribution systems. J.W. Harris, on the other hand, is a manufacturer of brazing and soldering alloys and welding consumables.

The merger resulted from a series of acquisitions by The Lincoln Electric Company, starting with the purchase of Harris Calorific in 1990 and followed by the addition of J.W. Harris in 2005. Also, included in the J.W. Harris acquisition was Autobrazo, a manufacturer of precision brazing rings and return bends utilized in the HVAC industry. Later in 2005, The Lincoln Electric Company acquired Gulf Wire Corporation, a manufacturer of aluminum and stainless welding consumables, and Filler Metals, a supplier of niche welding alloys. In 2008, The Harris Products Group purchased Brastak, a manufacturer of brazing alloys in Sao Paulo, Brazil.





FILLER METALS SELECTION CHART.....	4-5
PHOS COPPER ALLOYS.....	6-9
RING OF FIRE™.....	10-11
HIGH SILVER ALLOYS.....	12-17
ALUMINUM ALLOYS.....	19
COMMON SOLDERS.....	20-23
LEAD FREE SOLDERS.....	24-27
BRAZING & SOLDERING FLUX.....	28-29
BRAZING & SOLDERING SELECTION CHART.....	30-31
AIR FUEL HAND TORCHES.....	32-35
INFERNO® AIR FUEL TIPS.....	36-38
INFERNO® AIR FUEL KITS.....	39
OXY FUEL CUTTING ATTACHMENT AND HANDLES.....	40-41
OXY FUEL KITS (ACETYLENE).....	42-43
OXY FUEL KITS (ALTERNATE FUEL).....	44-45
MIXERS & TIP TUBES.....	46-47
OXY ACETYLENE WELDING AND BRAZING TIPS.....	48-49
OXY ACETYLENE HEATING AND CUTTING TIPS.....	50-51
ALTERNATE FUEL BRAZING, HEATING & CUTTING TIPS.....	52-53
GAS REGULATION EQUIPMENT.....	54-55
ACCESSORIES.....	56
BRAZING AND SOLDERING TRAINING.....	57
POINT OF PURCHASE.....	58



# FILLER METALS

PRODUCTS	QQ-B-654A	AMS	AWS A5.8	Ag	Cu	Zn	Ni	Sn	OTHER	SOLIDUS		LIQUIDUS	
										°F	°C	°F	°C
DYNAFLOW®				6	87.9				6.1P	1190	643	1465	796
BLOCKADE®			BCuP-9		REM			6.5	6.5P Si	1178	637	1247	674
HARRIS 0			BCuP-2		92.9				7.1P	1310	710	1475	802
STAY-SILV® 2			BCuP-6	2	91.0				7.0P	1190	643	1450	788
STAY-SILV® 5			BCuP-3	5	89.0				6.0P	1190	643	1500	816
STAY-SILV® 6				6	87.5				6.5P	1190	643	1425	774
STAY-SILV® 15	BCuP-5		BCuP-5	15	80.0				5.0P	1190	643	1480	804
LOW FUMING BRONZE			RBCuZn-C		58	40		1	1 Fe	1590	866	1630	888
SAFETY-SILV® 25				25	43	30		2		1270	688	1435	779
SAFETY-SILV® 30	BAG-20		BAG-20	30	38	32				1250	677	1410	766
SAFETY-SILV® 35			BAG-35	35	32	33				1250	677	1350	732
SAFETY-SILV® 38T			BAG-34	38	32	28		2		1220	660	1325	718
SAFETY-SILV® 40				40	30.5	29.5				1250	660	1350	732
SAFETY-SILV® 40T			BAG-28	40	30	28		2		1220	660	1310	710
SAFETY-SILV® 45	BAG-5		BAG-5	45	30	25				1225	663	1370	743
SAFETY-SILV® 45T			BAG-36	45	27	25		3		1195	646	1265	685
SAFETY-SILV® 50			BAG-6	50	34	16				1270	688	1425	774
SAFETY-SILV® 50N		4788	BAG-24	50	20	28	2			1220	660	1305	707
SAFETY-SILV® 56	BAG-7	4763	BAG-7	56	22	17		5		1145	618	1205	652
AL-BRAZE™ 1070			BAISi4							1070	577	1080	582
AL-BRAZE™ 4043										1065	574	1170	632
ALCOR®										824	440	824	440
ALSOLDER™ 500						15		85		391	199	482	250
NICK®										438	225	729	387
SPEEDY®										450	232	555	290
STAY-BRITE®				4				96		430	221	430	221
STAY-BRITE® 8				6				94		430	221	535	279
BRIDGIT®										460	238	630	332

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



**WARNING** Protect yourself and others. Read and understand this information.

**BRAZING AND SOLDERING ALLOYS AND FLUXES MAY PRODUCE FUMES AND GASES HAZARDOUS TO YOUR HEALTH.**

- Before use, read and understand the manufacturer's instructions, Material Safety Data Sheets (MSDS) and your employer's safety practices.
- Keep your head out of the fumes.
- Use enough ventilation, exhaust at the flame or both, to keep fumes and gases from your breathing zone and the general area.
- For maximum safety, be certified for and wear a respirator at all times when welding or brazing.
- Wear correct eye, ear and body protection.
- Do not touch live electrical parts.
- See American National Standard Z49.1, Safety in welding, cutting and allied processes, published by the American Welding Society, 500 N.W. LeJeune Road, Miami Florida 33126; OSHA Safety and Health Standards, 29 CFR 1910, Available from the U.S. Government printing office, Washington, D.C. 20402.
- MSDS are available for all Harris products. MSDS contain detailed safety and health information about possible hazards associated with use of these products. MSDS are available from your employer or by contacting the Harris Products Group, Mason, OH 45040.



# SELECTION CHART

FLUIDITY RATING*	TYPICAL APPLICATION
3	Premium alloy for copper or brass. Excellent strength and ductility, use as replacement for 15. For copper or brass. Lower brazing temperature, excellent replacement for many silver bearing BCuP alloys.
5	For copper. Requires medium fit-up, .002-.007" clearance.
4	Broadens melting range of 0. For copper or brass. Clearance range .002-.005".
3	For copper or brass. Used to bridge gaps where close fit-up can't be maintained.
5	For copper or brass. Medium range alloy for applications with clearances or .002-.005".
3	For copper or brass. Useful for wide clearance.002-.006". Good ductility. For steel and cast iron. Braze welding type alloy with flux coating.
5	For steel to copper alloys. Moderate ductility. For dissimilar metals joint should be in compression on cooling.
6	Use with ferrous and non-ferrous base metals. Flow suitable for bridging gaps.
5	Ferrous and non-ferrous base metals. Moderate temperature and good ductility.
7	Low-temperature, free-flowing alloy with exceptional fillet-forming quality. For ferrous and non-ferrous metals.
5	For steel, nickel, and copper alloys. Suitable for wider clearance yet provides good ductility.
6.5	Good flow properties. Suitable for ferrous and non-ferrous base metals.
6.5	General purpose filler for steel and copper alloys. Melting range useful for wide clearances.
7	Good flow properties. Suitable for ferrous and non-ferrous base metals.
5.5	Often used to braze galvanized steel but suitable for bridging gaps in other ferrous and non-ferrous metals.
7	For stainless steel applications to prevent crevice corrosion.
8	For ferrous and non-ferrous alloys. Often used to braze stainless steel for food service. NSF 51 listed. For brazing aluminum base metals.
	Aluminum repair, brazing of splits/holes. Wider melting range than Al-Braze™ 1070. For the repair of heat exchangers, air conditioners, aluminum alloy condensers and other applications.
	A low temperature solder for aluminum and copper. Fit small tight fitting connections and to bridge gaps in large, loose fitting, or non-concentric pipe.
	Faster melting range. Allows operator to fit small, tight fitting pipe connections quickly.
10	Low-temperature solder for all metals except aluminum. Used in refrigeration joints. NSF 51 listed.
8	Similar to Stay-Brite®. Plastic range useful in bridging wider gaps. Certified to NSF 51 listed.
6	Lead-free, nickel & silver-bearing solder of exceptional strength & capping ability. NSF 61 listed.

# PHOS COPPER ALLOYS

The Harris Products Group brazing alloy purity runs all the way through the rod, top to bottom, making a huge difference in the integrity of the brazed joint. This eliminates leaks caused by oxide, impurities, and contamination. Wherever there is contamination, the alloy flows around it, leaving pinholes in the joint. These pinholes allow gases to leak. Properly brazed, the biggest difference between a Harris joint and a joint brazed with another brand is reliability.

We produce the highest quality phosphorus/copper brazing rod in the world. The proprietary production technology that was developed to manufacture these alloys is unique. The alloy's phosphorus content is controlled to a tolerance five times tighter than normal industry standards. Such tight control means consistency in application and product performance.

## **Dynaflow**<sup>®</sup>

Dynaflow<sup>®</sup> is an exceptionally pure phos/copper/silver brazing alloy recommended for all copper to copper and copper to brass cooling applications. This alloy has provided decades of serviceability and economics to our customers. Dynaflow<sup>®</sup> is a premium, medium range silver alloy developed to mirror the performance characteristics of the 15% silver brazing filler metals. Excellent for brazing both tight and loose fitted application. It is a leading choice for operators, service technicians, and end users.

## **BLOCKADE**

Blockade<sup>™</sup> is the first of a new family of silicon/tin alloy brazing filler metals. Blockade<sup>™</sup> is engineered to join copper, brass, or bronze. Blockade's innovative composition provides the ability to form a large shoulder, or cap, at the braze connection. Excellent for all industries.

## **Low Fuming Bronze (LFB)**

A braze-welding alloy used to braze steel, steel alloys, and cast iron. LFB is frequently used to braze steel brackets, straps, angles and related fittings. Rod is deposited by melting it along the length of the joint. This alloy requires wider joint gaps, fillets, or vee-grooved butt joints for best results.

## **HARRIS 0**

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

## **Stay-Silv<sup>®</sup> 2**

Stay-Silv<sup>®</sup> 2 is an economical, low silver alloy, designed to broaden the melting range of Harris 0, and has proven useful in some specific applications where mechanical properties are less critical.

## **Stay-Silv<sup>®</sup> 5**

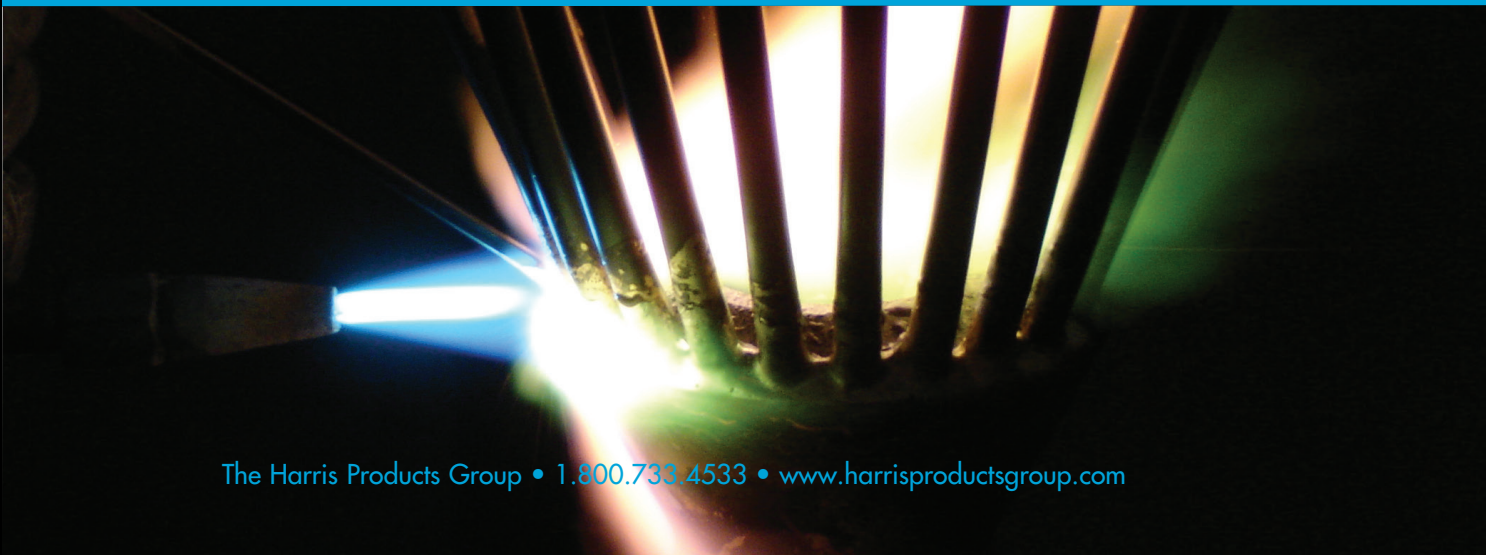
Stay-Silv<sup>®</sup> 5 is useful primarily where fit-up cannot be tightly controlled. Stay-Silv<sup>®</sup> 5 is a medium melting range alloy.


## **Stay-Silv<sup>®</sup> 6**

Stay-Silv<sup>®</sup> 6 is slightly more fluid and can be used where closer tolerances are available and is somewhat more ductile than Harris 0.

## **Stay-Silv<sup>®</sup> 15**

Stay-Silv<sup>®</sup> 15 is the industry standard for air conditioning/refrigeration applications. Its melting range is useful in filling wider clearances while providing good service ductility.





ALLOY	Ag %	P %	Cu %	SOLIDUS		LIQUIDOUS		FLUIDITY RATING	AWS A5.8	BS1845	DIN 8513	RECOMMENDED JOINT CLEARANCE
				°F	°C	°F	°C					
DYNAFLOW®	6	6.1	87.9	1190	643	1465	796	3	-	-	-	.002/.006"
BLOCKADE®	*	*	*	1178	637	1247	673	-	BCuP-9	-	-	.002/.005"
HARRIS 0	0	7.1	92.9	1310	710	1475	802	5	BCuP-2	-	L-CuP7	.002/.007"
STAY-SILV® 2	2	7.0	91.0	1190	643	1450	788	4	BCuP-6	CP2	-	.002/.005"
STAY-SILV® 5	5	6.0	89.0	1190	643	1500	816	3	BCuP-3	CP4	-	.002/.006"
STAY-SILV® 6	6	6.5	87.5	1190	643	1425	774	5	-	-	-	.002/.005"
STAY-SILV® 15	15	5.0	80.0	1190	643	1480	804	3	BCuP-5	CP1	-	.002/.006"
LFB	-	-	58.0	1590	866	1630	888	-	-	-	-	-

\* Proprietary composition



# PHOS COPPER ALLOYS



DESCRIPTION	DYNAFLOW®	BLOCKADE®	HARRIS O
.050 x 1/16 x 20 x 51 STICK TUBE			
.050 x 1/16 x 20 x 25 LB PACKAGE			
.050 x 1/8" x 28 STICK TUBE - 5LB	D620F15P	BK220R15P	0620F15P
.050 x 1/8" x 28 STICK TUBE - 25LB	D620F1		0620F1
.050 x 1/8" x 20 x 5 LB PACKAGE			
.050 x 1/8" x 20 x 25 LB PACKAGE	D620F		0620F
.050 x 1/8" x 36 x 25 LB PACKAGE			0636F
1/16" DIA x 20 x 25 LB PACKAGE		BK320R	0320R
1/16" DIA x 36 x 25 LB PACKAGE		BK336R	0336R
1/16" DIA x 20 x 51 STICK TUBE			0320R1
2MM DIA x 20 STICK TUBE		BK220R1	
2MM DIA x 20 x 25 LB PACKAGE		BK220R	
2MM DIA x 500MM x 20 STICK TUBE FC		BKFC2500R1	
3/32" DIA x 18 x 3 STICK TUBE			
3/32" DIA x 20 x 24 STICK TUBE			0520R1
3/32" DIA x 20 x 25 LB PACKAGE	D520R	BK520R	0520R
3/32" DIA x 36 x 25 LB PACKAGE	D536R	BK536R	0536R
3/32" SQ x 20 x 20 STICK TUBE			0520S1
3/32" SQ x 20 x 25 LB PACKAGE			0520S
3/32" SQ x 36 x 25 LB PACKAGE			0536S
1/8" DIA x 20 x 14 STICK TUBE			0620R1
1/8" DIA x 20 x 25 LB PACKAGE	D620R	BK620R	0620R
1/8" DIA x 36 x 25 LB PACKAGE		BK636R	0636R
1/8" SQ x 20 x 11 STICK TUBE			
1/8" SQ x 20 x 25 LB PACKAGE			0620S
1/8" SQ x 36 x 10 LB PACKAGE			
1/8" SQ x 36 x 25 LB PACKAGE	D636S		0636S
3/16" DIA x 36 x 25 LB PACKAGE			
1/4" DIA x 36 x 25 LB PACKAGE			0936R
1/4" DIA x 36 x 25 LB PACKAGE BLANK			0936RK
.050 x 1/8" x MINNI - PACK 8 STICK POP	D620FMPOP		0620FMPOP

# PRODUCT SELECTION GUIDE



STAY-SILV® 2



STAY-SILV® 5



STAY-SILV® 6



STAY-SILV® 15



LFB

			15320F1	
			15320F	
2620F15P	5620F15P	6620F15P	15620F15P	
2620F1	5620F1	6620F1	15620F1	
	5620F5			
2620F	5620F	6620F	15620F	
2636F	5636F	6636F	15636F	
2320R	5320R		15320R	
2336R	5336R	6336R	15336R	
	5320R1		15320R1	
				015FC53POP
	5520R1		15520R1	
2520R	5520R		15520R	
2536R	5536R	6536R	15536R	
2520S			15520S	
	5536S		15536S	
	5620R1		15620R1	
2620R	5620R		15620R	
2636R	5636R	6636R	15636R	
			15620S1	
			15620S	
			15636S10	
	5636S	6636S	15636S	
		6836R		
	5620FMPOP		1520FMPOP	

\*FOR ADDITIONAL SIZES AVAILABLE CONTACT CUSTOMER SERVICE

The Harris Products Group • 1.800.733.4533 • [www.harrisproductsgroup.com](http://www.harrisproductsgroup.com)

# RING OF FIRE™

## STAY-SILV® 15% BRAZING RINGS

CONVENIENT | CONSISTENT | QUALITY

Ring of Fire™ is the perfect alternative for any brazing project. It's easy to use, gives you a consistent braze every time and meets the same high standards you expect from Harris.

### YOU ALSO RECEIVE THESE BENEFITS:

- Harris is Made in the USA in one of America's Best Plants
- Consistent joints
- Variety of sizes available
- Reduce and control waste
- Manage inventory with smaller packages
- Purchase and carry only what you need
- Visual verification of a completed joint
- Never use too much or too little alloy

When you're working in the field, you need supplies and tools you can rely on and that make your job easier. Ring of Fire™ is a great alternative to rod for any brazing project. It's easy to use and gives you a consistent braze every time. With the same formulation, testing and standards as the Harris' signature Stay-Silv® 15 (15% silver alloy), you can now purchase it in ring form.

PERFECT FOR YOUR BRAZING APPLICATIONS. BE CONFIDENT YOU HAVE A TIGHT, LEAK-PROOF JOINT.

Ask for Harris' Ring of Fire™ wherever you buy brazing alloys and other HVAC/R supplies.



Scan the QR code for a video.

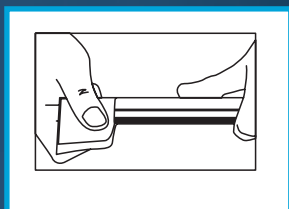




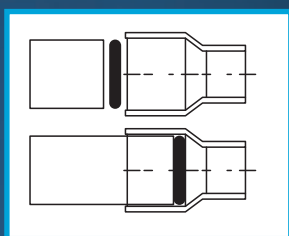
AVAILABLE IN THESE CONVENIENT SIZES:

Part Number	Item Description
RF15250	SS15 - 1/4 Joint Ring x 25 PKG
RF15375	SS15 - 3/8 Joint Ring x 25 PKG
RF15500	SS15 - 1/2 Joint Ring x 25 PKG
RF15625	SS15 - 5/8 Joint Ring x 25 PKG
RF15750	SS15 - 3/4 Joint Ring x 25 PKG
RF15875	SS15 - 7/8 Joint Ring x 25 PKG
RF151125	SS15 - 1 1/8 Joint Ring x 10 PKG
RF15VAR	SS15 - Tubing Joint Ring Variety Pack

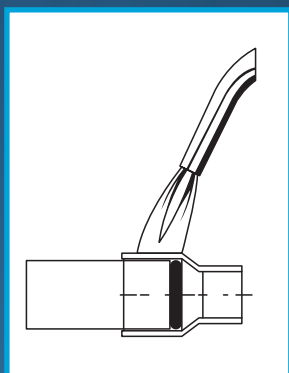
## 3 EASY STEPS FOR A TIGHT, LEAK- PROOF JOINT



1. Clean the tube, pipe and fittings to be brazed.



2. Place the Ring of Fire inside the coupling and insert the tube. Be sure the ring is at the bottom and touches the end of the tube.



3. Heat the tube and coupling, applying heat to all the parts.

Heat will transfer throughout the part and draw the alloy through the capillary space. The molten braze will appear around the top of the coupling for easy visual verification of the completed braze.

Read the complete instructions inside the package and refer to the Material Safety Data Sheet (MSDS) before use.



# HIGH SILVER ALLOYS

The Harris Products Group manufactures a complete line of cadmium-free, high silver brazing alloys. Only pure base metals are used. Precision production procedures ensure consistency in product quality, composition, chemistry, dimension, and performance.

Since 1986, The Harris Products Group has manufactured and sold cadmium-free alloys. Our cadmium-free alloys offer excellent performance characteristics and dependable results, while eliminating hazardous cadmium fumes. The charts throughout this brochure allow our customers to select the appropriate alloy. If you need additional technical assistance please call 1-800-733-4533 or visit our website at [www.harrisproductsgroup.com](http://www.harrisproductsgroup.com).

## Safety-Silv<sup>®</sup> 25

A low cost, general purpose silver brazing alloy. Exhibits moderate ductility and slightly higher melting temperature than alloys containing higher percentages of silver and/or tin.

## Safety-Silv<sup>®</sup> 30

A cadmium free alloy with a melting range of 175°F (79°C) with good flow and good fillet forming quality. It produces high strength and ductile joints.

## Safety-Silv<sup>®</sup> 35

This smooth flowing alloy exhibits good ductility on ferrous and non-ferrous base materials. It is often used as an economical alternative to higher silver content alloys.

## Safety-Silv<sup>®</sup> 38T

This tin bearing alloy combines excellent fillet-forming characteristics with good flow properties. The addition of a small amount of tin provides qualities normally associated with alloys containing greater quantities of silver.

## Safety-Silv<sup>®</sup> 40

Ductile, free flowing alloy offers economy, good penetration into tight connections and medium temperature. Silver to light yellow color as in polished brass.

## Safety-Silv<sup>®</sup> 40T

Similar to 38T in its ability for excellent fillets and maintain good mechanical properties while flowing at a lower temperature.

## Safety-Silv<sup>®</sup> 45

Excellent general-purpose brazing alloy. Good ductility and capillary flow. Color is silver to light yellow. Available in flux coated (the flux is on the wire) which eliminates manual flux application.

## Safety-Silv<sup>®</sup> 45T



Performs like a 45% silver, cadmium bearing alloy, but is cadmium-free. Lower melting temperature than Safety-Silv<sup>®</sup> 45. Excellent fillet forming qualities. Produces high strength, ductile joints. NSF certified to NSF 51.

## Safety-Silv<sup>®</sup> 50

This composition has long been an industry standard. Similar to Safety-Silv<sup>®</sup> 45, it is an excellent choice for applications requiring a good blend of strength, ductility, and electrical conductivity.

## Safety-Silv<sup>®</sup> 50N

Often used to braze stainless steel to limit interface corrosion. It is also an excellent choice for tungsten carbide brazing applications.

## Safety-Silv<sup>®</sup> 56



High silver content alloy that makes premium quality brazes. Free flowing with unsurpassed capillary attraction and deep penetration. Ductility is high, and corrosion resistance is excellent. Offers highest elongation of silver brazing alloys. Can be used in the food processing industry. Silver color is an excellent match for stainless steel and silverware applications. NSF certified to NSF 51.







# HIGH SILVER

ALLOY	SILVER%	COPPER %	ZINC%	TIN%	SOLIDUS		LIQUIDUS		AWS A5.8
					°F	°C	°F	°C	
SAFETY-SILV® 25	25	43	30	2	1270	688	1435	779	
SAFETY-SILV® 30	30	38	32	-	1250	677	1410	766	BAG-20
SAFETY-SILV® 35	35	32	33	-	1250	677	1350	732	BAG-35
SAFETY-SILV® 38T	38	32	28	2	1220	660	1325	718	BAG-34
SAFETY-SILV® 40	40	30.5	29.5	-	1250	677	1350	732	
SAFETY-SILV® 40T	40	30	28	2	1220	660	1310	710	BAG-28
SAFETY-SILV® 45	45	30	25	-	1225	663	1370	743	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



# HIGH SILVER ALLOYS



HIGH SILVER

DESCRIPTION	SAFETY-SILV® 25	SAFETY-SILV® 30	SAFETY-SILV® 35
3/64" x 1 T.O. PACKAGE			
3/64" x 5 T.O. PACKAGE			
3/64" x 50 T.O. COIL		30250	
1/16" x 1 T.O. PACKAGE		3031	3531
1/16" x 3 T.O. PACKAGE			3533
1/16" x 5 T.O. PACKAGE			3535
1/16" x 25 T.O. COIL			35325
1/16" x 50 T.O. COIL	25350	30350	35350
1/16" x 18 x 15 T.O. TUBE	25318L	30318L	35318L
1/16" x 36 x 365 T.O.			
1/16" x 36 x 50 T.O. TUBE			
1/32" x 1 T.O. PACKAGE			
1/32" x 3 T.O. PACKAGE			
1/32" x 5 T.O. PACKAGE			
1/32" x 50 T.O. COIL			
3/32" x 1 T.O. PACKAGE			
3/32" x 3 T.O. PACKAGE			
3/32" x 5 T.O. PACKAGE			3555
3/32" x 36 x 50 T.O. TUBE			
3/32" x 50 T.O. COIL	25550		35550
3/32" DIA x 36 x 365 T.O.			Z35536
3/32" x 18 x 15 T.O. TUBE		30518L	35518L
1/8" x 18 x 15 T.O. TUBE		30618L	35618L
1/8" x 50 T.O. COIL		30650	35650
1/16" x 18 x 4 T.O. TUBE - FC		30F3184	35F3184
1/16" x 18 x 20 LB BULK BOX			
SILVER SOLDER KIT			
SILVER SOLDER KIT POP			
1/16" x 18 MINNI-PACK 5 STICK POP			
3/32" x 18 MINNI-PACK 3 STICK POP			

# PRODUCT SELECTION GUIDE



SAFETY-SILV® 38T	SAFETY-SILV® 40	SAFETY-SILV® 40T	SAFETY-SILV® 45
			4521
			4525
			45250H
	4031		4531
	4033		4533
	4035		4535
			45325H
38T350	40350H	40T350	45350H
	40318L	40T318L	45318L
Z38T336			
38T336L			45336L
			4511
			4513
			4515
			45150H
			4551
			4553
			4555
	40536L		45536L
38T550	40550H	40T550	45550H
		40T518L	45518L
			45618L
			45650H
	40F3184		
Z38TF318			
			45K
			45KPOP
			45318LMPOP
			45518LMPOP

HIGH SILVER

# HIGH SILVER ALLOYS

Continued...



HIGH SILVER

DESCRIPTION	SAFETY-SILV® 45T FLUX CORED	SAFETY-SILV® 45FC	SAFETY-SILV® 45T
2MM x 500 MM 4 STICK TUBE	45TCW25004		
3/64" x 5 T.O. PACKAGE			
3/64" x 50 T.O. COIL			45T250
3/64" x 25 LB SPOOL			45T225SP
1/16" x 1 T.O. PACKAGE			45T31
1/16" x 3 T.O. PACKAGE			45T33
1/16" x 5 T.O. PACKAGE			45T35
1/16" x 25 T.O. COIL			
1/16" x 50 T.O. COIL			45T350
1/16" x 18 x 15 T.O. TUBE			45T318L
1/16" x 18 4oz (9 STICK TUBE) - FC		45F3184	45TF3184
1/16" x 18 x (2) 1LB BAGS IN TUBE - FC		45F318L	
1/16" x 18 MINNI - PACK 3 STICK TUBE - FC		45F318MPOP	45TF318L
1/16" x 18 MINNI - PACK 5 STICK POP			
1/16" x 36 x 50 T.O. TUBE			
1/32" x 1 T.O. PACKAGE			
1/32" x 5 T.O. PACKAGE			
1/32" x 25 T.O. COIL			
1/32" x 50 T.O. COIL			45T150
3/32" x 3 T.O. PACKAGE			
3/32" x 5 T.O. PACKAGE			
3/32" x 36 x 50 T.O. TUBE			
3/32" x 50 T.O. COIL			45T550
3/32" x 18 x 4 oz (9 STICK TUBE) - FC		45F5184	
3/32" x 18 x (2) 1LB BAG IN TUBE - FC		45F518L	
3/32" x 18 x 15 T.O. TUBE			
3/32" x 18 x 300 T.O. BOX			
3/32" DIA x 25 LB SPOOL			
1/8" x 18 x 15 T.O. TUBE			
1/8" x 18 x 4 oz (9 STICK TUBE) - FC		45F6184	
1/8" x 18 x (2) 1 LB BAG IN TUBE - FC		45F618L	
1/8" x 50 T.O. COIL			
3/64" x 50 T.O. COIL			
SILVER SOLDER KIT			
SILVER SOLDER KIT POP			



# PRODUCT SELECTION GUIDE



**SAFETY-SILV® 50**

**SAFETY-SILV® 50N**

**SAFETY-SILV® 56**

**SAFETY-SILV® 56FC**

SAFETY-SILV® 50	SAFETY-SILV® 50N	SAFETY-SILV® 56	SAFETY-SILV® 56FC
		5625	
		56250	
		56225SP	
5031	50N31	5631	
5035		5633	
	50N35	5635	
	50N325	56325	
50318L	50N350	56350	
	50N318L	56318L	
			56F3184
			56F318L
			56F318MPOP
		56318LMPPOP	
	50N336L	56336L	
		5611	
		5615	
	50N125		
	50N150	56150	
		5653	
		5655	
50536L	50N536L		
50550H	50N550	56550	
			56F5184
			56F518L
	50N518L	56518L	
		Z56518	
		56525SP	
		56618L	
50650		56650	
	50N250		
		56K	
		56KPOP	

HIGH SILVER

# ALUMINUM ALLOYS

Aluminum components are becoming more prevalent in the HVAC/R industry. To help meet customer requirements, Harris produces a variety of brazing and soldering products. For brazing, our fast-flow Al-Braze® 1070 has become an industry standard. Our new Al-Braze® 4043 provides a wider melting range to help fill splits or gaps. Alcor® is a lower temperature flux cored solder that makes it easier to join low-melting aluminum base metals. An added benefit - the flux residue is non-corrosive. Al-Solder® 500 is the industry's most widely used product to join aluminum to aluminum and aluminum to copper.

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## AL-BRAZE® 1070, 4043

Superior brazing filler metals for joining aluminum. Al-Braze® 1070 is free-flowing with equaled capillary attraction. Al-Braze® 4043 provides a wider melting range. These alloys are not recommended for brazing aluminum directly to non-aluminum alloys as the joint may be brittle.

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## ALCOR®

A very easy to use aluminum alloy with non-corrosive flux inside the wire; no external flux is required with this product. Designed for the repair of heat exchangers, air conditioners, aluminum alloy condensers and other applications. Very good fluidity with good capillary attraction. Post-braze cleaning unnecessary. Better than tin-zinc and aluminum silicon alloys for aluminum coil repair.

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## AL-SOLDER® 500

Solder alloy for torch or iron. Used to join all solderable aluminum alloys to each other and to dissimilar metals. Also can be used for zinc die-cast. Forms excellent, corrosion resistant joints on the tough-to-solder aluminum alloys. Also beneficial as a high temperature solder on most other metals. Not recommended for magnesium.

# PRODUCT SELECTION GUIDE



DESCRIPTION	AL-BRAZE® 1070	AL-BRAZE® 4043	ALCOR®	AL-SOLDER® 500
AL-BRAZE® 1070 KIT	1070K	-	-	-
AL-BRAZE® 1070 POWDER FLUX - 1/2 LB	10701/2	-	-	-
AL-BRAZE® 1070 POWDER FLUX 2 - 1/2 LB	107021/2	-	-	-
AL-BRAZE® EC POWDER FLUX - 1/2 LB JAR	ECDF1/2	-	-	-
AL-BRAZE® EC POWDER FLUX - 40 LB PAIL	ECDF40	-	-	-
AL-BRAZE® 4043 KIT	-	4043K	-	-
ALCOR® - 2MM DIA x 10" x 25 LB PACKAGE	-	-	AL2001OR	-
ALCOR® - 2MM DIA x COIL	-	-	AL200RC	-
AL-SOLDER® 500 - 1/16" DIA x 20 LB SPOOL	-	-	-	500320
AL-SOLDER® 500 - 1/8" DIA x 1 LB SPOOL	-	-	-	50061H
AL-SOLDER® 500 - 1/8" DIA x 20 LB SPOOL	-	-	-	500620
AL-SOLDER® 500 - ALUM. KT. (ORM-D) NO AIR	-	-	-	500K

ALLOY	ALUMINUM %	SILICON %	ZINC %	TIN %	SOLIDUS		LIQUIDUS	
					°F	°C	°F	°C
AL-BRAZE® 1070	88	12	-	-	1070	577	1080	582
AL-BRAZE® 4043	95	5	-	-	1065	574	1170	632
ALCOR®	*	-	-	-	824	440	824	440
AL-SOLDER 500®	-	-	15	85	391	199	482	250

\*PROPRIETARY

# COMMON SOLDERS

The 40/60, 50/50, and 60/40 tin-lead composition comprise the majority of lead solder use. These tin based solders are frequently used for general repair, electrical connections, radiators, and drain/waste/vent (DWV) plumbing tube. The solders are available in solid wire and flux cored forms. Flux cored solders are available in both rosin and acid core types.



**CAUTION:** It is illegal to use lead-bearing solders in public and private potable water systems.

**NOTE:** Several states prohibit a plumbing supply business from selling lead bearing solders. Customers should check with the respective agency in the state in which the lead bearing solders are to be sold or distributed

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## 40/60

A general purpose solder with a 1000° F melting range. It is often used for body work “wiping” applications. It is also frequently used for sheet metal joints and auto radiator repair.

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## 50/50

A popular tin/lead alloy with a 600° F melting range. Compared to 40/60, the narrower melting range improves flow, yet provides sufficient body to “cap” finished joints. 50/50 is used for general soldering work including non-potable water DWV, copper tube plumbing applications.

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## 60/40

With an approximate 150° F melting range, 60/40 requires less heat to reach its melting temperature. This is often beneficial when soldering electrical or electronic components. This solder is also a popular choice for stain glass applications.





ALLOY	TIN %	LEAD %	SOLIDUS		LIQUIDUS		ASTM B32
			°F	°C	°F	°C	
40/60	40	60	360	182	460	238	Sn40A
50/50	50	50	360	182	420	216	Sn50, J-STD-006 Sn50, Pb50a
60/40	60	40	360	182	375	191	Sn60

# COMMON SOLDERS



**CAUTION:** It is illegal to use lead-bearing solders in public and private potable water systems.

**NOTE:** Several states prohibit a plumbing supply business from selling lead-bearing solders. Customers should check with the respective agency in the state in which the lead-bearing solders are to be sold or distributed



DESCRIPTION	40/60 ACID CORE	40/60 ROSIN CORE	40/60 SOLID CORE	50/50 ACID CORE
1/32" x 1 LB SPOOL				
3/64" x 1 LB SPOOL				
3/64" x 5 LB SPOOL				
3/64" x 20 LB SPOOL				
3/64" x 25 LB SPOOL				
1/16" x 1 LB SPOOL				
1/16" x 5 LB SPOOL		40R35		50A35
1/16" x 20 LB SPOOL				
3/32" x 1 LB SPOOL		40R51	406051	
3/32" x 5 LB SPOOL		40R55	406055	50A55
3/32" x 20 LB SPOOL				
3/32" x 25 LB SPOOL				
1/8" x 1 LB SPOOL	40A61	40R61	406061	50A61
1/8" x 5 LB SPOOL	40A65			
1/8" x 20 LB SPOOL		40R620	4060620	50A620
1/8" x 25 LB SPOOL		40R625		
1/8" x 50 LB SPOOL				
TRI-BAR				
1 LB BAR				
1/16" x 8oz SPOOL POP				
1/8" x 8oz SPOOL POP				

# PRODUCT SELECTION GUIDE



**CAUTION:** It is illegal to use lead-bearing solders in public and private potable water systems.

**NOTE:** Several states prohibit a plumbing supply business from selling lead-bearing solders. Customers should check with the respective agency in the state in which the lead-bearing solders are to be sold or distributed



**50/50  
ROSIN CORE**

**50/50  
SOLID CORE**

**60/40  
ACID CORE**

**60/40  
ROSIN CORE**

**60/40  
SOLID CORE**

	505011		60R11	
	505021			
	505025			
	5050220			
	5050225			
50R31			60R31	604031
	505035			
				6040320
50R51			60R51	604051
50R55	505055	60A55		604055
	5050520		60R520	
50R61	505061		60R61	604061
50R65		60A65	60R65	
50R620	5050620	60A620		6040620
	5050625			
	5050TB			
	50501B			60401B
			60R31/2POP	
	505061/2POP		60R61/2POP	

COMMON SOLDERS

# LEAD-FREE SOLDERS

The Harris Products Group offers a wide range of soldering alloys for both HVAC/R and plumbing applications. Each solder product meets the highest standard for consistency and performance.

## NICK®



Nick® is a lead-free plumbing solder specifically formulated as a replacement for the tin/lead solders. It has a wide melting range (2910 F - 1440 C) that allows operators to fill tight fitting pipe connections and also to bridge gaps in large, loose fitting or non-concentric pipe. Its ease of application in all types of copper joints, makes it the preferred solder of experienced operators and is the most forgiving in the hands of the less experienced. Nick® is a patented alloy which meets all Federal requirements for lead-free solders mandated by the Federal Safe Drinking Water Act Amendments of 1986. (Public Law 99-339)

## SPEEDY®

Speedy® has a faster melting range, which allows operators to fill small, tight-fitting pipe connections quickly. Speedy® low temperature, free flowing nature decreases cycle time while reducing setup time. Speedy® can be used with Stay-Clean® paste or liquid flux, as well as Bridgit® paste flux. Speedy® is a lead-free, low temperature alloy formulated for joining copper pipe in potable water systems. This tin-based alloy conforms to the 1986 Federal Safe Drinking Water Act Amendment.

## STAY-BRITE® & STAY-BRITE® 8



Silver-bearing solders are often used throughout the air conditioning industry as an alternative to 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. Use for all metals with the exception of aluminum. This is a low temperature solder excellent for many HVAC connections.

## BRIDGIT®



Lead-free solder widely used in plumbing applications where lead-bearing solders are prohibited. Contains nickel to increase joint strength. A wide melting 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. Meets or exceeds NSF/ANSI 61, Annex G/California AB 1953.

## 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 installation of small diameter, tight fitting connections. Not recommended for use on brass or HVAC connections.





LEAD-FREE SOLDERS

ALLOY	SILVER %	TIN %	ANTIMONY %	SOLIDUS		LIQUIDUS		SPECIFICATIONS
				°F	°C	°F	°C	
NICK®	-	-	-	438	225	729	387	GRADE HN, B32, NSF 61
SPEEDY®	-	-	-	450	232	555	290	TIN COPPER ALLOY
STAY-BRITE®	4	96	-	430	221	430	221	ASTM B32 Sn96, NSF 51, J-STD-006 Sn96Ag 04A
STAY-BRITE® 8	6	94	-	430	221	535	279	ASTM B32 GRADE Sn95, NSF 51
BRIDGIT®	-	-	-	460	238	630	332	ASTM B32 GRADE HB, NSF/ANSI 61, ANNEX G/ CALIFORNIA AB 1953, NSF 51
95/5®	-	95	5	452	233	464	240	ASTM B32 Sb5, J-STD-006 Sn95 Sb05A

# LEAD-FREE SOLDERS



LEAD-FREE SOLDERS

DESCRIPTION	NICK®	SPEEDY®	STAY-BRITE®
1/32" x 1 LB SPOOL			SB11
3/64" x 1 LB SPOOL			SB21
1/16" x 1 LB SPOOL			SB31
1/16" x 5 LB SPOOL			
1/16" x 20 LB SPOOL			
1/16" x 25 LB SPOOL			
1/16" x 50 LB SPOOL			
3/32" x 1 LB SPOOL			SB51
3/32" x 5 LB SPOOL			
3/32" x 25 LB SPOOL			
1/8" x 1 LB SPOOL	NICK61	SPDY61	SB61
1/8" x 5 LB SPOOL			SB65
1/8" x 5 LB ROSIN CORE			SBRC65
1/8" x 25 LB SPOOL			SB625
1 LB BAR x 24	NICK1/24		
1 LB BAR			
TRI-BAR			
1/8" x 8oz SPOOL POP			SB61/2POP
1/8" x 1 LB SPOOL POP	NICK61POP	SPDY61POP	
KIT W/FLUX			SBSK
KIT W/FLUX POP			SBSKPOP

# PRODUCT SELECTION GUIDE



STAY-BRITE® 8	BRIDGIT®	95/5 ROSIN CORE	95/5 SOLID CORE
SB811			
SB821			
SB831	BRGT31		95531
	BRGT35	955R35	
		955R320	
SB8325	BRGT325	955R325	
SB8350			
SB851	BRGT51		95551
SB855			
			955525
SB861	BRGT61		95561
	BRGT65		95565
	BRGT625		955625
			9551
			955TB
	BRGT61/2POP		95561/2POP

LEAD-FREE SOLDERS

# BRAZING/SOLDERING FLUX

To ensure the best connections, The Harris Products Group produces a wide variety of flux products designed for specific applications throughout a number of different industries.

## **BRIDGIT®**

### **PASTE FLUX:**

Designed for use with lead-free solders. Works extremely well with Bridgit® lead-free solder in potable water systems and equally well with other solders. Meets all requirements of the Safe Drinking Water Act. Stays active to 800° F and will not burn at soldering temperature. This reduces black carbon formations that can result in voids and leaks.

### **WATER SOLUBLE FLUX:**

A water flushable paste that holds its shape and will not slump. Use with plumbing applications, copper and copper-alloy tubes, heating, air-conditioning, mechanical piping, and fire sprinklers. Water soluble alternative to petroleum-based plumbing fluxes, begins cleaning metals at room temperature, excellent solderability with lead-free solders.

## **STAY-CLEAN®**

### **ALUMINUM FLUX:**

A liquid flux for use with aluminum soldering. Use with Al-Solder® 500. Joins aluminum to dissimilar metals.

### **PASTE FLUX:**

An active soldering flux formulated for use with tin-lead, tin-antimony, and tin-silver solders. Superior flux for most metals, copper, brass, bronze, steel, galvanized, and Monel®. Not recommended for aluminum, magnesium, or titanium. Not recommended for electrical or electronic applications.

### **LIQUID FLUX:**

A general purpose zinc chloride flux for soldering with all soft solders use with tin-lead solder, tin-antimony solder, Stay-Brite® solder, for soldering virtually all metals, except aluminum, magnesium or titanium. Not recommended for use in electrical or electronic applications.

## **STAY-SILV®**

### **BLACK FLUX:**

An all purpose, high temperature flux for use in silver brazing. Formulated for applications where the work is subjected to rapid, localized heating. Particularly useful in applications where large amounts of refractory oxides may form, such as with stainless steel alloys. Use with stainless steel, carbide, heavy parts, and prolonged heating cycles.

### **WHITE FLUX:**

An all purpose, low temperature flux for use in silver brazing. Use with most ferrous and non ferrous metals, not recommended on aluminum, magnesium, and titanium.

### **POWDER FLUX:**

Stay-Silv® white powder flux is similar to the white paste flux but in a dry powder mixture. It is typically applied by heating the braze rod end and dipping it into the flux. The flux will adhere to the heated rod. It can be used in applications where a small amount of flux, applied during heating, provides sufficient joint protection.

Examples are:

- A. Brass charge valves to copper tubes
- B. 1/4" tube connections
- C. Leak repair on previously brazed joints
- D. Capillary tube insertion into brass distributors





# PRODUCT SELECTION GUIDE

FLUX	ACTIVE RANGE		SPECIFICATIONS
	°F	°C	
BRIDGIT PASTE	200° - 800°	93° - 427°	-
BRIDGIT WATER SOLUBLE	250° - 600°	121° - 315°	ASTM B813
STAY CLEAN ALUMINUM	350° - 550°	177° - 288°	-
STAY CLEAN PASTE	UP TO 700°	UP TO 371°	A-A-51145C, FORM A
STAY CLEAN LIQUID	UP TO 700°	UP TO 371°	A-A-5145C, FORM B
STAY-SILV BLACK	1050° - 1800°	566° - 982°	OF499 TYPE B, AWS A 5.31 CLASS FB3C, AMS3411
STAY-SILV WHITE	1050° - 1600°	566° - 871°	OF499 TYPE B, AWS A 5.31 CLASS FB3A, AMS3410
STAY-SILV POWDER	1050° - 1600°	566° - 871°	AWS A 5.31 CLASS FB3F

## BRIDGIT®

PART NUMBER	SIZE	TYPE
BRPF1	1 LB JAR	PASTE
BRPF4	4 oz JAR	PASTE
BRPF4WS	4 oz JAR	WATER SOLUBLE
BRPF4POP	4 oz JAR	PASTE

## STAY-CLEAN®

PART NUMBER	SIZE	TYPE
SCPF1	1 LB JAR	PASTE
SCPF4	4 oz JAR	PASTE
SCLF4	4 oz BOTTLE	LIQUID
SCLF16	16 oz BOTTLE	LIQUID
SCLF32	32 oz BOTTLE	LIQUID
SCLF1G	1 GALLON	LIQUID
SCLF55	55 GALLONS	LIQUID
SCAF4	4 oz BOTTLE	LIQUID
SCPF4POP	4 oz JAR	PASTE

## STAY-SILV® BLACK

PART NUMBER	SIZE	TYPE
SSBF1/2	1/2 LB JAR	PASTE
SSBF1	1 LB JAR	PASTE
SSBF5	5 LB JAR	PASTE
SSBF30	30 LB PAIL	PASTE
SSBF60	60 LB PAIL	PASTE

## STAY-SILV® WHITE

PART NUMBER	SIZE	TYPE
SSWF1	1 LB JAR	PASTE
SSWF1/4	1/4 LB JAR	PASTE
SSWF1/2	1/2 LB JAR	PASTE
SSWF5	5 LB JAR	PASTE
SSWF7	6.5 oz BOTTLE	PASTE
SSWF25	25 LB PAIL	PASTE
SSWF60	60 LB PAIL	PASTE
SSWF7POP	6.5 oz BOTTLE	PASTE

## STAY-SILV® POWDER

PART NUMBER	SIZE	TYPE
SS9940	40 LB PAIL	POWDER
SSPF1/4	1/4 LB JAR	POWDER
SSPF1/2	250 g JAR	POWDER



A LINCOLN ELECTRIC COMPANY

FILLER METAL CHART

METALS TO BE JOINED	FILLER METALS		MELTING RANGE	
	SOLDERS	BRAZING FILLER METALS	SOLIDUS °F / °C	LIQUIDUS °F / °C
Copper or Brass To Copper or Brass	Stay-Brite®		430 / 221	430 / 221
	Stay-Brite® 8		430 / 221	535 / 279
	Bridgit®		460 / 238	630 / 332
		Blockade®	1178 / 637	1247 / 674
		Harris 0	1310 / 710	1475 / 802
		Stay-Silv® 5	1190 / 643	1500 / 816
		Dynaflow®	1190 / 643	1465 / 796
Copper or Brass To Steel or Stainless	Stay-Brite®		430 / 221	430 / 221
	Stay-Brite® 8		430 / 221	535 / 279
		Safety-Silv® 56	1145 / 618	1205 / 652
		Safety-Silv® 38T	1220 / 660	1325 / 718
		Safety-Silv® 45	1225 / 663	1370 / 743
Steel or Stainless To Steel or Stainless	Stay-Brite®		430 / 221	430 / 221
	Stay-Brite® 8		430 / 221	535 / 279
		Safety-Silv® 56	1145 / 618	1205 / 652
		Safety-Silv® 38T	1220 / 660	1325 / 718
		Safety-Silv® 40Ni2	1220 / 660	1435 / 779
		Safety-Silv® 45	1225 / 663	1370 / 743
		Safety-Silv® 45T	1195 / 646	1265 / 685
Steel or Stainless To Carbides	<b>NOT RECOMMENDED</b>			
		Safety-Silv® 40Ni2	1220 / 660	1435 / 779
		Safety-Silv® 50N	1220 / 660	1305 / 707
Alum. To Alum. (1)	Alsolder® 500		391 / 199	482 / 250
Alum. To Copper Or Brass (2)	Alcor®			824 / 440
Alum. To Steel Or Stainless (2)		Albraze® 4043	1065 / 574	1170 / 632
		Albraze® 1070	1070 / 577	1080 / 582

NOTE - aluminum to dissimilar metal joints may be subject to galvanic corrosion.

(1) Can be directly brazed or soldered.  
 (2) Solder directly with Alsolder® 500, or coat steel side with aluminum and solder with Alcor® or Braze with Albraze® 1070

Safety Information: WARNING: PROTECT yourself and others. Read and understand this information. FUMES AND GASES can be hazardous to your health. HEAT RAYS (INFRARED RADIATION) from flame or hot metal can injure eyes. Before use, read and understand the manufacturer's instructions, Material Safety Data Sheet (MSDS) and your employer's safety practices. Keep your head out of fumes. Use enough ventilation, exhaust at the flame, or both, to keep fumes and gases from your breathing zone and the general area. Wear correct eye, ear and body protection. See American National Standard Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society, 550 N.W. LeJeune Road, Miami, Florida 33126; OSHA Safety Standards, available from the U.S. Government Office, Washington, DC 20402. STATEMENT OF LIABILITY - DISCLAIMER Any suggestion of product applications or results is given without representation or warranty, either expressed or implied. Without exception or limitation, there are no warranties of merchantability or of fitness for particular purpose or application. The user must fully evaluate every process and application in all aspects, including suitability, compliance with applicable law and non-infringement of the rights of others. The Harris Products Group and its affiliates shall have no liability in respect thereof.

# BRAZING & SOLDERING FILLER METAL SELECTION CHART

## FLUIDITY

## RATING\*

## FLUX\*\*

## TORCHES & FLAMES\*\*\*

10 8 6	Stay Clean® Soldering Fluxes, Liquid or Paste Bridgit® Paste or Water Soluble Paste Flux	Harris Inferno® Air - Fuel Equipment Harris Inferno® Air - Fuel Equipment
7 5 3 3 5 3	No flux required for copper-to-copper joints with the phosphorus-bearing filler metals  For brass and other alloys of copper, use Stay-Silv® White Brazing Flux	Harris Inferno® Air - Fuel Equipment or Harris Oxy-Acetylene Equipment (Neutral Flame)
10 8	Stay-Clean® Liquid Soldering Flux	Harris Inferno® Air - Fuel Equipment
8 7 6.5 7	Stay-Silv® White Brazing Flux Stay-Silv® Black Flux for Stainless	Harris Inferno® Air - Fuel Equipment or Harris Oxy-Acetylene Equipment (Slightly Reducing Flame)
10 8	Stay-Clean® Liquid Soldering Flux	Harris Inferno® Air - Fuel Equipment
8 7 4.5 6.5 7 7	Stay-Silv® White Brazing Flux Stay-Silv® Black Flux for Stainless	Harris Inferno® Air - Fuel Equipment or Harris Oxy-Acetylene Equipment (Slightly Reducing Flame)
4.5 7	Stay Silv® Black Brazing Flux	Harris Inferno® Air - Fuel Equipment or Harris Oxy-Acetylene Equipment (Reducing Flame)
NOT RATED NOT RATED	Stay-Clean® Aluminum Soldering Flux Flux cored - flux is contained inside wire	Harris Inferno® Air - Fuel Equipment
7 9	Albraze® 1070 Flux	Harris Inferno® Air - Fuel Equipment or Harris Oxy-Acetylene Equipment (reducing flame)

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

\*\* Remove flux residue after soldering or brazing, except for Alcor as flux residue is non corrosive

\*\*\* For best results and strong leak proof bonds, filler metal should be applied to the joint area only after the parts are heated to the proper brazing or soldering temperature. Oxy-Acetylene torches may be substituted for air-fuel but may require care to prevent overheating of the base metal/flux with the higher temperature flame.



**MORE HEAT,  
CONTROL AND  
CONSISTENCY**

# HARRIS AIR-FUEL HAND TORCHES FOR DEMANDING PROFESSIONALS

The new line of Harris air-fuel hand torches brings high performance and convenience to professional heating, ventilation, air conditioning, plumbing and refrigeration contractors. Built with heating performance, temperature consistency and flame control in mind, a Harris hand torch is the perfect partner for demanding brazing and soldering applications.

P/N 1400351

## HSLT604HD

Heavy Duty  
Trigger Torch

**MAP-Pro™**  
Propane

- Ignition button lock for continuous use
- Piezo igniter for instant flame
- Ergonomic handle design
- Swirl combustion tip
- Heavy duty

Solder Capacity ] **MAP-Pro™**  
3/4" - 4"  
20 - 102 mm

Brazing Capacity ] **MAP-Pro™**  
1/4" - 1 1/4"  
6 - 32 mm

Solder Capacity ] **Propane**  
3/4" - 3"  
20 - 76 mm

Brazing Capacity ] **Propane**  
1/4" - 1"  
6 - 25 mm

P/N 1400350

## HSLT604

Trigger Torch

**MAP-Pro™**  
Propane

- Ignition button lock for continuous use
- Piezo igniter for instant flame
- Ergonomic handle design
- Swirl combustion tip

Solder Capacity ] **MAP-Pro™**  
1/8" - 3"  
3 - 76 mm

Brazing Capacity ] **MAP-Pro™**  
1/16" - 1"  
1.6 - 25 mm

Solder Capacity ] **Propane**  
1/8" - 2"  
3 - 51 mm

Brazing Capacity ] **Propane**  
1/16" - 3/4"  
1.6 - 20 mm

P/N 1400354

## HTS99

Auto Ignite

**MAP-Pro™**  
Propane

- Adjustable flame control
- Swirl tip swivels 360°
- Piezo igniter for instant flame
- Heavy duty

Solder Capacity ] **MAP-Pro™**  
1/4" - 3"  
6 - 76 mm

Brazing Capacity ] **MAP-Pro™**  
1/4" - 1 3/4"  
6 - 45 mm

Solder Capacity ] **Propane**  
1/4" - 3"  
6 - 76 mm

Brazing Capacity ] **Propane**  
1/4" - 1"  
6 - 25 mm







HSLT604HD TIP DETAIL

## HOT TECHNOLOGY

Professional contractors need high-performance torches with truly hot flames engineered to deliver faster brazing and soldering times. Harris hand torches incorporate specially designed high-output swirl combustion tips that are tested for optimal brazing and soldering performance. When it's time to work, have the power of a Harris torch in your hand ... and get the job done right.



HSLT604

## DURABLE MATERIALS

Harris hand torches are constructed to stand up in the harshest situations. With industrial grade materials like 304 stainless steel and 360 brass, Harris hand torches mean business. In fact, our hand torches are individually tested for quality and performance. With Harris, you get a high degree of durability and reliability in every hand torch.



## VERSATILE PERFORMANCE

Harris hand torches have the heating performance and temperature consistency needed for many of today's common brazing and soldering situations. And, with precise flame controls, professional contractors can easily get dialed in for a wide range of applications. With a Harris hand torch, professional contractors are set up to deliver.

P/N 1400352

### HTM9

Manual Lighting  
**MAP-Pro™**  
 Propane

- Adjustable flame control
- Swirl tip swivels 360°
- Heavy duty

Solder Capacity ] **MAP-Pro™**  
 1/4" – 3"  
 6 – 76 mm

Brazing Capacity ] **MAP-Pro™**  
 1/4" – 1 3/4"  
 6 – 45 mm

Solder Capacity ] **Propane**  
 1/4" – 3"  
 6 – 76 mm

Brazing Capacity ] **Propane**  
 1/4" – 1"  
 6 – 25 mm



P/N 1400353

### HTM11

Manual Lighting  
**MAP-Pro™**  
 Propane

- Adjustable flame control
- Swirl tip swivels 360°
- Double-barrel tip
- Heavy duty

Solder Capacity ] **MAP-Pro™**  
 3/4" – 4"  
 20 – 102 mm

Brazing Capacity ] **MAP-Pro™**  
 1/2" – 2"  
 13 – 51 mm

Solder Capacity ] **Propane**  
 3/4" – 3 1/2"  
 20 – 90 mm

Brazing Capacity ] **Propane**  
 1/2" – 2"  
 13 – 51 mm



Harris offers 14.1 oz. **MAP-Pro™** and **Propane** tanks.

# OXY FUEL vs. AIR FUEL

www.harrisproductsgroup.com



OXY FUEL vs. AIR FUEL

	OXY FUEL	AIR FUEL
<b>GENERAL APPLICATIONS</b>	Suited for production brazing and soldering Fast / high-volume work Thicker base metals	Suited for installation and repair in field Confined spaces, portability, and versatility Thinner base metals
<b>COST</b>	More expensive Initial equipment \$300-\$500	Less expensive Initial equipment \$90-\$150
<b>PERFORMANCE</b>	Higher temperature - up to 6000° F High flame intensity - heat transfer fast Confined heat zone Generally tips have a narrow operating range Larger size and weight - less convenient to use	Lower temperature - up to 2000° F to 3000° F Low flame intensity - heat transfer slow Broad heat zone Tips have a wide operating range Smaller size and weight - more convenient to use
<b>SAFETY</b>	Less safe due to possibility of flashbacks More expensive to repair Rules and regulations pertaining to safe transport of gases more complex	Very stable Durable and less expensive to repair Gases can be transported with less restrictions

# AIR FUEL TORCH HANDLES

Harris air fuel torch handles are ergonomically designed with a super tough grip for balance and comfort.

HQA-4

PN: 140084

QUICK CONNECT



"A" HOSE CONNECTION

3/8" - 24

HQB-4

PN: 140085

QUICK CONNECT



"B" HOSE CONNECTION

9/16" - 18

HAS-400

PN: 140086

SCREW CONNECT



"A" HOSE CONNECTION

3/8" - 24



HTA

PN: 4300676

Quick Connect Adaptor Converts HAS-400 handle to quick connect HA, HT Series tips



# inferno®

BY HARRIS

## SWIRL COMBUSTION TECHNOLOGY

The revolutionary Inferno® tip has a specially designed insert that delivers reliable swirl combustion performance every time. The swirl combustion of the Inferno® tip is unlike anything offered on the market. Contractors get a consistent, hotter flame that will engulf and wrap around the work piece for maximum efficiency.

## DURABLE, LONG-LIFE DESIGN

Tips take a beating, so the Inferno® is constructed from thick and strong 304 stainless steel tube stock. All Inferno® tips are crafted from industrial grade materials designed to stand up in the field. The Inferno® by The Harris Products Group is a tip that is built to last.

## QUALITY, PRECISION MANUFACTURING

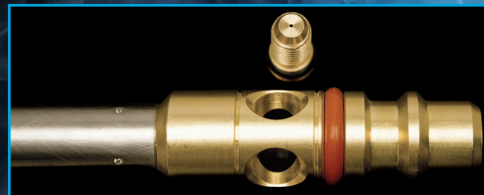
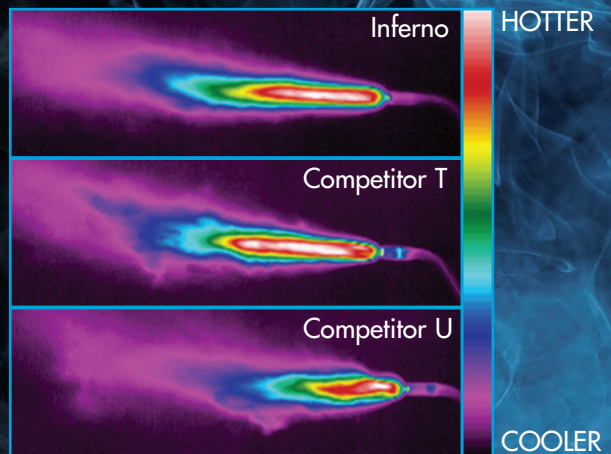
Engineers at The Harris Products Group, in developing the Inferno®, understand that the heat contractors need starts with the precision of the tip orifice. To get the best flame, the team at The Harris Products Group developed a unique manufacturing process that allows for consistent production of all Inferno® tip orifices. Our exacting manufacturing standards ensure the optimal delivery of fuel gas, resulting in the perfect flame. In addition, during the manufacturing process, every tip is tested twice, once to ensure the perfect orifice and once to ensure flame quality – this all adds up to making a truly great, hot tip.

## THE HOTTEST TIP, EVERYTIME

The technology behind the Inferno® is the result of exhaustive research and development followed by exacting standards in manufacturing. The lack of heat, inconsistency and “Horns” you might find in the flames of other brands are not found in the flame of the Inferno® by The Harris Products Group. With Inferno®, you get a richer, hotter, more perfect burn.

## PROOF POSITIVE – THE PERFECT FLAME

Using thermal photography techniques, the product development team at The Harris Products Group evaluated the relative flame consistency and heat of the Inferno® tips. The team focused on developing a configuration in the design of the Inferno® tips that would produce the proper heat with reliable and repeatable flame performance.





# MORE HEAT, CONTROL AND CONSISTENCY

Contractors in heating, ventilation, air conditioning, plumbing and refrigeration know that when it comes to quality and performance, the heat, temperature consistency and flame need to be perfect every time. The equipment they choose and the brand they rely on need to deliver. We created the Inferno<sup>®</sup> to meet the rigorous needs of today's contractor.

## YOUR GO-TO TIP

The Inferno<sup>®</sup> by Harris can deliver what projects in the field require – a hot, consistent and controllable flame with optimal safety for a job well done. Sure, professional contractors need to have air-fuel and oxy fuel equipment choices at their disposal. But why be burdened with a complicated oxy fuel setup when a high-performance air fuel Inferno<sup>®</sup> tip is really the best tool for the job? Contractors can rely on the Inferno<sup>®</sup> by Harris for the hot, consistent and controllable flame they need.

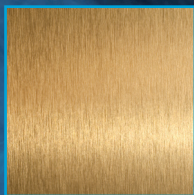
## EASY TO INTEGRATE

All Inferno<sup>®</sup> tips were designed to work and integrate with today's existing quick-connect air fuel handles. This allows contractors to simply and quickly connect the Inferno<sup>®</sup> tip to their existing torch handle and they are ready to work. And, the Inferno<sup>®</sup> by The Harris Products Group was designed to be compact and portable, meeting the real-world needs that contractors have.

## INFERNO<sup>®</sup> APPLICATIONS



COPPER



BRASS



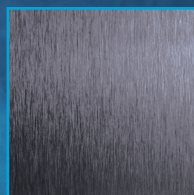
STAINLESS



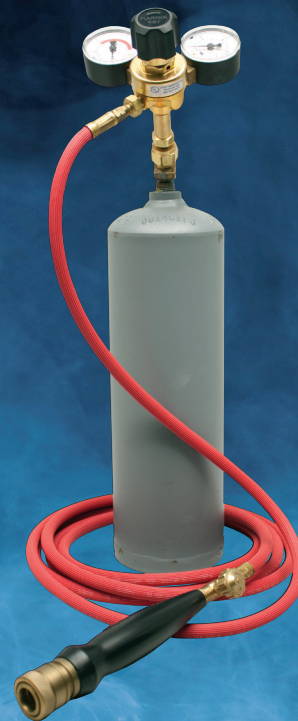
ALUMINUM



STEEL



CARBIDES



Applications in the field vary.

Contractors will have confidence with the Inferno<sup>®</sup> by The Harris Products Group that the right combination of tip and alloys needed to get the job done right are always available.

# AIR FUEL EQUIPMENT

## INFERNO® AIR FUEL QUICK CONNECT SWIRL TIPS



### COPPER TUBING CAPACITY

PART NO.	MODEL	TIP SIZE		GAS FLOW		SOFT SOLDER		BRAZING	
		INCHES	MM	@14 PSI SCFH	(0.9 BAR) M3/HR	INCHES	MM	INCHES	MM
1601110	HA-3i	1/4"	6.65	3.10	0.09	UP TO 1"	25.40	UP TO 1/2"	UP TO 12.70
1601111	HA-5i	5/16"	7.87	5.80	0.16	3/4" - 2"	19.05 - 50.80	1/4" - 1"	6.35 - 25.40
1601112	HA-8i	3/8"	9.65	6.60	0.19	1" - 3"	25.40 - 76.20	1/2" - 1 1/4"	12.70 - 31.75
1601113	HA-11i	7/16"	11.18	9.80	0.28	1 1/4" - 4"	31.75 - 101.60	7/8" - 2"	22.23 - 50.80
1601114	HA-14i	1/2"	12.70	12.60	0.36	2" - 5"	50.80 - 127.00	1 1/2" - 3"	38.10 - 76.20
1601115	HA-32i	3/4"	19.05	27.50	0.78	4" - 6"	101.60 - 152.40	1 1/2" - 5"	38.10 - 127.00

PART NO.	MODEL	TIP SIZE		GAS FLOW		SOFT SOLDER		BRAZING	
		INCHES	MM	@28 PSI SCFH	(1.9 BAR) M3/HR	INCHES	MM	INCHES	MM
1601130	HT-2i	5/16"	7.87	1.50	0.04	1/8" - 1/4"	3 - 6	1/16" - 1/4"	2 - 6
1601131	HT-3i	7/16"	11.18	3.10	0.09	1/4" - 1"	6 - 25	1/8" - 1/2"	3 - 13
1601132	HT-4i	1/2"	12.70	3.60	0.11	1/4" - 1 1/2"	6 - 38	1/4" - 3/4"	6 - 19
1601133	HT-5i	3/4"	19.05	11.50	0.33	1 1/2" - 2 1/2"	38 - 64	1/2" - 1 1/4"	13 - 32

PART NO.	MODEL	TIP SIZE		GAS FLOW		SOFT SOLDER		BRAZING	
		INCHES	MM	@28 PSI SCFH	(1.9 BAR) M3/HR	INCHES	MM	INCHES	MM
1601130	HT-2i	5/16"	7.87	1.50	0.04	1/8" - 1 1/2"	3.18 - 38.10	1/8" - 1/4"	3.18 - 6.35
1601131	HT-3i	7/16"	11.18	3.10	0.09	1/4" - 1 1/2"	6.35 - 38.10	1/4" - 3/4"	6.35 - 19.05
1601132	HT-4i	1/2"	12.70	3.60	0.11	1/4" - 3"	6.35 - 76.20	1/2" - 1 1/4"	12.70 - 31.75
1601133	HT-5i	3/4"	19.05	11.50	0.33	2 1/2" - 6"	63.50 - 152.40	1 1/4" - 2 1/2"	31.75 - 63.50

## AIR FUEL / ACETYLENE SCREW CONNECT SOFT FLAME TIPS



PART NO.	MODEL	TIP SIZE		GAS FLOW		SOFT SOLDER		BRAZING	
		INCHES	MM	@9 PSI SCFH	(0.6 BAR) M3/HR	INCHES	MM	INCHES	MM
1601020	HS-1	3/16"	4.76	0.31	0.01	1/16" TO 1/8"	1.6 - 3.2	UP TO 1/16"	UP TO 1.6
1601021	HS-2	7/32"	5.36	0.92	0.03	1/8" - 3/8"	3.2 - 9.5	UP TO 1/8"	UP TO 3.2
1601022	HS-3	1/4"	6.35	3.30	0.09	3/8" - 1/2"	9.5 - 13	UP TO 3/8"	UP TO 9.5
1601023	HS-4	9/32"	7.14	4.60	0.13	1/2" - 1"	13 - 25	UP TO 1/2"	UP TO 13
1601024	HS-5	5/16"	7.94	6.60	0.19	3/4" - 1 1/2"	19 - 38	1/2" - 3/4"	13 - 19
1601025	HS-6	7/16"	11.11	12.70	0.36	1" - 4"	25 - 102	3/4" - 1 1/2"	19 - 38



# PRODUCT SELECTION GUIDE

## INFERNO® KITS - QUICK CONNECT "A" HOSE CONNECTIONS



ACETYLENE						
PART NUMBER	4400083	4400084	4400085	4400086	4400087	4400088
DESCRIPTION	HX-3B HQA-4 601-520A	HX-4B HQA-4 601-520A	HX-5B HQA-4 601-520A	HX-8B HQA-4 601-520A	HX-5MC HQA-4 601-200A	HX-6MC HQA-4 601-200A
HANDLE	HQA-4	HQA-4	HQA-4	HQA-4	HQA-4	HQA-4
TANK CONN	B	B	B	B	MC	MC
FUEL GAS REG	601-15-520A	601-15-520A	601-15-520A	601-15-520A	601-15-200A	601-15-200A
BRAZING TIPS	HA-3i, HA-11i	HA-5i, HA-14i	HA-5i	HA-8i	HA-5i	HA-3i, HA-8i
WRENCH	#5 CHROME	#5 CHROME	#5 CHROME	#5 CHROME	#5 CHROME	#5 CHROME
HOSE	3/16" x 12' AxA RED	3/16" x 12' AxA RED	3/16" x 12' AxA RED	3/16" x 12' AxA RED	3/16" x 12' AxA RED	3/16" x 12' AxA RED

## INFERNO® KITS - SCREW CONNECT "A" HOSE CONNECTIONS



ACETYLENE		
PART NUMBER	4400091	4400092
DESCRIPTION	HSF-3 HAS-400 601-200A	HSF-4 HAS-400 601-520A
HANDLE	HAS-400	HAS-400
TANK CONN	MC	B
FUEL GAS REG	601-15-200A	601-15-520A
BRAZING TIPS	HS-4	HS-4
WRENCH	#5 CHROME	#5 CHROME
HOSE	3/16" x 12' AxA RED	3/16" x 12' AxA RED

## INFERNO® KITS - QUICK CONNECT "B" HOSE CONNECTIONS



PROPANE/PROPYLENE		
PART NUMBER	4400089	4400090
DESCRIPTION	HLP-2 HQB-4 601-510P	HLP-3 HQB-4 601-510P
HANDLE	HQB-4	HQB-4
TANK CONN	510	510
FUEL GAS REG	601-50-510P	601-50-510P
BRAZING TIPS	HT-5i, HT-3i	HT-4i
WRENCH	#5 CHROME	#5 CHROME
HOSE	3/16" x 12' BxB BLACK	3/16" x 12' BxB BLACK

# OXY FUEL EQUIPMENT

All Harris oxy fuel equipment is industrial grade for professional use. Their heavy-duty construction will deliver years of superior performance.

## SOLID FORGED HEAD

Cutting attachments feature a solid brass forged head that withstands rough field handling and resists flashback damage. The head is designed with a low profile for better visibility.

## HEAVY-DUTY CUTTING TIPS

Harris cutting tips are manufactured with materials such as premium grade tellurium copper to withstand higher heat with no damage to the tip.

## STAINLESS STEEL TUBES

The triangular tube design of the harris cutting attachment is compact and lightweight with exceptional strength and rigidity. The silver brazed connections offer added strength and prevent leaks.

## SOLID BRASS FORGED LEVER

The solid brass forged lever is designed for quick handle connection. Lever flips forward for easy and convenient attachment to torch handle.

## EASE-ON CUTTING VALVE

Harris cutting attachments feature an ease-on cutting oxygen control for smoother starts.

## VALVES

Torch handle valves are located at the front of the torch handle for precise control while brazing.

## PROTECTED TORCH UNION

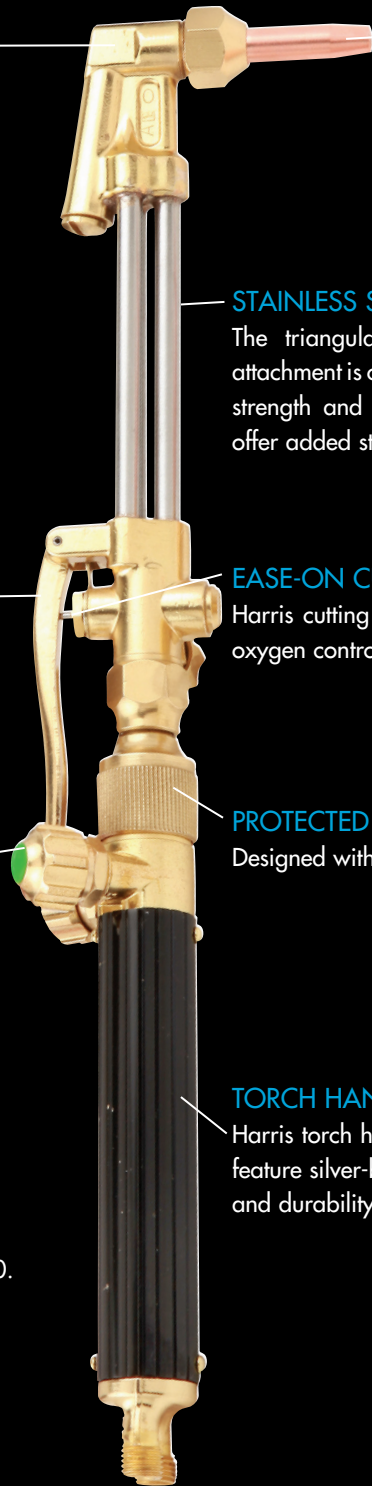
Designed with lock ring to protect seat from damage.

## TORCH HANDLE

Harris torch handles (Models 19-6A, 50-9, & 50-10) feature silver-brazed, twin-tube construction for safety and durability.

## UNIQUE MIXER

The Harris mixer fits tip sizes 0-10.





# PRODUCT SELECTION GUIDE

## BRAZING HANDLES



15-3



19-6A



50-9



50-10



85

PART NUMBER	MODEL NUMBER	CAPACITY	LENGTH/WEIGHT	HOSE CONNECTION	COMPATIBLE CUTTING ATTACH.	COMPATIBLE MIXER(S)	COMPATIBLE BRAZING TIPS
1400010	15-3	BRAZES TO 5/16"	L 5 3/4" W .5 LB	"A" 3/8"-24	N/A	B-15-3	5090, 1390, 8490
1401138	19-6A	BRAZES TO 5/16"	L 7 1/2" W .7 LB	"A" 3/8"-24	36-2 36-2N	H-16-2E H-16-E	23A90, 1390, 5090, 8490
1401585	50-9 ACETYLENE	BRAZES TO 5/16"	L 7 1/2" W .7 LB	"B" 9/16"-18	36-2	H-16-2E H-16-E	23A90, 1390, 5090, 8490
1401590	50-10 PROPANE	BRAZES TO 1/2"	L 8" W .8 LB	"B" 9/16"-18	36-2N	H-16-S	1390-N, 1390H, 1390B, 8490-N
1401340	85	BRAZES TO 1/2"	L 8 1/2" W 1 LB	"B" 9/16"-18	72-3	D-85	23A90, 1390, 1390-HA, J63-1&2

## CUTTING ATTACHMENTS

36-2



36-2N



72-3



PART NUMBER	MODEL NUMBER	CAPACITY	LENGTH/WEIGHT	TORCH HEAD ANGLE	COMPATIBLE HANDLES	COMPATIBLE MIXER(S)	COMPATIBLE CUTTING TIPS
1300019 ACET	36-2	CUTS TO 3"	L 7 7/16" W 0.7 LB	90°	19, 50-9	H-16-E, H-16-2E	3690, 3690AC
1300011 PROPANE	36-2N	CUTS TO 3"	L 7 7/16" W 0.7 LB	90°	19, 50-10	H-16-E, H-16-2E	3690P
1300380	72-3	CUTS TO 5"	L 9 1/2" W 1.5 LB	90°	85	D85	6290, 6290AC

# OXY FUEL EQUIPMENT

## OUTFITS

ACETYLENE    ACETYLENE    ACETYLENE    ACETYLENE    ACETYLENE    ACETYLENE    ACETYLENE



PART NUMBER	4400155	4400156	4400157	4400158
MODEL NUMBER	19601-200A	19601-200A DLX	19601-520A	19601-520A DLX
HANDLE	19-6A	19-6A	19-6A	19-6A
HANDLE CONNECTION	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS
CUTTING ATTACHMENT	-	36-2	-	36-2
MIXER	H-16-2E	H-16-2E	H-16-2E	H-16-2E
OXYGEN REGULATOR	601-80-540A	601-80-540A	601-80-540A	601-80-540A
OXY INLET CONNECTION	CGA 540	CGA 540	CGA 540	CGA 540
OXY OUTLET CONNECTION	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS
ACETYLENE REGULATOR	601-15-200A	601-15-200A	601-15-520A	601-15-520A
ACET INLET CONNECTION	CGA 200 "MC" TANK	CGA 200 "MC" TANK	CGA 520 "B" TANK	CGA 520 "B" TANK
ACET OUTLET CONNECTION	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS
BRAZING TIPS	23A90-1, 23A90-3	23A90-1, 23A90-3	23A90-1, 23A90-3	23A90-1, 23A90-3
CUTTING TIPS	-	3690-0AC	-	3690-0AC
GOGGLES	#5 GREEN	#5 GREEN	#5 GREEN	#5 GREEN
HOSE	3/16" x 12" A x A TWIN	3/16" x 12" A x A TWIN	3/16" x 12" A x A TWIN	3/16" x 12" A x A TWIN
TOTE	-	-	-	-
OXYGEN CYLINDER	-	-	-	-
ACETYLENE CYLINDER	-	-	-	-
STRIKER	#26	#26	#26	#26

# PRODUCT SELECTION GUIDE

PORT-A-TORCH®

ACETYLENE

ACETYLENE

ACETYLENE

ACETYLENE

ACETYLENE

ACETYLENE

ACETYLENE



4400159	4400160	4400161	4400162
19601-200A PAT	19601-200A PAT DLX	19601-200A PAT W/CYL	19601-200A PAT DLX W/C
19-6A	19-6A	19-6A	19-6A
"A" FITTINGS	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS
-	36-2	-	36-2
H-16-2E	H-16-2E	H-16-2E	H-16-2E
601-80-540A	601-80-540A	601-80-540A	601-80-540A
CGA 540	CGA 540	CGA 540	CGA 540
"A" FITTINGS	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS
601-15-200A	601-15-200A	601-15-200A	601-15-200A
CGA 200 "MC" TANK	CGA 200 "MC" TANK	CGA 200 "MC" TANK	CGA 200 "MC" TANK
"A" FITTINGS	"A" FITTINGS	"A" FITTINGS	"A" FITTINGS
23A90-1, 23A90-3	23A90-1, 23A90-3	23A90-1, 23A90-3	23A90-1, 23A90-3
-	3690-OAC	-	3690-OAC
#5 GREEN	#5 GREEN	#5 GREEN	#5 GREEN
3/16" x 12"	3/16" x 12"	3/16" x 12"	3/16" x 12"
AxA TWIN	AxA TWIN	AxA TWIN	AxA TWIN
RED INJECTION MOLDED PLASTIC	RED INJECTION MOLDED PLASTIC	RED INJECTION MOLDED PLASTIC	RED INJECTION MOLDED PLASTIC
-	-	20 CU. FT. CYL SHIPPED EMPTY	20 CU. FT. CYL SHIPPED EMPTY
-	-	10 CU. FT. "MC" CYL SHIPPED EMPTY	10 CU. FT. "MC" CYL SHIPPED EMPTY
#26	#26	#26	#26

OXY FUEL EQUIPMENT

# OXY FUEL EQUIPMENT

## OUTFITS

ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL



PART NUMBER	4400166	4400167
MODEL NUMBER	19601-600	19601-600 DLX
HANDLE	19-6A	19-6A
HANDLE CONNECTION	"A" FITTINGS	"A" FITTINGS
CUTTING ATTACHMENT	-	36-2N
MIXER	H-16-2E	H-16-2E
OXYGEN REGULATOR	601-80-540	601-80-540
OXY INLET CONNECTION	CGA 540	CGA 540
OXY OUTLET CONNECTION	"A" FITTINGS	"A" FITTINGS
FUEL REGULATOR	601-50-600	601-50-600
FUEL INTLET CONNECTION	CGA 600	CGA 600
FUEL OUTLET CONNECTION	"A" FITTINGS	"A" FITTINGS
BRAZING TIPS	1390-2N	1390-2N
CUTTING TIPS	-	3690-1P
TIP TUBE	8593	8593
GOGGLES	#5 GREEN	#5 GREEN
HOSE	3/16 x 12' AxA GRADE T	3/16 x 12' AxA GRADE T
TOTE	BLACK FRAME/TOOL BAG	BLACK FRAME/TOOL BAG
OXYGEN CYLINDER	20 CU FT - EMPTY	20 CU FT - EMPTY
FUEL CYLINDER	*	*
STRIKER	#26	#26



# PRODUCT SELECTION GUIDE

PORT-A-TORCH®

ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL ALTERNATE FUEL



4400164	4400165	4406230	4406231
19601-510P BRAZE	1901-501P BRAZE/CUT	CGA600 CONVERSION	CGA510P CONVERSION
19-6	19-6	-	-
"B" FITTINGS	"B" FITTINGS	"A" FITTINGS	"B" FITTINGS
-	36-2N	-	-
H-16-2E	H-16-2E	-	-
601-80-540	601-80-540	-	-
CGA 540	CGA 540	-	-
"B" FITTINGS	"B" FITTINGS	-	-
601-50-510P	601-50-510P	601-50-600	601-50-510P
CGA 510P	CGA 510P	CGA 600	CGA 510P
"B" FITTINGS	"B" FITTINGS	"A" FITTINGS	"B" FITTINGS
1390-2N	1390-2N	1390-2N	1390-2N
-	-	-	-
8593	8593	8593	8593
#5 GREEN	#5 GREEN	-	-
1/4 x12' BxB GRADE T	1/4 x12' BxB GRADE T	3/16 x 12' AxA GRADE T	1/4 x12' BxB GRADE T
-	-	-	-
-	-	-	-
-	-	-	-
#26	#26	#26	#26

OXY FUEL EQUIPMENT

# MIXERS & TIP TUBES

## MIXERS

## ACETYLENE

PART NUMBER	MIXER	FITS HANDLE	TIP TUBES	ACETYLENE WELDING TIPS	ACETYLENE HEATING TIPS
9100070	B-15-3 - -	15-3 - -	D-50-C TH-50-2 TH-50-2XL	5090-0 THRU 8 1390-0 THRU 8 8490-0 THRU 8	8490-6-65
910072	15-3S	15-3	8493-N	8490-0 THRU 8	-
9101244	H-16-2E -	50-9, 19 -	- 8593	23A90-0 THRU 10 1390-0 THRU 10	J-63-1, J-63-2 1390-HA
9100096	H-16-E	50-9, 19	TH-50-2 D-50-C TH50-2XL	5090-0 THRU 10 1390-0 THRU 8 1390-0 THRU 10	8490-6-65 1390-HA
9100614	D-85 -	85 -	- 8593	23A90-0 THRU 10 1390-0 THRU 0-10	J-63-1, J-63-2 1390-HA

## TIP TUBES FOR SEPARABLE WELDING, BRAZING AND HEATING TIPS




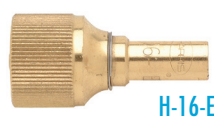

PART NUMBER	TIP TUBES	FITS HANDLE	MIXER	TIPS	TUBE LENGTH
1601590	TH-50-2*	50-9, 19 15-3	H-16-E B-15-3	8490-2 THRU 6, 8490-6-65 8490-2N THRU 10N	5 1/2"
1601596	TH-50-2XL	50-9, 19 15-3	H-16-E B-15-3	8490-2 THRU 6, 8490-6-65 8490-2N-10N	7 1/4"
9100379	D-50-C	50-9, 50-10, 19	H-16-E	1390-0 THRU 10, 1390HA 1390-2N THRU 10N 1390-H+B	4"
9100872	D-50-CXL	50-9, 50-10, 19	H-16-E	1390-0 THRU 10, 1390HA 13902N THRU 10N 1390-H+B	7"
9003681	8593	85	D85	1390-0 THRU 10, 1390HA 1390-2N-10N 1390-H+B	4"

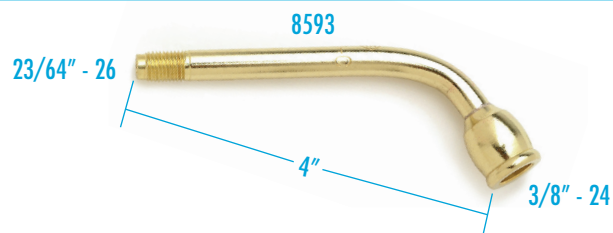
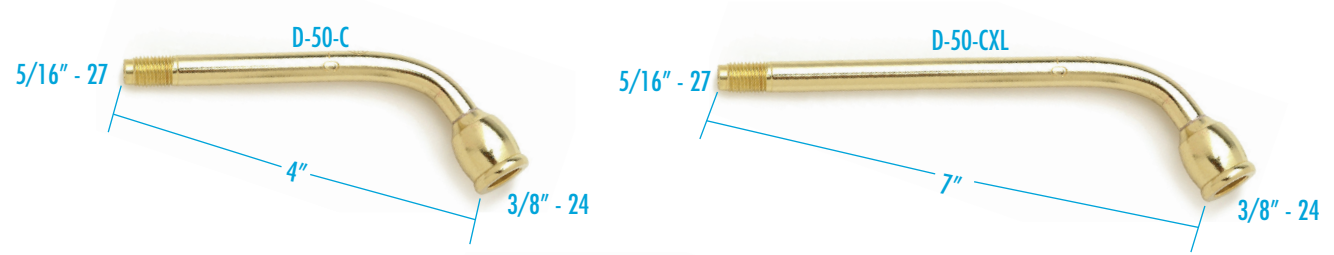
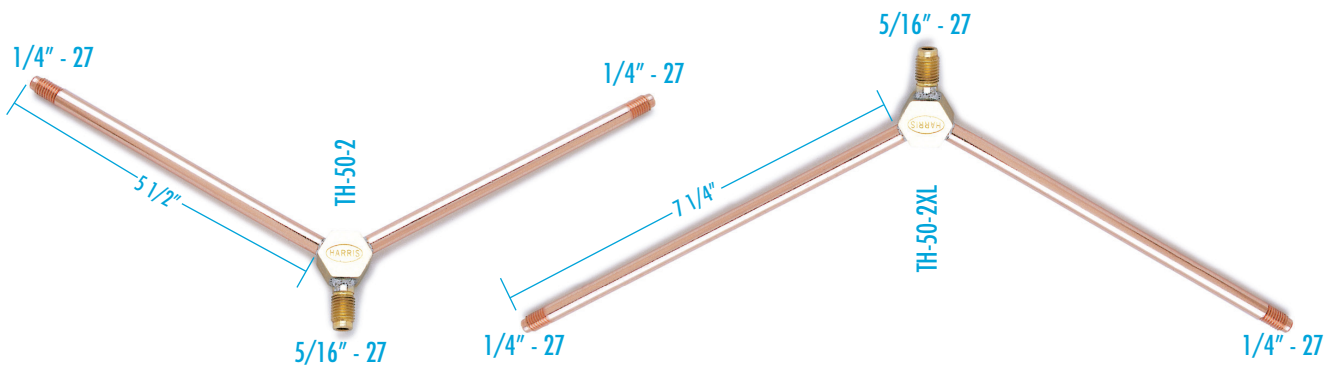
\*TWIN TIP TUBE-REQUIRES TWO TIPS

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# PRODUCT SELECTION GUIDE

## ALTERNATE FUELS

FITS HANDLE	TIP TUBES	BRAZING TIPS	PROPANE/PROPYLENE HEATING TIPS	
15-3	D-50-C, CXL TH-50-2 TH-50-2XL	1390-4N THRU 8N 8490-4N THRU 8N	8490-6-65	 B-15-3 5/16" - 27
15-3	8493-N	8490-4N, 8N	8490-6-65	 B-15-3S 1/4" - 32
50-10, 19	8593	1390-4N THRU 10N	1390-B, 1390-H	 H-16-2E 23/64" - 26
50-9, 19	D-50-C TH-50-2 TH-50-2XL	1390-4N THRU 10N 8490-2N THRU 8N	1390-B, 1390-H 8490-6-65	 H-16-E 5/16" - 27
85	8593	1390-4N THRU 10N	1390-B, 1390-H	 D-85 23/64" - 26



MIXERS & TIP TUBES

# OXY ACETYLENE WELDING AND BRAZING TIPS

PART NUMBER	TIP SERIES	COMPATIBLE HANDLE	TIP SIZE	METAL THICKNESS "INCHES"	OXYGEN PSIG
1601690	5090	15-3, 50-9, 19	0	1/64"	1
1601700	5090	15-3, 50-9, 19	1	1/32"	1
1601710	5090	15-3, 50-9, 19	2	3/64"	2
1601730	5090	15-3, 50-9, 19	3	1/16"	3
1601740	5090	15-3, 50-9, 19	4	3/32"	4
1601760	5090	15-3, 50-9, 19	5	1/8"	5
1601780	5090	15-3, 50-9, 19	6	3/16"	6
1601800	5090	15-3, 50-9, 19	7	1/4"	7
1601810	5090	15-3, 50-9, 19	8	5/16"	8
1600971	23A90	50-9, 19, 85	0	1/64"	1
1600972	23A90	50-9, 19, 85	1	1/32"	1
1600973	23A90	50-9, 19, 85	2	3/64"	2
1600974	23A90	50-9, 19, 85	3	1/16"	3
1600975	23A90	50-9, 19, 85	4	3/32"	4
1600976	23A90	50-9, 19, 85	5	1/8"	5
1600977	23A90	50-9, 19, 85	6	3/16"	6
1600978	23A90	50-9, 19, 85	7	1/4"	7
1600979	23A90	50-9, 19, 85	8	5/16"	8
1600020	1390	15-3, 50-9, 19, 85	0	1/64"	1
1600030	1390	15-3, 50-9, 19, 85	1	1/32"	1
1600040	1390	15-3, 50-9, 19, 85	2	3/64"	2
1600050	1390	15-3, 50-9, 19, 85	3	1/16"	3
1600060	1390	15-3, 50-9, 19, 85	4	3/32"	4
1600070	1390	15-3, 50-9, 19, 85	5	1/8"	5
1600080	1390	15-3, 50-9, 19, 85	6	3/16"	6
1600090	1390	15-3, 50-9, 19, 85	7	1/4"	7
1601990	8490	15-3, 50-9*, 19*	2	3/64"	2
1602010	8490	15-3, 50-9*, 19*	4	3/32"	4
1602030	8490	15-3, 50-9*, 19*	6	3/16"	6
1602060	8490	15-3, 50-9*, 19*	8	5/16"	8

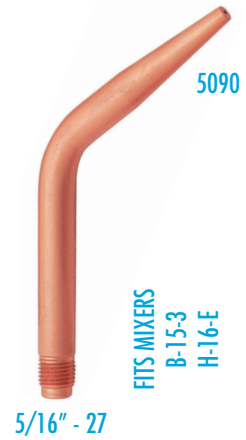
\*TWIN TIP TUBE-REQUIRES TWO TIPS



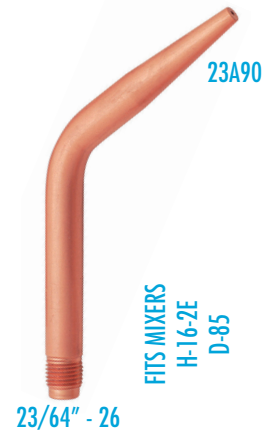
# PRODUCT SELECTION GUIDE

## OXY ACETYLENE TIPS

ACETYLENE PSIG	ACETYLENE FLOW "CFH"		RECOMMENDED HOSE ID
	WELDING	HEATING	
1	1-3	5	3/16"
1	2-5	7	3/16"
2	3-8	10	3/16"
3	5-11	14	3/16"
4	6-14	18	3/16"
5	8-18	22	3/16"
6	10-20	30	3/16"
7	13-25	35	3/16"
8	16-32	40	3/16"



1	1-3	5	3/16"
1	2-5	7	3/16"
2	3-8	10	3/16"
3	5-11	14	3/16"
4	6-14	18	3/16"
5	8-18	22	3/16"
6	10-20	30	3/16"
7	13-25	35	3/16"
8	16-32	40	3/16"



1	1-3	5	3/16"
1	2-5	7	3/16"
2	3-8	10	3/16"
3	5-11	14	3/16"
4	6-14	18	3/16"
5	8-18	22	3/16"
6	10-20	30	3/16"
7	13-25	35	3/16"



2	3-8	10	3/16"
4	6-14	18	3/16"
6	10-20	30	3/16"
8	16-32	40	3/16"



# OXY ACETYLENE HEATING AND CUTTING TIPS

## HEATING TIPS

PART NUMBER	TIP SERIES	COMPATIBLE HANDLE	TIP SIZE	ORIFICE SIZE	OXYGEN & ACETYLENE MAX. PSI	MIN. PSI
1800028	1390	50-9, 19	HA	(10) #65	5	5
1602040	8490	15-3, 50-9, 19	6-65	(6) #65	8	8
1800713	J-63-1	50-9, 19, 85	1	(6) #60 (.040)	6	2
1800714	J-63-2	50-9, 19, 85	2	(8) #60 (.040)	7	3

1. MAXIMUM PRESSURE - NEUTRAL FLAME WITH NO FLAME BLOW-OFF (HIGHEST STABLE FLAME).
2. MINIMUM PRESSURE - NEUTRAL FLAME WITH NO FLAME POP-OUT (LOWEST STABLE FLAME).
3. ACETYLENE FLOWS SHOWN - OXYGEN FLOW THEORETICALLY 1.1 OF ACETYLENE FLOW FOR NEUTRAL FLAME.
4. HEAT OUTPUT CALCULATED WITH 1475 BTU/CU.FT.

\* EXCEEDS THE CAPACITY OF ONE STANDARD 320CF ACETYLENE CYLINDER (1/7TH RULE)



8490-6-65

FITS TUBES  
TH-50-2  
TH-50-2XL

## CUTTING TIPS

PART NUMBER	TIP SERIES	COMPATIBLE CUTTING ATTACHMENT	TIP SIZE	METAL THICKNESS "INCHES"	ORIFICE DRILL SIZE
1500820	6290	72-3	00	3/16" - 3/8"	#64
1500830	6290	72-3	0	3/8" - 5/8"	#60
1500840	6290	72-3	1	5/8" - 1"	#56
1500850	6290	72-3	2	1" - 2"	#52

PART NUMBER	TIP SERIES	COMPATIBLE CUTTING ATTACHMENT	TIP SIZE	METAL THICKNESS "INCHES"	ORIFICE DRILL SIZE
1500405	3690AC	36-2	0	1/4" - 1/2"	#60
1500406	3690AC	36-2	1	1/2" - 1"	#56
1500407	3690AC	36-2	2	1" - 2"	#52

PART NUMBER	TIP SERIES	COMPATIBLE CUTTING ATTACHMENT	TIP SIZE	METAL THICKNESS "INCHES"	ORIFICE DRILL SIZE
1500650	3690	36-2	0	1/4" - 1/2"	#60
1500660	3690	36-2	1	1/2" - 1"	#56
1500670	3690	36-2	2	1" - 2"	#52

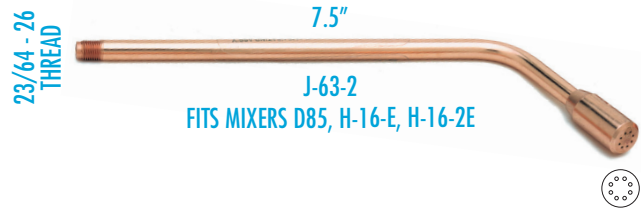
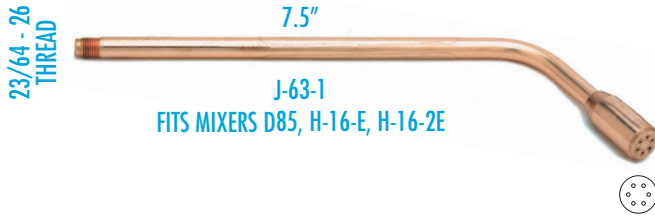
PART NUMBER	TIP SERIES	COMPATIBLE CUTTING ATTACHMENT	TIP SIZE	METAL THICKNESS "INCHES"	ORIFICE DRILL SIZE
1502081	V 3-101	VICTOR®	00	1/8" - 5/16"	#69
1502082	V 3-101	VICTOR®	0	5/16" - 5/8"	#61
1502083	V 3-101	VICTOR®	1	5/8" - 1"	#56
1502084	V 3-101	VICTOR®	2	1" - 2"	#53

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# PRODUCT SELECTION GUIDE

ACETYLENE FLOW "CFH"		APROX. GROSS HEATING OUTPUT BTU/HR	
MAX. FLOW	MIN. FLOW	MAX.	MIN.
52	35	60,840	40,950
55	30	64,350	35,100
35	20	51,500	29,500
50*	30	74,000	44,000



OXYGEN PSIG	ACETYLENE PSIG	TOTAL OXYGEN FLOW "CFH"	ACETYLENE FLOW "CFH"
20-25	5-15	45-50	10-15
35-40	5-15	70-85	10-15
35-40	5-15	95-105	15-25
40-45	5-15	180-215	20-30



OXYGEN PSIG	ACETYLENE PSIG	TOTAL OXYGEN FLOW "CFH"	ACETYLENE FLOW "CFH"
20-25	5	70-85	10-15
25-45	5	95-105	15-25
40-60	5	180-215	20-30



OXYGEN PSIG	ACETYLENE PSIG	TOTAL OXYGEN FLOW "CFH"	ACETYLENE FLOW "CFH"
20-25	5	70-85	10-15
25-45	5	95-105	15-25
40-60	5	180-215	20-30



OXYGEN PSIG	ACETYLENE PSIG	TOTAL OXYGEN FLOW "CFH"	ACETYLENE FLOW "CFH"
20-30	5	45-50	4-6
30-40	7	70-75	5-10
40-50	7	160-170	8-13
45-55	8	235-250	10-16



## OXY ACETYLENE TIPS

# ALTERNATE FUEL BRAZING, HEATING & CUTTING TIPS

## BRAZING & HEATING TIPS

## NORMAL BRAZING

PART NUMBER	TIP SERIES	COMPATIBLE HANDLE	TIP SIZE	OXYGEN "PSIG"		FUEL GAS "PSIG"	
				PRESSURE	FLOW	PRESSURE	FLOW
1600183	1390	15-3, 50-10, 19, 85	2N	2	16	1	4.0
1600193	1390	15-3, 50-10, 19, 85	3N	2	18	1	4.5
1600203	1390	15-3, 50-10, 19, 85	4N	2	20	1	5
1600213	1390	15-3, 50-10, 19, 85	5N	2	22	1	5.5
1600223	1390	15-3, 50-10, 19, 85	6N	3	25	2	6.3
1600233	1390	15-3, 50-10, 19, 85	7N	3	30	2	7.5
1600243	1390	15-3, 50-10, 19, 85	8N	4	35	2	7.8
1600250	1390	15-3, 50-10, 19, 85	9N	5	40	3	10
1600260	1390	15-3, 50-10, 19, 85	10N	6	45	4	11.2
1800025	1390	50-10, 19, 85	H	5-25	48-160	2-12	12-40
1800015	1390	50-10, 19, 85	B	5-25	48-160	2-12	12-40
1602090	8490	15-3, 50-9*, 19*	4N	2	20	1	5
1602100	8490	15-3, 50-9*, 19*	5N	2	22	1	5.5
1602110	8490	15-3, 50-9*, 19*	6N	3	25	2	6.3
1602120	8490	15-3, 50-9*, 19*	7N	3	30	2	7.5
1602130	8490	15-3, 50-9*, 19*	8N	4	35	2	7.8
1602040	8490-6-65	15-3, 50-9*, 19*	6-65	8	8		22.8

\*TWIN TIP TUBE-REQUIRES TWO TIPS

## CUTTING TIPS

PART NUMBER ATTACHMENT	TIP SERIES	COMPATIBLE CUTTING	TIP SIZE	METAL THICKNESS "INCHES"		ORIFICE DRILL SIZE PSIG
				PSIG		
1500600	3690P	36-2N	OOP	1/4"		#64
1500610	3690P	36-2N	OP	1/4" - 1/2"		#60
1500620	3690P	36-2N	1P	1/2" - 1"		#56



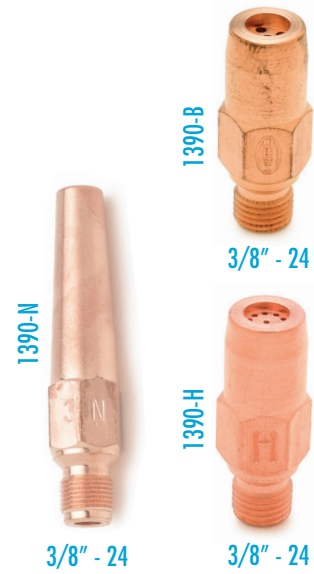
# PRODUCT SELECTION GUIDE

## MAX HEATING

OXYGEN "PSIG"		FUEL GAS "PSIG"		RECOMMENDED HOSE ID
PRESSURE	FLOW	PRESSURE	FLOW	
2	26	2	6.5	3/16"
2	28	2	7.0	3/16"
3	30	2	7.5	3/16"
4	32	2	7.8	3/16"
6	45	4	11.2	3/16"
9	55	5	13.8	1/4"
13	70	6	17.5	1/4"
16	85	7	21.3	1/4"
20	100	8	25	1/4"
-	-	-	-	1/4"
-	-	-	-	1/4"

3	30	2	7.5	3/16"
4	35	2	7.8	3/16"
6	45	4	11.2	3/16"
9	55	5	13.8	1/4"
13	70	6	17.5	1/4"
-	-	-	-	1/4"



OXYGEN FLOW "CFH"	FUEL GAS FLOW "CFH"	TOTAL OXYGEN	FUEL GAS FLOW "CFH"
15-30	4 oz to 2 PSIG	45-50	7.5-12
20-25	4 oz to 2 PSIG	70-85	8-12
25-45	4 oz to 2 PSIG	95-105	15-23



# GAS REGULATION EQUIPMENT

For over 100 years Harris has designed and manufactured precision-built industrial regulators with durable, time tested materials. Our industrial regulators put it all together - proven safety features, quality manufacturing processes, consistency in performance and the best overall value.

## MADE IN THE USA

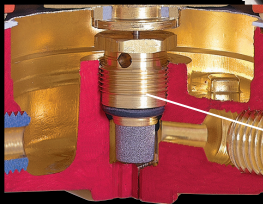
Harris regulators are manufactured in our Gainesville, Georgia, USA facility and meet or exceed all relevant industry standards and guidelines.

## 2" DUAL SCALE GAUGES

Regulators feature large scale gauges for easy readability (Models 226 & 25)

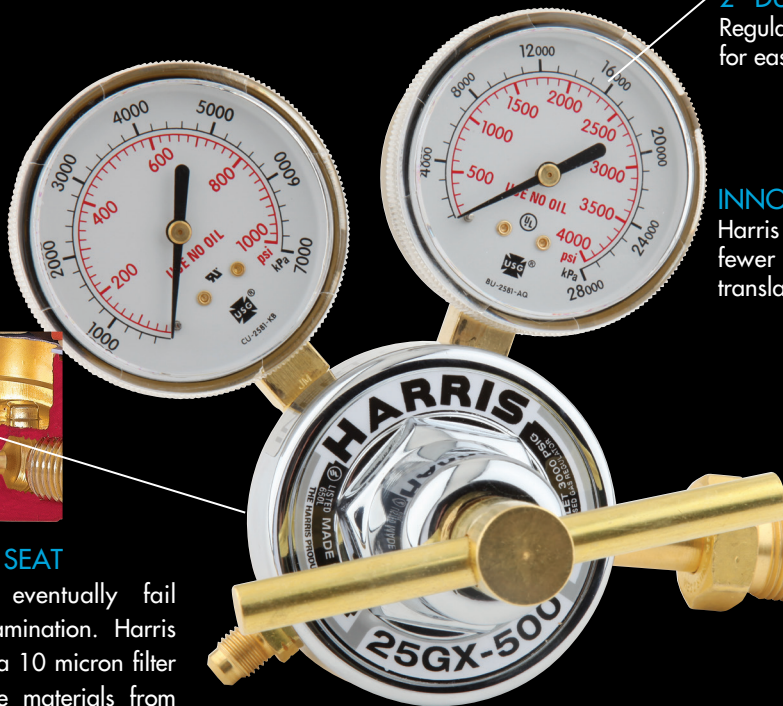
## INNOVATIVE DESIGN

Harris regulators are designed with fewer internal components which translates to fewer failures.



## ENCAPSULATED SEAT

Most regulators eventually fail due to seat contamination. Harris regulators include a 10 micron filter to keep particulate materials from contaminating the valve seat.



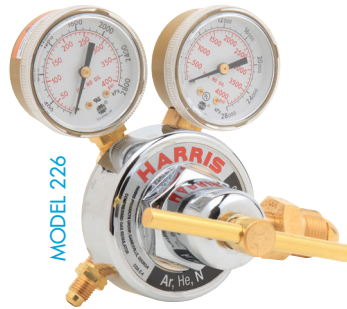
## DURABLE MATERIALS

Only the highest-quality industrial grade materials, such as brass, stainless steel, nickel and chrome are used in the construction of Harris regulators. We avoid the use of lower-cost plastic composites and other materials that will not hold up to every day industrial use.

# PRODUCT SELECTION GUIDE



MODEL 601



MODEL 226



MODEL 25GX

## 601 REGULATORS

PART NO.	MODEL NO.	GAS	MAXIMUM INLET PSIG	DELIVERY PRESSURE RANGE PSIG	DELIVERY PRESSURE GAUGE PSIG	SUPPLY PRESSURE GAUGE PSIG	INLET CONNECTION
3000407	601-15-200-"A" FITTING	ACETYLENE	500	0-15	30	400	CGA 200 (MC)
3000295	601-15-200-"B" FITTING	ACETYLENE	500	0-15	30	400	CGA 200 (MC)
3000409	601-50-510P-"B" FITTING	PROPANE	500	0-50	60	400	CGA 510P (LPG)
3000408	601-15-520-"A" FITTING	ACETYLENE	500	0-15	30	400	CGA 520 (B)
3000411	601-15-520-"B" FITTING	ACETYLENE	500	0-15	30	400	CGA 520 (B)
3000412	601-80-540-"A" FITTING	OXYGEN	3000	0-80	100	4000	CGA 540
3000296	601-80-540-"B" FITTING	OXYGEN	3000	0-80	100	4000	CGA 540
3002318	601-50-600-"A" FITTING	LPG	500	0-50	60	400	CGA 600
3002317	601-50-600-"B" FITTING	LPG	500	0-50	60	400	CGA 600

"A" = 3/8" - 24 OUTLET "B" = 9/16" - 18 OUTLET

## NITROGEN PURGING REGULATORS

PART NO.	MODEL NO.	GAS	MAXIMUM INLET PSIG	DELIVERY PRESSURE RANGE PSIG	DELIVERY PRESSURE GAUGE PSIG	SUPPLY PRESSURE GAUGE PSIG	INLET CONNECTION	OUTLET CONNECTION
3000616	226-250C-580	Ar,N2,He	3000	0-250	400	4000	CGA 580	1/4" FLARE
3000606	25GX-500C-580	Ar,N2,He	3000	0-500	1000	4000	CGA 580	1/4" FLARE

## REGULATOR GAUGES

PART NO.	DESCRIPTION	FITS HARRIS REGULATORS
9006257	50MM 30PSI/2BAR ABS 1/8 BSP	601-15-200 "A", AND "B", 520 "A" + "B" 510P
9006311	50MM 60PSI/4BAR ABS 1/8 BSP	601-50-510P AND 600 "A" + "B"
9006254	50MM 4000PSI/315BAR ABS 1/8 BSP	601-80-540 "A" AND "B"
9006256	50MM 400PSI/28BAR ABS 1/8 BSP	601-15-200 "A" + "B", 520 "A" + "B" AND 510P
9006255	50MM 100PSI/7BAR ABS 1/8 BSP	601-80-540 "A" + "B"
9006130	2" 400PSIG/ 2,800KPA STEEL 1/4"	226-250-580
9006131	2" 1000PSIG/7,000KPA STEEL 1/4"	25-500C-580
9006135	2" 4000PSIG/28,000KPA STEEL 1/4"	226-250-580, 25-500C-580





# ACCESSORIES

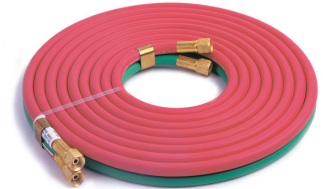
## SINGLE HOSE

PART NO.	DESCRIPTION
4300775	3/16" X 12' ACETYLENE HOSE (A & A FITTINGS)
4300777	3/16" X 24' ACETYLENE HOSE (A & A FITTINGS)
4300774	3/16" X 12' ACETYLENE HOSE (B & B FITTINGS)
4300779	3/16" X 24' ACETYLENE HOSE (B & B FITTINGS)



## TWIN HOSE

PART NO.	DESCRIPTION
4300556	3/16" X 12' TWIN HOSE (B & B FITTINGS)
4300557	3/16" X 20' TWIN HOSE (B & B FITTINGS)
4300005	3/16" X 12' TWIN HOSE (A & B FITTINGS)
4300155	3/16" X 12' TWIN HOSE (A & A FITTINGS)
4300583	1/4" X 12' TWIN BXB T-GRADE FOR ALL FUEL GASES
4300225	3/16" X 12' TWIN AXA T-GRADE FOR ALL FUEL GASES



## FLASHBACK ARRESTORS & CHECK-VALVES

PART NO.	DESCRIPTION	
4300414	REGULATOR TYPE - MODEL 88-5SFBR (R&L)	FBA
4300415	TORCH TYPE - MODEL 88-5SFBT (R&L)	FBA
4300389	REGULATOR TYPE - MODEL 88-6CVR (R&L)	CV
4300390	TORCH TYPE - MODEL 88-6CVT (R&L)	CV
4300835	TORCH TYPE - MODEL 88-6CVTA (R&L) "A"	CV

FLASHBACK ARRESTORS



9/16" - 18 TORCH 88-5SFBT

CHECK-VALVES



3/8" - 24 TORCH CV

## GAS & TANK STANDS

PART NO.	DESCRIPTION
4300672	MAP-PRO® 14.1oz CYL/SOLD IN CASES OF 12
4300675	PROPANE 1 LB CYL/SOLD IN CASES OF 12
4300677	CARRYING STAND, B ACETYLENE TANK
4300678	CARRYING STAND, MC ACETYLENE TANK
8800337	CYLINDER 20CF OXYGEN
8800336	CYLINDER MC
8855032	PLASTIC PAT TOTE



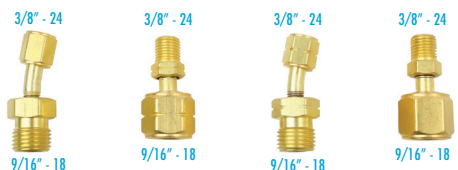
## ACCESSORIES

PART NO.	DESCRIPTION
4300679	FLAME BARRIER 12" x 12"
4300833	TIP CLEANER
4300418	FLINT, 26-L
4300834	SINGLE FLINT STRIKER WITH REPLACEABLE FLINT
LEAK8	LEAK DETECTOR



## ADAPTORS

PART NO.	DESCRIPTION
9004418	ADAPTOR, M/A TO F/B RH OXYGEN
9004419	ADAPTOR, M/A TO F/B LH ACETYLENE/FUEL GAS
9004426	ADAPTOR, OXYGEN HOSE (1 PACK)
9004427	ADAPTOR, M/B TO F/A LH ACETYLENE/FUEL GAS



PART NO. 9004426 HOSE ADAPTOR - B x A (R)    PART NO. 9004419 HOSE ADAPTOR - B x A (L)    PART NO. 9004427 HOSE ADAPTOR - B x A (L)    PART NO. 9004418 HOSE ADAPTOR - B x A (R)



# BRAZING AND SOLDERING TRAINING



North American Technician Excellence (NATE,) headquartered in Arlington, VA., was founded in 1997 and is the nation's largest non-profit certification organization for heating, ventilation, air conditioning and refrigeration technicians. NATE is the only technician certification organization governed, owned, operated, developed and supported by the HVACR industry.

## Outline for HVACR NATE Recognized Program

### CREDITS EARNED

The course CEH indicates the approximate number of hours the course should last period.

#### 2 CONTINUING EDUCATION HOURS (CEH)

Field training course with lecture/discussion/demonstration  
NATE course number 5272-0004

#### 3 CONTINUING EDUCATION HOURS (CEH)

Field training course with lecture/discussion/demonstration  
NATE course number 5272-0002

#### 4 CONTINUING EDUCATION HOURS (CEH)

Field training course with lecture/discussion/demonstration and hands on participant brazing  
NATE course number 5272-0003

#### 12 CONTINUING EDUCATION HOURS (CEH)

The Harris Products Group two day "Brazing Workshop" is given at Mason, Ohio headquarters. Lecture/discussion/demonstrations/hands on participant brazing  
NATE course number 5272-001

### REQUIRED TOPICS IN ALL SESSIONS:

- Brazing and Soldering Basics – capillary action, wetting
- Brazing and Soldering Preparation – cutting, cleaning, reaming, (copper tube)
- Brazing and Soldering Equipment – oxy/acetylene & air-fuel, operation and safety
- Importance of purging with nitrogen during brazing
- Brazing filler metals – phosphorus copper alloys – properties and applications, (copper and copper to brass)
- Brazing filler metals – high silver alloys – properties and applications, (copper, steel, brass, bronze, stainless steel)
- Solder filler metals – properties and applications
- Aluminum solder and brazing products
- Fluxes for soldering and brazing – types, purpose, application, and post-braze/solder cleaning
- Base metals – properties and filler metal selection
- Heating technique and filler metal application

All attendees must sign a NATE Official Recognized Provider Attendance Record.  
Harris will provide a certificate of completion to each person.

This course applies to the following NATE course outlines:

### INSTALLER

ACIN Air Conditioning – Air to Air  
HPIN Heating – Reverse Cycle Air to Air  
HGIN Heating Hydronics – Gas  
RLIN Light Commercial Refrigeration  
RCIN Commercial Refrigeration

### SERVICE

ACSV Air Conditioning – Air to Air  
HPSV Heating – Reverse Cycle Air to Air  
RLSV Light Commercial Refrigeration  
RCSV Commercial Refrigeration

NATE is a registered trademark of the North American Technician Excellence, Inc.

# MERCHANDISING

POINT OF PURCHASE



CONTACT HARRIS CUSTOMER SERVICE  
FOR DETAILS





A LINCOLN ELECTRIC COMPANY

The Harris Products Group  
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Mason, OH 45040  
Customer Service: 1-800-733-4533  
Fax: 513-754-8778

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