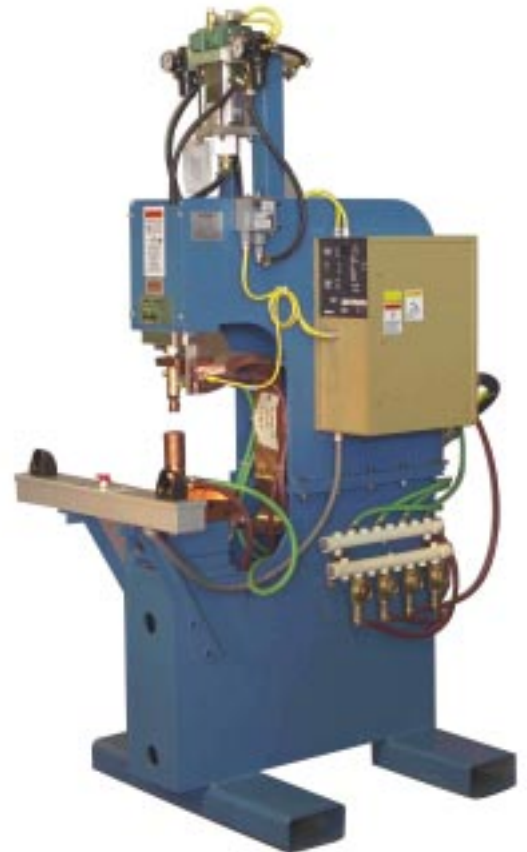




Tipaloy

MANUFACTURERS OF

ELECTRODES AND EQUIPMENT



UNITED STATES
TIPALOY, INC.
1435 E. MILWAUKEE AVE.
DETROIT, MI 48211
PHONE (313) 875-5145
FAX (313) 875-6027

CANADA
TIPALOY, LTD
430 PELESSIER AVE., SUITE 326
WINDSOR, ONTARIO N9A 4K9
PHONE(888) 847-2569
FAX (888) 551-2055

WORLD WIDE WEB: WWW.TIPALOY.COM
E-MAIL TIPALOY@TIPALOY.COM



UNITED STATES (313) 875-5145
FAX (313) 875-6027
WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
FAX (888) 551-2055
E-MAIL TIPALOY@TIPALOY.COM



SC-1000

35 KVA, 45 KVA, & 65 KVA

This single hit projection and spot welder is designed to give maximum productivity with a minimum of cost and floor space. Tipaloy can readily adapt Nut and Stud feed units* to this equipment for increased output.



SC-2000

100 KVA & 125 KVA

A heavy-duty welder with the superior follow up supplied by Air over Oil pressure system for single hit projection welding projects. This welder will also supply excellent spot welds. The lower knee comes with a "T" slotted platen adapter to hold any tooling of fixturing required for your parts.



SC-4000

100 KVA , 125 KVA & 150 KVA

Multiple weld cylinders are available in either air, or air over oil, on this versatile welder. Designed with upper and lower working surfaces of 8" x 30" this welder offers a perfect solution to those two to six hit projection or spotwelding applications.

Dedicated Welders -

Send us your "IGES" or Auto Cad files, blue prints, or sample parts for a quotation on a dedicated welder to meet your production requirements

Welding controls & options

Choose your welding control or let us help you decide the best control for your application. Options include primary voltage or secondary amperage monitoring, pressure sensing, programable sensing, networking, ect.

Tooling & Fixturing

Tipaloy will design tooling or fixturing for your part using your existing welder, or better yet one of ours!
Send us your "IGES" or Auto Cad files.

* Ask about our part present, nut or stud present, nut upside down, stud or nut feeding equipment, ect..



TABLE OF CONTENTS

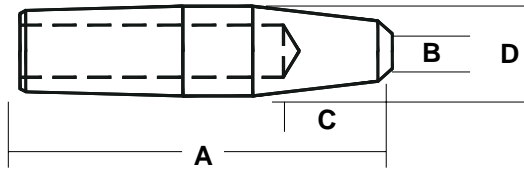
ACCESSORIES		ELECTRODES (CONTINUED)	
Conductivity Related Products	38	Offset	5
Copper Paste, Jet-Lube	38	Pointed	2
Dresser Blades & Chucks	40,41	Radius	6
Dresser, Ratchet	43	Rectangular Faced	14
Dressers, Pneumatic Cap & Tip	39	Round Faced	15
Extractors, Cap and Tip	43	Single Bend	10
Files, Radius	43	Socket (Button)	28
Gauges, Pressure	44	Stud and Nut (New Product)	16-19,2
Insulating Material	38	Swivel	15
Micarta	38	TCL Heads (New Product)	20
Reamers, Taper	42	Truncated	6
Silver Plating Solution	38		
Water Connections	42	FORGINGS AND CASTINGS	56
Water Tubes	37		
ADAPTERS		HOLDERS	
Tapered	22	20 Degree Offset	28
Threaded	22,23	Close Coupled	28
	33,34	Cylinder Gun Holders	36
		Gun Holders and Components	36,37
ALLOYS		Holder/Adapter Combinations	25
Copper Alloy Bar Stock	53	Offset, Cast	29-32
Copper Tungsten	55	Paddle Type	28
Molybdenum	55	Platen Adapters	26
Refractory Metals	55	Spring Loaded (Low Inertia)	35
Tungsten	55	Straight Tapered Barrel	27
		"T" Connections	33,34
		Universal Holder Assemblies	33,34
CHARTS AND DATA		Water Tubes	37
Cable Selection	49,50		
Cap Taper Chart, RWMA	60		
Electrode Alloy Chart	51		
Electrode Taper / Pressure Chart, RWMA	59	JUMPERS (CABLES)	
Weld Schedule Data	57,58	Air Cooled (Dry)	46
		Kickless	48
ELECTRODES		Laminated Shunts	45
30 Degree Offset	7	Water Cooled	47
Air Pressure Nut (New Product)	19,20		
Cap Tips and Shanks, Female	9		
Cap Tips and Shanks, Male	8	WELDERS, FIXTURES, TOOLING	
Cast Irregular Offset	12,13	Build A Die (New Product)	18,19
Copper Tungsten Faced	7	Welder Arms	24
CT Faced	7	Welders and Components	1
Dome	3	Welders, SC-1000	INSIDE
Double Bend	11	Welders, SC-2000	INSIDE
Flat	4	Welders, SC-4000	INSIDE



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

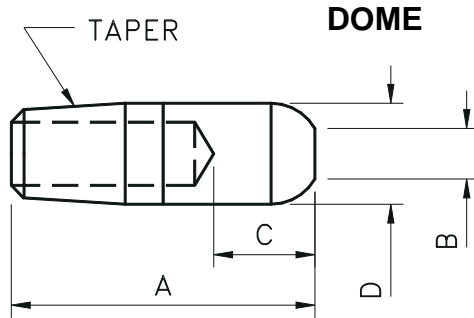
POINTED



TIPALOY		R.W.M.A.	
D	= POINTED NOSE	B	= "B" NOSE
2	= #5RW TAPER	02	= CLASS 2 COPPER
250	= 2.50" LONG	5	= #5RW TAPER
		10	= LENGTH IN 1/4"

POINTED ELECTRODES

	CLASS 2		CLASS 1		CLASS 3		OVERALL LENGTH	WELD FACE DIA.	FACE TO WATER HOLE	MAJOR DIA.
	#130 CODE	RWMA CODE #	#100 CODE	RWMA CODE #	#200 CODE	RWMA CODE #	A	B	C	D
	P1-100	A02404	P1-100-100	A01404	-	-	1			
	P1-125	A02405	P1-125-100	A01405	P1-125-200	A03405	1-1/4			
	P1-150	A02406	P1-150-100	A01406	P1-150-200	A03406	1-1/2			
4 RW	P1-175	A02407	P1-175-100	A01407	P1-175-200	A03407	1-3/4			
OR	P1-200	A02408	P1-200-100	A01408	P1-200-200	A03408	2			
# 1MT	P1-225	A02409	P1-225-100	A01409	P1-225-200	A03409	2-1/4	3/16	1/2	.482
	P1-250	A02410	P1-250-100	A01410	P1-250-200	A03410	2-1/2			OR
	P1-275	A02411	P1-275-100	A01411	P1-275-200	A03411	2-3/4			.500
	P1-300	A02412	P1-300-100	A01412	P1-300-200	A03412	3			
	P1-325	A02413	P1-325-100	A01413	P1-325-200	A03413	3-1/4			
	P1-350	A02414	P1-350-100	A01414	P1-350-200	A03414	3-1/2			
	P1-375	A02415	P1-375-100	A01415	P1-375-200	A03415	3-3/4			
	P1-400	A02416	P1-400-100	A01416	P1-400-200	A03416	4			
	P2-125	A02505	P2-125-100	A01505	P2-125-200	A03505	1-1/4			
	P2-150	A02506	P2-150-100	A01506	P2-150-200	A03506	1-1/2			
	P2-175	A02507	P2-175-100	A01507	P2-175-200	A03507	1-3/4			
	P2-200	A02508	P2-200-100	A01508	P2-200-200	A03508	2			
5 RW	P2-225	A02509	P2-225-100	A01509	P2-225-200	A03509	2-1/4			
OR	P2-250	A02510	P2-250-100	A01510	P2-250-200	A03510	2-1/2	1/4	3/4	.625
# 2MT	P2-275	A02511	P2-275-100	A01511	P2-275-200	A03511	2-3/4			
	P2-300	A02512	P2-300-100	A01512	P2-300-200	A03512	3			
	P2-325	A02513	P2-325-100	A01513	P2-325-200	A03513	3-1/4			
	P2-350	A02514	P2-350-100	A01514	P2-350-200	A03514	3-1/2			
	P2-375	A02515	P2-375-100	A01515	P2-375-200	A03515	3-3/4			
	P2-400	A02516	P2-400-100	A01516	P2-400-200	A03516	4			
	P6-200	A02608	P6-200-100	A01608	P6-200-200	A03608	2			
6 RW	P6-250	A02610	P6-250-100	A01610	P6-250-200	A03610	2-1/2	9/32	3/4	.750
	P6-300	A02612	P6-300-100	A01612	P6-300-200	A03612	3			
	P3-200	A02708	P3-200-100	A01708	P3-200-200	A03708	2			
7 RW	P3-250	A02710	P3-250-100	A01710	P3-250-200	A03710	2-1/2	5/16	3/4	.875
OR	P3-300	A02712	P3-300-100	A01712	P3-300-200	A03712	3			
# 3MT	P3-400	A02716	P3-400-100	A01716	P3-400-200	A03716	4			



TIPALOY		R.W.M.A.	
0	= POINTED NOSE	D	= "D" NOSE
2	= #5RW TAPER	02	= CLASS 2 COPPER
250	= 2.50" LONG	5	= #5RW TAPER
		10	= LENGTH IN 1/4"

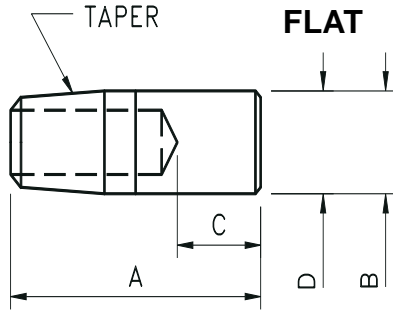
DOMES ELECTRODES

TAPER	CLASS 2		CLASS 1		CLASS 3		OVERALL LENGTH A	WELD FACE DIA. B	FACE TO WATER HOLE C	MAJOR DIA. D
	#130 CODE	RWMA CODE #	#100 CODE	RWMA CODE #	#200 CODE	RWMA CODE #				
4 RW OR # 1MT	P1-100	A02404	P1-100-100	A01404	-	-	1	3/16	1/2	.482 OR .500
	P1-125	A02405	P1-125-100	A01405	P1-125-200	A03405	1-1/4			
	P1-150	A02406	P1-150-100	A01406	P1-150-200	A03406	1-1/2			
	P1-175	A02407	P1-175-100	A01407	P1-175-200	A03407	1-3/4			
	P1-200	A02408	P1-200-100	A01408	P1-200-200	A03408	2			
	P1-225	A02409	P1-225-100	A01409	P1-225-200	A03409	2-1/4			
	P1-250	A02410	P1-250-100	A01410	P1-250-200	A03410	2-1/2			
	P1-275	A02411	P1-275-100	A01411	P1-275-200	A03411	2-3/4			
	P1-300	A02412	P1-300-100	A01412	P1-300-200	A03412	3			
	P1-325	A02413	P1-325-100	A01413	P1-325-200	A03413	3-1/4			
	P1-350	A02414	P1-350-100	A01414	P1-350-200	A03414	3-1/2			
	P1-375	A02415	P1-375-100	A01415	P1-375-200	A03415	3-3/4			
P1-400	A02416	P1-400-100	A01416	P1-400-200	A03416	4				
5 RW OR # 2MT	P2-125	A02505	P2-125-100	A01505	P2-125-200	A03505	1-1/4	1/4	3/4	.625
	P2-150	A02506	P2-150-100	A01506	P2-150-200	A03506	1-1/2			
	P2-175	A02507	P2-175-100	A01507	P2-175-200	A03507	1-3/4			
	P2-200	A02508	P2-200-100	A01508	P2-200-200	A03508	2			
	P2-225	A02509	P2-225-100	A01509	P2-225-200	A03509	2-1/4			
	P2-250	A02510	P2-250-100	A01510	P2-250-200	A03510	2-1/2			
	P2-275	A02511	P2-275-100	A01511	P2-275-200	A03511	2-3/4			
	P2-300	A02512	P2-300-100	A01512	P2-300-200	A03512	3			
	P2-325	A02513	P2-325-100	A01513	P2-325-200	A03513	3-1/4			
	P2-350	A02514	P2-350-100	A01514	P2-350-200	A03514	3-1/2			
P2-375	A02515	P2-375-100	A01515	P2-375-200	A03515	3-3/4				
P2-400	A02516	P2-400-100	A01516	P2-400-200	A03516	4				
6 RW	P6-200	A02608	P6-200-100	A01608	P6-200-200	A03608	2	9/32	3/4	.750
	P6-250	A02610	P6-250-100	A01610	P6-250-200	A03610	2-1/2			
	P6-300	A02612	P6-300-100	A01612	P6-300-200	A03612	3			
7 RW OR # 3MT	P3-200	A02708	P3-200-100	A01708	P3-200-200	A03708	2	5/16	3/4	.875
	P3-250	A02710	P3-250-100	A01710	P3-250-200	A03710	2-1/2			
	P3-300	A02712	P3-300-100	A01712	P3-300-200	A03712	3			
	P3-400	A02716	P3-400-100	A01716	P3-400-200	A03716	4			



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM



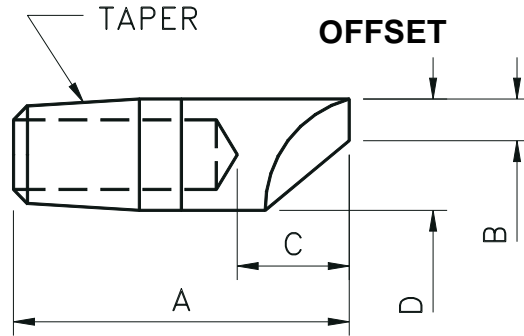
TIPALOY		R.W.M.A.	
F	= POINTED NOSE	C	= "C" NOSE
2	= #5RW TAPER	02	= CLASS 2 COPPER
250	= 2.50" LONG	5	= #5RW TAPER
		10	= LENGTH IN 1/4"

FLAT ELECTRODES

	CLASS 2		CLASS 1		CLASS 3		OVERALL	WELD	FACE TO	MAJOR
	#130	RWMA	#100	RWMA	#200	RWMA	LENGTH	FACE	WATER	DIA.
TAPER	CODE	CODE #	CODE	CODE #	CODE	CODE #	A	B	C	D
	F1-100	C02404	F1-100-100	C01404	-	-	1			
	F1-125	C02405	F1-125-100	C01405	F1-125-200	C03405	1-1/4			
	F1-150	C02406	F1-150-100	C01406	F1-150-200	C03406	1-1/2			
4 RW	F1-175	C02407	F1-175-100	C01407	F1-175-200	C03407	1-3/4			
OR	F1-200	C02408	F1-200-100	C01408	F1-200-200	C03408	2			
# 1MT	F1-225	C02409	F1-225-100	C01409	F1-225-200	C03409	2-1/4	3/16	1/2	.482
	F1-250	C02410	F1-250-100	C01410	F1-250-200	C03410	2-1/2			OR
	F1-275	C02411	F1-275-100	C01411	F1-275-200	C03411	2-3/4			.500
	F1-300	C02412	F1-300-100	C01412	F1-300-200	C03412	3			
	F1-325	C02413	F1-325-100	C01413	F1-325-200	C03413	3-1/4			
	F1-350	C02414	F1-350-100	C01414	F1-350-200	C03414	3-1/2			
	F1-375	C02415	F1-375-100	C01415	F1-375-200	C03415	3-3/4			
	F1-400	C02416	F1-400-100	C01416	F1-400-200	C03416	4			
	F2-125	C02505	F2-125-100	C01505	F2-125-200	C03505	1-1/4			
	F2-150	C02506	F2-150-100	C01506	F2-150-200	C03506	1-1/2			
	F2-175	C02507	F2-175-100	C01507	F2-175-200	C03507	1-3/4			
	F2-200	C02508	F2-200-100	C01508	F2-200-200	C03508	2			
5 RW	F2-225	C02509	F2-225-100	C01509	F2-225-200	C03509	2-1/4			
OR	F2-250	C02510	F2-250-100	C01510	F2-250-200	C03510	2-1/2	1/4	3/4	.625
# 2MT	F2-275	C02511	F2-275-100	C01511	F2-275-200	C03511	2-3/4			
	F2-300	C02512	F2-300-100	C01512	F2-300-200	C03512	3			
	F2-325	C02513	F2-325-100	C01513	F2-325-200	C03513	3-1/4			
	F2-350	C02514	F2-350-100	C01514	F2-350-200	C03514	3-1/2			
	F2-375	C02515	F2-375-100	C01515	F2-375-200	C03515	3-3/4			
	F2-400	C02516	F2-400-100	C01516	F2-400-200	C03516	4			
	F6-200	C02608	F6-200-100	C01608	F6-200-200	C03608	2			
6 RW	F6-250	C02610	F6-250-100	C01610	F6-250-200	C03610	2-1/2	9/32	3/4	.750
	F6-300	C02612	F6-300-100	C01612	F6-300-200	C03612	3			
	F3-200	C02708	F3-200-100	C01708	F3-200-200	C03708	2			
7 RW	F3-250	C02710	F3-250-100	C01710	F3-250-200	C03710	2-1/2	5/16	3/4	.875
OR	F3-300	C02712	F3-300-100	C01712	F3-300-200	C03712	3			
# 3MT	F3-400	C02716	F3-400-100	C01716	F3-400-200	C03716	4			



EXAMPLE OF PART CODING:			
TIPALOY		R.W.M.A.	
0	= POINTED NOSE	D	= "D" NOSE
2	= #5RW TAPER	02	= CLASS 2 COPPER
250	= 2.50" LONG	5	= #5RW TAPER
		10	= LENGTH IN 1/4"



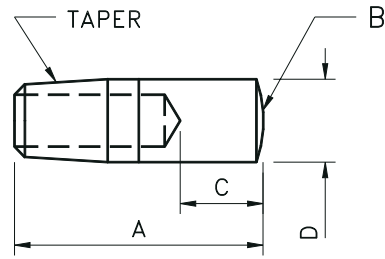
	CLASS 2		CLASS 1		CLASS 3		OVERALL LENGTH	WELD FACE DIA.	FACE TO WATER HOLE	MAJOR DIA.
TAPER	#130 CODE	RWMA CODE #	#100 CODE	RWMA CODE #	#200 CODE	RWMA CODE #	A	B	C	D
	01-100	D02404	01-100-100	D01404	-	-	1			
	01-125	D02405	01-125-100	D01405	01-125-200	D03405	1-1/4			
	01-150	D02406	01-150-100	D01406	01-150-200	D03406	1-1/2			
4 RW	01-175	D02407	01-175-100	D01407	01-175-200	D03407	1-3/4			
OR	01-200	D02408	01-200-100	D01408	01-200-200	D03408	2			
# 1MT	01-225	D02409	01-225-100	D01409	01-225-200	D03409	2-1/4	3/16	1/2	.482
	01-250	D02410	01-250-100	D01410	01-250-200	D03410	2-1/2			OR
	01-275	D02411	01-275-100	D01411	01-275-200	D03411	2-3/4			.500
	01-300	D02412	01-300-100	D01412	01-300-200	D03412	3			
	01-325	D02413	01-325-100	D01413	01-325-200	D03413	3-1/4			
	01-350	D02414	01-350-100	D01414	01-350-200	D03414	3-1/2			
	01-375	D02415	01-375-100	D01415	01-375-200	D03415	3-3/4			
	01-400	D02416	01-400-100	D01416	01-400-200	D03416	4			
	02-125	D02505	02-125-100	D01505	02-125-200	D03505	1-1/4			
	02-150	D02506	02-150-100	D01506	02-150-200	D03506	1-1/2			
	02-175	D02507	02-175-100	D01507	02-175-200	D03507	1-3/4			
	02-200	D02508	02-200-100	D01508	02-200-200	D03508	2			
5 RW	02-225	D02509	02-225-100	D01509	02-225-200	D03509	2-1/4			
OR	02-250	D02510	02-250-100	D01510	02-250-200	D03510	2-1/2	1/4	3/4	.625
# 2MT	02-275	D02511	02-275-100	D01511	02-275-200	D03511	2-3/4			
	02-300	D02512	02-300-100	D01512	02-300-200	D03512	3			
	02-325	D02513	02-325-100	D01513	02-325-200	D03513	3-1/4			
	02-350	D02514	02-350-100	D01514	02-350-200	D03514	3-1/2			
	02-375	D02515	02-375-100	D01515	02-375-200	D03515	3-3/4			
	02-400	D02516	02-400-100	D01516	02-400-200	D03516	4			
	06-200	D02608	06-200-100	D01608	06-200-200	D03608	2			
6 RW	06-250	D02610	06-250-100	D01610	06-250-200	D03610	2-1/2	9/32	3/4	.750
	06-300	D02612	06-300-100	D01612	06-300-200	D03612	3			
	03-200	D02708	03-200-100	D01708	03-200-200	D03708	2			
OR	03-250	D02710	03-250-100	D01710	03-250-200	D03710	2-1/2	5/16	3/4	.875
# 3MT	03-300	D02712	03-300-100	D01712	03-300-200	D03712	3			
	03-400	D02716	03-400-100	D01716	03-400-200	D03716	4			

OFFSET ELECTRODES



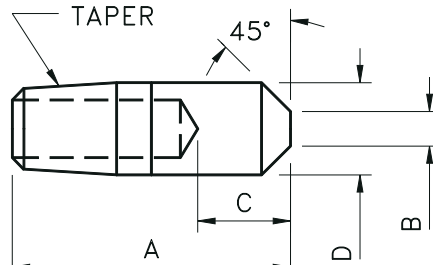
RADIUS AND TRUNCATED TIPS

RADIUS AND TRUNCATED TIPS



RADIUS

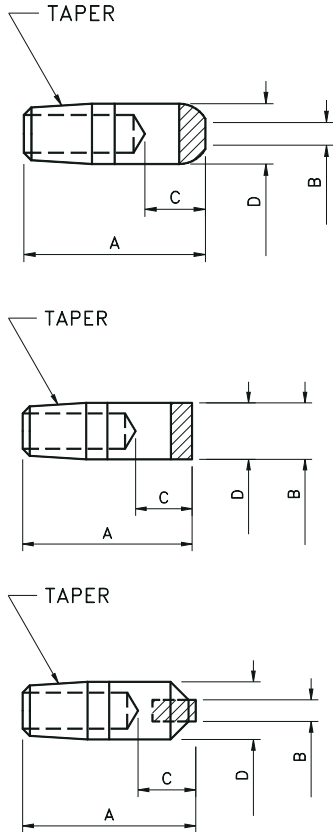
	#130 CODE NO.	#100 CODE NO.	OVERALL LENGTH	WELD FACE DIA.	FACE TO WATER HOLE	MAJOR DIAMETER
	CLASS 2	CLASS 1	A	B	C	D
4RW / #1MT	TC-244	TC-144	1	3/16	.500	.482 OR 0.5
	TC-246	TC-146	1-1/2			
	TC-248	TC-148	2			
	TC-2410	TC-1410	2-1/2			
5RW / #2MT	TC-2412	TC-1412	3	1/4	3/4	.625
	TC-256	TC-156	1-1/2			
	TC-258	TC-158	2			
	TC-2510	TC-1510	2-1/2			
	TC-2512	TC-1512	3			
7RW / #3MT	TC-2514	TC-1514	3-1/2	5/16	3/4	.875
	TC-2516	TC-1516	4			
	TC-278	TC-178	2			
	TC-2712	TC-1712	3			
	TC-2716	TC-1716	4			



TRUNCATED

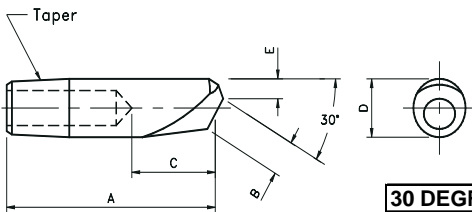
	#130 CODE NO.	#100 CODE NO.	OVERALL LENGTH	WELD FACE DIA.	FACE TO WATER HOLE	MAJOR DIAMETER
	CLASS 2	CLASS 1	A	B	C	D
4RW / #1MT	TC-244	TC-144	1	3/16	.500	.482 OR 0.5
	TC-246	TC-146	1-1/2			
	TC-248	TC-148	2			
	TC-2410	TC-1410	2-1/2			
5RW / #2MT	TC-2412	TC-1412	3	1/4	3/4	.625
	TC-256	TC-156	1-1/2			
	TC-258	TC-158	2			
	TC-2510	TC-1510	2-1/2			
	TC-2512	TC-1512	3			
7RW / #3MT	TC-2514	TC-1514	3-1/2	5/16	3/4	.875
	TC-2516	TC-1516	4			
	TC-278	TC-178	2			
	TC-2712	TC-1712	3			
	TC-2716	TC-1716	4			

CT FACED & OFFSET ELECTRODES



TAPER	T10W CU/TUNG FACING CODE NO.	T100W TUNGSTEN FACING CODE NO.	T100M MOLLY FACING CODE NO.	OVERALL LENGTH A	WELD FACE DIA. B	FACE TO WATER HOLE C	MAJOR DIA. D
DOMES - CT FACED							
4RW / #1MT	CT-1578	CT-1577	M-1579	2	1/8	3/8	.500
5RW / #2MT	CT-1581	CT-1580	M-1582		1/8		.625
7RW / #3MT	CT-1584	CT-1583	M-1585		1/4		.875
FLAT - CT FACED							
4RW / #1MT	CT-1587	CT-1586	M-1588		1/2		.500
5RW / #2MT	CT-1590	CT-1589	M-1591	2	5/8	3/8	.625
7RW / #3MT	CT-1593	CT-1592	M-1594		7/8		.875
CENTER INSERTED							
4RW / #1MT	H-147400	CT-147400	M-147400		3/16	1/2	.500
5RW / #2MT	H-147500	CT-147500	M-147500	2	1/4	9/16	.625
7RW / #3MT	H-147600	CT-147600	M-147600		3/8	11/16	.875

COPPER TUNGSTEN, TUNGSTEN, AND MOLYBDENUM ARE ALSO AVAILABLE IN CUT-TO-LENGTH INSERTS, IN 8" OR 12" LENGTHS, AND IN ROUND OR RECTANGULAR SHAPES.



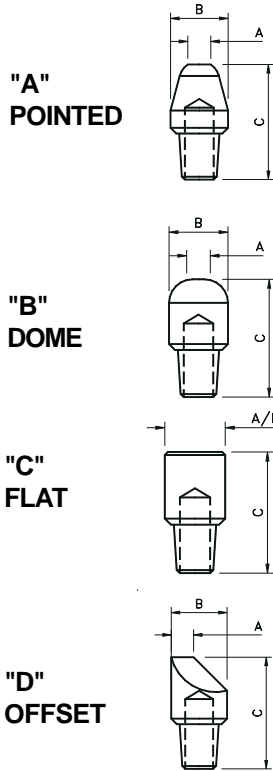
30 DEGREE OFFSET						
TAPER	#130 CODE NO.	LENGTH TO CENTER OF FACE A	WELD FACE DIA. B	FACE TO WATER HOLE C	MAJOR DIA. D	CLEARANCE DISTANCE E
4RW / #1MT	SP-219-1	2	1/4		.482 / .500	3/16
5RW / #2MT	SP-219-2	2-1/2	3/8	2-1/2	0.625	1/4
7RW / #3MT	SP-219-3	3	1/2		0.875	5/16

SPECIAL OFFSET TIPS CAN BE MANUFACTURED TO YOUR SPECIFICATIONS INCLUDING BUTTON STYLE, LOW PROFILE-ELECTRODE TAPER STYLE, AND VARIATIONS OF THE STANDARDS SHOWN ABOVE.

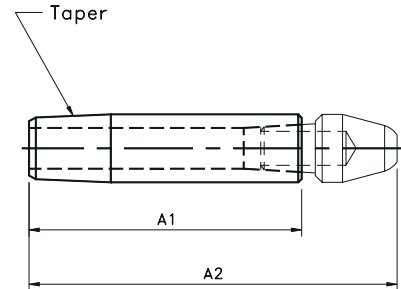
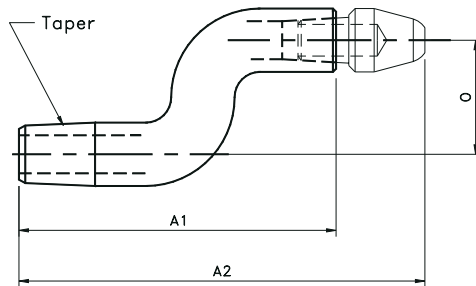
CT FACED & OFFSET ELECTRODES

MALE CAP TIPS AND SHANKS

MALE CAP TIPS



TAPER	ALLOY #100 CLASS 1	ALLOY #130 CLASS 2	ALLOY #Z169 Zr/Cu.	ALLOY #200 CLASS 3	WELD FACE DIA. A	MAJOR DIA. B	OVERALL LENGTH C
"A" Nose (Pointed)							
4 RWMC	CA-14	CA-24	CA-Z4	CA-34	3/16	1/2	1-1/8
5 RWMC	CA-15	CA-25	CA-Z5	CA-35	1/4	5/8	1-1/4
7 RWMC	-	CA-27	-	-	5/16	7/8	1-5/8
"B" Nose (Dome)							
4 RWMC	CB-14	CB-24	CB-Z4	CB-34	3/16	1/2	1-1/8
5 RWMC	CB-15	CB-25	CB-Z5	CB-35	1/4	5/8	1-1/4
7 RWMC	-	CB-27	-	-	5/16	7/8	1-5/8
"C" Nose (Flat)							
4 RWMC	CC-14	CC-24	CC-Z4	CC-34	1/2	1/2	1-1/8
5 RWMC	CC-15	CC-25	CC-Z5	CC-35	5/8	5/8	1-1/4
7 RWMC	-	CC-27	-	-	7/8	7/8	1-5/8
"D" Nose (Offset)							
4 RWMC	CD-14	CD-24	CD-Z4	CD-34	3/16	1/2	1-1/8
5 RWMC	CD-15	CD-25	CD-Z5	CD-35	1/4	5/8	1-1/4
7 RWMC	-	CD-27	-	-	5/16	7/8	1-5/8

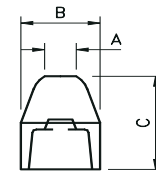


5 RW Taper Code No.	Shank Length A1	Ass'y Length A2	Tip Offset O
Alloy #130			
OS-2528-4	2-1/2	3-1/4	1/4
OS-2528-8	2-1/2	3-1/4	1/2
OS-2534-16	3-1/4	4	1
OS-25212-20	2-3/4	3-1/2	1-1/4
OS-25312-24	3-3/4	4-1/2	1-1/2
OS-25212-28	2-3/4	3-1/2	1-3/4
OS-25314-40	3-7/8	4-5/8	2-1/2
OS-2534-32	3-1/4	4	2

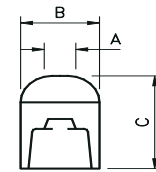
4 RW TAPER (#1MT)	5 RW TAPER (#2MT)	SHANK LENGTH A1	ASSY. LENGTH A2
CS-245	CS-255	1-1/4	2
CS-246	CS-256	1-1/2	2-1/4
CS-247	CS-257	1-3/4	2-1/2
CS-248	CS-258	2	2-3/4
CS-249	CS-259	2-1/4	3
CS-2410	CS-2510	2-1/2	3-1/4
CS-2411	CS-2511	2-3/4	3-1/2
CS-2412	CS-2512	3	3-3/4
CS-2413	CS-2513	3-1/4	4

FEMALE CAP TIPS

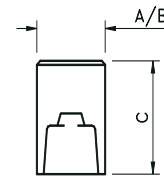
RWMA Female Cap Tape	Alloy #130 Class 2	Alloy Z#169 Zirc. Cu.	Alloy "G" Glidcop	Weld Face A	Major Diameter B	Overall Length C
"A" Nose (Pointed)						
4 RW	CAF-24	CAF-Z4	CAF-G4	3/16	1/2	0.84
5 RW	CAF-25	CAF-Z5	CAF-G5	1/4	5/8	0.88
6 RW	CAF-26	CAF-Z6	CAF-G6	9/32	3/4	1
"B" Nose (Dome)						
4 RW	CBF-24	CBF-Z4	CBF-G4	3/16	1/2	0.84
5 RW	CBF-25	CBF-Z5	CBF-G5	1/4	5/8	0.88
6 RW	CBF-26	CBF-Z6	CBF-G6	9/32	3/4	1
"C" Nose (Flat)						
4 RW	CCF-24	CCF-Z4	CCF-G4	1/2	1/2	0.84
5 RW	CCF-25	CCF-Z5	CCF-G5	5/8	5/8	0.88
6 RW	CCF-26	CCF-Z6	CCF-G6	3/4	3/4	1
"D" Nose (Offset)						
4 RW	CDF-24	CDF-Z4	CDF-G4	3/16	1/2	0.84
5 RW	CDF-25	CDF-Z5	CDF-G5	1/4	5/8	0.88
6 RW	-	-	-	9/32	3/4	1



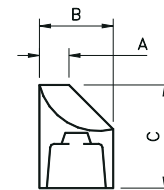
CAF (POINTED)



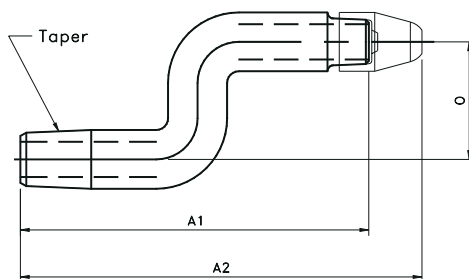
CBF (DOME)



CCF (FLAT)

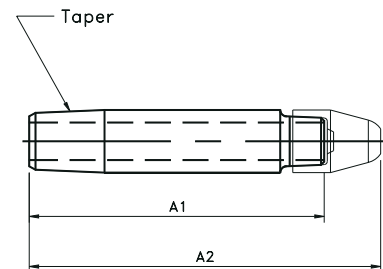


CDF (OFFSET)



OFFSET FEMALE CAP SHANKS

5 RW Taper Code No. Alloy #130	Shank Length A1	Ass'y Length A2	Tip Offset O
OSF-2511-8	2-3/4	3-1/4	1/2
OSF-2511-12	2-3/4	3-1/4	3/4
OSF-2511-16	2-3/4	3-1/4	1
OSF-2513-8	3-1/4	3-3/4	1/2
OSF-2514-16	3-1/2	4	1
OSF-2515-20	3-3/4	4-1/4	1-1/4



STRAIGHT FEMALE CAP SHANKS

4RW Taper (#1 MT)	5RW Taper (#2 MT)	Shank Length A1	Ass'y Length A2
CSF-246	CSF-256	1-1/2	2
CSF-248	CSF-258	2	2-1/2
CSF-2410	CSF-2510	2-1/2	3
CSF-2412	CSF-2512	3	3-1/2
CSF-2414	CSF-2514	3-1/2	4
CSF-2416	CSF-2516	4	4-1/2

FEMALE CAP TIPS AND SHANKS



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

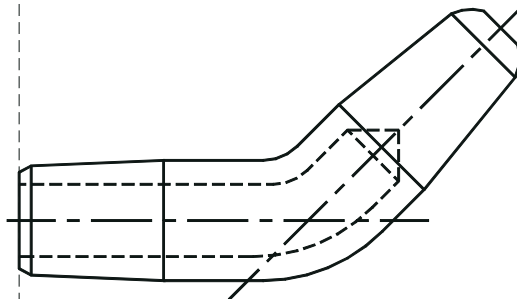
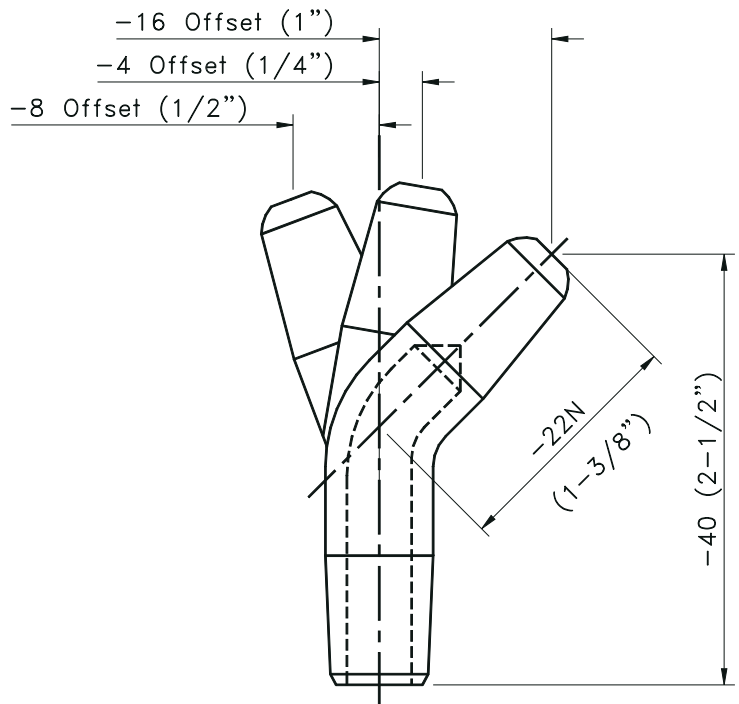
SINGLE BEND TIPS

*WATER COOLING REACHES THE NOSE OF THE TIP, INCREASING LIFE OVER TRADITIONAL CAST OR FORGED OFFSET TIPS.
 *WATER TUBES ARE SUPPLIED ON ALL DOUBLE BEND TIPS AND ON SEVERE SINGLE BEND TIPS. TIPS CAN BE SUPPLIED WITHOUT WATER TUBES ON REQUEST. THIS IS ONLY ADVISABLE IN VERY UNUSUAL APPLICATIONS.

NOTE: *Quantity shipped on specials may run +/- 10% of order quantity. (2 pieces on runs under 25 pieces)
 *Six piece minimum order on special bends.

SINGLE BEND TIP CODING

S= SINGLE BEND TIP
16= NOSE LENGTH IN 1/16" INCREMENTS
P= POINTED NOSE
D= DOME NOSE
F= FLAT NOSE
O= OFFSET NOSE
R= RADIUS NOSE*
1= ALLOY SPECIFICATION (RWMA CLASS 1)
2= ALLOY SPECIFICATION (RWMA CLASS 2)
3= ALLOY SPECIFICATION (RWMA CLASS 3)
4= TAPER SPECIFICATION (#4 RW TAPER)
5= TAPER SPECIFICATION (#5 RW TAPER)
6= TAPER SPECIFICATION (#6 RW TAPER)
7= TAPER SPECIFICATION (#7 RW TAPER)
2= LENGTH IN 1 INCH INCREMENTS
14= FRACTIONAL LENGTH IN 1/16" INCREMENTS
8= OFFSET IN 1/16" INCREMENTS
EXAMPLE: S16-P14214-8
*NOTE: Please specify radius

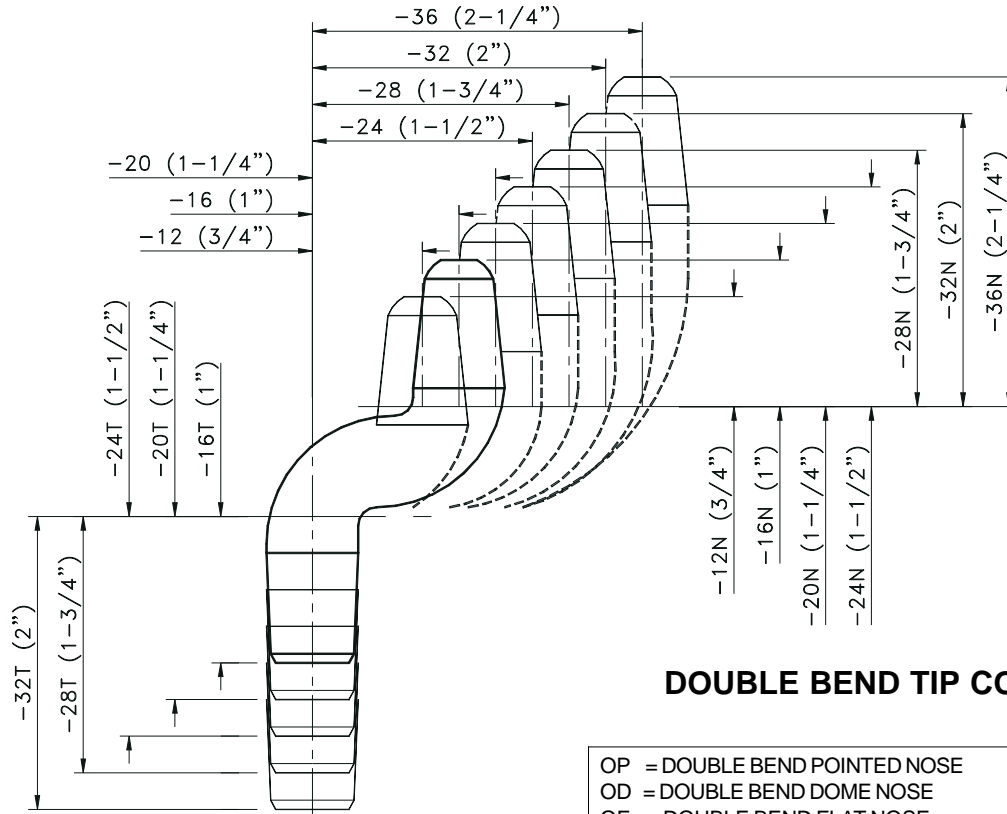


- 1/2"
- 1"
- 1-1/2"
- 2"
- 2-1/2"
- 3"
- 3-1/2"
- 4"
- 4-1/2"
- 5"
- 5-1/2"
- 6"

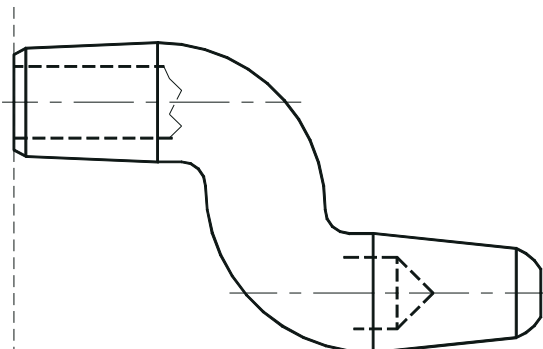
SINGLE BEND TIPS

DOUBLE BEND TIPS

Please call our order desk and ask about the many standard double and single bend tips in stock or determine your exact requirement using the coding shown below. You may also use the chart on this page to measure the nose, taper, overall length, and offset of the double bend tips you currently use.



Minimum Overall Length = Nose Length + Taper Length + Body Diameter.
 Maximum Offset = 2-1/2"



DOUBLE BEND TIP CODING

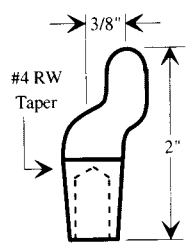
OP = DOUBLE BEND POINTED NOSE
OD = DOUBLE BEND DOME NOSE
OF = DOUBLE BEND FLAT NOSE
OO = DOUBLE BEND OFFSET NOSE
OR = DOUBLE BEND RADIUS NOSE (SPECIFY RADIUS*)
1 = ALLOY SPECIFICATION (1 = RWMA CLASS 1)
2 = ALLOY SPECIFICATION (2 = RWMA CLASS 2)
3 = ALLOY SPECIFICATION (3 = RWMA CLASS 3)
4 = TAPER SPECIFICATION (4 = #4 RW TAPER)
5 = TAPER SPECIFICATION (5 = #5 RW TAPER)
6 = TAPER SPECIFICATION (6 = #6 RW TAPER)
7 = TAPER SPECIFICATION (7 = #7 RW TAPER)
3 = LENGTH IN 1 INCH INCREMENTS
14 = FRACTIONAL LENGTH IN 1/16" INCREMENTS
16 = OFFSET IN 1/16" INCREMENTS
20N = NOSE LENGTH IN 1/16" INCREMENTS
24T = TAPER LENGTH IN 1/16" INCREMENTS
EXAMPLE: OP-14314-16-20N-24T
* FOR RADIUS NOSE, ADD THE REQUIRED RADIUS TO THE END OF THE PART NUMBER. (3 = 3" SPHERICAL RADIUS)

DOUBLE BEND TIPS

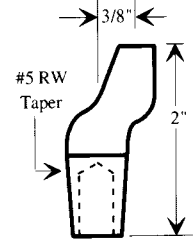
- 1/2" -----
- 1" -----
- 1-1/2" -----
- 2" -----
- 2-1/2" -----
- 3" -----
- 3-1/2" -----
- 4" -----
- 4-1/2" -----
- 5" -----
- 5-1/2" -----
- 6" -----

CAST IRREGULAR OFFSET TIPS

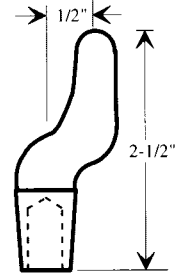
CAST IRREGULAR OFFSET TIPS



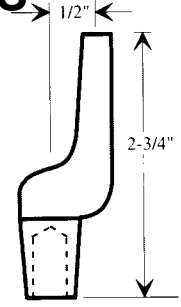
OF1-375



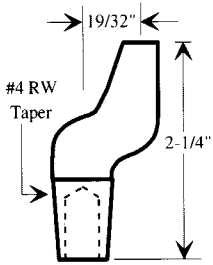
OF2-375



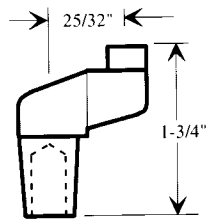
OF1-500S / OF2-500S
#4 RW / #5 RW



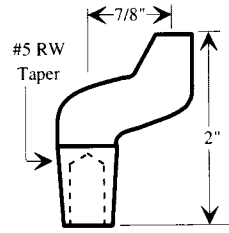
OF1-500 / OF2-500
#4 RW / #5 RW



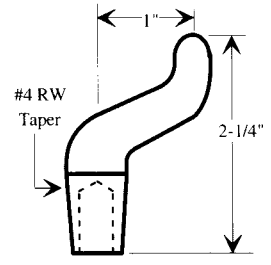
OF1-1932



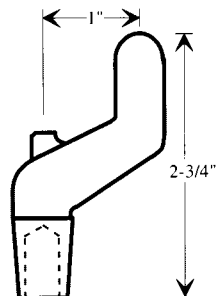
OF1-2532 / OF2-2532
#4 RW / #5 RW



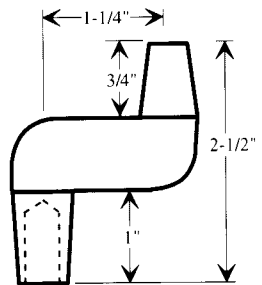
OF2-875



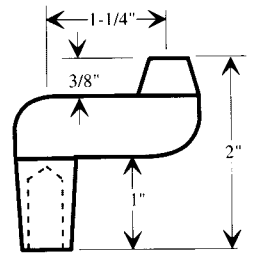
OF1-1000S



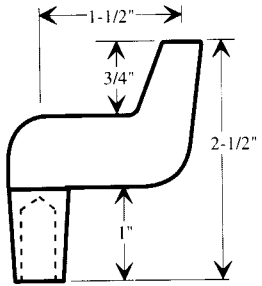
OF1-1000 / OF2-1000
#4 RW / #5 RW



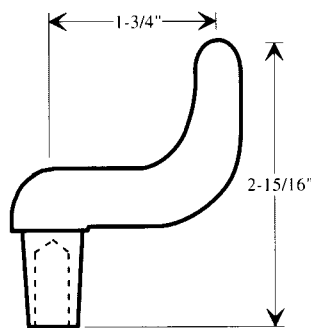
OF1-1250 / OF2-1250
#4 RW / #5 RW
(FORGED)



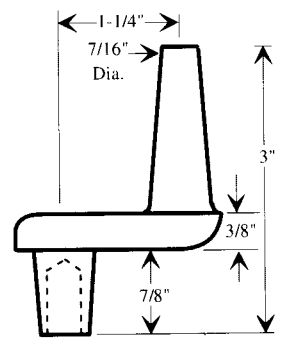
OF1-1250S / OF2-1250S
#4 RW / #5 RW
(FORGED)



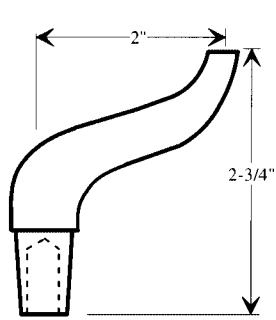
OF1-1500 / OF2-1500
#4 RW / #5 RW
(FORGED)



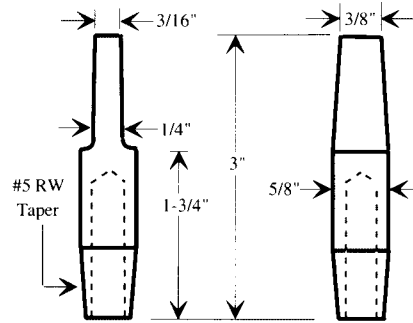
OF1-1750 / OF2-1750
(RW-985 / RW-959)
#4 RW / #5 RW



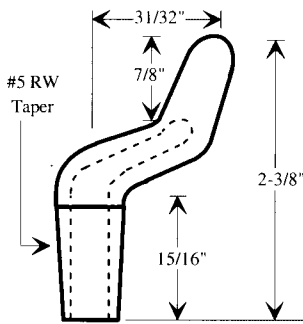
RW-969 / RW-1284
#4 RW / #5 RW



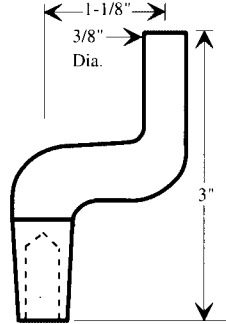
OF1-2000 / OF2-2000
 (RW-1995 / RW-88)
 #4 RW / #5 RW



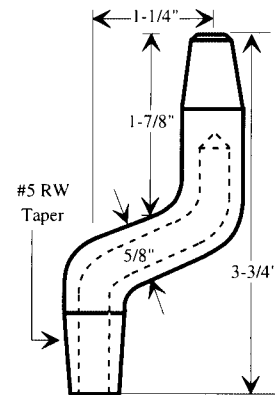
RW-990



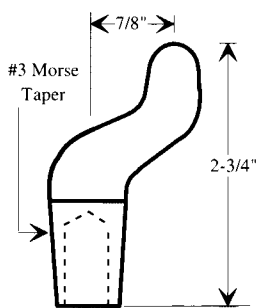
RW-1190
 Cold Formed Tip



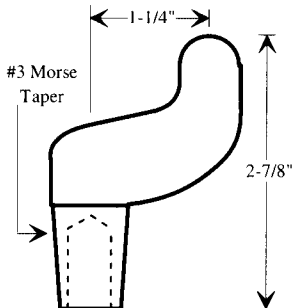
SPB-553-1 / SPB-553-2
 (RW-1137 / RW-1138)
 #4 RW / #5 RW
 Cold Formed



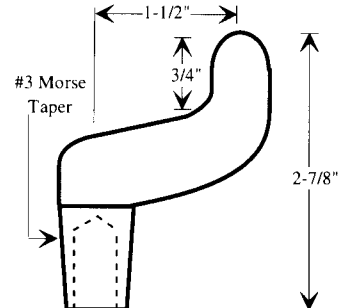
OF2-1250 3.75
 Cold Formed
OP-25312-20-30N-16T



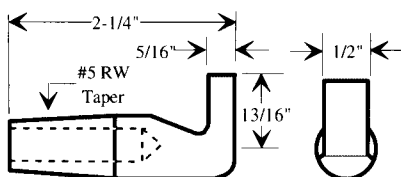
OF3-875



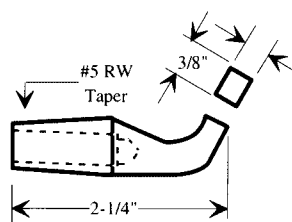
OF3-1250



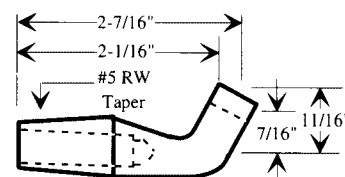
OF3-1500



RW-1178



A2-200



A2-205

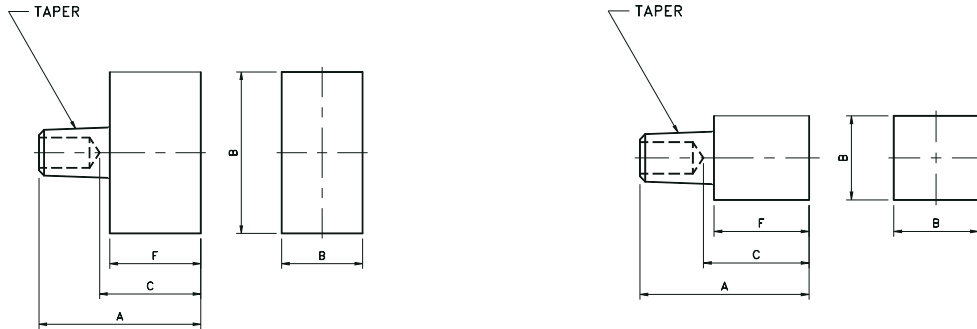
CAST IRREGULAR OFFSET TIPS



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

RECTANGULAR & SQUARE FACE TIPS



EXAMPLE OF PART CODING		
TS	=	TIPALOY SQUARE/ RECTANGULAR FACE
2	=	RWMA CLASS 2 COPPER
5	=	#5 RW TAPER
24	=	LENGTH IN 1/16" (24 = 1-1/2")
10x16	=	WIDTH X LENGTH OF FACE IN 1/16" (10X16 = 5/8" X 1")
18	=	WATER HOLE DEPTH (IF DIFFERENT THAN STD. 7/8")
CT	=	COPPER TUNGSTEN FACING

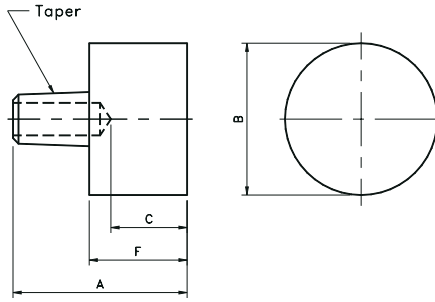
RECTANGULAR FACE TIPS

Taper	#130 Code No.	Previous Code No.	Overall Length	Weld Face Dimension	Face to Water Hole	Length of Face
	Class 2		A	B	C	F

4 RW Taper (#1 MT)	TS-24-25-10X32	SP-220-1	1-9/16	5/8 x 2	13/16	11/16
	TS-24-26-8X16	SP-248-1	1-5/8	1/2 x 1	1/2	1
	TS-24-24-8X8	SP-261	1-1/2	1/2 x 1/2		7/8
	TS-24-24-8X16	SP-271-1	1-1/2	1/2 x 1		
	TS-24-35-4X16	SPB-329-1	2-3/16	1/4 x 1	1-5/16	

5 RW Taper (#2 MT)	TS-25-25-10X32	SP-220-2	1-9/16	5/8 x 2	13/16	11/16
	TS-25-29-10X16	SP-248-2	1-13/16	5/8 x 1	11/16	15/16
	TS-25-24-10X16	SP-271-2	1-1/2		1/2	5/8
	TS-25-28-10X10	SP-291	1-3/4	5/8 x 5/8	3/4	7/8
	TS-25-35-4X16	SPB-329-2	2-3/16	1/4 x 1	1-5/16	1

* Additional rectangular or square face sizes and lengths available.

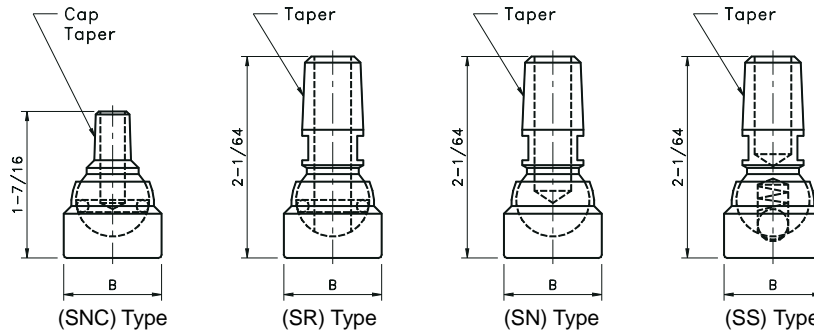


EXAMPLE OF PART CODING:	
TR =	TIPALLOY ROUND FACE TIP
2 =	CLASS 2 COPPER
5 =	#5 RW TAPER
24 =	OVERALL LENGTH IN 1/16"
14 =	WELD FACE DIAMETER IN 1/16"
16 =	WATER HOLE DEPTH IN 1/16" IF DIFFERENT THAN STANDARD (7/8")
CT =	COPPER TUNGSTEN FACING

ROUND FACE TIPS

New Part No.	Old Part No.	Overall Length	Weld Face	Face to Water Dia.	Length of Face Hole
		A	B	C	F
4 RW Taper (#1 MT)					
TR-24-24-14	SP-221-1	1-1/2	7/8	5/8	7/8
TR-24-20-16-13	SP-222	1-1/4	1	7/16	5/8
TR-24-20-12-16	SPB-680-1	1-1/4	3/4	1/4	5/8
TR-24-20-20-16	SPB-682-1	1-1/4	1-1/4	1/4	5/8
TR-24-32-14-20	SP-279	2	7/8	3/4	1-3/8
5 RW Taper (#2 MT)					
TR-25-24-14-14	SP-221-2	1-1/2	7/8	5/8	5/8
TR-25-24-16-18	SP-223	1-1/2	1	3/8	1
TR-25-30-14-14	SP-250	1-7/8	7/8	1	1
TR-25-24-14-18	SP-292-2	1-1/2	7/8	3/8	5/8
TR-25-24-12-18	SPB-681-2	1-1/2	3/4	3/8	5/8
TR-25-24-20-18	SPB-682-2	1-1/2	1-1/4	3/8	5/8
TR-25-46-12-14	SP-275	2-7/8	3/4	2	2
TR-25-46-16-14	SP-276	2-7/8	1	2	2
TR-25-32-16-20	SP-280	2	1	3/4	1-1/8
TR-25-32-24-16	SPB-510-2	2	1-1/2	1	1-1/8

* Additional diameters and lengths available from stock.



SWIVEL TIPS

5 RW Male Cap Taper Part No.	Spring Ball Type Part No.	Blind Hole Type Part No.	O Ring Type Part No.	Weld Face Diameter B
4 RW Taper (#1 MT)				
-	SS-147	SN-147	SR-147	7/8
-	SS-148	SN-148	SR-148	1
-	SS-1410	SN-1410	SR-1410	1-1/4
-	SS-1412	SN-1412	SR-1412	1-1/2
5 RW Taper (#2 MT)				
SNC-157	SS-157	SN-157	SR-157	7/8
SNC-158	SS-158	SN-158	SR-158	1
SNC-1510	SS-1510	SN-1510	SR-1510	1-1/4
-	SS-1512	SN-1512	SR-1512	1-1/2

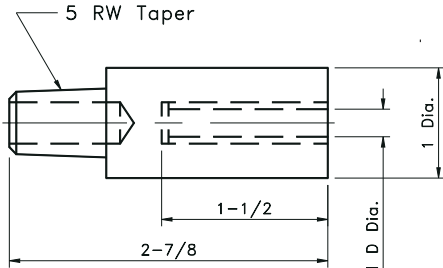
EXAMPLE OF PART CODING:	
SNC =	SWIVEL - MALE CAP TAPER
SS =	SWIVEL - SPRING AND BALL TYPE
SNC =	SWIVEL - BLIND HOLE TYPE
SR =	SWIVEL - "O" RING TYPE
1 =	CLASS 2 COPPER
4 =	#4 RW TAPER
7 =	WELD FACE DIAMETER IN 1/8"

SWIVEL & ROUND FACE TIPS

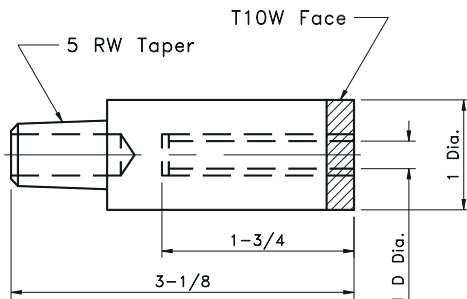
STUD & NUT ELECTRODES

STUD & NUT ELECTRODES

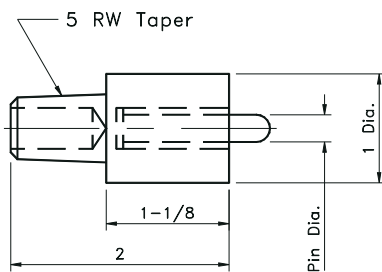
T-600 SERIES



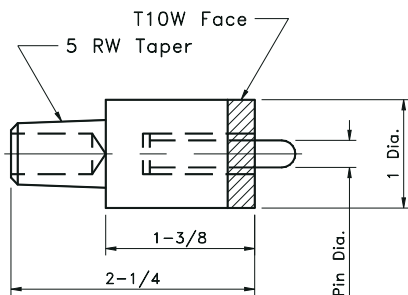
T-600-CT SERIES



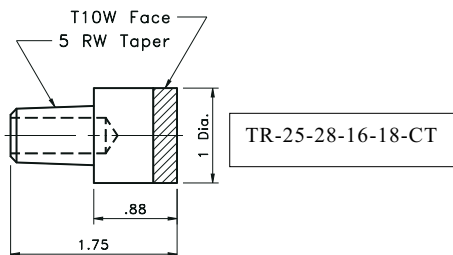
T-610 SERIES



T-610-CT SERIES



UPPER ELECTRODE - CT FACED



STUD ELECTRODES - 5RW TAPER

PART #	PART #	PART #	STUD SIZE & DIA.	
ALLOY #130	ALLOY #130 WITH T-10W FACE	ALLOY #200		
T-601	T-601-CT	T-701	#8	.164 DIA.
T-602	T-602-CT	T-702	#10	.190 DIA.
T-603	T-603-CT	T-703	#12	.216 DIA.
T-604	T-604-CT	T-704	1/4	.250 DIA.
T-605	T-605-CT	T-705	5/16	.312 DIA.
T-606	T-606-CT	T-706	3/8	.164 DIA.
T-607	T-607-CT	T-707	7/16	.164 DIA.

METRIC STUD ELECTRODES - 5RW TAPER

PART #	PART #	PART #	STUD SIZE & DIA.	
ALLOY #130	ALLOY #130 WITH T-10W FACE	ALLOY #200		
T-606MM	T-606MM-CT	T-706MM	6MM	.236 DIA.
T-608MM	T-608MM-CT	T-708MM	8MM	.316 DIA.
T-6010MM	T-6010MM-CT	T-7010MM	10MM	.394 DIA.

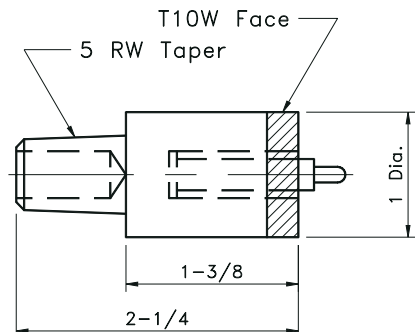
SELF PILOTING NUT ELECTRODES - 5RW TAPER

PART #	PART #	PART #	NUT SIZE	PIN DIA	PILOT PIN HEIGHT
ALLOY #130	ALLOY #130 WITH T-10W FACE	ALLOY #200			
T-611	T-611-CT	T-711	#8-32	.126 DIA.	3/16
T-612	T-612-CT	T-712	#10-24	.144 DIA.	3/16
T-613	T-613-CT	T-713	#12-24	.170 DIA.	1/4
T-614	T-614-CT	T-714	1/4-20	.187 DIA.	5/16
T-615	T-615-CT	T-715	5/16-18	.250 DIA.	5/16
T-616	T-616-CT	T-716	3/8-16	.312 DIA.	3/8
T-617	T-617-CT	T-717	7/16-14	.355 DIA.	3/8
T-618	T-618-CT	T-718	1/2-13	.414 DIA.	3/8

METRIC NUT ELECTRODES - 5RW TAPER

PART #	PART #	PART #	STUD SIZE & DIA.	
ALLOY #130	ALLOY #130 WITH T-10W FACE	ALLOY #200		
T-616MM	T-616MM-CT	T-716MM	6MM	.188 DIA.
T-618MM	T-618MM-CT	T-718MM	8MM	.260 DIA.
T-6110MM	T-6110MM-CT	T-7110MM	10MM	.328 DIA.

Stepped pins are also available, please supply us with a print, sample or consult factory.



STUD & NUT ELECTRODES

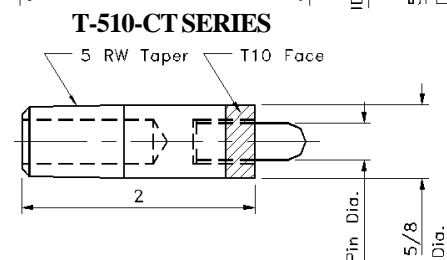
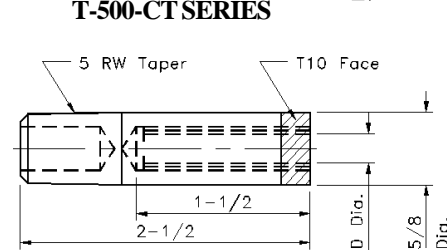
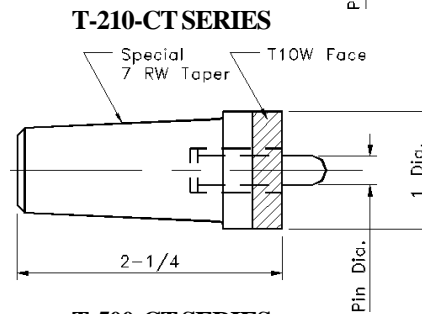
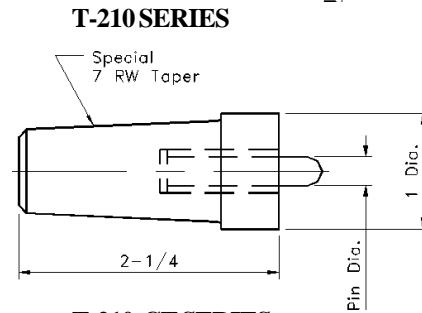
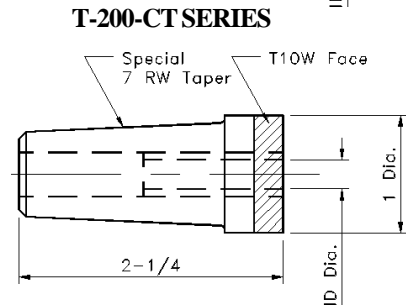
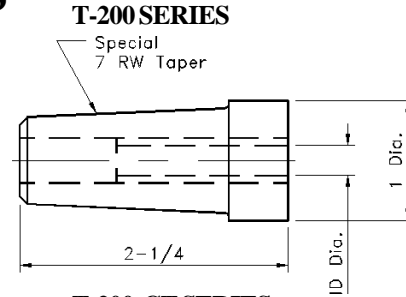
STUD ELECTRODES - SPECIAL 7RW TAPER			
PART # ALLOY #130	PART # ALLOY #130 WITH T-10W FACE	STUD SIZE & DIA.	
T-201	T-201-CT	#8	.164 DIA.
T-202	T-202-CT	#10	.190 DIA.
T-203	T-203-CT	#12	.216 DIA.
T-204	T-204-CT	1/4	.250 DIA.
T-205	T-205-CT	5/16	.312 DIA.
T-206	T-206-CT	3/8	.164 DIA.
T-207	T-207-CT	7/16	.164 DIA.

Also available in metric sizes.

SELF PILOTING NUT ELECTRODES - SPECIAL 7RW TAPER				
PART # ALLOY #130	PART # ALLOY #130 WITH T-10W FACE	NUT SIZE	PIN DIA	PILOT PIN HEIGHT
T-211	T-211-CT	#8-32	.126 DIA.	3/16
T-212	T-212-CT	#10-24	.144 DIA.	3/16
T-213	T-213-CT	#12-24	.170 DIA.	1/4
T-214	T-214-CT	1/4-20	.187 DIA.	5/16
T-215	T-215-CT	5/16-18	.250 DIA.	5/16
T-216	T-216-CT	3/8-16	.312 DIA.	3/8
T-217	T-217-CT	7/16-14	.355 DIA.	3/8
T-218	T-218-CT	1/2-13	.414 DIA.	3/8

STUD ELECTRODES - 5RW TAPER		
PART # ALLOY #130	PART # ALLOY #130 WITH T-10W FACE	STUD SIZE & DIA.
T-501	T-501-CT	#8 .164 DIA.
T-502	T-502-CT	#10 .190 DIA.
T-503	T-503-CT	#12 .216 DIA.
T-504	T-504-CT	1/4 .250 DIA.

SELF PILOTING NUT ELECTRODES - 5RW TAPER				
PART # ALLOY #130	PART # ALLOY #130 WITH T-10W FACE	NUT SIZE	PIN DIA	PILOT PIN HEIGHT
T-511	T-511-CT	#8-32	.126 DIA.	3/16
T-512	T-512-CT	#10-24	.144 DIA.	3/16
T-513	T-513-CT	#12-24	.170 DIA.	1/4

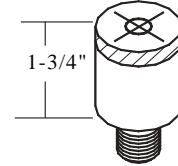
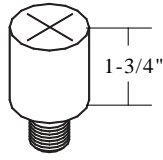


STUD & NUT ELECTRODES

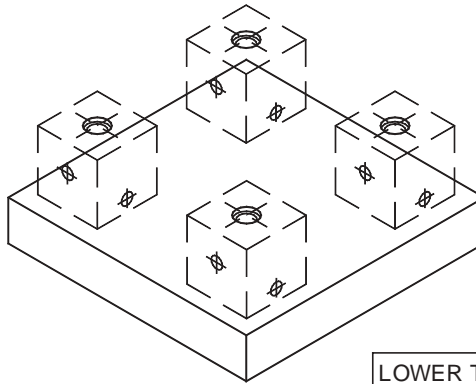
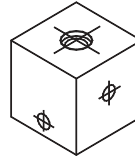
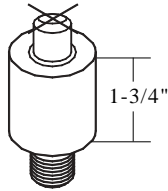
BUILD A DIE COMPONENTS



ELECTRODES	
PART #	DIA.
TDTE-2-19-BLANK	3/4"
TDTE-2-22-BLANK	7/8"
TDTE-2-25-BLANK	1"
TDTE-2-32-BLANK	1-1/4"



FIXED PIN NUT ELECTRODES		
PART #	NUT SIZE	DIA.
TDTN-2-25-611	#8	1"
TDTN-2-25-612	#10	1"
TDTN-2-25-613	#12	1"
TDTN-2-25-614	1/4"	1"
TDTN-2-25-615	5/16"	1"
TDTN-2-25-616	3/8"	1"
TDTN-2-25-617	7/16"	1"
TDTN-2-25-618	1/2"	1"
TDTN-2-25-614MM	4MM	1"
TDTN-2-25-616MM	6MM	1"
TDTN-2-25-618MM	8MM	1"
TDTN-2-25-6110MM	10MM	1"
TDTN-2-25-6112MM	12MM	1"



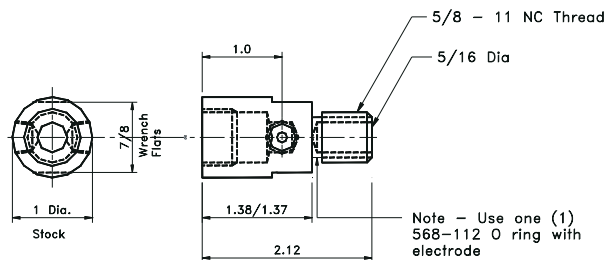
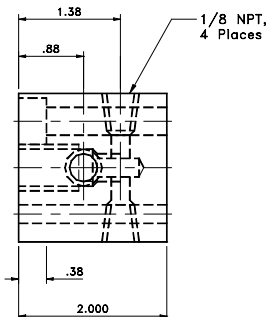
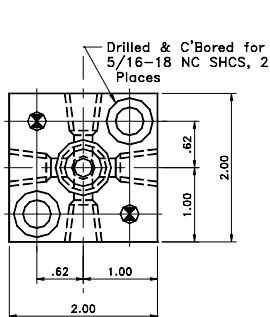
STUD ELECTRODES		
PART #	NUT SIZE	DIA.
TDTS-2-25-601	#8	1"
TDTS-2-25-602	#10	1"
TDTS-2-25-603	#12	1"
TDTS-2-25-604	1/4"	1"
TDTS-2-25-605	5/16"	1"
TDTS-2-25-606	3/8"	1"
TDTS-2-25-607	7/16"	1"
TDTS-2-25-608	1/2"	1"
TDTS-2-25-604MM	4MM	1"
TDTS-2-25-606MM	6MM	1"
TDTS-2-25-608MM	8MM	1"
TDTS-2-25-6110MM	10MM	1"
TDTS-2-25-6112MM	12MM	1"

NOTE: For copper tungsten faced electrodes please add a "-CT" to the end of the part number.

NOTE: For copper tungsten faced electrodes please add a "-CT" to the end of the part number.

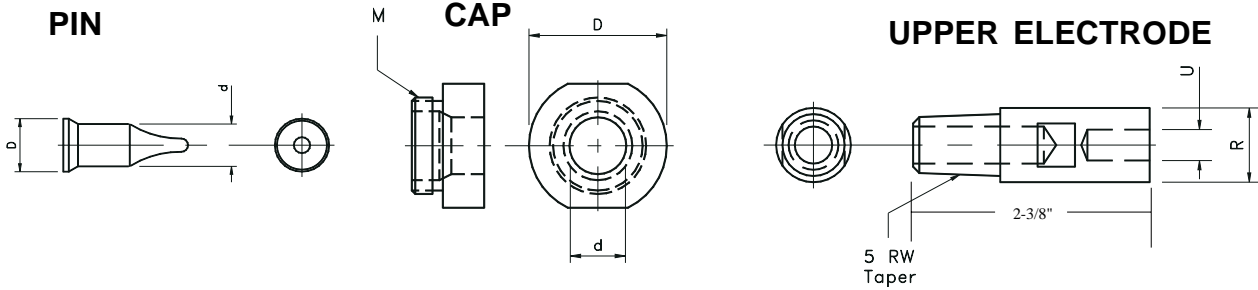
WATER COOLED BLOCKS		
PART #	STOCK SIZE	THD.
T-4000-01	2" X 2"	5/8-11

LOWER THREADED BODY			
PART #	THD. SIZE	DIA.	USE HEAD
TDT-25-C	5/8-11	1"	TCN-M04 - M09
TDT-30-C	5/8-11	1-1/4"	TCN-M10 - M13
TDT-25-C-CL	5/8-11	1"	TCL-200 SERIES
TDT-30-C-CL	5/8-11	1-1/4"	TCL-300 SERIES



Note - Use with TDT-25/30-C for welding fixtures and dies.

AIR PRESSURE NUT ELECTRODES



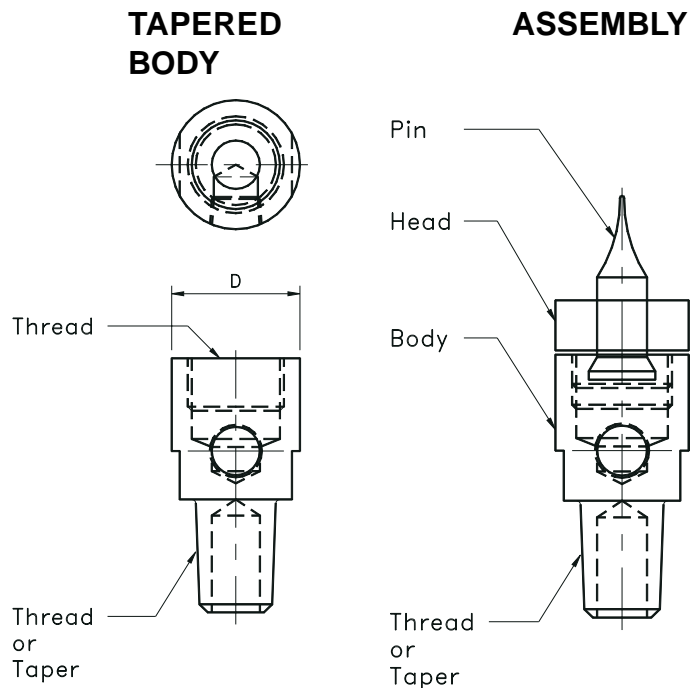
PIN			CAP				UPPER ELECTRODE		NUT	
NUMBER	d	D	NUMBER	D	d	M	ELECTRODE	SIZE	R	U
TDP-M04	5	12	TCN-M04	25	5	18	TNFD-16-M5-16-3	M 4-6	16MM	5MM
TDP-M05	6	12	TCN-M05	25	6	18	TNFD-16-M5-16-3	M 4-6	16MM	5MM
TDP-M06	7	12	TCN-M06	25	7	18	TNFD-20-M6-16-3	M 6-7	20MM	6MM
TDP-M07	8	12	TCN-M07	25	8	18	TNFD-20-M6-16-3	M 6-7	20MM	6MM
TDP-M08	9	12	TCN-M08	25	9	18	TNFD-20-M8-16-3	M 8-9	20MM	7.5MM
TDP-M09	10	12	TCN-M09	25	10	18	TNFD-20-M8-16-3	M 8-9	20MM	7.5MM
TDP-M10	11	16	TCN-M10	32	11	22	TNFD-20-M10-16-3	M 10-11	20MM	10MM
TDP-M11	12	16	TCN-M11	32	12	22	TNFD-20-M10-16-3	M 10-11	20MM	10MM
TDP-M12	13	16	TCN-M12	32	13	22	TNFD-20-M12-16-3	M 12-13	20MM	12MM
TDP-M13	14	16	TCN-M13	32	14	22	TNFD-20-M12-16-3	M 12-13	20MM	12MM

NOTE: For solid copper tungsten heads please add a "-CT" to the end of the part number.

NOTE: For copper tungsten faced electrodes please add a "-CT" to the end of the part number.

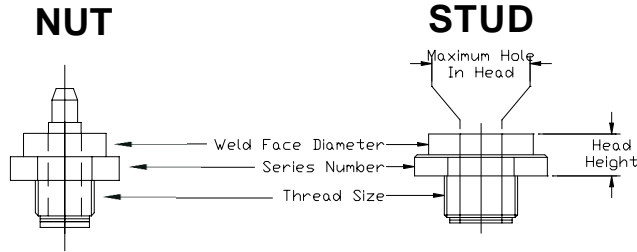
BODY NUMBER	D	TAPER / THREAD	CAP THREAD
TDH-25-A	25	MT #1	18MM
TDH-25-B	25	1/10	18MM
TDH-25-C	25	MT #2	18MM
TDH-25-D	25	1/10	18MM
TDH-25-E	25	1/5	18MM
TDH-30-A	32	MT #2	22MM
TDH-30-B	32	1/10	22MM
TDT-25-C	25	5/8-11	18MM
TDT-30-C	32	5/8-11	22MM
TDT-25-C-CL	25	5/8-11	5/8-18
TDT-30-A-CL	32	5/8-11	7/8-14

Specials available upon request.



AIR PRESSURE NUT ELECTRODES

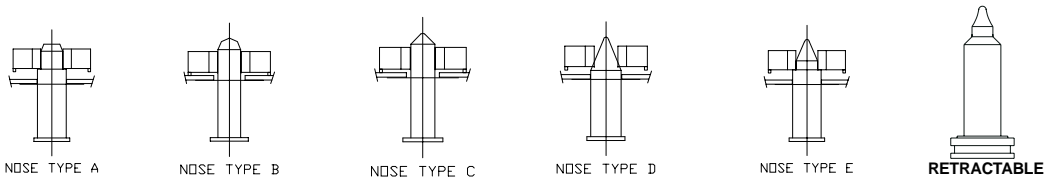
TCL HEADS & COMPONENTS



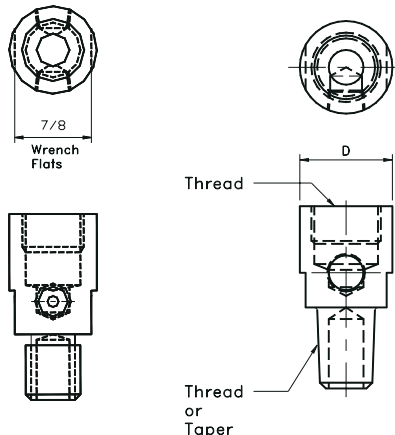
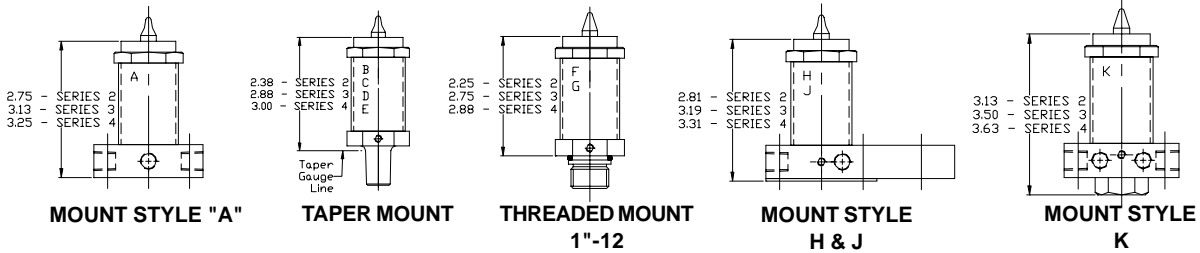
SERIES	THREAD SIZE	WELD FACE DIA.	HEAD HEIGHT	MAX. HOLE DIA.
TCL-201	5/8-18"	7/8"	1/2"	.427 (10.85) ID
TCL-301	7/8-14"	1-1/4"	1/2"	.642 (16.31) ID
TCL-401	1-1/8-12"	1-1/2"	5/8"	.852 (21.64) ID

*specials available in round stock or hex stock

WELD NUT PIN NOSE STYLES



STANDARD BODY & MOUNTING STYLES



INFORMATION REQUIRED TO ORDER "TCL" PARTS			
	TCL HEAD	TCL PIN	STUD
Nut type (piloted, Non-oiloted, ect)		X	
Nut style(sq., hex, round)		X	
Head Series		X	X
Hole in stamping	X	X	
Hole in nut	X	X	X
Stamping thickness	X	X	
Hand load		X	
Auto load		X	
Air / Spring operated		X	
Retractable (Air only)		X	
Length of stud	X		X
Head dia. Of stud	X		X
Stud dia	X		X

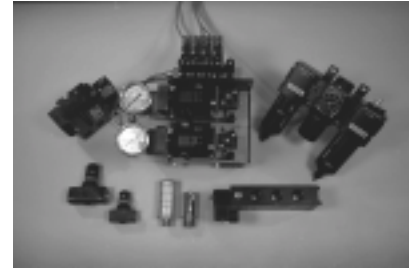
CONSULT FACTORY FOR ADDITIONAL INFORMATION ON THESE ITEMS

WELDERS & COMPONENTS

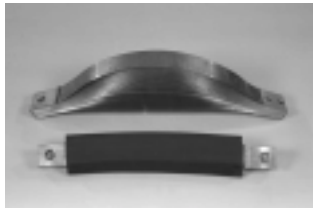
CYLINDERS



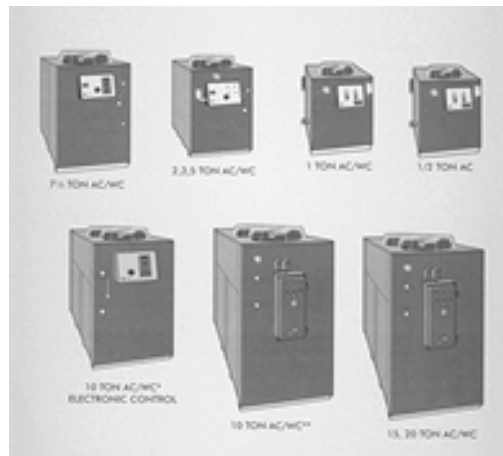
ACCESSORIES*



CABLES / SHUNTS



WATER CHILLERS*



SENSE-A-TOUCH PALM BUTTON SYSTEM, FOOT SWITCH & ACCESSORIES*



TRANSFORMERS*



CONTROLS / MONITORING DEVICES*



TIPALLOY SC-1000 SPOT WELDERS



AIR SYSTEMS & COMPONENTS*



ARO
 ATEK
 DARRAH ELECTRIC
 DIGIMETRICS
 ENTRON

MEDAR
 ROBOTRON
 UNITROL
 WELTRONIC

TIPALLOY CAN BUILD DEDICATED WELDERS AND / OR FIXTURING TO MEET YOUR SPECIFIC REQUIREMENTS.

SEND US A SAMPLE AND / OR PRINTS FOR THE JOB YOU WOULD LIKE US TO EVALUATE AND QUOTE

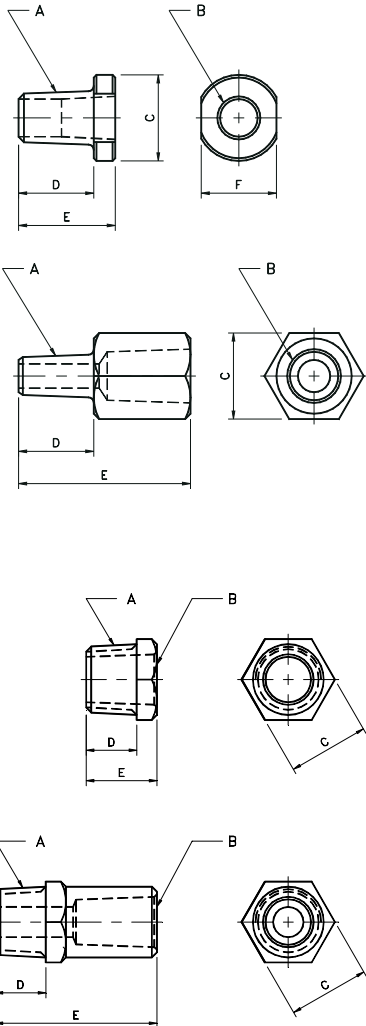
A WIDE ARRAY OF OPTIONS SUCH AS: MULTIPLE PRESSURE AIR SYSTEMS AND PART DETECTION EQUIPMENT IS AVAILABLE.

CHECK OUR INVENTORY FOR USED COMPONENTS.

*PLEASE CONSULT TIPALLOY FOR MORE INFORMATION ON THESE ITEMS

WELDERS & COMPONENTS

TIP ADAPTERS



EXAMPLE OF PART CODING:	
AT	= TAPER
H	= HEX STOCK
R	= ROUND STOCK
2	= CLASS 2 COPPER
4	= # 4 RW FEMALE TAPER
5	= # 5 RW MALE TAPER
8	= LENGTH IN 1/8" INCREMENTS

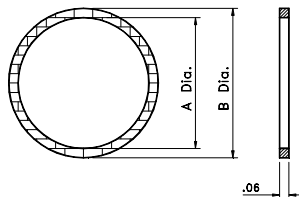
FEMALE TAPER TO MALE TAPER						
#130 Code No.	Male Taper	Female Taper	Stock Size	Length Under Head	Overall Length	Wrench Flats
	A	B	C	D	E	F
AT-R245-9	5 RW	4 RW	1	7/8	1-1/8	7/8
AT-R247-12	7 RW		1-1/8	1-1/4	1-1/2	1
AT-R257-12		5 RW				

#130 Code No.	Male Taper	Female Taper	Stock Size	Length Under Head	Overall Length
	A	B	C	D	E
AT-H254-15	4 RW	5 RW	1	7/8	1-7/8

FEMALE TAPER TO MALE STRAIGHT THREAD					
#130 Code No.	Male Thread	Female Taper	Stock Size	Length Under Head	Overall Length
	A	B	C	D	E
AS-H245-7	5/8-18	4 RW	1	5/8	7/8
AS-H255-13		5 RW			1-5/8
AS-H247-7	7/8-14	4 RW	1-1/4		7/8
AS-H257-7		5 RW			
AS-H248-7	1-14	4 RW			
AS-H258-7		5 RW			

* Sealing Ring included on Straight Threaded Adapters

COPPER SEALING RINGS



Part Number	A Dia.	B Dia.
760-0-0001	7/8 Dia.	1 Dia.
780-0-0001	1 Dia.	1-1/8 Dia.

EXAMPLE OF PART CODING:	
AS	= STRAIGHT THREAD
H	= HEX STOCK
R	= ROUND STOCK
2	= CLASS 2 COPPER
4	= #4 RW FEMALE TAPER
7	= EXTERNAL THREAD SIZE
8	= LENGTH IN 1/8" INCREMENTS

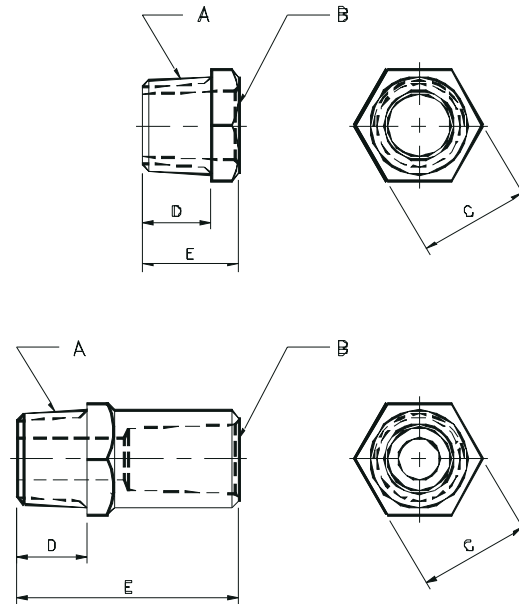
TIP ADAPTERS

FEMALE TAPER TO MALE PIPE THREAD					
#130 Code No.	Male Pipe Thread	Female Taper	Stock Size	Length Under Head	Overall Length
	A	B	C	D	E
AP-H24A-8 *	3/8			3/4	1
AP-H24B-7 *					7/8
AP-H24B-8					1
AP-H24B-10	1/2	4 RW	1	5/8	1-1/4
AP-H24B-12					1-1/2
AP-H24B-16					2
AP-H24B-20					2-1/2
AP-H24B-24					3
AP-H24C-7 *	5/8				7/8
AP-H24C-8					1
AP-H25A-13	3/8			3/4	1-5/8
AP-H25B-7 *					7/8
AP-H25B-8					1
AP-H25B-10	1/2	5 RW	1	5/8	1-1/4
AP-H25B-12					1-1/2
AP-H25B-16					2
AP-H25B-20					2-1/2
AP-H25B-24					3
AP-H25C-7 *	5/8				7/8
AP-H25C-8					1

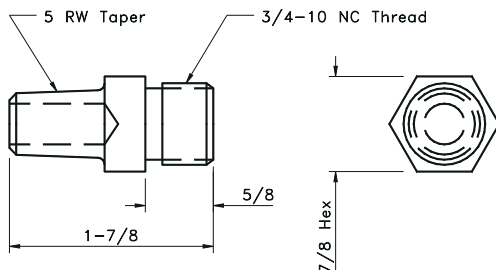
EXAMPLE OF PART CODING:		
AP	=	PIPE THREAD
H	=	HEX STOCK
R	=	ROUND STOCK
2	=	CLASS 2 COPPER
4	=	#4 RW TAPER
A	=	3/8" MALE PIPE THREAD
B	=	1/2" MALE PIPE THREAD
C	=	5/8" MALE PIPE THREAD
D	=	3/4" MALE PIPE THREAD
8	=	LENGTH IN 1/8" INCREMENTS

#130 Code No.	Male Pipe Thread	Female Taper	Stock Size	Length Under Head	Overall Length
	A	B	C	D	E
AP-H35D-11*					1-3/8
AP-H35D-12					1-1/2
AP-H35D-16		5 RW			2
AP-H35D-20					2-1/2
AP-H35D-24	3/4		1-1/4	7/8	3
AP-H36D-11*					1-3/8
AP-H36D-12					1-1/2
AP-H36D-16		6 RW			2
AP-H36D-20					2-1/2
AP-H36D-24					3

* Denotes Minimum Length Available



TAPER ADAPTER



810408-A

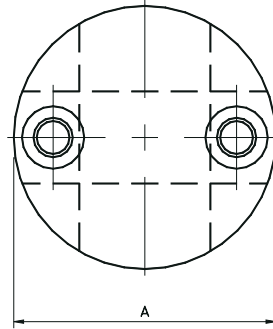
TIP ADAPTERS



WELDER ARMS

EXAMPLE OF PART CODING:

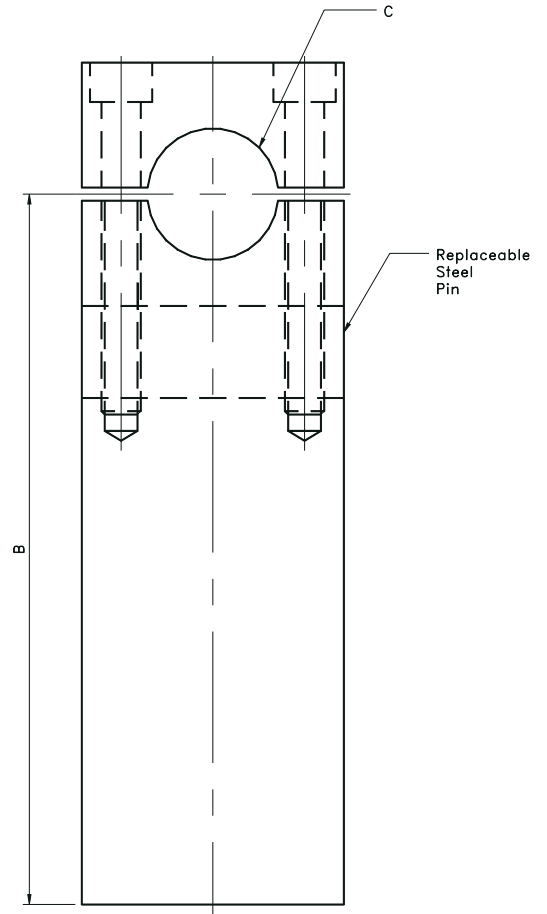
- TWA = TIPALOY WELDER ARM
- A = ARM DIAMETER IN 1/8" INCREMENTS
- B = LENGTH TO CENTERLINE OF SHANK HOLE IN 1/4" INCREMENTS
- C = SHANK HOLE DIAMETER IN 1/8" INCREMENTS



TIPALOY WELDING MACHINE ARMS

PART #	DIA.	O.A.L.	HOLE DIA.
	A	B	C
TWA-16-48-8	2"	12	1"
TWA-16-64-8		16	
TWA-16-72-8		18	
TWA-16-80-8		20	
TWA-16-96-8		24	
TWA-16-144-8		36	
TWA-20-48-10	2-1/2"	12	1-1/4"
TWA-20-64-10		16	
TWA-20-72-10		18	
TWA-20-80-10		20	
TWA-20-96-10		24	
TWA-20-144-10		36	
TWA-24-48-12	3"	12	1-1/2"
TWA-24-64-12		16	
TWA-24-72-12		18	
TWA-24-80-12		20	
TWA-24-96-12		24	
TWA-24-144-12		36	

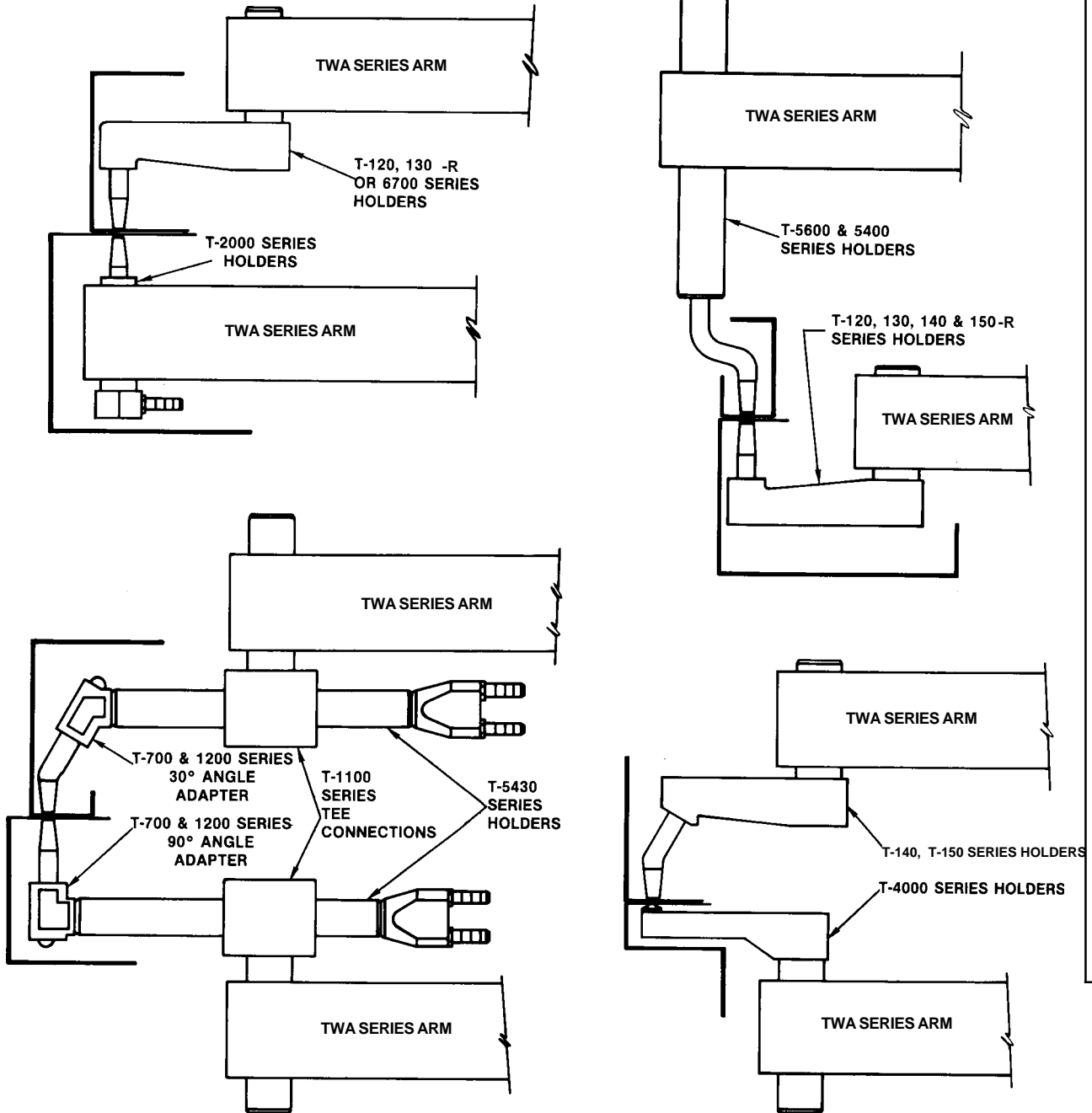
OTHER LENGTHS AND DIAMETERS AVAILABLE.



WELDER ARMS

HOLDER AND ADAPTER COMBINATIONS

The following illustrations are a representative sampling of ways to use Tipaloy Welder Arms, Holders, "T" Connectors, and Adapters. There are many other possible combinations. The following pages can identify components to suit your individual applications.



HOLDER AND ADAPTER COMBINATIONS



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

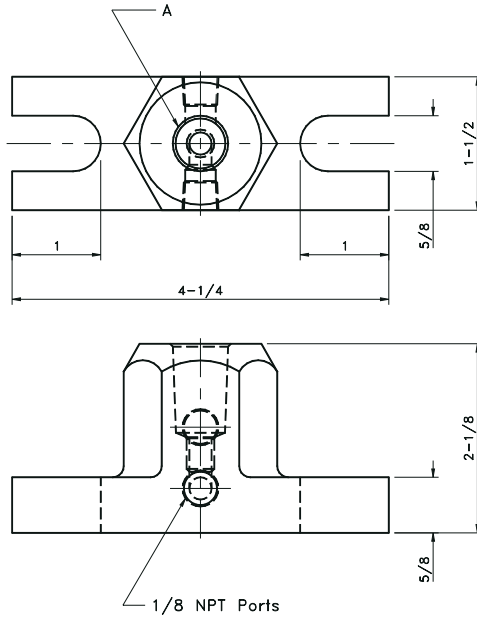
CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

PLATEN ADAPTERS

Tipaloy platen adapters make it possible to use press type welders for a wider range of applications, including stud and nut welding, single spot welding, and special fixture components. Both sizes match RWMA T-slot spacing.

T-8000 SERIES

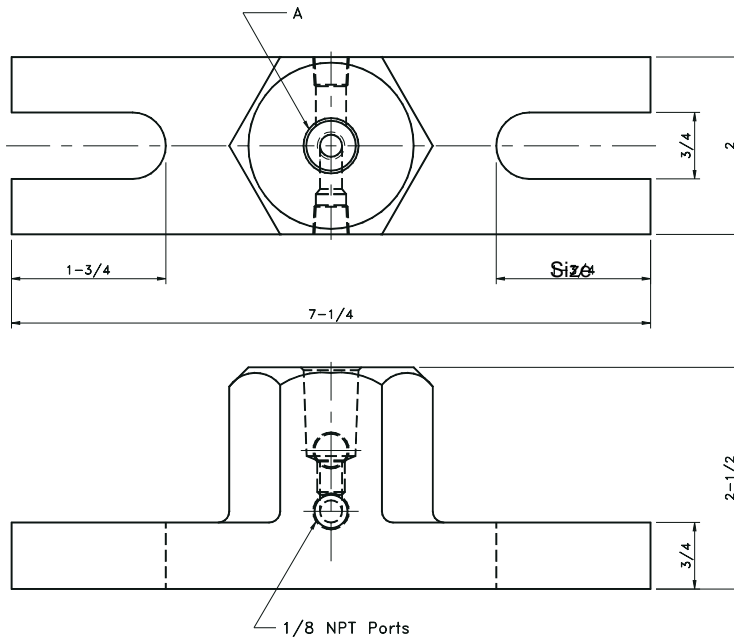
Use T-8000 series for
 3-1/2" centerline



Part Number	Taper or Thread Size A
T-8001	4 RW (#1 MT)
T-8002	5 RW (#2 MT)
T-8003	6 RW -
T-8004	7 RW (#3 MT)
T-8005	SPECIAL 7RW
T-8006	1/2" NPT
T-8007	5/8" NPT
T-8008	3/4" NPT
T-8009	7/8-14 NPT
T-8010	1-14 NPT
T-8012	7/8-9 NC
T-8013	5/8-11 NC
T-8014	3/4-10 NC

T-8100 SERIES

Use T-8100 series for
 5" - 6" centerline

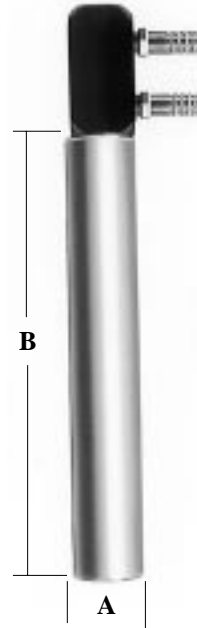


Part Number	Taper or Thread A
T-8102	5 RW (#2 MT)
T-8103	6 RW -
T-8104	7 RW (#3 MT)
T-8105	SPECIAL 7RW
T-8106	1/2" NPT
T-8107	5/8" NPT
T-8108	3/4" NPT
T-8109	7/8-14 NPT
T-8110	1-14 NPT
T-8111	T-230SERIES
T-8112	7/8-9 NC
T-8113	5/8-11 NC
T-8114	3/4-10 NC

PLATEN ADAPTERS

STANDARD T-5400 STRAIGHT HOLDERS NON-EJECTOR TYPE

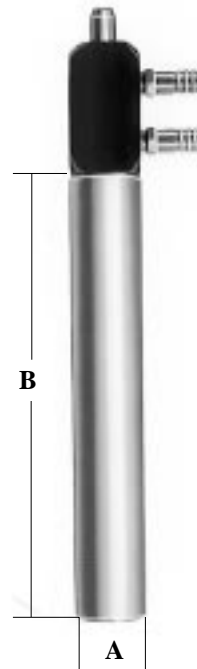
	Part Number	Holder Body Diameter	Body Length
		A	B
4 RW Taper (#1 MT)	T-5400 **	3/4	8"
	T-5401	7/8	
	T-5402 *	1	
	T-5403	1-1/4	
	T-5404	1-1/2	
5 RW Taper (#2 MT)	T-5405	7/8	8"
	T-5406 *	1	
	T-5407 *	1-1/4	
	T-5408 *	1-1/2	
7 RW Taper (#3 MT)	T-5409	1-1/4	8"
	T-5410 *	1-1/2	



ALSO AVAILABLE IN THREADED STYLE

STANDARD T-5600 STRAIGHT HOLDERS EJECTOR TYPE

	Part Number	Holder Body Diameter	Body Length
		A	B
4 RW Taper (#1 MT)	T-5600 **	3/4	8"
	T-5601	7/8	
	T-5602 *	1	
	T-5603	1-1/4	
	T-5604	1-1/2	
5 RW Taper (#2 MT)	T-5605	7/8	8"
	T-5606 *	1	
	T-5607 *	1-1/4	
	T-5608 *	1-1/2	
7 RW (#3 MT)	T-5609	1-1/4	8"
	T-5610 *	1-1/2	
8 Degree Taper .625 Eng.	T-5611	1	8"
	T-5612	1-1/4	
	T-5613	1-1/2	
8 Degree Taper .875 Eng.	T-5614	1-1/4	8"
	T-5615	1-1/2	



* ALSO STOCKED IN 12" BARREL LENGTHS
 ** EXTERNAL THREAD ON BARREL AT HOLDER HEAD
 SPECIAL LENGTHS AVAILABLE

STRAIGHT TAPERED BARREL HOLDERS

SPECIAL HOLDERS



CLOSE COUPLED HOLDERS T-2000/T-2000E

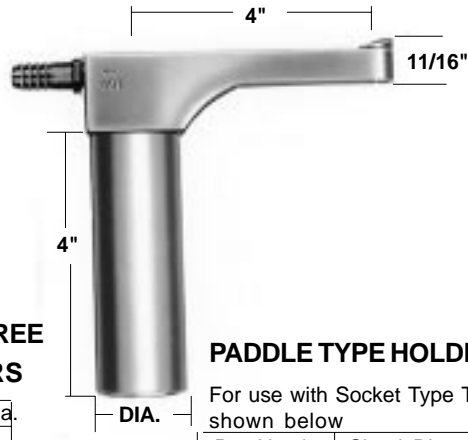
	Part Number Non-Ejector Type	Part Number Ejector Type	Holder Body Diameter	Holder Body Length
4 RW Taper (#1 MT)	T-2000	T-2000-E	3/4	3
	T-2001	T-2001-E	7/8	
	T-2002	T-2002-E	1	
5 RW Taper (#2 MT)	T-2003	T-2003-E	1	3
	T-2004	T-2004-E	1-1/4	
	T-2005	T-2005-E	1-1/2	

Custom barrel lengths available



SPECIAL 20 DEGREE OFFSET HOLDERS

Part Number	Shank Dia.
T-5200	1
T-5205	1-1/4



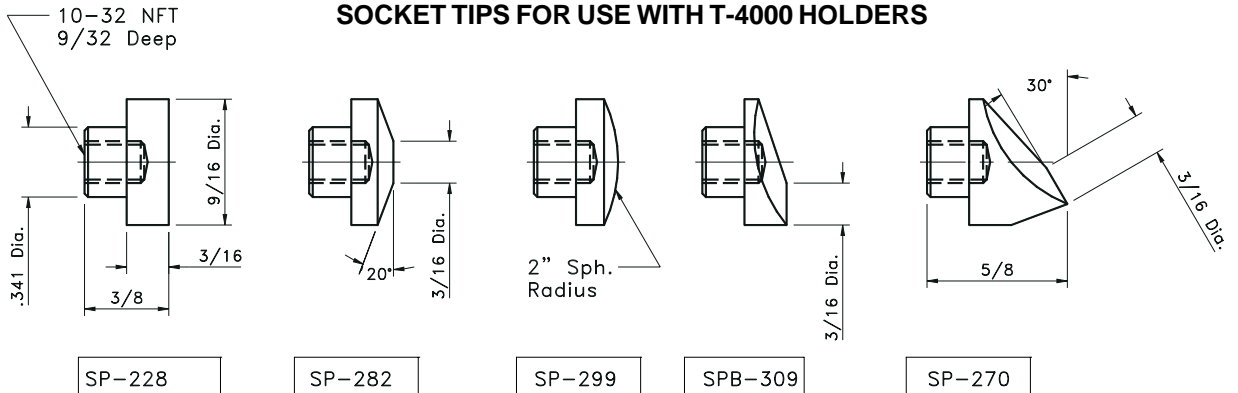
PADDLE TYPE HOLDERS

For use with Socket Type Tips as shown below

Part Number	Shank Diameter
T-4012	3/4
T-4014	7/8
T-4016	1
T-4020	1-1/4
T-4024	1-1/2

Replacement Screw P/N 10F37SHC

SOCKET TIPS FOR USE WITH T-4000 HOLDERS



SP-228

SP-282

SP-299

SPB-309

SP-270

LIGHT DUTY OFFSET HOLDERS

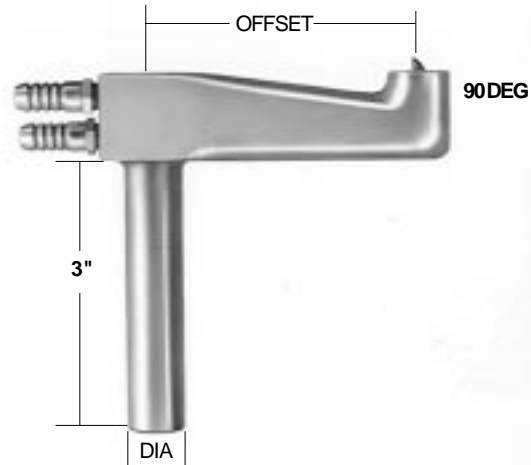
LIGHT DUTY - 90 DEGREE OFFSET NON-EJECTOR TYPE

4 RW
 Taper
 (#1 MT)

Part Number	Offset	Shank Diameter
T-121	2	3/4
T-122		7/8
T-123		1
T-124		1-1/4
T-131	4	3/4
T-132		7/8
T-133		1
T-134		1-1/4

5 RW
 Taper
 (#2 MT)

T-127	2	7/8
T-128		1
T-129		1-1/4
T-137	4	7/8
T-138		1
T-139		1-1/4



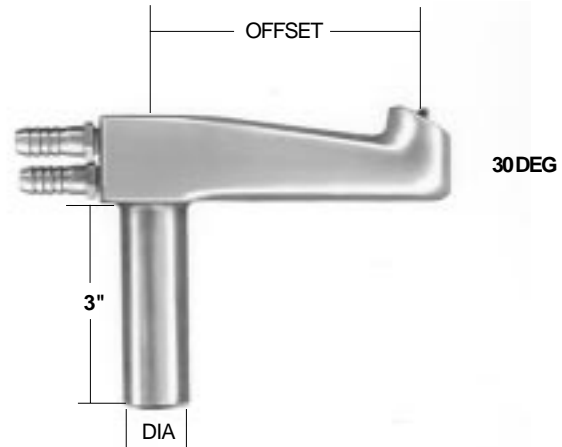
LIGHT DUTY - 30 DEGREE OFFSET NON-EJECTOR TYPE

4 RW
 Taper
 (#1 MT)

Part Number	Offset	Shank Diameter
T-141	2	3/4
T-142		7/8
T-143		1
T-144		1-1/4
T-152	4	7/8
T-153		1
T-154		1-1/4

5 RW
 Taper
 (#2 MT)

T-147	2	7/8
T-148		1
T-149		1-1/4
T-157	4	7/8
T-158		1
T-159		1-1/4



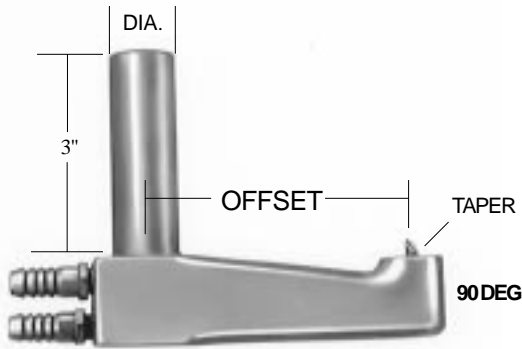
LIGHT DUTY OFFSET HOLDERS

**SPECIAL SHANK DIAMETERS, LENGTHS, AND OFFSET LENGTHS
 ARE AVAILABLE ON A MADE TO ORDER BASIS**

REVERSE OFFSET HOLDERS

REVERSE OFFSET HOLDERS

**90 DEGREE REVERSE OFFSET
 HOLDERS NON-EJECTOR TYPE**



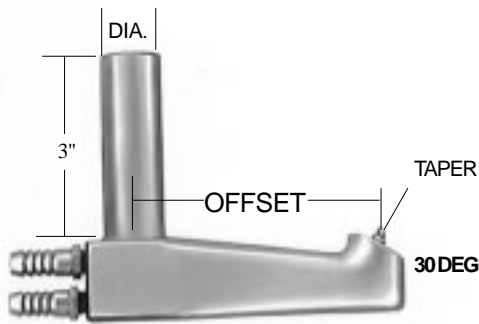
4 RW
Taper
(#1 MT)

Part Shank	Offset	Shank Diameter
T-122-R	2	7/8
T-123-R		1
T-124-R		1-1/4
T-132-R	4	7/8
T-133-R		1
T-134-R		1-1/4

5 RW
Taper
(#2 MT)

T-127-R	2	7/8
T-128-R		1
T-129-R		1-1/4
T-137-R	4	7/8
T-138-R		1
T-139-R		1-1/4

**30 DEGREE REVERSE OFFSET
 HOLDERS NON-EJECTOR TYPE**



4 RW
Taper
(#1 MT)

Part Number	Offset	Shank Diameter
T-141-R	2	3/4
T-142-R		7/8
T-143-R		1
T-144-R		1-1/4
T-152-R	4	7/8
T-153-R		1
T-154-R		1-1/4

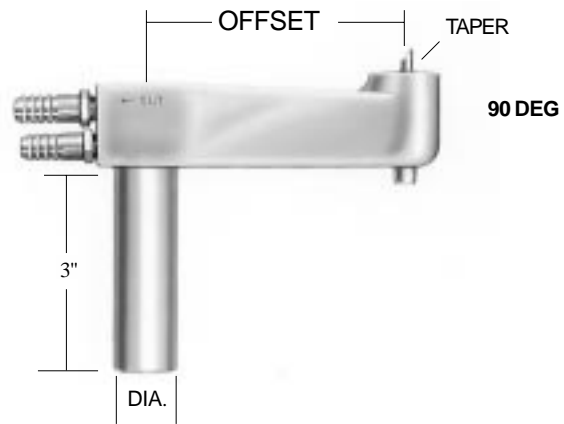
5 RW
Taper
(#2 MT)

T-147-R	2	7/8
T-148-R		1
T-149-R		1-1/4
T-157-R	4	7/8
T-158-R		1
T-159-R		1-1/4

STANDARD OFFSET HOLDERS - EJECTOR

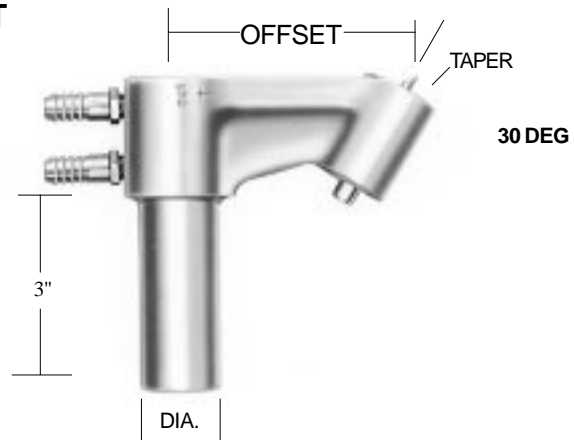
90 DEGREE STANDARD DUTY OFFSET HOLDERS EJECTOR TYPE

Part Number	Offset	Shank Diameter	
4 RW Taper (#1 MT)	2	T-6700	3/4
		T-6701	7/8
		T-6702	1
		T-6703	1-1/4
		T-6703-A	1-1/2
	4	T-6704	3/4
		T-6705	7/8
		T-6706	1
		T-6707	1-1/4
		T-6707-A	1-1/2
5 RW Taper (#2 MT)	2	T-6708	3/4
		T-6709	7/8
		T-6710	1
		T-6711	1-1/4
		T-6711-A	1-1/2
	4	T-6712	3/4
		T-6713	7/8
		T-6714	1
		T-6715	1-1/4
		T-6715-A	1-1/2



30 DEGREE STANDARD DUTY OFFSET HOLDERS EJECTOR TYPE

Part Number	Offset	Shank Diameter	
4 RW Taper (#1 MT)	3-1/2	T-6800	3/4
		T-6801	7/8
		T-6802	1
		T-6803	1-1/4
5 RW Taper (#2 MT)	3-1/2	T-6804	3/4
		T-6805	7/8
		T-6806	1
		T-6807	1-1/4



STANDARD OFFSET HOLDERS - EJECTOR

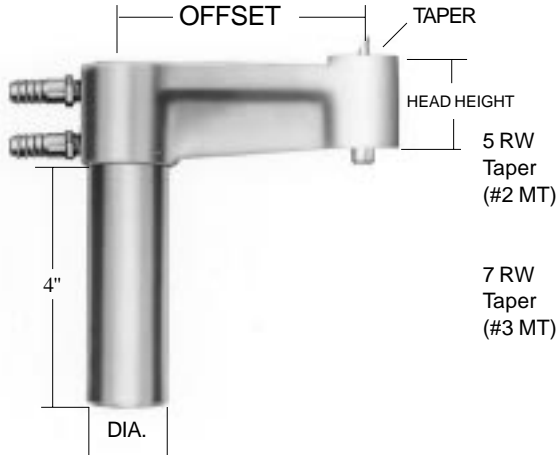


UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

HEAVY DUTY OFFSET HOLDERS

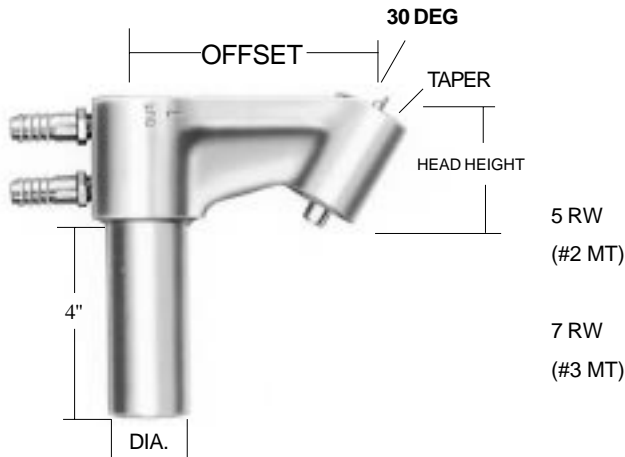
HEAVY DUTY OFFSET HOLDERS



90 DEGREE HEAVY DUTY OFFSET HOLDERS EJECTOR TYPE

Part Number	Offset	Shank Diameter	Head Height
T-9021	2	1-1/4	1-7/8
T-9022		1-1/2	
T-9041	4	1-1/4	
T-9042		1-1/2	

T-9023	2	1-1/4	2-1/4
T-9024		1-1/2	
T-9043	4	1-1/4	
T-9044		1-1/2	



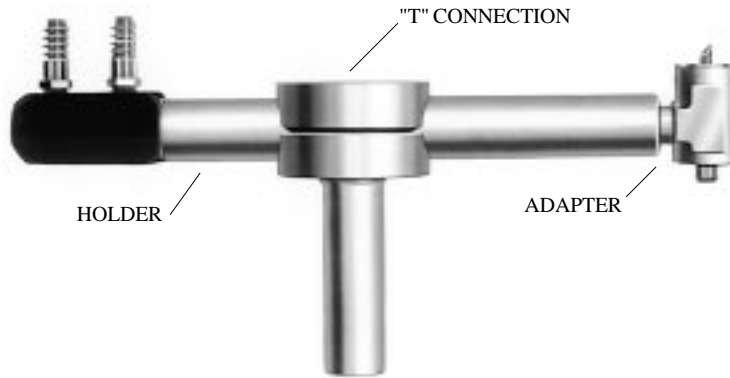
30 DEGREE HEAVY DUTY OFFSET HOLDERS EJECTOR TYPE

Part Number	Offset	Shank Diameter	Head Height
T-9341	4	1-1/4	1-7/8
T-9342		1-1/2	

T-9343	4	1-1/4	2-1/4
T-9344		1-1/2	

SPECIAL CAST AND COLD FORMED HOLDERS ARE AVAILABLE ON A MADE TO ORDER BASIS.

PLEASE CALL OR FAX WITH YOUR CUSTOM REQUIREMENTS



UNIVERSAL TAPERED BARREL HOLDER ASSEMBLY

ASSEMBLY PART NO.	"T" CONNECTION				HOLDER			ADAPTER HEAD			
	Part No.	Hole Dia.	Shank Dia.	Shank Length	Part No.	Body Dia.	Taper	Part No.	Angle of Head	Taper to Holder	Taper to Electrode
T-1099	T-1159	7/8	7/8	4	T-5405	7/8	5 RW Taper (#2 MT)	T-1190	90 Deg.	5 RW Taper (#2 MT)	4 RW
T-1100	T-1160	1	1		T-5406	1		T-1190			4 RW
T-1125	T-1161	1-1/4	1-1/4		T-5407	1-1/4		T-1290			5 RW
T-1200	T-1163	1	1-1/4		T-5406	1		T-1130	30 Deg.	4 RW	
T-1250	T-1164	1	1-1/2		T-5406	1		T-1230		5 RW	

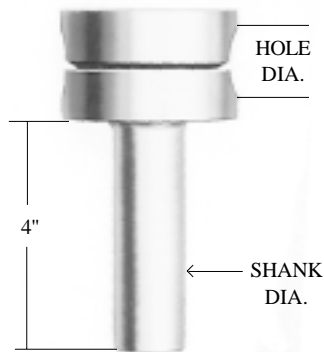


HOLDER ADAPTER HEADS

MALE TAPER TYPE

Part Number	Degree of Angle	Holder Taper	Electrode Taper
T-1190	90	5 RW	4 RW
T-1290	90	Taper (#2 MT)	5 RW
T-1130	30		4 RW
T-1230	30		5 RW

Straight Tapered Barrel holders are shown on page 31.



"T" CONNECTIONS FOR HOLDERS

Part Number	Hole Dia.	Shank Dia.	Shank Length
T-1159	7/8	7/8	4
T-1160	1	1	
T-1161	1-1/4	1-1/4	
T-1162	1-1/2	1-1/2	
T-1163	1	1-1/4	
T-1164	1	1-1/2	
T-1165	1-1/4	1-1/2	

TAPERED BARREL HOLDER ASSEMBLIES

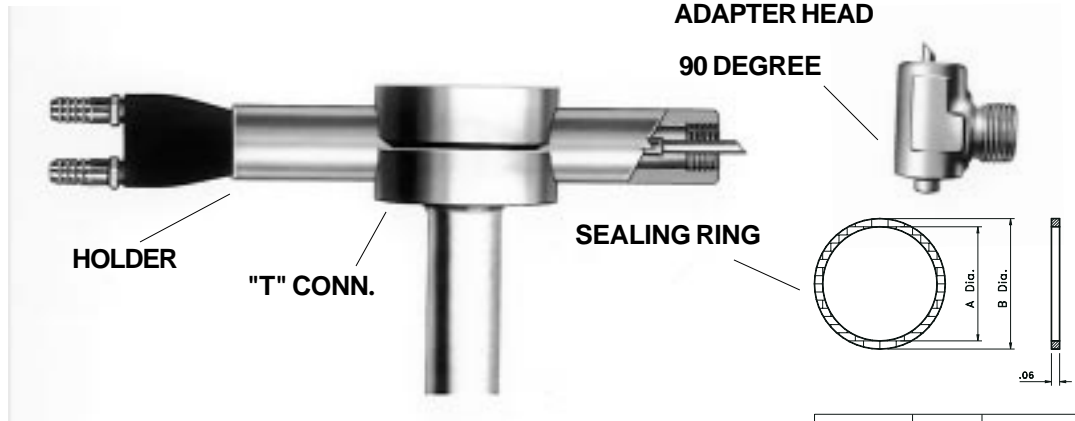
SPECIAL SHANK DIAMETERS ARE AVAILABLE.



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

THREADED BARREL HOLDER ASSEMBLIES



UNIVERSAL THREADED BARREL HOLDER ASSEMBLY

Part Number	A Dia.	B Dia.
760-0-0001	7/8 Dia.	1 Dia.
780-0-0001	1 Dia.	1-1/8 Dia.

ASSEMBLY PART NO.
T-2104
T-2106
T-2114
T-2116
T-2128
T-2120
T-2105
T-2107
T-2115
T-2117
T-2129
T-2121

"T" CONNECTION			
Part No.	Hole Dia.	Shank Dia.	Shank Length
T-1160	1	1	4
T-1160	1	1	
T-1161	1-1/4	1-1/4	
T-1161	1-1/4	1-1/4	
T-1162	1-1/2	1-1/2	
T-1162	1-1/2	1-1/2	
T-1160	1	1	
T-1160	1	1	
T-1161	1-1/4	1-1/4	
T-1161	1-1/4	1-1/4	
T-1162	1-1/2	1-1/2	
T-1162	1-1/2	1-1/2	

HOLDER		
Part No.	Body Dia.	Thread
T-5432-A	1	7/8-14
T-5433-A	1-1/4	
T-5433-A	1-1/4	1-14
T-5435-A	1-1/2	
T-5435-A	1-1/2	7/8-14
T-5432-A	1	
T-5432-A	1	1-14
T-5433-A	1-1/4	
T-5433-A	1-1/4	1-14
T-5435-A	1-1/2	
T-5435-A	1-1/2	

ADAPTER HEAD			
Part No.	Angle of Head	Holder Thread	Taper to Electrode
T-764	90 Deg.	7/8-14	4 RW
T-766			5 RW
T-764			4 RW
T-766			5 RW
T-778			4 RW
T-780			5 RW
T-765	30 Deg.	7/8-14	4 RW
T-767			5 RW
T-765			4 RW
T-767			5 RW
T-779			4 RW
T-781			5 RW

STRAIGHT THREADED BARREL HOLDERS



90 DEG

Part No.
T-5432-A
T-5433-A
T-5434-A
T-5435-A

Barrel Dia.	Barrel Length	Barrel Thread
1	8	7/8-14
1-1/4		
1-1/2		
1-1/2		



30 DEG

90 DEGREE HOLDER ADAPTER HEADS MALE THREAD TYPE

30 DEGREE HOLDER ADAPTER HEADS MALE THREAD TYPE

Part Number
T-764
T-766
T-778
T-780

Degree of Angle	Holder Thread	Electrode Taper
90	7/8-14	4 RW
		5 RW
	1-14	4 RW
		5 RW

Part Number
T-765
T-767
T-779
T-781

Degree of Angle	Holder Thread	Electrode Taper
30	7/8-14	4 RW
		5 RW
	1-14	4 RW
		5 RW

SPRING LOADED HOLDERS



IMPROVE THE QUALITY OF PROJECTION TYPE WELDS
 AND WELDS ON MATERIALS WITH LIMITED PLASTIC RANGES

Tipaloy's low inertia (fast follow-up) holders are designed for easy maintenance. Adjustments for different pressure ranges can be made by simply changing the external spring. Taper changes are made by replacing the threaded adapter.

A solid electrical connection is ensured on all current carrying members through the use of clamp and bolted connections good for the life of the product. There are no sliding type connections which can create wear related problems.

These units can be ganged together for multiple spot or projection welding applications. For use with offset electrodes, add "NR" at the end of the part number for a non-rotating holder.

The T-3300 Series holders are supplied ready to use. Simply add your electrodes. Each unit is supplied with a DFF-600MCM-12" cable, a stationary and sliding water tube, and either an AP-H24B-7 (4 RW) or AP-H25B-7 (5 RW) threaded adapter. Other cables and adapters are available at an additional cost. Each unit is supplied with complete instructions for optimum use.

Please call Tipaloy for additional information on our low inertia holders or any of your resistance welding requirements.

SPRING LOADED HOLDERS

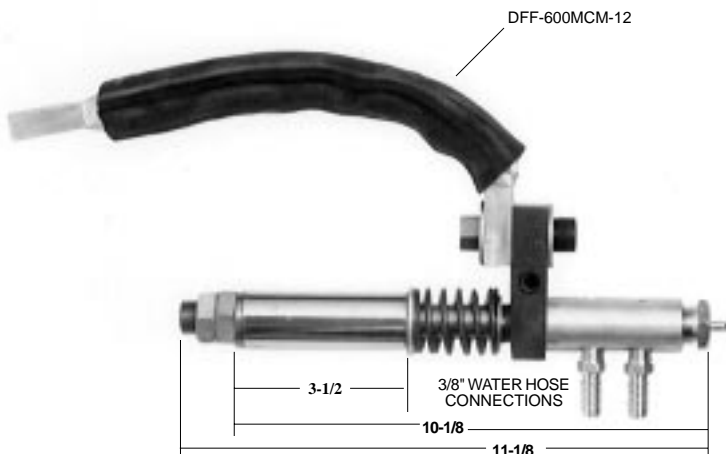
(LOW INERTIA)

Part Number	Barrel Dia.	Taper
T-3314-*	1	4 RW
T-3324-*	1-1/4	Taper
T-3334-*	1-1/2	(#1 MT)
T-3315-*	1	5 RW
T-3325-*	1-1/4	Taper
T-3335-*	1-1/2	(#2 MT)

* Specify one of the following:

4	= 400 Pound Spring
7	= 700 Pound Spring
10	= 1,000 Pound Spring

NOTE - For a non-rotating unit for use with offset tips, add "NR" at the end of the part number when ordering.



SPRING LOADED HOLDERS



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

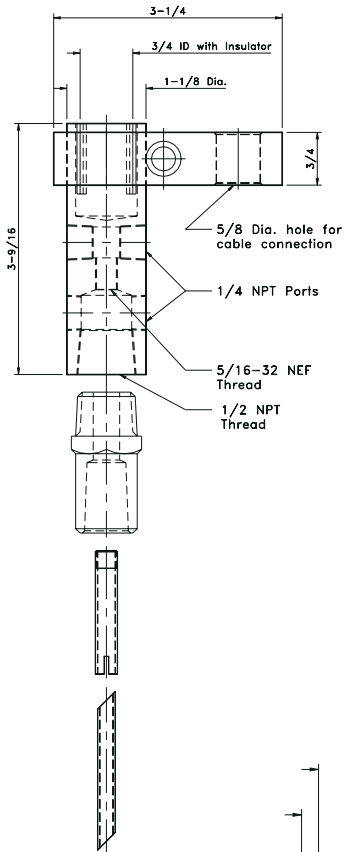
CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

WELD GUN CYLINDER HOLDERS

- *Designed for air and hydraulic guns and cylinders on resistance spot welding equipment.
- *Individual supply of water and current to each holder for better weld quality.
- *Silver plated barrel and clamp for higher conductivity and corrosion resistance.
- *Available for 4 RW, 5 RW, 6 RW, and 7 RW taper electrodes.
- *When ordering, specify assembly size as shown below.
- *To complete your set-up, order hose barbs, adapters, stationary water tubes and sliding tubes to suit your specific requirements.
- *Replacement parts may be ordered individually

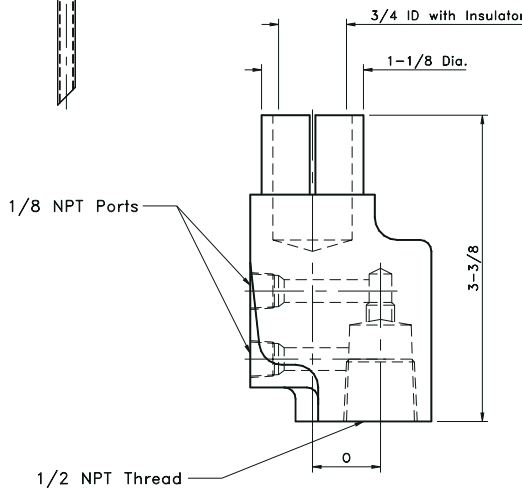
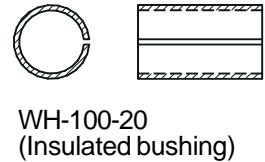
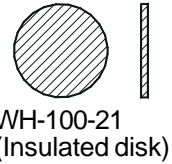
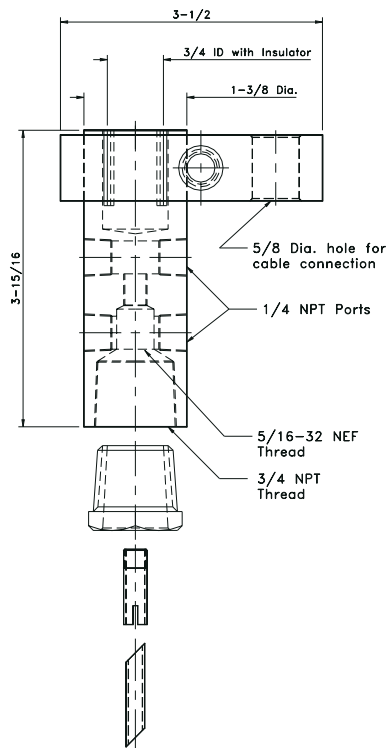
T-101

Barrel and Clamp Assembly
 For 4 RW and 5 RW Electrodes



T-102

Barrel and Clamp Assembly
 For 6 RW or 7 RW Electrodes



OFFSET HOLDERS

Part No.	Offset
	O
T-101-.50	1/2"
T-101-.75	3/4"
T-101-1.0	1"

OPTIONS

- * Additional offsets
- * #6 & #7 RW Tapers
- * 3/4 NPT water connections

WELDING GUN CYLINDER HOLDER COMPONENTS

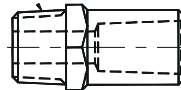
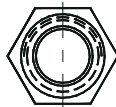
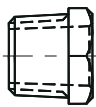
WELD GUN CYLINDER COMPONENTS

ELECTRODE ADAPTER SELECTION CHART

Adapter Length
7/8
1
1-1/4
1-3/8
1-1/2
2
2-1/2
3

T-101 size Adapters 1/2" NPT	
4 RW Taper	5 RW Taper
AP-H24B-7	AP-H25B-7
AP-H24B-8	AP-H25B-8
AP-H24B-10	AP-H25B-10
-	-
AP-H24B-12	AP-H25B-12
AP-H24B-16	AP-H25B-16
AP-H24B-20	AP-H25B-20
AP-H24B-24	AP-H25B-24

T-102 Size Adapters 3/4" NPT	
6 RW Taper	7 RW Taper
-	-
-	-
-	-
AP-H36D-11	AP-H37D-11
AP-H36D-12	AP-H37D-12
AP-H36D-16	AP-H37D-16
AP-H36D-20	AP-H37D-20
AP-H36D-24	AP-H37D-24

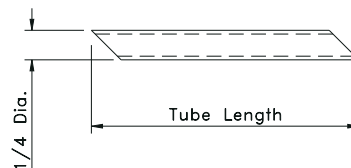
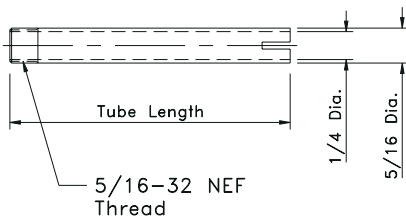


STATIONARY WATER TUBES

Part Number	Length
DS-5-3	3/4
DS-5-4	1
DS-5-5	1-1/4
DS-5-6	1-1/2
DS-5-8	2
DS-5-10	2-1/2

SLIDING WATER TUBES

Part Number	Length
DF-4-4	1
DF-4-5	1-1/4
DF-4-6	1-1/2
DF-4-8	2
DF-4-10	2-1/2
DF-4-12	3
DF-4-16	4



HOW TO ORDER:

T-101 Tubes for use with 4 RW Adapters -

ORDER STATIONARY TUBE AT LEAST 1/4" SHORTER THAN ADAPTER LENGTH.

T-101 Tubes for use with 5 RW Adapters -

ORDER STATIONARY TUBE 1/2" LONGER THAN ADAPTER FOR TUBE TO BE FLUSH.

T-102 Tubes for use with 6 RW or 7 RW Adapters -

ORDER STATIONARY TUBE 3/4" LONGER THAN ADAPTER FOR TUBE TO BE FLUSH.

SLIDING TUBES SHOULD BE ORDERED AT LEAST 1/2" LONGER THAN WATER HOLE DEPTH OF TIP BEING USED.

SILVER PLATING SOLUTIONS AND SUPPLIES



PART # 10532 536B1 DRY MIX
(Silver Plating Solution)

PART # 10530
(Marvel Cleaning Solution)

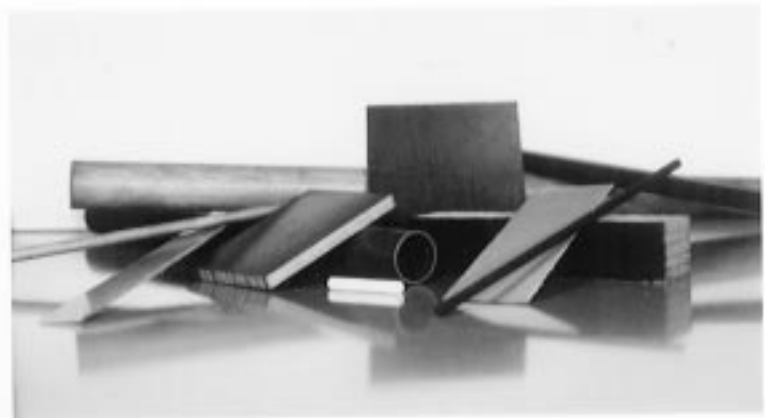
JET-LUBE COPPER PASTE



PART # SS-30 (1/2 lb. can)
PART # XXXXX (1 lb. can)

INSULATING MATERIALS

(Micarta & Nylon)



Available in rod, bar and tubing
Please specify sizes.

T-185-AC PNEUMATIC ELECTRODE DRESSER

- *Light Weight (1-3/4 lbs.) - Designed for Electrode Dressing at the Work Station
- *Variable Speed to 1,500 RPM
- *Operates on 60 PSI Air Pressure, (70 - 100 PSI is Recommended)
- ***Saves You Money in Electrode Dressing Time and Improves Weld Quality by Maintaining Proper Weld Face Diameters.**



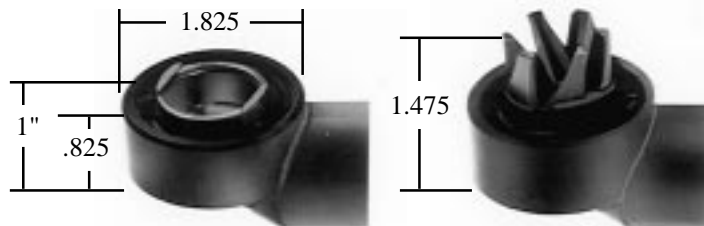
T-195-AC AUXILIARY DRIVE UNIT

- *3,000 RPM Maximum
- *Designed to be driven by auxiliary power.
- *3/8" Hex Drive Extension on rear of unit allows you to select your method for driving the unit.



CLEARANCE DIMENSIONS

Flush Cutters have an overall height of 1". Extended Cutters have an overall height of 1.475".
The diameter of the dresser head is 1.825".

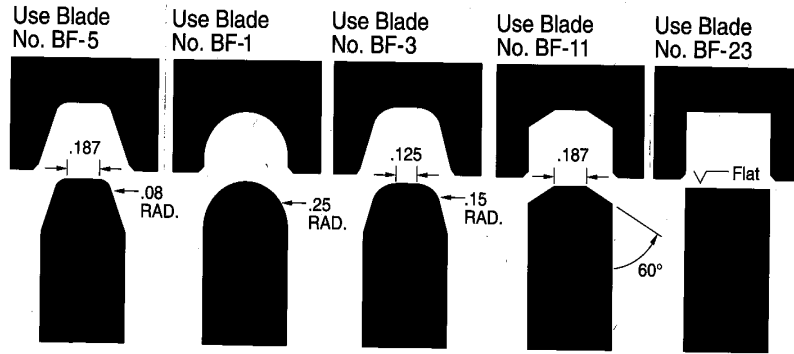


TIP DRESSING BLADES & CHUCKS

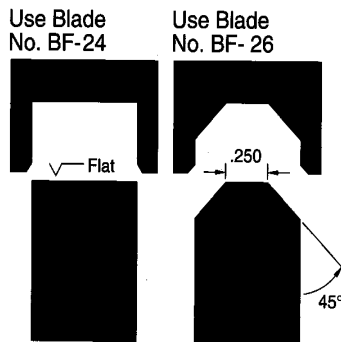
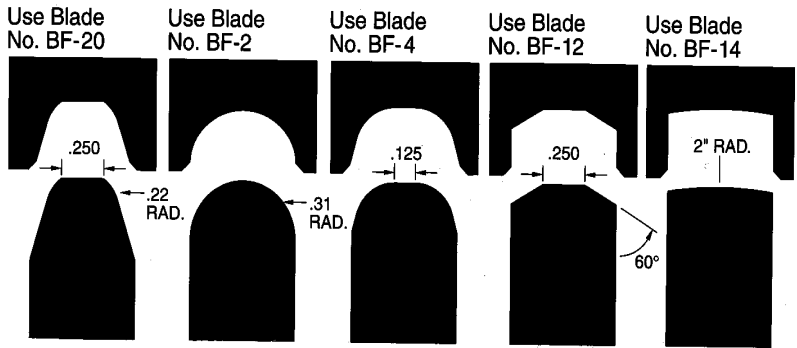
FLUSH TYPE STRAIGHT



For No. 4RW Electrodes
 Use chuck No. C-6 for all.



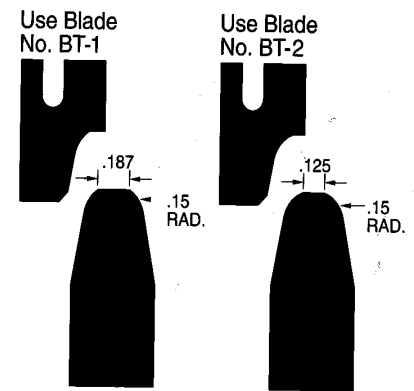
For No. 5RW Electrodes
 Use chuck No. C-5 for all



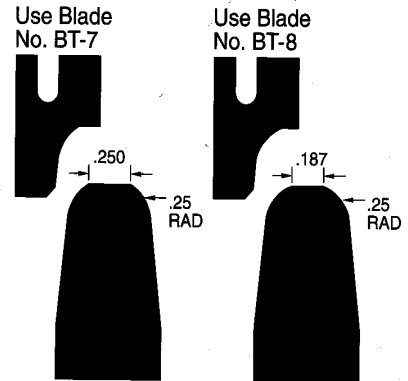
FLUSH TYPE TAPERED



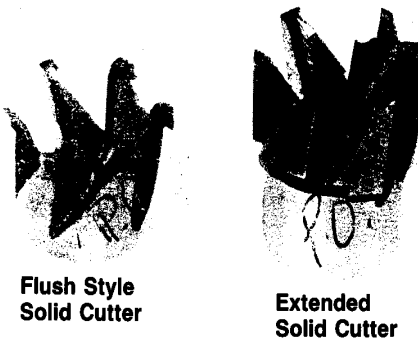
For No. 4RW Electrodes
 Use chuck No. C-3 for all.



For No. 5RW Pointed Electrodes
 Use chuck No. C-4 for all



Solid Style Cutters, 1 Piece
 For #4 & #5RW Electrodes



Lathe or Drill Press
 Adaptor

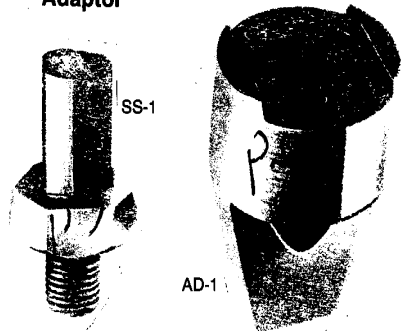




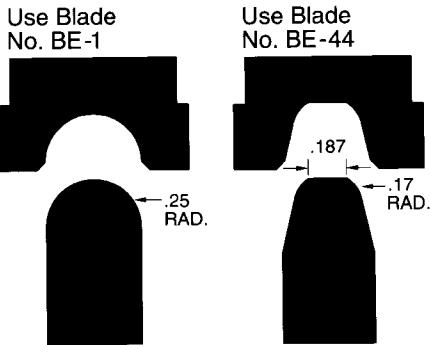
Table Dresser

This off-line table dresser is perfect for high production redressing of cap tips. This machine will accommodate both male and female caps (with available tooling)

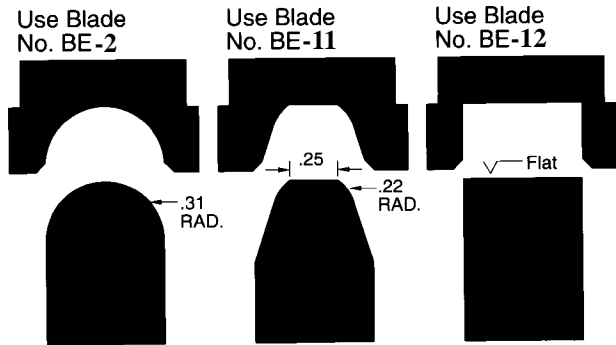
PART # DT-1

TIP DRESSING BLADES & CHUCKS

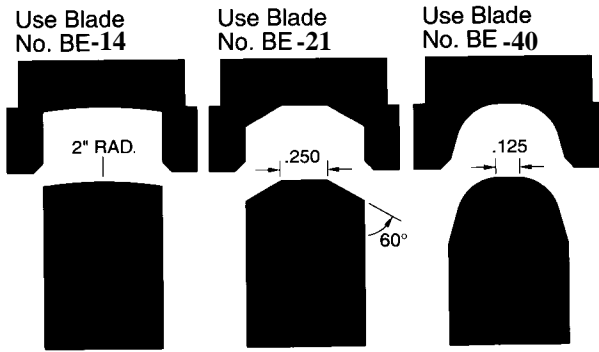
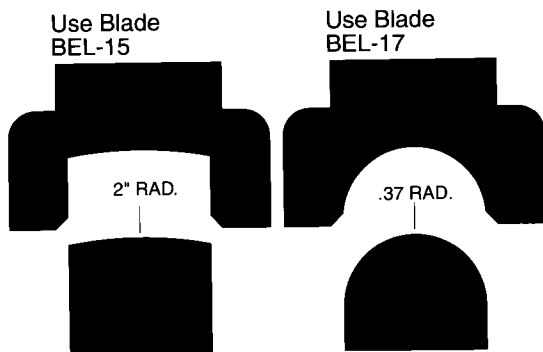
**For No. 4RW Electrodes
 Use Chuck No. C-1; Nut N-1, Ring No. R-2**



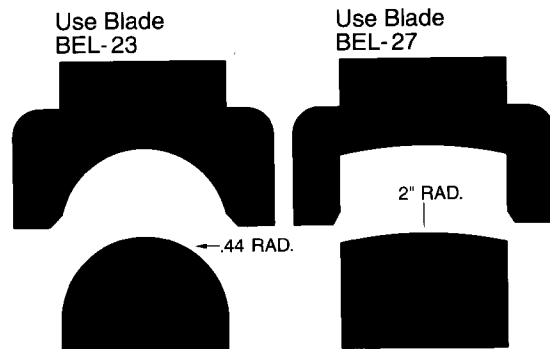
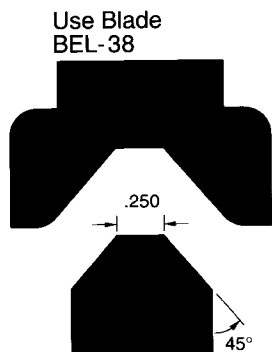
**For No. 5RW Electrodes
 Use Chuck No. C-1; Nut N-1, Ring No. R-1**



**For No. 6RW Electrodes
 Use Chuck No. C-2; Nut N-2**



**For No. 7RW Electrodes
 Use Chuck No. C-2; Nut N-3**





MALE CONNECTIONS

Part No.	Connection
601-AC	1/8" MPT
603-AC	1/4" MPT



NON-CONDUCTIVE WATER HOSE

Part No.	Color
T-320-AC	RED
T-320-AC BLACK	BLACK
T-320-AC GREEN	GREEN



MALE CONNECTIONS

Part No.	Connection
01-AC	1/8" MPT
03-AC	1/4" MPT



FEMALE CONNECTIONS

Part No.	Connection
600-AC	1/8" FPT
602-AC	1/4" FPT



UNION STEMS

Part No.	Connection
T-201-AC	for 3/8" Hose



HOSE STEM CONNECTIONS

Part No.	Connection
07-AC	1/4" Hose Stem
09-AC	3/8" Hose Stem



HOSE STEM CONNECTIONS

Part No.	Connection
606-AC	1/4" Hose Stem
607-AC	5/16" Hose Stem
608-AC	3/8" Hose Stem



HOSE CLAMP

T-321-AC



WATER NIPPLES

For Standard 3/8" Hose

Part No.	Thread Size
5600-6-0323	1/8" NPT
T-324-AC	1/4" NPT



SPECIAL TAPER REAMERS

FOR HOLDERS

Part No.	Taper Size
----------	------------

STANDARD ELECTRODE TAPERS

T-300-AC	Morse Electrode
T-301-AC	4 RW (#1 MT) Electrode
T-302-AC	5 RW (#2 MT) Electrode
T-303-AC	7 RW (#3 MT) Electrode

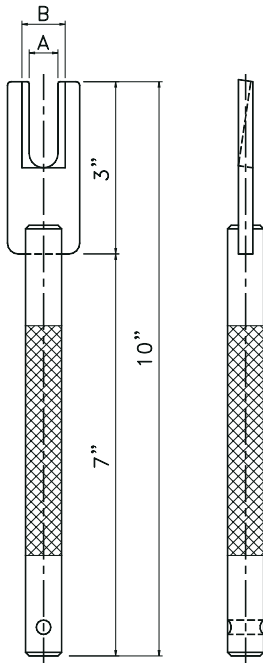
CAP TIP TAPERS

T-304-AC	4 RW (#1 MT) Cap
T-305-AC	5 RW (#2 MT) Cap
T-306-AC	6 RW Cap
T-307-AC	7 RW (#3 MT) Cap

These reamers provide an economical way of restoring worn tapers to their original cap tip or electrode taper socket size.

Special reamers, including 8 Degree, are also available.

ACCESSORIES



FORK TYPE EXTRACTORS

Part No.	Male cap Taper Size	Female Cap Taper Size
T-314-AC	4 RW & 5RW	4 RW
T-315-AC	6 RW	5 RW
T-316-AC	7 RW	6 RW & 7 RW



PLIER TYPE EXTRACTOR

Part No. T-380-AC



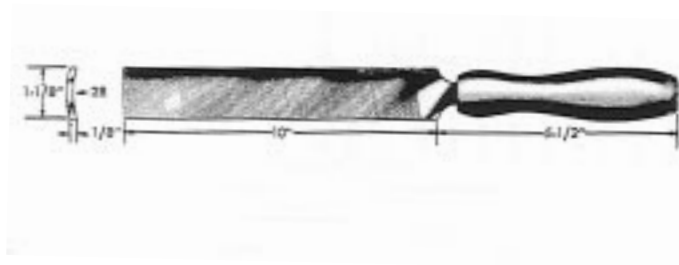
TIP EXTRACTOR

Part No. 250MM Speed Wrench



RATCHET STYLE DRESSER

Assembly Part No.	T-361-AC-B
Replacment Cutter Part No.	T-361-AC



2" RADIUS TIP FILE

Part No.	T-381-AC
Handle No.	GRA-05

ACCESSORIES



UNITED STATES (313) 875-5145
 FAX (313) 875-6027
 WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
 FAX (888) 551-2055
 E-MAIL TIPALOY@TIPALOY.COM

PRESSURE GAUGES

CONTROLLING WELD PRESSURE IS AN ESSENTIAL PART OF MAKING A GOOD WELD.
 TIPALOY GAUGES CAN REMOVE THE GUESS WORK.

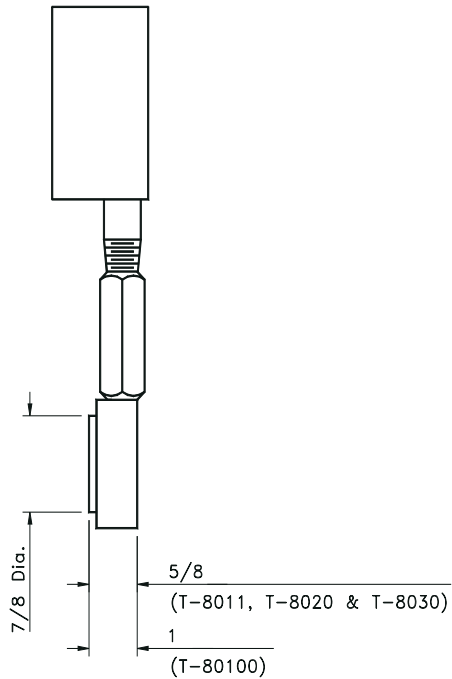
ADVANTAGES OF USING A TIPALOY PRESSURE GAUGE

*ACCURATE SET-UP AND TROUBLE SHOOTING *EASIER SET-UP AND MAINTENANCE

HOW TO USE:

WELD TIPS SHOULD BE PROPERLY ALIGNED
 CURRENT SHOULD BE OFF (MUST BE OFF ON T-80100)
 CONTACT BUTTON AS CLOSE TO CENTER AS POSSIBLE WITH LOW INITIAL PRESSURE
 INCREASE TO DESIRED WELD PRESSURE AFTER CONTACT HAS BEEN MADE

PRESSURE GAUGES



Part No.	Pressure Range	Minimum Tip Opening	Accuracy	Insulated Button	Zero Adjustment Screw
T-8011	0 - 1,000 lbs.	11/16"	+/- 3%	Standard	Standard
T-8020	0 - 2,000 lbs.				
T-8030	0 - 3,000 lbs.				
T-8050	0 - 5,000 lbs.	13/16"		Not Avail.	
T-80100	0 - 10,000 lbs.	13/16"		Not Avail.	

OPTIONS

*LAZY HAND
*12" EXTENSION
*NON-INSULATED STEEL BUTTON
*OIL FILLED GAUGE

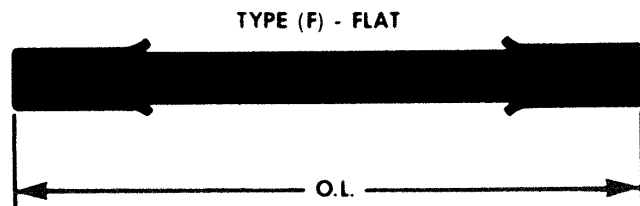
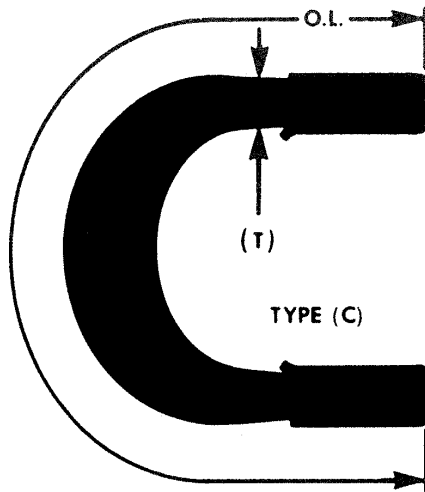
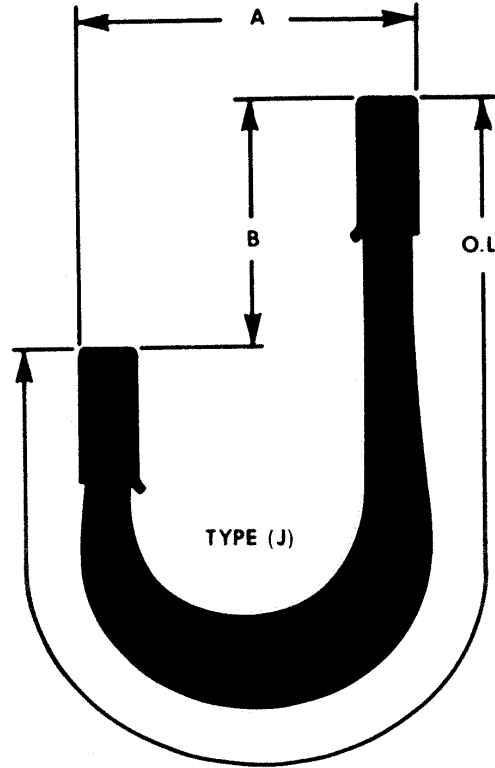
* Options must be specified at time of order.

LAMINATED SHUNTS

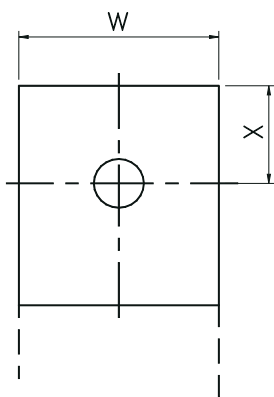
Tipaloy laminated shunts are custom designed to customer requirements and specifications and are readily available in any hole pattern or size. The secondary conductor strips are of high conductivity copper. Terminal ends can either be riveted or solder dipped to allow more positive current transfer area for improved efficiency.

HOW TO ORDER:

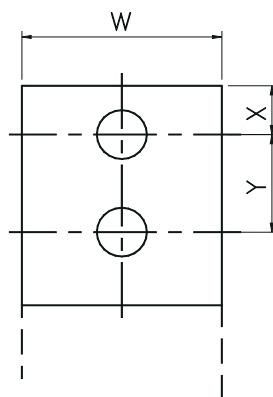
Please advise:
 Outside length (O.L.)
 Width required (W)
 Thickness (less clip) (T)
 Hole Dia.
 Type (letter shape)
 Hole pattern
 Available in any shape required.



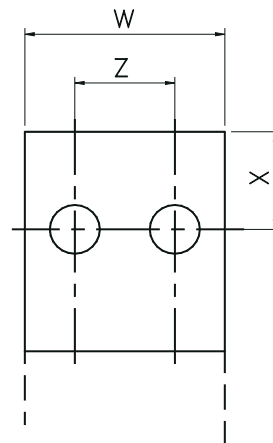
LAMINATED SHUNTS



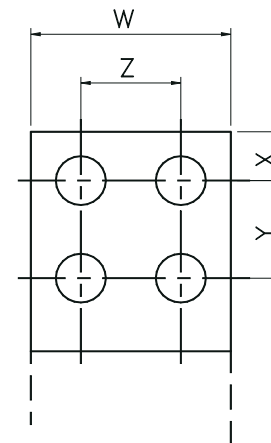
HOLE PATTERN "A"



HOLE PATTERN "B"



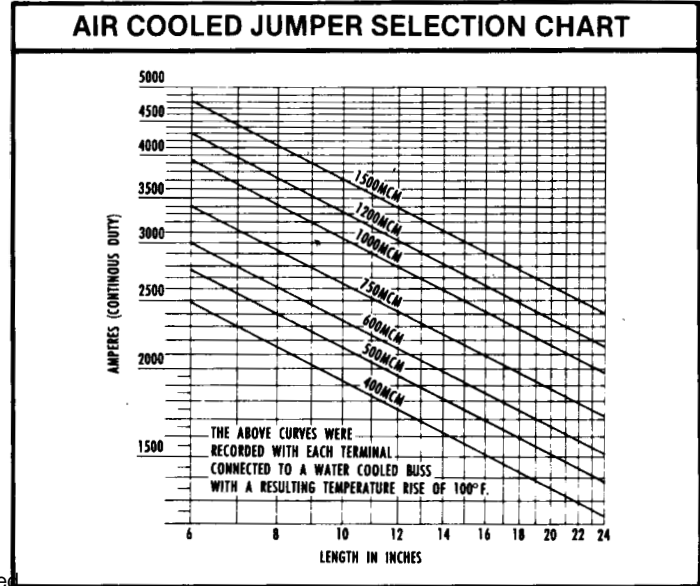
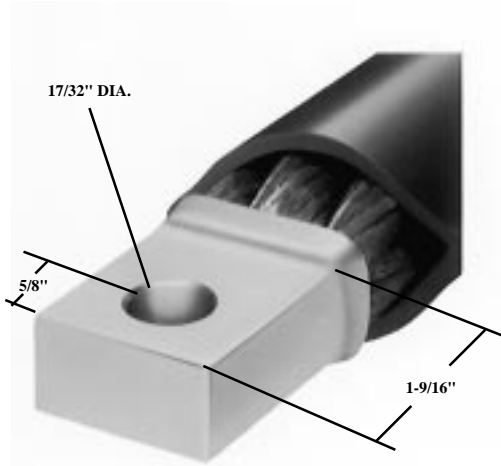
HOLE PATTERN "C"



HOLE PATTERN "D"

AIR COOLED JUMPER CABLES

AIR COOLED JUMPER CABLES



Every TIPALOY Dry Jumper has completely silver plated terminals, compressed under tons of pressure. Terminals can be manufactured up to 3-1/2" long for special applications.

"D" TERMINAL THICKNESS

MCM	1.250" Wide	1.375" Wide	1.500" Wide
350	0.370"	-	-
400	0.405"	0.370"	-
500	0.510"	0.465"	0.425"
600	0.540"	0.490"	0.450"
750	0.650"	0.590"	0.545"
1000	0.825"	0.750"	0.690"
1200	0.965"	0.880"	0.805"
1500	1.165"	1.060"	0.975"
2000	-	1.575"	1.440"

HOW TO ORDER:

Type "D" Dry Jumpers:

The length is measured from the bolt hole centers at each end of the cable on straight or 45 degree terminals. It is measured from the extreme ends of 90 degree terminals. On terminals with two holes, measure from the centers of the outer holes. The following information should be provided:

TYPE	MCM SIZE	LENGTH	TERMINALS	
			1ST END	2ND END
D	6C or 600MCM	16"	F	V

(Example: D-6C-16"-FV)

COVER MATERIAL IS AVAILABLE

TERMINAL CONNECTIONS



WATER COOLED JUMPER CABLES

All TIPALLOY Water Cooled Jumpers are equipped with full-length filter tubes to ensure free-flow water passage throughout the entire system. TIPALLOY Water Cooled Jumpers range from light to extra heavy-duty to meet the needs of today's industry. They make good single-conductor cables for push guns or where "Kickless" Cables are not used. Jumpers are furnished in exact lengths required.

CABLE SIZE	OUTER HOSE DIAMETER	HOSE I.D.
350 MCM	1-1/2"	1-1/16"
500 MCM	1-11/16"	1-1/4"
600 MCM	1-11/16"	1-1/4"
750 MCM	1-13/16"	1-3/8"
1000 MCM	2-1/16"	1-5/8"

HOW TO ORDER:

Type "W" Water Cooled Cables:

The length is measured from the bolt hole centers at each end of the cable on straight or offset terminals. It is measured from the extreme ends of 90 degree or threaded terminals. On terminals with two holes, measure from the centers of the outer holes. The following information should be provided:

TYPE	MCM SIZE	LENGTH	TERMINALS	
			1ST END	2ND END
W	5C or 500MCM	24"	B	B4 (1/2")

(Example: W-5C-24"-B-B4(1/2"))

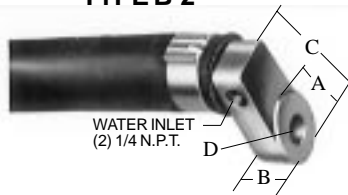
NOTE: TIPALLOY Water Cooled Jumpers are available with any combination of the terminals shown. If these terminals do not meet your requirements, special types can be designed.

TYPE B



MCM	A	B	C
350	9/16"	9/16"	1-5/16"
500/600	5/8"	9/16"	1-5/16"
750	11/16"	5/8"	1-3/8"
1000	3/4"	3/4"	1-1/2"

TYPE B-2



MCM	A	B	C	D
350	1-1/16"	11/16"	2-11/16"	17/32"
500/600	1-3/8"	13/16"	2-7/8"	17/32"
750	1-5/8"	13/16"	3-1/8"	21/32"
1000	1-7/8"	13/16"	3-1/4"	21/32"

TYPE B-4



MCM	A	B
350	1/2"	1-3/8"
500/600	5/8"	1-7/8"
750	5/8"	1-7/8"
1000	11/16"	2"

TYPE B-5



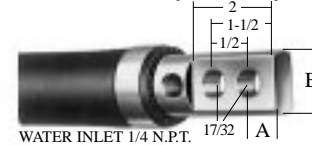
MCM	A	B	C	D
350	1/2"	9/16"	1-1/4"	1-1/8"
500/600	5/8"	5/8"	1-3/8"	1-1/4"
750	5/8"	5/8"	1-3/8"	1-3/8"
1000	5/8"	5/8"	1-3/8"	1-5/8"

TYPE B-6



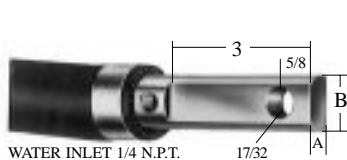
MCM	A	B
350	9/16"	1-1/8"
500/600	5/8"	1-1/4"
750	5/8"	1-3/8"
1000	5/8"	1-5/8"

TYPE B-6 (2-HOLE)



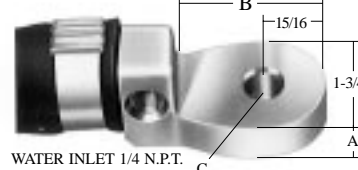
MCM	A	B
350	9/16"	1-1/8"
500/600	5/8"	1-1/4"
750	5/8"	1-3/8"
1000	5/8"	1-5/8"

TYPE B-7



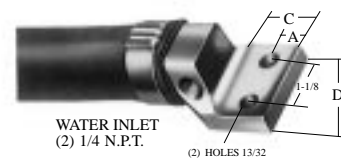
MCM	A	B
350	9/16"	1-1/8"
500/600	5/8"	1-1/4"
750	5/8"	1-3/8"
1000	5/8"	1-5/8"

TYPE B-9



MCM	A	B	C
350	9/16"	2-1/8"	17/32"
500/600	9/16"	2-1/8"	17/32"
750	9/16"	2-5/16"	21/32"
1000	5/8"	2-5/16"	21/32"

TYPE B-11



MCM	A	B	C	D
350	9/16"	3/8"	1-1/8"	2"
500/600	9/16"	3/8"	1-1/8"	2"
750	7/8"	5/8"	1-1/2"	2-1/2"
1000	7/8"	3/4"	1-1/2"	2-1/2"

WATER COOLED JUMPER CABLES

KICKLESS CABLES

Tipaloy kickless cables are designed to carry maximum current to the welding tips, taking the "kick" out of welding, and offering the lowest reactance.

A change to TIPALOY kickless will provide:

1. More Durability	5. Longer Life
2. Stronger Welds	6. Lower Maintenance
3. Increased Production	7. Maximum Electrical Cond.
4. Less Down Time	

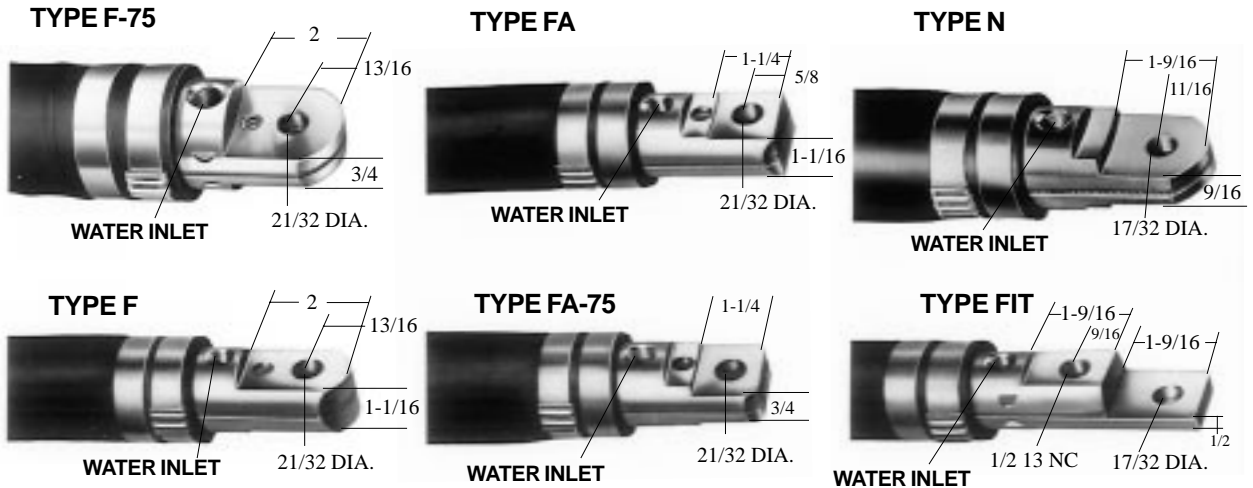
HOW TO ORDER:

Refer to Water Cooled example on page 51.

CABLE SIZE	WATER INLETS	TERMINAL DIAMETERS	OUTER HOSE DIAMETER
300 MCM	1/4" NPT	1-7/16"	1-7/16"
450 MCM		1-5/8"	1-7/8"
500 MCM		1-7/8"	2-3/8"
650 MCM		1-7/8"	2-3/8"

The Kickless Cable terminals shown are standard. Most types, as supplied by other manufacturers, are also available.

KICKLESS CABLES



Special diameter bolt holes furnished upon request
 Special terminals for all sizes upon request
 All water inlets 1/4" N.P.T.

SPECIAL TERMINALS



USE OF CABLE SELECTION CHARTS

The following is based upon individual cable thermal limitations and will demonstrate the correct method for determining circular mil requirements for all types of cables displayed in this catalog.

Regardless of the type cable which may be of interest first consult the Conversion Factor Chart with the known factors:

EXAMPLE:

Cycles of current "on time" per weld .6
 Number of welds per minute.....60
 Amperes per weld.....16,000
 Kickless Cable length.....10 Ft.

STEP # 1 Lay one side of a straight edge across the 6 cycles of current "on time" on the left hand vertical scale of the Conversion Factor Chart.

STEP #2 Lay the other side of the straight edge across the 60 welds per minute of the vertical right hand scale.

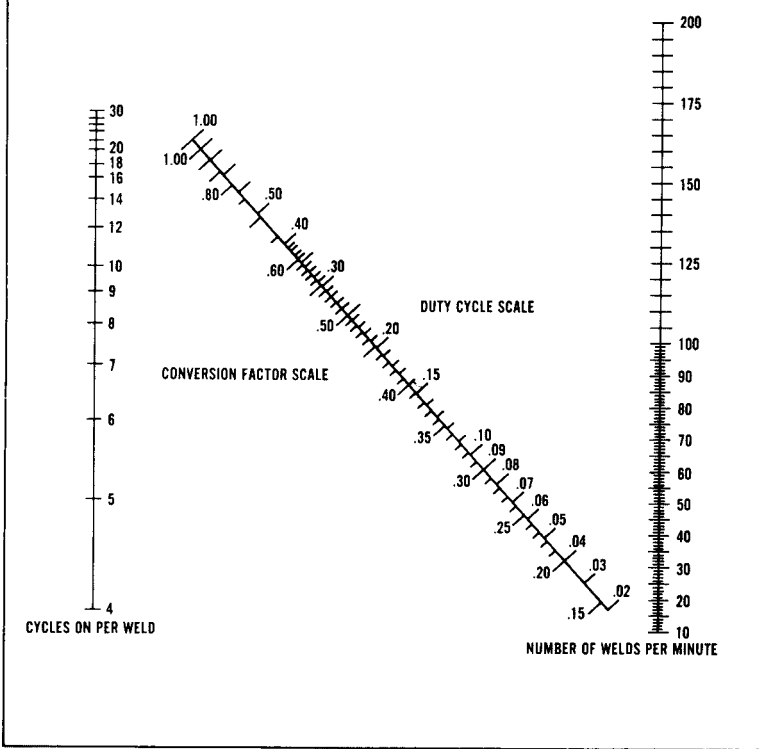
STEP # 3 At the point of intersection with the center slanted scale, a .32 Conversion Factor is indicated by the lower scale. (A duty cycle of .10 or 10% is identified by the lower scale, which in this case is not of interest.)

STEP # 4 Multiply the required current of 16,000 amperes by the .32 Conversion Factor which will amount to a "Continuous Duty Current" of 5,120 amperes.

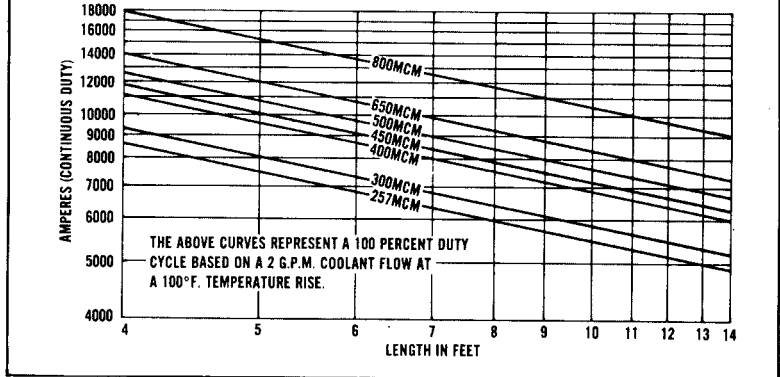
STEP # 5 Proceeding to the Kickless Cable Chart, draw a horizontal line across the chart from the 5,120 ampere point on the vertical left hand scale.

STEP #6 Draw a vertical line from the 10 ft. point on the lower horizontal scale.

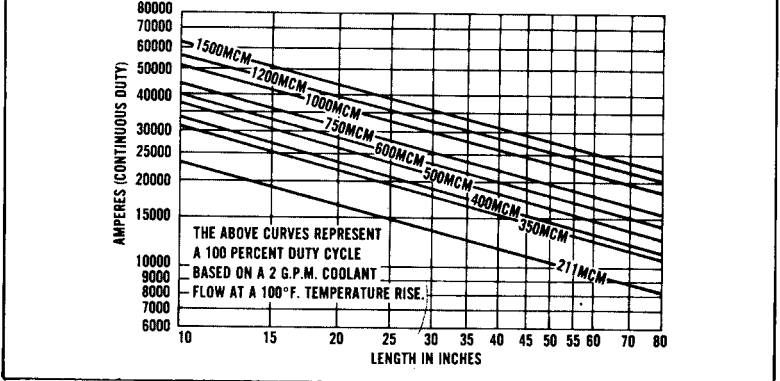
CONVERSION FACTOR & DUTY CYCLE CHART



KICKLESS CABLE SELECTION CHART



WATER COOLED JUMPER SELECTION CHART



CABLE SELECTION CHART

USE OF VOLTAGE DROP CHART FOR KICKLESS CABLES

To calculate the voltage drop across both legs of a dual Conductor Kickless Cable, first determine the known factors.

EXAMPLE:

Amperes per weld.....20,000
 Cable Length.....8 Ft.
 Circular Mil.....400 M.C.M.

STEP # 1: Follow the vertical line "A" from 20,000 ampere point on the lower horizontal scale until it intersects the 8 ft. cable length curve, indicated by the vertical right hand scale.

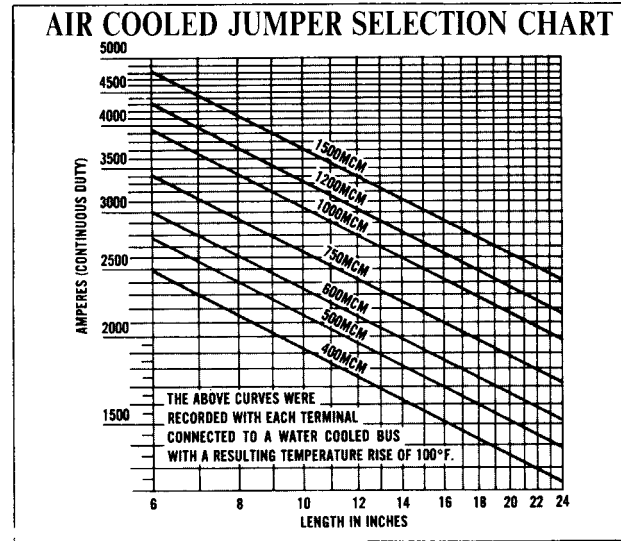
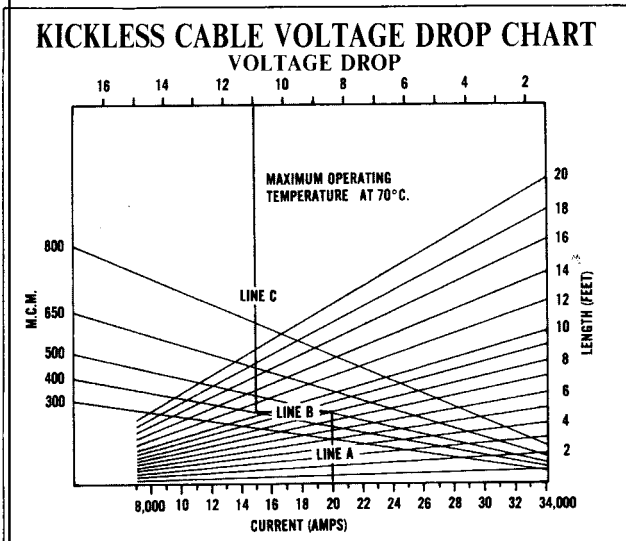
STEP # 2: At the point of intersection, follow the horizontal line "B" to the left until it intersects the 400 M.C.M. cable curve indicated by the vertical left hand scale.

STEP # 3: Follow the vertical line "C" from this point until it intersects the voltage drop scale at the top of the chart, which in this case indicates 10.9 volt drop.

Always locate the known factors on the chart in the following sequence.

1. Current
2. Cable Length
3. Cable Circular Mil
4. Voltage Drop

CABLE SELECTION CHART



How to Order Tipaloy Cables

TYPE "K" "KICKLESS" CABLES:

The length is measured from the bolt hole centers at each end of the cable. The following information should be provided:

TYPE	MCM SIZE	LENGTH	TERMINALS	
			1ST END	2ND END
K	300MCM	72"	F75	FA

TYPE "D" DRY JUMPERS:

The length is measured from the bolt hole centers at each end of the cable on straight or 45 deg. terminals. It is measured from the extreme ends at 90 deg. terminals. On terminals with two holes, measure from the outer holes. The following information should be provided:

TYPE	MCM SIZE	LENGTH	TERMINAL
D	300MCM	72"	DFP

TYPE "W" WATER COOLED CABLES:

The length is measured from the bolt hole centers of each end of the cable on straight or offset terminals. It is measured from the extreme ends of 90 deg. or threaded terminals. On terminals with two holes, measure from the centers of the outer holes. The following information should be provided:

TYPE	MCM SIZE	LENGTH	TERMINAL	
			1ST END	2ND END
W	300MCM	72"	B6	B9

Refer to Page 51 to order these shunts. Supply a sketch of the same in its normal position and state the amount of movement in each direction. It is also a good policy to supply Tipaloy with either inside or outside lamination to assure proper hole spacing as these are all custom made conductors.



ELECTRODE ALLOY CHART

Recommended Alloys for Spot Welding Similar and Dissimilar Metals,
 Using Conventional Spot Welding Methods

	Tungsten Molybdenum	Magnesium	Zinc	Nickel Alloys	Nickel	Tin	Lead	Stainless Steel	Chrome Plate	Cadmium Plate	Galvanized Iron Zinc-Plate	Terne Plate	Tin Plate	Scaly Steel	C.R. Steel	Phosphor Bronze	Silicon Bronze	Nickel Silver	Cupro Nickel	Brass Yellow	Brass Red	Copper	Aluminum Alloys	Aluminum
Aluminum		C I D I	E II E II	E I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Aluminum Alloys Duralumin		C I D I	E II E II	E I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Copper—Pure	H I H I	H I H I	E II E II	E I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Brass—Red 5:25% Zinc		H I H I	D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Brass—Yellow 25-40% Zinc		E I D I	D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Cupro-Nickel		D I I	C II C II	D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Nickel—Silver		D I I	C II C II	D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Silicon Bronze		D I D I	C II C II	D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Phosphor Bronze Grades A, C, & D		E I E I	D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
C. R. Steel	D II		D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
H. R. Steel—Clean	H II		D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Scaly H. R. Steel	H II		D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Tin Plate	E II	E I	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II
Terne Plate	E II	E I	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II
Galvanized Iron Zinc-Plate	E II	E I	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II
Cadmium Plate	E II	E I	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II	D II
Chrome Plate	D II		D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Stainless Steel 18-8 Type	D II		D II D II	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I	H I H I
Lead		E I	D II	H I	H I	H I	H I	D I																
Tin		E I	D II	H I	H I	H I	H I	D I																
Nickel	D II		C II	B II																				
Nickel Alloys Monel-Nichrome (High Res.)	C II		B II																					
Zinc		E I	D I																					
Magnesium Alloys		B I																						
Molybdenum Tungsten	D II																							

BLOCK INTERPRETATION

Weldability	Electrode Against
Electrode Against	Special Information

ELECTRODE ALLOYS

I	TIPALLOY #100
II	TIPALLOY #130
III	TIPALLOY #200 & #240
IV	COPPER TUNGSTEN T-10W
V	COPPER TUNGSTEN T-100W

- Electrode materials in circles are second choice
 * TIPALLOY Tungsten T-100W may be substituted

WELDABILITY

A	Excellent
B	Very Good
C	Good
D	Fair
E	Poor
H	Very Poor
K	Impractical

SPECIAL INFORMATION

- Good weld strength
- May be welded under special conditions
- Low weld strength
- No actual weld nugget occurs, a "stick" is obtained
- Welding conditions must be accurately controlled
- Keep electrodes clean to prevent sticking to the work
- Good practice recommends cleaning steel before welding
- Use one flat tip to minimize distortion or discoloration
- Coating may dissolve in other metals, or burn away
- Should be projection welded

ELECTRODE ALLOY CHART

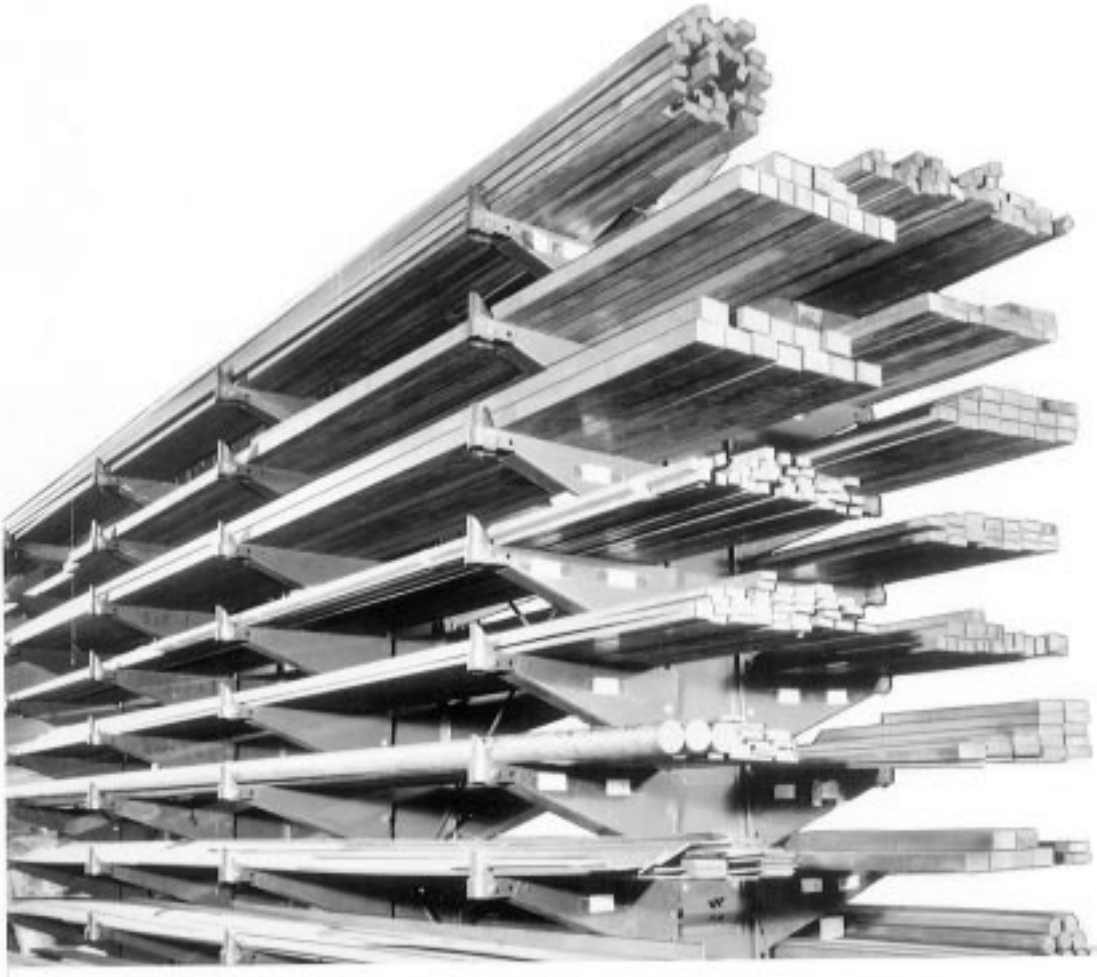


UNITED STATES (313) 875-5145
FAX (313) 875-6027
WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
FAX (888) 551-2055
E-MAIL TIPALOY@TIPALOY.COM

R.W.M.A. GROUP A - COPPER BASE ALLOYS HEX, SQUARE, ROUND AND RECTANGULAR SHAPES

ROD, BAR AND PLATE



TIPALOY rod and bar is stocked in a variety of shapes and sizes for use as back-up bars, electrodes, dies, fixtures and any electrical or thermal conductive component. If your requirements demand non-standard sizes, we offer saw cut plate in both Class 2 and Class 3 alloys.

For physical and mechanical properties and application information on these alloys, please refer to the next page.



Tipaloy Alloy No	RWMA Alloy Group A	Rockwell Hardness	Electrical Conductivity % IACS	Ultimate Strength PSI	Elongation % in 2"	Annealing Temperature	
						Celsius	Fahrenheit
#100	Class 1 - Wrought	60-B	80	65,000	14	350	660
#130	Class 2 - Cast	55-B	70	55,000	13	500	930
	- Wrought	65-B	75	80,000	12	500	930
Z#139	Class 2 - Wrought	65-B	70	80,000	13	500	930
Z#169	Class 1 - Wrought	60-B	80	62,000	14	-	-
#200	Class 3 - Cast	90-B	45	90,000	8	550	1020
	- Wrought	90-B	45	100,000	5	550	1020
#240	Class 3 - Cast	90-B	45	75,000	5	500	900
	- Wrought	95-B	45	95,000	10	500	900
T-4	Class 4 - Cast	33-C	20	110,000	0.5	375	710
	- Wrought	33-C	20	170,000	1	375	710
T-5	Class 5 - Cast	75-B	12	70,000	12	-	-
Copper	- Cast	30-B	70	25,000	55	200	390
	-Wrought	40-B	100	40,000	35	200	390
"G"	Class 20 (Grp. C)	70-B	75	-	13	-	-
#340P	Class 20 (Grp. C)	70-B	85	-	-	-	-

RWMA GROUP A - COPPER BASE ALLOYS GENERAL INFORMATION

TIPALOY #100 - Class 1 - A Cadmium Copper alloy, is superior to pure copper as an electrode material and is recommended because of its high electrical and thermal conductivity. Uses include spot welding aluminum alloys, magnesium alloys, coated materials (terne plate, tin plate, galvanized iron, cadmium plate, brass and bronze). Used as spot welding electrodes, seam weld wheels, seam weld shafts, flash and butt welding dies, and weld fixtures. Not available in cast form.

TIPALOY #130 - Class 2 - A Chrome Copper alloy, specifically recommended for high level production spot and seam welding of clean mild steel, low alloy steel, stainless steel, low conductivity brasses and bronzes, nickel-silver, nickel, nickel alloys, and monel. Suitable for projection welding dies, seam weld shafts and bearings, flash and butt welding dies, and current carrying structural members. Available in cast form for use as gun welder arms, welder platens and secondary circuit structural members. Tipaloy #130 is heat treatable.

TIPALOY Z#139 - Class 2 - A Chrome Zirconium Copper alloy, is used primarily as an electrode material when welding coated materials such as galvanized and galvaneal. Supplied primarily as male and female cap tips.

TIPALOY Z#169 - Class 1 - A Zirconium Copper alloy, designed for use on coated steels where electrode sticking is a problem, such as galvanized and galvaneal. Used as spot welding electrodes and seam weld wheels. Supplied primarily as male and female cap tips.

TIPALOY #200 - Class 3 - A Beryllium Copper alloy, and **TIPALOY #240** - A Silicon Nickel Chrome alloy, are recommended for use as seam weld wheels, projection welding dies, flash and butt welding dies, current carrying shafts and bushings, high stressed structural current carrying members, electrode holders, and high pressure electrodes where the welded material has a high electrical resistance. Available in cast, forged, and extruded forms. Heat treat processes differ from alloy #200 to #240, and both are generally supplied in the full heat treated condition to the customer.

TIPALOY "G" Class 20 - A Aluminum Dispersion Hardened Copper, Usually used in applications where metallic coated metals, such as galvanized steel or turn plate, requires high energy and non sticking characteristics. Supplied primarily in male & female cap tips as well as seam welding wheels.

TIPALOY T-4 - Class 4 - An extremely high hardness and high tensile strength alloy with low electrical conductivity. Generally used as an electrode material for welding inserts and die facings where pressures are extremely high and wear is severe, but heating is not excessive. Available in cast and wrought forms, and is generally supplied in the annealed condition, in which it can be more readily machined, and may be subsequently heat treated to maximum hardness.

TIPALOY T-5 - Class 5 - An Aluminum Copper alloy used for certain flash and butt welding operations, back-up applications, and current carrying structural members of welding equipment. Available only in cast form and is not heat treatable.

CALL TIPALOY FOR PRICE AND AVAILABILITY OF ROD, BAR, PLATE, CAST AND FORGED MATERIAL.

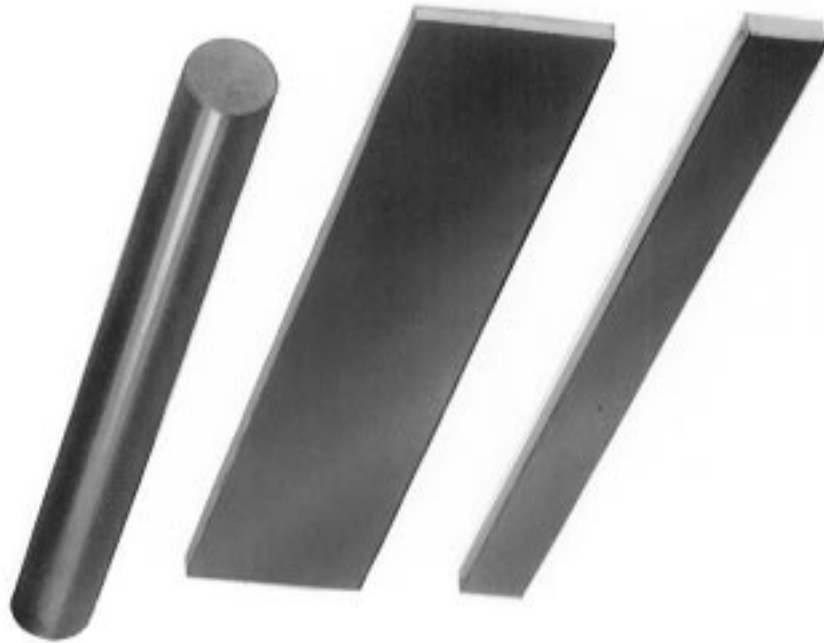
ROD, BAR, AND PLATE



UNITED STATES (313) 875-5145
FAX (313) 875-6027
WORLD WIDE WEB: WWW.TIPALOY.COM

CANADA (888) 847-2569
FAX (888) 551-2055
E-MAIL TIPALOY@TIPALOY.COM

REFRACTORY METALS



R.W.M.A. GROUP B - COPPER TUNGSTEN AND REFRACTORY METALS SQUARE, ROUND AND RECTANGULAR SHAPES

TIPALOY offers a complete line of Copper Tungsten, Silver Tungsten, pure Tungsten, and Molybdenum alloys in rod and bar form in lengths of 8" and 12", as well as round, square, and rectangular inserts. Due to rigid quality control throughout the manufacturing process, TIPALOY Copper Tungsten is of the highest quality and uniformity.



REFRACTORY METALS



REFRACTORY METALS

Grade	RWMA Group B	Type	Density Gm./cc	Electrical Cond. % IACS	Rockwell Hardness	Ultimate Strength PSI	Cross Break Strength PSI
T-1W	Class 10	Copper Tungsten	12.6	53 - 60	72 - 82-B	63,000	110,000
T-3W			13.93	48 - 53	85 - 92-B	75,000	130,000
T-5W			14.18	46 - 52	88 - 95-B	85,000	140,000
T-10W	Class 11		14.8	42 - 50	94 - 100-B	90,000	150,000
T-20W	Class 12		15.12	41 - 52	98 - 107-B	95,000	160,000
T-30W			15.6	41 - 49	98 - 106-B	100,000	158,000
T-3W53 *		Copper Alloy	13.5	28 - 32	101 - 106-E	120,000	180,000
T-10W53 *		Tungsten	14.6	26 - 30	105 - 110-E	160,000	200,000
T-TC5		Copper Tungsten	11.27	42 - 50	90 - 100-B	70,000	140,000
T-TC10		Carbide	11.64	38 - 45	97 - 108-B	75,000	160,000
T-TC20			12.7	27 - 35	34 - 40-C	85,000	180,000
T-TC53 *		Copper Alloy Tungsten Carbide	12.6	18 - 23	40 - 50-C	150,000	220,000
T-G12		Silver Tungsten	11.8	50 - 60	50 - 65-B	35,000	65,000
T-G13		Carbide	12.2	45 - 55	70 - 85-B	40,000	90,000
T-G14			13.1	30 - 40	95 - 105-B	55,000	120,000
T-G17		Silver	10.1	45 - 50	80 - 90-B	60,000	135,000
T-G18		Molybdenum	10.2	50 - 55	70 - 80-B	45,000	110,000
T-20S		Silver Tungsten		48 - 53	90 - 100-B	70,000	130,000
T-35S				50 - 56	80 - 87-B	50,000	120,000
T-100W	Class 13	Tungsten	19.28	31	35 - 50-C	100,000	-
T-100M	Class 14	Molybdenum	10.2	32	88 - 98-B	100,000	-

* Properties listed are those of fully heat treated material.

COPPER TUNGSTEN ALLOYS - GENERAL INFORMATION

TIPALLOY T-1W AND T-3W - Copper Tungsten materials recommended as facings or inserts for projection welding electrodes and flash or butt welding dies where high electrical conductivity is desirable and a degree of malleability is necessary.

TIPALLOY T-5W AND T-TC5 - Copper Tungsten alloys used primarily for projection welding dies where abrasion may be encountered and pressures are light.

TIPALLOY T-10W - Recommended as facings and inserts for flash and butt welding dies and general purpose projection welding electrodes. It may also be used as seam welder bearing inserts and facings for electro-forging dies. It is also recommended for spot welding steels having high resistance, such as stainless steel.

TIPALLOY T-20W AND TC-10 - Specifically recommended for heavy duty projection welding electrodes and for die facings in electro-forming and electro-forging applications. Also suitable for die material for electrical upsetting of rivets and studs.

TIPALLOY T-30W - This Copper Tungsten, due to its greater hardness, offers increased wear resistance without loss of conductivity in projection welding dies, electrical upsetting, and cross wire welding.

TIPALLOY T-3W53 AND T-10W53 - Copper Alloy Tungstens supplied in the full heat treated condition. When brazed to die backings, they should be heat treated to restore hardness.

TIPALLOY T-TC20 AND T-TC53 - Copper Alloy Tungsten Carbide materials having good wear resistance and extreme hardness. All contours should be formed by grinding. Recommended for electro-forging and upsetting where high temperatures and heavy pressures are encountered.

TIPALLOY T-100W - An extremely hard Tungsten with low ductility that must be ground to contour. Used primarily when welding non-ferrous metals, such as copper to brass and copper to copper. Also used in electrical upsetting and for electro-forging electrodes.

TIPALLOY T-100M - Used primarily for welding or electro-brazing non-ferrous metals having relatively high electrical conductivity. Welding of copper and brass wires and copper wire braid to brass and bronze terminals are typical applications. Special procedures are generally required.

REFRACTORY METALS

FORGINGS & CASTINGS

FORGINGS

ALLOYS:	RWMA Class 1, Class 2, Class 3, Beryllium Free Class 3, Class 4, and Class 5 Additional non-ferrous alloys are available.
APPLICATIONS:	Seam welding and Tube Mill wheels, electrodes, bearings and shafts, welding dies - flash and butt, round, square, and rectangular bars, rings, and custom shapes.
AVAILABLE AS:	Rough forged, semi-finished, and finish machined. Please furnish dimensions, drawings, or sketches for quotation.
IN STOCK:	Many sizes of seam welding discs are in stock for immediate shipment.



CASTINGS

ALLOYS:	High Conductivity Copper, RWMA Class 1, Class 2, Class 3, Beryllium Free Class 3, Class 4, and Class 5. Additional non-ferrous alloys are available.
APPLICATIONS:	Electrodes, bearings, welding dies, back-up bars, and fixture components.
AVAILABLE AS:	Cast or finish machined, from 4 ounces to 6,000 pounds.





APPLICATION DATA SHEET

Schedule for Spot Welding Stainless Steel

Spotwelding Stainless Steel Schedule

Thickness "T" of Thinnest Outside Piece P See Notes 1, 2, 3, and 4 Below	Electrode Diameter And Shape (See Note 5)		Electrode Force LB	Weld Time Cycles (60°)	Welding Current (Approx.) Amps		Minimum Contacting Overlap In.	Minimum Weld Spacing (See Note 6 Below) $\text{C} \text{ } \text{C}$ In.	Diameter Of Fused Zone In. Approx.	Minimum Shear Strength Lb.			
	Inches	D, In., Min.			d, In., Max.	Tensile Strength Below 150000 Psi				Tensile Strength 150000 Psi and Higher	Ultimate Tensile Strength of Metal		
											70000 Up To 90000 Psi	90000 Up To 150000 Psi	150000 Psi and Higher
0.006	3/16	3/32	180	2	2000	2000	3/16	3/16	0.045	60	70	85	
0.008	3/16	3/32	200	3	2000	2000	3/16	3/16	0.055	100	130	145	
0.010	3/16	1/8	230	3	2000	2000	3/16	3/16	0.065	150	170	210	
0.012	1/4	1/8	260	3	2100	2000	1/4	1/4	0.076	185	210	250	
0.014	1/4	1/8	300	4	2500	2200	1/4	1/4	0.082	240	250	320	
0.016	1/4	1/8	330	4	3000	2500	1/4	5/16	0.088	280	300	380	
0.018	1/4	1/8	380	4	3500	2800	1/4	5/16	0.093	320	360	470	
0.021	1/4	5/32	400	4	4000	3200	5/16	5/16	0.100	370	470	500	
0.025	3/8	5/32	520	5	5000	4100	3/8	7/16	0.120	500	600	680	
0.031	3/8	3/16	650	5	6000	4800	3/8	1/2	0.130	680	800	930	
0.034	3/8	3/16	750	6	7000	5500	7/16	9/16	0.150	800	920	1100	
0.040	3/8	3/16	900	6	7800	6300	7/16	5/8	0.160	1000	1270	1400	
0.044	3/8	3/16	1000	8	8700	7000	7/16	11/16	0.180	1200	1450	1700	
0.050	1/2	1/4	1200	8	9500	7500	1/2	3/4	0.190	1450	1700	2000	
0.056	1/2	1/4	1350	10	10300	8300	9/16	7/8	0.210	1700	2000	2450	
0.062	1/2	1/4	1500	10	11000	9000	5/8	1	0.220	1950	2400	2900	
0.070	5/8	1/4	1700	12	12300	10000	5/8	1-1/8	0.250	2400	2800	3550	
0.078	5/8	5/16	1900	14	14000	11000	11/16	1-1/4	0.275	2700	3400	4000	
0.094	5/8	5/16	2400	16	15700	12700	3/4	1-3/8	0.285	3550	4200	5300	
0.109	3/4	3/8	2800	18	27700	14000	13/16	1-1/2	0.290	4200	5000	6400	
0.125	3/4	3/8	3300	20	18000	15500	7/8	2	0.300	5000	6000	7600	

NOTES:

- Type of Steel — 301, 302, 303, 304, 308, 309, 310, 316, 317, 321, 347 and 349
- Material should be free from scale oxides, paint, grease and oil
- Welding conditions determined by thickness of thinnest outside piece "T"

- Data for total thickness of pile-up not exceeding 4 "T". Maximum ratio between two thicknesses 3 to 1
- Electrode Material, Class 2, Class 3, or Tipalloy T-10-W
- Minimum weld spacing is that spacing for two pieces for which no special precautions need be taken to compensate for shunted current effect of adjacent welds. For three pieces increase spacing 30 per cent.

Design And Welding Data For Projection Welding Low Carbon Steels

Thickness of Thinnest Outside Piece Inches	PROJECTION DESIGN Base Diameter of Projection Dp Height of Projection H Inches		ELECTRODE DIAMETERS (d = 2 x Projection Diameter) Minimum d Inches Minimum D Inches		Electrode Force Pounds	Weld Time (Cycles) 60 Cycles per Sec.	Held Time (Cycles) Minimum	Welding Current Amperes (Approx.)	Diameter of Fused Zone Dw Inches L-S	Minimum Shear Strength (Single Projection Only) (For Steels Having Strength of 100,000 psi and below) Pounds	Minimum Contacting Overlap L Inches L-S																	
	0.010	0.012	0.014	0.016								0.021	0.025	0.031	0.034	0.044	0.062	0.070	0.078	0.094	0.109	0.125	0.140	0.156	0.171	0.187	0.203	0.250
0.010	0.055	0.015	0.125	1/2	50	3	3	2,800	0.112	150	1/8																	
0.012	0.055	0.015	0.125	1/2	80	3	3	3,100	0.112	200	1/8																	
0.014	0.055	0.015	0.125	1/2	100	3	3	3,400	0.112	250	1/8																	
0.016	0.067	0.017	0.187	1/2	115	4	4	3,600	0.112	285	5/32																	
0.021	0.067	0.017	0.187	1/2	150	6	6	4,000	0.140	380	5/22																	
0.025	0.081	0.020	0.187	1/2	200	6	8	4,500	0.140	525	3/16																	
0.031	0.094	0.022	0.187	1/2	300	8	8	5,100	0.169	740	7/22																	
0.034	0.094	0.022	0.187	1/2	300	8	10	5,400	0.169	900	7/32																	
0.044	0.119	0.028	0.250	5/8	480	13	14	6,500	0.169	1,080	9/32																	
0.062	0.156	0.035	0.312	7/8	750	21	20	8,400	0.225	2,100	3/8																	
0.070	0.156	0.035	0.312	7/8	900	24	9,200	0.281	2,550	2,550	3/8																	
0.078	0.187	0.041	0.375	7/8	1,050	26	30	10,500	0.281	2,950	7/16																	
0.094	0.218	0.048	0.500	7/8	1,300	32	30	11,800	0.281	3,700	1/2																	
0.109	0.250	0.054	0.500	7/8	1,650	38	36	13,300	0.338	4,500	5/8																	
0.125	0.281	0.060	0.500	7/8	1,900	45	40	15,000	0.338	5,200	11/16																	
0.140	0.312	0.066	0.625	1	2,300	60	45	15,700	0.437	6,000	3/4																	
0.156	0.343	0.072	0.625	1	2,800	80	50	17,250	0.500	7,500	13/16																	
0.171	0.375	0.078	0.750	1	3,300	105	50	18,600	0.562	8,500	7/8																	
0.187	0.406	0.085	0.750	1	3,900	125	50	20,000	0.562	10,000	15/16																	
0.203	0.437	0.091	0.875	1-1/4	4,500	145	55	21,500	0.625	12,000	1																	
0.250	0.531	0.110	1.000	1-1/4	6,600	230	60	26,000	0.687	15,000	1-1/4																	

NOTES:

- Type of Steel — Low Carbon SAE 1010 — 0.15% Carbon Maximum.
- Material free of scale, oxide, paint, dirt, etc.
- Size of projection determined by thickness of thinnest piece and projection should be on thickest piece.
- Data is based on thickness of thinnest sheet for two thicknesses only. Maximum ratio between two thicknesses 3 to 1.
- See TABLE BELOW for design of punch and die for making projections.
- Contacting overlap does not include any radii from forming.

- Projection should be located in center of overlap.
- Tolerance for Projection Dimensions:

	Thickness	Thickness
	Up to 0.050"	Over 0.050"
Diameter "D"	± 0.003"	± 0.007"
Height "H"	± 0.002"	± 0.005"

- Electrode Material:
Class 3 TC-10 T-10W

WELD SCHEDULE DATA



APPLICATION DATA SHEET

Spot Welding Data

Optimum Conditions Schedules For Spot Welding Low Carbon Steel — SAE 1010

Thickness of Thinnest Outside Piece	Electrode Diameters and Shape*			Recommended Minimum Standard Electrode Size	Weld Force (Lbs.)	Weld Time (Cycles) (60 Cycles per Sec.)	Hold Time (Cycles)	Welding Current (Amps.)	Weld Shear Strength (For Steels Having Ultimate Tensile psi and below) Minimum Strength (Lbs./Weld)	Diameter of Fused Zone (Approx.) 	Minimum Weld Spacing 	Minimum Contacting Overlap
	Flat Face		Radius Face									
	Maximum d (inches)	Min. D (inches)	Radius R (inches)									
0.010	0.125	1/2	2	Morse Taper No. 1	160	4	5	4,000	130	0.113	1/4	3/8
0.021	0.187	1/2	2	Morse Taper No. 1	244	6	8	6,500	300	0.139	3/8	7/16
0.031	0.187	1/2	2	Morse Taper No. 1	326	8	10	8,000	530	0.161	1/2	7/16
0.040	0.250	5/8	3	Morse Taper No. 2	412	10	12	8,800	812	0.181	3/4	1/2
0.050	0.250	5/8	3	Morse Taper No. 2	554	14	16	9,600	1,195	0.210	7/8	9/16
0.062	0.250	5/8	3	Morse Taper No. 2	670	18	20	10,600	1,717	0.231	1	5/8
0.078	0.312	5/8	3	Morse Taper No. 2	903	25	30	11,800	2,365	0.268	1-1/8	11/16
0.094	0.312	5/8	4	Morse Taper No. 3	1,160	34	35	13,000	3,054	0.304	1-1/4	3/4
0.109	0.375	7/8	4	Morse Taper No. 3	1,440	45	40	14,200	3,672	0.338	1-5/16	13/16
0.125	0.375	7/8	4	Morse Taper No. 3	1,760	60	45	15,600	4,300	0.375	1-1/2	7/8
0.156	0.500	7/8	6	Male or Female Threaded	2,500	93	50	18,000	6,500	0.446	1-3/4	1
0.187	0.625	1	6	Male or Female Threaded	3,340	130	55	20,500	9,000	0.516	2	1-1/4
0.250	0.750	1-1/4	6	Male or Female Threaded	5,560	230	60	26,000	18,000	0.660	4	1-1/2

Permissible Schedule Variations For Spot Welding Low Carbon Steel (Low Carbon Steel Spot Welding Data Chart — Single Impulse Welding)

DATA COMMON TO ALL CLASSES OF SPOT WELDS				WELDING SET-UP FOR BEST QUALITY—CLASS A WELDS					WELDING SET-UP FOR MEDIUM QUALITY—CLASS B WELDS					WELDING SET-UP FOR GOOD QUALITY—CLASS C WELDS					
Thickness of Each of the Two Work Pieces Inches			Min. Weld Spacing (Note 4) Inches	Min. Con-Overlap (Note 6) Inches	Weld Time (Note 7) Cycles	Elec-trode Force Pounds	Weld-ing Cur-rent Amps.	Diam. of Fused Zone Inches	Average Tensile Shear Strength ±14% Pounds	Weld Time (Note 7) Cycles	Elec-trode Force Pounds	Weld-ing Cur-rent Amps.	Diam. of Fused Zone Inches	Average Tensile Shear Strength ±17% Pounds	Weld Time (Note 7) Cycles	Elec-trode Force Pounds	Weld-ing Cur-rent Amps.	Diam. of Fused Zone Inches	Average Tensile Shear Strength ±20% Pounds
	Min. D Inches	Max. d Inches																	
.010	1/2	1/8	1/4	3/8	4	200	4000	.13	235	5	130	3700	.12	200	15	65	3000	.11	160
.021	1/2	3/16	3/8	7/16	6	300	6100	.17	530	10	200	5100	.16	460	22	100	3800	.14	390
.031	1/2	3/16	1/2	7/16	8	400	8000	.21	980	15	275	6300	.20	850	29	135	4700	.18	790
.040	5/8	1/4	3/4	1/2	10	500	9200	.23	1350	21	360	7500	.22	1230	38	180	5600	.21	1180
.050	5/8	1/4	7/8	9/16	12	650	10300	.25	1820	24	410	8000	.23	1700	42	205	6100	.22	1600
.062	5/8	1/4	1	5/8	14	800	11600	.27	2350	29	500	9000	.26	2150	48	250	6800	.25	2050
.078	5/8	5/16	1-1/8	11/16	21	1100	13300	.31	3225	36	650	10400	.30	3025	58	325	7900	.28	2900
.094	5/8	5/16	1-1/4	3/4	25	1300	14700	.34	4100	44	790	11400	.33	3900	66	390	8800	.31	3750
.109	7/8	3/8	1-5/16	13/16	29	1600	16100	.37	5300	50	960	12200	.36	5050	72	480	9500	.35	4850
.125	7/8	3/8	1-1/2	7/8	30	1800	17500	.40	6900	60	1140	12900	.39	6500	78	570	10000	.37	6150

NOTES:

- Low Carbon Steel is hot rolled, pickled, and slightly oiled with an ultimate strength of 42,000 to 45,000 PSI. Similar to SAE 1005—SAE 1010.
- Electrode Material is Tipaloy #130.
- Surface of steel is lightly oiled but free from grease, scale or dirt.
- Minimum weld spacing is that distance for which no increase in welding current is necessary to compensate for the shunted current effect of adjacent welds.
- Radius Face electrodes may be used:
 0.010 to 0.031 — 2" Radius
 0.031 to 0.078 — 3" Radius
 0.078 to 0.125 — 4" Radius

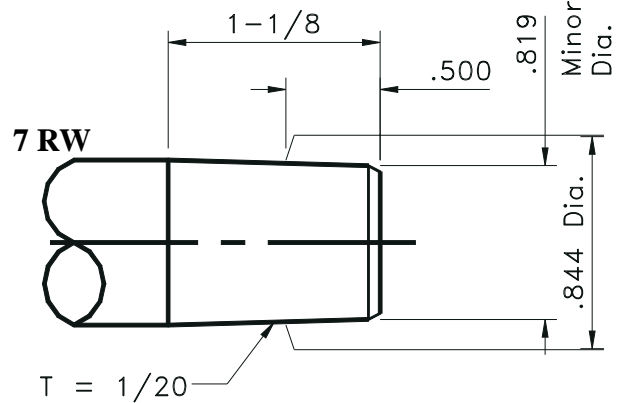
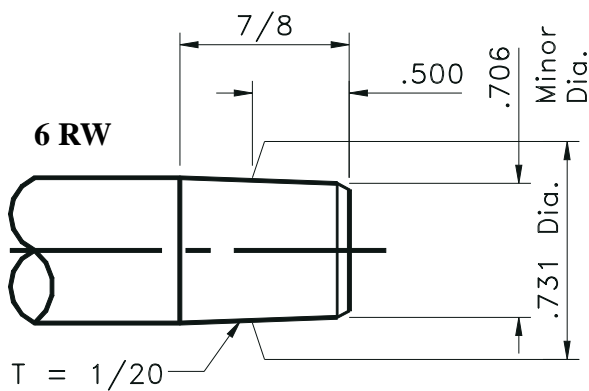
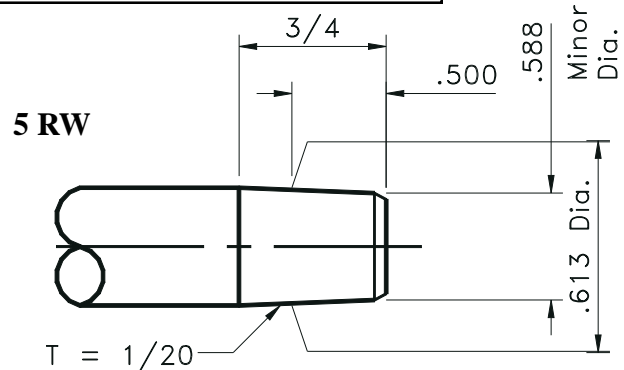
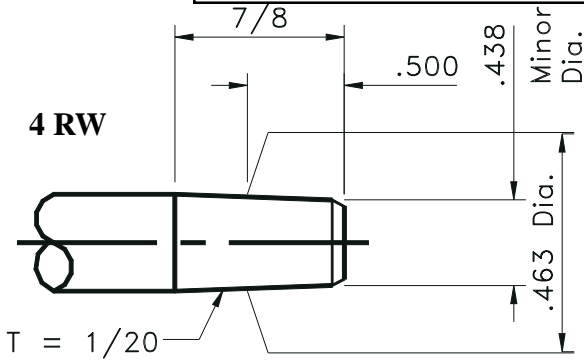
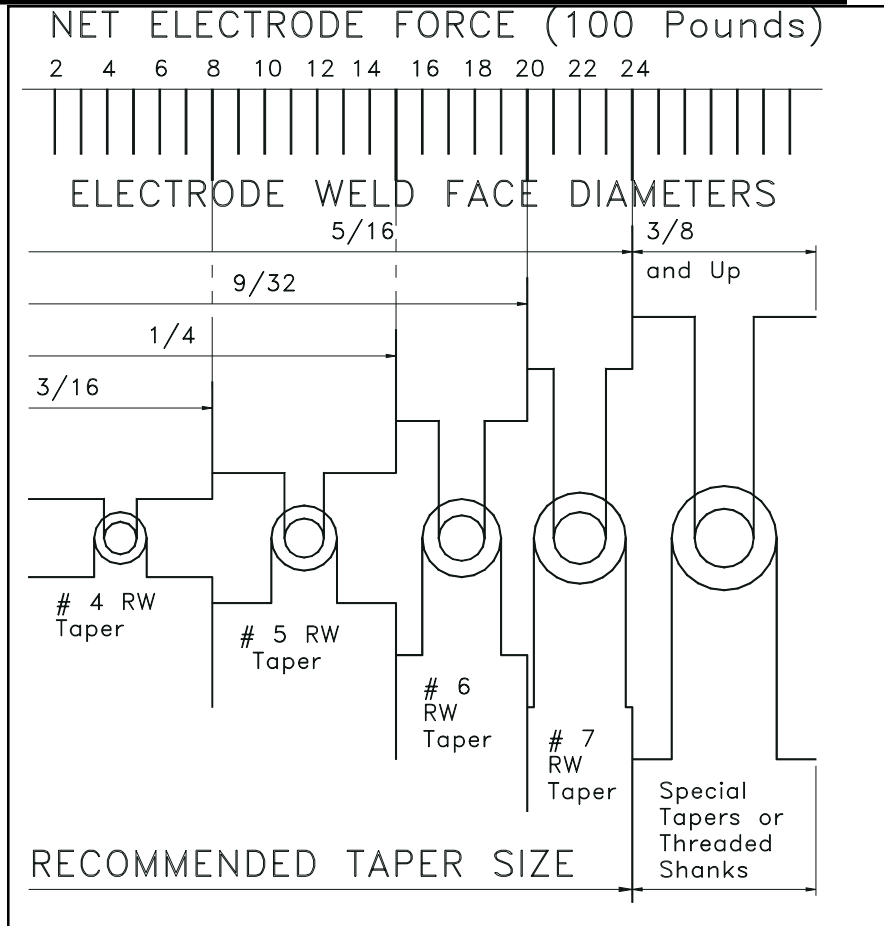
- Weld time is indicated in cycles of 60 cycle frequency.
- Tensile shear strength values are based on recommended test sample sizes.

Direction of Force	Thickness	Width	Length
	.000" to .029"	5/8"	3"
	.030" to .058"	1"	4"
	.059" to .115"	1-1/2"	5"
	.116" to .190"	2"	6"

- Tolerance for machining of electrode diameter "d" is ± .015" of specified dimension.
- Electrode force does not provide for force to press ill-fitting parts together.



WELD SCHEDULE DATA

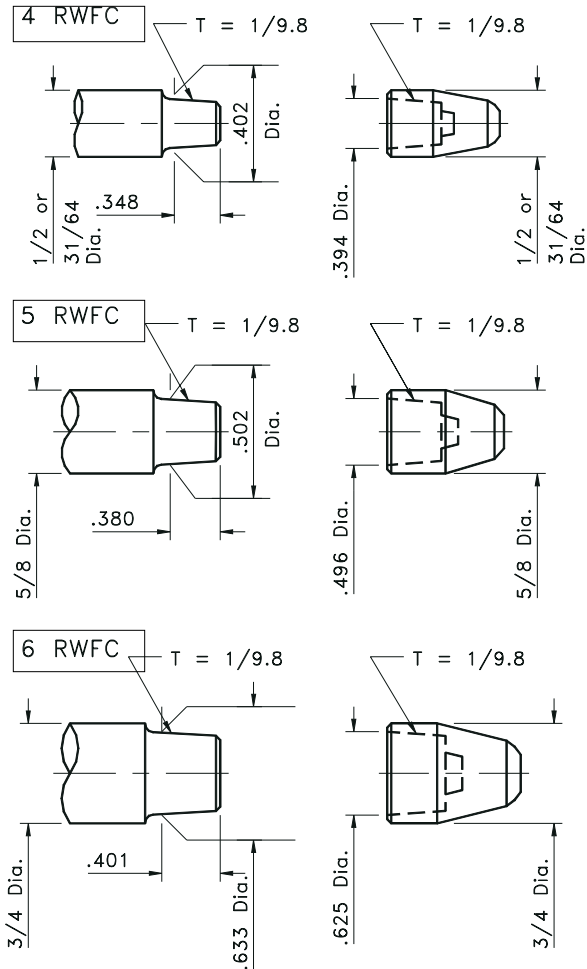


TAPER SELECTION CHART

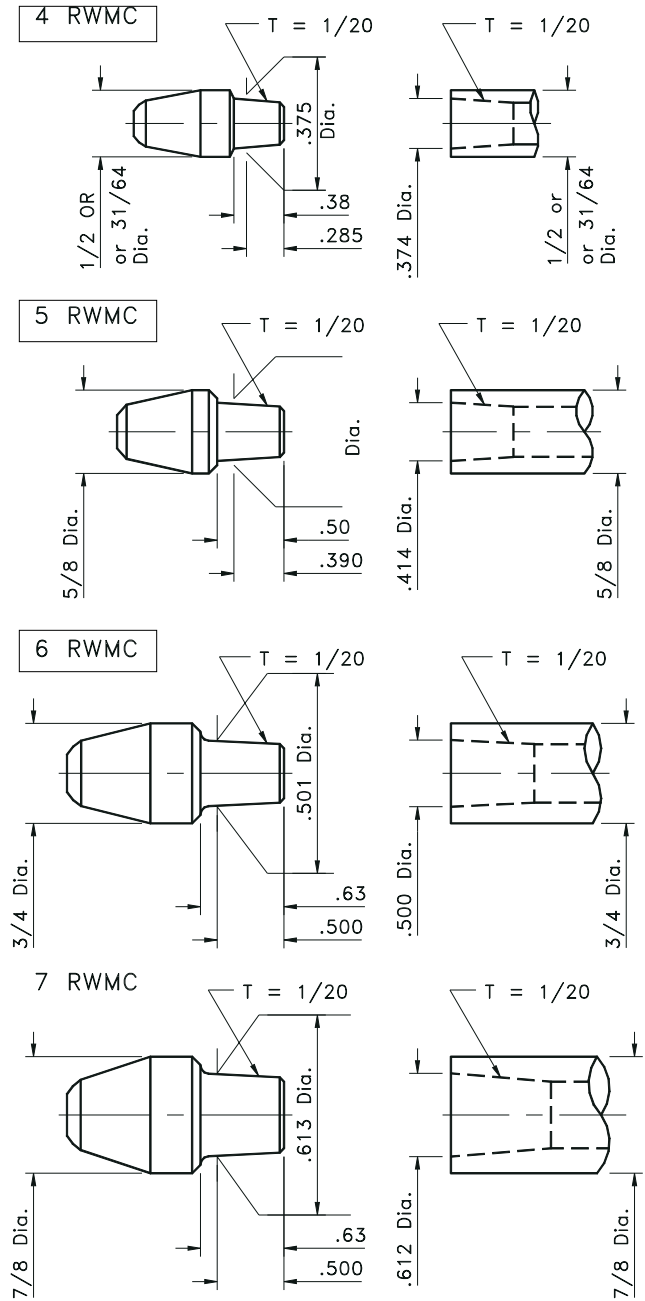
RWMA STANDARD CAP TAPERS

RWMA STANDARD CAP TAPERS

FEMALE CAP TAPERS

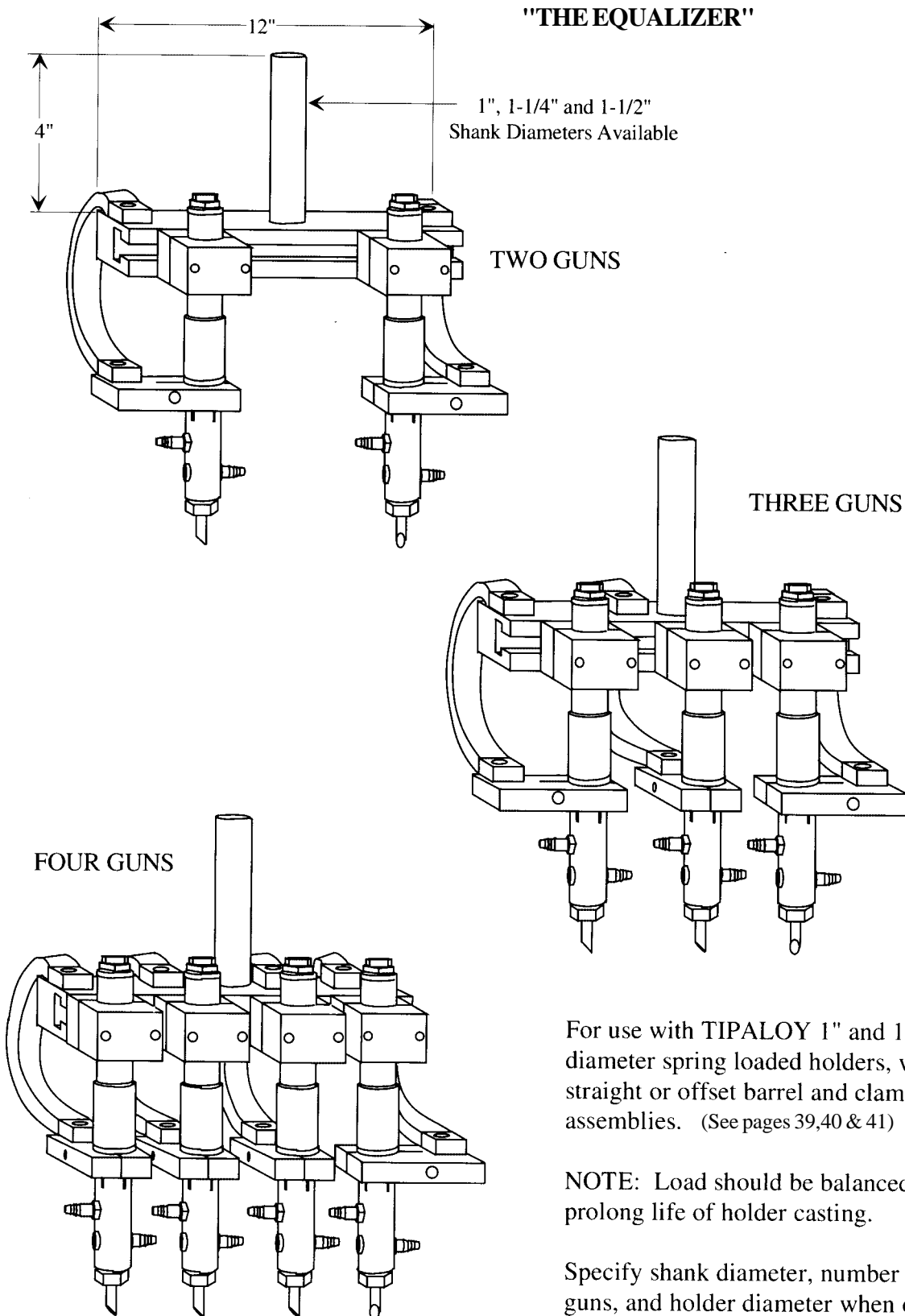


MALE CAP TAPERS



T-3600 SERIES MULTI-SPOT HOLDER

TIPALOY EQUALIZER



For use with TIPALOY 1" and 1-1/4" diameter spring loaded holders, with straight or offset barrel and clamp assemblies. (See pages 39,40 & 41)

NOTE: Load should be balanced to prolong life of holder casting.

Specify shank diameter, number of guns, and holder diameter when ordering.