These standard-tip holders are mounted directly to air or hydraulic cylinder pistons. They are ideal for assembling special multi-head resistance welding equipment. Current and coolant water are brought to each of the holders separately.

Electrode adapters for the tip diameter being used and in lengths to suit your set-up are ordered separately: see page 16. Water tubes, for carrying water into the tip, should also be ordered separately.

TUFFALOY offers both straight and offset holders for cylinder mounting. Clamps, hose connections, water tubes and adaptors are not included. Order separately.

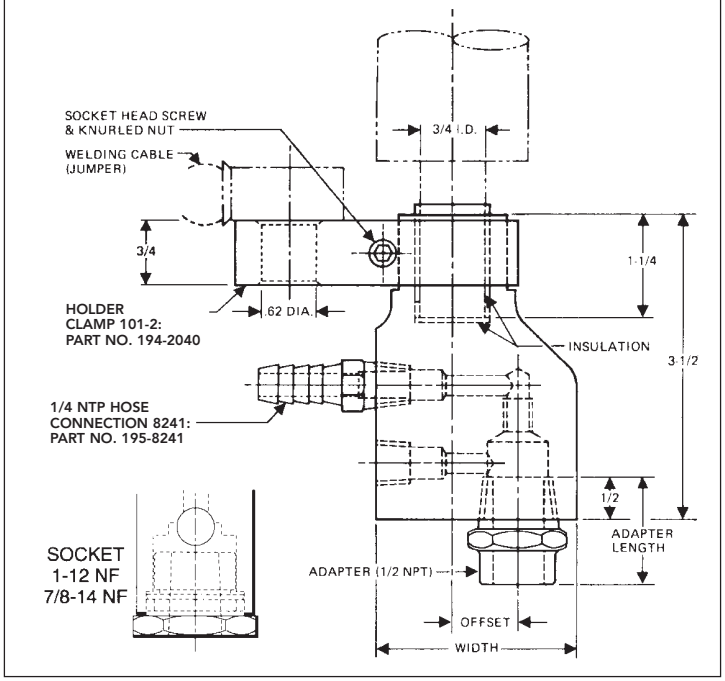
OFFSET HOLDERS

Offset holders are offered in eight offset sizes, from 1/8 to 1 inch. The standard models have a 1/2-NPT adapter socket, to hold adapters for 4 & 5RW tips. Ordering a 3/4-NPT socket will permit adapters for 6 & 7RW tips to be used.

OFFSET HOLDERS

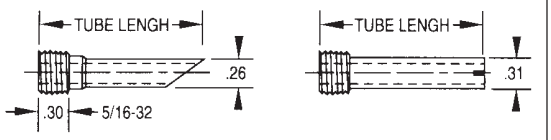
Offset (inches)	Width (inches)	4 & 5 RW Part No. 7/8-14 Threads	4 & 5 RW Part No. 1/2" Pipe	6 & 7 RW Part No. 3/4" Pipe
1.0	2.5	194-1578	194-1588	194-1598
0.88	2.5	194-1577	194-1587	
0.75	2.31	194-1576	194-1586	194-1596
0.62	2.18	194-1575	194-1585	
0.50	2.06	194-1574	194-1584	194-1594
0.38	1.94	194-1573	194-1583	
0.25	1.81	194-1572	194-1582	
0.12	1.68	194-1571	194-1581	

ORDER CLAMP SEPARATELY



To determine distance adapter sticks out from holder, deduct 1/2-in from length of adapter selected. Water tubes 1/2-in. longer than adapter will install approximately flush with adapter face.

STATIONARY WATER TUBES



FOR 4 & 5 RW TIPS FOR 6 OR 7 RW TIPS

STATIONARY WATER TUBES

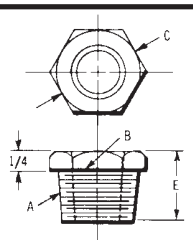
Length	FOR 4RW USE Description	FOR 4RW USE Part No.	FOR 5RW, 6RW OR 7RW USE Description	FOR 5RW, 6RW OR 7RW USE Part No.
3/4	301-.7	194-3107	312-.7	194-3207
1	301-1.0	194-3110	312-1.0	194-3210
1-1/4	301-1.2	194-3112	312-1.2	194-3212
1-1/2	301-1.5	194-3115	312-1.5	194-3215
1-3/4	301-1.7	194-3117	312-1.7	194-3217
2	301-2.0	194-3120	312.2.0	194-3220
2-1/2	301-2.5	194-3125	312-2.5	194-3225
3	301-3.0	194-3130	312-3.0	194-3230
3-1/2	301-3.5	194-3135	312-3.5	194-3235
4	301-4.0	194-3140	312-4.0	194-3240
4-1/2	301-4.5	194-3145	312-4.5	194-3245

TUFFALOY TIP ADAPTERS

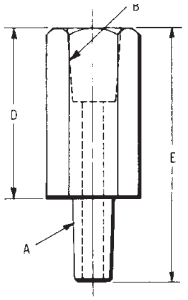
TUFFALOY threaded electrode adapters are used to provide longer electrode holder life, by providing a changable tip socket in holders having threaded openings. Class 2 alloy. Other alloys available.

A Pipe Thread or Taper	B Taper Socket	C Body Size	D Body Length	E Over-All Length	Description	Part Number
1/2-14 NPT	4RW	1" Hex	1/4 3/8 5/8 7/8 1-1/8 1-3/8 1-5/8 1-7/8 2-1/8 2-3/8 2-5/8 2-7/8 3-1/8 3-3/8 4-3/8	7/8 1 1-1/4 1-1/2 1-3/4 2 2-1/4 2-1/2 2-3/4 3 3-1/4 3-1/2 3-3/4 4 5	AD-124-.8 AD-124-1.0 AD-124-1.2 AD-124-1.5 AD-124-1.7 AD-124-2.0 AD-124-2.2* AD-124-2.5 AD-124-2.7* AD-124-3.0 AD-124-3.2* AD-124-3.5 AD-124-3.7* AD-124-4.0 AD-124-5.0*	190-1408 190-1410 190-1412 190-1415 190-1417 190-1420 190-1425 190-1430 190-1435 190-1440
1/2-14 NPT	5RW	1" Hex	1/4 3/8 5/8 7/8 1 1-1/8 1-3/8 1-5/8 1-7/8 2-1/8 2-3/8 2-5/8 2-7/8 3-1/8 3-3/8 3-7/8	7/8 1 1-1/4 1-1/2 1-5/8 1-3/4 2 2-1/4 2-1 /2 2-3/4 3 3-1/4 3-1/2 3-3/4 4 4-1/2	AD-125-.8 AD-125-1.0 AD-125-1.2 AD-125-1.5 AD-125-1.6* AD-125-1.7 AD-125-2.0 AD-125-2.2* AD-125-2.5 AD-125-2.7* AD-125-3.0 AD-125-3.2* AD-125-3.5 AD-125-3.7* AD-125-4.0 AD-125-4.5	190-1508 190-1510 190-1512 190-1515 190-1517 190-1520 190-1525 190-1530 190-1535 190-1540 190-1545
5/8-14 NPT	4RW	1" Hex	1/4 3/8 7/8 1-3/8	7/8 1 1-1/2 2	AD-584-.8 AD-584-1.0 AD-584-1.5* AD-584-2.0*	190-2408
5/8-14 NPT	5RW	1" Hex	1/4 3/8 5/8 7/8 1-1/8 1-3/8 1-7/8 2-3/8 3-3/8	7/8 1 1-1/4 1-1/2 1-3/4 2 2-1/2 3 4	AD-585-.8 AD-585-1.0* AD-585-1.2 AD-585-1.5 AD-585-1.7 AD-585-2.0* AD-585-2.5* AD-585-3.0* AD-585-4.0*	190-2508 190-2510 190-2512 190-2515 190-2517
3/4-14 NPT	5RW	1.25 Hex	3/16 7/16 9/16 13/16 1-1/16 1-9/16 2-1/16 2-9/16 3-1/16 4-1/16	1-1/8 1-3/8 1-1/2 1-3/4 2 2-1/2 3 3-1/2 4 5	AD-345-1.1* AD-345-1.3* AD-345-1.5 AD-345-1.7 AD-345-2.0 AD-345-2.5 AD-345-3.0 AD-345-3.5 AD-345-4.0 AD-345-5.0	 190-3515 190-3517 190-3520 190-3525 190-3530 190-3535 190-3540 190-3550
3/4-14 NPT	6RW	1.25 Hex	5/16 7/16 9/16 1-1/16 1-9/16 1-13/16 2-1/16 2-9/16 3-1/16 3-9/16 4-1/16	1-1/4 1-3/8 1-1/2 2 2-1/2 2-3/4 3 3-1/2 4 4-1/2 5	AD-346-1.2* AD-346-1.3 AD-346-1.5 AD-346-2.0 AD-346-2.5 AD-346-2.7* AD-346-3.0 AD-346-3.5 AD-346-4.0 AD-346-4.5 AD-346-5.0	 190-3613 190-3615 190-3620 190-3625 190-3630 190-3635 190-3640 190-3645 190-3650
3/4-14 NPT	7RW	1.25 Hex	9/16 1-1/16 1-9/16 2-1/16 2-9/16 3-1/16 3-9/16 4-1/16	1-1/2 2 2-1/2 3 3-1/2 4 4-1/2 5	AD-347-1.5 AD-347-2.0 AD-347-2.5 AD-347-3.0 AD-347-3.5 AD-347-4.0 AD-347-4.5 AD-347-5.0	190-3715 190-3720 190-3725 190-3730 190-3735 190-3740 190-3745 190-3750
4RW	5RW	1" Hex	1 2 3	2 3 4	AD-45-2 AD-45-3 AD-45-4	190-4520 190-4530 190-4540
5RW	4RW	7/8 Hex	1/4 1 1-1/2 2 3	1-1/8 2 2-1/2 3 4	AD-54-1 AD-54-2 AD-54-2.5* AD-54-3 AD-54-4	190-5410 190-5420 190-5430 190-5440
5RW	5RW	7/8 Hex	1 1-1/2 2 3 4	2 2-1/2 3 4 5	AD-55-2 AD-55-2.5 AD-55-3* AD-55-4 AD-55-5	190-5520 190-5525 190-5540 190-5550
5RW 6RW 6RW 7RW	6RW 4RW 5RW 4RW	1" Hex 1" Hex 1" Hex 1" Hex	1-1/8 1/4 1/4 1/4	2 1-1/4 1-1/4 1-1/2	AD-56-2 AD-64-1 AD-65-1 AD-74-1	190-5620 190-6410 190-6510 190-7410
7RW	5RW	1" Hex	1/4 3/4 2-1/4 2-3/4	1 2 3-1/2 4	AD-75-1 AD-75-2 AD-75-3.5* AD-75-4*	190-7510 190-7520

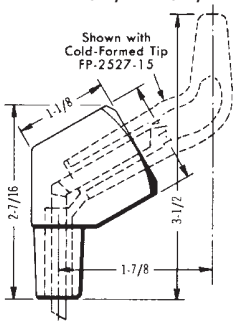
** Not commonly stocked - other adapters available upon request*



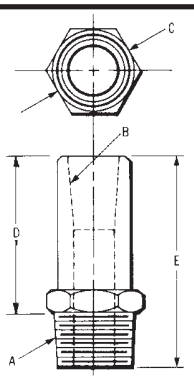
AD-124-.8, AD-125-.8,
AD-584-.8, AD-585-.8,



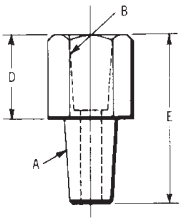
AD-45-2, AD-45-4,



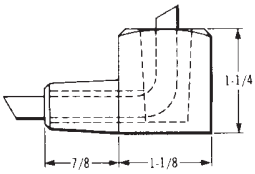
AD-55-30, for 5 RW Tip,
Part No. 190-9553



AD-124-1.0, AD-124-4.0,
AD-125-1.0, AD-125-4.0,
AD-345-1.0, AD-347-4.0,



AD-54-1, AD-75-2,



AD-55-90, for 5 RW Tip,
Part No. 190-9559

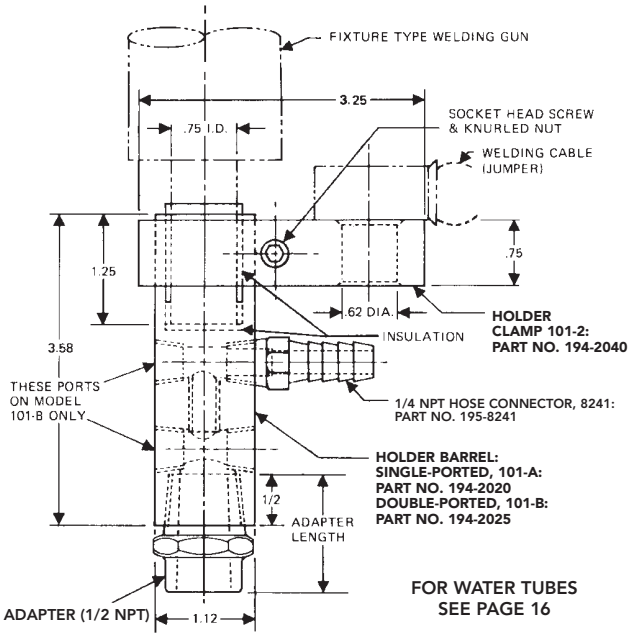
AD-54-90, for 4 RW Tip,
Part No. 190-9549

STRAIGHT THREADED ADAPTERS FOR MULTI-SPOT BARREL AND CLAMP

	A	B	Description	Part No.
1.25 Hex	**4 RW TAPER - 7/8-14 NF**			
	3/8	1-1/8	AD-134-1.1	190-3211
	1/2	1-1/4	AD-134-1.2	190-3212
	5/8	1-3/8	AD-134-1.3	190-3213
	3/4	1-1/2	AD-134-1.5	190-3215
	1	1-3/4	AD-134-1.7	190-3217
	1-1/4	2	AD-134-2.0	190-3220
	1-1/2	2-1/4	AD-134-2.2	190-3222
	1-3/4	2-1/2	AD-134-2.5	190-3225
	2-1/4	3	AD-134-3.0	190-3230
	2-3/4	3-1/2	AD-134-3.5	190-3250
1.25 Hex	**5 RW TAPER - 7/8-14 NF**			
	3/8	1-1/8	AD-135-1.1	190-3311
	1 /2	1-1/4	AD-135-1.2	190-3312
	5/8	1-3/8	AD-135-1.3	190-3313
	3/4	1-1/2	AD-135-1.5	190-3315
	1	1-3/4	AD-135-1.7	190-3317
	1-1/4	2	AD-135-2.0	190-3320
	1-1/2	2-1/4	AD-135-2.2	190-3322
	1-3/4	2-1/2	AD-135-2.5	190-3325
	2-1/4	3	AD-135-3.0	190-3330
	2-3/4	3-1/2	AD-135-3.5	190-3335
1.25 Hex	**5 RW TAPER - 1-12 NF**			
	3/8	1-1/8	AD-105-1.1	190-4311
	1/2	1-1/4	AD-105-1.2	190-4312
	5/8	1-3/8	AD-105-1.3	190-4313
	3/4	1-1/2	AD-105-1.5	190-4315
	1	1-3/4	AD-105-1.7	190-4317
	1-1/4	2	AD-105-2.0	190-4320
1.25 Hex	**5 RW TAPER - 1-12 NF**			
	1-1/2	2-1/4	AD-105-2.2	190-4322
	1-3/4	2-1/2	AD-105-2.5	190-4325
	2	2-3/4	AD-105-2.7	190-4327
	2-1/4	3	AD-105-3.0	190-4330
	2-3/4	3-1/2	AD-105-3.5	190-4335

194-2085 1-3/8 D. Barrel Required for 1-12 NF Adapter

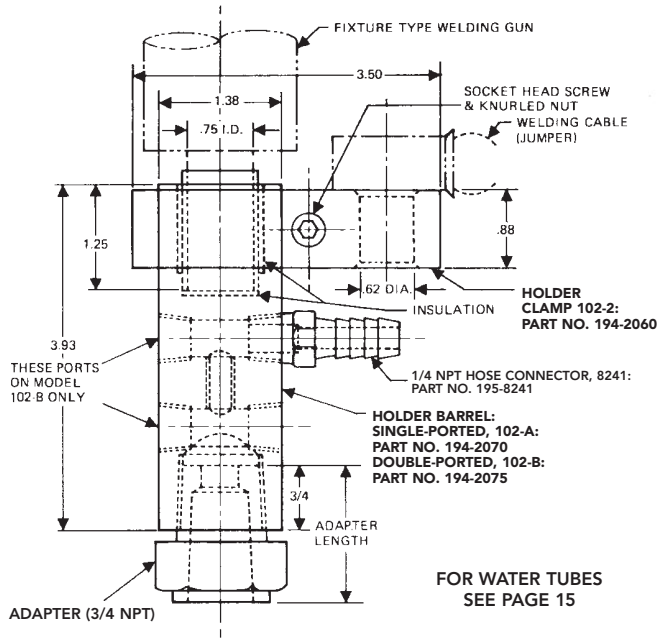
101 SERIES HOLDERS (For 4 & 5 RW Tips)



FOR WATER TUBES SEE PAGE 16

To determine distance adapter sticks out from holder, deduct 1/2" from length of adapter selected. Water tubes 1/2" longer than adapter will install approximately flush with adapter face.

102 SERIES HOLDERS (For 6 & 7 RW Tips)



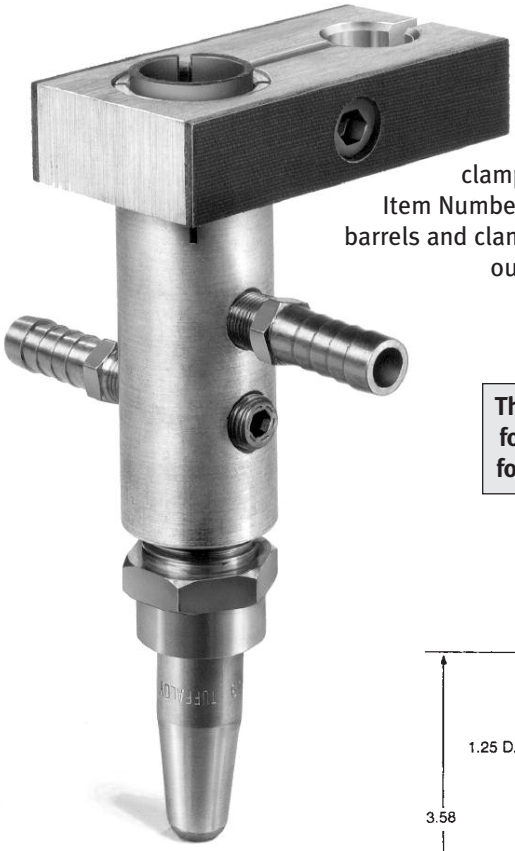
FOR WATER TUBES SEE PAGE 15

To determine distance adapter sticks out from holder deduct 3/4" from length of adapter selected. Water tubes 3/4" longer than adapter will install approximately flush with adapter face.

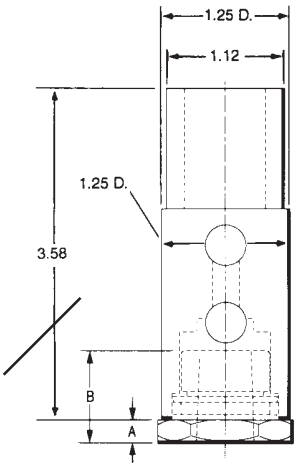
STRAIGHT HOLDERS

Straight holders for multi-spot welding are available in two sizes, to carry tips having four different diameters. Series 101 holders are for 4 & 5RW tips, and Series 102 holders are for 6 & 7RW tips. They may be ordered with one or two sets of coolant ports.

Mating electrical contact surfaces of both the barrels and the clamp are silver plated. Item Numbers for replacement barrels and clamp parts are called out on the drawings.



Threaded adapters for barrels can be found on page 16.



194-2080 Barrel Only for 7/8 - 14 NF Adapter

194-2081 Barrel Only Dual w/Con. @ 20° Offset for 7/8 - 14 NF Adapter

CLAMP AND BARREL ARE SEPARATE PARTS

Adapters, water connectors and water tubes (see page 15 & 16) are sold separately.

HOLDERS and CLAMPS

Holders For Tip Sizes	Number of Coolant Ports					
	One Set		Two Sets		Clamp	
	Description	Part No.	Description	Part No.	Description	Part No.
4 & 5 RW	101-A	194-2020	101-B	194-2025	101-2	194-2040
6 & 7 RW	102-A	194-2070	102-B	194-2075	102-2	194-2060
4 & 5 RW	103-A	194-2080	103-B	194-2081	101-2	194-2040
5 RW			SH-102-B	194-2085	102-2	194-2060

194-2085 (1-3/8 diameter barrel) only for 1-12 NF adapter

GOLDCROWN® AND STANDARD EJECTOR HOLDERS

with self-adjusting water tubes

TUFFALOY straight tip-ejecting holders deliver dependable, first class performance. They are designed with maximum simplicity to require minimum maintenance.
All TUFFALOY straight holders now feature exclusive spring-loaded self-adjusting water tubes to ensure the proper flow of coolant through resistance welding electrodes.
The larger ejector holders incorporate bigger fittings for higher coolant flow rates.

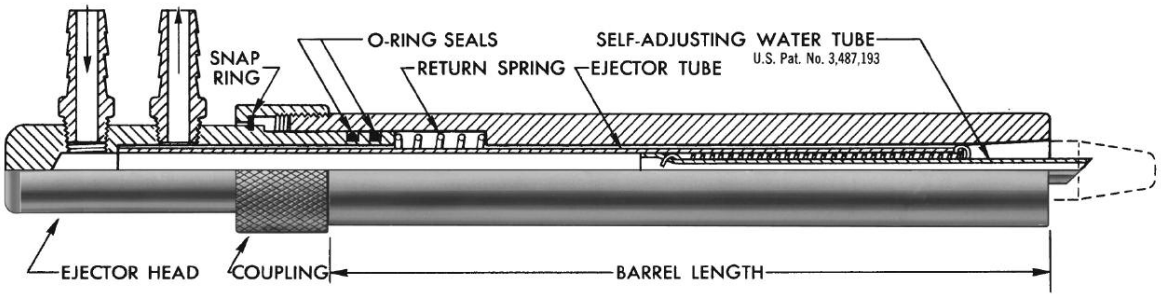
Goldcrown premium holders are made of extra-strength Class 2 alloy and are ground and polished to yield greatest conductivity.

ADAPTER SIZE FOR THREADED BARRELS			
Part No.	Descrip-tion	Taper	THD Size
195-8550	8550	4RW	5/8-14 NPT
195-8551	8551	5RW	5/8-14 NPT
190-3615	AD-346-1.5	6RW	3/4-14 NPT

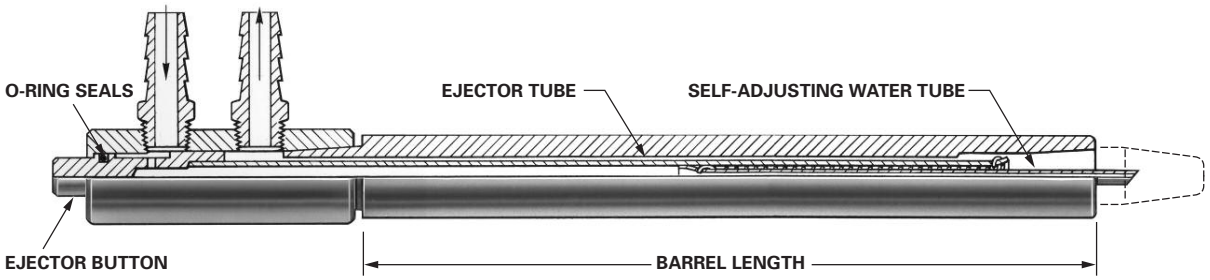
THESE ADAPTERS ARE SUPPLIED *with the holder*

			GOLDCROWN		STANDARD	
Barrel Dia.	Tip Socket RW	Barrel Length	Descrip-tion	Part No.	Descrip-tion	Part No.
5/8	4	8	E-05084	320-0100		
5/8	4	12	E-05124	320-0120		
3/4	4	8	E-06084	320-0140		
3/4	5	8	E-06085	320-0150		
3/4	4	12	E-06124	320-0160		
3/4	5	12	E-06125	320-0170*		
7/8	4	8	E-07084	320-0180		
7/8	5	8	E-07085	320-0190		
7/8	4	12	E-07124	320-0200		
7/8	5	12	E-07125	320-0210		
1	4	8	E-08084	320-0220	SHE-08084	321-0220
1	5	8	E-08085	320-0230	SHE-08085	321-0230
1	6	8	E-08086	320-0240*	SHE-08086	321-0240*
1	4	12	E-08124	320-0250	SHE-08124	321-0250
1	5	12	E-08125	320-0260	SHE-08125	321-0260
1	6	12	E-08126	320-0270*	SHE-08126	321-0270*
1-1/4	4	8	E-10084	320-0280	SHE-10084	321-0280
1-1/4	5	8	E-10085	320-0290	SHE-10085	321-0290
1-1/4	6	8	E-10086	320-0300*	SHE-10086	321-0300*
1-1/4	7	8	E-10087	320-0310	SHE-10087	321-0310
1-1/4	4	12	E-10124	320-0320	SHE-10124	321-0320
1-1/4	5	12	E-10125	320-0330	SHE-10125	321-0330
1-1/4	6	12	E-10126	320-0340*	SHE-10126	321-0340*
1-1/4	7	12	E-10127	320-0350	SHE-10127	321-0350
1-1/2	4	8	E-12084	320-0360*	SHE-12084	321-0360
1-1/2	5	8	E-12085	320-0370	SHE-12085	321-0370
1-1/2	5	8	E-12085-A	320-0375*	SHE-12085-A	321-0375*
1-1/2	6	8	E-12086	320-0380	SHE-12086	321-0380
1-1/2	6	8	E-12086-A	320-0385	SHE-12086-A	321-0385
1-1/2	7	8	E-12087	320-0390	SHE-12087	321-0390
1-1/2	4	12	E-12124	320-0410	SHE-12124	321-0410
1-1/2	4	12	E-12124-A	320-0415*	SHE-12124-A	321-0415*
1-1/2	5	12	E-12125	320-0420	SHE-12125	321-0420
1-1/2	5	12	E-12125-A	320-0425*	SHE-12125-A	321-0425*
1-1/2	6	12	E-12126	320-0440*	SHE-12126	321-0440*
1-1/2	7	12	E-12127	320-0450	SHE-12127	321-0450

Suffix 'A' in holder description denotes a threaded tip adapter is supplied
**Item not normally stocked*



Cross-section of holders with barrels 1 inch or more in diameter.



Cross-section of holders with barrels 7/8 inch or less in diameter.

GOLDSPOT® AND STANDARD NON-EJECTOR HOLDERS

with self-adjusting water tubes

TUFFALOY straight non-ejector holders are now equipped with the same springloaded self-adjusting water tubes as the Goldcrown ejector unit, so electrode cooling is facilitated and improved. They are low in initial cost and inexpensive to maintain. Simple design and few parts contribute to low maintenance cost and excellent performance. Holders are heavy-duty and built to withstand very high welding rates.

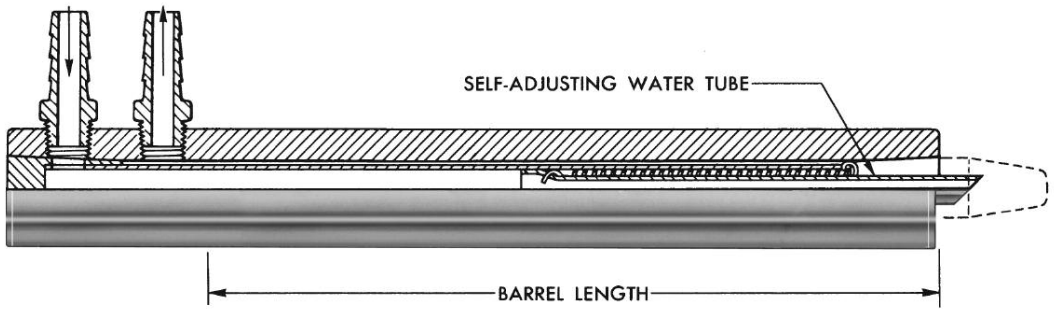
Goldspot premium holders have barrels of Class 2 alloy, ground and polished for best conductivity.

ADAPTER SIZE FOR THREADED BARRELS			
Part No.	Descrip-tion	Taper	THD Size
195-8550	8550	4RW	5/8-14 NPT
195-8551	8551	5RW	5/8-14 NPT
190-3615	AD-346-1.5	6RW	3/4-14 NPT

THESE ADAPTERS ARE SUPPLIED *with the holder*

			GOLDSPOT		STANDARD	
Barrel Dia.	Tip Socket RW	Barrel Length	Descrip-tion	Part No.	Descrip-tion	Part No.
5/8	4	8	N-05084	325-0100		
5/8	4	12	N-05124	325-0120*		
3/4	4	8	N-06084	325-0140		
3/4	5	8	N-06085	325-0150*		
3/4	4	12	N-06124	325-0160*		
3/4	5	12	N-06125	325-0170*		
7/8	4	8	N-07084	325-0180		
7/8	5	8	N-07085	325-0190*		
7/8	4	12	N-07124	325-0200		
7/8	5	12	N-07125	325-0210*		
1	4	8	N-08084	325-0220	SHN-08084	326-0220
1	4	8	N-08084-A	325-0225	SHN-08084-A	326-0225
1	5	8	N-08085	325-0230	SHN-08085	326-0230
1	5	8	N-08085-A	325-0235*	SHN-08085-A	326-0235*
1	6	8	N-08086	325-0240*	SHN-08086	326-0240*
1	4	12	N-08124	325-0250	SHN-08124	326-0250
1	4	12	N-08124-A	325-0255	SHN-08124-A	326-0255
1	5	12	N-08125	325-0260	SHN-08125	326-0260
1	5	12	N-08125-A	325-0265	SHN-08125-A	326-0265
1	6	12	N-08126	325-0270*	SHN-08126	326-0270*
1-1/4	4	8	N-10084	325-0280*	SHN-10084	326-0280*
1-1/4	4	8	N-10084-A	325-0285	SHN-10084-A	326-0285
1-1/4	5	8	N-10085	325-0290	SHN-10085	326-0290
1-1/4	5	8	N-10085-A	325-0295	SHN-10085-A	326-0295
1-1/4	6	8	N-10086	325-0300*	SHN-10086	326-0300*
1-1/4	7	8	N-10087	325-0310*	SHN-10087	326-0310*
1-1/4	4	12	N-10124	325-0320	SHN-10124	326-0320
1-1/4	4	12	N-10124-A	325-0325*	SHN-10124-A	326-0325*
1-1/4	5	12	N-10125	325-0330	SHN-10125	326-0330
1-1/4	5	12	N-10125-A	325-0335	SHN-10125-A	326-0335
1-1/4	6	12	N-10126	325-0340*	SHN-10126	326-0340*
1-1/4	7	12	N-10127	325-0350*	SHN-10127	326-0350*
1-1/2	4	8	N-12084	325-0360*	SHN-12084	326-0360*
1-1/2	4	8	N-12084-A	325-0365*	SHN-12084-A	326-0365*
1-1/2	5	8	N-12085	325-0370	SHN-12085	326-0370
1-1/2	5	8	N-12085-A	325-0375	SHN-12085-A	326-0375
1-1/2	6	8	N-12086	325-0380*	SHN-12086	326-0380*
1-1/2	7	8	N-12087	325-0390	SHN-12087	326-0390
1-1/2	4	12	N-12124	325-0410*	SHN-12124	326-0410*
1-1/2	5	12	N-12125	325-0420	SHN-12125	326-0420
1-1/2	5	12	N-12125-A	325-0425*	SHN-12125-A	326-0425*
1-1/2	6	12	N-12126	325-0440*	SHN-12126	326-0440*
1-1/2	7	12	N-12127	325-0450*	SHN-12127	326-0450*

Suffix "A" in holder description denotes a threaded tip adapter is supplied
**Item not normally stocked*

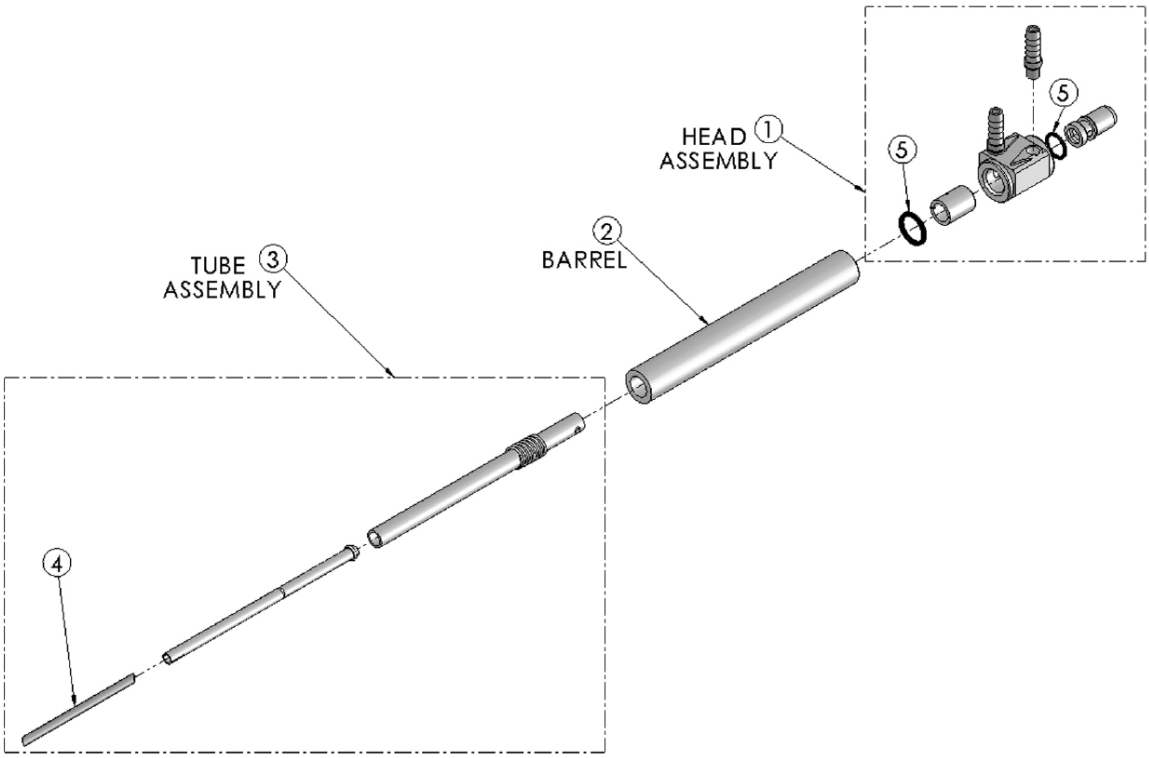


Cross-section view of holders with barrels 1 inch or more in diameter.

Barrel Diameter	Tip Socket RW	Barrel Length	Descrip-tion	Holder Assy.
1	4	8	NHE-08084	319-0213
1-1/4	4	8	NHE-10084	319-0214
1	5	8	NHE-08085	319-0216
1-1/4	5	8	NHE-10085	319-0217
1	4	12	NHE-08124	319-0233
1-1/4	4	12	NHE-10124	319-0234
1	5	12	NHE-08125	319-0236
1-1/4	5	12	NHE-10125	319-0237

TUFFALOY NICKEL PLATED EJECTOR HOLDERS

TUFFALOY nickel plated ejector holders feature high conductivity copper with nickel plated surfaces for corrosion resistance and super conductivity. These holders also feature adjustable water tubes to insure proper water flow for all electrodes.



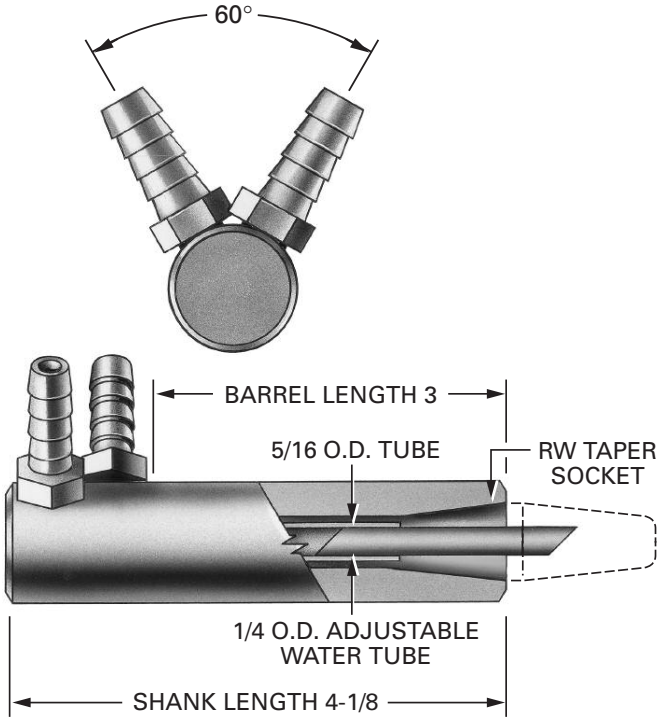
Descrip-tion	Holder Assy.	1 Head Assy.	2 Barrel	3 Tube Assy.	4 Water Tube	5 Hose O-Ring Kit
NHE-08084	319-0213	195-0101	001-213B	195-0210	195-0017	037-0105
NHE-10084	319-0214	195-0101	001-214B	195-0210	195-0017	037-0105
NHE-08085	319-0216	195-0100	001-216B	195-0208	195-0015	037-0106
NHE-10085	319-0217	195-0100	001-217B	195-0208	195-0015	037-0106
NHE-08124	319-0233	195-0101	001-233B	195-0211	195-0017	037-0105
NHE-10124	319-0234	195-0101	001-234B	195-0211	195-0017	037-0105
NHE-08125	319-0236	195-0100	001-236B	195-0212	195-0015	037-0106
NHE-10125	319-0237	195-0100	001-237B	195-0212	195-0015	037-0106

CLOSED-COUPLED HOLDERS

For use where welding space is limited. Standard body length is 3 inches. Other lengths are made on request; minimum length 2 inches.

Body Dia.	Tip Socket	Descrip-tion	Part No.
3/4	4RW	N-06034	330-0140
7/8	4RW	N-07034	330-0180
7/8	5RW	N-07035	330-0190
1	4RW	N-08034	330-0220
1	5RW	N-08035	330-0230
1-1/4	4RW	N-10034	330-0280
1-1/4	5RW	N-10035	330-0290
1-1/2	4RW	N-12034	330-0360*
1-1/2	5RW	N-12035	330-0370*

**Item not normally stocked*

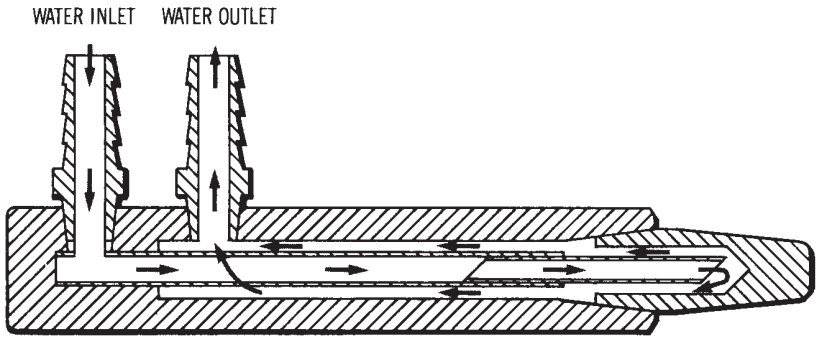


ADJUSTABLE WATER TUBE USE

It is very important that resistance welding electrodes be kept as cool as possible; excessive heat softens them, allowing the nose to mushroom and weld quality to drop.

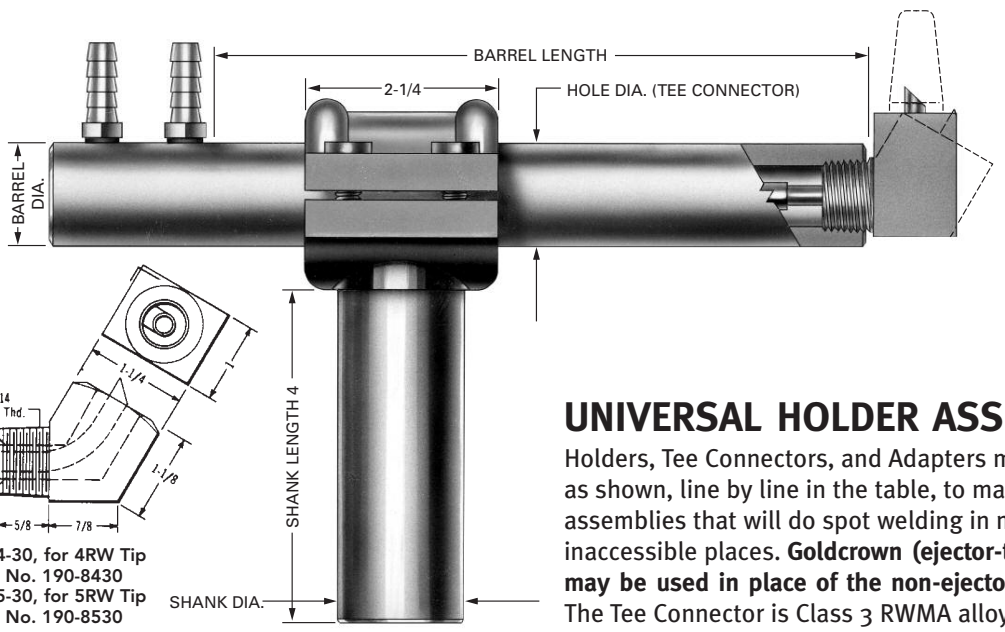
Adjustable water tubes are used to deflect incoming coolant water to the full extent of the water hole in the electrode. Before installing a tip, check that there is an adjustable water tube in place and that it is pulled out far enough so that it will contact the end of the water hole in the tip.

The drawing shows a typical straight holder, but the principle is the same for all types of holders.

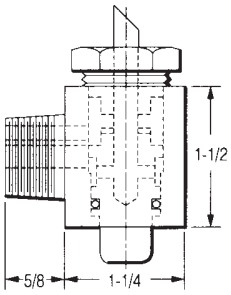


Adjustable water tube correctly positioned in tip. Cold water will strike the hottest part of the tip first.

TUFFALOY OFFSET HOLDERS



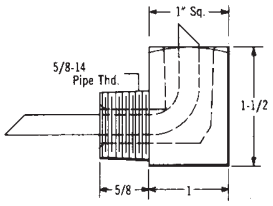
AD-584-30, for 4RW Tip
Part No. 190-8430
AD-585-30, for 5RW Tip
Part No. 190-8530



AD-584-90E, for 4RW Tip
Part No. 190-9490
AD-585-90E, for 5RW Tip
Part No. 190-9590

UNIVERSAL HOLDER ASSEMBLIES

Holders, Tee Connectors, and Adapters may be assembled as shown, line by line in the table, to make up holder assemblies that will do spot welding in many otherwise inaccessible places. **Goldcrown (ejector-type) holders may be used in place of the non-ejector holders listed.** The Tee Connector is Class 3 RWMA alloy.



AD-584-90, for 4RW Tip
Part No. 190-8490
AD-585-90, for 5RW Tip
Part No. 190-8590

HOLDERS				TEE CONNECTORS			
Barrel Dia.	Barrel Length	Descrip-tion.	Part No.	Hole Dia.	Shank Dia.	Descrip-tion	Part No.
1	8	N-08085-A	325-0235	1	1	T-1-1	192-1100
1-1/4	8	N-10085-A	325-0295	1-1/4	1	T-1	192-1000
1-1/4	8	N-10085-A	325-0295	1-1/4	1	T-1	192-1000
1-1/4	8	N-10085-A	325-0295	1-1/4	1-1/4	T-125	192-1250
1-1/4	8	N-10085-A	325-0295	1-1/4	1-1/4	T-125	192-1250
1-1/4	8	N-10085-A	325-0295	1-1/4	1-1/4	T-125	192-1250
1-1/2	8	N-12085-A	325-0375	1-1/2	1-1/2	T-15	192-1500
1-1/2	8	N-12085-A	325-0375	1-1/2	1-1/2	T-15	192-1500
1-1/2	8	N-12085-A	325-0375	1-1/2	1-1/2	T-15	192-1500

ADAPTERS TO CHOOSE FROM			
Tip Socket	Angle Degrees	Descrip-tion	Part No.
4RW	90	AD-584-90	190-8490
4RW	30	AD-584-30	190-8430
5RW	90	AD-585-90	190-8590
5RW	30	AD-585-30	190-8530
6RW	90	AD-586-90	190-8690

WELDER ARMS TUFFALOY

Class 2 spot welding machine arms made by Tuffaloy reduce set up time and give longer life.

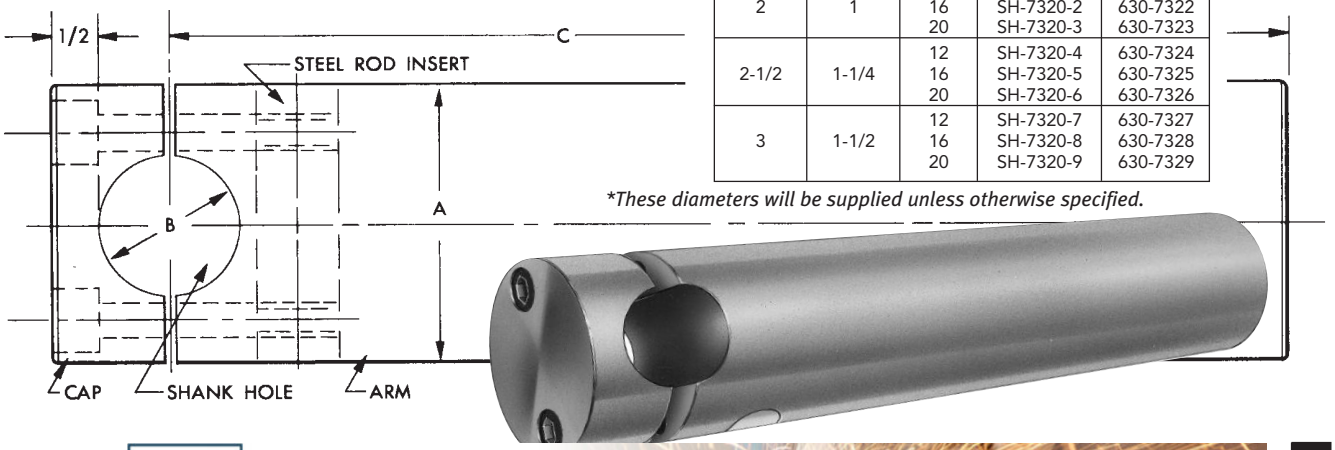
Electrode holder shanks can be attached to these arms from the front, by bolting the cap over them. This means no extra clearance is required between the arms to allow running a shank up (or down) into a hole in the arm. It makes the insertion of Tuffaloy multiple-welding holders much easier.

One of the most common failures of welder arms is the destruction of the bolt hole threads, due to the relatively soft copper involved. Tuffaloy arms have a transverse steel bar insert in which the bolt hole threads are cut. This provides greatly increased thread life.

Standard arm configurations are shown in the table. Special arms are also available.

A Arm Diameter	B Hole Diameter*	C Arm Length	Descrip-tion	Part No.
2	1	12	SH-7320-1	630-7321
		16	SH-7320-2	630-7322
		20	SH-7320-3	630-7323
2-1/2	1-1/4	12	SH-7320-4	630-7324
		16	SH-7320-5	630-7325
		20	SH-7320-6	630-7326
3	1-1/2	12	SH-7320-7	630-7327
		16	SH-7320-8	630-7328
		20	SH-7320-9	630-7329

**These diameters will be supplied unless otherwise specified.*

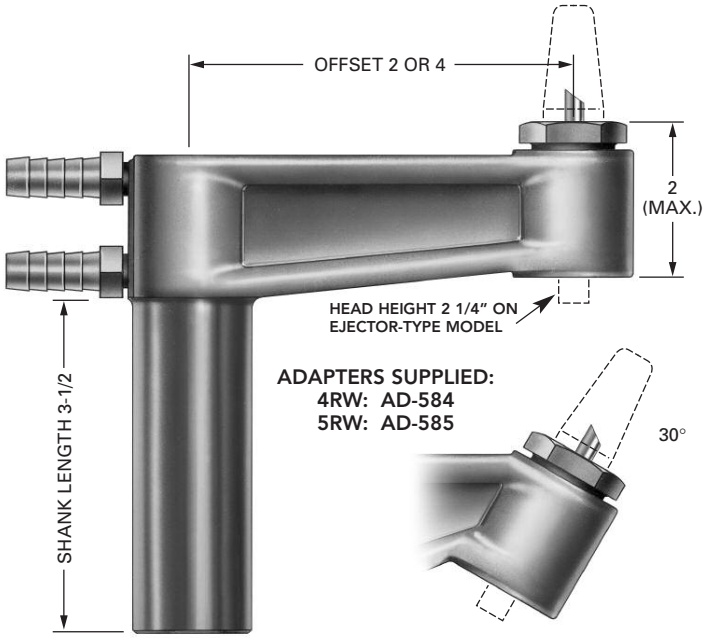


STANDARD OFFSET HOLDERS

TUFFALOY Cast Class 3 Alloy offset holders combine long life with good conductivity. Threaded tip adapters are easily replaced when tip socket is worn beyond use, or when you wish to change to a different taper size.

TUFFALOY offset holders are made in 2- and 4-inch offsets, and in four shank sizes, with 90° and 30° heads. They are supplied with adapters for No. 4 or No. 5 RW taper tips.

Tip Ejector mechanisms are available on all 90° head holders and the 30° head 4-in. offset holders. **When ordering this feature change order number prefix from 'ON' to 'OE'. Example: OE-874-290.**



TWO-INCH OFFSET HOLDERS

Adapter Tip Socket	Socket Angle	3/4" SHANK DIA.		7/8" SHANK DIA.		1" SHANK DIA.		1-1/4" SHANK DIA.		1-1/2" SHANK DIA.	
		Description	Part No.	Description	Part No.	Description	Part No.	Description	Part No.	Description	Part No.
4RW	30°	ON-754-230	335-1300	ON-874-230	335-1400*	ON-14-230	335-1000	ON-1254-230	335-1100	ON-154-230	335-1200*
4RW	90°	ON-754-290	335-1310*	ON-874-290	335-1410*	ON-14-290	335-1010	ON-1254-290	335-1110	ON-154-290	335-1210*
5RW	30°	ON-755-230	335-1350*	ON-875-230	335-1450*	ON-15-230	335-1050	ON-1255-230	335-1150	ON-155-230	335-1250*
5RW	90°	ON-755-290	335-1360*	ON-875-290	335-1460*	ON-15-290	335-1060	ON-1255-290	335-1160	ON-155-290	335-1260

FOUR-INCH OFFSET HOLDERS

4RW	30°	ON-754-430	335-1320*	ON-874-430	335-1420*	ON-14-430	335-1020	ON-1254-430	335-1120	ON-154-430	335-1220*
4RW	90°	ON-754-490	335-1330*	ON-874-490	335-1430*	ON-14-490	335-1030	ON-1254-490	335-1130	ON-154-490	335-1230*
5RW	30°	ON-755-430	335-1370*	ON-875-430	335-1470*	ON-15-430	335-1070	ON-1255-430	335-1170	ON-155-430	335-1270
5RW	90°	ON-755-490	335-1380*	ON-875-490	335-1480*	ON-15-490	335-1080	ON-1255-490	335-1180	ON-155-490	335-1280

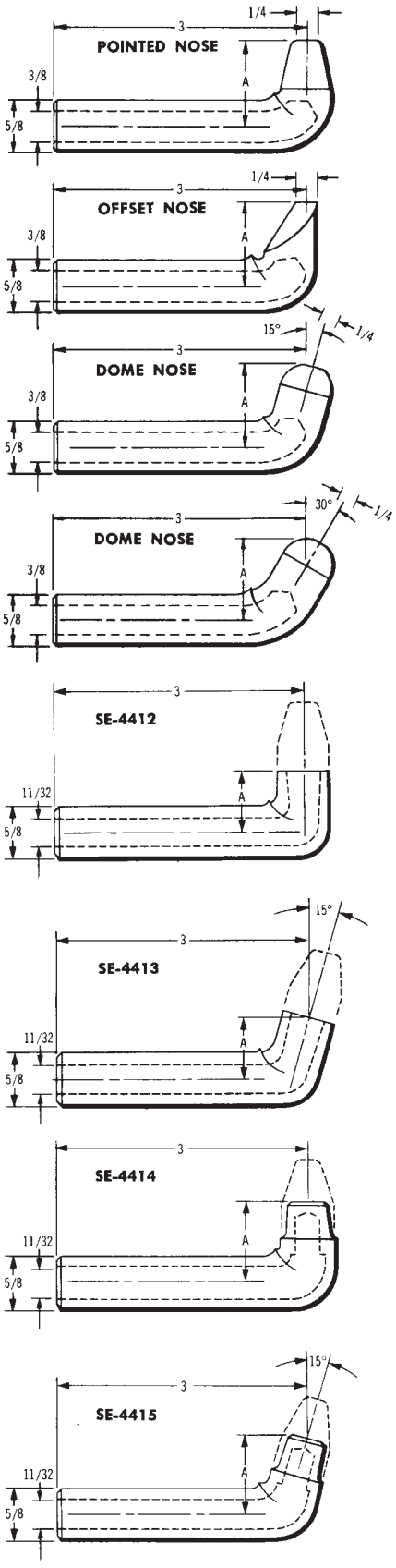
TWO-INCH EJECTOR STYLE OFFSET HOLDERS

Adapter Tip Socket	Socket Angle	3/4" SHANK DIA.		7/8" SHANK DIA.		1" SHANK DIA.		1-1/4" SHANK DIA.		1-1/2" SHANK DIA.	
		Description	Part No.	Description	Part No.	Description	Part No.	Description	Part No.	Description	Part No.
4RW	90°	OE-754-290	335-0315*	OE-874-290	335-0410*	OE-14-290	335-0010	OE-1254-290	335-0110	OE-154-290	335-0210
5RW	90°	OE-755-290	335-0360*	OE-875-290	335-0460*	OE-15-290	335-0060	OE-1255-290	335-0160	OE-155-290	335-0260

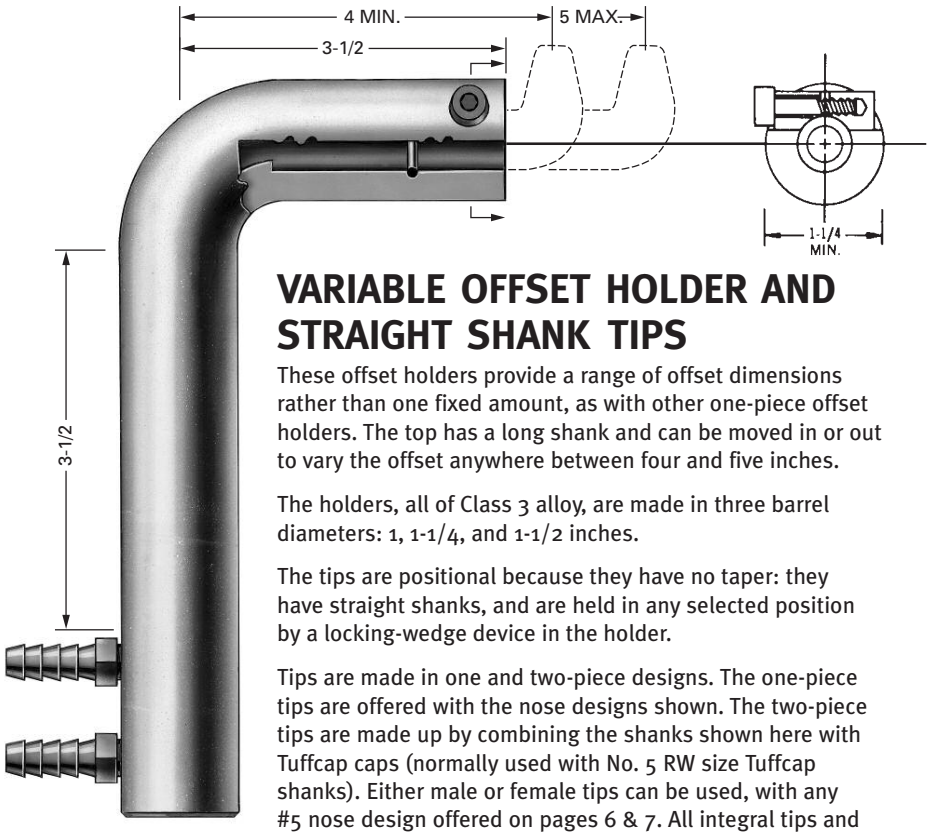
FOUR-INCH EJECTOR STYLE OFFSET HOLDERS

4RW	30°	OE-754-430	335-0320*	OE-874-430	335-0420*	OE-14-430	335-0020	OE-1254-430	335-0120	OE-154-430	335-0220
4RW	90°	OE-754-490	335-0330*	OE-874-490	335-0430*	OE-14-490	335-0030	OE-1254-490	335-0130	OE-154-490	335-0230
5RW	30°	OE-755-430	335-0370*	OE-875-430	335-0470*	OE-15-430	335-0070	OE-1255-430	335-0170	OE-155-430	335-0270
5RW	90°	OE-755-490	335-0380*	OE-875-490	335-0480*	OE-15-490	335-0080	OE-1255-490	335-0180	OE-155-490	335-0280

**May not be in stock*



VARIABLE-OFFSET HOLDERS		
Shank Dia.	Descrip-tion	Part No.
1	SH-7223	345-7223
1-1/4	SH-7224	345-7224
1-1/2	SH-7225	345-7225



VARIABLE OFFSET HOLDER AND STRAIGHT SHANK TIPS

These offset holders provide a range of offset dimensions rather than one fixed amount, as with other one-piece offset holders. The top has a long shank and can be moved in or out to vary the offset anywhere between four and five inches.

The holders, all of Class 3 alloy, are made in three barrel diameters: 1, 1-1/4, and 1-1/2 inches.

The tips are positional because they have no taper: they have straight shanks, and are held in any selected position by a locking-wedge device in the holder.

Tips are made in one and two-piece designs. The one-piece tips are offered with the nose designs shown. The two-piece tips are made up by combining the shanks shown here with Tuffcap caps (normally used with No. 5 RW size Tuffcap shanks). Either male or female tips can be used, with any #5 nose design offered on pages 6 & 7. All integral tips and shanks shown here are of Class 2 alloy.

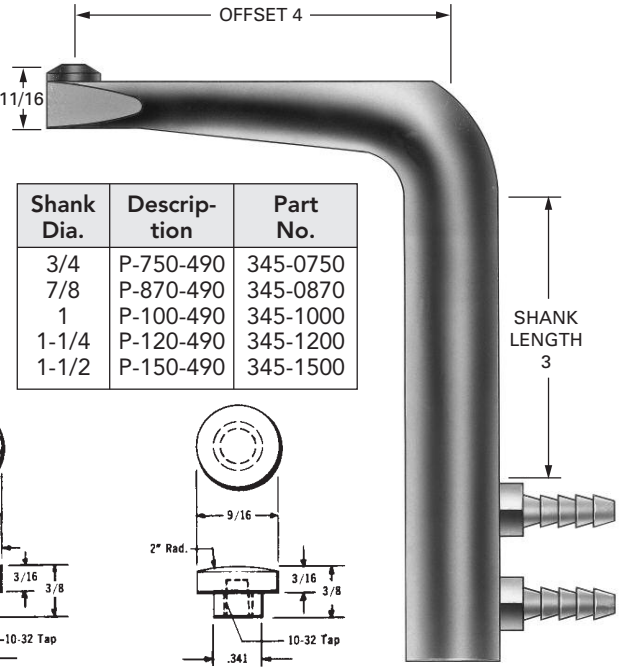
STRAIGHT-SHANK TIPS			
Type of Tip	Nose Length 'A'	Descrip-tion	Part No.
Pointed	1"	SE-4408-1	170-4408
Offset	1"	SE-4409-1	170-4409
15° Dome	1"	SE-4410-1	170-4410
30° Dome	1"	SE-4411-1	170-4411
Pointed	2"	SE-4408-2	170-4418
Offset	2"	SE-4409-2	170-4419
15° Dome	2"	SE-4410-2	170-4420
30° Dome	2"	SE-4411-2	170-4421

STRAIGHT-SHANK TUFFCAP SHANKS				
Tuffcap Cap Type	Nose Length 'A'	Angle	Descrip-tion	Part No.
Male	3/4"	90°	SE-4412	170-4422
Male	3/4"	15°	SE-4413	170-4423
Female	1"	90°	SE-4414	170-4424
Female	1"	15°	SE-4415	170-4425

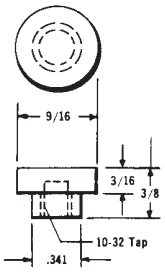
TUFFALOY PADDLE-TYPE HOLDERS AND SOCKET-TYPE TIPS

This holder is for welding in very restricted areas. It provides a very low head height and a four-inch offset. It is made in shank diameters of 3/4, 7/8, 1, and 1-1/4 inches. An adapter bushing is used to add a 1-1/2-in. dia. model to the line. Each holder comes complete with a socket-type tip (SE-3101) and holding screw. The tip may be inserted in either side of the paddle. Holders are of Class 2 alloy. Tips are available in Class 1, Class 2, Class 3 alloy, or Z alloy.

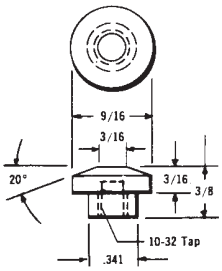
The four socket-type tips shown here can be used in special welding fixtures and dies as well as in the paddle-type holders.



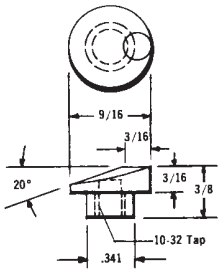
Shank Dia.	Descrip-tion	Part No.
3/4	P-750-490	345-0750
7/8	P-870-490	345-0870
1	P-100-490	345-1000
1-1/4	P-120-490	345-1200
1-1/2	P-150-490	345-1500



FLAT FACED
Class 1 SE-3099-1
Part No. 170-3099-1
Class 2 SE-3099
Part No. 170-3099
Class 3 SE-3111
Part No. 170-3111
ZIRC SE-3099-Z
Part No. 170-3099-Z

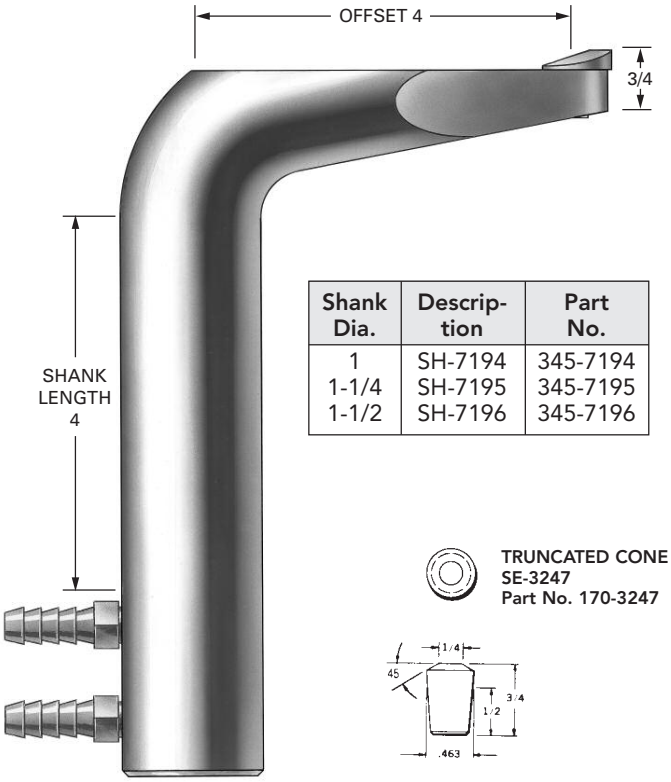


TRUNCATED CONE
Class 1 SE-3101-1
Part No. 170-3101-1
Class 2 SE-3101
Part No. 170-3101
Class 3 SE-3113
Part No. 170-3113
ZIRC SE-3101-Z
Part No. 170-3101-Z



OFFSET
Class 1 SE-3102-1
Part No. 170-3102-1
Class 2 SE-3102
Part No. 170-3102
Class 3 SE-3123
Part No. 170-3123
ZIRC SE-3102-Z
Part No. 170-3102-Z

RADIUS FACED
Class 1 SE-3110-1
Part No. 170-3110-1
Class 2 SE-3110
Part No. 170-3110
Class 3 SE-3133
Part No. 170-3133
ZIRC SE-3110-Z
Part No. 170-3110-Z



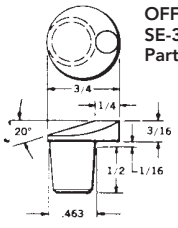
Shank Dia.	Descrip-tion	Part No.
1	SH-7194	345-7194
1-1/4	SH-7195	345-7195
1-1/2	SH-7196	345-7196

TUFFALOY HEAVY-DUTY PADDLE-TYPE HOLDERS AND TIPS

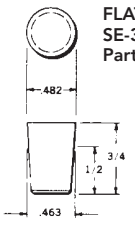
TUFFALOY heavy-duty paddle-type holders are made of the stronger Class 3 alloy, for greater rigidity and minimum deflection, even under loads of 1000 pounds and more. Class 3 alloy provides 154% more tensile strength. Head height is a low 3/4-in. and the shank length is a usable 4 inches.

Three low-profile electrodes of Class 2 alloy are offered for use in this heavy-duty holder. If applications permit greater head height, any standard No. 4 RW tip may be used.

TRUNCATED CONE
SE-3247
Part No. 170-3247



OFFSET
SE-3248
Part No. 170-3248



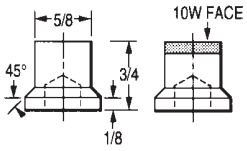
FLAT FACED
SE-3249
Part No. 170-3249

HIGH PRESSURE TIPS

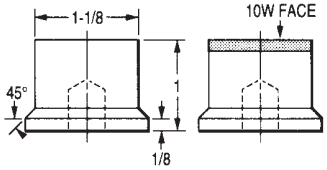
Spot and projection welding operations may utilize pressures over 2000 lbs. TUFFALOY high-pressure tips have flat bottoms which eliminates tip jamming in tapered holders. Assembled tip and holder heights are always the same, as contrasted to tapered tips which can be forced into the sockets varying distances.

TUFFALOY high pressure tips can be used in the two holder styles shown: PM holders for mounting on the platens of press-type welders, and straight holders for spot welder arm mounting. The tips are held to the holders by a threaded coupling. Copper tungsten faced tips are available for high pressure wear and projection welding.

FLAT FACED

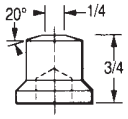


Size 1 PMC-2503
Part No. 180-2203
Part No. 180-2203-10W

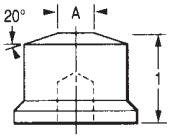


Size 2 PMC-2104
Part No. 180-1040
Part No. 180-2104-10W

TRUNCATED CONE



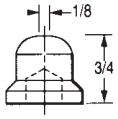
Size 1 PME-2503
Part No. 180-2303



Size 2

'A'	Description	Part No.
1/4	PME-21041	180-1041
5/16	PME-21042	180-1042
3/8	PME-21043	180-1043
7/16	PME-21044	180-1044
1/2	PME-21045	180-1045

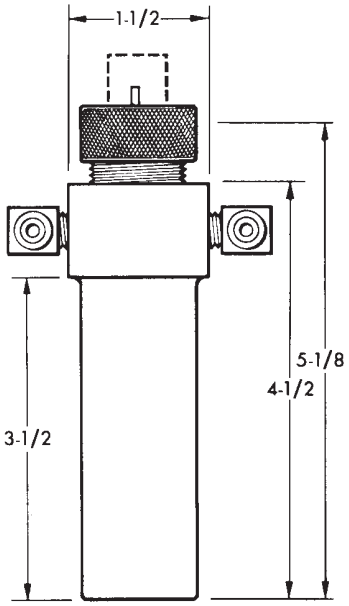
DOME NOSED

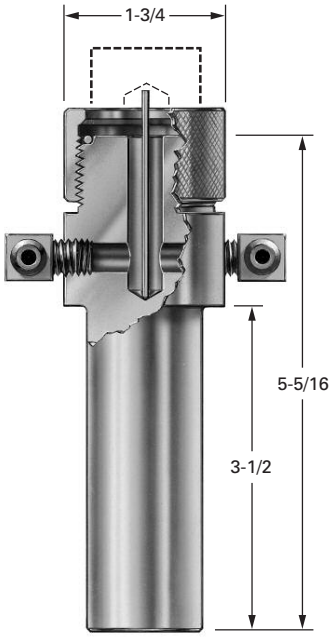


Size 1 PMB-2503
Part No. 180-2103

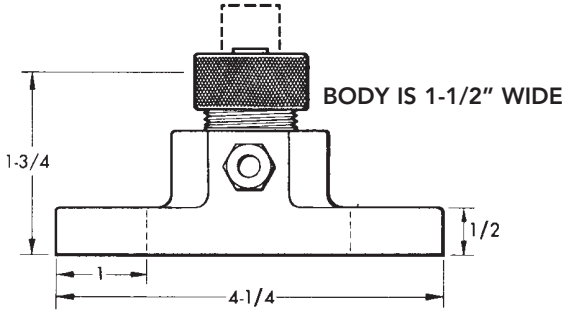
STRAIGHT HOLDERS CLASS 2 ALLOY

Straight holders are made for carrying TUFFALOY high pressure tips in rocker arm welders or press-type welder horn extensions. They are made in two basic sizes, to accommodate the Size 1 and 2 tips. They are of Class 2 alloy and hold the tips in the same manner as do the PM holders.

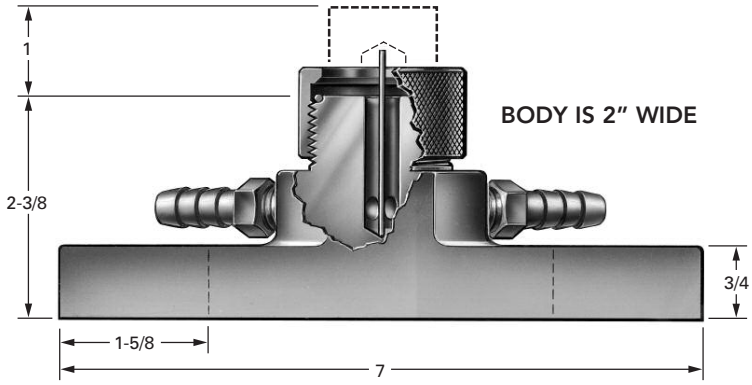




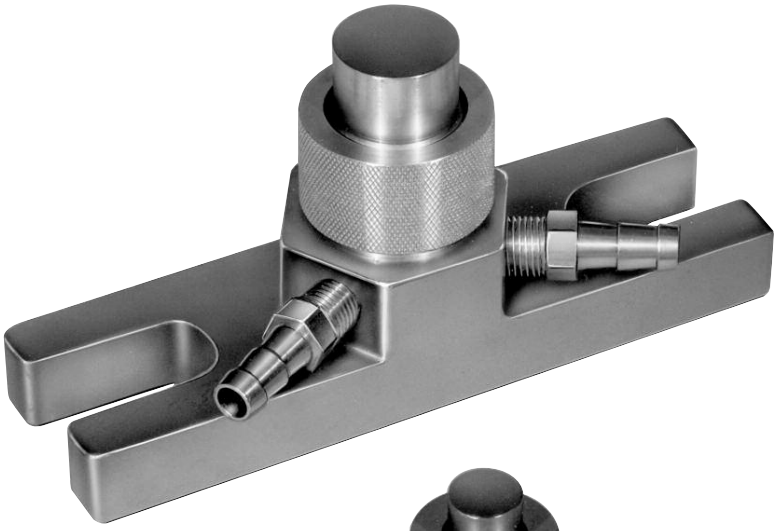
Size	Barrel Dia.	Descrip-tion	Part No.
1	1	4511	350-4511
1	1-1/4	4512	350-4512
1	1-1/2	4513	350-4513
2	1-1/4	4521	350-4521
2	1-1/2	4522	350-4522

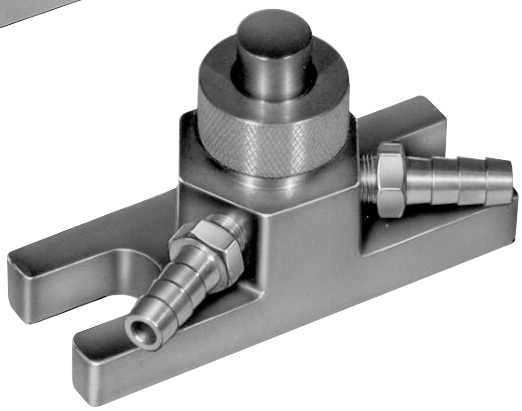


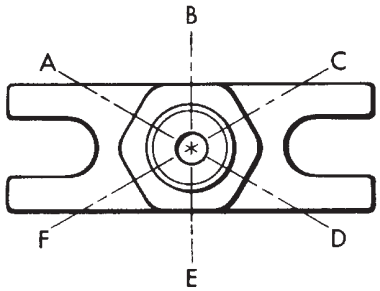
Size 1 PM holder (9/16-in. mounting bolts)
4510 holder, Part No. 350-4510



Size 2 PM holder (3/4-in. mounting bolts)
4520 holder, Part No. 350-4520







PM HOLDERS

TUFFALOY PM holders are mounted directly to press-type welder platens, or are used as components of special weld fixturing.

Platen Mounting: PM holders bolt easily to the platen T-slots at any desired location, in a minimum of time (no intermediary device is required). Big half-inch mounting bolts may be used to assure good conductivity. They are the first such standard, stocked holders to be made available. They come in two sizes, to match standard T-slot spacing, and to hold the 2 sizes of tips shown. The small size 1 PM holder is for use on RWMA Size 1 press-type welders (3-1/2 in. spacing) and the large size, 2 PM holder is for Size 2 and 3 welders (5- and 6-in. spacing). The electrodes used do not require any particular radial positioning to obtain proper coolant flow. These are compact holders that may be used one-to-one or in multiples in close proximity to one another.

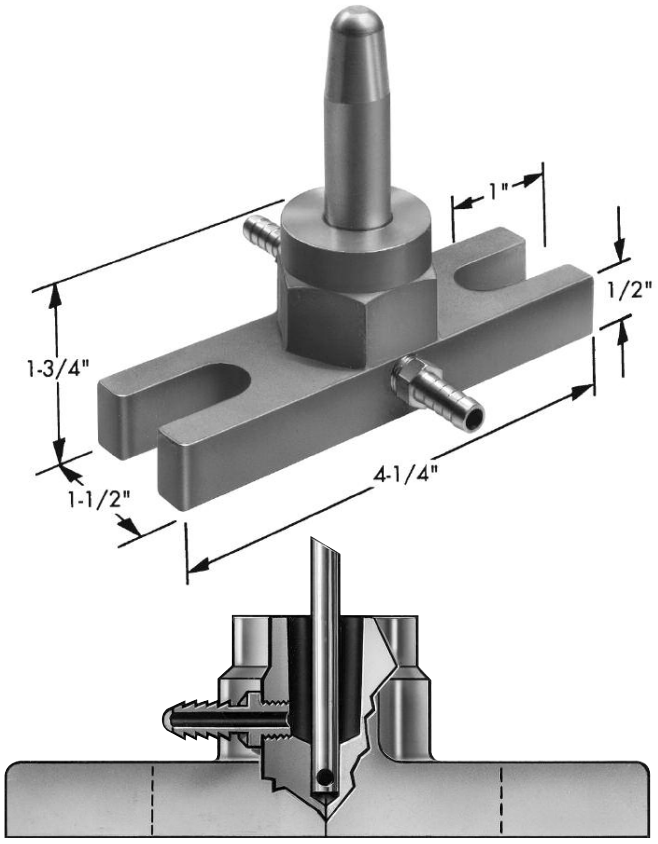
Fixture Building: PM holders make special fixture building easy too. They can be bolted to a fixture or backup base as easily as to a platen. They are compact and have self-contained coolant systems that eliminate making a coolant manifold out of the fixture.

Hose Connections: You may specify where you want the hose connectors in the hexagonal base. Select any two of the six possible locations and specify by using the symbols shown on the diagram (connector locations: A-B, or A-D, etc.). Position A-C is standard. (A-F and C-D are not possible.)

PM HOLDERS

TUFFALOY PM holders may be mounted directly to press-type welder platens, or they can be used as components of special weld fixturing. They come in two sizes, which match standard T-slot spacings (either of which can be furnished to hold any of the four standard tips: 4, 5, 6 or 7 RW). The smaller holder is for use on RWMA Size 1 welders, which have the 3-1/2" spacing. The larger one is for the Size 2 and 3 welders, which have the 5- and 6-inch spacing.

Big, half-inch mounting bolts may be used to assure good conductivity. The holders may be used one-to-one or in multiples closely bunched. PM holders make special fixture building easy. They can be bolted to a fixture or back-up base as easily as to a platen. They are compact and have self-contained coolant systems.



Size 2 PM Holder (3/4-in. mounting bolts)

STANDARD TIP PM HOLDERS

RW Tip Socket	Size 1 (Small)		Size 2 (Large)	
	Description	Part No.	Description	Part No.
4	4560	350-4560	4570	350-4570
5	4561	350-4561	4571	350-4571
6	4562	350-4562	4572	350-4572*
7	4563	350-4563	4573	350-4573

**Item not normally stocked*

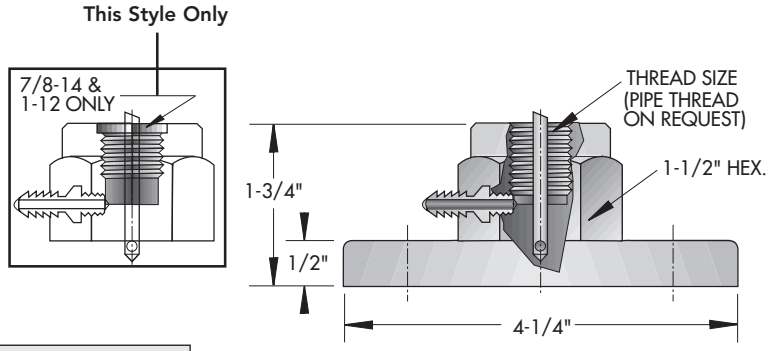
FOR THREADED ELECTRODES

Thread Size	Size 1	Size 2
5/8-11	350-4580	350-4590
3/4-10	350-4581	350-4591

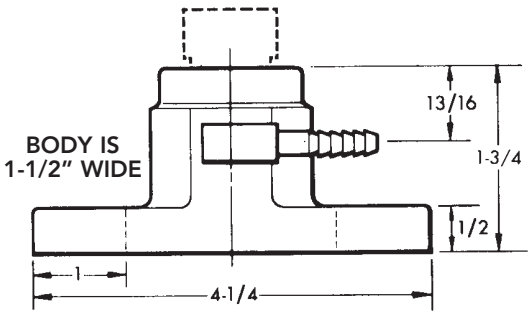
FOR THREADED ADAPTERS

Thread Size	Size 1	Size 2
7/8-14	350-4582	350-4592
1-12	350-4583	350-4593

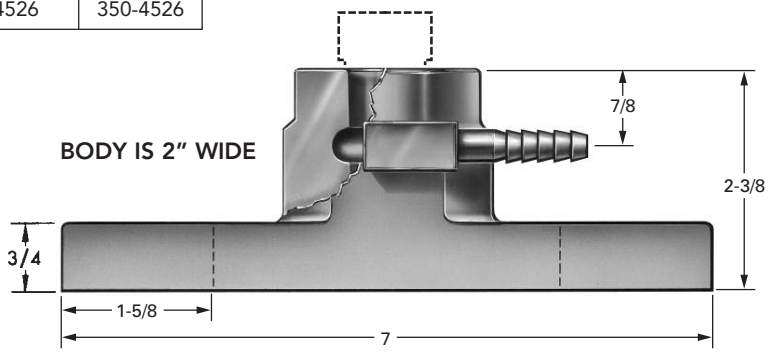
See adapters page 16



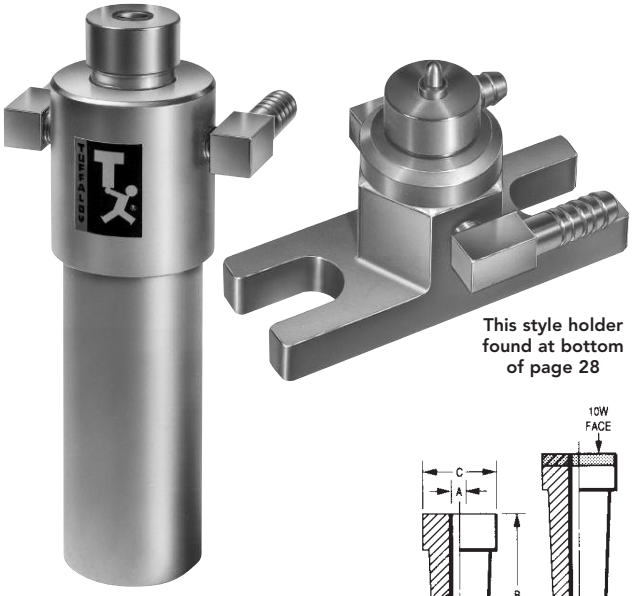
PM Holders T-Slot Spacing	Holder Size	For 1" Dia. Electrodes		For 1-1/2" Dia. Electrodes	
		Description	Part No.	Description	Part No.
3-1/2	1PM	4515	350-4515		
5 & 6	2PM	4525	350-4525	4526	350-4526



Size 1 PM Holder



Size 2 PM Holder



This style holder found at top of page 28

This style holder found at top of page 30

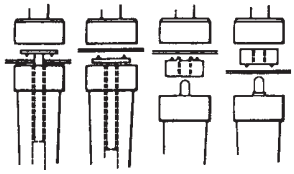
ELECTRODES

Stud Electrodes

Tuffaloy stud electrode tips are for projection-welding screws, bolts or pins, whether they pass through the sheet or are to be attached directly to its face.

Nut Electrodes

Tuffaloy projection weld nut electrodes are designed for either self-piloted or non-piloted nuts. The pilots of the non-piloted-nut electrodes are spring-loaded so they can't interfere with the contacting of nut and sheet under welding pressure.

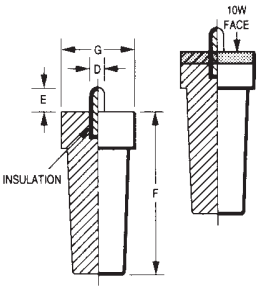


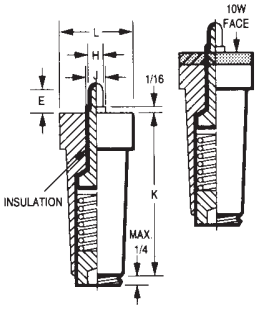
Welding a stud through a hole in sheet metal.

Welding a stud directly to face of sheet metal.

Self-piloted nut aligns itself with the hole in sheet.

Non-piloted-nut is guided by specially designed electrode.





The various types and sizes of TUFFALOY stud-and-nut welding electrodes and holders are described below. For excessive wear applications any of these electrodes may be ordered with refractory metal facings, such as TUFFALOY 10W.

STUD ELECTRODES

A	B	C	Description	Part No.	With 10W Face Refractory - Item Number
.150			400	175-4001	175-4001-10W
.164			401	175-4011	175-4011-10W
.190			402	175-4021	175-4021-10W
.216			403	175-4031	175-4031-10W
1/4	2-1/4	1	404	175-4041	175-4041-10W
5/16 & 8mm			405	175-4051	175-4051-10W
3/8			406	175-4061	175-4061-10W
6mm			506	175-5061	175-5061-10W
7mm			507	175-5071	175-5071-10W
9mm			509	175-5091	175-5091-10W
10mm			510	175-5101	175-5101-10W
3/8			436	175-4361	175-4361-10W
7/16			437	175-4371	175-4371-10W
1/2			438	175-4381	175-4381-10W
9/16	2-3/4	1-1/2	439	175-4391	175-4391-10W
5/8			440	175-4401	175-4401-10W
11/16			441	175-4411	175-4411-10W
3/4			442	175-4421	175-4421-10W
10mm			510-2	175-5102	175-5102-10W
12mm			512-2	175-5122	175-5122-10W

SELF-PILOTED-NUT ELECTRODES

For Nut Size	E Pin Length	F Electrode Length	G Electrode Diameter	Description	Part No.	With 10W Face Refractory - Item Number
.164	3/16			411	175-4111	175-4111-10W
.190	3/16			412	175-4121	175-4121-10W
.216	1/4			413	175-4131	175-4131-10W
1/4	5/16	2-1/4	1	414	175-4141	175-4141-10W
5/16 & 8mm	5/16			415	175-4151	175-4151-10W
3/8	3/8			416	175-4161	175-4161-10W
6mm	1/4			606	175-6061	175-6061-10W
7mm	5/16			607	175-6071	175-6071-10W
9mm	3/8			609	175-6091	175-6091-10W
10mm	3/8			610	175-6101	175-6101-10W
3/8	3/8			456	175-4561	175-4561-10W
7/16	3/8			457	175-4571	175-4571-10W
1/2	7/16			458	175-4581	175-4581-10W
9/16	7/16	2-3/4	1-1/2	459	175-4591	175-4591-10W
5/8	1/2			460	175-4601	175-4601-10W
11/16	1/2			461	175-4611	175-4611-10W
3/4	5/8			462	175-4621	175-4621-10W
10mm	3/8			610-2	175-6102	175-6102-10W
12mm	7/16			612-2	175-6122	175-6122-10W

NON-PILOTED-NUT ELECTRODES

For Nut Size	J Pin Diameter	K Electrode Length	L Electrode Diameter	Description	Part No.	With 10W Face Refractory - Item Number
.164	0.18			421	175-4211	175-4211-10W
.190	0.215			422	175-4221	175-4221-10W
.216	0.24			423	175-4231	175-4231-10W
1/4	0.275	2-1/4	1	424	175-4241	175-4241-10W
5/16 & 8mm	0.345			425	175-4251	175-4251-10W
3/8	0.405			426	175-4261	175-4261-10W
6mm	0.261			706	175-7061	175-7061-10W
7mm	0.3			707	175-7071	175-7071-10W
9mm	0.385			709	175-7091	175-7091-10W
10mm	0.425			710	175-7101	175-7101-I0W
3/8	0.437			476	175-4761	175-4761-10W
7/16	0.562			477	175-4771	175-4771-10W
1/2	0.625	2-3/4	1-1/2	478	175-4781	175-4781-10W
9/16	0.687			479	175-4791	175-4791-I0W
5/8	0.75			480	175-4801	175-4801-10W
10mm	0.453			710-2	175-7102	175-7102-10W
12mm	0.595			712-2	175-7122	175-7122-10W

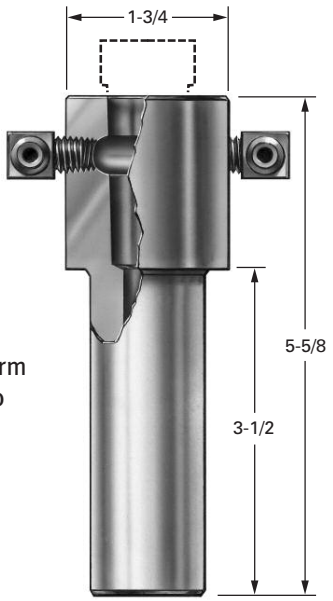
ELECTRODE HOLDERS

U.S. Pat. No. 3,504,159 Canada Pat. No. 858,060

Several standard electrode holders are manufactured by Tuffaloy to accommodate all the Tuffaloy stud-and nut electrode tips.

Straight Holders Barrel Diameter	A Dia.	B Length	For 1" Dia. Electrodes		For 1-1/2" Dia. Electrodes	
			Description	Part No.	Description	Part No.
1	1-3/4	5-5/8	4530	350-4530		
1-1/4	1-3/4	5-5/8	4531	350-4531		
1-1/2	1-3/4	5-5/8	4532	350-4532		
1	2	5-3/4			4535	350-4535
1-1/4	2	5-3/4			4536	350-4536
1-1/2	2	5-3/4			4537	350-4537

Straight Holders - Tuffaloy straight nut-and-stud-electrode holders are of the same high quality as the standard straight holders made for spot welder arm mounting. Coolant is brought to the tip and circulated around it. Holders are available in three barrel diameters.



Straight Holder

ARCTIC HOLDERS

ARCTIC STUD ELECTRODES

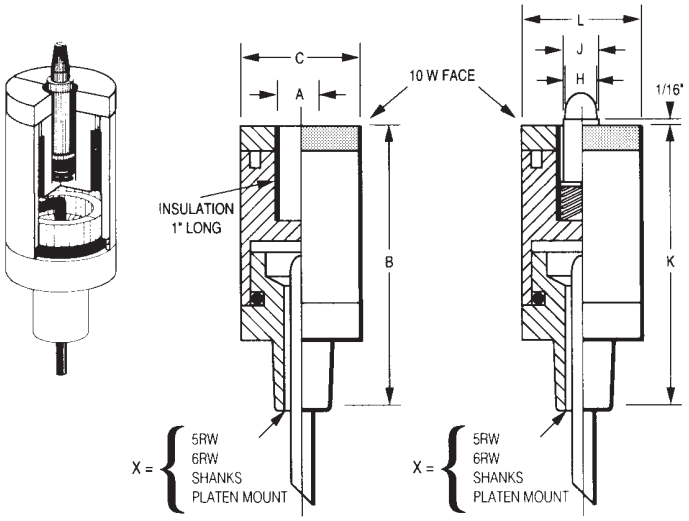
A For Stud Diameter	B Electrode Length	C Electrode Diameter	Description	Part Number Shank Size
0.150	3	1-1/4	115	175-1151-X
0.164			116	175-1161-X
0.190			119	175-1191-X
0.216			122	175-1221-X
1/4			125	175-1252-X
5/16 & 8mm			131	175-1312-X
3/8			138	175-1382-X
7/16			144	175-1442-X
6mm			106	175-1061-X
7mm			107	175-1072-X
9mm			109	175-1092-X
10mm			110	175-1102-X
1/2	3	1-1/2	150	175-1503-X
9/16			156	175-1563-X
5/8			163	175-1633-X
11/16			169	175-1693-X
12mm			112	175-1123-X

ARCTIC NON-PILOTED-NUT ELECTRODES

H For Nut Diameter	J Pilot Diameter	K Electrode Length	L Electrode Diameter	Description	Part Number Shank Size
0.164	0.180	4	1-1/4	216	175-2162-X
0.190	0.215			219	175-2192-X
0.216	0.240			222	175-2222-X
1/4	0.275			225	175-2252-X
5/16 & 8mm	0.345			231	175-2312-X
3/8	0.405			238	175-2382-X
6mm	0.261			206	175-2062-X
7mm	0.300			207	175-2072-X
9mm	0.385			209	175-2092-X
10mm	0.425			210	175-2102-X
7/16	0.562	4	1-1/2	244	175-2443-X
1/2	0.625			250	175-2503-X
9/16	0.687			256	175-2563-X
12mm	0.595			212	175-2123-X

Arctic Electrodes - The Arctic system is a compact stud-and-nut electrode with internal water cooling. Also available with optional air expulsion and platen mounts.

Patent Pending



Stud Welding Nut Welding

QUICKEST WAY TO CUT WELDING COSTS

Increased productivity without capital investment or increased labor costs just has to spell PROFIT. Hundreds of resistance welding users are profiting from the TUFFALOY methods of multiple welding, to produce almost any assembly requiring closely spaced welds.

The key is to **"think multiple!"** Whenever the welding machine goes through a cycle, have it do more than one weld at a time. It's easy and practical with one of the TUFFALOY multiple welding devices: The Teeter-Tip dual tip adapter, the Equatip dual tip holder, the Equa-Press dual tip holder, or the Tri-Spacer.

They're ready to go to work, cutting costs and increasing production efficiency for you.

Study the multiple welding holders and adapters in this section. Learn their capabilities, **"think multiple,"** and you'll probably see many ways in which TUFFALOY multiple welding can improve your operation. Remember that TUFFALOY is prepared to provide any special fixturing you need. Show our engineers what you require, and they'll design a set-up to do it.

TEETER-TIP DUAL TIP ADAPTERS

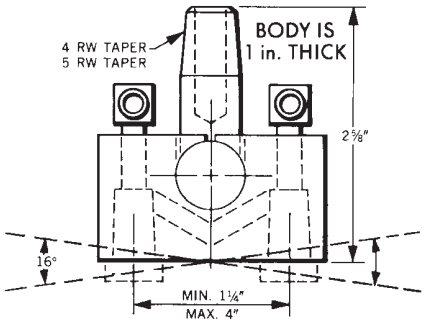
U.S. Pat. 3,356,821

You can spot or projection weld in half the time by doubling the number of welds per machine stroke. Use Teeter-Tip dual tip adapters, which come with water-coolant fittings to beat high heat build-up. These, adapters transmit total pressures of 1000 lbs., and deliver equal current and pressure to each tip. They compensate for normal electrode wear, imperfect tip dressing, and work variations up to .060".

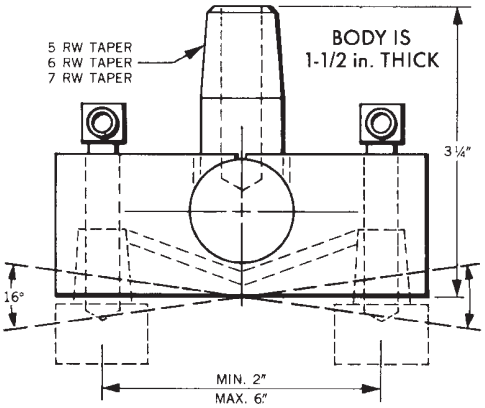
LIGHT-DUTY adapters have no. 4 or 5 RW shanks, tip spacing to 4 inches, tip sockets for 1/2" or 5/8" diameter male Tuffcap caps, or 4 RW tips (5/8" cap sockets are standard).

HEAVY-DUTY adapters have shanks from 5 to 7 RW size, tip spacing to 6 inches, tip sockets for 1/2" or 5/8" diameter male Tuffcap caps, or 4 or 5 RW tips (4 RW sockets are standard). These adapters have a deeper, stronger body.

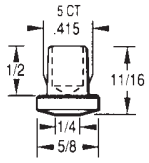
Two low-height 5/8" dia. cap-type tips are shown below. They are recommended for use in these adapters. Other standard caps, both 5/8" & 1/2" dia., are tabled on the next page. You must specify the size tip sockets you want, or the standard socket will be supplied.



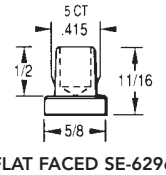
LIGHT DUTY



HEAVY DUTY



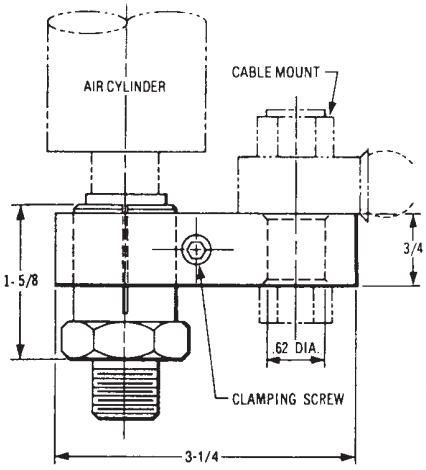
TRUNCATED CONE SE-6332
(Part No. 186-0522)



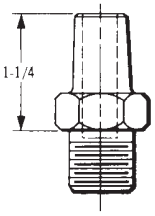
FLAT FACED SE-6296
(Part No. 186-0523)

Style	Shank Taper	Description*	Tip Spacing Range (inches)	Socket Taper
LIGHT Duty	4RW	TT-1408	1-1/4 to 2	4RW 4CT 5CT
	4RW	TT-1416	2 to 4	4RW 4CT 5CT
	5RW	TT-1508	1-1/2 to 2	4RW 4CT 5CT
	5RW	TT-1516	2 to 4	4RW 4CT 5CT
HEAVY Duty	5RW	TT-15516	2 to 4	4RW 5RW 4CT 5CT
	5RW	TT-15524	4 to 6	4RW 5RW 4CT 5CT
	6RW	TT-15616	2 to 4	4RW 5RW 4CT 5CT
	6RW	TT-15624	4 to 6	4RW 5RW 4CT 5CT
	7RW	TT-15716	2 to 4	4RW 5RW 4CT 5CT
	7RW	TT-15724	4 to 6	4RW 5RW 4CT 5CT

**When ordering, also state exact tip spacing and tip socket size, Example: TT - 1508 - 1-1/2 - 5CT. (5CT means 5/8" diameter cap, 4CT means 1/2" diameter cap.)*



Cylinder-mounting adapter shank, Part No. 195-7063; clamp, Part No. 194-2040, not included



5 RW taper adapter shank, Part No. 195-5680

EQUATIP DUAL TIP HOLDERS

U.S. Pat. No. 3,558,847

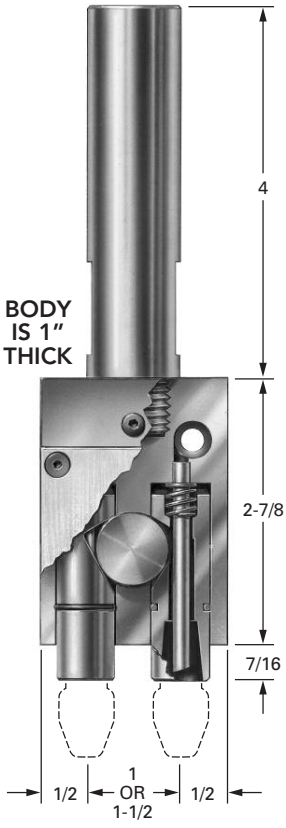
The Equatip dual tip holder is a smaller version of the Equa-Press holder (on next page). It is more compact, and is more economical for those applications where it will work equally well. An even smaller device, the Equatip adapter (not water-cooled) is shown in box below.

Using the Equatip holder, both tips contact the work squarely, because tip axes remain parallel to direction of force (unlike the Teeter-Tip adapters). An internal roller equalizes current and pressure between the two electrodes, and will compensate for work height variations up to 1/16".

The holders are ordered with either 1" or 1-1/2" spacing between barrels, and with tip sockets to accept either male Tuffcap caps (5/8" dia.) or straight No. 4 RW electrodes. (Bent tips are not recommended.) The distance between welds can be varied by rotating offset-nose tips in the barrels.

Equatip holders can be supplied with straight shanks for arm mounting, a tapered adapter shank for holder mounting, or a cylinder adapter shank to be clamped to a cylinder rod.

Equatip holders can be used with forces up to 1000 lbs.



5/8" DIA. TUFFCAP CAPS (5 CT)

Nose Style	Alloy Class	Descrip-tion	Part No.
Pointed	1	TA-15	111-0015
	2	TA-25	112-0025
Dome	1	TB-15	113-0015
	2	TB-25	114-0025
Flat	1	TC-15	115-0015
	2	TC-25	116-0025
Offset	1	TD-15	117-0015
	2	TD-25	118-0025

Those caps are fully dimensioned on page 6.

EQUATIP HOLDERS

Tip Spacing & Mounting Style	For 5/8" Dia. Tuffcap Caps: Descrip-tion	For 5/8" Dia. Tuffcap Caps: Part No.	For No. 4 RW Tips: Descrip-tion	For No. 4 RW Tips: Part No.
ONE-INCH SPACING:				
1-in. shank	4050	350-4050	4055	350-4055
1-1/4-in. shank	4051	350-4051	4056	350-4056
1-1/2-in. shank	4052	350-4052	4057	350-4057
5RW adapter	4053	350-4053	4058	350-4058
Cylinder adapter*	4054	350-4054	4059	350-4059
1-1/2-INCH SPACING:				
1-in. shank	4150	350-4150	4155	350-4155
1-1/4-in. shank	4151	350-4151	4156	350-4156
1-1/2-in. shank	4152	350-4152	4157	350-4157
5RW adapter	4153	350-4153	4158	350-4158
Cylinder adapter*	4154	350-4154	4159	350-4159

**Without clamp*

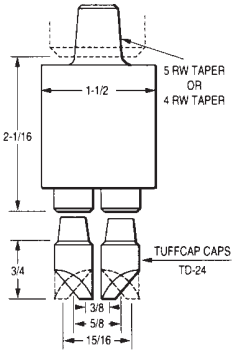
For light-duty welding
EQUATIP ADAPTER

The Equatip dual tip adapter works like the Equatip holder, but it is not water-cooled and is meant for less demanding jobs. It costs less, and is a little smaller, barrels being 5/8" apart. Its straight tips are TUFFCAP caps, 1/2" in diameter.

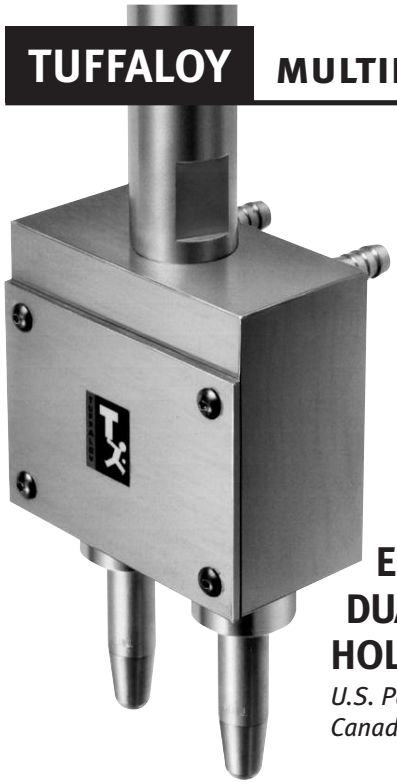
1/2" DIA. TUFFCAP CAPS (4 CT)

Nose Style	Alloy Class	Descrip-tion	Part No.
Pointed	1	TA-14	111-0014
	2	TA-24	112-0024
Dome	1	TB-14	113-0014
	2	TB-24	114-0024
Flat	1	TC-14	115-0014
	2	TC-24	116-0024
Offset	1	TD-14	117-0014
	2	TD-24	118-0024

Those caps are fully dimensioned on page 6.



4045, Part No. 350-4045-5RW
4046, Part No. 350-4046-4RW



EQUA-PRESS™ DUAL TIP HOLDERS

U.S. Pat. No. 2,979,599
Canada Pat. 637470

The Equa-Press Holder makes two identical welds at once. When it contacts the workpiece, the forging pressure is automatically equalized between the two electrodes, regardless of variations in work thickness, or electrode wear (up to 3/16"). The two tip-holding barrels are sliding pistons, whose movements are controlled by a mechanical equalizing slide in the housing (see cutaway drawings). The spring's only function is to return the barrels to a fully extended position when there is no work contact. Maximum conductivity is maintained through sturdy copper alloy working parts. Spacing can vary up to 4 inches, using TUFFALOY bent offset tips in Equa-Press holders having the standard barrel spacing of two inches (shown).

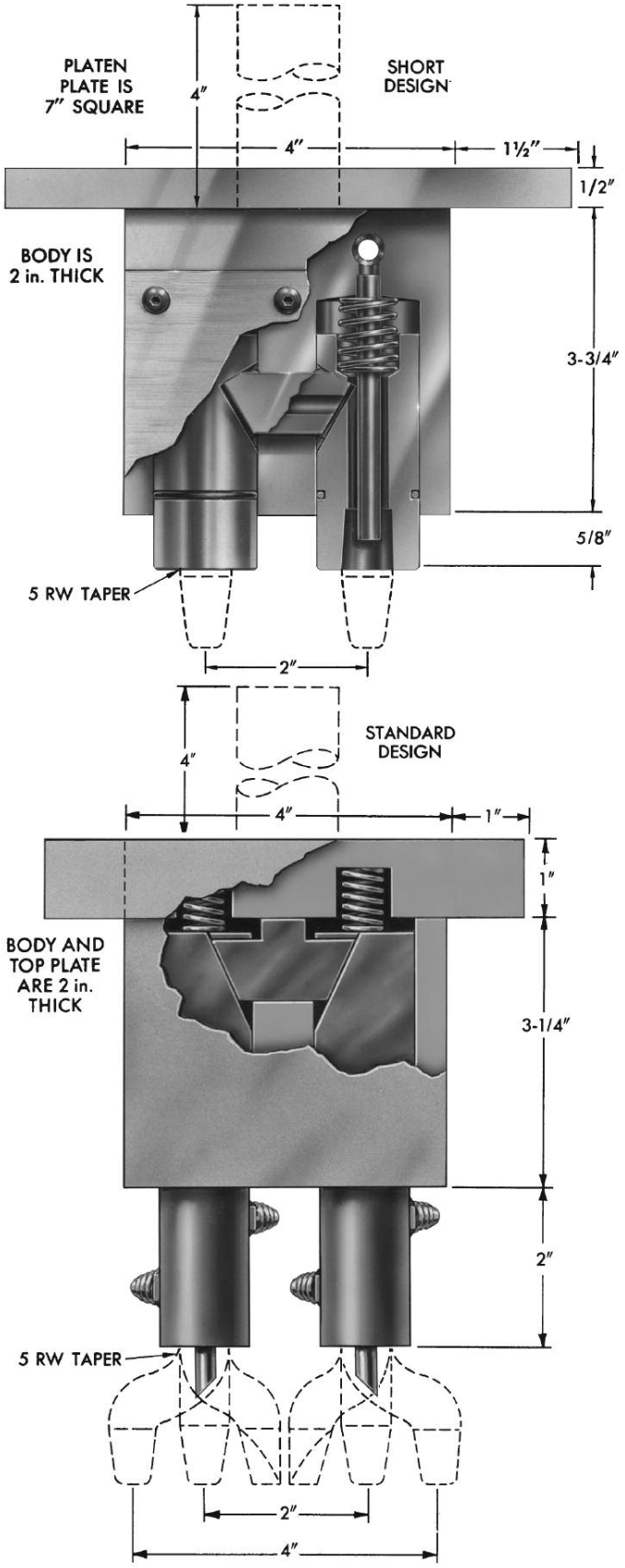
Barrel spacing up to six inches is available as semi-standard (see price list). These are drilled to order from stock components. To order you must give the barrel spacing desired, along with the Item number (from table).

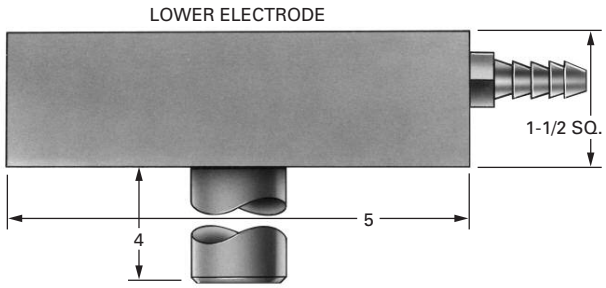
Equa-Press Holders are made in two mounting styles: platen models to mount directly to the platen on press-type welding machines, and shank models for rocker arm machines. All are available in two designs: the standard and the short (close-coupled) type. The short design is internally flood-cooled and takes up less space in the welder.

Equa-Press holders can be used with forces up to 1500 lbs.

Mounting Style	Standard Design		Short Design	
	Descrip-tion	Part No.	Descrip-tion	Part No.
1-in. shank	4010	350-4010	4015	350-4015
1-1/4-in. shank	4011	350-4011	4016	350-4016
1-1/2-in. shank	4012	350-4012	4017	350-4017
Platen	4013	350-4013	4018	350-4018

Note: For best results, position the holder so that a line drawn through the electrode centers is at, or nearly at, right angles to the direction of the welder arms. Otherwise, the magnetic field between the arms can cause an excess of current to flow through the inboard electrode.

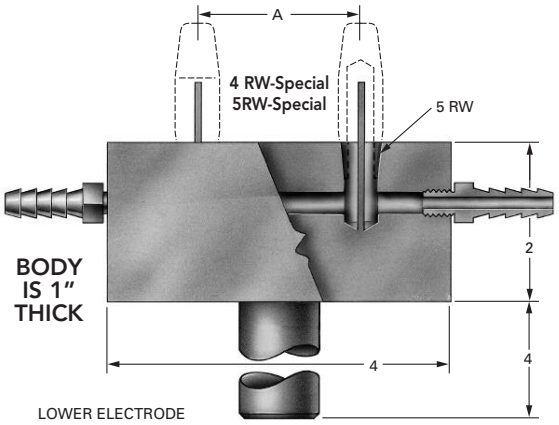




LOWER ELECTRODES		
Shank Diameter	Description	Part No.
1	4020	350-4020
1-1/4	4021	350-4021
1-1/2	4022	350-4022

LOWER HOLDERS AND ELECTRODES FOR USE WITH EQUA-PRESS HOLDER

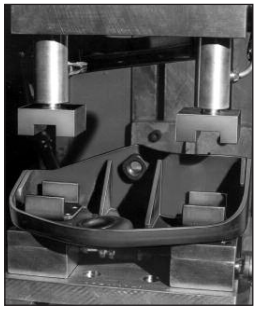
A lower, fixed, dual tip holder is offered for use with Equa-Press Holders. Like the Equa-Press, it has a standard two-inch tip spacing and helps make two welds at once, precisely alike. The standard trans-verse bar electrode shown is used when work geometry doesn't require tips on the lower side. They are water-cooled.



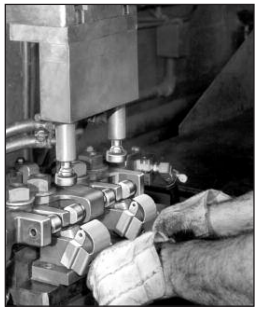
STANDARD LOWER HOLDER - 2" SPACING 5 RW		
	Lower Holder	
Shank Diameter	Description	Part No.
1	4030	350-4030
1-1/4	4031	350-4031
1-1/2	4032	350-4032

SPECIAL LOWER ELECTRODES			
Style	Shank Diameter (inches)	Description*	A Tip Spacing Range (inches)
4" Body	1	4030	1-1/4 to 2-7/8
	1-1/4	4031	1-1/4 to 2-7/8
	1-1/2	4032	1-1/4 to 2-7/8
8" Body	1	8030	3 to 6
	1-1/4	8031	3 to 6
	1-1/2	8032	3 to 6

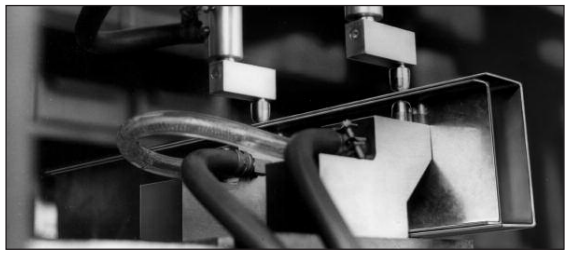
** When ordering specify center distance and either 4RW or 5RW sockets*



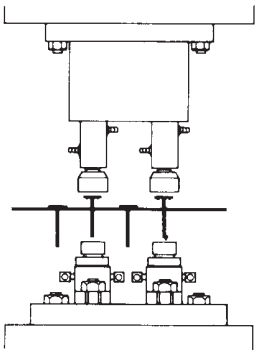
A Case History: Projection welding brackets to automotive frame assemblies is twice as fast with an Equa-Press dual tip holder. Lower welding fixture acts as an inspection device, so warped parts are discovered before welding. Inspection time and scrap loss are both reduced.



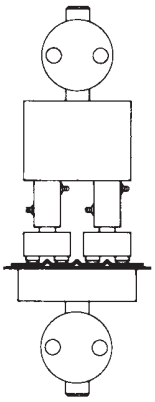
A Case History: Joining a piece of metal to itself is always tough. This job was done with an Equa-Press holder - two at a time. Lower clamp faces, carrying current, contact parts near the weld areas to avoid current bypassing weld projections. Two standard swivel tips make four welds, two per part.



A Case History: Dual spot welding of panelled wall sections reduced welding costs enough to justify buying welding machine to do the job in-plant. Equa-Press holder with 5-inch spacing, and special (but simple) tooling to provide two offset tip adapters and matching holders were used. Electrodes are standard TUFFCAP caps.



In this drawing, two studs are projection welded in each welder stroke, using an Equa-Press dual holder over a pair of studwelding electrodes held in PM-style holders.



Here, four spot welds are made simultaneously on a corrugated part. An Equa-Press dual holder is used to hold two Teeter-Tip dual tip adapters.

TRISPACER HOLDER		
Mounting Style	Description	Part No.
1-in. shank	4040	350-4040
1-1/4-in. shank	4041	350-4041
1-1/2-in. shank	4042	350-4042
Platen	4043	350-4043

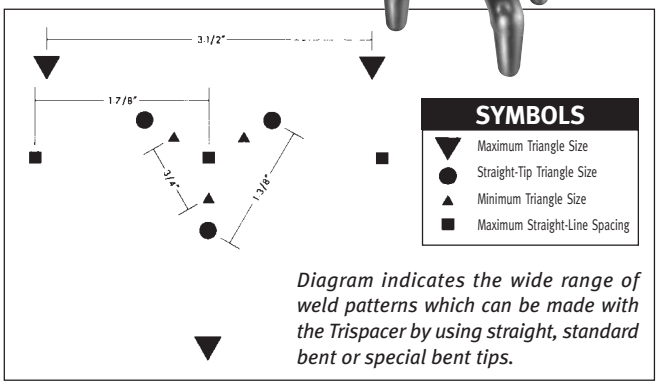


Diagram indicates the wide range of weld patterns which can be made with the Trispacer by using straight, standard bent or special bent tips.

TRISPACER™ TRIPLE TIP HOLDER

U.S. Pat. No. 3,558,848

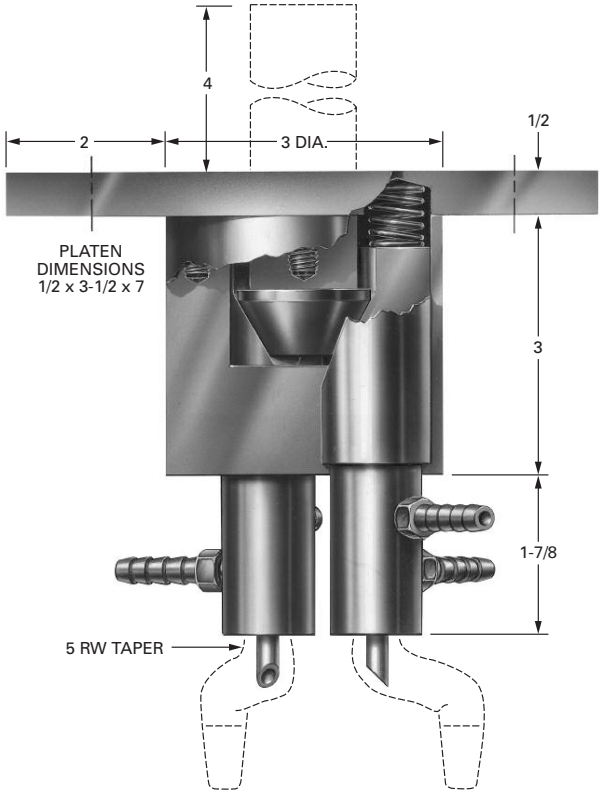
The Trispacer tip holder will make three spot welds at one time, automatically splitting the current and the pressure equally between the three tips. In doing so, it compensates for variations in work thicknesses and electrode wear-up to 3/16-in.

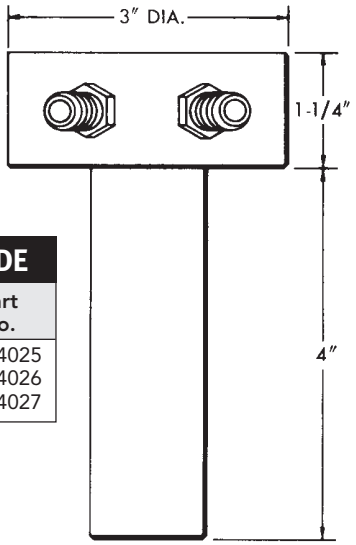
The three tip-holder barrels (#5 RW) are equidistant from one another, all falling on a 1-5/8-in. diameter circle (in the standard model shown). Using straight tips the weld pattern would form an equilateral triangle. However, the weld pattern can be widely varied by using standard or special bent tips. In fact, the three welds can be made in a straight line.

The Trispacer Holder works in the same simple, mechanical way as the Equa-Press Holder: The tip-holding barrels have a limited up-and-down movement, to accommodate work conditions, and are adjusted to deliver equal pressure by the cone-shaped equalizing device in the housing. All current-carrying parts are made of RWMA copper alloys. It is made in two styles: to mount directly to the platen of press-type welders, and with shanks to fit in welder arms.

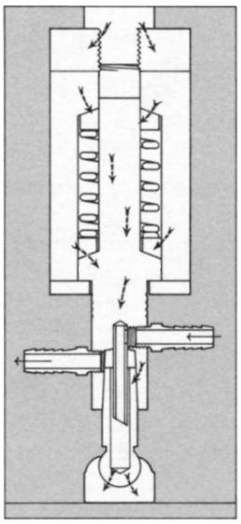
LOWER ELECTRODE

A simple, water-cooled lower electrode is made for use with the Trispacer holder. Its three-inch-diameter face makes it usable with any weld pattern that may be developed for the Trispacer. It comes in three shank diameter models.





LOWER ELECTRODE		
Shank Dia.	Description	Part No.
1	4025	350-4025
1-1/4	4026	350-4026
1-1/2	4027	350-4027



Current flow follows dashed arrow through the outer body, two split contact rings, tapered tip socket, and to the electrode.

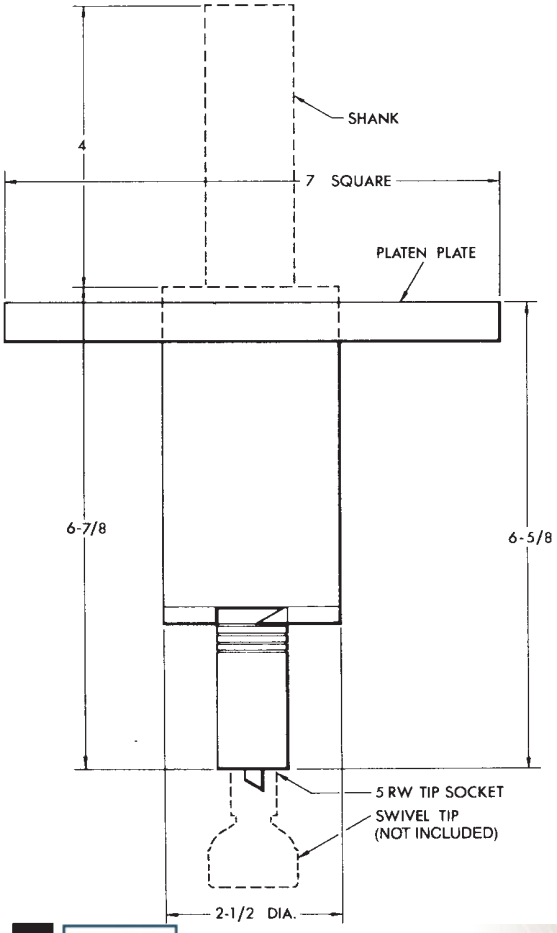
U.S. Pat. No. 3,632,958 Canada Pat. No. 902,189

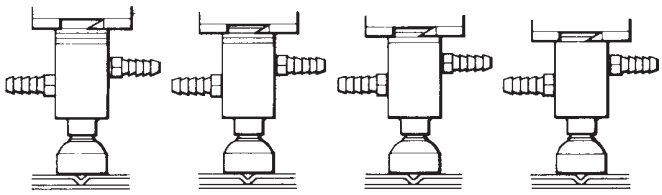
TUFFALOY fast-follow-up (low inertia) holders solve the problem of maintaining adequate weld pressure on rapidly collapsing projection welds-with fewer set-up problems and reduced maintenance.

These holders can be set to deliver fast-follow-up forces of from 140 to 1300 pounds, a range covering 90% of all projection welding operations. They are compact, water cooled, and easy to maintain.

Plus features of the TUFFALOY fast-follow-up holder include: (1) wider range of pressures than any competitive make (2) no flexible shunt-a common cause of holder failure (3) use of standard, unmodified die springs, so if you need a spring of different strength, it's easily available (4) spring forces available are clearly indicated, so it's easy to set up for a specific force (5) three shank sizes, or it can be platen-mounted-the only fast-follow-up holder that can (6) extremely low height permits use where larger units can't be used.

TUFFALOY fast-follow-up holders can be used to limit the weld pressure of any spot welding machine regardless of cylinder size or air pressure. This is better than reducing air pressure, which slows the return stroke and retards production.





A
No external Compression

B
Compression 1 mark

C
Compression 2 marks

D
Compression 3 marks

For every one-eighth of an inch that a fast-follow-up is compressed when setting up, a known amount of force is provided, to quickly follow up any reduction in work thickness. Example: at position B, a type MH spring would delivery 310 lb, at C, 440 lb, etc.

FAST-FOLLOW-UP FORCE CHART (LBS.)

Spring Type	1/8-in. Compression	1/4-in. Compression	3/8-in. Compression	1/2-in. Compression
M (300 lbs. max.)	140	200	250	300
MH (680 lbs. max.)	310	440	560	680
H (1300 lbs. max.)	600	840	1070	1300

Mounting Style	300 LBS MAX. (M SPRING)		680 LBS. MAX. (MH SPRING)		1300 LBS. MAX. (H SPRING)	
	Descrip-tion	Part No.	Descrip-tion	Part No.	Descrip-tion	Part No.
1" Shank	4620	350-4620	4621	350-4621	4622	350-4622
1-1/4" Shank	4623	350-4623	4624	350-4624	4625	350-4625
1-1/2" Shank	4626	350-4626	4627	350-4627	4628	350-4628
Platen-Mtd.	4629	350-4629	4630	350-4630	4631	350-4631