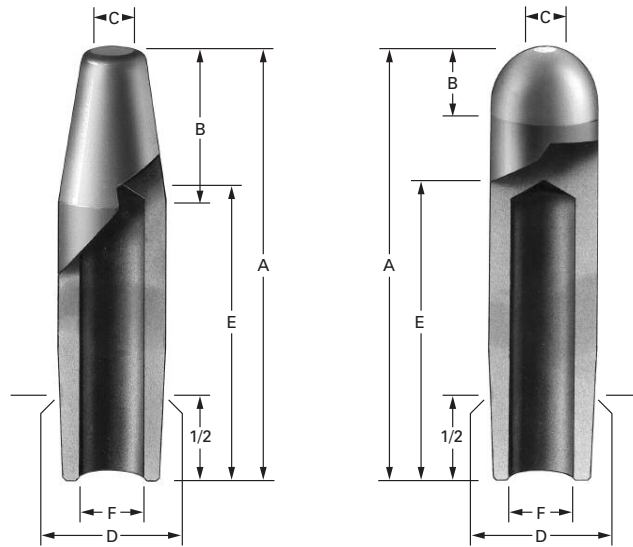


TUFFALOY STANDARD STRAIGHT TIPS

Straight tips from TUFFALOY are distinguished for their high conductivity and resistance to deformation, which are the two major requirements of resistance welding tips. Modern manufacturing methods and constant scientific quality control make the difference, starting with the alloying of pure copper, through bar extrusion, and the conversion of this high-quality bar stock into welding tips.

TUFFALOY ensures conformity to all standard dimensions. Before shipment, all tips must pass inspection by gage for uniform length, taper, and outline of point.



'A' POINTED NOSE

'B' DOME NOSE

A Overall Length	C Welding Face Dia.	D Gauging Dia.	E Water Hole Depth	F Water Hole Dia.
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B Nose Length	RWMA CLASS 1		RWMA CLASS 2	
	Description	Part No.	Description	Part No.

B Nose Length	RWMA CLASS 1		RWMA CLASS 2	
	Description	Part No.	Description	Part No.

NO. 4 RW TAPER - 1/2" DIAMETER

1	3/16	.463	1/2	9/32
1-1/4	3/16	.463	3/4	9/32
1-1/2	3/16	.463	1	9/32
1-3/4	3/16	.463	1-1/4	9/32
2	3/16	.463	1-1/2	9/32
2-1/4	3/16	.463	1-3/4	9/32
2-1/2	3/16	.463	2	9/32
2-3/4	3/16	.463	2-1/4	9/32
3	3/16	.463	2-1/2	9/32
3-1/4	3/16	.463	2-3/4	9/32
3-1/2	3/16	.463	3	9/32
3-3/4	3/16	.463	3-1/4	9/32
4	3/16	.463	3-1/2	9/32

3/8	A-1404	131-1404	A-2404	132-2404
3/4	A-1405	131-1405	A-2405	132-2405
3/4	A-1406	131-1406	A-2406	132-2406
3/4	A-1407	131-1407	A-2407	132-2407
3/4	A-1408	131-1408	A-2408	132-2408
3/4	A-1409	131-1409	A-2409	132-2409
3/4	A-1410	131-1410	A-2410	132-2410
3/4	A-1411	131-1411	A-2411	132-2411
3/4	A-1412	131-1412	A-2412	132-2412
3/4	A-1413	131-1413	A-2413	132-2413
3/4	A-1414	131-1414	A-2414	132-2414
3/4	A-1415	131-1415	A-2415	132-2415
3/4	A-1416	131-1416	A-2416	132-2416

1/4	B-1404	133-1404	B-2404	134-2404
1/4	B-1405	133-1405	B-2405	134-2405
1/4	B-1406	133-1406	B-2406	134-2406
1/4	B-1407	133-1407	B-2407	134-2407
1/4	B-1408	133-1408	B-2408	134-2408
1/4	B-1409	133-1409	B-2409	134-2409
1/4	B-1410	133-1410	B-2410	134-2410
1/4	B-1411	133-1411	B-2411	134-2411
1/4	B-1412	133-1412	B-2412	134-2412
1/4	B-1413	133-1413	B-2413	134-2413
1/4	B-1414	133-1414	B-2414	134-2414
1/4	B-1415	133-1415	B-2415	134-2415
1/4	B-1416	133-1416	B-2416	134-2416

NO. 5 RW TAPER - 5/8" DIAMETER

1-1/4	1/4	.613	3/4	3/8
1-1/2	1/4	.613	3/4	3/8
1-3/4	1/4	.613	1	3/8
2	1/4	.613	1-1/4	3/8
2-1/4	1/4	.613	1-1/2	3/8
2-1/2	1/4	.613	1-3/4	3/8
2-3/4	1/4	.613	2	3/8
3	1/4	.613	2-1/4	3/8
3-1/4	1/4	.613	2-1/2	3/8
3-1/2	1/4	.613	2-3/4	3/8
3-3/4	1/4	.613	3	3/8
4	1/4	.613	3-1/4	3/8

1/2	A-1505	131-1505	A-2505	132-2505
7/8	A-1506	131-1506	A-2506	132-2506
7/8	A-1507	131-1507	A-2507	132-2507
7/8	A-1508	131-1508	A-2508	132-2508
7/8	A-1509	131-1509	A-2509	132-2509
7/8	A-1510	131-1510	A-2510	132-2510
7/8	A-1511	131-1511	A-2511	132-2511
7/8	A-1512	131-1512	A-2512	132-2512
7/8	A-1513	131-1513	A-2513	132-2513
7/8	A-1514	131-1514	A-2514	132-2514
7/8	A-1515	131-1515	A-2515	132-2515
7/8	A-1516	131-1516	A-2516	132-2516

3/8	B-1505	133-1505	B-2505	134-2505
3/8	B-1506	133-1506	B-2506	134-2506
3/8	B-1507	133-1507	B-2507	134-2507
3/8	B-1508	133-1508	B-2508	134-2508
3/8	B-1509	133-1509	B-2509	134-2509
3/8	B-1510	133-1510	B-2510	134-2510
3/8	B-1511	133-1511	B-2511	134-2511
3/8	B-1512	133-1512	B-2512	134-2512
3/8	B-1513	133-1513	B-2513	134-2513
3/8	B-1514	133-1514	B-2514	134-2514
3/8	B-1515	133-1515	B-2515	134-2515
3/8	B-1516	133-1516	B-2516	134-2516

NO. 6 RW TAPER - 3/4" DIAMETER

2	9/32	.731	1-1/4	7/16
2-1/2	9/32	.731	1-3/4	7/16
3	9/32	.731	2-1/4	7/16
3-1/2	9/32	.731	2-3/4	7/16
4	9/32	.731	3-1/4	7/16

1	A-1608	131-1608	A-2608	132-2608
1	A-1610	131-1610	A-2610	132-2610
1	A-1612	131-1612	A-2612	132-2612
1	A-1614	131-1614	A-2614	132-2614
1	A-1616	131-1616	A-2616	132-2616

3/8	B-1608	133-1608	B-2608	134-2608
3/8	B-1610	133-1610	B-2610	134-2610
3/8	B-1612	133-1612	B-2612	134-2612
3/8	B-1614	133-1614	B-2614	134-2614
3/8	B-1616	133-1616	B-2616	134-2616

NO. 7 RW TAPER - 7/8" DIAMETER

2	5/16	.844	1-1/4	1/2
2-1/2	5/16	.844	1-3/4	1/2
3	5/16	.844	2-1/4	1/2
3-1/2	5/16	.844	2-3/4	1/2
4	5/16	.844	3-1/2	1/2

1-1/8	A-1708	131-1708	A-2708	132-2708
1-1/8	A-1710	131-1710	A-2710	132-2710
1-1/8	A-1712	131-1712	A-2712	132-2712
1-1/8	A-1714	131-1714	A-2714	132-2714
1-1/8	A-1716	131-1716	A-2716	132-2716

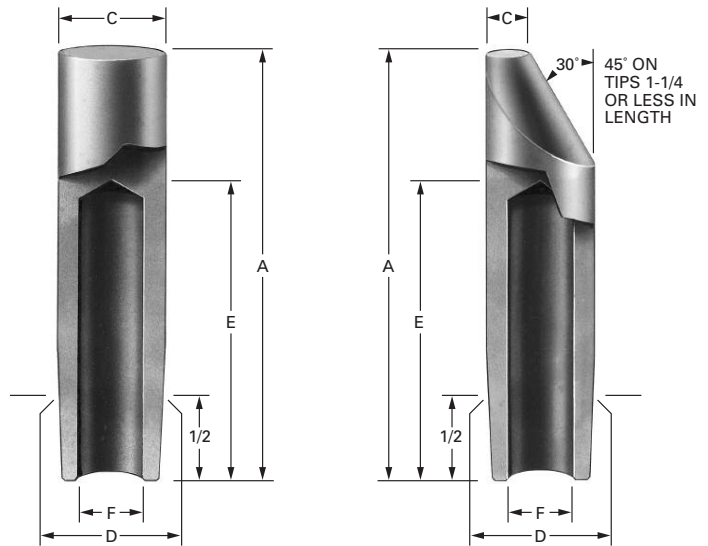
3/8	B-1708	133-1708	B-2708	134-2708
3/8	B-1710	133-1710	B-2710	134-2710
3/8	B-1712	133-1712	B-2712	134-2712
3/8	B-1714	133-1714	B-2714	134-2714
3/8	B-1716	133-1716	B-2716	134-2716



The bright shiny look of TUFFALOY tips is the result of a passivation process that eliminates excessive oxidation. It reflects the deep-down quality built into these tips and into all TUFFALOY products.

Only RWMA Class 1 (TUFFALOY 88) and Class 2 (TUFFALOY 77) tips are listed here. Class 3 alloy (TUFFALOY 55) tips are also available. For recommended uses of these alloys, see page 46.

To order Class 3 alloy tips, change description code to indicate it: see "Key to Description", page 4.



'C' FLAT NOSE

A Overall Length	D Gauging Dia.	E Water Hole Depth	F Water Hole Dia.
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NO. 4 RW TAPER - 1/2" DIAMETER

1	.463	1/2	9/32
1-1/4	.463	3/4	9/32
1-1/2	.463	1	9/32
1-3/4	.463	1-1/4	9/32
2	.463	1-1/2	9/32
2-1/4	.463	1-3/4	9/32
2-1/2	.463	2	9/32
2-3/4	.463	2-1/4	9/32
3	.463	2-1/2	9/32
3-1/4	.463	2-3/4	9/32
3-1/2	.463	3	9/32
3-3/4	.463	3-1/4	9/32
4	.463	3-1/2	9/32

NO. 5 RW TAPER - 5/8" DIAMETER

1-1/4	.613	3/4	3/8
1-1/2	.613	3/4	3/8
1-3/4	.613	1	3/8
2	.613	1-1/4	3/8
2-1/4	.613	1-1/2	3/8
2-1/2	.613	1-3/4	3/8
2-3/4	.613	2	3/8
3	.613	2-1/4	3/8
3-1/4	.613	2-1/2	3/8
3-1/2	.613	2-3/4	3/8
3-3/4	.613	3	3/8
4	.613	3-1/4	3/8

NO. 6 RW TAPER - 3/4" DIAMETER

2	.731	1-1/4	7/16
2-1/2	.731	1-3/4	7/16
3	.731	2-1/4	7/16
3-1/2	.731	2-3/4	7/16
4	.731	3-1/4	7/16

NO. 7 RW TAPER - 7/8" DIAMETER

2	.844	1-1/4	1/2
2-1/2	.844	1-3/4	1/2
3	.844	2-1/4	1/2
3-1/2	.844	2-3/4	1/2
4	.844	3-1/2	1/2

C Welding Face Dia.	RWMA CLASS 1		RWMA CLASS 2	
	Descrip-tion	Part No.	Descrip-tion	Part No.

1/2	C-1404	135-1404	C-2404	136-2404
1/2	C-1405	135-1405	C-2405	136-2405
1/2	C-1406	135-1406	C-2406	136-2406
1/2	C-1407	135-1407	C-2407	136-2407
1/2	C-1408	135-1408	C-2408	136-2408
1/2	C-1409	135-1409	C-2409	136-2409
1/2	C-1410	135-1410	C-2410	136-2410
1/2	C-1411	135-1411	C-2411	136-2411
1/2	C-1412	135-1412	C-2412	136-2412
1/2	C-1413	135-1413	C-2413	136-2413
1/2	C-1414	135-1414	C-2414	136-2414
1/2	C-1415	135-1415	C-2415	136-2415
1/2	C-1416	135-1416	C-2416	136-2416

C Welding Face Dia.	RWMA CLASS 1		RWMA CLASS 2	
	Descrip-tion	Part No.	Descrip-tion	Part No.

3/16	D-1404	137-1404	D-2404	138-2404
3/16	D-1405	137-1405	D-2405	138-2405
3/16	D-1406	137-1406	D-2406	138-2406
3/16	D-1407	137-1407	D-2407	138-2407
3/16	D-1408	137-1408	D-2408	138-2408
3/16	D-1409	137-1409	D-2409	138-2409
3/16	D-1410	137-1410	D-2410	138-2410
3/16	D-1411	137-1411	D-2411	138-2411
3/16	D-1412	137-1412	D-2412	138-2412
3/16	D-1413	137-1413	D-2413	138-2413
3/16	D-1414	137-1414	D-2414	138-2414
3/16	D-1415	137-1415	D-2415	138-2415
3/16	D-1416	137-1416	D-2416	138-2416

5/8	C-1505	135-1505	C-2505	136-2505
5/8	C-1506	135-1506	C-2506	136-2506
5/8	C-1507	135-1507	C-2507	136-2507
5/8	C-1508	135-1508	C-2508	136-2508
5/8	C-1509	135-1509	C-2509	136-2509
5/8	C-1510	135-1510	C-2510	136-2510
5/8	C-1511	135-1511	C-2511	136-2511
5/8	C-1512	135-1512	C-2512	136-2512
5/8	C-1513	135-1513	C-2513	136-2513
5/8	C-1514	135-1514	C-2514	136-2514
5/8	C-1515	135-1515	C-2515	136-2515
5/8	C-1516	135-1516	C-2516	136-2516

1/4	D-1505	137-1505	D-2505	138-2505
1/4	D-1506	137-1506	D-2506	138-2506
1/4	D-1507	137-1507	D-2507	138-2507
1/4	D-1508	137-1508	D-2508	138-2508
1/4	D-1509	137-1509	D-2509	138-2509
1/4	D-1510	137-1510	D-2510	138-2510
1/4	D-1511	137-1511	D-2511	138-2511
1/4	D-1512	137-1512	D-2512	138-2512
1/4	D-1513	137-1513	D-2513	138-2513
1/4	D-1514	137-1514	D-2514	138-2514
1/4	D-1515	137-1515	D-2515	138-2515
1/4	D-1516	137-1516	D-2516	138-2516

3/4	C-1608	135-1608	C-2608	136-2608
3/4	C-1610	135-1610	C-2610	136-2610
3/4	C-1612	135-1612	C-2612	136-2612
3/4	C-1614	135-1614	C-2614	136-2614
3/4	C-1616	135-1616	C-2616	136-2616

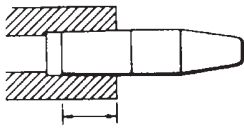
9/32	D-1608	137-1608	D-2608	138-2608
9/32	D-1610	137-1610	D-2610	138-2610
9/32	D-1612	137-1612	D-2612	138-2612
9/32	D-1614	137-1614	D-2614	138-2614
9/32	D-1616	137-1616	D-2616	138-2616

7/8	C-1708	135-1708	C-2708	136-2708
7/8	C-1710	135-1710	C-2710	136-2710
7/8	C-1712	135-1712	C-2712	136-2712
7/8	C-1714	135-1714	C-2714	136-2714
7/8	C-1716	135-1716	C-2716	136-2716

5/16	D-1708	137-1708	D-2708	138-2708
5/16	D-1710	137-1710	D-2710	138-2710
5/16	D-1712	137-1712	D-2712	138-2712
5/16	D-1714	137-1714	D-2714	138-2714
5/16	D-1716	137-1716	D-2716	138-2716

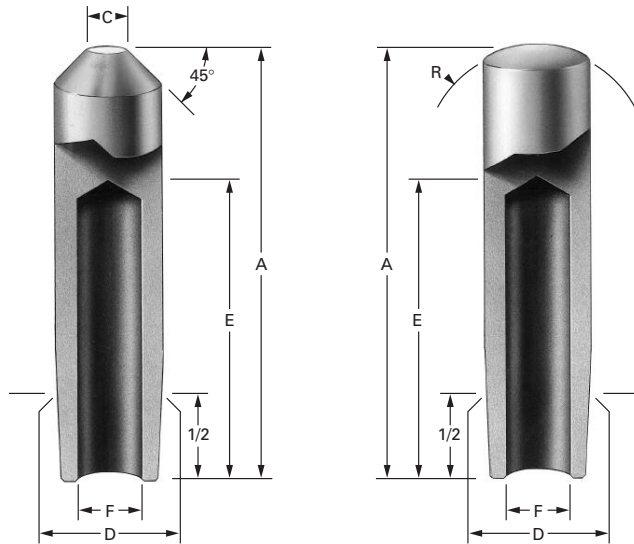
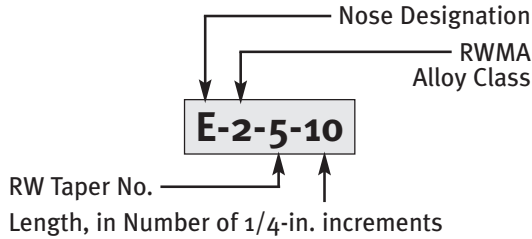


TAPER ENGAGEMENT



TIP SIZE	LENGTH
4 RW	1/2-in.
5 RW	3/4-in.
6 RW	7/8-in.
7 RW	1-1/8-in.

KEY TO DESCRIPTION



'E' TRUNCATED CONE

'F' RADIUS FACED

A Overall Length	D Gauging Dia.	E Water Hole Depth	F Water Hole Dia.
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NO. 4 RW TAPER - 1/2" DIAMETER

1	.463	1/2	9/32
1-1/4	.463	3/4	9/32
1-1/2	.463	1	9/32
1-3/4	.463	1-1/4	9/32
2	.463	1-1/2	9/32
2-1/4	.463	1-3/4	9/32
2-1/2	.463	2	9/32
2-3/4	.463	2-1/4	9/32
3	.463	2-1/2	9/32
3-1/4	.463	2-3/4	9/32
3-1/2	.463	3	9/32
3-3/4	.463	3-1/4	9/32
4	.463	3-1/2	9/32

C Welding Face Dia.	RWMA CLASS 1		RWMA CLASS 2	
	Description	Part No.	Description	Part No.

3/16	E-1404	140-1404	E-2404	140-2404
3/16	E-1405	140-1405	E-2405	140-2405
3/16	E-1406	140-1406	E-2406	140-2406
3/16	E-1407	140-1407	E-2407	140-2407
3/16	E-1408	140-1408	E-2408	140-2408
3/16	E-1409	140-1409	E-2409	140-2409
3/16	E-1410	140-1410	E-2410	140-2410
3/16	E-1411	140-1411	E-2411	140-2411
3/16	E-1412	140-1412	E-2412	140-2412
3/16	E-1413	140-1413	E-2413	140-2413
3/16	E-1414	140-1414	E-2414	140-2414
3/16	E-1415	140-1415	E-2415	140-2415
3/16	E-1416	140-1416	E-2416	140-2416

R Nose Radius	RWMA CLASS 1		RWMA CLASS 2	
	Description	Part No.	Description	Part No.

2	F-1404	141-1404	F-2404	141-2404
2	F-1405	141-1405	F-2405	141-2405
2	F-1406	141-1406	F-2406	141-2406
2	F-1407	141-1407	F-2407	141-2407
2	F-1408	141-1408	F-2408	141-2408
2	F-1409	141-1409	F-2409	141-2409
2	F-1410	141-1410	F-2410	141-2410
2	F-1411	141-1411	F-2411	141-2411
2	F-1412	141-1412	F-2412	141-2412
2	F-1413	141-1413	F-2413	141-2413
2	F-1414	141-1414	F-2414	141-2414
2	F-1415	141-1415	F-2415	141-2415
2	F-1416	141-1416	F-2416	141-2416

NO. 5 RW TAPER - 5/8" DIAMETER

1-1/4	.613	3/4	3/8
1-1/2	.613	3/4	3/8
1-3/4	.613	1	3/8
2	.613	1-1/4	3/8
2-1/4	.613	1-1/2	3/8
2-1/2	.613	1-3/4	3/8
2-3/4	.613	2	3/8
3	.613	2-1/4	3/8
3-1/4	.613	2-1/2	3/8
3-1/2	.613	2-3/4	3/8
3-3/4	.613	3	3/8
4	.613	3-1/4	3/8

1/4	E-1505	140-1505	E-2505	140-2505
1/4	E-1506	140-1506	E-2506	140-2506
1/4	E-1507	140-1507	E-2507	140-2507
1/4	E-1508	140-1508	E-2508	140-2508
1/4	E-1509	140-1509	E-2509	140-2509
1/4	E-1510	140-1510	E-2510	140-2510
1/4	E-1511	140-1511	E-2511	140-2511
1/4	E-1512	140-1512	E-2512	140-2512
1/4	E-1513	140-1513	E-2513	140-2513
1/4	E-1514	140-1514	E-2514	140-2514
1/4	E-1515	140-1515	E-2515	140-2515
1/4	E-1516	140-1516	E-2516	140-2516

2	F-1515	141-1505	F-2505	141-2505
2	F-1506	141-1506	F-2506	141-2506
2	F-1507	141-1507	F-2507	141-2507
2	F-1508	141-1508	F-2508	141-2508
2	F-1509	141-1509	F-2509	141-2509
2	F-1510	141-1510	F-2510	141-2510
2	F-1511	141-1511	F-2511	141-2511
2	F-1512	141-1512	F-2512	141-2512
2	F-1513	141-1513	F-2513	141-2513
2	F-1514	141-1514	F-2514	141-2514
2	F-1515	141-1515	F-2515	141-2515
2	F-1516	141-1516	F-2516	141-2516

NO. 6 RW TAPER - 3/4" DIAMETER

2	.731	1-1/4	7/16
2-1/2	.731	1-3/4	7/16
3	.731	2-1/4	7/16
3-1/2	.731	2-3/4	7/16
4	.731	3-1/4	7/16

9/32	E-1608	140-1608	E-2608	140-2608
9/32	E-1610	140-1610	E-2610	140-2610
9/32	E-1612	140-1612	E-2612	140-2612
9/32	E-1614	140-1614	E-2614	140-2614
9/32	E-1616	140-1616	E-2616	140-2616

4	F-1608	141-1608	F-2608	141-2608
4	F-1610	141-1610	F-2610	141-2610
4	F-1612	141-1612	F-2612	141-2612
4	F-1614	141-1614	F-2614	141-2614
4	F-1616	141-1616	F-2616	141-2616

NO. 7 RW TAPER - 7/8" DIAMETER

2	.844	1-1/4	1/2
2-1/2	.844	1-3/4	1/2
3	.844	2-1/4	1/2
3-1/2	.844	2-3/4	1/2
4	.844	3-1/2	1/2

5/16	E-1708	140-1708	E-2708	140-2708
5/16	E-1710	140-1710	E-2710	140-2710
5/16	E-1712	140-1712	E-2712	140-2712
5/16	E-1714	140-1714	E-2714	140-2714
5/16	E-1716	140-1716	E-2716	140-2716

6	F-1708	141-1708	F-2708	141-2708
6	F-1710	141-1710	F-2710	141-2710
6	F-1712	141-1712	F-2712	141-2712
6	F-1714	141-1714	F-2714	141-2714
6	F-1716	141-1716	F-2716	141-2716



DOUBLE-BEND, WITH STANDARD NOSE DESIGNS

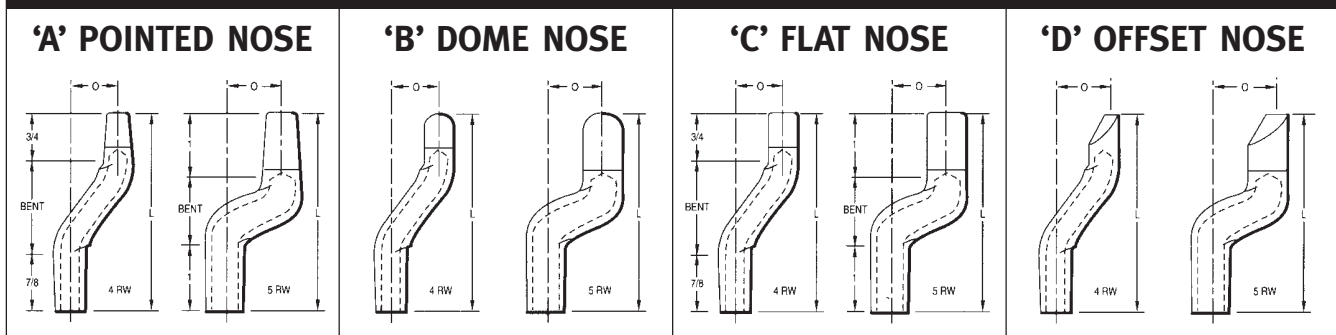
These standard cold-formed tips are bent from straight tips (some after added machining) and have the same hardness and conductivity. They outlast, many times over, the old cast and forged tips of similar geometry, which are impossible to cool adequately.

The table shows a wide range of tips generally available from stock. For sizes not shown, refer to the diagrams and description key at the bottom of the page, and order what you need. All measurements will be accurate. However, over-all length, in 1/8-in. multiples, will be held to within 1/16-in.

Tapers, water holes, and nose designs are the same as the standard straight tips in this catalog. Water tubes can be furnished.

Standard nose designs other than those shown here may be furnished on short order. Follow the "Key to Description", using a 'B' for Dome nose, 'C' for flat nose, 'E' for truncated cone, and 'F' for radius nose.

DOUBLE-BENT, ADDITIONAL NOSE DESIGNS



KEY TO DESCRIPTION

FX-YZLD-O

Example:
FB-1438-16-T

F = Cold-Formed, Double-Bend Tips

X = Nose Type

A

B

C

D

Y = RWMA Alloy Class

1 = Class 1

2 = Class 2

Z = RW Taper Number

4 = 4RW

5 = 5RW

L = Length in inches

Refer to table for availability

D = Additional Length in 16ths

3

3

3

3

3

3

O = Offset in 16ths

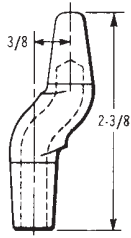
Refer to table for availability

T = With water tubes

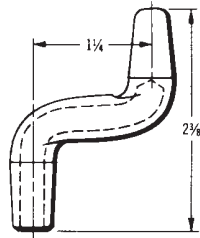
Taper No.	Length	Offset	CLASS 1				CLASS 2			
			FA Pointed Nose		FD Offset Nose		FA Pointed Nose		FD Offset Nose	
			Description	Item No.	Description	Item No.	Description	Item No.	Description	Item No.
3 RW	1-1/2	7/16					FA-2317-8	167-0060		
4 RW	2-3/16	1								
	2-1/4	1/2	FA-1424-8	165-0100			FA-2424-8	167-0100	FD-2423-16	167-2080
	2-1/4	3/4					FA-2424-12	167-0120		
	2-3/8	3/8	FA-1426-6	165-0160			FA-2426-6	167-0160		
	2-3/8	3/4					FA-2426-12	167-0180		
	2-3/8	1-1/4	FA-1426-20	165-0200	FD-1426-20	165-2200	FA-2426-20	167-0200	FD-2426-20	167-2200
	2-1/2	1/2					FA-2428-8	167-0240		
	2-1/2	1	FA-1428-16	165-0280	FD-1428-16	165-2280	FA-2428-16	167-0280	FD-2428-16	167-2280
	2-5/8	3/4	FA-14210-12	165-0320			FA-24210-12	167-0320	FD-24210-12	167-2320
	2-3/4	1/2	FA-14212-8	165-0360			FA-24212-8	167-0360	FD-24212-8	167-2360
	2-3/4	1					FA-24212-16	167-0400		
	2-3/4	1-1/4					FA-24212-20	167-0420		
2-7/8	3/4					FA-24214-12	167-0430			
2-7/8	1-1/4	FA-14214-20	165-0460			FA-24214-20	167-0460			
3	1	FA-1430-16	165-0520			FA-2430-16	167-0520			
3-3/8	1-1/4					FA-2436-20	167-0580			
3-1/2	1					FA-2438-16	167-0620			
5 RW	2-1/4	1/2			FD-1524-20	165-3140			FD-2524-8	167-3100
	2-1/4	1-1/4							FD-2524-20	167-3140
	2-3/8	3/8	FA-1526-6	165-1160			FA-2526-6	167-1160	FD-2526-6	167-3160
	2-3/8	3/4			FD-1526-12	165-3180	FA-2526-12	167-1180	FD-2526-12	167-3180
	2-1/2	1/2	FA-1528-8	165-1240			FA-2528-8	167-1240		
	2-1/2	1					FA-2528-16	167-1280		
	2-3/4	1/2	FA-15212-8	165-1360	FD-15212-8	165-3360	FA-25212-8	167-1360	FD-25212-8	167-3360
	2-3/4	3/4					FA-25212-12	167-1380		
	2-3/4	1	FA-15212-16	165-1400	FD-15212-16	165-3400	FA-25212-16	167-1400	FD-25212-16	167-3400
	2-7/8	1					FA-25214-16	167-1440		
	2-7/8	1-1/4	FA-15214-20	165-1460			FA-25214-20	167-1460		
	3	1/2	FA-1530-8	165-1480			FA-2530-8	167-1480	FD-2530-8	167-3480
	3	3/4					FA-2530-12	167-1500		
	3	1-3/4					FA-2530-28	167-1540		
	3	1							FD-2530-16	167-3520
	3-1/4	1	FA-1534-16	165-1560			FA-2534-16	167-1560		
	3-3/8	3/8			FD-1536-6	165-3570				
	3-3/8	1-1/4	FA-1536-20	165-1580	FD-1536-20	165-3580	FA-2536-20	167-1580	FD-2536-20	167-3580
3-1/2	1/2	FA-1538-8	165-1600			FA-2538-8	167-1600			
3-1/2	1					FA-2538-16	167-1620	FD-2538-16	167-3620	



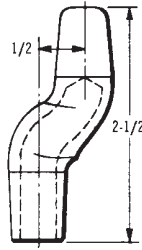
'A' POINTED NOSE



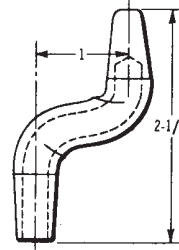
FA-1426-6 | FA-2426-6
FA-1526-6 | FA-2526-6



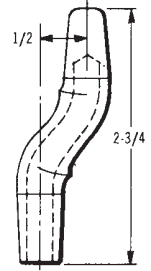
FA-1426-20 | FA-2426-20



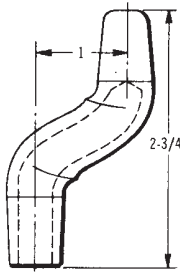
FA-2428-8
FA-1528-8 | FA-2528-8



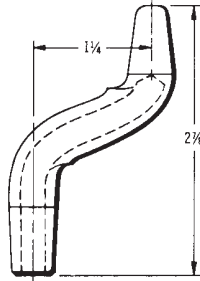
FA-1428-16 | FA-2428-16
FA-2528-16



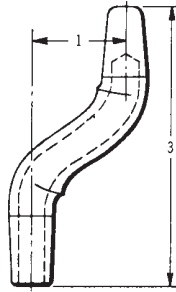
FA-14212-8 | FA-24212-8
FA-15212-8 | FA-25212-8



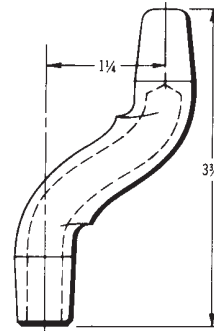
FA-15212-16 | FA-25212-16



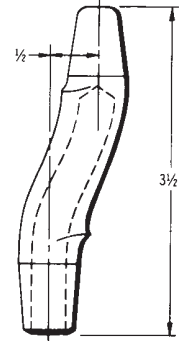
FA-14214-20 | FA-24214-20
FA-15214-20 | FA-25214-20



FA-1430-16 | FA-2430-16

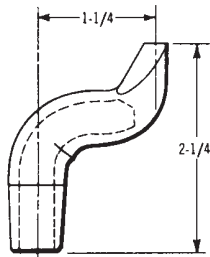


FA-2436-20
FA-1536-20 | FA-2436-20

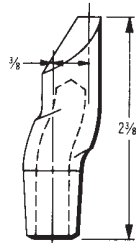


FA-1538-8 | FA-2538-8

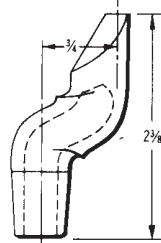
'D' OFFSET NOSE



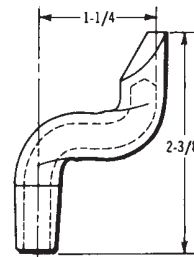
FD-1524-20 | FD-2524-20



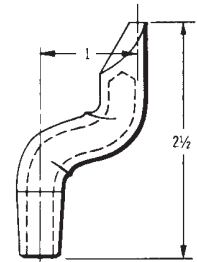
FD-2526-6



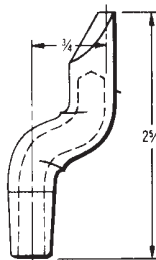
FD-1526-12 | FD-2526-12



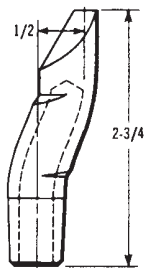
FD-1426-20 | FD-2426-20



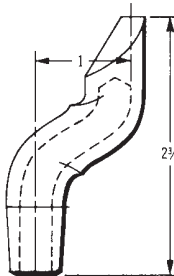
FD-1428-16 | FD-2428-16



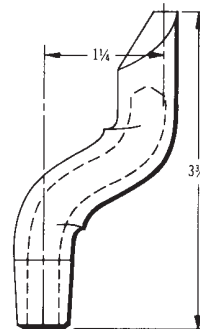
FD-24210-12



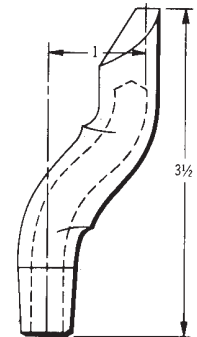
FD-15212-8 | FD-24212-8
FD-25212-8



FD-15212-16 | FD-25212-16



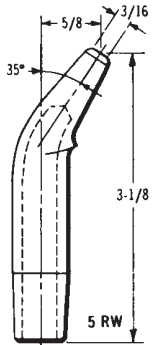
FD-1536-20 | FD-2536-20



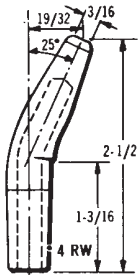
FD-2538-16



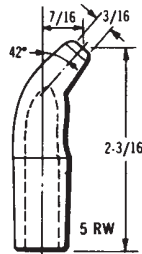
SINGLE-BEND TIPS



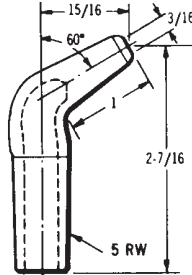
FP-2532-10
Part No.
167-5540



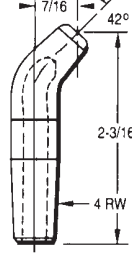
FP-2428-9.5
Part No.
167-4260



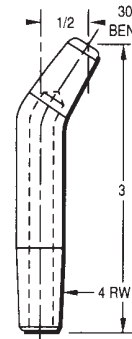
FP-2523-7
Part No.
167-5060



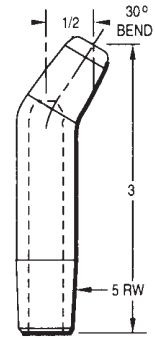
FP-2527-15
Part No.
167-5220



FP-2423-7
Part No.
167-5055

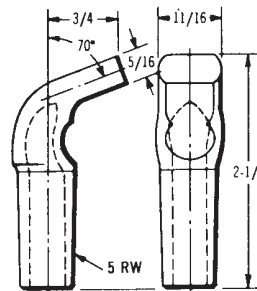


FP-2430-8
Part No.
167-5065

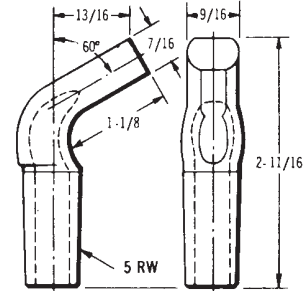


FP-2530-8
Part No.
167-5070

Cold-formed tips with a single bend have standard pointed-nose design. Other single-bend tips with flat noses (below) or other special designed noses and configurations are available on special order. These are of Class 2 alloy; Class I alloy can also be ordered.



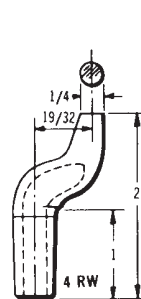
SE-4268
Part No. 170-4268



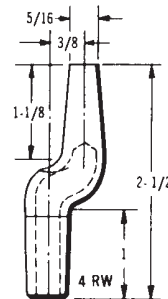
SE-4269
Part No. 170-4269

MISCELLANEOUS TIPS

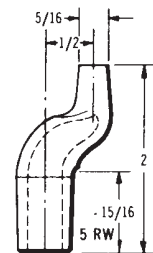
Double bend and flattened tips are made from bar stock. These are some of the standard designs available, but special designs can also be made. These are of Class 2 alloy; Class I alloy can also be ordered.



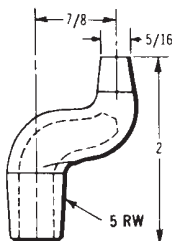
SE-4270
Part No. 170-4270



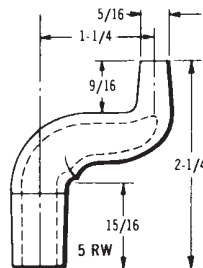
SE-4271
Part No. 170-4271



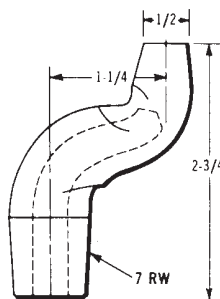
SE-4272
Part No. 170-4272



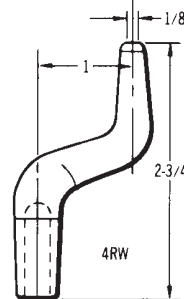
SE-4273
Part No. 170-4273



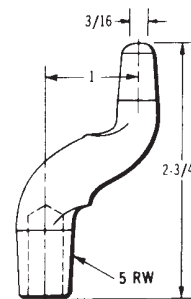
SE-4274
Part No. 170-4274



SE-4275
Part No. 170-4275



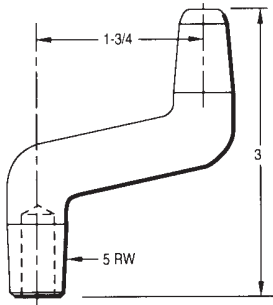
SE-4276-1
Part No. 170-4276-1



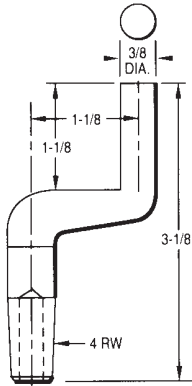
SE-4276
Part No. 170-4276



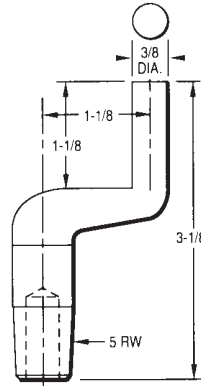
These standard bent tips are in addition to those shown on page 9. They are of class 2 alloy; Other alloys can also be ordered.



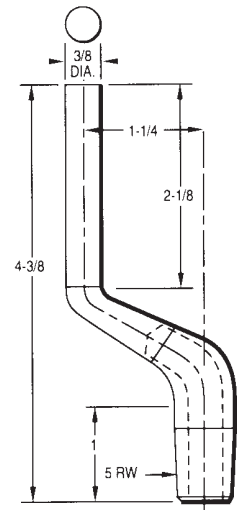
SE-4284 (short water hole)
Part No. 170-4284



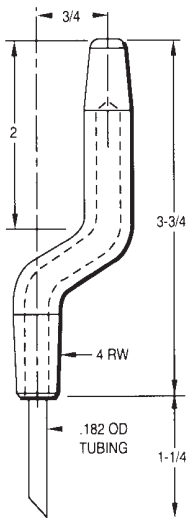
SE-4285
Part No. 170-4285



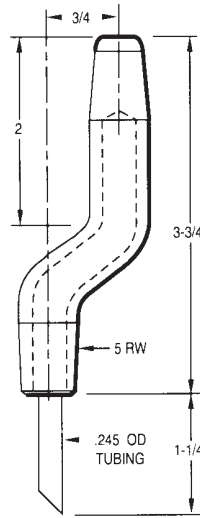
SE-4286
Part No. 170-4286



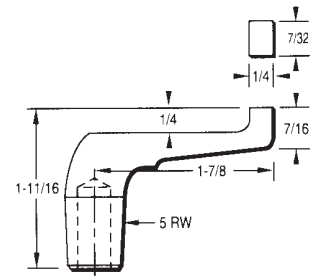
SE-4287
Part No. 170-4287



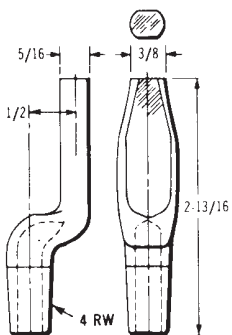
SE-4282
Part No. 170-4282



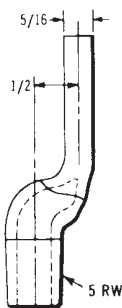
SE-4283
Part No. 170-4283



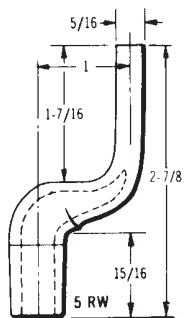
SE-4288
Part No. 170-4288



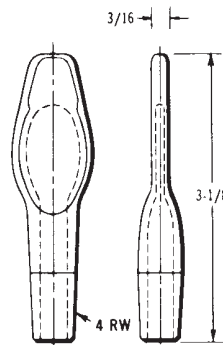
SE-4277
Part No. 170-4277



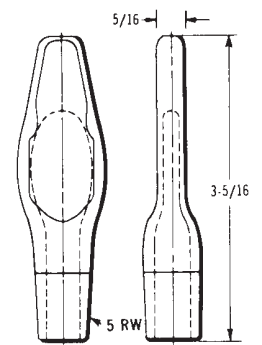
SE-4278
Part No. 170-4278



SE-4279
Part No. 170-4279

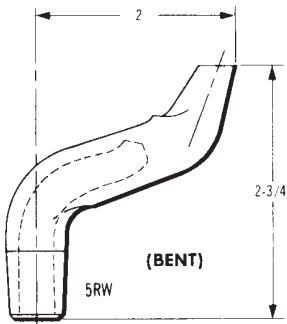


SE-4280
Part No. 170-4280

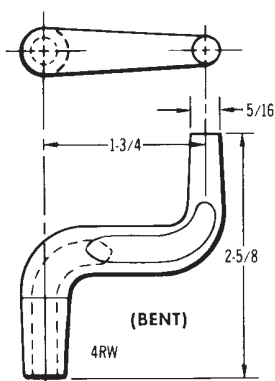


SE-4281
Part No. 170-4281

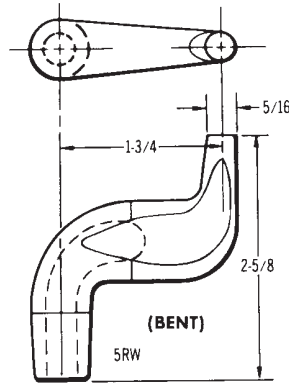




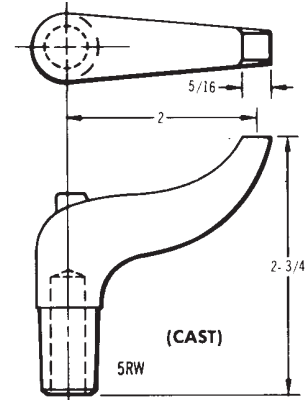
SE-4535
Part No. 186-0520



SE-4089-4
Part No. 170-4090



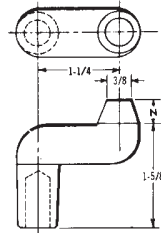
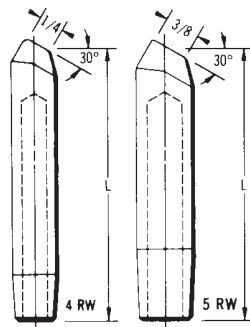
SE-4089-5
Part No. 170-4089



5RW: C-507-5, Part No. 186-0507
4RW: C-507-4, Part No. 186-0508

These straight tips have welding faces angled 30°.

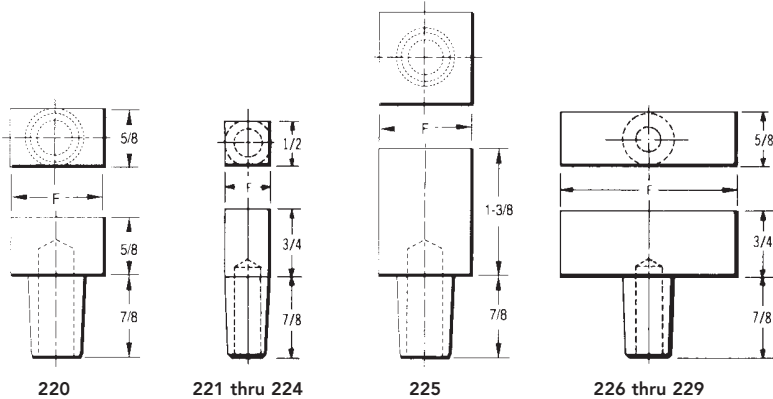
Alloy Class	Taper No.	Length 'L'	Description	Part No.
2	4RW	2	H-2408-30	145-2408
2	4RW	3	H-2412-30	145-2412
2	4RW	4	H-2416-30	145-2416
2	5RW	2	H-2508-30	145-2508
2	5RW	3	H-2512-30	145-2512
2	5RW	4	H-2516-30	145-2516



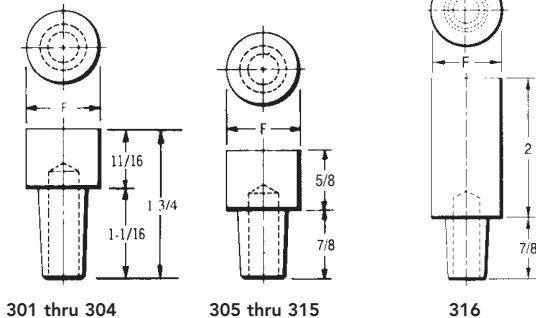
N-15 thru N-28

Alloy Class	Taper No.	Length 'N'	Description	Part No.
2	4RW	3/8	N-15	186-0015
2	4RW	3/4	N-16	186-0016
2	5RW	3/8	N-27	186-0027
2	5RW	3/4	N-28	186-0028

BACK UP ELECTRODES



These tips are all machined from bar stock. Special designs can be made to order.



301 thru 304

305 thru 315

316

*311, 313 and 316 available with Copper Tungsten face. See pg. 32

RECTANGULAR FACE

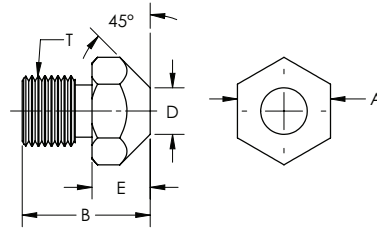
Alloy Class	Taper No.	Face 'F'	Description	Part No.
2	5RW	1	220	186-0220
2	4RW	1/2	221	186-0221
2	4RW	1	223	186-0223
2	5RW	1	224	186-0224
2	5RW	1	225	186-0225
2	5RW	2	226	186-0226
2	4RW	2	227	186-0227
2	5RW	1-1/2	228	186-0228
2	4RW	1-1/2	229	186-0229

ROUND FACE

Alloy Class	Taper No.	Face 'F'	Description	Part No.
2	4RW	7/8	301	186-0301
1	4RW	7/8	302	186-0302
2	5RW	7/8	303	186-0303
1	5RW	7/8	304	186-0304
2	4RW	7/8	305	186-0305
1	4RW	7/8	306	186-0306
2	5RW	7/8	307	186-0307
1	5RW	7/8	308	186-0308
2	4RW	1	309	186-0309
1	4RW	1	310	186-0310
2	5RW	1	311*	186-0311
1	5RW	1	312	186-0312
2	5RW	1-1/4	313*	186-0313
2	5RW	1-1/2	315	186-0315
2	5RW	1	316*	186-0316

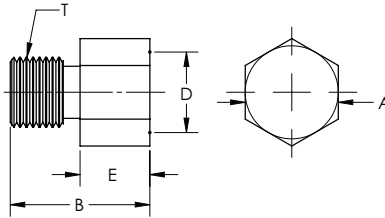
Additional Back Up Electrodes with Copper Tungsten Faces - See Page 22





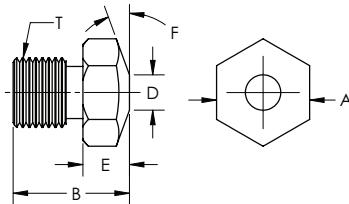
“A” POINTED NOSE THREADED ELECTRODE

RWMA Alloy Class No.	Part Number	Part Description	T Thread Size	A Hex Size (in)	B Overall Length	D Weld Face Diameter	E Hex Body Length (in)	Angle
2 (CuCr)	188-2431-16-A	TH-2431-16-A	3/8-16	1/2	11/16	1/4	5/16	45°
2 (CuCrZr)	188-2431-16-AZ	TH-2431-16-AZ	3/8-16	1/2	11/16	1/4	5/16	45°
2 (CuCrZr)	188-2437-16-AZ	TH-2437-16-AZ	3/8-16	1/2	3/4	1/4	3/8	45°
2 (CuCrZr)	188-2450-16-AZ	TH-2450-16-AZ	3/8-16	1/2	7/8	1/4	1/2	45°
3	188-3450-16-A	TH-3450-16-A	3/8-16	1/2	7/8	1/4	1/2	45°



“C” FLAT NOSE THREADED ELECTRODE

RWMA Alloy Class No.	Part Number	Part Description	T Thread Size	A Hex Size (in)	B Overall Length	D Weld Face Diameter	E Hex Body Length (in)
3	188-3437-16-C	TH-3437-16-C	3/8-16	1/2	3/4	1/2	3/8
2 (CuCr)	188-2450-16-C	TH-2450-16-C	3/8-16	1/2	7/8	1/2	1/2
3	188-3450-16-C	TH-3450-16-C	3/8-16	1/2	7/8	1/2	1/2
2 (CuCr)	187-5062-14	5062-14-C	7/16-14	5/8	3/4	5/8	3/8
2 (CuCr)	187-5062-16	5062-16-C	3/8-16	5/8	3/4	5/8	3/8
2 (CuCr)	187-5100-10	5100-10-C	3/4-10	1	2	1	1-3/8
2 (CuCr)	187-5125-10	5125-10-C	3/4-10	1-1/4	2	1-1/4	1-3/8
2 (CuCr)	187-5100-11	5100-11-C	5/8-11	1	2	1	1-3/8
2 (CuCr)	187-5100-18	5100-18-C	5/8-18	1	2	1	1-3/8



“E” TRUNCATED NOSE THREADED ELECTRODE

RWMA Alloy Class No.	Part Number	Part Description	T Thread Size	A Hex Size (in)	B Overall Length	D Weld Face Diameter	E Hex Body Length (in)	F Angle
2 (CuCr)	188-2425-16-E	TH-2425-16-E	3/8-16	1/2	5/8	3/16	1/4	20°
3	188-3425-16-E	TH-3425-16-E	3/8-16	1/2	5/8	3/16	1/4	20°
3	188-3437-16-E	TH-3437-16-E	3/8-16	1/2	3/4	3/16	3/8	20°
2 (CuCr)	188-2450-16-E	TH-2450-16-E	3/8-16	1/2	7/8	3/16	1/2	20°
3	188-3450-16-E	TH-3450-16-E	3/8-16	1/2	7/8	3/16	1/2	20°
2 (CuCr)	188-5062-14	5062-14-E	7/16-14	5/8	3/4	1/4	3/8	45°
2 (CuCr)	188-5100-11	5100-11-E	5/8-11	1	2	1/2	1-3/8	20°
2 (CuCr)	188-5100-18	5100-18-E	5/8-18	1	2	1/2	1-3/8	20°
2 (CuCr)	188-5100-10	5100-10-E	3/4-10	1	2	1/2	1-3/8	20°
2 (CuCr)	188-5125-10	5125-10-E	3/4-10	1	2	1/2	1-3/8	20°

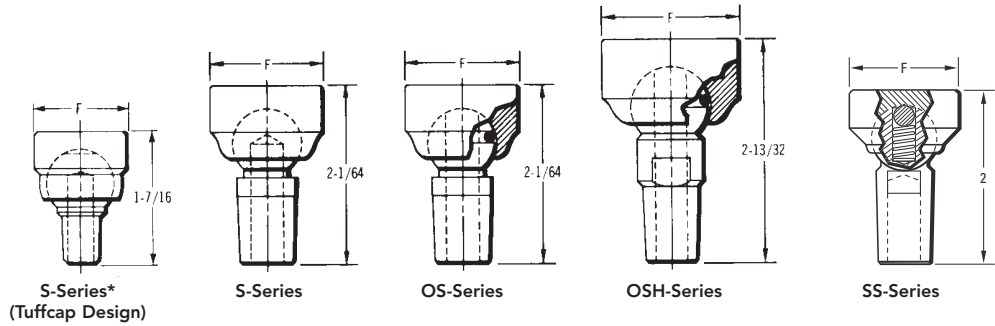


TUFFALOY SWIVEL TIPS

Swivel tips have ball-jointed swivel heads to compensate for minor misalignment, and to eliminate marking of the work surface. They are all machined from Class 2 alloy bar stock. The S- and SS-Series tip water hole does not reach the head. In the OS and OSH models, the water does contact the head, and O-rings are used to seal it. In the SS Series a spring is used to keep pressure on head for better positioning.

Class 1 and class 3 heads are also available.

Note: Standard swivel tilt is approximately 18°, a 25° swivel is available on request. Add suffix "HS" to above part number.



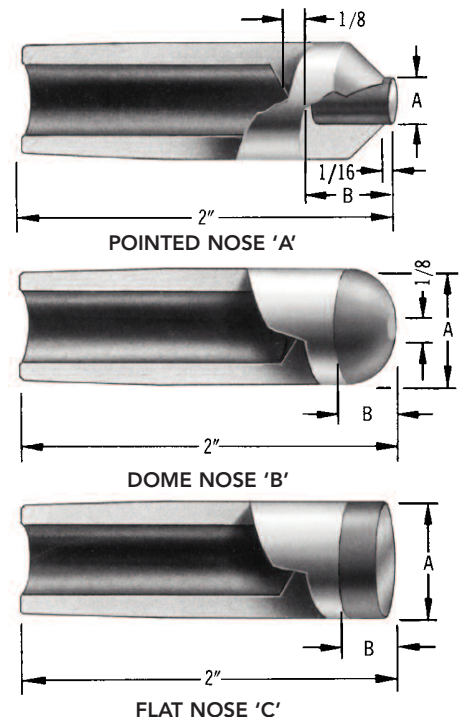
Taper No.	Face Dia. 'F'	S-Series		OS-Series		OSH-Series		SS-Series	
		Description	Part No.	Description	Part No.	Description	Part No.	Description	Part No.
5-CT*	7/8	S-248	182-0248						
	1	S-249	182-0249						
	1-1/4	S-250	182-0250						
4RW	7/8	S-348	182-0348	OS-348	182-1348				
	1	S-350	182-0350	OS-350	182-1350				
	1-1/4	S-351	182-0351	OS-351	182-1351				
5RW	7/8	S-349	182-0349	OS-349	182-1349	OSH-353	182-2353	SS-353	182-3353
	1	S-353	182-0353	OS-353	182-1353	OSH-354	182-2354	SS-354	182-3354
	1-1/4	S-354	182-0354	OS-354	182-1354	OSH-356	182-2356		
	1-1/2					OSH-358	182-2358		
7RW	2-1/2					3360	182-3360		

*Will fit Tuffcap adapter shanks having No. 5 RW tapers, as shown on page 6.

TUFFALOY REFRACTORY METAL-FACED TIPS

Nose Type	Taper No.	Facing Alloy Class	Dimensions		Description	Part No.
			A	B		
Pointed	4RW	14	3/16	3/8	A-2408-100M	185-0120
	4RW	13	3/16	3/8	A-2408-100W	185-0130
	5RW	11	1/4	3/8	A-2508-10W	185-0150
	5RW	14	1/4	3/8	A-2508-100M	185-0160
	5RW	13	1/4	3/8	A-2508-100W	185-0170
Dome	4RW	11	1/2	1/4	B-2408-10W	185-1110
	5RW	11	5/8	1/4	B-2508-10W	185-1120
	5RW	13	5/8	1/4	B-2508-100W	185-1170
Flat	4RW	11	1/2	1/4	C-2408-10W	185-1210
	4RW	14	1/2	1/4	C-2408-100M	185-1220
	4RW	13	1/2	1/4	C-2408-100W	185-1230
	5RW	11	5/8	1/4	C-2508-10W	185-1250
	5RW	14	5/8	1/4	C-2508-100M	185-1260
5RW	13	5/8	1/4	C-2508-100W	185-1270	

The TUFFALOY copper-tungsten, tungsten and molybdenum-faced tips listed here withstand greater heat and pressure, at the expense of some conductivity. Besides being used for spot welding high resistance base metals, they are useful in achieving "heat balance" when welding dissimilar metals. (The higher resistance electrode is used against the lower resistance, or thinner, member, to help contain the heat generated.) They have the same diameters and tapers as the standard straight tips in this catalog. Bodies are of Class 2 alloy. Lengths other than those shown can be ordered.



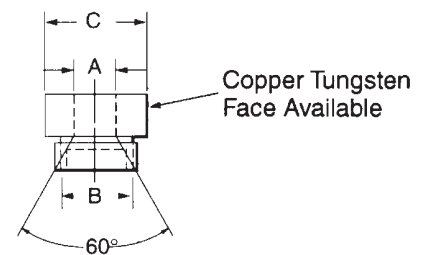
METRIC NUT ELECTRODES

TUFFALOY now stocks the head/pin style welding system components that adds to your selection for stud and nut welding needs. From our standard style to our Arctic, that produces higher quality welds and longer life, you can select the product that best meets your needs.

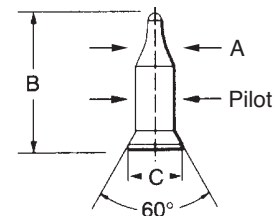
Heads are made from RWMA class 2 material that are an optimal cost consumable. Class 3 and 10W are available for longer life. With a concave seat the pin locates in the center of assembly when air is applied to the system. This gives you a repeatable location for automated nut feeders to introduce the nut to the environment.

Pins have a nonconductive surface on a steel matrix that gives longer life in a repetitive motion environment. With the threaded head securing the pin in place it makes it easy to replace the pin to meet your requirements. TUFFALOY can design pins for special applications.

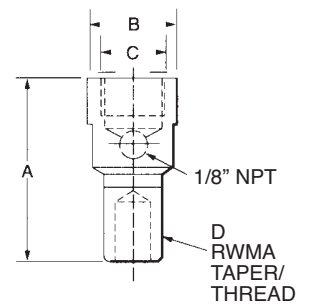
HEADS					
Part Number	Hole Dia.	A Pin Size	B Thread	C Dia.	Copper-Tungsten Faced Heads
175-8004	.197	4mm	M18	1.0	175-8004-10W
175-8005	.236	5mm			175-8005-10W
175-8006	.276	6mm			175-8006-10W
175-8007	.315	7mm			175-8007-10W
175-8008	.354	8mm			175-8008-10W
175-8009	.394	9mm			175-8009-10W
175-8010	.432	10mm	M22	1.125"	175-8010-10W
175-8011	.472	11mm			175-8011-10W
175-8012	.512	12mm			175-8012-10W
175-8013	.551	13mm			175-8013-10W
175-8014	.588	14mm	M26	1.250"	175-8014-10W



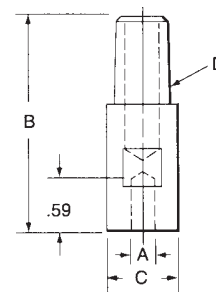
PINS				
Part Number	A Nut	B OAL	C Base	Pilot Dia.
195-3004	4mm	1.12"	12mm	.185
195-3005	5mm	1.17"		.224
195-3006	6mm	1.23"		.264
195-3007	7mm	1.24"		.303
195-3008	8mm	1.25"		.340
195-3009	9mm	1.19"		.380
195-3010	10mm	1.37"	16mm	.422
195-3011	11mm	1.38"		.458
195-3012	12mm	1.40"		.500
195-3013	13mm	1.37"		.539
195-3014	14mm	1.50"	.815	.580
195-3015	15mm	1.52"	.815	.620



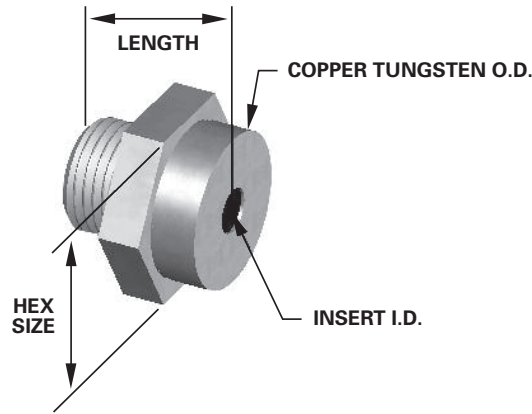
BODIES					
Description	Part Number	A OAL	B Dia.	C Thread	D Taper/Thread
TDH-25A	301-0004	1.77"	1"	18mm	#4
TDH-25C	301-0005	1.97"	1"	18mm	#5
TDH-25C-THD	301-0006	2.13"	1"	18mm	5/8-11
TDH-30A	301-0015	1.97"	1.125"	22mm	#5
TDH-35A	301-0020	1.97"	1.125"	26mm	#5



UPPER ELECTRODE					
Description	Part Number	A ID	B OAL	C Dia.	D Taper
TNFD 16-M5-16-3	186-0101	5mm	2.36"	.625"	5RW
TNFD 20-M6-16-3	186-0102	6mm		.75"	
TNFD 20-M8-16-3	186-0103	7.5mm		.75"	
TNFD 20-M10-16-3	186-0104	10mm		.75"	
TNFD 20-M12-16-3	186-0105	12mm		.75"	



GH SERIES NUT WELDING HEADS

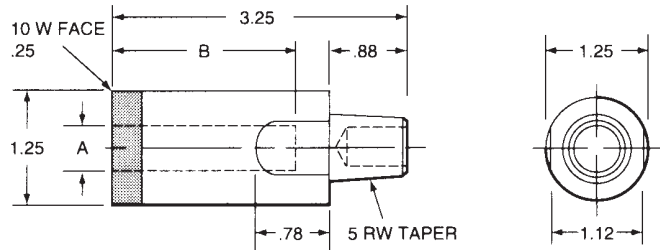
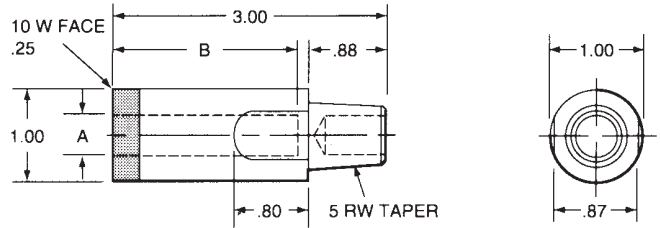


	175-GH-2 Series	175-GH-3 Series	175-GH-4 Series	Insert I.D.	175-GH-2 Series	175-GH-3 Series	175-GH-4 Series	Insert I.D.
Length	0.875	1.000	1.125		0.875	1.000	1.125	
Tungsten OD	0.875	1.250	1.500		0.875	1.250	1.500	
Hex Size	1.000	1.375	1.500		1.000	1.375	1.500	
Thread Size	5/8-18	7/8-14	1 1/8-12		5/8-18	7/8-14	1 1/8-12	
	175-GH-2-188	175-GH-3-188		0.188	175-GH-2-368			0.368
	175-GH-2-193	175-GH-3-193		0.193	175-GH-2-372	175-GH-3-372		0.372
	175-GH-2-197			0.197		175-GH-3-392		0.392
		175-GH-3-200		0.200		175-GH-3-397		(10mm) 0.397
	175-GH-2-212			0.212		175-GH-3-412		0.412
	175-GH-2-218			0.218		175-GH-3-417		0.417
	175-GH-2-239			0.239		175-GH-3-423		0.423
	175-GH-2-240			0.240		175-GH-3-425		0.425
	175-GH-2-242	175-GH-3-242		(6mm) 0.242		175-GH-3-427		0.427
	175-GH-2-245	175-GH-3-245		0.245		175-GH-3-430		0.430
		175-GH-3-247		0.247		175-GH-3-432		0.432
	175-GH-2-250			0.250		175-GH-3-437		0.437
		175-GH-3-251		0.251		175-GH-3-445		0.445
	175-GH-2-252			0.252		175-GH-3-447		0.447
		175-GH-3-254		0.254		175-GH-3-452		0.452
	175-GH-2-258			0.258		175-GH-3-465		0.465
		175-GH-3-262		0.262		175-GH-3-467		0.467
	175-GH-2-263			0.263		175-GH-3-470		0.470
		175-GH-3-264		0.264		175-GH-3-472		0.472
	175-GH-2-272	175-GH-3-272		0.272		175-GH-3-480		(12mm) 0.480
	175-GH-2-273	175-GH-3-273		0.273		175-GH-3-504		0.504
	175-GH-2-275			0.275		175-GH-3-507		0.507
	175-GH-2-277			0.277		175-GH-3-508		0.508
	175-GH-2-280			0.280			175-GH-4-509	0.509
	175-GH-2-282			0.282		175-GH-3-512		0.512
	175-GH-2-287			0.287		175-GH-3-517		0.517
	175-GH-2-312	175-GH-3-312		0.312		175-GH-3-522		0.522
		175-GH-3-317		(8mm) 0.317			175-GH-4-532	0.532
	175-GH-2-322	175-GH-3-322		0.322		175-GH-3-538		0.538
	175-GH-2-325		175-GH-4-325	0.325		175-GH-3-542		0.542
		175-GH-3-326		0.326		175-GH-3-547		0.547
	175-GH-2-332	175-GH-3-332		0.332		175-GH-3-548		0.548
		175-GH-3-337		0.337		175-GH-3-552		0.552
	175-GH-2-342			0.342		175-GH-3-557		0.557
	175-GH-2-347	175-GH-3-347		0.347		175-GH-3-587		0.587
		175-GH-3-351	175-GH-4-351	0.351		175-GH-3-592		0.592
	175-GH-2-352	175-GH-3-352		0.352		175-GH-3-632		0.632
	175-GH-2-354			0.354		175-GH-3-656		0.656
	175-GH-2-357	175-GH-3-357		0.357			175-GH-4-667	0.667
	175-GH-2-359			0.359			175-GH-4-677	0.677

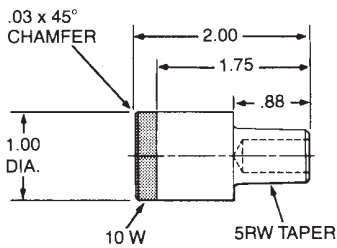


These series of Stud electrodes are made from RWMA Class 2 material with TUFFALOYS' 10W (copper tungsten) on the weld face and wrench flats for easy removal from holders. The Insulator is made to withstand the constant friction that is applied as the stud is inserted and removed.

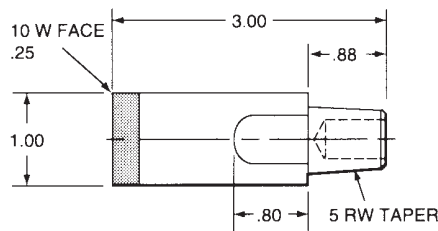
Screw Thread Size	INSULATOR		Part Number
	ID. A	Length B	
6mm 0.250 0.312, 8mm 0.375 10mm	.218	1"	175-0316-4032-10W
	.243		175-0316-40062-10W
	.256		175-0316-4042-10W
	.319		175-0316-4052-10W
	.381		175-0316-4062-10W
	.400		175-0316-40102-10W
6mm 0.250 0.312, 8mm 0.375 10mm	.218	2"	175-0316-4031-10W
	.243		175-0316-4006-10W
	.256		175-0316-4041-10W
	.319		175-0316-4051-10W
	.381		175-0316-4061-10W
	.400		175-0316-4010-10W
0.437 12mm 0.500	.444	1"	175-1313-4372-10W
	.479		175-1313-40122-10W
	.506		175-1313-4382-10W
	.569		175-1313-4392-10W
	.652		175-1313-4402-10W
	.694		175-1313-4412-10W
.777	175-1313-4422-10W		
0.437 12mm 0.500	.444	2"	175-1313-4371-10W
	.479		175-1313-4012-10W
	.506		175-1313-4381-10W
	.569		175-1313-4391-10W
	.652		175-1313-4401-10W
	.694		175-1313-4411-10W
.777	175-1313-4421-10W		



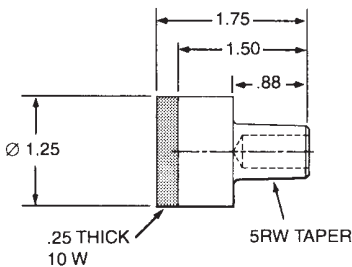
BACKUP ELECTRODES FOR UPPERS



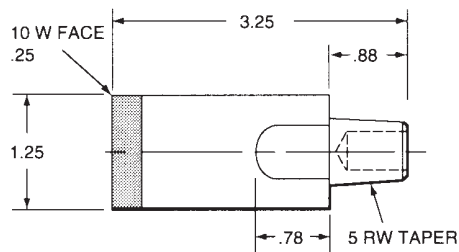
186-0311-10W



186-0316-10W



186-0313-10W



186-1313-10W

