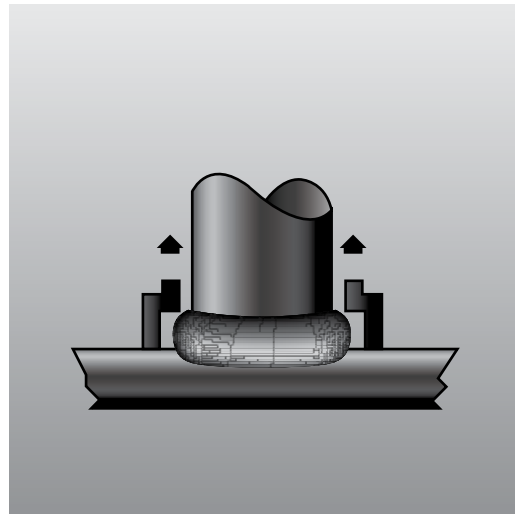
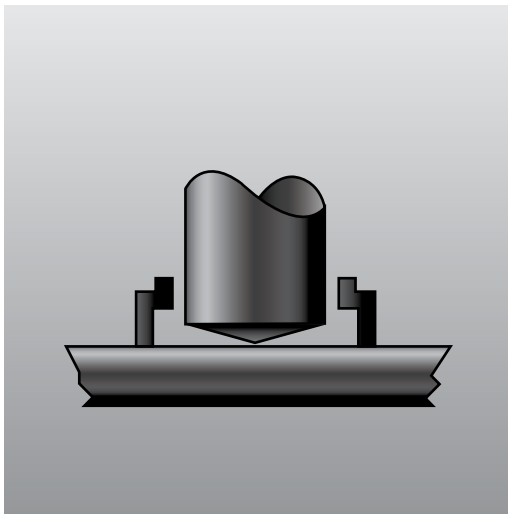




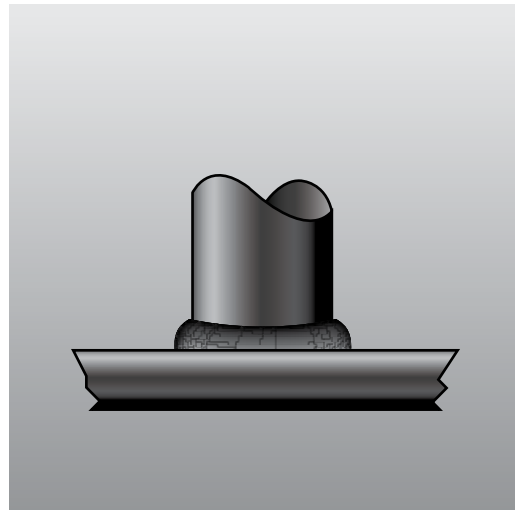
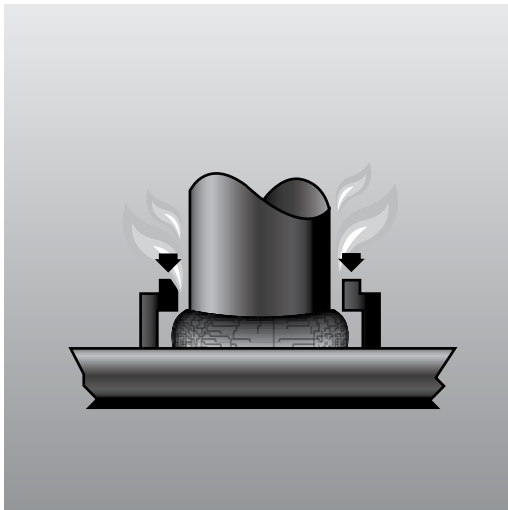
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website: [www.midwestfasteners.com](http://www.midwestfasteners.com)

# ***ARC WELD STUDS***

## **SPECIFICATION GUIDE**



FOUR STAGES OF THE ARC STUD WELDING PROCESS



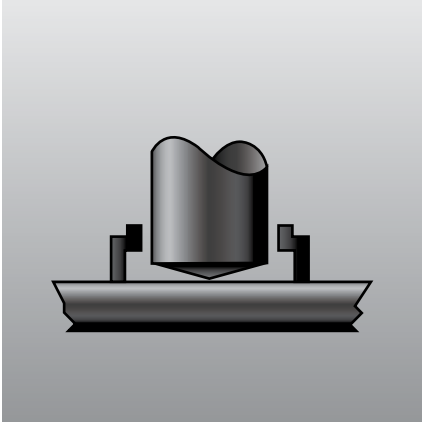
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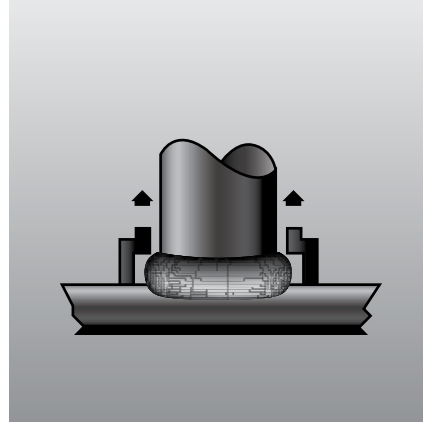
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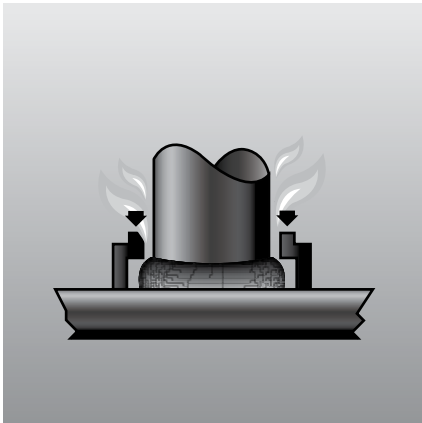
## THE ARC STUD WELDING PROCESS



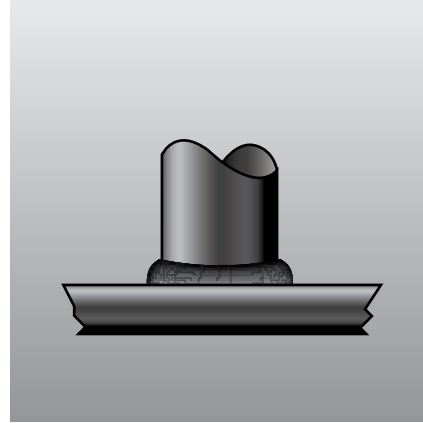
**1. STUD AND CERAMIC FERRULE AGAINST THE WORK PLATE**



**2. STUD LIFTS AND ARC IS DRAWN**



**3. CONTROL TIMES OUT AND STUD PLUNGES INTO MOLTEN STEEL**



**4. METAL SOLIDIFIES AND WELD IS COMPLETED IN MILLISECONDS**

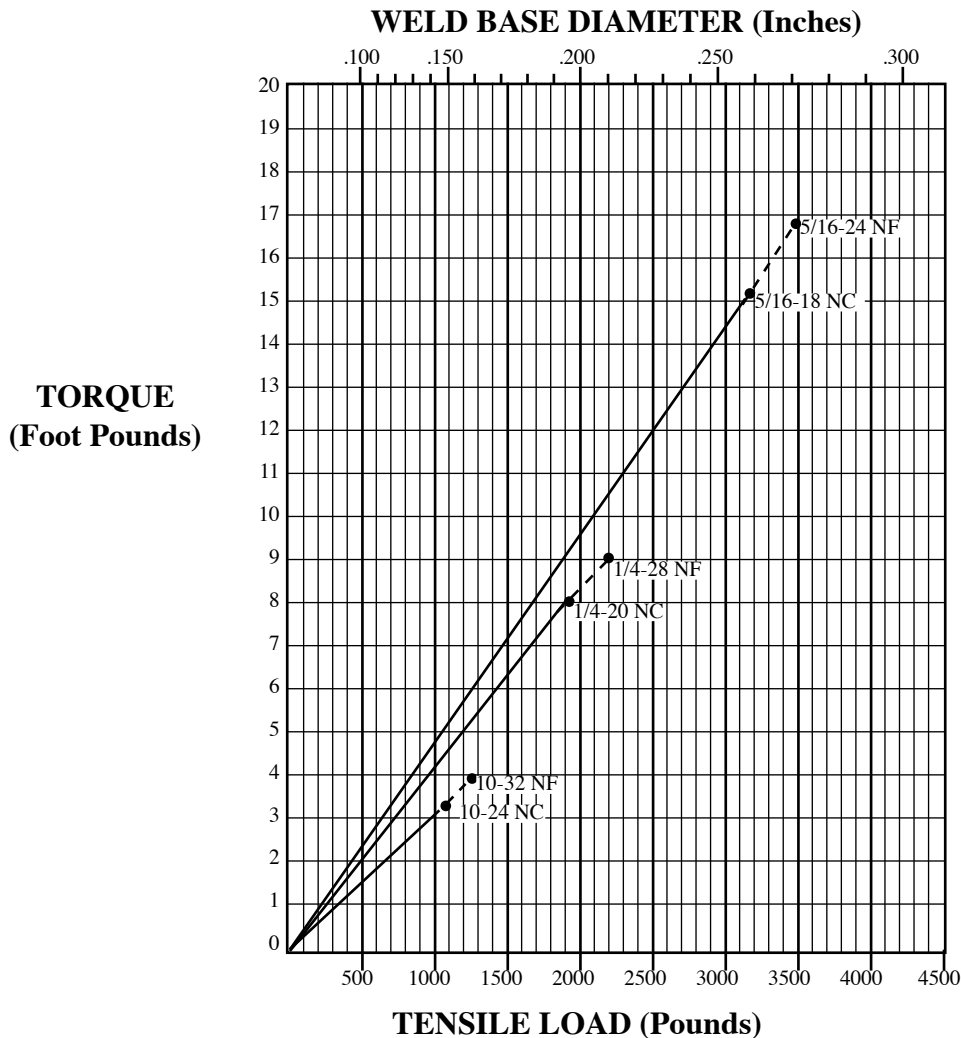
ARC Stud Welding involves the same basic principles and metallurgical aspects as any other arc welding procedure. The weld gun lifts the stud a short distance from the base metal and initiates a controlled electric arc from the power source which melts the end of the stud and a portion of the base metal. The ceramic ferrule contains the molten metal into which the stud is thrust automatically and a high quality fusion weld is accomplished.

ARC Stud Welding is generally used to weld larger diameter studs to thick base metals. ARC studs may be almost any shape and there are literally hundreds; however, they must have one end of the stud designed for ARC welding and must be made of weldable materials. Mild steel, stainless steel, and aluminum are applicable materials for ARC stud welding.

Contact MIDWEST FASTENERS Customer Service Department for technical assistance in non-standard arc stud fastener design.



# MIDWEST FASTENERS, INC. WELDED STEEL ARC STUDS TENSILE & TORQUE STRENGTHS



Graphs are based on 60,000 psi strength steel.

Of course, in actual practice, a stud should never be used at its yield load. A factor of safety must be applied. It is generally recommended that studs be used at no more than 60% of yield. However, the factor of safety may vary up or down, depending of the particular application. The user will make this determination. If further assistance is needed, contact MIDWEST FASTENERS Customer Service Department.

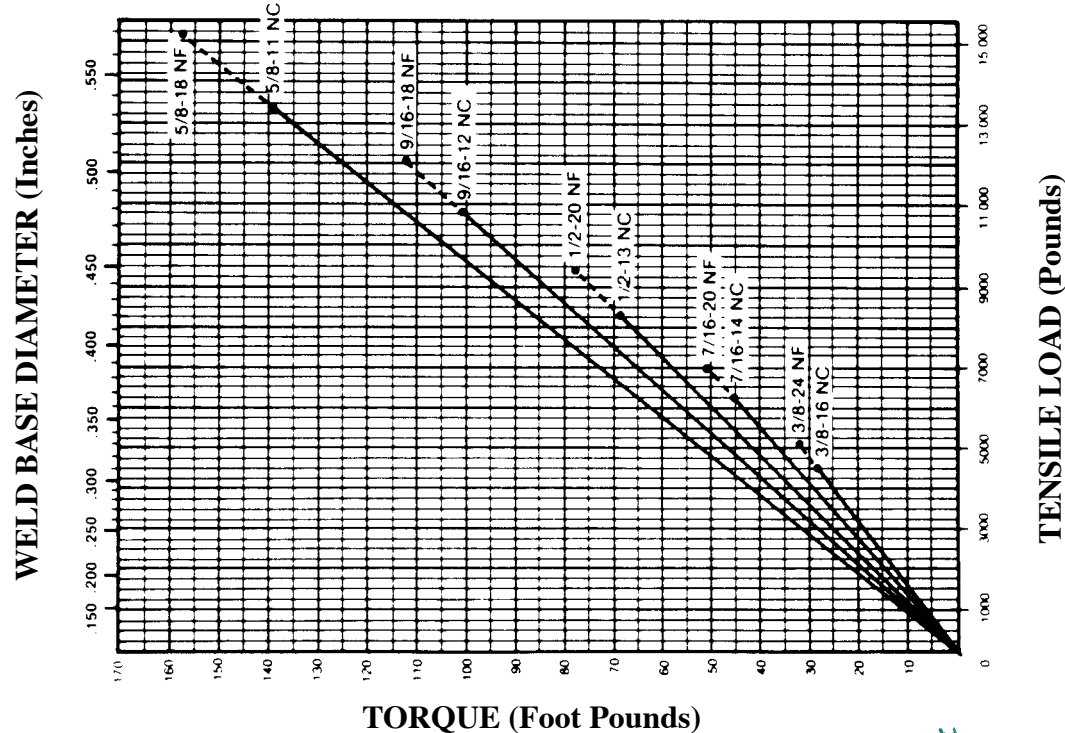
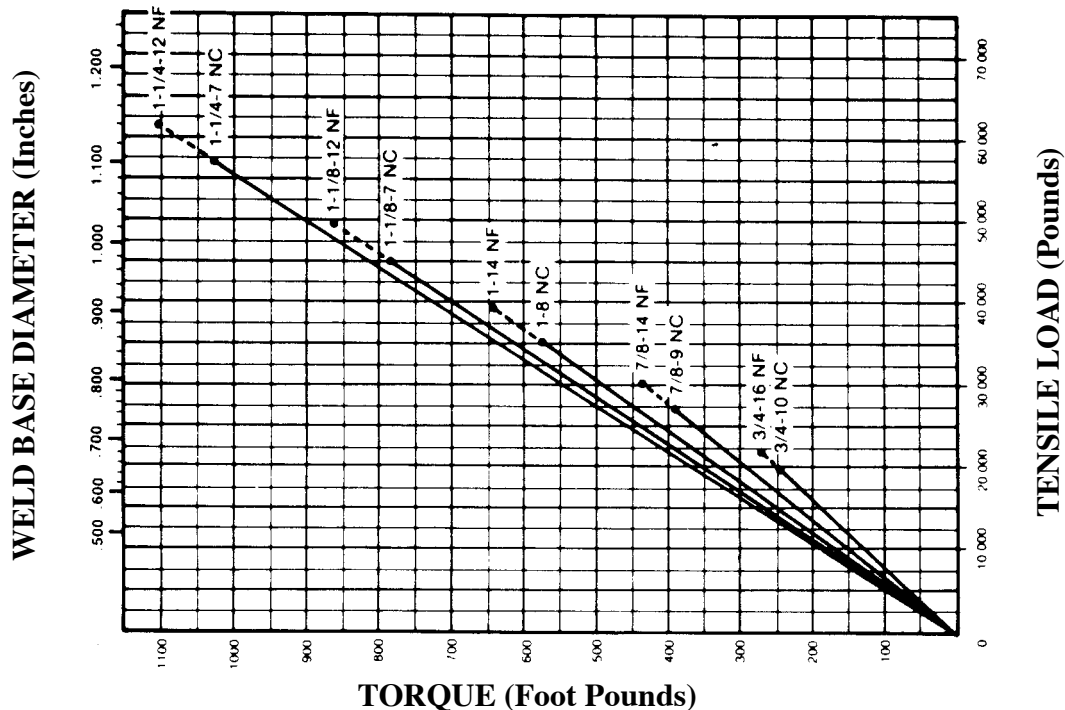
Scale along the top of each graph represents weld base diameter in inches, while the one at the graph's bottom edge shows tensile load in pounds. A separate line is plotted for each thread diameter. The solid portion of each line terminates at a small dot which represents the tensile yield of the national course thread. A dashed line is then extended to a second dot at the tensile yield load of the national fine thread.



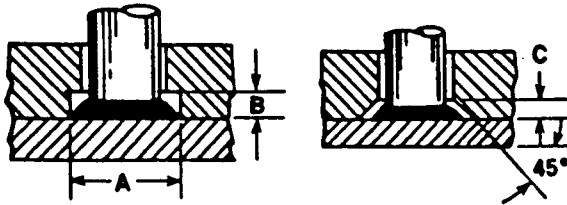
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# MIDWEST FASTENERS, INC. WELDED STEEL ARC STUDS TENSILE & TORQUE STRENGTHS



## ARC STUD WELD FILLET ACCOMMODATION

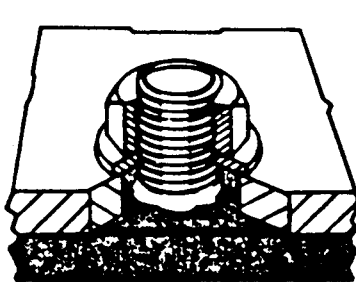


### COUNTER BORE OR COUNTER SINK METHODS

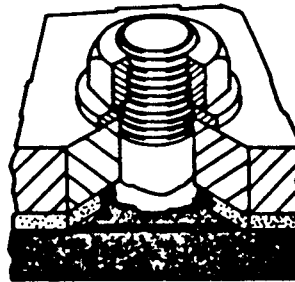
When an arc stud is welded, a fillet forms around its base with the fillet dimensions being closely controlled by the design of the ferrule used. Since the diameter of the fillet is generally larger than the diameter of the stud, some consideration is required in the design of mating parts. MIDWEST FASTENERS recommends a counter bore and counter sink method for this application. Dimensions will vary with studs and ferrules. Additional methods of accommodating fillet include over-sized clearance holes, use of a gasket material around the fillet or use of a dog type construction.

| STUD SIZE<br>(in.) | COUNTERBORE<br>(in.) |       | 90° COUNTERSINK<br>(in.) |
|--------------------|----------------------|-------|--------------------------|
|                    | A                    | B     | C                        |
| 1/4                | 0.437                | 0.125 | 0.125                    |
| 5/16               | 0.500                | 0.125 | 0.125                    |
| 3/8                | 0.593                | 0.125 | 0.125                    |
| 7/16               | 0.656                | 0.187 | 0.125                    |
| 1/2                | 0.750                | 0.187 | 0.187                    |
| 5/8                | 0.875                | 0.218 | 0.187                    |
| 3/4                | 1.125                | 0.312 | 0.187                    |

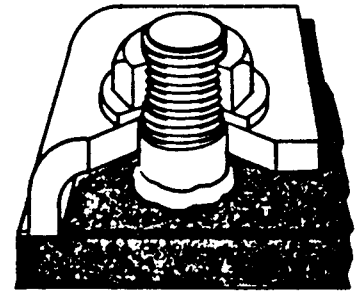
### SEVERAL OPTIONAL METHODS OF FILLET ACCOMMODATION:



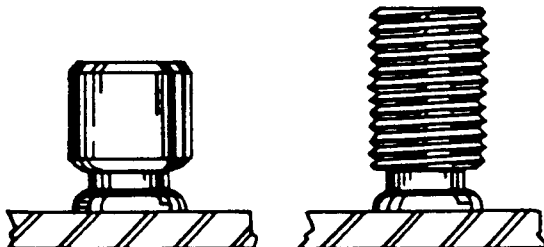
(A) OVERSIZE  
CLEARANCE HOLE



(B) GASKET  
MATERIAL



(C) DOG CLAMP



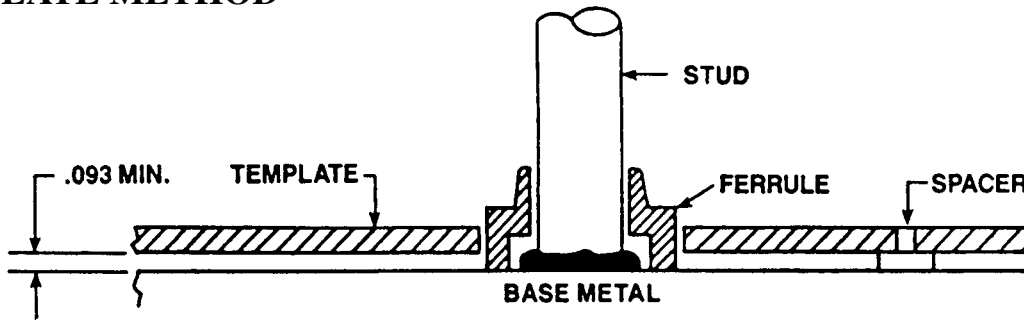
### IF AN OVERSIZE FILLET DOES NOT MEET THE APPLICATION:

A MIDWEST FASTENERS weld stud designed with a reduced weld base is available so that the weld fillet does not exceed the maximum diameter of fastener. This design is not recommended if full fastener strength is important.



## ARC STUD LOCATION TEMPLATE & BUSHING DESIGN

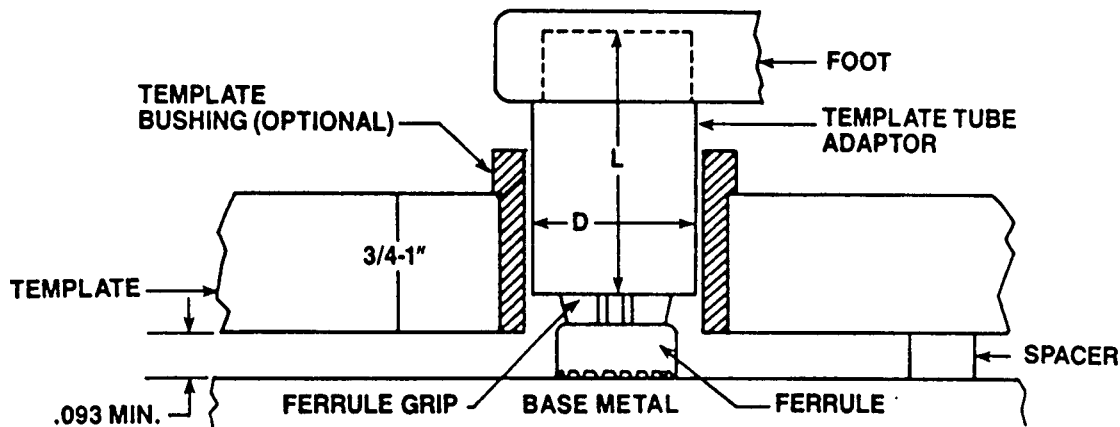
### TEMPLATE METHOD



This method of templating is recommended by MIDWEST FASTENERS for use with ferrules. The template is usually a steel plate 3/32" to 3/16" thick. Spacers are required to allow the gases to escape during the welding cycle. The ferrule can be held by a standard ferrule grip or where clearance is prohibitive a tube type set-up can be used. The recommended hole sizes on the template to locate the

ferrules should equal the maximum outside diameter of the ferrule plus 1/32". Holes may be drilled or bored at required locations. See stud specification sheets for ferrule details. For further assistance contact the MIDWEST FASTENERS Customer Service Department.

### BUSHING METHOD



This method of templating is recommended by MIDWEST FASTENERS for use with all arc stud styles. The design makes it possible to accurately hold angular alignment of the studs as well as stud location. The template should be made of ebonite or masonite of a thickness sufficient to afford good alignment. Template bushings may be used to insure greater accuracy and extend the life of the template. Standard ferrule grips are used with the tube adapter. This permits standardization of templates since it is only necessary to change the ferrule grip to weld studs of different diameters. The hole diameter of the

bushing or template should be approximately .010 larger than the maximum outside diameter of the template tube adapter.

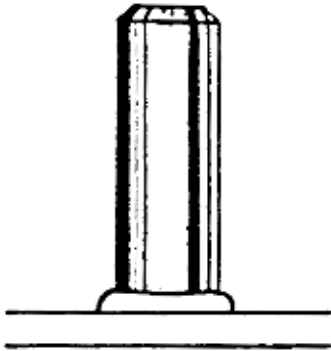
| STUD Size       | D     | L     |
|-----------------|-------|-------|
| 1/2" and under  | 1.250 | 2.000 |
| 5/8" and 3/4"   | 1.562 | 2.500 |
| 7/8" and larger | 2.125 | 2.500 |



## ARC STUD LOCATION TEMPLATE & BUSHING DESIGN

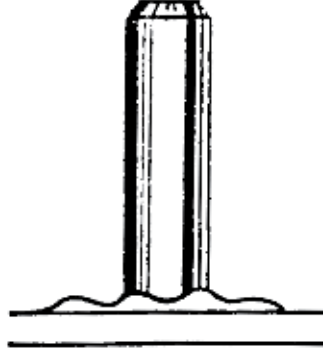
### ARC STUD WELD INSPECTION (VISUAL)

The MIDWEST FASTENERS ARC stud weld can be visually inspected by observing the fillet at the base of the stud. The illustrations and comments below will assist you in visually judging the quality of the weld.



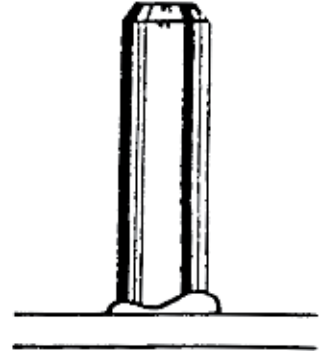
#### **GOOD WELD**

Full, even, shiny fillet all around stud.



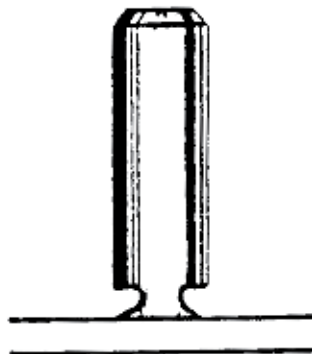
#### **HOT WELD**

Very shiny, low profile fillet extending beyond outside of ferrule.



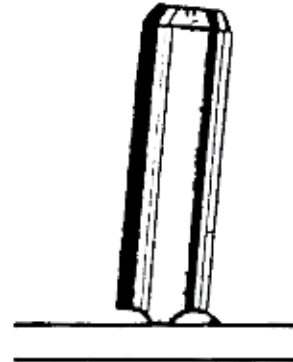
#### **COLD WELD**

Small, uneven, dull appearing fillet with fingers of metal extending through vents of ferrule.



#### **SHORT PLUNGE OR HANG-UP**

No fillet, no stud burn-off, or undercut base.



#### **MISALIGNMENT**

Partial or no fillet, undercut, stud not perpendicular to base metal.



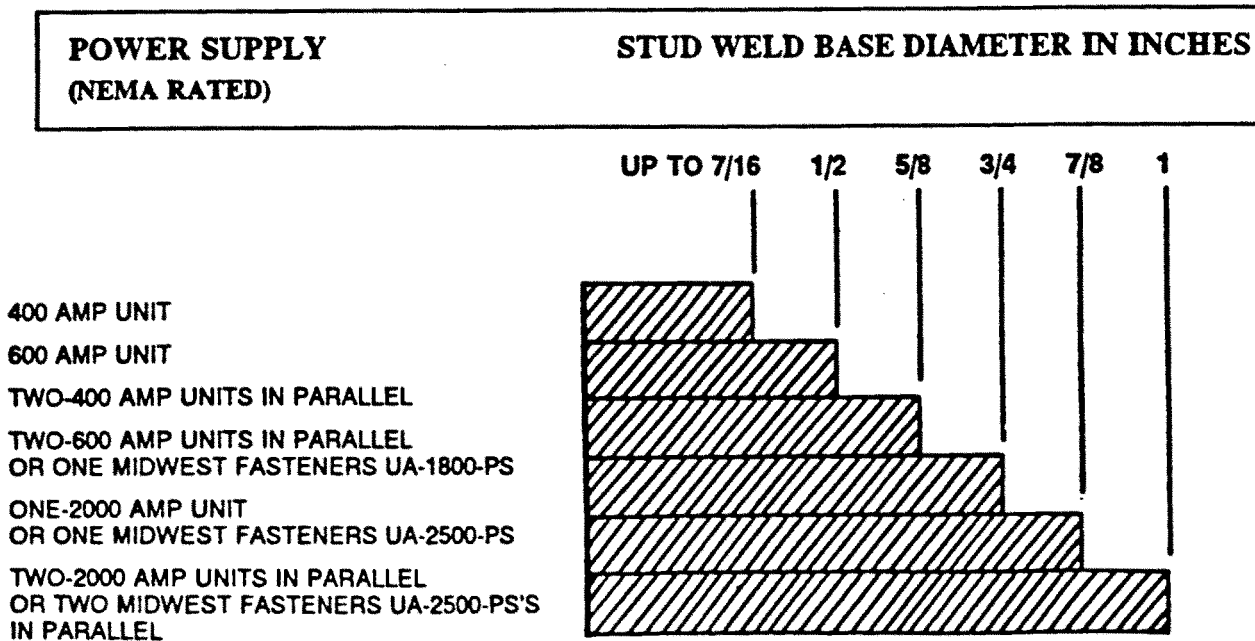
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## ARC STUD WELDING RECOMMENDED MINIMUM BASE METAL THICKNESS

| STUD WELD<br>BASE DIA.<br>(in.) | STEEL          |        | ALUMINUM       |             |
|---------------------------------|----------------|--------|----------------|-------------|
|                                 | WITHOUT BACKUP |        | WITHOUT BACKUP | WITH BACKUP |
|                                 | (in.)          | (gage) | (in.)          | (in.)       |
| 0.187                           | 0.0359         | 20     | 0.125          | 0.125       |
| 0.250                           | 0.0478         | 18     | 0.125          | 0.125       |
| 0.312                           | 0.0598         | 16     | 0.187          | 0.125       |
| 0.375                           | 0.0747         | 14     | 0.187          | 0.187       |
| 0.437                           | 0.0897         | 13     | 0.250          | 0.187       |
| 0.500                           | 0.1196         | 11     | 0.250          | 0.250       |
| 0.625                           | 0.148          | 9      |                |             |
| 0.750                           | 0.187          |        |                |             |
| 0.875                           | 0.250          |        |                |             |
| 1.000                           | 0.375          |        |                |             |

## ARC STUD WELDING DC POWER SUPPLY REQUIREMENTS



## ARC STUDS WEIGHT CHARTS (STEEL)

| MIDWEST FASTENERS ESTIMATED WEIGHTS OF THREADED STUDS IN POUNDS PER 1000 PIECES |        |         |        |         |        |        |        |       |
|---------------------------------------------------------------------------------|--------|---------|--------|---------|--------|--------|--------|-------|
| LENGTH                                                                          | 1/4-20 | 5/16-18 | 3/8-16 | 7/16-14 | 1/2-13 | 5/8-11 | 3/4-10 | 7/8-9 |
| 3/4                                                                             | 8.3    | 12.8    | 18.8   | 25.5    | 34.5   |        |        |       |
| 1                                                                               | 11.0   | 17.0    | 25.0   | 34.0    | 46.0   | 70.0   |        |       |
| 1-1/4                                                                           | 13.8   | 21.3    | 31.3   | 42.5    | 57.5   | 87.5   | 133.8  |       |
| 1-1/2                                                                           | 16.5   | 25.5    | 37.5   | 51.0    | 69.0   | 105.0  | 160.5  | 243.8 |
| 1-3/4                                                                           | 19.3   | 29.8    | 43.8   | 59.5    | 80.5   | 122.5  | 187.3  | 284.4 |
| 2                                                                               | 22.0   | 34.0    | 50.0   | 68.0    | 92.0   | 140.0  | 214.0  | 325.0 |
| 2-1/4                                                                           | 24.8   | 38.3    | 56.3   | 76.5    | 103.5  | 157.5  | 240.8  | 365.6 |
| 2-1/2                                                                           | 27.5   | 42.5    | 62.5   | 85.0    | 115.0  | 175.0  | 267.5  | 406.3 |
| 2-3/4                                                                           | 30.3   | 46.8    | 68.8   | 93.5    | 126.5  | 192.5  | 294.3  | 446.9 |
| 3                                                                               | 33.0   | 51.0    | 75.0   | 102.0   | 138.0  | 210.0  | 321.0  | 487.5 |
| 3-1/4                                                                           | 35.8   | 55.3    | 81.3   | 110.5   | 149.5  | 227.5  | 347.8  | 528.1 |
| 3-1/2                                                                           | 38.5   | 59.5    | 87.5   | 119.0   | 161.0  | 245.0  | 374.5  | 568.8 |
| 3-3/4                                                                           | 41.3   | 63.8    | 93.8   | 127.5   | 172.5  | 262.5  | 401.3  | 609.4 |
| 4                                                                               | 44.0   | 68.0    | 100.0  | 136.0   | 184.0  | 280.0  | 428.0  | 650.0 |
| 4-1/4                                                                           | 46.8   | 72.3    | 106.3  | 144.5   | 195.5  | 297.5  | 454.8  | 690.6 |
| 4-1/2                                                                           | 49.5   | 76.5    | 112.5  | 153.0   | 207.0  | 315.0  | 481.5  | 731.3 |
| 4-3/4                                                                           | 52.3   | 80.8    | 118.8  | 161.5   | 218.5  | 332.5  | 508.3  | 771.9 |
| 5                                                                               | 55.0   | 85.0    | 125.0  | 170.0   | 230.0  | 350.0  | 535.0  | 812.5 |
| EACH ADD'L. INCH                                                                | 11.0   | 17.0    | 25.0   | 34.0    | 46.0   | 70.0   | 107.0  | 162.5 |
| "P" FERRULE                                                                     | 1.8    | 2.8     | 3.1    | 4.5     | 5.9    | 10.8   | 21.9   | 39.0  |

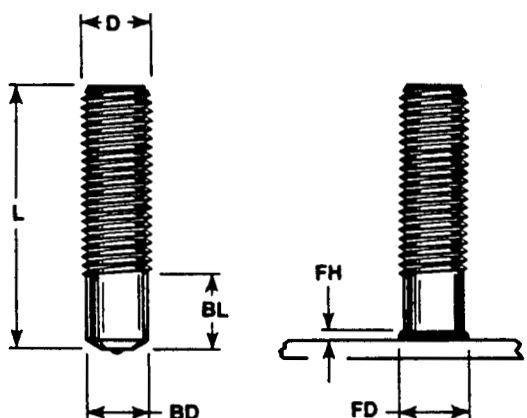
| MIDWEST FASTENERS ESTIMATED WEIGHTS OF NO-THREAD STUDS IN POUNDS PER 1000 PIECES |           |          |           |          |           |          |          |          |          |
|----------------------------------------------------------------------------------|-----------|----------|-----------|----------|-----------|----------|----------|----------|----------|
| LENGTH                                                                           | 3/16 dia. | 1/4 dia. | 5/16 dia. | 3/8 dia. | 7/16 dia. | 1/2 dia. | 5/8 dia. | 3/4 dia. | 7/8 dia. |
| 3/4                                                                              | 6.0       | 10.5     | 16.4      | 23.5     | 31.9      | 41.7     |          |          |          |
| 1                                                                                | 8.0       | 14.0     | 21.8      | 31.3     | 42.5      | 55.6     | 86.6     |          |          |
| 1-1/4                                                                            | 10.0      | 17.5     | 27.3      | 39.1     | 53.1      | 69.5     | 108.3    | 156.0    |          |
| 1-1/2                                                                            | 12.0      | 21.0     | 32.7      | 47.0     | 63.8      | 83.4     | 129.9    | 187.2    | 225.0    |
| 1-3/4                                                                            | 14.0      | 24.5     | 38.2      | 54.8     | 74.4      | 97.3     | 151.6    | 218.4    | 297.5    |
| 2                                                                                | 16.0      | 28.0     | 43.6      | 62.6     | 85.0      | 111.2    | 173.2    | 249.6    | 340.0    |
| 2-1/4                                                                            | 18.0      | 31.5     | 49.1      | 70.4     | 95.6      | 125.1    | 194.9    | 280.8    | 382.5    |
| 2-1/2                                                                            | 20.0      | 35.0     | 54.5      | 78.3     | 106.3     | 139.0    | 216.5    | 312.0    | 425.0    |
| 2-3/4                                                                            | 22.0      | 38.5     | 60.0      | 86.1     | 116.9     | 152.9    | 238.2    | 343.2    | 467.5    |
| 3                                                                                | 24.0      | 42.0     | 65.4      | 93.9     | 127.5     | 166.8    | 259.8    | 374.4    | 510.0    |
| 3-1/4                                                                            | 26.0      | 45.5     | 70.9      | 101.7    | 138.1     | 180.7    | 281.5    | 405.6    | 552.5    |
| 3-1/2                                                                            | 28.0      | 49.0     | 76.3      | 117.4    | 148.8     | 194.6    | 303.1    | 436.8    | 595.0    |
| 3-3/4                                                                            | 30.0      | 52.5     | 81.8      | 125.2    | 159.4     | 208.5    | 324.8    | 468.0    | 637.5    |
| 4                                                                                | 32.0      | 56.0     | 87.2      | 125.2    | 170.0     | 222.4    | 346.4    | 499.2    | 680.0    |
| 4-1/4                                                                            | 34.0      | 59.5     | 92.7      | 133.0    | 180.6     | 236.3    | 368.1    | 530.4    | 722.5    |
| 4-1/2                                                                            | 36.0      | 63.0     | 98.1      | 140.9    | 191.3     | 250.2    | 389.7    | 561.6    | 765.0    |
| 4-3/4                                                                            | 38.0      | 66.5     | 103.6     | 148.7    | 201.9     | 264.1    | 411.4    | 592.8    | 807.5    |
| 5                                                                                | 40.0      | 70.0     | 109.0     | 156.5    | 212.5     | 278.0    | 433.0    | 624.0    | 850.0    |
| EACH ADD'L. IN.                                                                  | 8.0       | 14.0     | 21.8      | 31.3     | 42.5      | 55.6     | 86.6     | 124.8    | 170.0    |
| "F" FERRULE                                                                      | 2.0       | 2.9      | 4.3       | 5.0      | 5.2       | 7.4      | 15.5     | 30.1     | 49.0     |



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## STANDARD THREAD

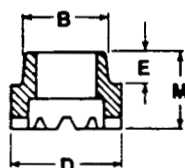


| STUD |           |      |            |       |      |  | FERRULE<br>CODE |
|------|-----------|------|------------|-------|------|--|-----------------|
| D    | MIN.<br>L | BD   | MIN.<br>BL | FD    | FH   |  |                 |
| 1/4  | 3/4       | .215 | .375       | .312  | .093 |  | P250            |
| 5/16 | 3/4       | .275 | .375       | .406  | .109 |  | P312            |
| 3/8  | 3/4       | .330 | .390       | .468  | .109 |  | P375            |
| 7/16 | 3/4       | .387 | .437       | .531  | .125 |  | P347            |
| 1/2  | 7/8       | .446 | .500       | .593  | .156 |  | P500            |
| 5/8  | 1         | .562 | .625       | .750  | .187 |  | P625            |
| 3/4  | 1-1/4     | .680 | .796       | .920  | .250 |  | P750            |
| 7/8  | 1-3/8     | .798 | .859       | 1.046 | .312 |  | P875            |
| 1"   | 1-1/2     | .913 | .921       | 1.187 | .375 |  | P1000           |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request.  
Maximum standard thread length is 3-7/8".

|                               |                                                                                                                                     |                                                                       |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>MATERIAL:</b>              | <b>LOW CARBON STEEL</b>                                                                                                             | <b>STAINLESS STEEL</b>                                                |
|                               | C - 0.23% max.    P - 0.04% max.<br>Mn - 0.90% max.    S - 0.05% max.                                                               | AISI grade - 302/304/305 std.<br>Other grades available upon request. |
| <b>MECHANICAL PROPERTIES:</b> | Tensile                  60,000 psi (min.)<br>Yield                    50,000 psi (min.)<br>Elongation            20% (in 2 inches) | Values for various grades available<br>upon request.                  |
|                               | <b>PLATING:</b> Plating is not standard.<br>Copper, nickel, and zinc available<br>upon customer request.                            | Does not apply to Stainless.                                          |

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



| FERRULE |       |       |      |      |             |
|---------|-------|-------|------|------|-------------|
| CODE    | B     | D     | E    | M    | PART NO.    |
| P250    | .380  | .455  | .125 | .250 | 092 0008 06 |
| P312    | .445  | .535  | .125 | .250 | 092 0008 07 |
| P375    | .505  | .595  | .125 | .265 | 092 0008 08 |
| P437    | .585  | .675  | .156 | .329 | 092 0008 09 |
| P500    | .650  | .740  | .156 | .362 | 092 0008 10 |
| P625    | .785  | .906  | .156 | .433 | 092 0008 11 |
| P750    | 1.030 | 1.150 | .187 | .526 | 092 0008 12 |
| P875    | 1.203 | 1.330 | .187 | .593 | 092 0008 13 |
| P1000   | 1.406 | 1.500 | .187 | .593 | 092 0008 14 |

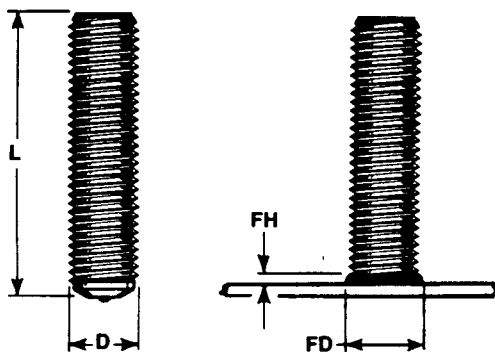
### TO ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC ST
2. Diameter.....D
3. Length .....L
4. Material .....



## FULL THREAD

## STUD



| D    | MIN.** |       | FERRULE |      |
|------|--------|-------|---------|------|
|      | L      | FD    | FH      | CODE |
| #10  | 3/4*   | .281  | .093    | F187 |
| 1/4  | 3/4*   | .359  | .109    | F250 |
| 5/16 | 3/4*   | .437  | .109    | F312 |
| 3/8  | 3/4*   | .500  | .125    | F375 |
| 7/16 | 7/8    | .578  | .140    | F437 |
| 1/2  | 7/8    | .625  | .156    | F500 |
| 5/8  | 1-1/8  | .796  | .187    | F625 |
| 3/4  | 1-1/8  | .937  | .250    | F750 |
| 7/8  | 1-1/2  | 1.093 | .312    | F875 |

\* Ferrules used with studs 3/4" long are special "short F" ferrules.

\*\*KNOCK-OFF studs are available if shorter lengths are required.

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request.  
Maximum standard thread length is 3-7/8".

**MATERIAL:** **LOW CARBON STEEL**  
C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**  
AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**  
Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

Values for various grades available upon request.

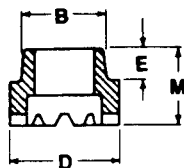
**PLATING:** Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

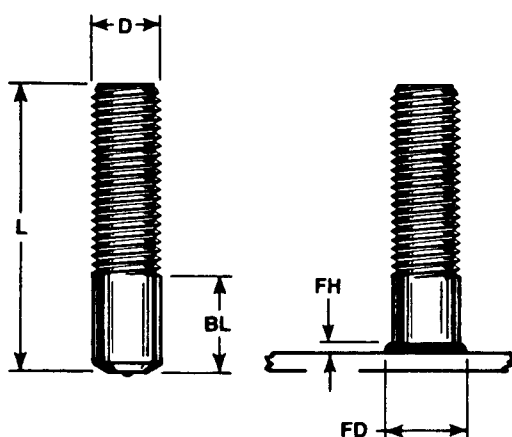
## FERRULE

| CODE | B     | D     | E    | M    | PART NO.    |
|------|-------|-------|------|------|-------------|
| F187 | .305  | .390  | .156 | .390 | 092 0005 05 |
| F250 | .380  | .455  | .156 | .390 | 092 0005 06 |
| F312 | .445  | .578  | .156 | .265 | 092 0005 07 |
| F375 | .505  | .640  | .156 | .329 | 092 0005 08 |
| F437 | .585  | .703  | .188 | .362 | 092 0005 09 |
| F500 | .650  | .795  | .188 | .433 | 092 0005 10 |
| F625 | .785  | 1.030 | .188 | .526 | 092 0005 11 |
| F750 | 1.030 | 1.218 | .188 | .593 | 092 0005 12 |
| F875 | 1.203 | 1.406 | .188 | .732 | 092 0005 13 |



## TO ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC FT
2. Diameter.....D
3. Length ..... L
4. Material .....



## FULL BASE

### STUD

| D    | MIN. L | MIN. BL | MAX. FD | MAX. FH | FERRULE CODE |
|------|--------|---------|---------|---------|--------------|
| 1/4  | 3/4*   | .375    | .335    |         | F250         |
| 5/16 | 7/8    | .375    | .406    | .125    | F312         |
| 3/8  |        | .500    | .468    | .141    | F375         |
| 7/16 | 1-1/8  | .500    | .546    | .156    | F437         |
| 1/2  | 1-1/4  | .500    | .609    | .172    | F500         |
| 5/8  | 1-1/2  | .500    | .765    | .266    | F625         |
| 3/4  | 1-3/4  | .675    | .906    | .335    | F750         |
| 7/8  | 2-1/2  | .750    | 1.046   | .390    | F875         |
| 1    | 2-1/2  | 1.000   | 1.203   | .468    | F1000        |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request.  
Maximum standard thread length is 3-7/8".

**MATERIAL: LOW CARBON STEEL**  
C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**  
AISI grade - 302/304/305 std.  
Other grades available upon request.

### MECHANICAL PROPERTIES:

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

Values for various grades available upon request.

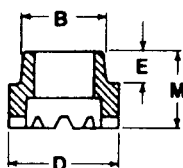
**PLATING:** Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

### FERRULE

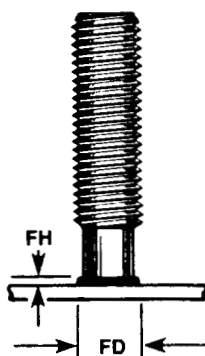
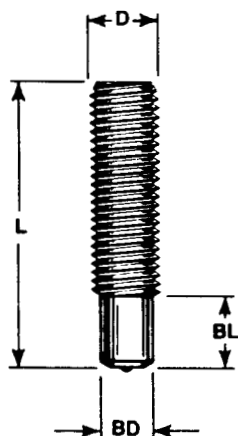
| CODE  | B     | D     | E     | M    | PART NO.    |
|-------|-------|-------|-------|------|-------------|
| F250  | .380  | .455  | .125  | .390 | 092 0005 06 |
| F312  | .445  | .578  | .156  | .390 | 092 0005 07 |
| F375  | .505  | .640  | .156  | .390 | 092 0005 08 |
| F437  | .585  | .703  | .188  | .422 | 092 0005 09 |
| F500  | .650  | .795  | .188  | .438 | 092 0005 10 |
| F625  | .785  | 1.030 | .188  | .516 | 092 0005 11 |
| F750  | 1.030 | 1.218 | .188  | .681 | 092 0005 12 |
| F875  | 1.203 | 1.406 | .194  | .734 | 092 0005 13 |
| F1000 | 1.406 | 1.609 | .1250 | .843 | 092 0005 14 |



### TO ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC FB
2. Diameter.....D
3. Length.....L
4. Material.....





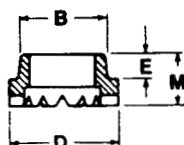
## LONG REDUCED BASE

| STUD |        |         |         |      |      | FERRULE |
|------|--------|---------|---------|------|------|---------|
| D    | MIN. L | MIN. BD | MIN. BL | FD   | FH   | CODE    |
| 1/4  | 3/4    | .187    | .375    | .281 | .109 | FS187   |
| 5/16 | 3/4    | .250    | .375    | .359 | .125 | FS250   |
| 3/8  | 3/4    | .312    | .375    | .437 | .125 | FS312   |
| 7/16 | 1      | .375    | .375    | .500 | .140 | FS375   |
| 1/2  | 1      | .437    | .437    | .578 | .140 | FS437   |
| 5/8  | 1-1/4  | .500    | .500    | .656 | .156 | FS500   |
| 3/4  | 1-1/2  | .625    | .718    |      |      | FS625   |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request. Maximum standard thread length is 3-7/8".

|                               |                                                                                       |                                                                       |
|-------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>MATERIAL:</b>              | <b>LOW CARBON STEEL</b>                                                               | <b>STAINLESS STEEL</b>                                                |
|                               | C - 0.23% max. P - 0.04% max.<br>Mn - 0.90% max. S - 0.05% max.                       | AISI grade - 302/304/305 std.<br>Other grades available upon request. |
| <b>MECHANICAL PROPERTIES:</b> | Tensile 60,000 psi (min.)<br>Yield 50,000 psi (min.)<br>Elongation 20% (in 2 inches)  | Values for various grades available upon request.                     |
|                               |                                                                                       |                                                                       |
| <b>PLATING:</b>               | Plating is not standard.<br>Copper, nickel, and zinc available upon customer request. | Does not apply to Stainless.                                          |
|                               |                                                                                       |                                                                       |

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



| FERRULE |      |       |      |      |             |
|---------|------|-------|------|------|-------------|
| CODE    | B    | D     | E    | M    | PART NO.    |
| FS187   | .305 | .390  | .125 | .250 | 092 0004 05 |
| FS250   | .380 | .455  | .125 | .250 | 092 0004 06 |
| FS312   | .505 | .595  | .125 | .250 | 092 0004 07 |
| FS375   | .585 | .675  | .125 | .250 | 092 0004 08 |
| FS437   | .650 | .740  | .156 | .281 | 092 0004 09 |
| FS500   | .785 | .875  | .156 | .281 | 092 0004 10 |
| FS625   | .921 | 1.030 | .187 | .375 | 092 0004 11 |

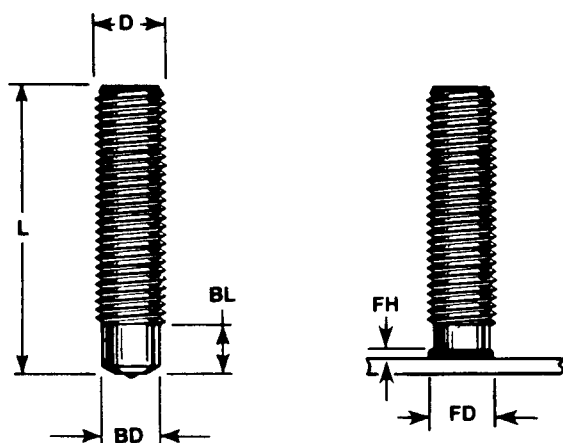
## O ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC LRB
2. Diameter.....D
3. Length.....L
4. Material.....



450 Richard St, Miamisburg, OH 45342 | Toll Free: 800-852-8352 | Fax: 937-866-4174 | [www.midwestfasteners.com](http://www.midwestfasteners.com)

All information contained herein is subject to change without notice.



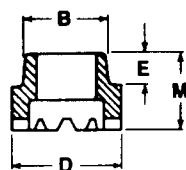
## SHORT REDUCED BASE

| STUD |        |        |         |         |         |              |
|------|--------|--------|---------|---------|---------|--------------|
|      | MIN. D | MIN. L | MIN. BD | MIN. BL | MIN. FD | FERRULE CODE |
| 1/4  | 7/8    | .187   | .156    | .281    | .109    | TB250        |
| 5/16 | 7/8    | .275   | .250    | .390    | .109    | RB312        |
| 3/8  | 7/8    | .312   | .250    | .437    | .125    | RB375        |
| 1/2  | 1      | .435   | .250    | .593    | .156    | RB500        |
| 5/8  | 1-1/8  | .500   | .312    | .687    | .156    | TB625        |
| 3/4  | 1-1/8  | .625   | .375    | .812    | .187    | TB750        |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request. Maximum standard thread length is 3-7/8".

| MATERIAL:              |  | LOW CARBON STEEL                                                                   | STAINLESS STEEL                                   |
|------------------------|--|------------------------------------------------------------------------------------|---------------------------------------------------|
|                        |  | C - 0.23% max. P - 0.04% max.                                                      | AISI grade - 302/304/305 std.                     |
|                        |  | Mn - 0.90% max. S - 0.05% max.                                                     | Other grades available upon request.              |
| MECHANICAL PROPERTIES: |  |                                                                                    | Values for various grades available upon request. |
|                        |  | Tensile 60,000 psi (min.)                                                          |                                                   |
|                        |  | Yield 50,000 psi (min.)                                                            |                                                   |
|                        |  | Elongation 20% (in 2 inches)                                                       |                                                   |
| PLATING:               |  | Plating is not standard. Copper, nickel, and zinc available upon customer request. | Does not apply to Stainless.                      |

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



| FERRULE |      |       |      |      |             |
|---------|------|-------|------|------|-------------|
| CODE    | B    | D     | E    | M    | PART NO.    |
| TB250   | .380 | .455  | .156 | .375 | 092 0012 06 |
| RB312   | .445 | .546  | .156 | .437 | 092 0012 07 |
| RB375   | .505 | .640  | .156 | .437 | 092 0012 08 |
| RB500   | .650 | .796  | .187 | .468 | 092 0012 10 |
| TB625   | .785 | 1.030 | .187 | .578 | 092 0012 11 |
| TB750   | .921 | 1.140 | .203 | .593 | 092 0012 12 |

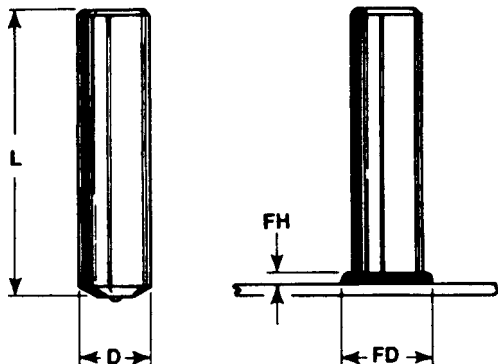
### TO ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC SRB
2. Diameter.....D
3. Length .....L
4. Material .....



## NO THREAD

## STUD



| D    | MIN** |       | FERRULE |       |
|------|-------|-------|---------|-------|
|      | L     | FD    | FH      | CODE  |
| 3/16 | 3/4*  | .281  | .093    | F187  |
| 1/4  | 3/4*  | .359  | .109    | F250  |
| 5/16 | 3/4*  | .437  | .109    | F312  |
| 3/8  | 3/4*  | .500  | .125    | F375  |
| 7/16 | 3/4*  | .578  | .140    | F437  |
| 1/2  | 7/8   | .627  | .156    | F500  |
| 5/8  | 1"    | .796  | .187    | F625  |
| 3/4  | 1-1/8 | .937  | .250    | F750  |
| 7/8  | 1-1/4 | 1.093 | .312    | F875  |
| 1"   | 1-1/2 | 1.312 | .375    | F1000 |

\* Ferrules used with studs 3/4" long are special "short F" ferrules.

\*\* KNOCK-OFF studs are available if shorter lengths are required.

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.

Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.

Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)

Yield 50,000 psi (min.)

Elongation 20% (in 2 inches)

Values for various grades available upon request.

**PLATING:**

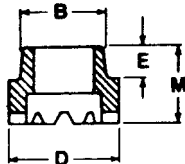
Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

## FERRULE

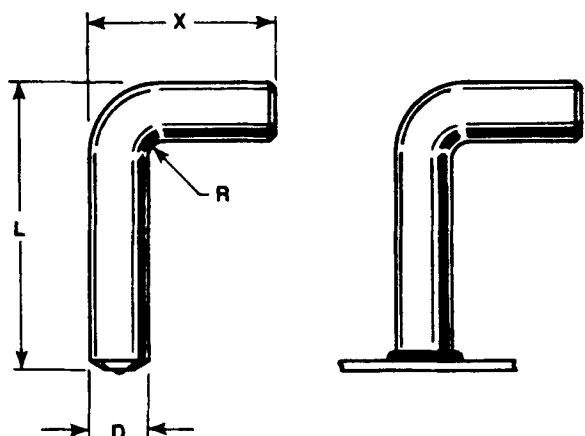
| CODE  | B     | D     | E    | M    | PART NO.    |
|-------|-------|-------|------|------|-------------|
| F187  | .305  | .390  | .156 | .390 | 092 0005 05 |
| F250  | .380  | .455  | .156 | .390 | 092 0005 06 |
| F312  | .445  | .578  | .156 | .265 | 092 0005 07 |
| F375  | .505  | .640  | .156 | .329 | 092 0005 08 |
| F437  | .585  | .703  | .188 | .362 | 092 0005 09 |
| F500  | .650  | .795  | .188 | .433 | 092 0005 10 |
| F625  | .785  | 1.030 | .188 | .526 | 092 0005 11 |
| F750  | 1.030 | 1.218 | .188 | .593 | 092 0005 12 |
| F875  | 1.203 | 1.406 | .188 | .732 | 092 0005 13 |
| F1000 | 1.406 | 1.609 | .188 | .820 | 092 0005 14 |

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code..... ARC NT
2. Diameter..... D
3. Length ..... L
4. Material .....

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All information contained herein is subject to change without notice.



## BENT - NO THREAD

| STUD |        |        |        |              |
|------|--------|--------|--------|--------------|
| D    | MIN. L | MIN. X | MIN. R | FERRULE CODE |
| 1/4  | 1-1/8  | 1-1/4  | .125   | F250         |
| 5/16 | 1-1/4  | 1-1/2  | .218   | F312         |
| 3/8  | 1-1/2  | 1-1/2  | .218   | F375         |
| 7/16 | 1-5/8  | 1-5/8  | .250   | F437         |
| 1/2  | 1-3/4  | 1-3/4  | .250   | F500         |
| 5/8  | 1-7/8  | 2"     | .312   | F625         |
| 3/4  | 2-3/4  | 3"     | .500   | F750         |
| 7/8  | 3-1/2  | 3-3/8  | .500   | F875         |

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

Values for various grades available upon request.

**PLATING:**

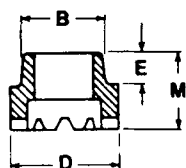
Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

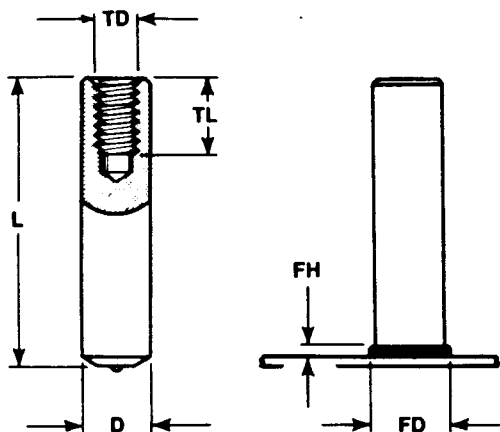
**FERRULE**

| CODE | B     | D     | E    | M    | PART NO.    |
|------|-------|-------|------|------|-------------|
| F250 | .380  | .455  | .156 | .390 | 092 0005 06 |
| F312 | .445  | .578  | .156 | .390 | 092 0005 07 |
| F375 | .505  | .640  | .156 | .390 | 092 0005 08 |
| F437 | .585  | .703  | .188 | .422 | 092 0005 09 |
| F500 | .650  | .795  | .188 | .438 | 092 0005 10 |
| F625 | .785  | 1.030 | .188 | .516 | 092 0005 11 |
| F750 | 1.030 | 1.218 | .188 | .656 | 092 0005 12 |
| F875 | 1.203 | 1.406 | .188 | .732 | 092 0005 13 |


**TO ORDER OR SPECIFY, GIVE:**

1. Product Code..... ARC B-NT
2. Diameter..... D
3. Length..... L
4. Length..... X
5. Material.....





## TAPPED - FULL BASE

## STUD

| D    | MIN. L | TD      | TL*   | MAX. FD | MAX. FH | FERRULE CODE |
|------|--------|---------|-------|---------|---------|--------------|
| 1/4  | 9/16   | 8-32    | 1/4   | .359    | .109    | F250         |
| 5/16 | 21/32  | 10-24   | 9/32  | .437    | .109    | F312         |
| 3/8  | 13/16  | 1/4-20  | 3/8   | .500    | .125    | F375         |
| 7/16 | 29/32  | 5/16-18 | 15/32 | .578    | .140    | F437         |
| 1/2  | 1-1/32 | 3/8-16  | 9/16  | .625    | .156    | F500         |
| 5/8  | 1-9/32 | 3/8-16  | 9/16  | .625    | .156    | F500         |
| 3/4  | 1-3/8  | 1/2-13  | 3/4   | .937    | .250    | F750         |
| 7/8  | 1-5/8  | 5/8-11  | 15/16 | 1.093   | .312    | F875         |

\* Maximum standard tap depth equals 1-1/2 times tap diameter.

**TAPS:** Standard tap is UNC-2B, other taps are available.

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

Values for various grades available upon request.

**PLATING:**

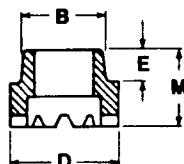
Plating is not standard.  
Copper nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

## FERRULE

| CODE | B     | D     | E    | M    | PART NO.    |
|------|-------|-------|------|------|-------------|
| F250 | .380  | .455  | .156 | .390 | 092 0005 06 |
| F312 | .445  | .578  | .156 | .390 | 092 0005 07 |
| F375 | .505  | .640  | .156 | .390 | 092 0005 08 |
| F437 | .585  | .703  | .188 | .422 | 092 0005 09 |
| F500 | .650  | .795  | .188 | .438 | 092 0005 10 |
| F625 | .785  | 1.030 | .188 | .516 | 092 0005 11 |
| F750 | 1.030 | 1.218 | .188 | .656 | 092 0005 12 |
| F875 | 1.203 | 1.406 | .188 | .732 | 092 0005 13 |

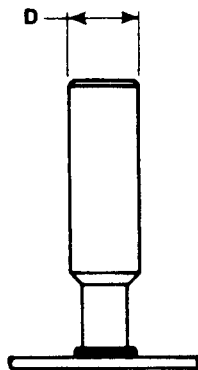
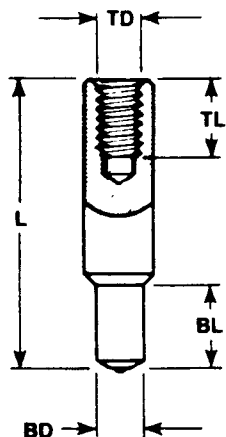


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All information contained herein is subject to change without notice.

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code..... ARC TAPFB
2. Diameter..... D
3. Length..... L
4. Tap Diameter..... TD
5. Tap Length..... TL
6. Material.....



## TAPPED - REDUCED BASE

| STUD |        |         |       |      |      | FERRULE |
|------|--------|---------|-------|------|------|---------|
| D    | MIN. L | TD      | TL*   | BD   | BL   | CODE    |
| 3/8  | 1-1/2  | 1/4-20  | 3/8   | .250 | 7/16 | FS250   |
| 1/2  | 1-1/2  | 3/8-16  | 9/16  | .375 | 7/16 | FS375   |
| 5/8  | 1-1/2  | 7/16-14 | 21/32 | .500 | 1/2  | FS500   |
| 3/4  | 1-1/2  | 7/16-14 | 21/32 | .500 | 1/2  | FS500   |
| 7/8  | 2      | 5/8-11  | 15/16 | .625 | 5/8  | FS625   |
| 1"   | 2-1/2  | 3/4-10  | 1"    | .750 | 5/8  | FS750   |

\* Maximum standard tap depth equals 1-1/2 times tap diameter.

**TAPS:** Standard tap is UNC-2B, other taps are available.

**MATERIAL: LOW CARBON STEEL**  
 C - 0.23% max. P - 0.04% max.  
 Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**  
 AISI grade - 302/304/305 std.  
 Other grades available upon request.

**MECHANICAL PROPERTIES:**

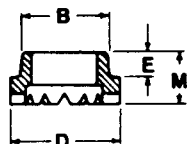
Tensile 60,000 psi (min.)  
 Yield 50,000 psi (min.)  
 Elongation 20% (in 2 inches)

Values for various grades available upon request.

**PLATING:** Plating is not standard.  
 Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

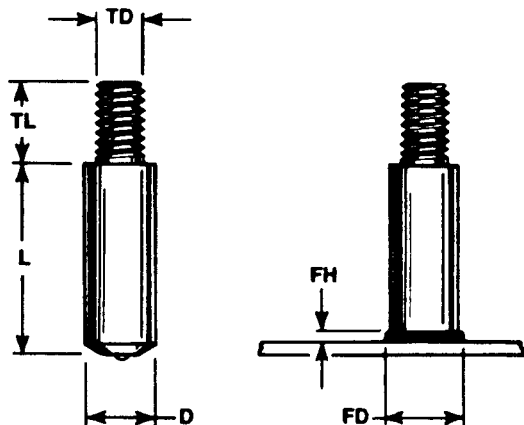


| FERRULE |       |       |      |      |             |
|---------|-------|-------|------|------|-------------|
| CODE    | B     | D     | E    | M    | PART NO.    |
| FS250   | .380  | .455  | .125 | .250 | 092 0005 06 |
| FS375   | .585  | .675  | .125 | .250 | 092 0005 08 |
| FS500   | .785  | .875  | .156 | .281 | 092 0005 10 |
| FS625   | .921  | 1.030 | .187 | .375 | 092 0005 11 |
| FS750   | 1.043 | 1.203 | .187 | .375 | 092 0005 12 |

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC TAPRB
2. Base Diameter .....BD
3. Base Length .....BL
4. Thread Diameter .....TD
5. Thread Length .....TL
6. Material .....





## SHOULDER - THREADED

### STUD

|      | MIN. |      | MAX.  |       | FERRULE |      |
|------|------|------|-------|-------|---------|------|
| D    | L    | TD   | TL    | FD    | FH      | CODE |
| 1/4  | .312 | #8   | .437  | .359  | .109    | F250 |
| 5/16 | .375 | #10  | .500  | .437  | .109    | F312 |
| 3/8  | .375 | 1/4  | .750  | .500  | .125    | F375 |
| 7/16 | .437 | 5/16 | .875  | .578  | .140    | F437 |
| 1/2  | .500 | 3/8  | 1.000 | .627  | .156    | F500 |
| 5/8  | .625 | 1/2  | 1.250 | .796  | .187    | F625 |
| 3/4  | .625 | 5/8  | 1.625 | .937  | .250    | F750 |
| 7/8  | .750 | 3/4  | 1.875 | 1.093 | .312    | F875 |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads available upon request.

**MATERIAL:** **LOW CARBON STEEL**  
 C - 0.23% max. P - 0.04% max.  
 Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**  
 AISI grade - 302/304/305 std.  
 Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
 Yield 50,000 psi (min.)  
 Elongation 20% (in 2 inches)

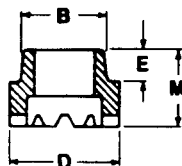
Values for various grades available upon request.

**PLATING:** Plating is not standard.  
 Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

### FERRULE



| CODE | B     | D     | E    | M    | PART NO.    |
|------|-------|-------|------|------|-------------|
| F250 | .380  | .455  | .156 | .390 | 092 0005 06 |
| F312 | .445  | .578  | .156 | .390 | 092 0005 07 |
| F375 | .505  | .640  | .156 | .390 | 092 0005 08 |
| F437 | .585  | .703  | .188 | .422 | 092 0005 09 |
| F500 | .650  | .795  | .188 | .438 | 092 0005 10 |
| F625 | .785  | 1.030 | .188 | .516 | 092 0005 11 |
| F750 | 1.030 | 1.218 | .188 | .656 | 092 0005 12 |
| F875 | 1.203 | 1.406 | .188 | .732 | 092 0005 13 |

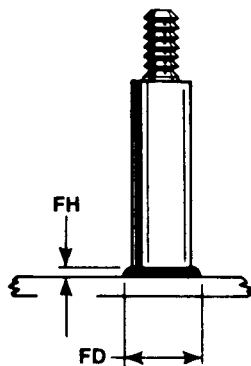
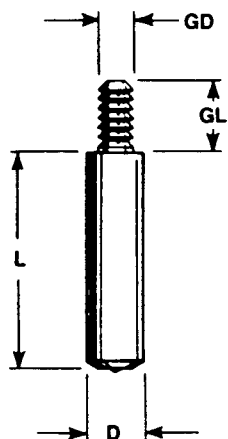
### TO ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC SH-T
2. Diameter.....D
3. Length.....L
4. Thread Diameter.....TD
5. Thread Length.....TL
6. Material.....



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## SHOULDER - ANNULAR GROVE

### STUD

| MIN. |    |      |      |      |      | FERRULE |
|------|----|------|------|------|------|---------|
| D    | L  | GD   | GL   | FD   | FH   | CODE    |
| 5/16 | 1" | .187 | .375 | .437 | .109 | F312    |
| 5/16 | 1" | .187 | .437 | .437 | .109 | F312    |

### MATERIAL: LOW CARBON STEEL

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

### STAINLESS STEEL

AISI grade - 302/304/305 std.  
Other grades available upon request.

### MECHANICAL PROPERTIES:

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

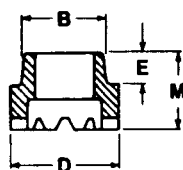
Values for various grades available upon request.

### PLATING:

Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

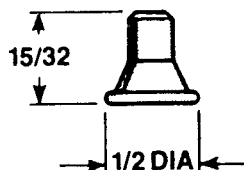


### FERRULE

| CODE | B    | D    | E    | M    | PART NO.    |
|------|------|------|------|------|-------------|
| F312 | .445 | .578 | .156 | .390 | 092 0005 07 |

### TO ORDER OR SPECIFY, GIVE:

1. Product Code..... ARC SH-AG
2. Diameter..... D
3. Length..... L
4. Groove Diameter..... GD
5. Groove Length..... GL
6. Material.....



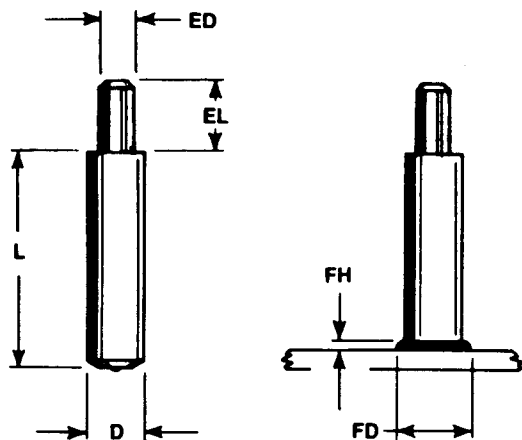
## WAG AL “Setting Cap” (Aluminum)

**CAP:** Sold separately. Not a component part of stud.

**CAP-SETTING** For installing WAG AL, available from stock.

**TOOL:** PART NO. – 102-0100-08.





## SHOULDER - NO THREAD

**STUD**

|      | MIN. |      |       |      |      | FERRULE |
|------|------|------|-------|------|------|---------|
| D    | L    | ED   | EL    | FD   | FH   | CODE    |
| 5/16 | 3/8  | 3/16 | 3/16  | .437 | .109 | F312    |
| 3/8  | 3/8  | 3/16 | 3/16  | .500 | .125 | F375    |
| 1/2  | 1/2  | 3/8  | 45/64 | .627 | .156 | F500    |

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

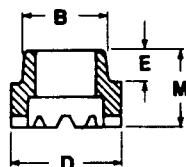
Values for various grades available upon request.

**PLATING:**

Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



**FERRULE**

| CODE | B    | D    | E    | M    | PART NO.    |
|------|------|------|------|------|-------------|
| F312 | .445 | .578 | .156 | .390 | 092 0005 07 |
| F375 | .505 | .640 | .156 | .390 | 092 0005 08 |
| F500 | .560 | .795 | .188 | .438 | 092 0005 10 |

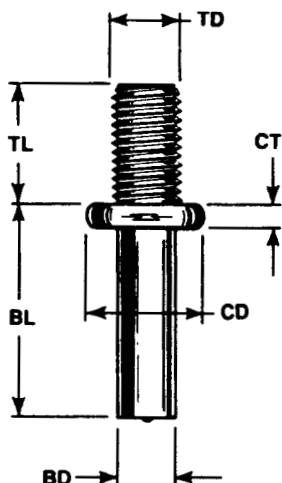


**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC SH-NT
2. Diameter.....D
3. Length ..... L
4. Groove Diameter..... ED
5. Groove Length ..... EL
6. Material .....

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## COLLAR

| STUD |      |      |      |      |      |         |
|------|------|------|------|------|------|---------|
|      | MIN  |      | MIN  |      |      | FERRULE |
| TD   | TL   | BD   | BL   | CD   | CT   | CODE    |
| 1/4  | .375 | .215 | .500 | .500 | .093 | C250    |
| 5/16 | .375 | .275 | .500 | .562 | .093 | C312    |
| 3/8  | .500 | .330 | .500 | .625 | .109 | C375    |
| 1/2  | .625 | .448 | .593 | .750 | .140 | C500    |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request.  
Maximum standard thread length is 3-7/8".

**MATERIAL: LOW CARBON STEEL**  
C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**  
AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

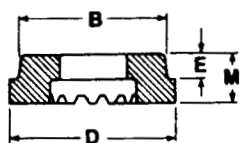
Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

Values for various grades available upon request.

**PLATING:** Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



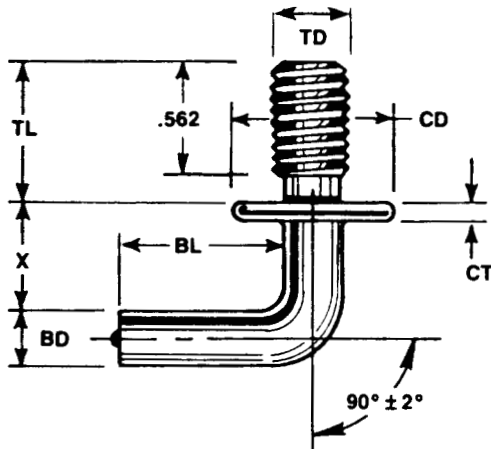
| FERRULE |       |       |      |      |             |
|---------|-------|-------|------|------|-------------|
| CODE    | B     | D     | E    | M    | PART NO.    |
| C250    | .785  | .875  | .125 | .250 | 092 0014 06 |
| C312    | .785  | .875  | .125 | .250 | 092 0014 07 |
| C375    | .785  | .875  | .125 | .250 | 092 0014 08 |
| C500    | 1.030 | 1.203 | .125 | .281 | 092 0014 10 |

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC COL
2. Base Diameter.....BD
3. Base Length.....BL
4. Thread Diameter.....TD
5. Thread Length.....TL
6. Material.....



## BENT-COLLAR



STUD

|        | STD.  | MIN  |      |     |      |     |
|--------|-------|------|------|-----|------|-----|
| TD     | TL    | BL   | BD   | CD  | CT   | X   |
| 3/8-16 | 1.375 | .625 | .331 | 5/8 | .109 | 5/8 |

**THREADS:** Standard thread is UNC-2A (Rolled when possible), other threads are available upon request. Maximum standard thread length is 3-7/8".

**MATERIAL: LOW CARBON STEEL**  
 C - 0.23% max. P - 0.04% max.  
 Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**  
 AISI grade - 302/304/305 std.  
 Other grades available upon request.

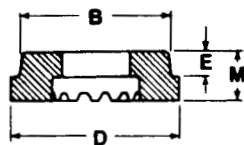
**MECHANICAL PROPERTIES:**  
 Tensile 60,000 psi (min.)  
 Yield 50,000 psi (min.)  
 Elongation 20% (in 2 inches)

Values for various grades available upon request.

**PLATING:** Plating is not standard. Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



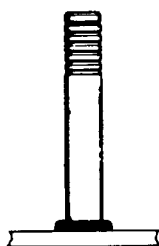
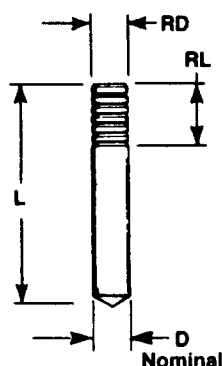
FERRULE

| CODE | B    | D    | E    | M    | PART NO.    |
|------|------|------|------|------|-------------|
| C375 | .785 | .875 | .125 | .250 | 092 0014 08 |

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC B-COL
2. Base Diameter.....BD
3. Base Length.....BL
4. Thread Diameter.....TD
5. Thread Length.....TL
6. Material.....

# ANNULAR RING (NAVY)



## STUD

| NOM.<br>D | MIN.<br>L | RD   | RL   | FERRULE<br>CODE |
|-----------|-----------|------|------|-----------------|
| 3/16      | 3/4"*     | .175 | .312 | F187            |

\* Ferrules used with Studs 3/4" long are special "short F" ferrules.

### MATERIAL: LOW CARBON STEEL

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.  
Conforms to: MIL-S-24149  
Type: I Class: III

### STAINLESS STEEL

AISI grade - 302/304/305 std.  
Other grades available upon request.

### MECHANICAL PROPERTIES:

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

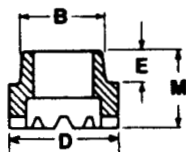
Values for various grades available upon request.

### PLATING:

Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



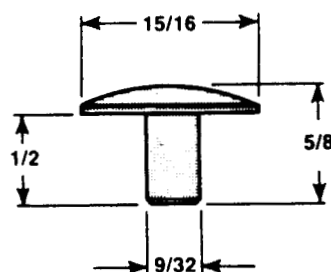
## FERRULE

| CODE | B    | D    | E    | M    | PART NO.    |
|------|------|------|------|------|-------------|
| F187 | .305 | .380 | .156 | .390 | 092-0005-05 |

### TO ORDER OR SPECIFY, GIVE:

1. Product Code..... ARC AR
2. Diameter..... D
3. Length..... L
4. Material.....

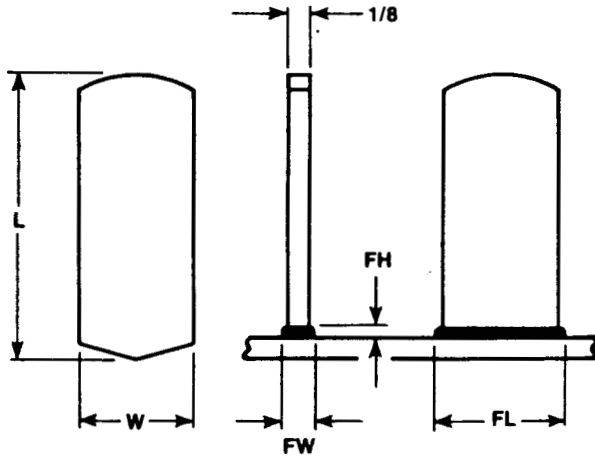
PART NO. MCAL-625-875



### "MUSHROOM NAVY CAP" (Aluminum)

**CAP:** Sold separately. Not a component part of stud.





## RECTANGULAR-PLAIN

| STUD |        |      |      |      |              |
|------|--------|------|------|------|--------------|
| W    | MIN. L | FW   | FL   | FH   | FERRULE CODE |
| 3/8  | 7/8    | .218 | .437 | .125 | R375         |
| 5/8  | 1"     | .218 | .687 | .156 | R625         |

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

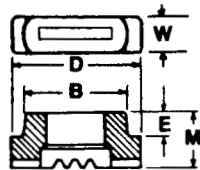
Values for various grades available upon request.

**PLATING:**

Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



| FERRULE |      |      |      |      |             |
|---------|------|------|------|------|-------------|
| CODE    | B    | D    | E    | M    | PART NO.    |
| R375    | .505 | .625 | .156 | .390 | 092 0020 08 |
| R625    | .921 | .500 | .188 | .438 | 092 0020 11 |

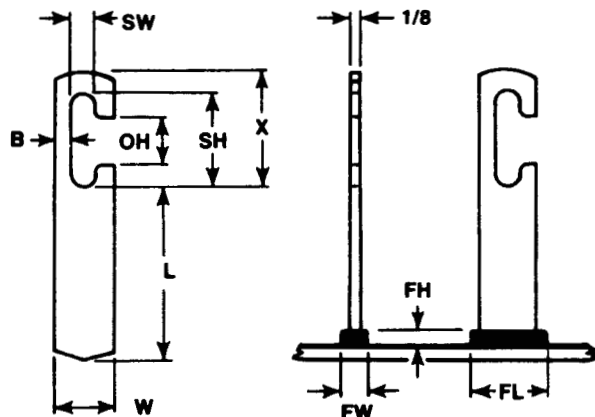
**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC R-PL
2. Size.....1/8 x W
3. Length.....L
4. Material.....

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## RECTANGULAR- 'T' SLOTTED



| STUD |        |      |       |       |      |
|------|--------|------|-------|-------|------|
| W    | MIN. L | OH   | SH    | X     | SW   |
| 3/8  | 1/2    | .322 | .531  | .765  | .130 |
| 5/8  | 1/2    | .500 | 1.000 | 1.250 | .255 |

| STUD (CONTINUED) |      |      |      |              |
|------------------|------|------|------|--------------|
| B                | FW   | FL   | FH   | FERRULE CODE |
| .122             | .218 | .437 | .125 | R375         |
| .185             | .218 | .687 | .156 | R625         |

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

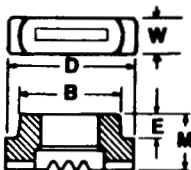
Values for various grades available upon request.

**PLATING:**

Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:** Ferrules are component parts of studs. Not sold separately.



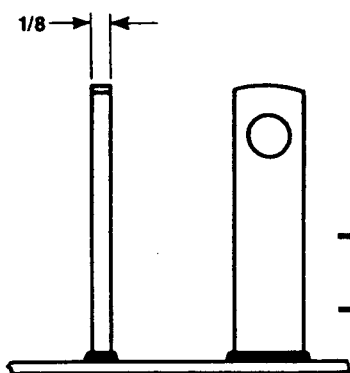
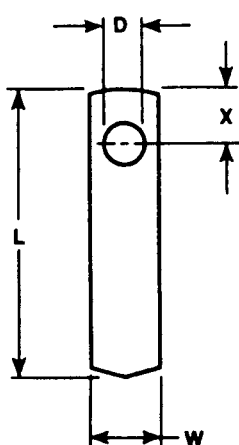
| FERRULE |      |       |      |      |             |
|---------|------|-------|------|------|-------------|
| CODE    | B    | D     | E    | M    | PART NO.    |
| R375    | .505 | .625  | .156 | .390 | 092 0020 08 |
| R625    | .921 | 1.093 | .188 | .438 | 092 0020 11 |

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC R-TS
2. Size.....1/8 x W
3. Length.....L
4. Material.....



## RECTANGULAR-WITH HOLE



| STUD |        |      |      |              |
|------|--------|------|------|--------------|
| W    | MIN. L | D    | X    | FERRULE CODE |
| 3/8  | 7/8    | .203 | 5/16 | R375         |
| 5/8  | 1"     | .312 | 5/16 | R625         |

**MATERIAL: LOW CARBON STEEL**

C - 0.23% max. P - 0.04% max.  
Mn - 0.90% max. S - 0.05% max.

**STAINLESS STEEL**

AISI grade - 302/304/305 std.  
Other grades available upon request.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)  
Yield 50,000 psi (min.)  
Elongation 20% (in 2 inches)

Values for various grades available upon request.

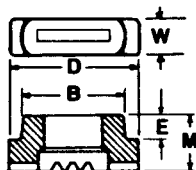
**PLATING:**

Plating is not standard.  
Copper, nickel, and zinc available upon customer request.

Does not apply to Stainless.

**FERRULES:**

Ferrules are component parts of studs. Not sold separately.



| FERRULE |      |      |      |      |             |
|---------|------|------|------|------|-------------|
| CODE    | B    | D    | E    | M    | PART NO.    |
| R375    | .505 | .625 | .156 | .390 | 092 0020 08 |
| R625    | .921 | .500 | .188 | .438 | 092 0020 11 |

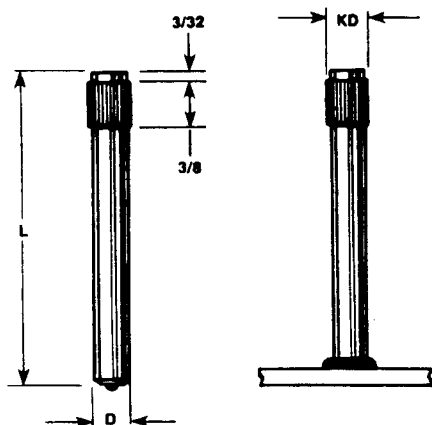
**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC R-WH
2. Size.....1/8 x W
3. Length ..... L
4. Material .....

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## KNURLED



## STUD

| D    | MIN.<br>L | KD   | FERRULE<br>CODE |
|------|-----------|------|-----------------|
| 5/16 | 1"        | .327 | F312            |

**MATERIAL: LOW CARBON STEEL**

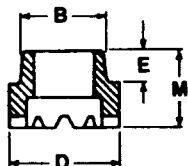
C - 0.23% max. P - 0.04% max.

Mn - 0.90% max. S - 0.05% max.

**MECHANICAL PROPERTIES:**

Tensile 60,000 psi (min.)

Elongation 20% (in 2 inches)

**FERRULES:** Ferrules are component parts of studs. Not sold separately.

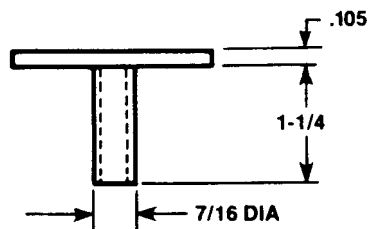
## FERRULE

| CODE | B    | D    | E    | M    | PART NO.    |
|------|------|------|------|------|-------------|
| F312 | .445 | .578 | .156 | .390 | 092 0005 07 |

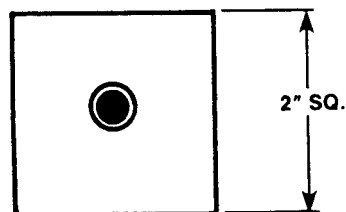
**TO ORDER OR SPECIFY, GIVE:**

1. Product Code.....ARC KNRL
2. Diameter.....D
3. Length.....L
4. Material.....

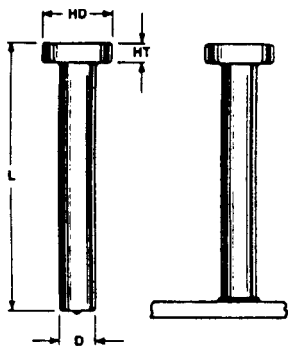
Part No. DPLM-200-312



## DRIVE PLATE (DPLM) 2" SQUARE

**DRIVE PLATE:** Sold separately. Not a component part of stud.

## HEADED CONCRETE ANCHOR



| STUD |       |       |      |               |
|------|-------|-------|------|---------------|
| D    | MIN L | HD    | HT   | FERRULE CODE* |
| 1/4  | 3/4   | 1/2   | 3/16 | F250          |
| 3/8  | 3/4   | 3/4   | 9/32 | F375          |
| 1/2  | 1"    | 1"    | 5/16 | F500          |
| 5/8  | 1"    | 1-1/4 | 5/16 | F625          |

**MATERIAL: LOW CARBON STEEL**

AISI C1010 through C1020

**MECHANICAL PROPERTIES:**

Tensile 55,000 psi (min.)  
 Elongation 20% (in 2 inches)

**OTHER MATERIALS:**

Also available in stainless steel.

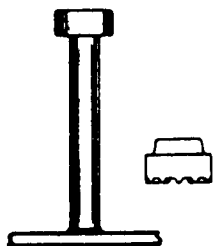
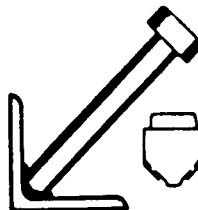
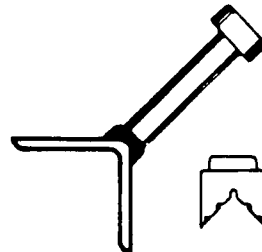
**SPECS:**

ALL MIDWEST FASTENERS ARC HCA studs meet AWS specifications.  
 Test reports available upon request.

**FERRULES:**

Ferrules are component parts of studs. Not sold separately.  
 Ferrule exterior dimensions are available upon request.

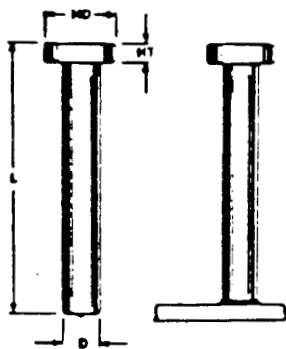
**\*HEADED CONCRETE ANCHORS** are available for welding to flat surface, inside angles, and outside angles. Each of these applications requires the proper style stud and ferrule, so please specify your application when ordering studs.

**FLAT SURFACE (F)**

**INSIDE ANGLE (IA)**

**OUTSIDE ANGLE (OA)**

**TO ORDER OR SPECIFY, GIVE:**

1. Product Code..... ARC HCA
2. Diameter..... D
3. Length..... L
4. Material.....
5. Welding Application.....


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## SHEAR CONNECTOR

| STUD |        |       |     |               |
|------|--------|-------|-----|---------------|
| D    | MIN. L | HD    | HT  | FERRULE CODE* |
| 3/4  | 1-1/2  | 1-1/4 | 3/8 | F750          |
| 7/8  | 2      | 1-3/8 | 3/8 | F875          |

**MATERIAL:** LOW CARBON STEEL  
AISI C1015, C1018, or C1020

### MECHANICAL PROPERTIES:

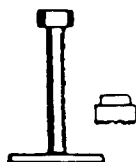
|                   |                   |
|-------------------|-------------------|
| Tensile           | 60,000 psi (min.) |
| Yield             | 50,000 psi (min.) |
| Elongation        | 20% (min.)        |
| Reduction of Area | 50% (min.)        |

**SPECS:** ALL MIDWEST FASTENERS ARC SC studs meet AWS, AASHTO, and ICBO specifications. Test reports available upon request.

**FERRULES:** Ferrules are component parts of studs. Not sold separately. Ferrule exterior dimensions are available upon request.

**\*SHEAR CONNECTORS:** Available for welding to flat surface, inside angles, outside angles, and "thru deck." Each of these applications requires the proper style stud and ferrule, so please specify your application when ordering studs.

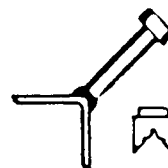
#### FLAT SURFACE (F)



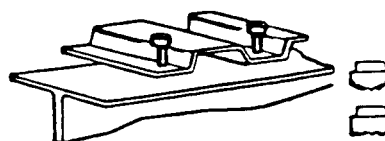
#### INSIDE ANGLE (IA)



#### OUTSIDE ANGLE (OA)



#### WELD THRU DECK (WTD)



### TO ORDER OR SPECIFY, GIVE:

1. Product Code.....ARC SC
2. Diameter.....D
3. Length ..... L
4. Material .....
5. Welding Application .....



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## MIDWEST FASTENERS ARC STUD WELDING SYSTEMS AND PORTABLE POWER SUPPLIES

### UA 500

A single-phase portable system designed to weld from #10 (4 mm) through 1/2" (14 mm) diameter weld base arc studs. This system features plug-in solid state circuitry accessible from rear door. Continuous current control from 250 to 900 amps. Continuous time control from .05 to .7 seconds. The UA 500 arc welding system also features a built-in chuck saver module. System comes complete with Solid State Power Supply, 25 feet of 1/0 ground cable with heavy duty clamp, 50 feet of 1/0 combination cable and stud welding gun with legs and foot piece.

! "##\$%& 150 lb. (#) " \* + # , \* + ' 16" wide x 16" deep x 41" high.



### UA 1000

This unique, multi-purpose three-phase system is designed for arc stud welding, stick welding and arc air gouging. The UA 1000 welds all sizes of arc studs from #10 (4mm) through 5/8" (16 mm) weld base arc studs, and all size electrodes in stick mode, and arc air gouging up to 450 amperes. This system features solid state full converter bridge output, constant current output, chuck saver, line voltage compensated, regulated timing, fused control circuitry, controlled hot plunge and low open circuit voltage.

! "##\$%& 500 lb. (#) " \* + # , \* + ' 22-1/4" wide x 35-3/4" deep x 30" high.



### UA 1800

This multi-purpose system also features arc stud welding, stick welding and arc air gouging. The UA 1800 welds all size arc studs from #10 (4 mm) through 7/8" (22mm) diameter studs and all sizes of electrodes in stick mode and arc air gouging up to 750 amperes. The UA 1800 arc stud welding system features solid state full converter bridge output constant current output, chuck saver, line voltage compensated, regulated timing, fused control circuitry, controlled hot plunge, low open circuit voltage and reduced weld current start. The UA 1800 comes complete with one (1) heavy duty arc welding gun with legs and foot piece, one (1) 50-foot length of 4/0 combination cable extension set and one (1) 25-foot length of 4/0 ground cable with heavy duty "C" clamp.

! "##\$%& 650 lb. (#) " \* + # , \* + ' 22-1/4" wide x 40" deep x 30" high.



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