

#### **Quarter-Turn Fasteners**

MIL-F-5591C\* Approved

The SU-2300 Line fasteners are designed for aircraft use and are used on external access panels and internal equipment.

They are also used on demanding non-aircraft application, where their special qualities of vibration endurance and limited sheet separation under overload are needed, or where an enclosed or floating receptacle is required.



SU-2300 Line Fasteners are approved under **MIL-F-5591C\*** for all sizes (2, 5, and 7), all stud types (1, 2, and 3), Class A floating and Class B rigid receptacles, and for the installation holes and stud retainers covered by styles 1 and 2.

SU-2300 Line Fasteners are offered in three sizes.

- □ Size 35 studs have a 7/32" (5.56 mm) shank diameter and a clamping tension of 15 lb.
- □ Size 5 studs have a 5/16" (7.94 mm) shank diameter and a clamping tension of 35 lb.
- □ Size 6 studs have a 3/8" (9.53 mm) shank diameter and a clamping tension of 50 lb.

<sup>\*</sup> Meets the design, physical and performance requirements of MIL-F-5591C, However, full mechanical properties testing may not be performed on each production lot.



#### **COMPONENTS**



Flush Head Stud

(Type 1)

Oval Head Stud 2xx1-20



(Type 2)

Oval Wing Head Stud 2xx1-W20



(Type 3)

SU-2300 Line Studs are made of a higher-tensile alloy steel than ST-1200 Line studs. Also, they are available in .030" (.08 mm) increments, reducing the extent of sheet separation in case of tensile overload.

**Half Grommet** 127H



Solid. Retains when flattened

**Snap Ring** 1219-R



Split rings install fast, take little space

Retaining **Spring** 1219-24



Holds stud in locking position for alignment with receptacle.

**Full Grommets** 1271 and 1276



Prevent panel hole wear, protect panel finish, and reduce stud play.

Rigid Receptacle Type 2xx0-18



(Class B)

Floating Receptacle Type 2xx0-18F



(Class A)

SU-2300 receptacles are enclosed to protect the parts, prevent the loss of plating chips, and provide a smooth stud entry. Type "2xx0-18" is used for rigid mounting, and Type "2xx0-18F" provides a floating feature to compensate for misalignment.



#### **Selection Procedure**

- 1. Select the appropriate fastener size with reference to the performance table below.
- 2. Select a stud head style. For example, the flush head type "2xx6-20"
- 3. Select a stud retainer and part number. For example, an aluminum half grommet type 127H.
- 4. Determine the total thickness of material to be fastened. See the next page for detailed measurement instructions.
- 5. Determine the correct stud length for the total thickness of material to be fastened, using the table for the appropriate stud size.
- 6. Choose either a rigid or floating receptacle.

**Mechanical Properties:** MIL-F-5591C\* (Style 1, Types 1-2-3, Class A & B)

	Performance Table									
5	Size Locking Torque			Initial	Initial Tension & Shear			Endurance		
AN	DFCI	Minimum	Maximum	Tension Min.	Rated	Plus 50%	Stop Strength	(Cycles)		
7	6	7.5 inlb.	18 inlb.	50 lb.	700 lb.	1050 lb.	80 inlb.	40,000		
5	5	5.0 inlb.	12 inlb.	35 lb.	500 lb.	750 lb.	60 inlb.	25,000		
2	35	2.5 inlb.	8 inlb.	15 lb.	200 lb.	300 lb.	30 inlb.	5,000		

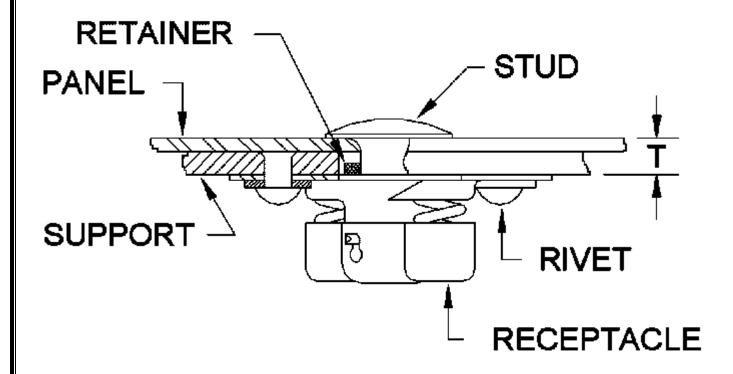
DFCI @ is a registered trademark of DFCI Solutions, Inc. Copyright @ 2002-2005 by DFCI Solutions, Inc. All rights reserved.

<sup>\*</sup> Meets the design, physical and performance requirements of MIL-F-5591C. However, full mechanical properties testing may not be performed on each production lot.



#### Finding the Total Thickness

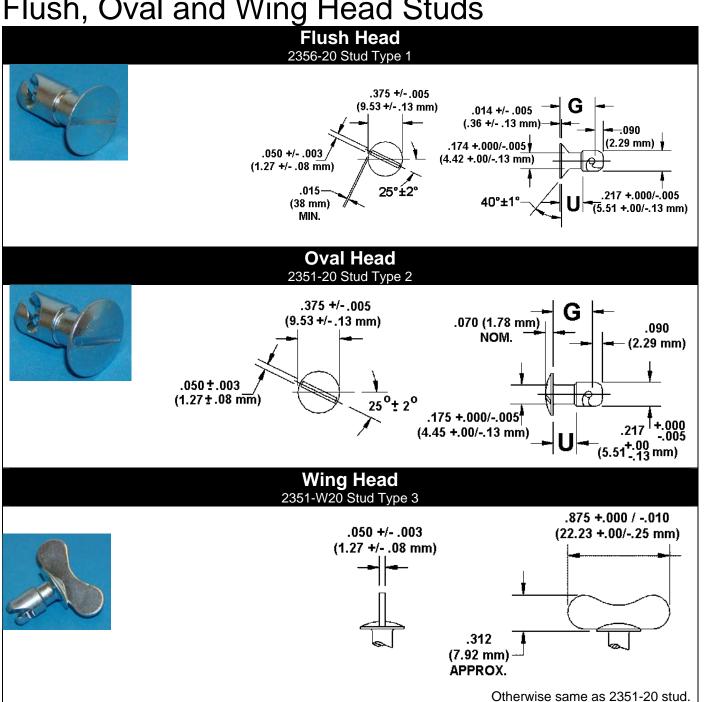
Assuming the stud and receptacle to be in locked position, determine the distance between the level of the stud head contact with the top of the panel in which it is retained, and the level of receptacle contact with the underside of the material on which it is mounted. Usually this distance is simply the combined thickness of the stud panel and receptacle support material, but gaskets or standoffs between the panel and the support can also add space. Material between the stud head and top of the panel, such as a full grommet, must also be counted, as must paint thickness applied to every intervening surface. Do not count stud retainer thickness on the panel underside, which enters the support hole.





#### Size 35

Flush, Oval and Wing Head Studs

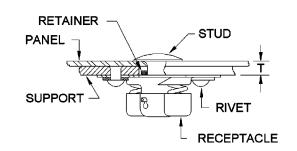




# Size 35 Stud Part Numbers

# 

- 1. Product Line (2 = SU-2300)
- 2. Shank Diameter x 1/16" (35 = 3.5)
- 3. Head Style (1-20 = Oval Head)
- 4. Stud Length Callout (see table below)
- 5. Finish Suffix



T TOTAL THICKNESS		STUD LENGTH CALLOUT	STUD SHANK DIMENSIONS G U				STUD WEIGHTS (LB. EA.)  FLUSH OVAL WING		
in.	mm		in. mm		In. mm		2356-20	2351-20	2351-W20
.000030	0.00 - 0.76	-3	.260	6.60	.130	3.30	.00305	.00315	.00548
.031060	0.76 – 1.52	-6	.290	7.37	.170	4.32	.00320	.00330	.00563
.061090	1.52 – 2.29	-9	.320	8.13	.170	4.32	.00335	.00345	.00578
.091120	2.29 - 3.05	-12	.350	8.89	.210	5.33	.00350	.00360	.00593
.121150	3.05 - 3.81	-15	.380	9.65	.250	6.35	.00365	.00375	.00608
.151180	3.81 – 4.57	-18	.410	10.41	.280	7.11	.00380	.00390	.00623
.181210	4.57 – 5.33	-21	.440	11.18	.290	7.37	.00395	.00405	.00638
.211240	5.33 - 6.10	-24	.470	11.94	.330	8.38	.00410	.00420	.00653
.241270	6.10 - 6.86	-27	.500	12.70	.370	9.40	.00425	.00435	.00668
.271300	6.86 - 7.62	-30	.530	13.46	.410	10.41	.00440	.00450	.00683
.301330	7.62 – 8.38	-33	.560	14.22	.410	10.41	.00455	.00465	.00698
.331360	8.38 – 9.14	-36	.590	14.99	.450	11.43	.00470	.00480	.00713
.361390	9.14 – 9.91	-39	.620	15.75	.490	12.45	.00485	.00495	.00728

MATERIALS: Hardened carbon steel studs, carbon steel wings

FINISH: Zinc Trivalent Clear .0003 thick. Trivalent Chromate Clear with Sealer (RoHS

Compliant) per ASTM-B-633, Type III, SC2 Clear

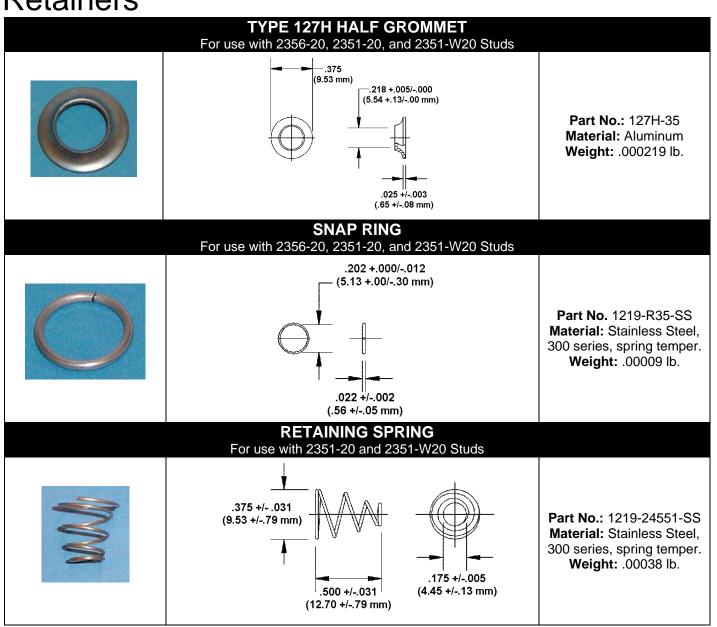
FINISH SUFFIX: -Z3CT.

The above mentioned finish will be supplied as the standard finish upon depletion of existing stock which are finished as follows: Cadmium electroplated .0003 thick, clear chromate per QQ-P-416, Type I, Class 2, Clear Finish suffix -C3C.

See page **SU-25** for additional finishes that may be available for this part.



# **Size 35**Retainers







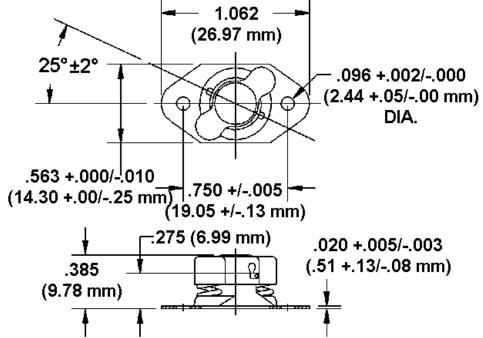
#### Size 35

#### Receptacles

#### Rigid Receptacle 2350-18-Z3CT (Class B)

For use with any size 35 SU-2300 Line Stud.





#### **MATERIALS:**

Receptacle base and Spring Cap: steel

Spring and Pin: Music Wire

FINISH: Zinc Trivalent Clear .0003 thick. Trivalent Chromate Clear with Sealer (RoHS

Compliant) per ASTM-B-633, Type III, SC2 Clear

FINISH SUFFIX: -Z3CT.

The above mentioned finish will be supplied as the standard finish upon depletion of existing stock which are finished as follows: Cadmium electroplated .0003 thick, clear chromate per QQ-P-416, Type I, Class 2, Clear Finish suffix -C3C.

See page **SU-25** for additional finishes that may be available for this part.

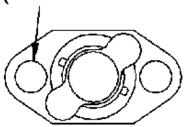
Weight: .0071 lb.



# Size 35 Receptacles

#### Floating Receptacles (Class A)

2350-18F-Z3CT .193 DIA. +.002/-.000 (4.90 DIA. +.05/-.00 mm)



Part No.: 2350-18F-Z3CT

Materials: Same as 2350-18-Z3CT Receptacle

Weight: .0072 lb. (this figure includes two 2350-18F-5-Z3CT

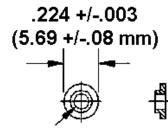
spacers)

Float: .050 (1.27 mm) All Directions (Otherwise same as

2350-18-Z3CT receptacle.)

#### Spacers

2 included with 2350-18F-Z3CT

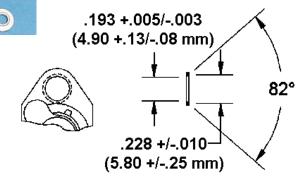


.096 DIA. +.004/-.000 (2.44 DIA. +.10/-.00 mm)

Part No.: 2350-18F-5-Z3CT Material: Same as receptacle base.

#### 2350-18F-24734-Z3CT

For thin paneling, .032 (.81 mm) or less. (Otherwise same as 2350-18F-Z3CT receptacle)



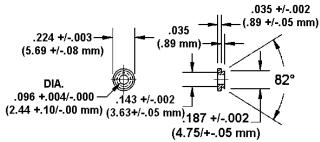
Materials: Same as 2350-18-Z3CT receptacle

Weight: .0072 lb. (this figure includes two 2350-18F-24734-

1-Z3CT Spacers.)

#### Spacers

2 included with 2350-18F-24734-1-Z3CT



Part No.: 2350-18F-24734-1-Z3CT Material: Same as receptacle base.

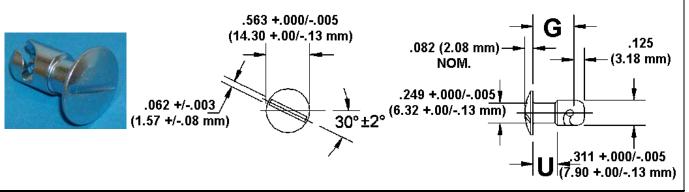


#### Size 5

#### Flush, Oval and Wing Head Studs

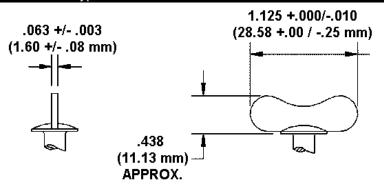
#### Flush Head 2506-20 Stud Type 1 .563 +.000/-.005 (14.30 +.00/-.13 mm) .023 +/-.005 .125 (.58 +/-.13 mm) (3.18 mm) .249 +.000/-.005 .062 +/-.003 (6.32 +.00/-.13 mm) (1.57 +/-.08 mm) .015-311 +.000/-.005 (.38 mm) (7.90 +.00/-.13 mm) MIN. **Oval Head**

#### 2501-20 Stud Type 2



#### Wing Head 2501-W20 Stud Type 3





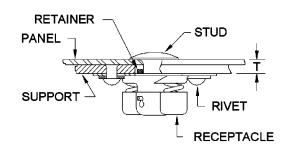
Otherwise same as 2501-20 stud.



# Size 5 Stud Part Numbers

# 

- 1. Product Line (2 = SU-2300)
- 2. Shank Diameter x 1/16" (50 = 5.0)
- 3. Head Style (1-20 = Oval Head)
- 4. Stud Length Callout (see table below)
- 5. Finish Suffix



	Т	STUD	STU	<u>D SHANK I</u>	DIMENSI	ONS	STUD WEIGHTS (LB. EA.)			
TOTAL THICKNESS		LENGTH CALLOUT	C	3		U	FLUSH	OVAL	WING	
ln.	Mm	CALLOUI	ln.	(mm)	ln.	mm	2506-20	2501-20	2501-W20	
.021050	0.53 - 1.27	-5	.350	8.89	.170	4.32	.00775	.00745	.01299	
.051080	1.27 – 2.03	-8	.380	9.65	.210	5.33	.00828	.00798	.01352	
.081110	2.03 - 2.79	-11	.410	10.41	.250	6.35	.00880	.00850	.01404	
.111140	2.79 - 3.56	-14	.440	11.18	.250	6.35	.00933	.00903	.01457	
.141170	3.56 - 4.32	-17	.470	11.94	.280	7.11	.00985	.00955	.01509	
.171200	4.32 - 5.08	-20	.500	12.70	.330	8.38	.01038	.01008	.01548	
.201230	5.08 - 5.84	-23	.530	13.46	.370	9.40	.01090	.01060	.01614	
.231260	5.84 - 6.60	-26	.560	14.22	.370	9.40	.01143	.01113	.01667	
.261290	6.60 - 7.37	-29	.590	14.99	.410	10.41	.01195	.01165	.01719	
.291320	7.37 – 8.13	-32	.620	15.75	.450	11.43	.01248	.01218	.01772	
.321350	8.13 – 8.89	-35	.650	16.51	.490	12.45	.01300	.01270	.01824	
.351380	8.89 – 9.65	-38	.680	17.27	.490	12.45	.01353	.01323	.01877	
.381410	9.65 – 10.41	-41	.710	18.03	.530	13.46	.01405	.01375	.01929	
.411440	10.41 - 11.18	-44	.740	18.80	.570	14.48	.01458	.01428	.01982	

MATERIALS: Hardened carbon steel studs, carbon steel wings

FINISH: Zinc Trivalent Clear .0003 thick. Trivalent Chromate Clear with Sealer (RoHS

Compliant) per ASTM-B-633, Type III, SC2 Clear

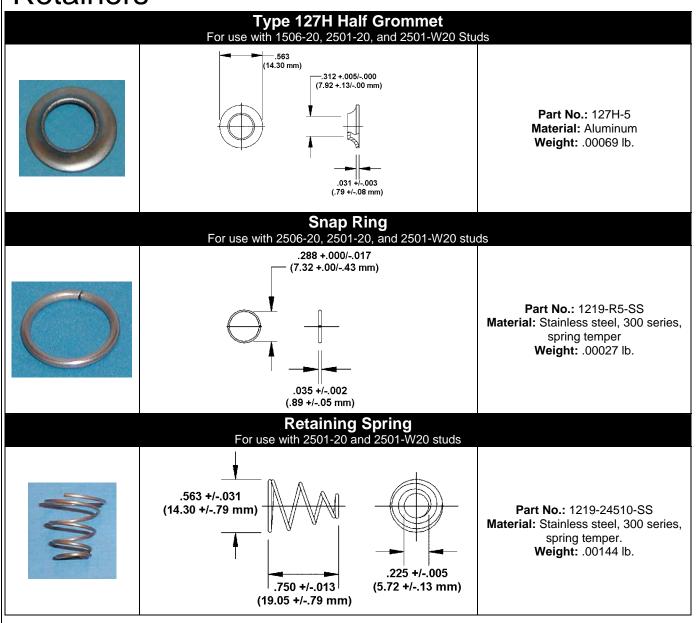
FINISH SUFFIX: -Z3CT.

The above mentioned finish will be supplied as the standard finish upon depletion of existing stock which are finished as follows: Cadmium electroplated .0003 thick, clear chromate per QQ-P-416, Type I, Class 2, Clear Finish suffix -C3C.

See page SU-25 for additional finishes that may be available for this part.

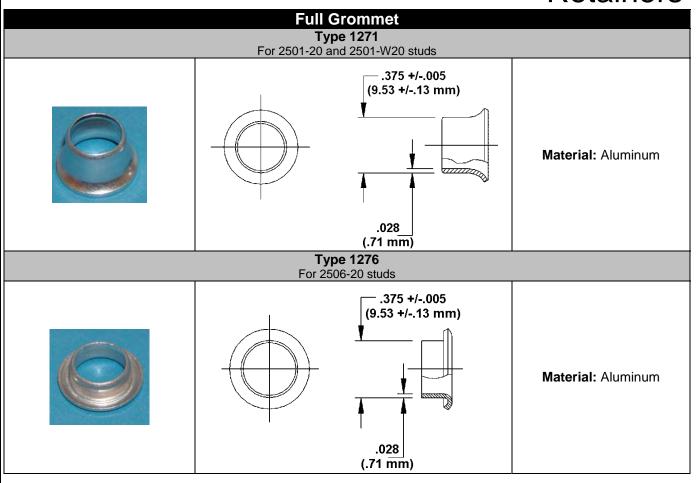


# **Size 5**Retainers





# **Size 5**Retainers



Part Numbers						
Panel Thickness	Type 1271	Type 1276				
.031" to .062" (0.79 to 1.57 mm)	1271-5312	1276-5175				
.063" to .094" (1.57 to 2.39 mm)	1271-5350	1276-5225				
.095" to .125" (2.39 to 3.18 mm)	1271-5375	1276-5250				



#### Size 5

#### Receptacles

# Rigid Receptacle 2500-18-Z3CT (Class B) For use with any Size 5 SU-2300 Line Stud 1.438 (36.53 mm) DIA. .128 +.002/-.000 (3.25 +.05/-.00 mm) .875 +.000/-.010 (22.23 +.00/-.25 mm) (25.40 +/-.13 mm) .350 (8.89 mm) .025 +.005/-.003 (.64 +.13/-.08 mm)

#### **MATERIALS:**

Receptacle base and Spring Cap: steel

Spring and Pin: Music Wire

FINISH: Zinc Trivalent Clear .0003 thick. Trivalent Chromate Clear with Sealer (RoHS

Compliant) per ASTM-B-633, Type III, SC2 Clear

FINISH SUFFIX: -Z3CT.

The above mentioned finish will be supplied as the standard finish upon depletion of existing stock which are finished as follows: Cadmium electroplated .0003 thick, clear chromate per QQ-P-416, Type I, Class 2, Clear Finish suffix -C3C.

See page **SU-25** for additional finishes that may be available for this part.

Weight: .0171 lb.



#### Size 5 Receptacles

#### Floating Receptacle 2500-18F-Z3CT (Class A)

For use with any Size 5 SU-2300 Line Stud



Receptacle

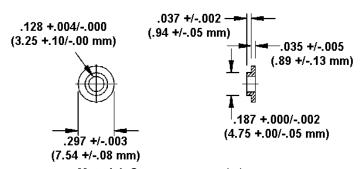
Part No.: 2500-18F-Z3CT

.261 DIA. +.002/-.000 (6.63 DIA. +.05/-.00 mm)

Material: Same as 2500-18-Z3CT Receptacle

Spacer

Part No.: 2500-18F-5-Z3CT (Two (2) included with 2500-18F-Z3CT Receptacle)



Material: Same as receptacle base.

Weight: .0183 lb. (This includes two 2500-18F-5-Z3CT spacers)

Float: .074 (1.88 mm) All Directions (Otherwise same as 2500-18-Z3CT Receptacle)



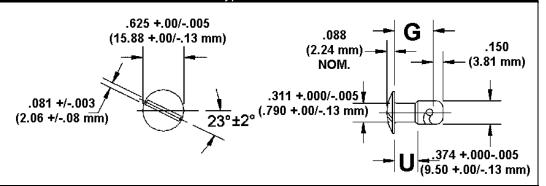
#### Size 6

#### Flush, Oval, and Wing Head Studs

#### Flush Head 2606-20 Stud Type 1 .625 +.000/-.005 (15.88 +.00/-.13 mm) .025 +/-.005 (.64 +/-.13 mm) <del>--.</del>150 (3.81 mm) .311 +.000/-.005 .081 +/-.003 (7.90 +.00/-.13 mm) (2.06 +/-.08 mm) .015 .374 +.000/-.005 (.38 mm) 30°±2° (9.50 +.00/-.13 mm)

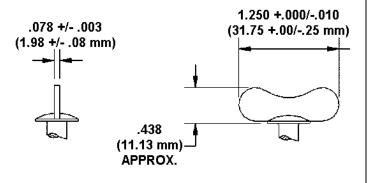
#### Oval Head 2601-20 Stud Type 2





#### Wing Head 2601-W20 Stud Type 3



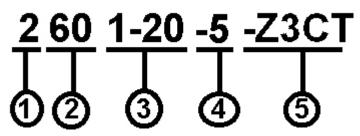


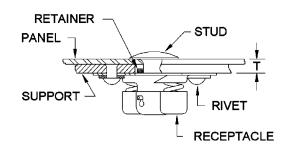
Otherwise same as 2601-20 stud.



#### Size 6

#### Stud Part Numbers





- 1. Product Line (2 = SU-2300)
- 2. Shank Diameter x 1/16" (60 = 6.0)
- 3. Head Style (1-20 = Oval Head)
- 4. Stud Length Callout (see table below)
- 5. Finish Suffix

Т		STUD	STUD SHANK DIMENSIONS				STUD WEIGHTS (LB. EACH)			
TOTAL THICKNESS		LENGTH	G		U		FLUSH	OVAL	WING	
In.	mm	CALLOUI	ln.	mm	ln.	mm	2606-20	2601-20	2601-W20	
.021"050"	0.53 - 1.27	-5	.410"	10.41	.180"	4.57	.01200	.01260	.02097	
.051"080"	1.27 – 2.03	-8	.440"	11.18	.230"	5.84	.01272	.01332	.02169	
.081"110"	2.03 - 2.79	-11	.470"	11.94	.280"	7.11	.01344	.01404	.02241	
.111"140"	2.79 - 3.56	-14	.500"	12.70	.280"	7.11	.01416	.01476	.02313	
.141"170"	3.56 - 4.32	-17	.530"	13.46	.330"	8.38	.01488	.01548	.02385	
.171"200"	4.32 - 5.08	-20	.560"	14.22	.330"	8.38	.01560	.01620	.02457	
.201"230"	5.08 - 5.84	-23	.590"	14.99	.380"	9.65	.01632	.01692	.02529	
.231"260"	5.84 - 6.60	-26	.620"	15.75	.430"	10.92	.01704	.01764	.02601	
.261"290"	6.60 - 7.37	-29	.650"	16.51	.430"	10.92	.01776	.01836	.02673	
.291"320"	7.37 – 8.13	-32	.680"	17.27	.480"	12.19	.01848	.01908	.02745	
.321"350"	8.13 - 8.89	-35	.710"	18.03	.480"	12.19	.01920	.01980	.02817	
.351"380"	8.89 - 9.65	-38	.740"	18.80	.530"	13.46	.01992	.02052	.02889	
.381"410"	9.65 - 10.41	-41	.770"	19.56	.580"	14.73	.02064	.02124	.02961	
.411"440"	10.41 – 11.18	-44	.800"	20.32	.580"	14.73	.02136	.02196	.03033	
.441"470"	11.18 – 11.94	-47	.830"	21.08	.630"	16.00	.02208	.02268	.03105	
.471"500"	11.94 – 12.70	-50	.860"	21.84	.630"	16.00	.02280	.02340	.03177	

MATERIALS: Hardened carbon steel studs, carbon steel wings

FINISH: Zinc Trivalent Clear .0003 thick. Trivalent Chromate Clear with Sealer (RoHS

Compliant) per ASTM-B-633, Type III, SC2 Clear

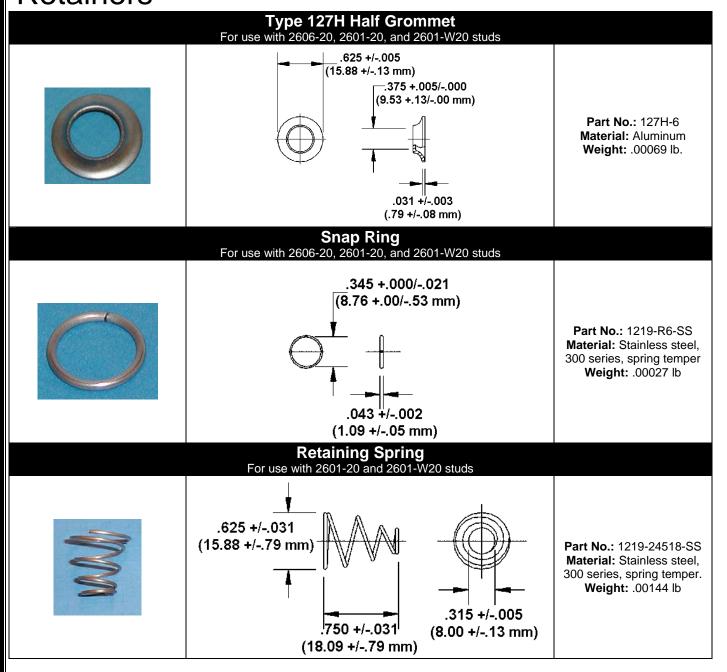
FINISH SUFFIX: -Z3CT.

The above mentioned finish will be supplied as the standard finish upon depletion of existing stock which are finished as follows: Cadmium electroplated .0003 thick, clear chromate per QQ-P-416, Type I, Class 2, Clear Finish suffix -C3C.

See page **SU-25** for additional finishes that may be available for this part.

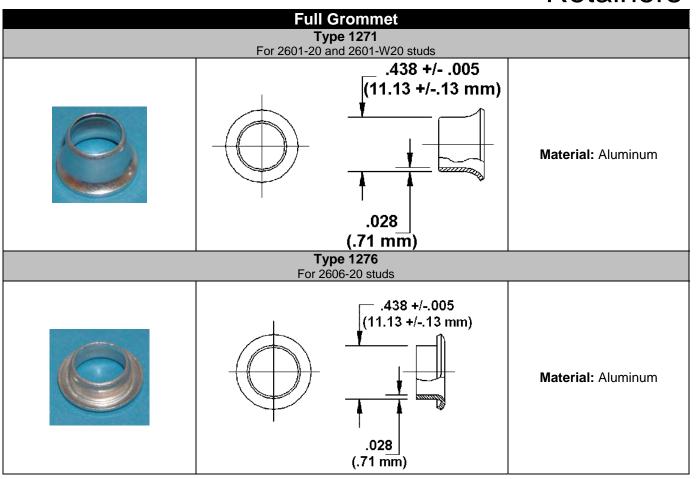


# **Size 6**Retainers





# Size 6 Retainers

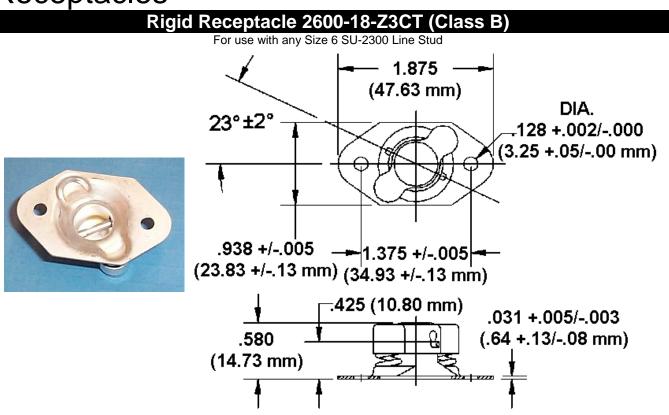


Part Numbers						
Panel Thickness	Type 1271	Type 1276				
.040" to .065" (1.02 to 1.65 mm)	1271-6350	1276-6218				
.066" to .100" (1.65 to 2.54 mm)	1271-6375	1276-6250				
.101" to .135" (2.54 to 3.43 mm)	1271-6425	1276-6300				



#### Size 6

#### Receptacles



#### **MATERIALS:**

Receptacle base and Spring Cap: steel

Spring and Pin: Music Wire

FINISH: Zinc Trivalent Clear .0003 thick. Trivalent Chromate Clear with Sealer (RoHS

Compliant) per ASTM-B-633, Type III, SC2 Clear

FINISH SUFFIX: -Z3CT.

The above mentioned finish will be supplied as the standard finish upon depletion of existing stock which are finished as follows: Cadmium electroplated .0003 thick, clear chromate per QQ-P-416, Type I, Class 2, Clear Finish suffix -C3C.

See page **SU-25** for additional finishes that may be available for this part.

Weight: .0333 lb.



# Size 6 Receptacles

#### Floating Receptacle 2600-18F-Z3CT (Class A)

For use with any size 6 SU-2300 Line Stud



#### Receptacle

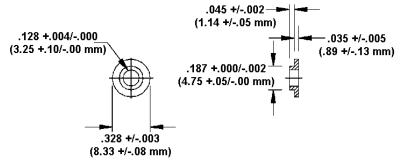
Part No.: 2600-18F-Z3CT

.281 DIA +.002/-.000 (7.14 DIA. +.05/-.00 mm)

Material: Same as 2600-18-Z3CT

#### Spacer

Part No.: 2600-18F-5-Z3CT 2 included with 2600-18F-Z3CT receptacle



Material: Same as receptacle base.

Weight: .0346 lb. (This includes two 2600-18F-5-Z3CT spacers)

Float: .094 (2.39 mm) All Directions (Otherwise same as 2600-18-Z3CT Receptacle)





#### **Optional Finishes**

Finish Suffix	Stud	Receptacle	Finish Description	Specification(s)
N4F	N/A		Nickel plate .0004 thick, with copper undercoating – dull	QQ-N-290, CLASS 1, GRADE F
Z3CT			Zinc Trivalent Clear .0003 Thick. Trivalent Chromate Clear with Sealer	ASTM-B-633, Type III, SC 2 Clear
Z3YT			Zinc Trivalent Yellow .0003 thick, Trivalent Chromate Yellow Dye with Sealer	ASTM-B-633, Type III, SC2, Yellow





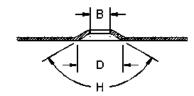


#### **Stud Installation**

#### Flush Head with 127H Half Grommet

1. Drill and dimple hole in panel.

Type of Stud	Dia. Before Dimpling	U +.010000 (+.2500 mm) (Dia. After dimpling)	D +.010000 (+.2500 mm)	H ±2°
2356-20	.198" (5.03 mm)	.218" (5.54 mm)	.406" (10.31 mm)	100°
2506-20	.297" (7.54 mm)	.312" (7.92 mm)	.640" (16.26 mm)	120°
2606-20	.359" (9.13 mm)	.375" (9.53 mm)	.710" (18.03 mm)	120°



Note: Dimpling tool not supplied.

2. Insert stud and slip grommet over stud.



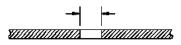
3. Flatten Grommet.



The triple-x (xxx) in the tool number is for the size. (35, 5, 6) E.g., 9916-1-6-H35

#### **Oval / Wing Head with 127H Half Grommet**

1. Drill hole in panel.

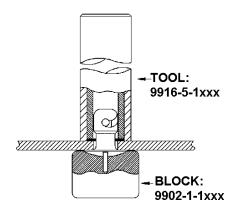


Stud Type	Hole Diameter
2351-20, 2351-W20	.219" (5.56 mm)
2501-20, 2501-W20	.313" (7.95 mm)
2601-20, 2601-W20	.375" (9.53 mm)

2. Insert stud and slip grommet over stud.



3. Flatten Grommet.



The triple-x (xxx) in the tool number is for the size. (35, 5, 6) E.g., 9916-5-135

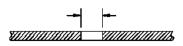
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#### **Stud Installation**

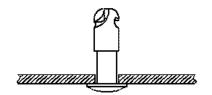
#### **Oval / Wing Head with Retaining Ring or Retaining Spring**

1. Drill hole in panel

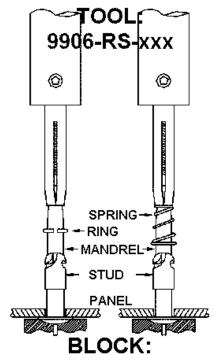


Stud Type	Hole Diameter
2351-20, 2351-W20	.219" (5.56 mm)
2501-20, 2501-W20	.313" (7.95 mm)
2601-20, 2601-W20	.375" (9.53 mm)

2. Insert stud



 Slip mandrel into stud. Place ring or spring over mandrel. Place tool over mandrel. Push retainer until it is seated in stud undercut.



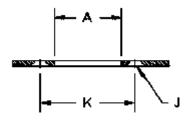
9902-1-1xxx

The triple-x (xxx) in the tool number is for the size. (35, 5, 6) E.g., 9906-RS-35



#### **Receptacle Installation**

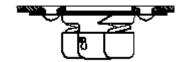
1. Drill holes and countersink rivet holes.



SU-2300 Stud Size	A ± .010 (±.25 mm)	K ± .005 (±.13 mm)	J	Drill Size	Countersink	Rivet
35	.468"	.750"	.096"	#41 (.096")	3/16D (4.76 mm)	3/32"
33	(11.89 mm)	(19.05 mm)	(2.44 mm)	(2.44 mm)	x 110°	(2.38 mm)
E	.703"	1.000"	.128"	#30 (.128")	1/4D (6.35 mm)	1/8"
5	(17.86 mm)	(25.40 mm)	(3.25 mm)	(3.25 mm)	x 110°	(3.18 mm)
6	.812"	1.375"	.128"	#30 (.128")	1/4D (6.35 mm)	1/8"
0	(20.62 mm)	(34.93 mm)	(3.25 mm)	(3.25 mm)	x 110°	(3.18 mm)

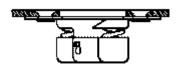
Type 2xx0-18 - Rigid Receptacle

2. Rivet Receptacle.



#### Type 2xx0-18F - Floating Receptacle

2. Place spacers in receptacle holes.



3. Rivet receptacle.

