

# Skybolt ZLoc® Stainless Series Fasteners

Rev 010612

Skybolt manufactures studs and buttons similar to existing designs.  
*Dzus is a registered trademark of the Dzus Fastener Co. Skybolt has no affiliation with Dzus Fasteners.*



## Design Selection Procedure:

1. From the information in the following table, consider a Stud type.
2. Select type of retainer (grommet or GP type retainer).
3. From charts, select Stud and S Spring combination for the application.

### Standard Line Performance

Fastener Size	3	4	5	6	7
Locked Service Tension (LBS)	20	30	45	55	65
Max. Tension W/O Distortion (LBS)	45	60	85	110	125
Rated Shear (LBS)	100	150	200	300	350
Wear Life (Uses)	5M	5M	25M	40M	40M

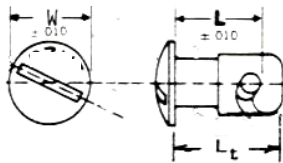
Max. sheet separation at 150% of locked service tension = 3/64".

## STUDS - Hardened Carbon Steel - Cadmium Plated per QQ-P-416, Type II, Class 2. and 300 Series Stainless (Skybolt Stainless ZLoc® Series Fasteners are TSO-C148)

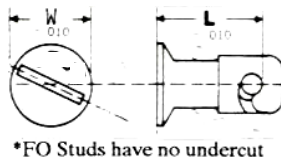
Note: SKYBOLT manufactures and stocks stainless ZLoc® Series studs.

### WING HEAD STUD Type AW, AJW, FW, FAW, FJW

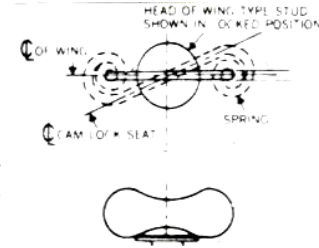
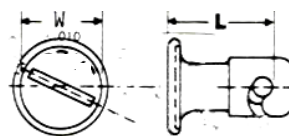
#### OVAL HEAD STUD Type A and AJ



#### FLUSH HEAD STUD Type F, FJ, FO\*



#### ROUNDED EDGE Type FA

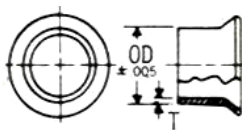


Note: AJ, FJ, AJW, and FJW studs have a long undercut and are a direct replacement for A and F studs. FA studs (common to WWII aircraft) available in 303 Stainless.

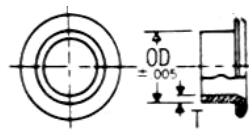
### STUD RETAINERS Type GA and GF Grommets are aluminum.

Type GP Retainer is Nylon

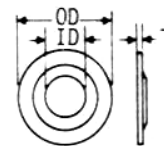
Type GA Full Grommet  
For use with all Studs  
except Flush Head



Type GF Full Grommet  
For use with Flush  
Head Studs (FJ Studs)

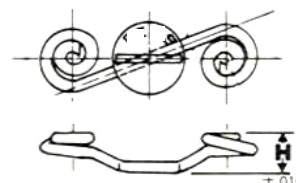


Type GP Half Grommet  
For use with all Studs



### RECEPTACLE - S SPRING Cadmium plated music wire.

#### Type SA Spring



# Skybolt Aircraft ZLoc®

Rev 010612

## Studs

Typical Stud Size	Lt	L	Head Size W	Drill	Drill	Rivet Spacing G	Rivet Size
				Outer Panel A max	Support Panel B*		
3-25	0.325	0.250	5/16	7/32	3/8	5/8	3/32
3-30	0.375	0.300					
4-30	0.400	0.300	7/16	5/16	3/4	3/4	3/32
4-35	0.450	0.350					
4-40	0.500	0.400					
5-35	0.475	0.350	9/16	3/8	5/8	1"	1/8
5-40	0.525	0.400					
5-45	0.575	0.450					
5-50	0.625	0.500					
5-55	0.675	0.550					
6-40	0.550	0.400	5/8	7/16	1	1-3/8	1/8
6-45	0.600	0.450					
6-50	0.650	0.500					
6-55	0.700	0.550					
6.5-40	0.570	0.400	11/16	1/2	1	1-3/8	1/8
6.5-45	0.620	0.450					
6.5-50	0.670	0.500					
6.5-55	0.720	0.550					
7-40	0.575	0.400	3/4	17/32	1-1/16	1-7/16	1/8
7-50	0.675	0.500					
7-60	0.775	0.600					



Note: B\* is oversize to allow relief for grommet/retainer or dimpled panels.

## Stud Grommet/Retainers

Stud Size	Panel (P) Thickness	GA and GF Full Grommet/Retainer				GP Plastic Retainer		
		Type GA	Type GF	OD	T*	Type GP	OD	T
3	.015-.025	<b>GA3-175</b>	NA	7/32	0.015	<b>GP3B</b>	5/16	.035
	.026-.050	<b>GA3-200</b>	NA					
	.051-.094	<b>GA3-250</b>	NA					
4	.015-.025	<b>GA4-225</b>	<b>GF4-125</b>	5/16	0.025	<b>GP4B</b>	7/16	.035
	.026-.050	<b>GA4-250</b>	<b>GF4-150</b>					
	.051-.075	<b>GA4-275</b>	<b>GF4-175</b>					
	.076-.100	<b>GA4-300</b>	<b>GF4-200</b>					
5	.031-.062	<b>GA5-312</b>	<b>GF5-175</b>	3/8	0.028	<b>GP5B</b>	9/16	.035
	.063-.094	<b>GA5-350</b>	<b>GF5-225</b>					
	.095-.125	<b>GA5-375</b>	<b>GF5-250</b>					
6	.040-.065	<b>GA6-350</b>	<b>GF6-218</b>	7/16	0.028	<b>GP6B</b>	5/8	.045
	.066-.100	<b>GA6-375</b>	<b>GF6-250</b>					
	.101-.135	<b>GA6-425</b>	<b>GF6-300</b>					
6.5	Max .062		<b>GF6.5-218</b>	1/2	0.035	<b>GP6B</b>	5/8	.045
	.063-.093	<b>GA6.5-375</b>	<b>GF6.5-250</b>					
	.094-.200	<b>GA6.5-500</b>						
7	.050-.095	<b>GA7-375</b>	<b>GF7-250</b>	17/32	0.040	NA		
	.096-.156	<b>GA7-475</b>	<b>GF7-325</b>					
	.157-.218	<b>GA7-525</b>	<b>GF7-400</b>					

## S SPRING RECEPTACLES

Size	S Spring Part#
3	S3-150
3	S3-175
4	S4-200
4	S4-225
5	S5A-200
5	S5A-225
5	S5A-250
5	S5A-275
5	S5A-300
5	S5A-325
6 & 6.5	S6A-225
6 & 6.5	S6A-250
6 & 6.5	S6A-275
6 & 6.5	S6A-300
6 & 6.5	S6A-400
6 & 6.5	S6A-425
7	S7A-225
7	S7A-250
7	S7A-275
7	S7A-300

## Total Thickness Charts

Choose correct chart for Stud Size. Enter Total Thickness column and select Stud/Spring combination

Size 3 Stud, SK3 Spring			Size 4 Stud, SK4 Spring			Size 5 Stud, SK5 Spring			Size 6 & 7 Stud, SK6 & 7 Spring		
Total Thickness	Stud Dim L	Use Spring Dim H	Total Thickness	Stud Dim L	Use Spring Dim H	Total Thickness	Stud Dim L	Use Spring Dim H	Total Thickness	Stud Dim L	Use Spring Dim H
.045-.069	-20	-175	.100-.124	-30	-225	.055-.079	-30	-275	.140-.164	-40	-300
.070-.094	-20	-150	.125-.149	-30	-200	.080-.104	-30	-250	.165-.189	-40	-275
.095-.119	-25	-175	.150-.174	-35	-225	.105-.129	-30	-225	.190-.214	-40	-250
.120-.144	-25	-150	.175-.199	-35	-200	.130-.154	-30	-200	.215-.239	-40	-225
.145-.169	-30	-175	.200-.224	-40	-225	.155-.179	-40	-275	.240-.264	-50	-300
.170-.194	-30	-150	.225-.249	-40	-200	.180-.204	-40	-250	.265-.289	-50	-275
						.205-.229	-40	-225	.290-.314	-50	-250
						.230-.254	-40	-200	.315-.339	-50	-225
						.255-.279	-50	-275	.340-.364	-60	-300

Determine Total Thickness by adding:

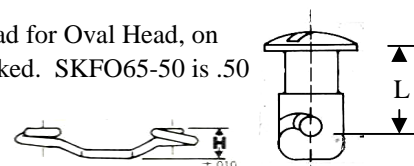
- 1) Outside Panel Thickness (P)
- 2) Inside (Support) Panel Thickness (Q)
- 3) Grommet Thickness (T) if GA or GF grommet used.
- 4) Allow for gasket material or paint build-up. **Allow for panel face misalignment.**

# ZLoc® Fastener Principles and Design Options

One usually thinks of two components as part of the ZLoc® Fastener, the Stud and Spring Receptacle. In the case of the EHF Ejector Series Stud, it is retained in the panel, when unlocked by the flange being fastened to the outside panel. Standard ZLoc® Studs, typically use a Stud retainer to prevent them from falling from the panel when unlocked. Two common retainers are the GP (Nylon) washer or the GA (for Oval Head Studs) or GF(for Flush Head Studs). GP (Nylon) Retainers require no installation tooling. GA and GF Grommet/Retainers require tooling to install. GP (Nylon) Grommets do not figure into Total Thickness calculations whereas GA or GF Grommets add .028 to Total Thickness Calculations.

### Some helpful hints to remember about ZLoc® Fasteners:

- 1) Thicker panels require shorter Springs for a given Stud. Likewise, thinner panels require a taller Spring for a given Stud.
- 2) When locked, the Stud slot or wing always aligns with the Spring mounting holes. Therefore, whatever angle you mount the Spring Receptacle, the Stud will align with it when locked.
- 3) SKEHF5 Studs should only use S5A or #5 Springs. SKEHF6 Pro Studs can use either S5A or S6A Springs.
- 4) TOTAL THICKNESS is the summation of both the outside and inside panels plus allowances for gaskets, grommets, interference *or panels that do not lay flat together. Panel facing (panels do not lay flat together, and in most applications, they do not) can add greatly to charted values.*
- 5) If springs are mounted to Weld Tabs of Plates, the Tab serves as the Inside Panel and adds .100 to Total Thickness
- 6) If locking torque is too tight or too loose, bend the spring with Skybolt Tool SK-7301
- 7) The Part# of a ZLoc® stud is the L Dimension measured from the head (beneath the head for Oval Head, on the top of the head for Flat Head) to the far end of the slot where the spring rests when locked. SKFO65-50 is .50 from the flat of the head to the end of the slot saddle.
- 8) The Part# of the Spring is the height of the Spring. SK6-375 is .375 high.



## Skybolt SK EHF Ejector Series

SKEHF5 and SKEHF6 Self Ejecting Fasteners provide ZLoc® 1/4-turn action with studs that eject from the receptacle when opened. Ejected studs won't hang up when sliding or curved panels are removed and give visual sign of unlocked fastener. The Stud assembly is riveted to the panel with 1/8" rivets or screws.



Head



Head



Total\*

### SKEHF

	Diameter	L	Thickness
SKEHF5-40	5/8	.40	.075-.125
SKEHF5-50	5/8	.50	.150-.225
SKEHF5-50W	5/8	.50	.150-.225
SKEHF5-55	5/8	.55	.225-.275
SKEHF5-60	5/8	.60	.275-.325
SKEHF5-65	5/8	.65	325-425
SKEHF6-40	3/4	.40	.050-.100
SKEHF6-50	3/4	.50	.100-.175
SKEHF6-55	3/4	.55	.200-.250
SKEHF6-60	3/4	.60	.250-.300
SKEHF6-65	3/4	.65	.300-.350

### SKEJ

	Diameter	L	Thickness
SKEJ-40A	3/4	.50	.075-.125
SKEJ-50A	3/4	.60	.150-.225
SKEJ-50AW	3/4	.60	.150-.225
SKEJ-55A	3/4	.65	.225-.275
SKEJ-60A	3/4	.70	.275-.325
SKEJ-65A	3/4	.75	325-425
SK-BN1	Standard Collar .125 Panel		
SK-BN2	Optional Collar .187 Panel		
SK-BN3	Optional Collar .250 Panel		
<b>Use LockTite to retain threaded BN collar</b>			

\*Note: Total Thickness figures are for most applications using either the SK5-325 height springs or SK6-375 height springs.