



GENERAL INFORMATION

ALUMI-FLEX®

Stainless Steel Self-Drilling Screws

PRODUCT DESCRIPTION

Alumi-Flex structural drill screws are 300 series (18-8) stainless steel self-drilling tapping screws that are used for fastening to aluminum when corrosion resistance and galvanic reaction are a primary concern.

GENERAL APPLICATIONS AND USES

- Aluminum-to-aluminum connections
- Attaching miscellaneous building materials to aluminum

FEATURES AND BENEFITS

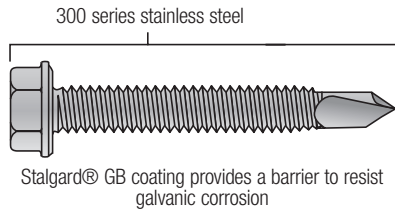
- + 300 series stainless steel provides a very high level of corrosion resistance
- + Stalgard GB coating provides greater galvanic compatibility in aluminum
- + Head marked with a "3" for easy identification (undercut flat head screws do not have a head marking)

APPROVALS AND LISTINGS

- Tested in accordance with AISI S905

GUIDE SPECIFICATIONS

05 05 23 – Metal Fastenings, 09 22 16.23 – Fasteners. Fasteners shall be Alumi-Flex as supplied by Elco Construction Products, Towson, MD. Fasteners shall be installed with published instructions and the Authority Having Jurisdiction.



Identification

The head marking consists of the number "3" above the ELCO® logo as shown below.



SECTION CONTENTS

General Information..... 1
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ANCHOR MATERIALS

- 300 series (18-8) stainless head

DIAMETER

- #10, #12
- 1/4"

DRILL POINT TYPES

- #3, #4

HEAD STYLES

- Hex Washer Head (HWH)
- Undercut Flat Head (PUFH)

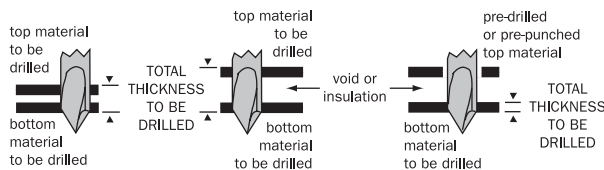
FINISH

- Stalgard GB (Galvanic Barrier) coating

INSTALLATION SPECIFICATIONS

Point Size Selection

Maximum Combined Material Thickness By Point Type



Maximum Recommended Installation RPM

Diameter	RPM
#10	2500
#12	
1/4"	1800

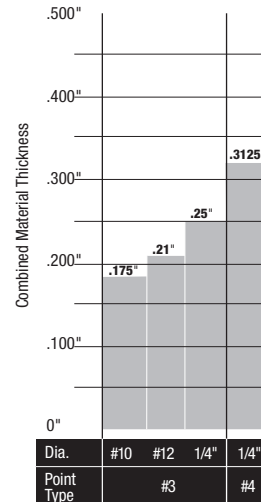
Nominal Sheet Metal Sizes (Aluminum)

Gauge	Decimal (in.)
22	0.025
20	0.032
18	0.040
16	0.050
14	0.064
12	0.100

Nominal Screw Sizes

Thread Dia.	Decimal (in.)
#10	.190
#12	.216
1/4"	.250

Drilling and Tapping Capacity in Aluminum (Maximum Material Thickness)



PERFORMANCE DATA
Fastener Strengths^{1,2,3,4,5,6,7}

Description	Tension (lbf)			Shear (lbf)			Minimum Torsional Strength (in-lbs)
	Ultimate	ASD	LRFD	Ultimate	ASD	LRFD	
#10-16	1,775	590	885	1,150	380	575	43
#12-14	2,320	770	1,160	1,545	515	770	73
1/4"-14	3,195	1,065	1,595	2,120	705	1,060	108
1/4"-20	3,265	1,085	1,630	2,135	710	1,065	108

1. Ultimate strengths are based on laboratory tests.
2. Allowable (ASD) strengths are based on a safety factor, Ω , of 3.00 in accordance with ICC-ES AC491 and AISI S100-16.
3. Design (LRFD) strengths are based on a resistance factor, ϕ , of 0.50 in accordance with ICC-ES AC491 and AISI S100-16.
4. For ASD tension connections, the lower of the ASD tension strength, ASD pull-out strength and ASD pull-over strength must be used for design.
5. For LRFD tension connections, the lower of the LRFD tension strength, LRFD pull-out strength and LRFD pull-over strength must be used for design.
6. For ASD shear connections, the lower of the ASD Shear (Bearing) Capacity and the ASD Fastener Shear Strength must be used for design.
7. For LRFD shear connections, the lower of the LRFD Shear (Bearing) Capacity and the LRFD Fastener Shear Strength must be used for design.

Ultimate Shear (Bearing) Capacity of Screw Connections in Aluminum, lbf^{1,2}

Diameter	Head Styles	Aluminum Thickness (Lapped Sheets/Bars)											
		1/16" - 1/16"			3/32" - 3/32"			1/8" - 1/8"			1/8" - 1/4"		
		6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6
#10-16	HWH, PUFH	390	535	750	590	800	1,115 ⁽²⁾	785	1,070	1,495	-	-	-
#12-14	HWH	445	610	850	670	910	1,410 ⁽²⁾	890	1,215	1,700	-	-	-
1/4"-14	HWH, PUFH	515	705	985	775	1,055	1,720 ⁽²⁾	1,030	1,405	1,970	1,030	1,405	1,970
1/4"-20	HWH	515	705	985	775	1,055	1,570 ⁽²⁾	1,030	1,405	1,970	1,030	1,405	1,970

1. Unless otherwise noted, ultimate strengths are based on calculations in accordance with the Aluminum Design Manual, AA ADM1-2015.
2. Ultimate strengths are based on laboratory testing.
3. Ultimate load capacities must be reduced by a minimum safety factor to determine allowable loads (ASD) or by a load resistance factor to determine strength design capacities (LRFD).

Allowable Shear (Bearing) Capacity of Screw Connections in Aluminum, lbf^{1,2}

Diameter	Head Styles	Aluminum Thickness (Lapped Sheets/Bars)											
		1/16" - 1/16"			3/32" - 3/32"			1/8" - 1/8"			1/8" - 1/4"		
		6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6
#10-16	HWH, PUFH	130	180	250	195	265	370	260	355	500	-	-	-
#12-14	HWH	150	205	285	225	305	470	295	405	565	-	-	-
1/4"-14	HWH, PUFH	170	235	330	260	350	575	345	470	655	345	470	655
1/4"-20	HWH	170	235	330	260	350	525	345	470	655	345	470	655

1. Allowable (ASD) strengths are based on a safety factor, $\Omega = 3.0$, determined in accordance with the Aluminum Design Manual, AA ADM1-2015.
2. Values are based on aluminum members with the following minimum tensile strengths: 6063-T5, $F_u = 22$ ksi; 6063-T6, $F_u = 30$ ksi; 6061-T6, $F_u = 42$ ksi
3. The first number is the thickness of aluminum in contact with the screw head, the second number is the thickness of the aluminum not in contact with the screw head.
4. Allowable (ASD) Shear (Bearing) capacities for other member thicknesses may be determined by interpolating within the table.
5. For aluminum with the following tensile strengths: 6063-T5, $F_u = 27$ ksi; 6063-T6, $F_u = 35$ ksi; 6061-T6, $F_u = 45$ ksi; multiply tabulated values by 1.22, 1.16, 1.07 respectively.
6. For ASD shear connections, the lower of the ASD Shear (Bearing) Capacity and the ASD Fastener Shear Strength must be used for design.

Design (LRFD) Shear (Bearing) Capacity of Screw Connections in Aluminum, lbf^{1,2,3,4,5,6}

Diameter	Head Styles	Aluminum Thickness (Lapped Sheets/Bars)											
		1/16" - 1/16"			1/16" - 1/8"			1/8" - 1/8"			1/8" - 1/4"		
		6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6
#10-16	HWH, PUFH	195	265	375	295	400	560	390	535	750	-	-	-
#12-14	HWH	225	305	425	335	455	705	445	610	850	-	-	-
1/4"-14	HWH, PUFH	260	350	490	385	530	860	515	705	985	515	705	985
1/4"-20	HWH	260	350	490	385	530	785	515	705	985	515	705	985

1. Design (LRFD) strengths are based on a safety factor, $\phi = 0.30$, determined in accordance with the Aluminum Design Manual, AA ADM1-2015.
2. Values are based on aluminum members with the following minimum tensile strengths: 6063-T5, $F_u = 22$ ksi; 6063-T6, $F_u = 30$ ksi; 6061-T6, $F_u = 42$ ksi
3. The first number is the thickness of aluminum in contact with the screw head, the second number is the thickness of the aluminum not in contact with the screw head.
4. Design (LRFD) Shear (Bearing) capacities for other member thicknesses may be determined by interpolating within the table.
5. For aluminum with the following tensile strengths: 6063-T5, $F_u = 27$ ksi; 6063-T6, $F_u = 35$ ksi; 6061-T6, $F_u = 45$ ksi; multiply tabulated values by 1.22, 1.16, 1.07 respectively.
6. For LRFD shear connections, the lower of the LRFD Shear (Bearing) Capacity and the LRFD Fastener Shear Strength must be used for design.



Ultimate Tension Pull-Out Capacity of Screw Connections in Aluminum, lbf ^{1,2}

Diameter	Point Type	Aluminum Thickness: 6061-T6					
		1/16"	3/32"	1/8"	3/16"	1/4"	5/16"
#10-16	#3	300	745	1,280	-	-	-
#12-14	#3	305	750	1,340	2,065	-	-
1/4"-14	#3	340	835	1,450	2,805	2,825	-
1/4"-20	#4	-	1,055	1,615	2,880	2,880	2,885

1. Ultimate strengths are based on laboratory tests.
2. Ultimate load capacities must be reduced by a minimum safety factor to determine allowable loads (ASD) or by a load resistance factor to determine strength design capacities (LRFD).

Allowable Tension Pull-Out Capacity of Screw Connections in Aluminum, lbf ^{1,2,3,4,5}

Diameter	Point Type	Aluminum Thickness: 6061-T6					
		1/16"	3/32"	1/8"	3/16"	1/4"	5/16"
#10-16	#3	100	250	425	-	-	-
#12-14	#3	100	250	445	690	-	-
1/4"-14	#3	115	280	485	935	940	-
1/4"-20	#4	-	350	540	960	960	960

1. Allowable (ASD) capacities are based on a safety factor, $\Omega = 3.00$ in accordance with AC491.
2. Allowable (ASD) capacities are based on 6061-T6 aluminum members with a minimum tensile strength of $F_u = 42$ ksi and a minimum yield strength of $F_y = 35$ ksi.
3. Allowable (ASD) pull-out capacities for other member thicknesses may be determined by interpolating within the table.
4. For aluminum with a minimum tensile strength $F_u \geq 45$ ksi and a minimum yield strength of $F_y = 40$ ksi, multiply tabulated values by 1.14.
5. For ASD tension connections, the lower of the ASD tension strength, ASD pull-out strength and ASD pull-over strength must be used for design.

Design (LRFD) Tension Pull-Out Capacity of Screw Connections in Aluminum, lbf ^{1,2,3,4,5}

Diameter	Point Type	Aluminum Thickness: 6061-T6					
		1/16"	3/32"	1/8"	3/16"	1/4"	5/16"
#10-16	#3	150	370	640	-	-	-
#12-14	#3	150	375	670	1,035	-	-
1/4"-14	#3	170	420	725	1,400	1,410	-
1/4"-20	#4	-	530	810	1,440	1,440	1,445

1. Design (LRFD) capacities are based on a resistance factor, $\phi=0.50$ in accordance with AC491.
2. Design (LRFD) capacities are based on 6061-T6 aluminum members with a minimum tensile strength of $F_u = 42$ ksi and a minimum yield strength of $F_y = 35$ ksi.
3. Design (LRFD) pull-out capacities for other member thicknesses may be determined by interpolating within the table.
4. For aluminum with a minimum tensile strength $F_u \geq 45$ ksi and a minimum yield strength of $F_y = 40$ ksi, multiply tabulated values by 1.14.
5. For LRFD tension connections, the lower of the LRFD tension strength, LRFD pull-out strength and LRFD pull-over strength must be used for design.

Ultimate Pull-Over Capacity of Screw Connections in Aluminum, lbf^{1,2}

Diameter	Head Styles	Minimum Thickness of Aluminum in Contact with Screw Head								
		1/32"			1/16"			1/8"		
		6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6
#10-16	HWH	225	355	495	505	790	1,105	1,225	1,915	2,680
#12-14	HWH	235	365	510	520	815	1,140	1,255	1,960	2,745
1/4"-14	HWH	275	430	605	605	945	1,325	1,425	2,225	3,115
1/4"-20	HWH	275	430	605	605	945	1,325	1,425	2,225	3,115

1. Ultimate strengths are based on calculations in accordance with the Aluminum Design Manual, AA ADM1-2015.
2. Ultimate load capacities must be reduced by a minimum safety factor to determine allowable loads (ASD) or by a load resistance factor to determine strength design capacities (LRFD).

Allowable (ASD) Pull-Over Capacity of Screw Connections in Aluminum, lbf^{1,2,3,4,5,6}

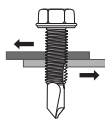
Diameter	Head Styles	Minimum Thickness of Aluminum in Contact with Screw Head								
		1/32"			1/16"			1/8"		
		6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6
#10-16	HWH	75	120	165	170	265	370	410	640	895
#12-14	HWH	80	120	170	175	270	380	420	655	915
1/4"-14	HWH	90	145	200	200	315	440	475	740	1,040
1/4"-20	HWH	90	145	200	200	315	440	475	740	1,040

1. Allowable strengths are based on a safety factor, $\Omega = 3.00$, determined in accordance with the Aluminum Design Manual, AA ADM1-2015.
2. Values are based on aluminum members with the following minimum yield strengths: 6063-T5, $F_y = 16$ ksi; 6063-T6, $F_y = 25$ ksi; 6061-T6, $F_y = 35$ ksi
3. Allowable (ASD) pull-over capacities for other member thicknesses may be determined by interpolating within the table.
4. For aluminum with the following yield strengths: 6063-T5, $F_y = 21$ ksi; 6063-T6, $F_y = 31$ ksi; 6061-T6, $F_y = 40$ ksi; multiply tabulated values by 1.31, 1.24, 1.14 respectively.
5. Tabulated pull over capacities are applicable to aluminum that has been self drilled by the screw fastener and for pre-drilled aluminum members with clearance holes sizes of 0.177, 0.201, 0.228 and 0.266 for #8, #10, #12 and 1/4" screws, respectively.
6. For ASD tension connections, the lower of the ASD tension strength, ASD pull-out strength and ASD pull-over strength must be used for design.

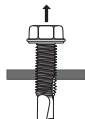
Design (LRFD) Pull-Over Capacity of Screw Connections in Aluminum, lbf^{1,2,3,4,5,6}

Diameter	Head Styles	Minimum Thickness of Aluminum in Contact with Screw Head								
		1/32"			1/16"			1/8"		
		6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6	6063-T5	6063-T6	6061-T6
#10-16	HWH	115	175	250	255	395	555	615	955	1,340
#12-14	HWH	115	185	255	260	405	570	630	980	1,375
1/4"-14	HWH	140	215	305	305	475	665	715	1,115	1,560
1/4"-20	HWH	140	215	305	305	475	665	715	1,115	1,560

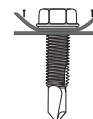
1. Design (LRFD) strengths are based on a resistance factor, $\phi = 0.50$, determined in accordance with the Aluminum Design Manual, AA ADM1-2015.
2. Values are based on aluminum members with the following minimum yield strengths: 6063-T5, $F_y = 16$ ksi; 6063-T6, $F_y = 25$ ksi; 6061-T6, $F_y = 35$ ksi
3. Design (LRFD) pull-over capacities for other member thicknesses may be determined by interpolating within the table.
4. For aluminum with the following yield strengths: 6063-T5, $F_y = 21$ ksi; 6063-T6, $F_y = 31$ ksi; 6061-T6, $F_y = 40$ ksi; multiply tabulated values by 1.31, 1.24, 1.14 respectively.
5. Tabulated pull over capacities are applicable to aluminum that has been self drilled by the screw fastener and for pre-drilled aluminum members with clearance holes sizes of 0.177, 0.201, 0.228 and 0.266 for #8, #10, #12 and 1/4" screws, respectively.
6. For LRFD tension connections, the lower of the LRFD tension strength, LRFD pull-out strength and LRFD pull-over strength must be used for design.



Lap Shear



Tension Pull-Out



Tension Pull-Over

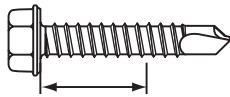
ORDERING INFORMATION

Alumi-Flex Self-Drilling Structural Screws

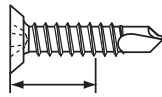
Cat. No. ⁵	Description (Diameter- TPI x Nominal Length)	Point Type	Finish	Maximum Load-Bearing Length (in.)	Minimum Protrusion Length ²	Nominal Head Diameter ³ (in.)	Nominal Head Height ⁴ (in.)	Qty / Carton
#10 Diameter, 5/16" Hex Washer Head								
EAH430-I	#10-16 X 1/2"	#3	Stalgard GB	0.063	7/16"	0.400	0.140	8,000
EAH445-I	#10-16 X 3/4"	#3	Stalgard GB	0.250	1/2"	0.400	0.140	6,000
EAH460-I	#10-16 X 1"	#3	Stalgard GB	0.500	1/2"	0.400	0.140	5,000
#10 Diameter, #2 Phillips Undercut Flat Head								
EBM160-I	#10 - 16 x 1"	#3	Stalgard GB	0.500	1/2"	0.350	0.075	10,000
#12 Diameter, 5/16" Hex Washer Head								
EAH630-I	#12 - 14 x 3/4"	#3	Stalgard GB	0.250	1/2"	0.415	0.180	5,000
EAH650-I	#12 - 14 x 1"	#3	Stalgard GB	0.500	1/2"	0.415	0.180	5,000
EAH680-I	#12 - 14 x 1-1/2"	#3	Stalgard GB	1.000	1/2"	0.415	0.180	3,000
1/4" Diameter, 3/8" Hex Washer Head								
EAH800-I	1/4" - 14 x 3/4"	#3	Stalgard GB	0.188	9/16"	0.500	0.220	3,500
EAH820-I	1/4" - 14 x 1"	#3	Stalgard GB	0.438	9/16"	0.500	0.220	3,000
EAH870-I	1/4" - 20 x 1"	#4	Stalgard GB	0.375	5/8"	0.500	0.220	2,000
EAH835-I	1/4" - 14 x 1-1/2"	#3	Stalgard GB	0.938	9/16"	0.500	0.220	2,000
EAH880-I	1/4" - 20 x 1-1/2"	#4	Stalgard GB	0.875	5/8"	0.500	0.220	2,000
1/4" Diameter, #3 Phillips Undercut Flat Head								
EBM260-I	1/4" - 14 x 1"	#3	Stalgard GB	0.438	9/16"	0.480	0.100	4,500

1. The Maximum Load Bearing Length is calculated by subtracting the Minimum Protrusion Length from the Nominal Length of the fastener.
2. Minimum Protrusion Length is the length that allows three full threads to protrude out of the back side of the supporting material.
3. Nominal head diameter is the diameter of the integral washer on hex washer head fasteners.
4. Nominal head height includes the thickness of the integral washer on hex washer head fasteners.

Load Bearing Area



Hex Washer Head



Undercut Flat Head

Screwguns

Cat. No.	Description	Screw Diameter
DW268	2,500 RPM VSR VERSA-CLUTCH™ Screwgun	#10
DW267	2,000 RPM VSR VERSA-CLUTCH™ Screwgun	#12 & 1/4"
DCF622M2	20V MAX* XR® VERSA-CLUTCH™ Adjustable Torque Screwgun Kit	#10-1/4"

For 20V MAX Maximum initial battery voltage measured without a workload is 20 volts. Nominal voltage is 18.

Fasteners must be installed perpendicular to the work surface using a maximum 2500 RPM screw gun with a torque sensing nose piece.

Guidance on installation RPM of particular screw diameters can be found on page 1.

Impact tools are not recommended for the installation of Alumi-Flex fasteners.



Accessories

Cat. No.	Description
DW2046	2" Bit Tip Holder
DWA1PH2IR2	#2 Phillips Bit Tip (2 Pack)
DWA1PH3IR2	#3 Phillips Bit Tip (2 Pack)
DW2219R	5/16" Impact Ready® Nut Driver
DW2223R	3/8" Impact Ready® Nut Driver
DWA2SLS30	Screwdriving Set
DWA2FTS25IR	Screwdriving Set

