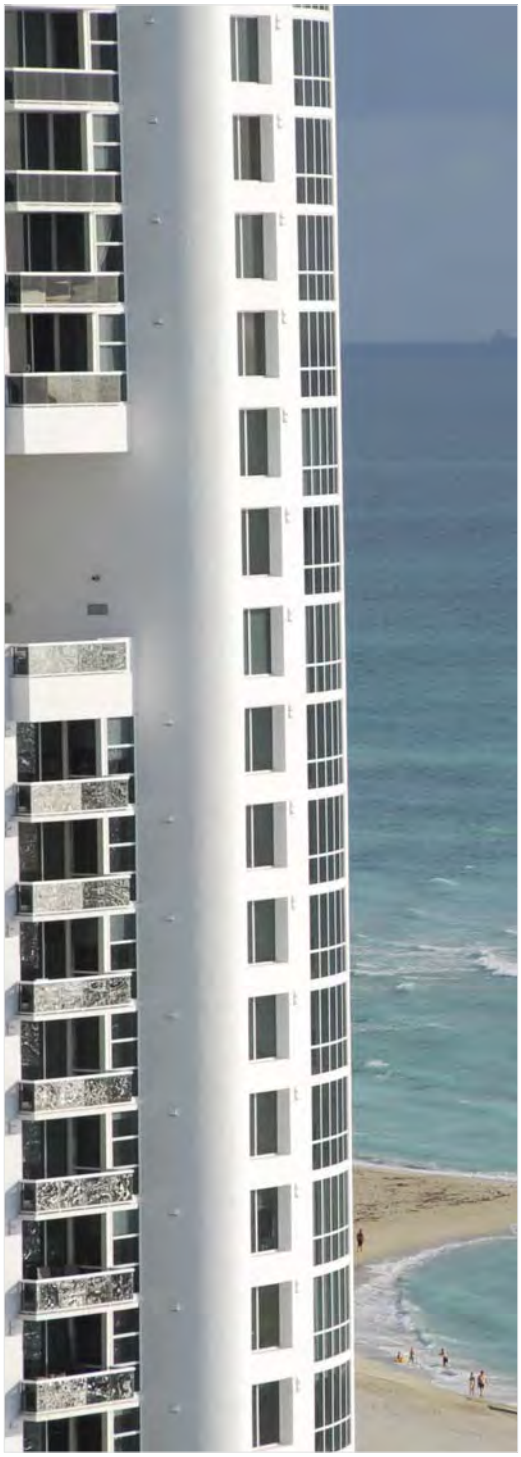
ELCO®

Flex Technology®

Innovative Fastening Technologies

The Industry Leader in Critical Fastening



STANLEY®

Engineered Fastening

The Flex Technology® Concept

Standard case hardened fasteners are vulnerable to delayed embrittlement failures. These failures are brought on by the presence of hydrogen which is generated in dissimilar metal applications. Galvanic reactions between dissimilar metals such as aluminum and steel, in the presence of moisture (humidity, condensation, exposure to inclement weather or coastal fog, e.g.), reduces detrimental hydrogen. This can destroy the integrity of fastener grain boundaries, leading to sudden and potentially catastrophic fastener failures. Metallurgically, this phenomenon is known as HASCC (Hydrogen Assisted Stress Corrosion Cracking) and it happens without any visible signs, such as red rust.

Elco Construction Products has developed a family of products that utilize **Flex Technology** to incorporate high performance and virtual immunity to delayed embrittlement failures. Using s**pecial alloy materials** that receive **proprietary heat treatments and tempering processes**, the Flex Technology line of products far surpasses any standard fastening format available. Flex Technology allows designers and system manufacturers to manage their risk and enhance the performance of critical connections.

All Flex Technology products also feature Stalgard durable, mult-layer, corrosion-resistant coatings. These environmentally-friendly coatings are free of chromates and silicates and any process that might induce hydrogen embrittlement.

Typical Applications

- Dissimilar metal applications
- Windows, doors and skylights
- Building enclosures/envelopes (curtain wall systems, stone facades, insulated metal panels)
- Blast protection systems
- Solar panel racking support systems

The Flex Technology Product Line

For Metal Applications

- Dril-Flex® Structural Drill Screws
- Tap-Flex® Structural Tapping Screws
- Bi-Flex® 300 Series Stainless Steel Self-Drilling Fasteners

For Concrete Applications

- ConFlex® Large Diameter Masonry Anchors
- Aggre-gator® 300 Series Stainless Anchors

For Aluminum Applications

- Alumi-Flex™ Stainless Steel Drill Screws
- AllFlex™ Stainless Steel Tapping Screws

Flex Technology® Products

Types of Corrosion:

Uniform corrosion is the general breakdown of a metal into an oxide of the metal or other corrosion product. The most common type of this corrosion is the visible formation of red rust on steel.

Galvanic corrosion occurs when dissimilar metals are in contact in the presence of an electrolyte (such as water, condensation, etc.). One metal will become the anode, or sacrificial component, and the other metal will be the cathode, or the metal that does not corrode (see chart).

Hydrogen assisted stress corrosion cracking occurs when hydrogen, generated most often during a galvanic corrosion process, enters hardened steels and causes damage. This is commonly described as “heads popping” off installed fasteners.

Hydrogen from the corrosion process accumulates in the highest stressed area of the installed fastener, typically under the head or at the interface of the application materials. There is no visible indication that embrittlement is taking place.

Ultimately, failures may occur without warning in less than 24 hours, or may be delayed, due to changing application conditions, for weeks, months or even years.

Galvanic Series

Anodic End	
Metal/Alloy	EMF(v)
Magnesium	-1.60
Zinc	-1.10
Alum (5000, 6000, 7000)	-.75
Iron, Low Alloy Steels	-.70
Alum (2000)	-.60
Lead	-.55
18% Chromium Steel	-.35
Naval Brass	-.30
Brass, Bronze	-.25
Austenitic Stainless (300 Series)	-.20
Nickel	-.15
Silver	0
Gold	+15
Cathodic End	

In the presence of moisture, materials higher on the list will be sacrificial to materials lower on the list. The greater the EMF differential, the greater the sacrificial action of the anode to the cathode in a galvanic cell.

Example of how fasteners can fail due to hydrogen-assisted cracking (HAASC). These 410 SS super passivated fasteners with plain finish (above) and 410 fasteners with aluminum-filled topcoat (below) failed at the interface of the aluminum and steel sheets during salt spray tests.

Why Other Fasteners Don't Perform

410 stainless steel fasteners

- Hard enough to drill and tap after heat treatment
- Require special platings and/or coatings to delay red rust corrosion
- Coatings applied to delay red rust do not protect against HASCC failures

410 super-passivated stainless steel fasteners

- Hard enough to drill and tap after heat treatment
- Super-passivation process does not protect against HASCC failures
- Subject to red rust and pitting corrosion

400 modified stainless steel fasteners

- Hard enough to drill and tap after heat treatment
- Modified chemistry improves corrosion resistance over standard 410 SS
- Modified chemistry does not protect against HASCC embrittlement failures

Turn to Flex Technology products for protection from all types of corrosion, including virtual immunity from HASCC embrittlement failures.

Unplated 300 series stainless screws vs. fasteners with Stalgard GB were installed side-by-side in aluminum plate and put into salt spray testing for 1000 hours per ASTM B117.

Flex Technology® Products

Stalgard® High-Performance Protective Coatings

Stalgard durable, multi-layer, corrosion-resistant coatings are engineered to provide optimal performance in demanding construction applications. These environmentally-friendly finishes are free of chromates and silicates and any process, like electroplating, that might induce hydrogen embrittlement, preventing structural failures.

- Maximizes fastener performance
- Salt spray at 1000+ hours with no red rust per ASTM B117
- Uniform thickness
- Low coefficient of friction – eliminates the need for post-coating lubricants to ease installation
- Does not use processes that introduce hydrogen – will not cause brittle failures like those caused by electroplating
- Durable tough finish – doesn't come off during handling or repeated installations
- Clean and dry – no oily residue
- Eliminates the plating process, resulting in a more environmentally-friendly product than those with plated zinc or other finishes
- Blue, grey, and white Stalgard are ACQ-compatible
- Maintains drilling and tapping performance

RoHS compliant (chrome-free)

Stalgard Coating for Induction Heat-Treated Fasteners

STALGARD® Outstanding Corrosion Protection

- Proven, outstanding corrosion resistance for most construction applications, including metal and wood
- Salt spray resistance: 1000 hours per ASTM B117
- Available colors: silver, black, blue, white, yellow, red, gray and brown

Stalgard GB (Galvanic Barrier) Coating

STALGARD® GB Galvanic Barrier Corrosion Protection

- Standard on all Elco stainless steel fasteners
- Prevents a galvanic reaction between the stainless steel and dissimilar application materials, which could lead to fastener and/or joint failure
- Salt spray resistance: 1000 hours per ASTM B117
- Available color: Silver

Stalgard SUB Coating

STALGARD® SUB Ultimate Barrier Corrosion Protection

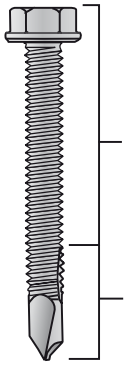
- For more severely-corrosive environments
- Salt spray 2,000 hours per ASTM B117
- Available color: Silver

Flex Technology® for Metal Applications

Dril-Flex® Structural Self-Drilling Fasteners

Made in the U.S.A.

Self-drilling point
Material/Heat Treat: Alloy steel with dual hardening:
Higher hardness (HRC 52 min.) point for fast, positive drilling
Lead threads with lower-hardness (HRC 28 – 34) load-bearing threads
Silver Stalgard® corrosion-resistant finish
Approvals:
ICC ES ESR-3332
COLA (City of Los Angeles) Research Report #25095



Product Selection

Catalog No.	Description	Pt.	Load-Bearing Area
#10 Diameter, 5/16" Hex Washer Head			
EAF430	10-16 x 3/4"	#3	.500"
EAF460	10-16 x 1-1/2"	#3	1.50"
EAF470	10-16 x 2"	#3	2.00"
EAF480	10-16 x 2-1/2"	#3	2.50"
#10 Diameter, #2 Phillips Pan Head			
EDX445	10-16 x 3/4"	#2	.500"
#10 Diameter, #2 Phillips Wafer Head			
EBL530	10-24 x 1-1/4"	#3	.750"
#12 Diameter, 5/16" Hex Washer Head			
EAF621*	12-14 x 7/8"	#3	.470"
EAF641	12-14 x 1"	#3	.500"
EAF681	12-14 x 1-1/2"	#3	1.00"
EAF690	12-14 x 2"	#3	1.50"
EAF715	12-14 x 3"	#3	2.50"
#12 Diameter, #3 Phillips Undercut Flat Head			
EBL215	12-14 x 1"	#3	.500"
EBL223	12-14 x 1-1/2	#3	1.00"
1/4" Diameter, 3/8" Hex Washer Head			
EAF816	1/4-14 x 1"	#3	.450"
EAF841	1/4-14 x 1-1/2"	#3	.950"
EAF876	1/4-20 x 1-1/2"	#4	.830"
EAF846	1/4-14 x 2"	#3	1.45"
EAF886	1/4-20 x 2"	#4	1.33"
EAF865	1/4-20 x 1-1/8"	#4	.500"
EAF888	1/4-20 x 1-3/4"	#5	.800"
EAF890	1/4-20 x 2-1/2"	#4	1.830"
EAF900	1/4-20 x 3-3/8"	#4	2.70"
EAF910	1/4-20 x 4"	#4	3.50"
1/4" Diameter, #3 Phillips Undercut Flat Head			
EBL330	1/4-20 x 3"	#4	2.50"
EBL340	1/4-20 x 4"	#4	3.50"
3/8" Diameter, Hex Washer Head			
EAF310	3/8-16	#3	
5/16" Diameter, 3/8" Hex Washer Head			
EAF940	5/16-18 x 1-1/2"	#3	.850"
EAF960	5/16-24 x 1-1/2"	#4	.850"
EAF970	5/16-24 x 2"	#4	1.35"

Performance Data

Pull-out Tests – Steel

Pull-out values shown are in lbs.

Screw Size	Pt.	Drill Cap.	Steel							
			18	16	14	12	1/8	3/16	1/4	5/16
10-16	#3	.150	396	501	634	1595	1693			
12-14	#3	.187	396	527	710	1678	2061	2898		
1/4-14	#3	.210	398	530	686	1950	2264	3919		
1/4-20	#4	.312		516	649	1912	2296	2928	3561	4488
5/16-24	#4	.312				2148	2573	4226	5424	6622

Shear Tests – Steel

Shear values shown are in lbs.

Screw Size	Pt.	Drill Cap.	Steel						
			18-18 ga.	18-14 ga.	16-16 ga.	14-14 ga.	1/8"–3/16"	3/16"–1/4"	1/4"–12 ga.
10-16	#3	.150	1362	1733	1462				
12-14	#3	.187	1315	2118	1655	1816			
1/4-14	#3	.210	1395	2313	1681	2417	2600		
1/4-20	#4	.312	1350	2086	1582	2450	2814	2810	2706
5/16-24	#4	.312					5486	5283	4761

Pull-out Tests – Aluminum

Pull-out values shown are in lbs.

Screw Size	Pt.	Drill Cap.	Aluminum 6063-T5		
			1/8"	1/4"	3/8"
10-16	#3	.150			
12-14	#3	.187	939	2286	
1/4-14	#3	.210	1003	2424	
1/4-20	#4	.312	897	2075	3683
5/16-24	#4	.312	1043	2566	

Shear Tests – Aluminum

Shear values shown are in lbs.

Screw Size	Pt.	Drill Cap.	Aluminum 6063-T5	
			1/8" – 1/8"	1/8" – 1/4"
10-16	#3	.150	1466	
12-14	#3	.187	1797	2483
1/4-14	#3	.210	1996	2883
1/4-20	#4	.312	2006	2926
5/16-24	#4	.312	1849	2926

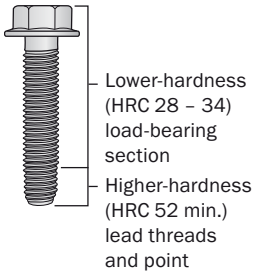
NOTE: All performance data shown is based on tests performed under laboratory conditions.

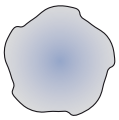
The appropriate safety factor should be applied and code requirements factored into specification and use of these fasteners. Final determination of the appropriate safety factor and use of these fasteners is the sole responsibility of the user, specifying Engineer or other person designing the connection.

Flex Technology® for Metal Applications

Tap-Flex® Structural Tapping Screws

- E-Form configuration overcomes friction build-up and reduces drive torque
- Roll forms its own work-hardened threads
- Material/Heat treat: Alloy steel
  - Higher-hardness (HRC 52 min.) lead threads and point for roll forming threads
  - Lower-hardness (HRC 28 -34) load-bearing area
- Finish: Silver Stalgard® GB coating
- Flex Technology heat treat provides required strength (Grade 5: meets ASTM A449 specifications of 120 ksi strength) and ductility
- Provides enhanced pull-out performance





E-Form® Profile

Product Selection

Size	Catalog No.	Finish	Load-Bearing Length	KSI*	Drill Bit Size
3/8" Diameter Anchors with 9/16" Hex Washer Head					
3/8-16 x 1-1/2	ESU310	Stalgard GB	1.00"	120 KSI min.	11/32"
3/8-16 x 2	ESU320	Stalgard GB	1.49"		
3/8-16 x 2-1/2	ESU330	Stalgard GB	1.99"		
1/2" Diameter Anchors with 3/4" Hex Washer Head					
1/2-13 x 1-1/2	ESU410	Stalgard GB	0.875"	120 KSI min.	15/32"
1/2-13 x 2	ESU420	Stalgard GB	1.365"		
1/2-13 x 2-1/2	ESU430	Stalgard GB	1.865"		
5/8" Diameter Anchors with 3/4" Hex Washer Head					
5/8-11 x 1-1/2	ESU510	Stalgard GB	0.800"	120 KSI min.	19/32"
5/8-11 x 2	ESU520	Stalgard GB	1.24"		
5/8-11 x 2-1/2	ESU530	Stalgard GB	1.74"		

* Per ASTM A449.

Identification

Elco flag in a raised circle

Installation

Anchor Size	Socket Size
3/8"	9/16"
1/2"	3/4"
5/8"	3/4"

NOTE: All performance data shown is based on tests performed under laboratory conditions. The appropriate safety factor should be applied and code requirements factored into specification and use of these fasteners. Final determination of the appropriate safety factor and use of these fasteners is the sole responsibility of the user, specifying Engineer or other person designing the connection.

Performance Data

Seating Torque (inlbs)

	6063 T5 Aluminum			6061 T6 Aluminum			6063 T5 on 1018 Steel				6061 T6 on 1018 Steel			
Size	**1/8**	**3/16**	**1/4**	**1/8**	**3/16**	**1/4**	**1/8**	**3/16**	**1/4**	**3/8**	**1/8**	**3/16**	**1/4**	**3/8**
3/8-16	171	214	285	231	328	490	412	638	805	858	389	581	740	771
1/2-13	255	368	471	338	547	767	558	955	1375	1895	513	807	1189	1658
5/8-11	261	486	662	343	694	943	654	1258	1662	2976	600	1061	1492	2083

Note: These numbers were calculated from the maximum reading (failure torque) during drive-to-fail testing (Seating Torque = Failure Torque x .75).

Shear (Ultimate lbs)

	6063 T5 Aluminum			6063 T5 to 1018 Steel			
Size	**1/8 to 1/8**	**3/16 to 3/16**	**1/4 to 1/4**	**1/8 to 1/8**	**3/16 to 3/16**	**1/4 to 1/4**	**1/4 to 3/8**
3/8-16	2321	3476	4979	5015	6560	6975	6965
1/2-13	2784	3669	5230	4773	6455	8396	8689
5/8-11	2696	3775	5455	4558	6196	8290	8060
	6061 T6 Aluminum			**6061 T6 to 1018 Steel**			
Size	**1/8 to 1/8**	**3/16 to 3/16**	**1/4 to 1/4**	**1/8 to 1/8**	**3/16 to 3/16**	**1/4 to 1/4**	**1/4 to 3/8**
3/8-16	3560	5205	6885	5711	8701	7721	7611
1/2-13	4482	6167	8718	6052	9769	13976	13340
5/8-11	4216	6768	9292	5967	9577	13124	15309

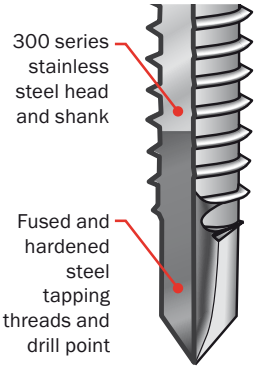
Pull Out (Ultimate lbs)

	6063 T5 Aluminum			
Size	**1/8**	**3/16**	**1/4**	**3/8**
3/8-16	1311	2365	3281	–
1/2-13	1431	2230	3694	–
5/8-11	1755	2907	4191	–
	6061 T6 Aluminum			
Size	**1/8**	**3/16**	**1/4**	**3/8**
3/8-16	2080	3805	5981	–
1/2-13	2190	3869	7527	–
5/8-11	2641	5202	8210	–
	1018 Steel			
Size	**1/8**	**3/16**	**1/4**	**3/8**
3/8-16	3501	5986	11440	11862
1/2-13	3668	7411	13613	20440
5/8-11	4500	8300	16678	26680

Flex Technology® for Metal Applications

Bi-Flex 300 Series Stainless Bi-Metal Fasteners

- Material/Heat Treat: Bi-metal technology
  - Head and shank made of (18-8) stainless steel alloy to provide unmatched corrosion resistance in your toughest applications
  - Fused and hardened steel drill point and lead threads quickly drill and tap structural steel and aluminum
- Finish: Silver Stalgard® GB coating, a galvanic barrier to protect aluminum components from accelerated corrosion
- **NEW:** Approvals
  - COLA (City of Los Angeles) Research Report #RR25886



Product Selection

	Cat. No.†	Dia. – TPI	L Length	Pt. Size	B Max. Load-bearing Length*
Hex Washer Head					
	EAJ100	8-18	3/4"	2	0.32"
	EAJ102	8-18	1"	2	0.50"
	EAJ110	10-16	3/4"	2	0.32"
	EAJ120	10 -16	1"	2	0.50"
	EAJ140	10-16	1-1/2"	2	1.10"
	EAJ185	12-14	1"	2	0.50"
	EAJ215	12-14	1-1/2"	2	1.00"
	EAJ190	12-14	1"	3	0.50"
	EAJ220	12-14	1-1/2"	3	1.00"
	EAJ260	12-14	2-1/2"	3	2.00"
	EAJ240	12-14	2"	2	1.50"
	EAJ320	12-24	1-1/2	5	1.50"
	EAJ340	12-24	2"	5	1.10"
	EAJ415	1/4-14	1"	2	0.50"
	EAJ430	1/4-14	1-1/2"	2	1.00"
	EAJ445	1/4-14	2"	2	1.50"
	EAJ540	1/4-20	1"	3	0.50"
	EAJ580	1/4-20	1-1/2"	3	1.00"
	EAJ600	1/4-20	1-1/2"	5	1.00"
	EAJ610	1/4-20	2"	3	1.50"
	EAJ615	1/4-20	2"	5	1.10"
	EAJ640	1/4-20	2-1/2"	3	2.00"
	EAJ650	1/4-20	3"	3	2.50"
	EAJ630	1/4-20	3"	5	2.10"
	EAJ660	1/4-20	4"	3	3.50"
	EAJ670	1/4-20	4"	5	3.10"
	EAJ675	1/4-20	5"	5	4.10"
	EAJ680	1/4-20	6"	5	5.10"
	EAJ690C	1/4-20	8"	5	7.10"
Flat Head Reamers w/wings					
	EBN140	10-16	1-1/2"	3	0.80"
	EBN345	12-24	2-13/16"	5	1.71"
	EBN645	1/4-20	2-13/16"	5	1.71"
Flat Head Undercut					
	EBN200	12-14	1"	2	0.50"
	EBN240	12-14	1-1/2"	2	1.00"
	EBN630	1/4-20	3"	2	2.50"
	EBN640	1/4-20	4"	2	3.50"

	Cat. No.†	Dia. – TPI	L Length	Pt. Size	B Max. Load-bearing Length*
Pan Head					
	EAX100	8-18	3/4"	2	0.320"
	EAX102	8-18	1"	2	0.500"
	EAX110	10-16	3/4"	2	0.320"
	EAX120	10-16	1"	2	0.500"
Pancake Head					
	EBN300	10-16	1"	2	0.500"
	EBN320	12-14	1"	3	0.500"

Identification

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

hex washer head | flat head

Performance Data

Pull-Out Values

Screw Size	Pt.	Drill Cap (in.)	Pull-Out (Lbs) Steel RB60-75 50 – 66KSI 18 ga.	16 ga.	14 ga.	12 ga.	1/8"	3/16"	1/4"	Aluminum 6063-T5 22KSI 1/8"	1/4"
10-16	#2	0.110	455	677	793	1394	–	–	–	994	–
10-16	#3	0.187	–	616	684	1242	1605	1527	–	961	–
12-14	#2	0.110	528	750	892	1536	–	–	–	1132	–
12-14	#3	0.230	417	679	802	1371	2028	2499	–	974	–
12-24	#5	0.500	–	–	–	–	–	2110	2781	538	1995
1/4-14	#2	0.110	619	885	1082	1830	–	–	–	1310	–
1/4-20	#3	0.230	–	680	780	1442	2623	3684	4069	1037	–
1/4-20	#5	0.500	–	–	–	–	–	–	2622	–	1724

Ultimate Strengths**

Size	Tensile (Lbs)	Shear Average Lbs Ultimate
10-16	1847	1282
12-14	2628	1950
12-24	2734	2284
1/4-14	3459	2676
1/4-20	4124	2860

** Values are for 300 series stainless fastener threaded shank

* The load-bearing length is the length of 300 series stainless under the hex head or including the flat head. Hardened steel length (lead threads and point) should be through the connection and not in the load-bearing section of the connection.

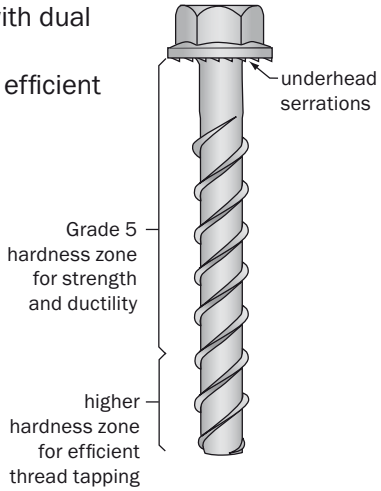
NOTE: All performance data shown is based on tests performed under laboratory conditions. The appropriate safety factor should be applied and code requirements factored into specification and use of these fasteners. Final determination of the appropriate safety factor and use of these fasteners is the sole responsibility of the user, specifying Engineer or other person designing the connection.

Flex Technology® for Concrete Applications

ConFlex® Large Diameter Concrete Anchors

Made in the U.S.A.

- Material/Heat Treat: Alloy steel with dual heat treatment
  - Higher hardness point ensures efficient tapping into concrete
  - Grade 5 load-bearing threads
- Thread Style: Double-lead
- Finish: Silver Stalgard® coating
- Tensile Yield: 92,000 KSI min. (Grade 5); Tensile Ultimate: 120,000 KSI min. (Grade 5)
- Locking serrations under the head provide back-out resistance



Product Selection

Catalog No.	Length	Thread Length
3/8" Diameter; 9/16" Hex Washer Head with Locking Serrations		
EMR215-050	2-1/2"	2-1/4"
EMR235-050	3"	2-1/4"
EMR255-050	4"	3-1/2"
EMR265-025	5"	3-1/2"
EMR285-025	7-1/2"	3-1/2"
1/2" Diameter; 3/4" Hex Washer Head with Locking Serrations		
EMR320-050	2-1/2"	2-1/4"
EMR340-050	3"	2-1/4"
EMR360-050	4"	3-1/2"
EMR370-025	5"	3-1/2"
EMR380-025	6"	3-1/2"

† **NOTE:** Indicated pull-out and shear values listed are ultimate values and were obtained in tests conducted by HETI/ Miami, FL, an independent test lab. These figures are offered only as a guide and are not guaranteed in any way by Elco Construction Products. A safety factor of 4:1 or 25% of ultimate values are generally accepted as a safe working load. Testing was done per ASTM E 488 - 96. Additional technical information is available upon request.

Performance Data†

Ultimate Value (Lbs) in Concrete

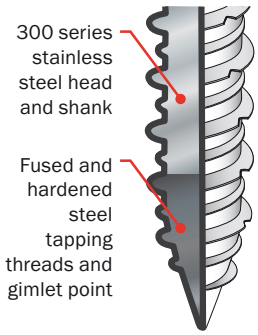
1,819 PSI				
Dia.	Edge Dist.	Embed.	Pull-out	Shear
3/8"	1-7/8" (5d)	1-1/2"	1,364	x
		2"	2,995	x
		2-1/2"	3,226	1,534
		3-1/2"	5,379	2,170
	2-5/8"	1-1/2"	x	x
		2"	x	x
		2-1/2"	3,620	2,459
		3-1/2"	6,070	3,902
	3-3/4" (10d)	1-1/2"	1,232	4,766
		2"	3,296	5,658
		2-1/2"	3,936	6,419
		3-1/2"	6,493	7,047
1/2"	2	1-3/4"	x	x
		2"	x	x
		3"	x	x
		4"	x	x
	2-1/2" (5d)	1-3/4"	2,266	x
		2"	2,706	x
		3"	4,666	4,549
		4"	7,058	6,960
	3-1/2"	1-3/4"	x	x
		2"	x	x
		3"	5,483	5,739
		4"	8,656	8,028
	4"	1-3/4"	x	x
		2"	x	x
		3"	x	x
		4"	x	x
	5" (10d)	1-3/4"	2,090	6,081
		2"	2,875	7,167
		3"	6,042	9,148
		4"	8,732	9,631

4,510 PSI				
Dia.	Edge Dist.	Embed.	Pull-out	Shear
3/8"	1-7/8" (5d)	1-1/2"	2,497	x
		2"	3,169	x
		2-1/2"	5,063	2,111
		3-1/2"	9,288	2,732
	2-5/8"	1-1/2"		
		2"		
		2-1/2"	5,111	2,667
		3-1/2"	8,438	4,046
	3-1/2"	1-1/2"	2,055	x
		2"	x	5,810
		2-1/2"	4,778	x
		3-1/2"	x	x
	3-3/4" (10d)	1-1/2"	2,055	3,414
		2"	x	5,810
		2-1/2"	5,111	7,309
		3-1/2"	9,508	8,339
1/2"	2"	1-3/4"	3,515	x
		2"	4,388	x
		3"	6,719	2,229
		4"	11,076	3,860
	3" (6d)	1-3/4"	x	x
		2"	x	x
		3"	x	x
		4"	x	x
	3-1/2"	1-3/4"	x	x
		2"	x	x
		3"	7,646	x
		4"	10,234	x
	4"	1-3/4"	2,887	6,787
		2"	4,310	6,678
		3"	8,169	8,489
		4"	11,111	10,942
	5" (10d)	1-3/4"	x	x
		2"	x	x
		3"	x	x
		4"	x	x

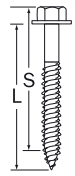
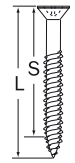
Flex Technology® for Concrete Applications

Aggre-gator 300 Series Stainless Bi-Metal Fasteners

- Material/Heat Treat:
  - Head and shank made of 300 series (18-8) stainless steel alloy
  - Fused and hardened steel tapping threads
- Finish: Silver-Stalgard GB (galvanic barrier), to protect aluminum components from accelerated corrosion
- Thread profile provides quick cutting and stability during installation
- Best choice for ACQ-treated lumber
- Approvals
  - Miami-Dade NOA No. 08-0813.06 High Velocity Hurricane Zone



Product Selection

	Cat. No.	L Length	S 300 Series (18-8) Stainless Steel Length
1/4" Diameter, Hex Washer Head			
	EML315	1-3/4"	1-1/4"
	EML325	2-1/4"	1-3/4"
	EML335	2-3/4"	2-1/4"
	EML345	3-1/4"	2-3/4"
	EML365	4"	3-1/2"
1/4" Diameter, TrimFit® Flat Head			
	EMM310	1-3/4"	1-1/4"
	EMM320	2-1/4"	1-3/4"
	EMM330	2-3/4"	2-1/4"
	EMM340	3-1/4"	2-3/4"
	EMM360	4"	3-1/2"

Performance Data

Substrate: 2220 PSI Concrete

Dia.	Min. Edge Dist.	Min. Spac.	Min. Embed.	Allow. Tension (lbs)	Allow. Shear (lbs)
1/4"	1.25"	3.0"	1.000"	118	
	2.50"	1.5"	1.000"	195	
	1.25"	3.0"	1.375"	289	
	2.50"	1.5"	1.375"	343	
	1.25"	3.0"	1.750"	517	
	2.50"	1.5"	1.750"	465	
1/4"	1.50"	3.0"	1.000"		204
	3.00"	1.5"	1.000"		259
	1.50"	3.0"	1.375"		259
	3.00"	1.5"	1.375"		413
	1.50"	3.0"	1.750"		318
	3.00"	1.5"	1.750"		488

Substrate: 3275 PSI Concrete

Dia.	Min. Edge Dist.	Min. Spac.	Min. Embed.	Allow. Tension (lbs)	Allow. Shear (lbs)
1/4"	1.25"	3.0"	1.000"	248	
	2.50"	1.5"	1.000"	263	
	1.25"	3.0"	1.375"	389	
	2.50"	1.5"	1.375"	251	
	1.25"	3.0"	1.750"	295	
	2.50"	1.5"	1.750"	319	
1/4"	1.50"	3.0"	1.000"		255
	3.00"	1.5"	1.000"		226
	1.50"	3.0"	1.375"		319
	3.00"	1.5"	1.375"		511
	1.50"	3.0"	1.750"		306
	3.00"	1.5"	1.750"		515

Substrate: 1x4 (3/4" Thick) Treated No. 2 SYP attached to 2220 PSI Concrete

Dia.	Min. Edge Dist.	Min. Spac.	Min. Embed.	Allow. Shear (lbs)
1/4"	2.50"	3.0"	1.5"	200

Substrate: 2x4 (1-1/2" Thick) Treated No. 2 SYP attached to 2220 PSI Concrete

Dia.	Min. Edge Dist.	Min. Spac.	Min. Embed.	Allow. Shear (lbs)
1/4"	2.50"	3.0"	1.75"	199

Substrate: Concrete Masonry Hollow Block

Dia.	Min. Edge Dist.	Min. Spac.	Min. Embed.	Allow. Tension (lbs)	Allow. Shear (lbs)
1/4"	2.00"	3.0"	1.250"	195	234
	4.00"	3.0"	1.250"	221	264

Substrate: Grout-Filled Concrete Block

Dia.	Min. Edge Dist.	Min. Spac.	Min. Embed.	Allow. Tension (lbs)	Allow. Shear (lbs)
1/4"	2.00"	3.0"	1.250"	208	259
	4.00"	1.5"	1.250"	186	352
	2.00"	3.0"	2.00"	407	591
	4.00"	1.5"	2.00"	504	597

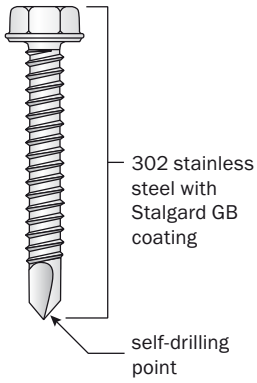
NOTE: All performance data shown is based on tests performed under laboratory conditions. The appropriate safety factor should be applied and code requirements factored into specification and use of these fasteners. Final determination of the appropriate safety factor and use of these fasteners is the sole responsibility of the user, specifying Engineer or other person designing the connection.

Flex Technology® for Aluminum Applications

Alumi-Flex™ 302 (18-8) Stainless Steel Drill Screws

Made in the U.S.A.

- Self-driling points: #3 and #4
- Material: 302 stainless steel
- Finish: Stalgard® GB (Galvanic Barrier) coating
- Provides a very high level of corrosion resistance
- Coating allows greater galvanic compatibility in dissimilar metal applications involving aluminum



Product Selection

Catalog No.	Description	Point Type
#10 Diameter Hex Washer Head		
EAH430	10-16 x 1/2"	#3
EAH445	10-16 x 3/4"	#3
EAH460	10-16 x 1"	#3
#10 Diameter, Undercut Flat Head		
EBM160	10-16 x 3/4"	#3
#12 Diameter Hex Washer Head		
EAH630	12-14 x 3/4"	#3
EAH650	12-14 x 1"	#3
EAH680	12-14 x 1-1/2"	#3
1/4" Diameter Hex Washer Head		
EAH800	1/4-14 x 3/4"	#3
EAH820	1/4-14 x 1"	#3
EAH835	1/4-14 x 1-1/2"	#3
EAH870	1/4-20 x 1"	#4
EAH880	1/4-20 x 1-1/2"	#4
1/4" Diameter, Undercut Flat Head		
EBM260	1/4-14 x 3/4"	#3

***Note:** For aluminum applications **only.**

Identification

hex washer head

flat head

The head marking consists of the number “3” below the Elco® logo as shown.

Flex Technology® for Aluminum Applications

AllFlex™ 302 Stainless Steel Fasteners

Made in the U.S.A.

- Material: 302 stainless steel
- Finish: Stalgard GB (Galvanic Barrier) coating
- Thread/Point Styles: Type B or AB thread-forming or Type F thread-cutting
- Cut or roll-form mating threads in aluminum components only
- Eliminate tapping operations and speed installation
- Stalgard GB coating prevents galvanic reaction between stainless steel fastener and aluminum components

Type F

Type B with 1/4" Lead

Type AB

Product Selection

Catalog No.	Description
Type F, Hex Washer Head	
EHE310	1/4-20 x 3/4"
EHE312	1/4-20 x 1"
EHE314	1/4-20 x 1-1/4"
Type F, Phillips Flat Head	
EHE321	1/4-20 x 1"
Type F, Phillips Flat Undercut Head	
EHE110	10-24 x 1/2"
EHE211	12-24 x 1/2"
Type B*, Hex Washer Head	
EHE336	14 x 1-1/2"
Type AB, Hex Washer Head	
EHE122	10 x 3/4"
EHE124	10 x 1"
EHE220	12 x 3/4"
EHE222	12 x 1"
EHE224	12 x 1-1/2"
EHE342	14 x 1"
EHE344	14 x 1-1/4"
EHE346	14 x 1-1/2"
Type AB, Phillips Flat Undercut Head	
EHE352	14 x 1"
Type AB, Phillips Flat Head	
EHE232	12 x 1"
EHE234	12 x 1-1/2"
EHE362	14 x 1"
EHE366	14 x 1-1/2"
Type AB, Phillips Pan Head	
EHE240	12 x 3/4"
EHE244	12 x 1-1/2"
EHE370	14 x 3/4"
EHE372	14 x 1"

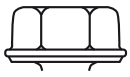
*with 1/4" lead point

Performance Data

Thread/ Point	Head Style	Screw Dia.	Ultimate Yield	Ultimate Tensile	Ultimate Shear	Screw Material KSI
Type F	Hex Washer	1/4	3203	3274	2259	103
	Flat	1/4	2945	3203	2123	101
	Undercut Flat	#10	1717	1839	1222	105
	Undercut Flat	#12	2243	2322	1604	96
Type B	Hex Washer	#14	3038	3233	2249	99
Type AB	Hex Washer	#10	1602	1616	1165	86
	Hex Washer	#12	2386	2399	1639	97
	Hex Washer	#14	3033	3187	2228	98
	Undercut Flat	#14	2819	3217	2230	99
	Flat	#12	1916	2130	2230	86
	Flat	#14	1916	2130	2230	86
	Pan	#12	2819	3217	2230	99
	Pan	#14	2819	3217	2230	99

NOTE: All performance data shown is based on tests performed under laboratory conditions. The appropriate safety factor should be applied and code requirements factored into specification and use of these fasteners. Final determination of the appropriate safety factor and use of these fasteners is the sole responsibility of the user, specifying Engineer or other person designing the connection.

Head Styles & Identification



Hex Washer

Phillips Pan

Phillips Flat

Phillips Flat Undercut

AllFlex™ headmarking

NOTE: All performance data shown is based on tests performed under laboratory conditions at independent construction testing facilities. The appropriate safety factor should be applied and code requirements factored into specification and use of these fasteners. A safety factor of 4:1 or 25% of the ultimate average values shown is generally accepted as an appropriate working load. Final determination of the appropriate safety factor and use of these fasteners is the sole responsibility of the user, specifying Engineer, Architect or other responsible person designing the connection. Due to a wide variety of application conditions or intervening factors not under our control, we assume no liability for the use of the information provided in this document. For additional product information and technical assistance, please contact Elco directly at 1-800-435-7213.

Elco Construction Products
Infastech Decorah, LLC
1304 Kerr Drive • Decorah, IA 52101
Phone: 800-435-7213 (USA & Canada)
Fax: 563-387-3540
www.elcoconstruction.com

STANLEY®
Engineered Fastening