

GENERAL INFORMATION

DRIL-FLEX®

Self-Drilling Structural Screws

PRODUCT DESCRIPTION

Dril-Flex Structural Screws are dual heat treated self-drilling tapping screws that provide the strength, ductility and resistance to embrittlement required for critical applications.

GENERAL APPLICATIONS AND USES

- Curtain walls
- Window walls/glazing
- Rainscreen
- Solar panel systems

FEATURES AND BENEFITS

- + High-hardness point and lead threads for drilling and tapping
- + Lower-hardness load bearing area provides increased resistance to Hydrogen-Assisted Stress Corrosion Cracking when compared to case hardened fasteners
- + Stalgard® and Stalgard® SUB Coatings provide improved corrosion resistance as well as enhanced galvanic compatibility in dissimilar metal applications, including those involving aluminum, compared with fasteners with standard zinc plating
- + Fasteners coated with Stalgard® SUB typically show no red rust or other base metal corrosion on significant surfaces after 2000 hours of salt spray exposure in accordance with ASTM B117
- + Fasteners coated with Stalgard® typically show no red rust or other base metal corrosion on significant surfaces after 1000 hours of salt spray exposure in accordance with ASTM B117

APPROVALS AND LISTINGS

- International Code Council, Evaluation Service (ICC-ES), ESR-3332
- International Code Council, Evaluation Service (ICC-ES), ESR-4367
- International Code Council, Evaluation Service (ICC-ES), ESR-4374
- Code compliant with the International Building Code/International Residential Code: 2021 IBC/IRC, 2018 IBC/IRC, 2015 IBC/IRC, and 2012 IBC/IRC
- Los Angeles Building Code (LABC) and Los Angeles Residential Code (LARC) ICC-ES Report Supplement (within each ICC-ES report)
- Florida Building Code (FBC) ICC-ES Report Supplement (within each ICC-ES report)
- Tested in accordance with ICC-ES AC118 for use in Steel-to-Steel Connections
- Tested in accordance with ICC-ES AC500 for attaching Miscellaneous Building Materials to Steel
- Tested in accordance with ICC-ES AC491 for use in Aluminum

GUIDE SPECIFICATIONS

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

SECTION CONTENTS

| | |
|-----------------------------------|----|
| General Information..... | 1 |
| Material Specifications | 2 |
| Installation Specifications | 2 |
| Installation Procedures | 3 |
| Performance Data | 4 |
| Ordering Information..... | 12 |



FASTENER MATERIALS

- Carbon Steel

HEAT TREAT

- Dual Hardened - Load Bearing Area meets SAE J429 Grade 5 and ASTM A449 Type 1 specifications

HEAD STYLES

- Hex Washer Head (HWH)
- Pan Head (PPH)
- Wafer Head (PWH)
- Undercut Flat Head (PUFH)

DIAMETER

- #10, #12
- 1/4", 5/16"

DRILL POINT TYPE

- #2, #3, #4, #5

FINISH

- Stalgard SUB coating (HWH)
- Stalgard coating

CODE LISTED
ICC-ES ESR-3332
STEEL-TO-STEEL

CODE LISTED
ICC-ES ESR-4367
WOOD-TO-STEEL

CODE LISTED
ICC-ES ESR-4374
ALUMINUM

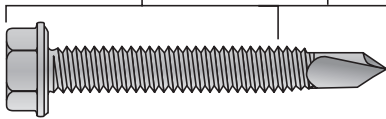
MATERIAL SPECIFICATIONS

| Fastener Component | | Specification |
|--------------------|-----------|--|
| Fastener | | Medium carbon steel |
| Plating/Coating | HWH, PPH | Stalgard SUB coating 2,000 hour rating in ASTM B117 salt spray test |
| | PWH, PUFH | Stalgard coating 1,000 hour rating in ASTM B117 salt spray test |

1. Head Styles: HWH = Hex Washer Head; PPH = Phillips Pan Head; PWH = Phillips Wafer Head, PUFH = Phillips Undercut Flat Head

SAE Grade 5 properties in "Load-Bearing Area" of fastener

Hardened point and tapping threads



Hex Washer Head

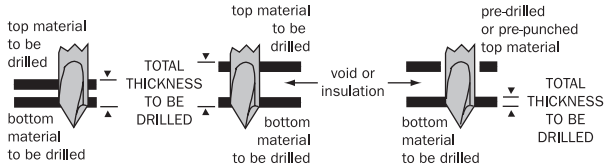


Flat, Pan and Pancake Head

INSTALLATION SPECIFICATIONS

Point Size Selection

Maximum Combined Material Thickness By Point Type



Maximum Recommended Installation RPM

| Diameter | RPM |
|----------|------|
| #10 | 2500 |
| #12 | |
| #12** | 1800 |
| 1/4" | |
| 5/16" | 1200 |

** Applies to #12 diameter screws with point type 5

Nominal Sheet Metal Sizes

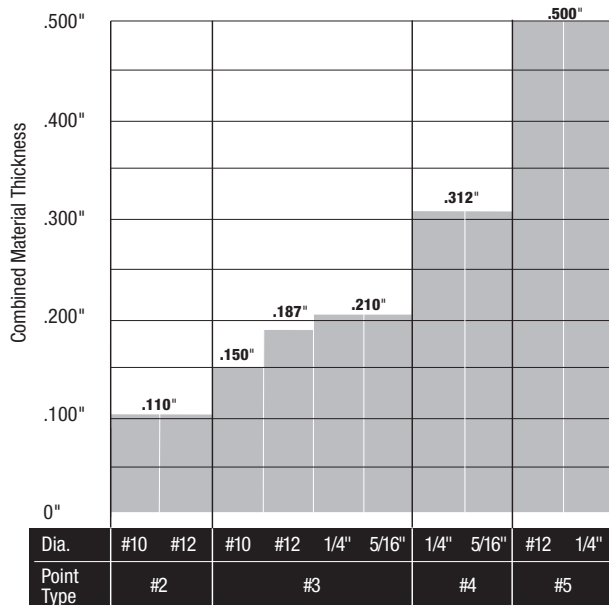
| Gauge | Decimal (in.) |
|-------|---------------|
| 18 | 0.048 |
| 16 | 0.060 |
| 14 | 0.075 |
| 12 | 0.105 |

Nominal Screw Sizes

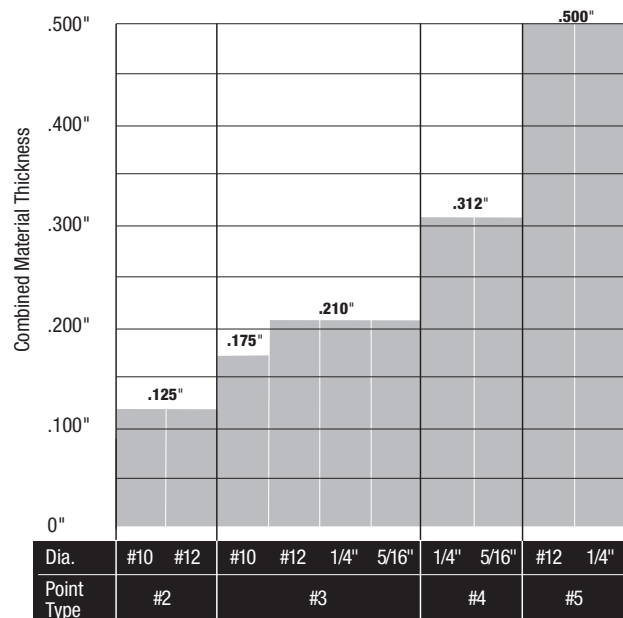
| Thread Dia. | Decimal (in.) |
|-------------|---------------|
| #10 | .190 |
| #12 | .216 |
| 1/4" | .250 |
| 5/16" | .3125 |

Drilling and Tapping Capacity (Maximum Material Thickness)

Steel



Aluminum



Minimum Screw Spacing and Edge Distance in Steel^{1,2}

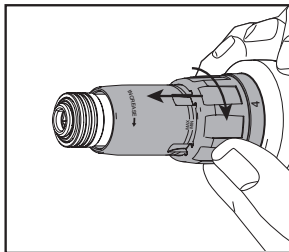
| Screw Diameter: d (in.) | Minimum Spacing: 3d (in.) | Minimum Edge Distance: 1.5d (in.) | Minimum Edge Distance For Framing Members Under The 2018, 2015, and 2012 IBC: 3d (in.) |
|-------------------------|---------------------------|-----------------------------------|--|
| 0.19 (#10) | 9/16 | 5/16 | 9/16 |
| 0.216 (#12) | 11/16 | 3/8 | 11/16 |
| 0.25 (1/4) | 3/4 | 3/8 | 3/4 |
| 0.3125 (5/16) | 15/16 | 1/2 | 15/16 |

- For screws used in framing connections, when the spacing between screws is less than 3 times the nominal screws diameter, but at least 2 times the screw diameter, the allowable and design connection shear strength values must be reduced by 20 percent [Refer to Section B1.5.1.3 of AISI S240 (Section D1.5 of AISI S200 for the 2015 and 2012 IBC)].
- For screws used in framing connections, when the edge is parallel to the direction of the applied force, the minimum edge distance may be 1.5 times the nominal screw diameter. [Refer to Section B1.5.1.3 of AISI S240 (Section D1.5 of AISI S200 for the 2015 and 2012 IBC)].

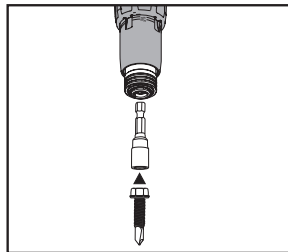
Minimum Screw Spacing and Edge Distance in Aluminum

| Screw Diameter: d (in.) | Minimum Spacing: 2.5d (in.) | Minimum Edge Distance: 1.5d (in.) |
|-------------------------|-----------------------------|-----------------------------------|
| 0.19 (#10) | 1/2 | 5/16 |
| 0.216 (#12) | 9/16 | 3/8 |
| 0.25 (1/4) | 5/8 | 3/8 |
| 0.3125 (5/16) | 13/16 | 1/2 |

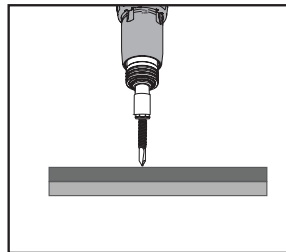
INSTALLATION PROCEDURES



Select a torque adjustable screwgun that aligns with the recommended installation RPM's of the particular fastener (DeWALT VersaClutch Screwguns are recommended). Adjust the setting on the screwgun so that the tool does not overdrive the fastener.

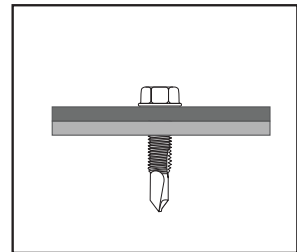


Attach an appropriate sized hex nut driver/ phillips bit to the screwgun. Mount the screw fastener head into the driver.



Place the screw fastener against the work surface. While the screw fastener is in a perpendicular position, begin driving the screw fastener into the base material.

Note: The ideal speed and pressure will depend on the characteristics of the base material as well as the screw size and point type. A trial installation is suggested to determine the optimal tool setting, speed and pressure for the material and application.



Drive the screw fastener until the head of the screw is in contact and snug tight with the work surface and/or the material being fastened.

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 | 2,275 | 760 | 1,140 | 1,460 | 485 | 730 | 61 |
| #10-24 | 2,610 | 870 | 1,305 | 1,080 | 360 | 540 | 65 |
| #12-14 | 3,215 | 1,070 | 1,610 | 1,990 | 665 | 995 | 92 |
| #12-14 (PUFH) | 2,150 | 715 | 1,075 | 1,980 | 660 | 990 | 92 |
| #12-24 | 3,255 | 1,085 | 1,625 | 1,935 | 645 | 965 | 100 |
| 1/4"-14 | 4,360 | 1,455 | 2,180 | 2,690 | 895 | 1,345 | 150 |
| 1/4"-20 | 4,360 | 1,455 | 2,180 | 2,615 | 870 | 1,310 | 156 |
| 5/16"-18 | 7,220 | 2,405 | 3,610 | 4,565 | 1,520 | 2,285 | 425 |
| 5/16"-24 | 8,755 | 2,920 | 4,380 | 4,960 | 1,655 | 2,480 | 425 |

1. Ultimate strengths are based on laboratory tests.
2. Allowable (ASD) strengths are based on a safety factor Ω , of 3.0 in accordance with ICC-ES AC118 and AISI S100-16.
3. Design (LRFD) strengths are based on a resistance factor, ϕ , of 0.50 in accordance with ICC-ES AC118 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 Steel, lbf^{1,2}

| Diameter | Point Type | 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 | 925 | 1,195 | 1,140 | - | - | - | - |
| #10-16 (PPH) | #2 | 865 | 865 | 1,210 | - | - | - | - |
| #10-24 (PWH) | #3 | 880 | 1,545 | 1,445 | - | - | - | - |
| #12-14 | #2/#3 | 895 | 1,460 | 1,290 | 1,255 | - | - | - |
| 12-14 (PUFH) | #3 | 880 | 1,650 | 1,305 | 1,690 | - | - | - |
| #12-24 | #5 | 785 | 1,650 | 1,285 | 1,750 | 1,705 | 1,985 | 1,620 |
| 1/4"-14 | #3 | 950 | 1,595 | 1,310 | 1,665 | 1,610 | - | - |
| 1/4"-20 | #4/#5 | 975 | 1,330 | 1,350 | 1,700 | 1,460 | 1,570 | 1,395 |
| 5/16"-18 | #3 | 1,025 | 1,585 | 1,410 | 2,245 | - | - | - |
| 5/16"-24 | #4 | - | - | - | - | 3,400 | - | 2,240 |

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

| Diameter | Point Type | 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 | 370 | 395 | 455 | - | - | - | - |
| #10-16 (PPH) | #2 | 290 | 290 | 405 | - | - | - | - |
| #10-24 (PWH) | #3 | 320 ^[10] | 570 ^[10] | 535 ^[7,8,9] | - | - | - | - |
| #12-14 | #2/#3 | 355 | 575 | 515 | 495 | - | - | - |
| 12-14 (PUFH) | #3 | 325 ^[10] | 610 ^[10] | 480 ^[7,8,9] | 625 ^[7,8] | - | - | - |
| #12-24 | #5 | 290 ^[10] | 610 ^[10] | 475 ^[7,8,9] | 645 ^[7,8] | 630 ^[7,8,9] | 735 ^[7,8,9] | 600 ^[7,8,9] |
| 1/4"-14 | #3 | 375 | 625 | 520 | 660 | 640 | - | - |
| 1/4"-20 | #4/#5 | 385 ^[7,8] | 525 ^[7,8] | 535 ^[8] | 670 ^[8] | 595 ^[9] | 625 ^[9] | 555 ^[9] |
| 5/16"-18 | #3 | 410 | 620 | 560 | 890 | - | - | - |
| 5/16"-24 | #4 | - | - | - | - | 1,345 | 985 | 885 |

1. Allowable (ASD) strengths are based on a safety factor Ω , determined in accordance with AISI S100-16.
2. Values are based on steel members with a minimum tensile strength of $F_u = 45$ ksi.
3. Allowable (ASD) Shear (Bearing) capacities for other member thicknesses may be determined by interpolating within the table.
4. For ASD shear connections, the lower of the ASD Shear (Bearing) Capacity and the ASD Fastener Shear Strength must be used for design.
5. Unless otherwise noted, for steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and for steel with a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
6. The first number is the thickness of steel in contact with the screw head, the second number is the thickness of the steel not in contact with the screw head.
7. For steel with a minimum tensile strength $F_u \geq 55$ ksi, multiply tabulated values by 1.22.
8. For steel with a minimum tensile strength $F_u \geq 52$ ksi, multiply tabulated values by 1.15.
9. For steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29.
10. Increasing values for higher steel tensile strength per Note 5 is not allowed.

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

| Diameter | Point Type | Steel Thickness (Lapped Sheets/ Bars) | | | | | | |
|--------------|------------|---------------------------------------|----------------------|------------------------|------------------------|--------------------------|--------------------------|------------------------|
| | | 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 | 590 | 630 | 725 | - | - | - | - |
| #10-16 (PPH) | #2 | 435 | 435 | 605 | - | - | - | - |
| #10-24 (PWH) | #3 | 515 | 915 | 855 | - | - | - | - |
| #12-14 | #2/#3 | 570 | 915 | 820 | 795 | - | - | - |
| 12-14 (PUFH) | #3 | 520 ^[10] | 975 ^[10] | 770 ^[7,8,9] | 1,000 ^[7,8] | - | - | - |
| #12-24 | #5 | 465 ^[10] | 976 ^[10] | 760 ^[7,8,9] | 1,035 ^[7,8] | 1,010 ^[7,8,9] | 1,175 ^[7,8,9] | 960 ^[7,8,9] |
| 1/4"-14 | #3 | 605 | 1,000 | 835 | 1,060 | 1,020 | - | - |
| 1/4"-20 | #4/#5 | 615 ^[7,8] | 840 ^[7,8] | 850 ^[8] | 1,070 ^[8] | 950 ^[8] | 1,000 ^[8] | 885 ^[8] |
| 5/16"-18 | #3 | 655 | 995 | 895 | 1,425 | - | - | - |
| 5/16"-24 | #4 | - | - | - | - | 2,155 | 1,575 | 1,420 |

- Design (LRFD) strengths are based on a safety factor ϕ , determined in accordance with AISI S100-16.
- Values are based on steel members with a minimum tensile strength of $F_u = 45$ ksi.
- Design (LRFD) Shear (Bearing) capacities for other member thicknesses may be determined by interpolating within the table.
- For LRFD shear connections, the lower of the LRFD Shear (Bearing) Capacity and the LRFD Fastener Shear Strength must be used for design.
- Unless otherwise noted, for steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and for steel with a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
- The first number is the thickness of steel in contact with the screw head, the second number is the thickness of the steel not in contact with the screw head.
- For steel with a minimum tensile strength $F_u \geq 55$ ksi, multiply tabulated values by 1.22.
- For steel with a minimum tensile strength $F_u \geq 52$ ksi, multiply tabulated values by 1.15.
- For steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29.

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

| Diameter | Point Type | Thickness of Steel Not in Contact with Screw Head | | | | | | | |
|----------|------------|---|--------|--------|--------|-------|-------|-------|-------|
| | | 18 Ga. | 16 Ga. | 14 Ga. | 12 Ga. | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | #2/#3 | 335 | 485 | 585 | 955 | 1,135 | - | - | - |
| #10-24 | #3 | 330 | 505 | 675 | 1,125 | 1,480 | - | - | - |
| #12-14 | #2/#3 | 335 | 510 | 655 | 790 | 1,380 | 1,795 | - | - |
| #12-24 | #5 | - | - | 605 | 1,030 | 1,370 | 2,410 | 2,760 | 2,760 |
| 1/4"-14 | #3 | 340 | 515 | 630 | 825 | 1,515 | 2,430 | - | - |
| 1/4"-20 | #4/#5 | - | 555 | 705 | 1,145 | 1,410 | 2,575 | 2,810 | 3,255 |
| 5/16"-18 | #3 | - | - | - | 1,400 | 1,915 | - | - | - |
| 5/16"-24 | #4 | - | - | - | 1,290 | 1,725 | 2,620 | 3,565 | 4,270 |

- Ultimate strengths are based on laboratory tests.
- 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 Steel, lbf^{1,2,3,4,5}

| Diameter | Point Type | Thickness of Steel Not in Contact with Screw Head | | | | | | | |
|----------|------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|-------|-------|
| | | 18 Ga. | 16 Ga. | 14 Ga. | 12 Ga. | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | #2/#3 | 135 | 195 | 235 | 305 | 295 | - | - | - |
| #10-24 | #3 | 120 ^[8] | 185 ^[7] | 250 ^[8] | 415 ^[8] | 545 ^[7] | - | - | - |
| #12-14 | #2/#3 | 130 | 205 | 265 | 330 | 510 | 665 | - | - |
| #12-24 | #5 | 95 ^[8] | 165 ^[7] | 225 ^[8] | 380 ^[8] | 505 ^[7] | 890 ^[8] | 1,020 | 1,020 |
| 1/4"-14 | #3 | 130 | 205 | 255 | 340 | 560 | 900 | - | - |
| 1/4"-20 | #4/#5 | - | 205 ^[8] | 260 ^[8] | 425 ^[8] | 525 ^[7] | 915 ^[7] | 1,045 | 1,205 |
| 5/16"-18 | #3 | - | - | - | 520 | 705 | - | - | - |
| 5/16"-24 | #4 | - | - | - | 460 | 635 | 725 | 1,190 | 1,425 |

- Allowable (ASD) strengths are based on a safety factor Ω , determined in accordance with AISI S100-16.
- Values are based on steel members with a minimum tensile strength of $F_u = 45$ ksi.
- Allowable (ASD) pull-over capacities for other member thicknesses may be determined by interpolating within the table.
- 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.
- Unless otherwise noted, for steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and for steel with a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
- For steel with a minimum tensile strength $F_u \geq 52$ ksi, multiply tabulated values by 1.15.
- For steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29.
- Increasing values for higher steel tensile strength per Note 5 is not allowed.

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

| Diameter | Point Type | Thickness of Steel Not in Contact with Screw Head | | | | | | | |
|----------|------------|---|--------------------|--------------------|--------------------|--------------------|----------------------|-------|-------|
| | | 18 Ga. | 16 Ga. | 14 Ga. | 12 Ga. | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | #2/#3 | 215 | 310 | 380 | 490 | 475 | - | - | - |
| #10-24 | #3 | 194 ⁽⁶⁾ | 295 ⁽⁷⁾ | 400 ⁽⁶⁾ | 665 ⁽⁶⁾ | 875 ⁽⁷⁾ | - | - | - |
| #12-14 | #2/#3 | 210 | 330 | 425 | 525 | 815 | 1,065 | - | - |
| #12-24 | #5 | 155 ⁽⁶⁾ | 265 ⁽⁷⁾ | 360 ⁽⁶⁾ | 610 ⁽⁶⁾ | 810 ⁽⁷⁾ | 1,425 ⁽⁸⁾ | 1,630 | 1,630 |
| 1/4"-14 | #3 | 210 | 330 | 410 | 550 | 895 | 1,440 | - | - |
| 1/4"-20 | #4/#5 | - | 325 ⁽⁶⁾ | 415 ⁽⁶⁾ | 675 ⁽⁶⁾ | 840 ⁽⁷⁾ | 1,460 ⁽⁷⁾ | 1,670 | 1,930 |
| 5/16"-18 | #3 | - | - | - | 830 | 1,130 | - | - | - |
| 5/16"-24 | #4 | - | - | - | 735 | 1,020 | 1,160 | 1,905 | 2,280 |

1. Design (LRFD) strengths are based on a resistance factor, ϕ , determined in accordance with AISI S100-16.
2. Values are based on steel members with a minimum tensile strength of $F_u = 45$ ksi.
3. Design (LRFD) pull-out capacities for other member thicknesses may be determined by interpolating within the table.
4. 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.
5. Unless otherwise noted, for steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and for steel with a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
6. For steel with a minimum tensile strength $F_u \geq 52$ ksi, multiply tabulated values by 1.15.
7. For steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29.
8. Increasing values for higher steel tensile strength per Note 5 is not allowed.

Ultimate Pull-Over Capacity of Screw Connections in Steel, lbf ^{1,3}

| Fastener Description | | Minimum Thickness of Steel in Contact with Screw Head | | | | | | | |
|----------------------|-----------------------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|-------|-------|
| | | 18 Ga. | 16 Ga. | 14 Ga. | 12 Ga. | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | Phillips Pan Head | 1,155 ⁽²⁾ | 1,200 | 1,200 | 1,200 | 1,200 | - | - | - |
| #10-16 | 5/16" Hex Washer Head | 1,245 | 1,200 | 1,200 | 1,200 | 1,200 | - | - | - |
| #10-24 | Phillips Wafer Head | 1,650 ⁽²⁾ | 1,615 ⁽²⁾ | 1,935 ⁽²⁾ | 1,935 ⁽²⁾ | 1,935 ⁽²⁾ | - | - | - |
| #12-14 | 5/16" Hex Washer Head | 1,290 | 1,610 | 2,015 | 1,835 | 1,835 | 1,835 | - | - |
| #12-14 | Phillips Undercut Flat Head | 1,060 ⁽²⁾ | 1,455 ⁽²⁾ | 1,845 ⁽²⁾ | 2,160 ⁽²⁾ | 2,160 ⁽²⁾ | 2,160 ⁽²⁾ | - | - |
| #12-24 | 5/16" Hex Washer Head | 1,290 | 1,610 | 2,015 | 1,835 | 1,835 | 1,835 | 1,835 | 1,835 |
| 1/4"-14 | 3/8" Hex Washer Head | 1,555 | 1,945 | 2,430 | 2,815 | 2,815 | 2,815 | - | - |
| 1/4"-20 | 3/8" Hex Washer Head | - | 1,945 | 2,430 | 2,815 | 2,815 | 2,815 | 2,815 | 2,815 |
| 5/16"-18 | 3/8" Hex Washer Head | - | - | - | 3,045 | 3,045 | - | - | - |
| 5/16"-24 | 3/8" Hex Washer Head | - | - | - | 3,045 | 3,045 | 3,045 | 3,045 | 3,045 |

1. Unless otherwise noted, ultimate strengths are based on calculations in accordance with AISI S100-16, or on the calculated shear strength of the integral washer.
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 (ASD) Pull-Over Capacity of Screw Connections in Steel, lbf ^{1,2,3,5,6}

| Fastener Description | | Minimum Thickness of Steel in Contact with Screw Head | | | | | | | |
|----------------------|-----------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|-------|-------|
| | | 18 Ga. | 16 Ga. | 14 Ga. | 12 Ga. | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | Phillips Pan Head | 385 | 480 | 480 | 480 | 480 | - | - | - |
| #10-16 | 5/16" Hex Washer Head | 415 | 480 | 480 | 480 | 480 | - | - | - |
| #10-24 | Phillips Wafer Head | 610 | 595 ⁽⁴⁾ | 715 ⁽⁴⁾ | 715 ⁽⁴⁾ | 715 ⁽⁴⁾ | - | - | - |
| #12-14 | 5/16" Hex Washer Head | 430 | 535 | 670 | 735 | 735 | 735 | - | - |
| #12-14 | Phillips Undercut Flat Head | 390 | 535 ⁽⁴⁾ | 680 ⁽⁴⁾ | 795 ⁽⁴⁾ | 795 ⁽⁴⁾ | 795 ⁽⁴⁾ | - | - |
| #12-24 | 5/16" Hex Washer Head | 430 | 535 | 670 | 735 | 735 | 735 | 735 | 735 |
| 1/4"-14 | 3/8" Hex Washer Head | 520 | 650 | 810 | 1,125 | 1,125 | 1,125 | - | - |
| 1/4"-20 | 3/8" Hex Washer Head | - | 650 | 810 | 1,125 | 1,125 | 1,125 | 1,125 | 1,125 |
| 5/16"-18 | 3/8" Hex Washer Head | - | - | - | 1,170 | 1,170 | - | - | - |
| 5/16"-24 | 3/8" Hex Washer Head | - | - | - | 1,325 | 1,325 | 1,325 | 1,325 | 1,325 |

1. Allowable (ASD) strengths are based on a safety factor, Ω , determined in accordance with AISI S100-16.
2. Values are based on steel members with with a minimum tensile strength of $F_u = 45$ ksi.
3. Unless otherwise noted, increasing values for higher steel tensile strength per Note 4 is not allowed.
4. For steel with a minimum tensile strength $F_u \geq 52$ ksi, multiply tabulated values by 1.15.
5. Allowable (ASD) pull-over capacities for other member thicknesses may be determined by interpolating within the table.
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 Steel, lbf^{1,2,3,5,6}

| Fastener Description | | Minimum Thickness of Steel in Contact with Screw Head | | | | | | | |
|----------------------|-----------------------------|---|--------------------|----------------------|----------------------|----------------------|----------------------|-------|-------|
| | | 18 Ga. | 16 Ga. | 14 Ga. | 12 Ga. | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | Phillips Pan Head | 580 | 725 | 780 | 780 | 780 | - | - | - |
| #10-16 | 5/16" Hex Washer Head | 620 | 780 | 780 | 780 | 780 | - | - | - |
| #10-24 | Phillips Wafer Head | 975 | 955 ⁽⁴⁾ | 1,140 ⁽⁴⁾ | 1,140 ⁽⁴⁾ | 1,140 ⁽⁴⁾ | - | - | - |
| #12-14 | 5/16" Hex Washer Head | 645 | 805 | 1,005 | 1,190 | 1,190 | 1,190 | - | - |
| #12-14 | Phillips Undercut Flat Head | 625 | 860 ⁽⁴⁾ | 1,090 ⁽⁴⁾ | 1,275 ⁽⁴⁾ | 1,275 ⁽⁴⁾ | 1,275 ⁽⁴⁾ | - | - |
| #12-24 | 5/16" Hex Washer Head | 645 | 805 | 1,005 | 1,190 | 1,190 | 1,190 | 1,190 | 1,190 |
| 1/4"-14 | 3/8" Hex Washer Head | 780 | 970 | 1,215 | 1,700 | 1,830 | 1,830 | - | - |
| 1/4"-20 | 3/8" Hex Washer Head | - | 970 | 1,215 | 1,700 | 1,830 | 1,830 | 1,830 | 1,830 |
| 5/16"-18 | 3/8" Hex Washer Head | - | - | - | 1,870 | 1,870 | 1,870 | - | - |
| 5/16"-24 | 3/8" Hex Washer Head | - | - | - | 2,120 | 2,120 | 2,120 | 2,120 | 2,120 |

1. Design (LRFD) strengths are based on a resistance factor, ϕ , determined in accordance with AISI S100-16.
2. Values are based on steel members with a minimum tensile strength of $F_u = 45$ ksi.
3. Unless otherwise noted, increasing values for higher steel tensile strength per Note 4 is not allowed.
4. For steel with a minimum tensile strength $F_u \geq 52$ ksi, multiply tabulated values by 1.15.
5. Design (LRFD) pull-over capacities for other member thicknesses may be determined by interpolating within the table.
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.

Ultimate Shear (Bearing) Capacity of Screw Connections of Aluminum to Steel, lbf^{1,2,3,4}

| Screw Size | Head Styles | Point Type | 6063-T5 to 58ksi Steel (Fy = 16 ksi, Fu = 22 ksi) | | | 6063-T6 to 58ksi Steel (Fy = 25 ksi, Fu = 30 ksi) | | | 6061-T6 to 58 ksi Steel (Fy = 35 ksi, Fu = 38 ksi) | | |
|------------|-------------|------------|---|-------------|-------------|---|-------------|-------------|--|-------------|-------------|
| | | | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" |
| #12 - 14 | HWH | 3 | 900 | - | - | 1,405 | - | - | 1,490 | - | - |
| #12 - 14 | PUFH | 3 | 970 | - | - | 1,515 | - | - | 1,605 | - | - |
| #12 - 24 | HWH | 5 | 905 | 2,120 | 1,775 | 1,410 | 2,515 | 2,105 | 1,495 | 2,515 | 2,105 |
| 1/4" - 14 | HWH | 3 | 905 | - | - | 1,415 | - | - | 1,495 | - | - |
| 1/4" - 20 | HWH | 4 | 875 | 2,300 | - | 1,370 | 2,730 | - | 1,450 | 2,730 | - |
| 1/4" - 20 | HWH | 5 | 905 | 2,265 | 1,835 | 1,415 | 2,690 | 2,180 | 1,495 | 2,690 | 2,180 |

1. Ultimate strengths are based on laboratory testing.
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).
3. The first thickness listed is of the aluminum in contact with the screw head, the second thickness listed is of the aluminum not in contact with the screw head.
4. Testing included the use of a flexible spacer material between the aluminum and the steel to simulate the use of interstitial materials intended to prevent galvanic corrosion. The thicknesses of these spacers are noted in the Allowable (ASD) and Design (LRFD) strength tables.

Allowable (ASD) Shear (Bearing) Capacity of Screw Connections of Aluminum to Steel, lbf^{1,2,3,4,5,6,7}

| Screw Size | Head Styles | Point Type | 6063-T5 to 58ksi Steel (Fy = 16 ksi, Fu = 22 ksi) | | | 6063-T6 to 58ksi Steel (Fy = 25 ksi, Fu = 30 ksi) | | | 6061-T6 to 58 ksi Steel (Fy = 35 ksi, Fu = 38 ksi) | | |
|------------|-------------|------------|---|-------------|-------------|---|-------------|-------------|--|-------------|-------------|
| | | | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" |
| #12 - 14 | HWH | 3 | 300 ⁽⁷⁾ | - | - | 470 ⁽⁷⁾ | - | - | 495 ⁽⁷⁾ | - | - |
| #12 - 14 | PUFH | 3 | 325 ⁽⁷⁾ | - | - | 505 ⁽⁷⁾ | - | - | 535 ⁽⁷⁾ | - | - |
| #12 - 24 | HWH | 5 | 300 | 705 | 590 | 470 | 840 | 700 | 500 | 840 | 700 |
| 1/4" - 14 | HWH | 3 | 300 ⁽⁸⁾ | - | - | 470 ⁽⁸⁾ | - | - | 500 ⁽⁸⁾ | - | - |
| 1/4" - 20 | HWH | 4 | 290 | 765 | - | 455 | 910 | - | 485 | 910 | - |
| 1/4" - 20 | HWH | 5 | 300 | 755 | 610 | 470 | 895 | 725 | 500 | 895 | 725 |

1. Allowable (ASD) strengths are based on a safety factor, $\Omega = 3.0$, determined in accordance with the Aluminum Design Manual, AA ADM-2020.
2. The first thickness listed is of the aluminum in contact with the screw head, the second thickness listed is of the aluminum not in contact with the screw head.
3. Values are based on the following minimum steel strengths: $F_u = 58$ ksi, $F_y = 36$ ksi.
4. For ASD shear connections, the lower of the ASD Shear (Bearing) Capacity and the ASD Fastener Shear Strength must be used for design.
5. Testing included the use of a flexible spacer material between the aluminum and the steel to simulate the use of interstitial materials intended to prevent galvanic corrosion. Unless otherwise noted, the spacer thickness used in testing was 0.063 inch.
6. Spacer thickness used in testing was 0.05 inch.
7. Spacer thickness used in testing was 0.008 inch.

Design (LRFD) Shear (Bearing) Capacity of Screw Connections of Aluminum to Steel, lbf^{1,2,3,4,5,6,7}

| Screw Size | Head Styles | Point Type | 6063-T5 to 58ksi Steel (Fy = 16 ksi, Fu = 22 ksi) | | | 6063-T6 to 58ksi Steel (Fy = 25 ksi, Fu = 30 ksi) | | | 6061-T6 to 58 ksi Steel (Fy = 35 ksi, Fu = 38 ksi) | | |
|------------|-------------|------------|--|-------------|-------------|--|-------------|-------------|---|-------------|-------------|
| | | | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" |
| #12 - 14 | HWH | 3 | 450 ⁽⁷⁾ | - | - | 700 ⁽⁷⁾ | - | - | 745 ⁽⁷⁾ | - | - |
| #12 - 14 | PUFH | 3 | 485 ⁽⁷⁾ | - | - | 755 ⁽⁷⁾ | - | - | 805 ⁽⁷⁾ | - | - |
| #12 - 24 | HWH | 5 | 450 | 1,060 | 885 | 705 | 1,260 | 1,055 | 750 | 1,260 | 1,055 |
| 1/4" - 14 | HWH | 3 | 450 ⁽⁶⁾ | - | - | 705 ⁽⁶⁾ | - | - | 750 ⁽⁶⁾ | - | - |
| 1/4" - 20 | HWH | 4 | 440 | 1,150 | - | 685 | 1,365 | - | 685 | 1,365 | - |
| 1/4" - 20 | HWH | 5 | 450 | 1,130 | 915 | 705 | 1,345 | 1,090 | 705 | 1,345 | 1,090 |

- Design (LRFD) strengths are based on a safety factor, $\Omega = 3.0$, determined in accordance with the Aluminum Design Manual, AA ADM-2020.
- The first thickness listed is of the aluminum in contact with the screw head, the second thickness listed is of the aluminum not in contact with the screw head.
- Values are based on the following minimum steel strengths: Fu = 58 ksi, Fy = 36 ksi.
- For LRFD shear connections, the lower of the LRFD Shear (Bearing) Capacity and the LRFD Fastener Shear Strength must be used for design.
- Testing included the use of a flexible spacer material between the aluminum and the steel to simulate the use of interstitial materials intended to prevent galvanic corrosion. Unless otherwise noted, the spacer thickness used in testing was 0.063 inch.
- Spacer thickness used in testing was 0.05 inch.
- Spacer thickness used in testing was 0.008 inch.

Ultimate Shear (Bearing) Capacity of Screw Connections in Aluminum, lbf^{1,2,3,4}

| Screw Size | Head Styles | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | |
|------------|-------------|------------|---------------------------------------|--------------|-------------|-------------|---------------------------------------|--------------|-------------|-------------|---------------------------------------|--------------|-------------|-------------|
| | | | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" |
| #10-16 | PPH | #2 | 395 | 395 | 785 | - | 535 | 535 | 1,070 | - | 680 | 680 | 1,355 | - |
| #10-16 | HWH | #3 | 395 | 395 | 785 | - | 535 | 535 | 1,070 | - | 680 | 680 | 1,355 | - |
| #10-24 | PWH | #3 | 480 | - | - | - | 610 | - | - | - | 610 | - | - | - |
| #12-14 | HWH | #2 | 445 | 445 | 890 | - | 610 | 610 | 1,215 | - | 770 | 770 | 1,540 | - |
| #12-14 | HWH | #3 | 445 | 445 | 890 | - | 610 | 610 | 1,215 | - | 770 | 770 | 1,540 | - |
| #12-14 | PUFH | #3 | 505 | 980 | - | - | 640 | 1,245 | - | - | 640 | 1,245 | - | - |
| #12-24 | HWH | #5 | 445 | 445 | 1,300 | 2,090 | 610 | 610 | 1,735 | 2,280 | 770 | 770 | 1,910 | 2,280 |
| 1/4"-14 | HWH | #3 | 515 | 515 | 1,030 | - | 700 | 700 | 1,405 | - | 890 | 890 | 1,780 | - |
| 1/4"-20 | HWH | #4 | 515 | 515 | 1,495 | - | 700 | 700 | 1,870 | - | 890 | 890 | 2,170 | - |
| 1/4"-20 | HWH | #5 | 515 | 515 | 1,500 | 2,285 | 700 | 700 | 1,710 | 2,615 | 890 | 890 | 2,060 | 2,285 |
| 5/16"-18 | HWH | #3 | - | - | 1,750 | 2,470 | - | - | 2,130 | 3,010 | - | - | 2,130 | 3,010 |
| 5/16"-24 | HWH | #4 | - | - | 1,520 | 2,355 | - | - | 1,850 | 2,865 | - | - | 1,850 | 2,865 |

- Ultimate strengths in shaded cells are based on laboratory testing.
- Ultimate strengths in unshaded cells are based on calculations in accordance with the Aluminum Design Manual, AA ADM-2020.
- 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).
- The first thickness listed is of the aluminum in contact with the screw head, the second thickness listed is of the aluminum not in contact with the screw head.

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

| Screw Size | Head Styles | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | |
|------------|-------------|------------|---------------------------------------|--------------|--------------------|--------------------|---------------------------------------|--------------|--------------------|----------------------|---------------------------------------|--------------|--------------------|----------------------|
| | | | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" |
| #10-16 | PPH | #2 | 130 | 130 | 260 | - | 180 | 180 | 355 | - | 225 | 225 | 450 | - |
| #10-16 | HWH | #3 | 130 | 130 | 260 | - | 180 | 180 | 355 | - | 225 | 225 | 450 | - |
| #10-24 | PWH | #3 | 160 | - | - | - | 205 | - | - | - | 205 | - | - | - |
| #12-14 | HWH | #2 | 150 | 150 | 295 | - | 205 | 205 | 405 | - | 255 | 255 | 515 | - |
| #12-14 | HWH | #3 | 150 | 150 | 295 | - | 205 | 205 | 405 | - | 255 | 255 | 515 | - |
| #12-14 | PUFH | #3 | 170 | 325 | - | - | 215 | 415 | - | - | 215 | 415 | - | - |
| #12-24 | HWH | #5 | 150 | 150 | 435 | 695 | 205 | 205 | 580 | 760 | 255 | 255 | 635 | 760 |
| 1/4"-14 | HWH | #3 | 170 | 170 | 345 | - | 235 | 235 | 470 | - | 295 | 295 | 595 | - |
| 1/4"-20 | HWH | #4 | 170 | 170 | 500 | - | 235 | 235 | 665 | - | 295 | 295 | 725 | - |
| 1/4"-20 | HWH | #5 | 170 | 170 | 500 | 760 | 235 | 235 | 655 | 760 | 295 | 295 | 685 | 760 |
| 5/16"-18 | HWH | #3 | - | - | 585 ^(B) | 825 ^(B) | - | - | 710 ^(B) | 1,005 ^(B) | - | - | 710 ^(B) | 1,005 ^(B) |
| 5/16"-24 | HWH | #4 | - | - | 505 ^(B) | 785 ^(B) | - | - | 615 ^(B) | 955 ^(B) | - | - | 615 ^(B) | 955 ^(B) |

1. Allowable (ASD) strengths are based on a safety factor, $\Omega = 3.0$, determined in accordance with the Aluminum Design Manual, AA ADM-2020.
2. The first thickness listed is of the aluminum in contact with the screw head, the second thickness listed is of the aluminum not in contact with the screw head.
3. Unless otherwise noted, allowable strengths in shaded cells are applicable to screws which are self-drilled through both pieces of aluminum.
4. Allowable strengths in unshaded cells are applicable to screws which are self-drilled through both pieces of aluminum and to screws which are installed through existing holes in the aluminum in contact with the screw head and self-drilled into the receiving member. Clearance holes have the following dimensions: 0.177 inch for #8 screws; 0.201 inch for #10 screws; 0.228 inch for #12 screws; 0.266 inch for 1/4-inch screws.
5. Allowable Strengths are applicable to screws which are installed through existing holes (D=21/64") in the aluminum in contact with the screw head and self-drilled into the receiving member.
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}

| Screw Size | Head Styles | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | |
|------------|-------------|------------|---------------------------------------|--------------|--------------------|---------------------|---------------------------------------|--------------|---------------------|---------------------|---------------------------------------|--------------|---------------------|---------------------|
| | | | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" | 1/16" - 1/16" | 1/16" - 1/8" | 1/8" - 1/8" | 1/8" - 1/4" |
| #10-16 | PPH | #2 | 195 | 195 | 390 | - | 265 | 265 | 535 | - | 340 | 340 | 675 | - |
| #10-16 | HWH | #3 | 195 | 195 | 390 | - | 265 | 265 | 535 | - | 340 | 340 | 675 | - |
| #10-24 | PWH | #3 | 240 | - | - | - | 305 | - | - | - | 305 | - | - | - |
| #12-14 | HWH | #2 | 225 | 225 | 445 | - | 305 | 305 | 610 | - | 385 | 385 | 770 | - |
| #12-14 | HWH | #3 | 225 | 225 | 445 | - | 305 | 305 | 610 | - | 385 | 385 | 770 | - |
| #12-14 | PUFH | #3 | 250 | 490 | - | - | 320 | 625 | - | - | 320 | 625 | - | - |
| #12-24 | HWH | #5 | 225 | 225 | 650 | 1,045 | 305 | 305 | 870 | 1,140 | 385 | 385 | 955 | 1,140 |
| 1/4"-14 | HWH | #3 | 260 | 260 | 515 | - | 350 | 350 | 705 | - | 445 | 445 | 890 | - |
| 1/4"-20 | HWH | #4 | 260 | 260 | 745 | - | 350 | 350 | 995 | - | 445 | 445 | 1,085 | - |
| 1/4"-20 | HWH | #5 | 260 | 260 | 750 | 1,140 | 350 | 350 | 980 | 1,140 | 445 | 445 | 1,030 | 1,140 |
| 5/16"-18 | HWH | #3 | - | - | 875 ^(B) | 1235 ^(B) | - | - | 1065 ^(B) | 1505 ^(B) | - | - | 1065 ^(B) | 1505 ^(B) |
| 5/16"-24 | HWH | #4 | - | - | 760 ^(B) | 1175 ^(B) | - | - | 925 ^(B) | 1435 ^(B) | - | - | 925 ^(B) | 1435 ^(B) |

1. Design (LRFD) strengths are based on a safety factor, $\Omega = 3.0$, determined in accordance with the Aluminum Design Manual, AA ADM-2020.
2. The first thickness listed is of the aluminum in contact with the screw head, the second thickness listed is of the aluminum not in contact with the screw head.
3. Unless otherwise noted, design strengths in shaded cells are applicable to screws which are self-drilled through both pieces of aluminum.
4. Design strengths in unshaded cells are applicable to screws which are self-drilled through both pieces of aluminum and to screws which are installed through existing holes in the aluminum in contact with the screw head and self-drilled into the receiving member. Clearance holes have the following dimensions: 0.177 inch for #8 screws; 0.201 inch for #10 screws; 0.228 inch for #12 screws; 0.266 inch for 1/4-inch screws.
5. Design Strengths are applicable to screws which are installed through existing holes (D=21/64") in the aluminum in contact with the screw head and self-drilled into the receiving member.
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}

| Screw Size | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | | |
|------------|------------|---------------------------------------|------|-------|-------|-------|---------------------------------------|-------|-------|-------|-------|---------------------------------------|-------|-------|-------|-------|
| | | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | #2 | 235 | 600 | - | - | - | 355 | 895 | - | - | - | 460 | 1,175 | - | - | - |
| #10-16 | #3 | 230 | 540 | - | - | - | 300 | 830 | - | - | - | 395 | 1,145 | - | - | - |
| #10-24 | #3 | 245 | 580 | - | - | - | 300 | 850 | - | - | - | 325 | 1,085 | - | - | - |
| #12 - 14 | #2 | 310 | 680 | - | - | - | 340 | 985 | - | - | - | 440 | 1,245 | - | - | - |
| #12 - 14 | #3 | 310 | 650 | 1,260 | - | - | 340 | 950 | 1,775 | - | - | 435 | 1,210 | 2,110 | - | - |
| #12 - 24 | #5 | - | 550 | 1,075 | 1,230 | 1,345 | - | 785 | 1,460 | 1,990 | 1,990 | - | 965 | 1,625 | 2,435 | 2,435 |
| 1/4" - 14 | #3 | 255 | 725 | 1,310 | - | - | 370 | 1,040 | 1,930 | - | - | 430 | 1,285 | 2,495 | - | - |
| 1/4" - 20 | #4 | - | 700 | 1,340 | 1,765 | 1,925 | - | 1,010 | 1,850 | 2,540 | 2,930 | - | 1,250 | 2,125 | 3,340 | 3,585 |
| 1/4" - 20 | #5 | - | 670 | 1,310 | 1,790 | 1,800 | - | 1,000 | 1,865 | 2,525 | 2,645 | - | 1,300 | 2,255 | 3,225 | 3,400 |
| 5/16"-18 | #3 | - | 920 | - | 2,435 | - | - | 1,120 | - | 2,965 | - | - | 1,120 | - | 2,965 | - |
| 5/16"-24 | #4 | - | 855 | - | 2,105 | - | - | 1,045 | - | 2,565 | - | - | 1,045 | - | 2,565 | - |

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

| Screw Size | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | | |
|------------|------------|---------------------------------------|------|-------|------|-------|---------------------------------------|------|-------|------|-------|---------------------------------------|------|-------|-------|-------|
| | | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | #2 | 80 | 200 | - | - | - | 120 | 300 | - | - | - | 155 | 390 | - | - | - |
| #10-16 | #3 | 75 | 180 | - | - | - | 100 | 275 | - | - | - | 130 | 380 | - | - | - |
| #10-24 | #3 | 80 | 195 | - | - | - | 100 | 285 | - | - | - | 110 | 360 | - | - | - |
| #12 - 14 | #2 | 105 | 225 | - | - | - | 115 | 330 | - | - | - | 145 | 415 | - | - | - |
| #12 - 14 | #3 | 105 | 215 | 420 | - | - | 115 | 315 | 590 | - | - | 145 | 405 | 705 | - | - |
| #12 - 24 | #5 | - | 185 | 360 | 410 | 450 | - | 260 | 485 | 665 | 665 | - | 320 | 540 | 810 | 810 |
| 1/4" - 14 | #3 | 85 | 240 | 435 | - | - | 125 | 345 | 645 | - | - | 145 | 430 | 830 | - | - |
| 1/4" - 20 | #4 | - | 235 | 445 | 590 | 640 | - | 335 | 615 | 845 | 975 | - | 415 | 710 | 1,115 | 1,195 |
| 1/4" - 20 | #5 | - | 225 | 435 | 595 | 600 | - | 335 | 620 | 840 | 880 | - | 435 | 750 | 1,075 | 1,135 |
| 5/16"-18 | #3 | - | 305 | - | 810 | - | - | 375 | - | 990 | - | - | 375 | - | 990 | - |
| 5/16"-24 | #4 | - | 285 | - | 700 | - | - | 350 | - | 855 | - | - | 350 | - | 855 | - |

1. Allowable (ASD) strengths are based on a safety factor, $\Omega = 3.0$.
2. 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}

| Screw Size | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | | |
|------------|------------|---------------------------------------|------|-------|-------|-------|---------------------------------------|------|-------|-------|-------|---------------------------------------|------|-------|-------|-------|
| | | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" | 1/16" | 1/8" | 3/16" | 1/4" | 5/16" |
| #10-16 | #2 | 120 | 300 | - | - | - | 180 | 445 | - | - | - | 230 | 585 | - | - | - |
| #10-16 | #3 | 115 | 270 | - | - | - | 150 | 415 | - | - | - | 200 | 570 | - | - | - |
| #10-24 | #3 | 125 | 290 | - | - | - | 150 | 425 | - | - | - | 165 | 540 | - | - | - |
| #12 - 14 | #2 | 155 | 340 | - | - | - | 170 | 495 | - | - | - | 220 | 620 | - | - | - |
| #12 - 14 | #3 | 155 | 325 | 630 | - | - | 170 | 475 | 885 | - | - | 220 | 605 | 1,055 | - | - |
| #12 - 24 | #5 | - | 275 | 535 | 615 | 675 | - | 395 | 730 | 995 | 995 | - | 485 | 815 | 1,220 | 1,220 |
| 1/4" - 14 | #3 | 130 | 360 | 655 | - | - | 185 | 520 | 965 | - | - | 215 | 640 | 1,250 | - | - |
| 1/4" - 20 | #4 | - | 350 | 670 | 885 | 960 | - | 505 | 925 | 1,270 | 1,465 | - | 625 | 1,065 | 1,670 | 1,795 |
| 1/4" - 20 | #5 | - | 335 | 655 | 895 | 900 | - | 500 | 930 | 1,260 | 1,325 | - | 650 | 1,130 | 1,615 | 1,700 |
| 5/16"-18 | #3 | - | 460 | - | 1,220 | - | - | 560 | - | 1,485 | - | - | 560 | - | 1,485 | - |
| 5/16"-24 | #4 | - | 430 | - | 1,055 | - | - | 520 | - | 1,285 | - | - | 520 | - | 1,285 | - |

1. Design (LRFD) strengths are based on a resistance factor, $\Omega = 0.5$.
2. 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.

Ultimate Pull-Over Capacity of Screw Connections in Aluminum, lbf^{1,2,3}

| Screw Size | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | |
|------------|------------|---------------------------------------|-------|-------|-------|---------------------------------------|-------|-------|-------|---------------------------------------|-------|-------|-------|
| | | 1/32" | 1/16" | 1/8" | 3/16" | 1/32" | 1/16" | 1/8" | 3/16" | 1/32" | 1/16" | 1/8" | 3/16" |
| #10-16 | PPH | 115 | 225 | 450 | 680 | 155 | 310 | 615 | 925 | 195 | 390 | 780 | 1,170 |
| #10-16 | HWH | 135 | 505 | 1,225 | 2,155 | 185 | 790 | 1,910 | 3,365 | 235 | 1,105 | 2,675 | 4,710 |
| #10-24 | PWH | - | 830 | 1,530 | - | - | 1,295 | 1,815 | - | - | 1,375 | 1,815 | - |
| #12-14 | HWH | 185 | 605 | 1,600 | 2,455 | 255 | 950 | 2,225 | 3,835 | 325 | 1,325 | 3,115 | 5,375 |
| #12-14 | HWH | 130 | 520 | 1,600 | 2,200 | 175 | 815 | 1,960 | 3,440 | 220 | 1,140 | 2,745 | 4,815 |
| #12-14 | PUFH | - | 745 | 1,545 | 1,545 | - | 1,170 | 1,835 | 1,835 | - | 1,240 | 1,835 | 1,835 |
| #12-24 | HWH | 130 | 520 | 1,600 | 2,200 | 175 | 815 | 1,960 | 3,440 | 220 | 1,140 | 2,745 | 4,815 |
| 1/4"-14 | HWH | 160 | 605 | 2,215 | 2,455 | 220 | 950 | 2,630 | 3,835 | 280 | 1,325 | 3,115 | 5,375 |
| 1/4"-20 | HWH | 160 | 605 | 2,215 | 2,965 | 220 | 950 | 2,630 | 3,835 | 280 | 1,325 | 3,115 | 5,375 |

1. Ultimate strengths in shaded cells are based on laboratory tests.
2. Ultimate strengths in unshaded cells are based on calculations in accordance with the Aluminum Design Manual, AA ADM-2020.
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 (ASD) Pull-Over Capacity of Screw Connections in Aluminum, lbf^{1,2,3,4,5}

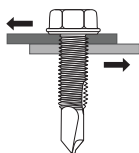
| Screw Size | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | |
|------------|------------|---------------------------------------|-------|------|-------|---------------------------------------|-------|------|-------|---------------------------------------|-------|-------|-------|
| | | 1/32" | 1/16" | 1/8" | 3/16" | 1/32" | 1/16" | 1/8" | 3/16" | 1/32" | 1/16" | 1/8" | 3/16" |
| #10-16 | PPH | 40 | 75 | 150 | 225 | 50 | 105 | 205 | 310 | 65 | 130 | 260 | 390 |
| #10-16 | HWH | 45 | 170 | 410 | 720 | 60 | 265 | 635 | 1,120 | 80 | 370 | 890 | 1,570 |
| #10-24 | PWH | - | 275 | 510 | - | - | 430 | 605 | - | - | 460 | 605 | - |
| #12-14 | HWH | 60 | 200 | 535 | 820 | 85 | 315 | 740 | 1,280 | 110 | 440 | 1,040 | 1,790 |
| #12-14 | HWH | 45 | 175 | 535 | 735 | 60 | 270 | 655 | 1,145 | 75 | 380 | 915 | 1,605 |
| #12-14 | PUFH | - | 250 | 515 | 515 | - | 390 | 610 | 610 | - | 415 | 610 | 610 |
| #12-24 | HWH | 45 | 175 | 535 | 735 | 60 | 270 | 655 | 1,145 | 75 | 380 | 915 | 1,605 |
| 1/4"-14 | HWH | 55 | 200 | 740 | 820 | 75 | 315 | 875 | 1,280 | 95 | 440 | 1,040 | 1,790 |
| 1/4"-20 | HWH | 55 | 200 | 740 | 990 | 75 | 315 | 875 | 1,280 | 95 | 440 | 1,040 | 1,790 |

1. Allowable strengths are based on a safety factor, $\Omega = 3.00$, determined in accordance with the Aluminum Design Manual, AA ADM-2020.
2. Available strengths in shaded cells apply to screws which are self-drilled.
3. Available strengths in unshaded cells are applicable to screws which are self-drilled and to screws which are installed in existing holes in the aluminum which have the following dimensions: 0.177 inch for #8 screws; 0.201 inch for #10 screws; 0.228 inch for #12 screws; 0.266 inch for 1/4-inch screws.
4. Allowable strengths for member thicknesses which are not addressed in the table may be determined by calculation in accordance with the ADM.
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.

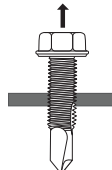
Design (LRFD) Pull-Over Capacity of Screw Connections in Aluminum, lbf^{1,2,3,4,5}

| Screw Size | Point Type | 6063-T5 (Fy = 16 ksi, Fu = 22 ksi) | | | | 6063-T6 (Fy = 25 ksi, Fu = 30 ksi) | | | | 6061-T6 (Fy = 35 ksi, Fu = 38 ksi) | | | |
|------------|------------|---------------------------------------|-------|-------|-------|---------------------------------------|-------|-------|-------|---------------------------------------|-------|-------|-------|
| | | 1/32" | 1/16" | 1/8" | 3/16" | 1/32" | 1/16" | 1/8" | 3/16" | 1/32" | 1/16" | 1/8" | 3/16" |
| #10-16 | PPH | 55 | 115 | 225 | 340 | 75 | 155 | 310 | 460 | 95 | 195 | 390 | 585 |
| #10-16 | HWH | 70 | 255 | 610 | 1,075 | 95 | 395 | 955 | 1,680 | 120 | 555 | 1,340 | 2,355 |
| #10-24 | PWH | - | 415 | 765 | - | - | 650 | 910 | - | - | 690 | 910 | - |
| #12-14 | HWH | 95 | 305 | 800 | 1,230 | 130 | 475 | 1,115 | 1,920 | 160 | 665 | 1,560 | 2,685 |
| #12-14 | HWH | 65 | 260 | 800 | 1,100 | 90 | 405 | 980 | 1,720 | 110 | 570 | 1,375 | 2,410 |
| #12-14 | PUFH | - | 375 | 775 | 775 | - | 585 | 920 | 920 | - | 620 | 920 | 920 |
| #12-24 | HWH | 65 | 260 | 800 | 1,100 | 90 | 405 | 980 | 1,720 | 110 | 570 | 1,375 | 2,410 |
| 1/4"-14 | HWH | 80 | 305 | 1,105 | 1,230 | 110 | 475 | 1,315 | 1,920 | 140 | 665 | 1,560 | 2,685 |
| 1/4"-20 | HWH | 80 | 305 | 1,105 | 1,480 | 110 | 475 | 1,315 | 1,920 | 140 | 665 | 1,560 | 2,685 |

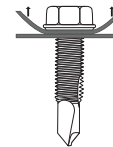
1. Design (LRFD) strengths are based on a resistance factor, $\phi = 0.50$, determined in accordance with the Aluminum Design Manual, AA ADM-2020.
2. Design strengths in shaded cells apply to screws which are self-drilled.
3. Design strengths in unshaded cells are applicable to screws which are self-drilled and to screws which are installed in existing holes in the aluminum which have the following dimensions: 0.177 inch for #8 screws; 0.201 inch for #10 screws; 0.228 inch for #12 screws; 0.266 inch for 1/4-inch screws.
4. Design strengths for member thicknesses which are not addressed in the table may be determined by calculation in accordance with the ADM.
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.



Shearing (Bearing)



Tension Pull-Out



Pull-Over

ORDERING INFORMATION

SCREW FASTENERS

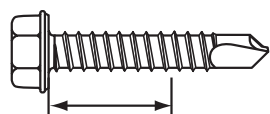
DRIL-FLEX®
Self-Drilling Structural Screws

Dril-Flex

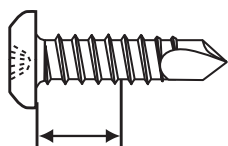
| Cat. No. | Description (Diameter- TPI x Nominal Length) | Point Type | Finish | Maximum Load-Bearing Length ¹ (in.) | Minimum Protrusion Length ² | Nominal Head Diameter ³ (in.) | Nominal Head Height ⁴ (in.) | Qty / Carton |
|--|--|------------|--------------|--|--|--|--|--------------|
| #10 Diameter, 5/16" Hex Washer Head | | | | | | | | |
| DFSEAF430 | #10 - 16 x 3/4" | #3 | Stalgard SUB | 0.250 | 1/2" | 0.400 | 0.14 | 6,000 |
| DFSEAF460 | #10 - 16 x 1-1/2" | #3 | Stalgard SUB | 1.000 | 1/2" | 0.400 | 0.14 | 2,500 |
| DFSEAF470 | #10 - 16 x 2" | #3 | Stalgard SUB | 1.500 | 1/2" | 0.415 | 0.17 | 2,000 |
| DFSEAF480 | #10 - 16 x 2-1/2" | #3 | Stalgard SUB | 2.000 | 1/2" | 0.400 | 0.14 | 1,500 |
| #10 Diameter, #2 Phillips Pan Head | | | | | | | | |
| DFSEDX445 | #10 - 16 x 3/4" | #2 | Stalgard | 0.344 | 13/32" | 0.365 | 0.13 | 6,000 |
| #10 Diameter, #2 Phillips Wafer Head | | | | | | | | |
| DFSEBL530 | #10 - 24 x 1-1/4" | #3 | Stalgard | 0.781 | 15/32" | 0.470 | 0.05 | 5,000 |
| #12 Diameter, 5/16" Hex Washer Head | | | | | | | | |
| DFSEAF621 | #12 - 14 x 7/8" | #3 | Stalgard SUB | 0.375 | 1/2" | 0.415 | 0.18 | 5,000 |
| DFSEAF641 | #12 - 14 x 1" | #3 | Stalgard SUB | 0.500 | 1/2" | 0.415 | 0.18 | 4,000 |
| DFSEAF661 | #12 - 14 x 1-1/4" | #3 | Stalgard SUB | 0.750 | 1/2" | 0.415 | 0.18 | 2,500 |
| DFSEAF681 | #12 - 14 x 1-1/2" | #3 | Stalgard SUB | 1.000 | 1/2" | 0.415 | 0.18 | 2,500 |
| DFSEAF755 | #12 - 24 x 1-3/4" | #5 | Stalgard SUB | 0.750 | 1" | 0.415 | 0.18 | 2,500 |
| DFSEAF690 | #12 - 14 x 2" | #3 | Stalgard SUB | 1.500 | 1/2" | 0.415 | 0.18 | 2,000 |
| DFSEAF715 | #12 - 14 x 3" | #2 | Stalgard SUB | 2.375 | 5/8" | 0.500 | 0.19 | 1,000 |
| #12 Diameter, #3 Phillips Undercut Flat Head | | | | | | | | |
| DFSEBL215 ⁽⁶⁾ | #12 - 14 x 1" | #3 | Stalgard | 0.500 | 1/2" | 0.415 | 0.09 | 4,000 |
| DFSEBL220 ⁽⁶⁾ | #12 - 14 x 1-1/4" | #3 | Stalgard | 0.750 | 1/2" | 0.415 | 0.09 | 3,000 |
| DFSEBL223 ⁽⁶⁾ | #12 - 14 x 1-1/2" | #3 | Stalgard | 1.000 | 1/2" | 0.415 | 0.09 | 2,500 |
| 1/4" Diameter, 3/8" Hex Washer Head | | | | | | | | |
| DFSEAF816 | 1/4" - 14 x 1" | #3 | Stalgard SUB | 0.438 | 9/16" | 0.500 | 0.23 | 3,000 |
| DFSEAF865 | 1/4" - 20 x 1-1/8" | #4 | Stalgard SUB | 0.313 | 13/16" | 0.500 | 0.23 | 2,500 |
| DFSEAF841 | 1/4" - 14 x 1-1/2" | #3 | Stalgard SUB | 0.938 | 9/16" | 0.500 | 0.23 | 2,000 |
| DFSEAF876 | 1/4" - 20 x 1-1/2" | #4 | Stalgard SUB | 0.688 | 13/16" | 0.500 | 0.23 | 2,000 |
| DFSEAF888 | 1/4" - 20 x 1-3/4" | #5 | Stalgard SUB | 0.750 | 1" | 0.500 | 0.23 | 1,000 |
| DFSEAF846 | 1/4" - 14 x 2" | #3 | Stalgard SUB | 1.438 | 9/16" | 0.500 | 0.23 | 1,500 |
| DFSEAF886 | 1/4" - 20 x 2" | #4 | Stalgard SUB | 1.188 | 13/16" | 0.500 | 0.23 | 1,500 |
| DFSEAF890 | 1/4" - 20 x 2-1/2" | #4 | Stalgard SUB | 1.688 | 13/16" | 0.500 | 0.23 | 1,000 |
| DFSEAF900 ⁽⁵⁾ | 1/4" - 20 x 3-3/8" | #4 | Stalgard SUB | 2.563 | 13/16" | 0.500 | 0.23 | 500 |
| DFSEAF910 ⁽⁵⁾ | 1/4" - 20 x 4" | #4 | Stalgard SUB | 3.188 | 13/16" | 0.500 | 0.23 | 500 |
| 1/4" Diameter, #3 Phillips Undercut Flat Head | | | | | | | | |
| DFSEBL330 ^(5,6) | 1/4" - 20 x 3" | #4 | Stalgard | 2.188 | 13/16" | 0.460 | 0.10 | 500 |
| DFSEBL340 ^(5,6) | 1/4" - 20 x 4" | #4 | Stalgard | 3.188 | 13/16" | 0.460 | 0.10 | 500 |
| 5/16" Diameter, 3/8" Hex Washer Head | | | | | | | | |
| DFSEAF940 | 5/16" - 18 x 1-1/2" | #3 | Stalgard SUB | 0.750 | 3/4" | 0.600 | 0.27 | 1,000 |
| DFSEAF960 | 5/16" - 24 x 1-1/2" | #4 | Stalgard SUB | 0.688 | 13/16" | 0.600 | 0.27 | 1,000 |
| DFSEAF970 | 5/16" - 24 x 2" | #4 | Stalgard SUB | 1.188 | 13/16" | 0.600 | 0.27 | 1,000 |

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 the higher hardness tip and lead 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.
5. Partially Threaded Fastener with a thread length of 2.00".
6. Undercut Flat Head screws have an 82 degree head angle.

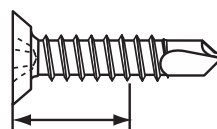
Load Bearing Area



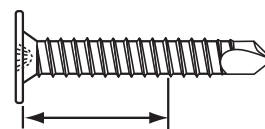
Hex Washer Head (HWH)



Pan Head (PPH)



Undercut Flat Head (PUFH)



Wafer head (PWH)

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" |
| DW269 | 1,000 RPM VSR VERSA-CLUTCH™ Screwgun | 5/16" |
| 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. Guidance on installation RPM of particular screw diameters can be found on page 1.

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



Accessories

| Cat. No. | Description |
|--------------|---|
| DWA3HLDFT | 3IN IMPACT READY® HOLDER |
| DWA1PH2IR3 | 1IN PHILLIPS #2 IMPACT READY® BIT TIP (3 PACK) |
| DWA1PH3IR3 | 1IN PHILLIPS #3 IMPACT READY® BIT TIP (3 PACK) |
| DW2221IR | 1/4" x 2-9/16" IMPACT READY® MAGNETIC NUT DRIVER |
| DW2222IR | 5/16" x 2-9/16" IMPACT READY® MAGNETIC NUT DRIVER |
| DW2223IR | 3/8" x 2-9/16" IMPACT READY® MAGNETIC NUT DRIVER |
| DWANGFT32SET | 32 PIECE NEXT GEN IR FLEX TORQ SET |
| DWANGFT26SET | 26 PIECE NEXT GEN IR FLEX TORQ SET |

