SECTION 11

FIBREBOLT®
STUDS AND NUTS

FIBREBOLT® STUDS AND NUTS

STANDARD COLOR–BROWN

SHAPE–HEX

For structural applications where mechanical fasteners must not only be strong, but also non-corrosive and/or non-conductive, **FIBREBOLT®** fiberglass studs and nuts can be used in place of steel or other metal fasteners.

FIBREBOLT® is being utilized in chemical process equipment, air and water pollution control equipment, marine applications electrical equipment and in general industry.

FIBREBOLT® is available in diameters of 3/8", 1/2", 5/8", 3/4" and 1" with nuts for immediate delivery. Four foot lengths are standard. Other lengths are available on request. Custom partial length threading is also available on request.

Properties

	3/8 16 UNC	1/2 13 UNC	5/8 11 UNC	3/4 10 UNC	1 8 UNC
Ultimate thread shear using Strongwell fiberglass nut (lb.)① ②	1,350	2,400	3,790	5,150	9600
Max ultimate tensile load using Strongwell fiberglass nut (lb.)②	1,050	2,000	3,100	4,500	6,500
Max ultimate tensile load using two (2) Strongwell fiberglass nuts (lb.)②	1,470	2,800	4,340	6,300	9,700
Transverse shear on threaded rod — double shear ASTM B-565 (min. load lb.)③	3,000	5,000	7,500	12,000	22,000
Transverse shear on threaded rod — single shear (min. load lb.)③	1,600	2,600	3,800	6,200	15,000
Compressive strength — longitudinal ASTM-D-695 (min. psi)③	60,000	60,000	60,000	60,000	60,000
Flexural strength ASTM-D-790 (min. psi)③	50,000	50,000	50,000	50,000	50,000
Flexural modulus ASTM-D-790 (min. psi x 10^6)③	2.0	2.0	2.0	2.50	2.75
Recommended maximum installation torque strength using Strongwell fiberglass nut lubricated with SAE 10W30 motor oil (ft./lbs.)②	4	8	16	24	50
Dielectric strength ASTM-D-149 (kv/in.)	35	35	35	35	35
Water absorption 24 hr. immersion—threaded ASTM-D-570 (%)	1	1	1	1	1
Coefficient of thermal expansion—longitudinal (in/in/°F)	$5x10^{-6}$	$5x10^{-6}$	$5x10^{-6}$	$5x10^{-6}$	$5x10^{-6}$
Max recommended operation temp —based on 50% retention of ultimate thread shear strength °C (°F)	95°C (203°F)	95°C (203°F)	95°C (203°F)	95°C (203°F)	95°C (203°F)
Stud weight (lb./ft.)	0.07	0.12	0.18	0.28	0.50
Thickness of nut & washer	3/4"	7/8"	1-1/8"	1-1/4"	1-5/8"
Flammability — ASTM – D635	Self-Extinguishing on All				

NOTE:

- All test results are for bolts with single nuts only. Proper safety factors should be applied to assembly.
- Properties above do not apply when fiberglass stud is used with metal nut.
- Appropriate safety factors must be applied.

① Ultimate strength values are averages obtained in design testing.
② New property categories added to better clarify stud thread shear properties.
③ Strength values are minimums derived from multiple production sample testing.

FIBREBOLT® STUDS AND NUTS USER'S GUIDE

FIBREBOLT® studs are pultruded, fiberglass reinforced vinyl ester threaded rods and thermoplastic hex-shaped nuts. The properties and characteristics of **FIBREBOLT®** differ from steel. Failure to follow the procedure below can result in damage and/or premature failure to the stud/nut assembly.

PROCEDURE

1) Verify that the nuts and studs are well lubricated. If the nuts are to be removed during the application, lubrication is a necessity. A light oil, dry lubricants, and silicone sprays are all satisfactory. Lubricants should be used in small quantities.
2) Bearing surfaces of the nuts must be parallel to the surfaces being fastened.
3) A torque wrench must be used.

The table below gives the ultimate and recommended maximum installation torque.

INSTALLATION TORQUE TABLE

Size	Ultimate Torque Strength	Recommended Maximum Installation Torque
3/8-16 UNC	8 ft-lbs.	4 ft-lbs.
1/2-13 UNC	18 ft-lbs.	8 ft-lbs.
5/8-11 UNC	35 ft-lbs.	16 ft-lbs.
3/4-10 UNC	50 ft-lbs.	24 ft-lbs.
1-8 UNC	110 ft-lbs.	50 ft-lbs.

4) Wrenches must make full contact with all nut edges. Partial contact will cause the corners to fracture, affecting the performance of the stud/nut assembly. A standard six point socket is recommended.
5) Whenever possible, the stud/nut assembly should be bonded to insure that the nuts do not loosen. The recommended bonding technique is to secure the nut to the proper torque value, then coat the entire nut and exposed stud assembly with a thick layer of adhesive or resin (this step is for assemblies in which the nut will not be subsequently removed).
6) Values reported in the **FIBREBOLT®** properties data sheet on the previous page were obtained for static conditions. Vibration should be eliminated or minimized in applications utilizing **FIBREBOLT®**.

CAUTION

1) All data regarding the FIBREBOLT® stud and nut assembly has been generated from tests involving only fiberglass nuts. No data has been generated for metal nuts. If metal nuts are used, strengths will be reduced because of less thread engagement. If metal nuts are used, extreme care should be taken to assure that the threads match and that a snug fit is achieved.

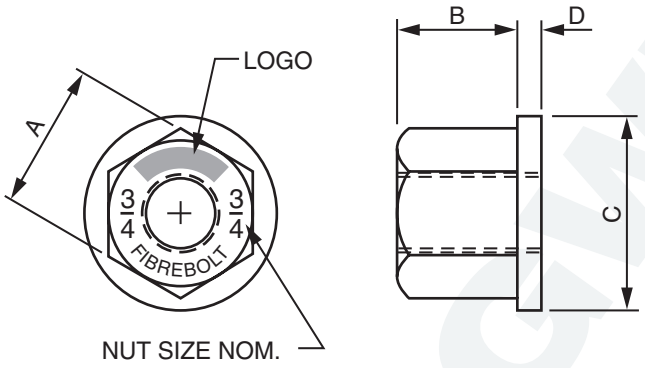
2) The FIBREBOLT® stud has cut, not molded threads. Threads that will be exposed to environments that might attack the glass reinforcements should be sealed after installation. If removal of the nut is anticipated, a very thin (1 mil) sprayed-on coat of polyurethane will normally be effective. Heavier coats of polyurethane, resin, or adhesive are recommended where possible.

FIBREBOLT® STUDS AND NUTS USER'S GUIDE

FIBREBOLT® NUTS

The hex shaped thermoplastic nut in Strongwell's **FIBREBOLT®** fastener system is manufactured from fiberglass reinforced PPS resin. The standard color is brown.

NOTE: FIBREBOLT® studs and nuts should be used together as a system to assure proper fit and properties. Interchange with other manufacturer's bolt or nut is not intended or assured.



FIBREBOLT® NUT

HEX NUT DIMENSIONS

NUT SIZE NOM.	WIDTH ACROSS FLATS "A"	NOM. WIDTH ACROSS FLATS	THICKNESS "B"	WASHER DIA. "C"	WASHER THICKNESS "D"
3/8 – 16 UNC	.745	3/4"	5/8"	1"	1/8"
1/2 – 13 UNC	.870	7/8"	3/4"	1-1/8"	1/8"
5/8 – 11 UNC	1.057	1-1/16"	15/16"	1-5/16"	3/16"
3/4 – 10 UNC	1.245	1-1/4"	1-1/16"	1-1/2"	3/16"
1 – 8 UNC	1.620	1-5/8"	1-3/8"	2"	1/4"