



# DragonPlate™

## Material Specifications

### Modular Connectors

DragonPlate lightweight modular tube connectors provide an easy and robust method for connecting either our roll-wrapped or braided carbon fiber tubes together to form lightweight rigid structures. Using these patent-pending anodized aluminum connectors, our 0.5", 0.75" or 1" carbon fiber tubes can be connected to form much longer disassembleable tubes and complex 3D structures. Both 2D and 3D joints are possible. The connectors are adhesively bonded into the ends of the carbon fiber tubes using an epoxy (we recommend Scotch-Weld 2216 adhesive)

One of the primary concerns when bonding metal fittings into carbon fiber tubes is the fact that the metal component, when subjected to reductions in temperature, will shrink much more than the carbon fiber tube. To eliminate this problem, our patent pending connector incorporates a slotted tubular design, which has a two-fold effect. First, the slots allow the aluminum to contract circumferentially without as much change in the nominal diameter of the insert. Secondly, the slots provide compliance to the part, which further alleviate peel stresses by prohibiting the aluminum part from imparting as much peel force on the adhesive layer. In addition, this design includes a ridged outer surface. This further strengthens the bond inside the carbon fiber tube by placing more epoxy in shear (and most structural epoxies are about 100 times stronger in shear than in peel).

This combination of form, function, and resistance to thermal delaminations makes our DragonPlate tube connectors a versatile and robust option for many projects. For added performance, reliability and integrity this connector is fitted with a HeliCoil stainless threaded insert. Each connector also comes with a foam plug to contain adhesive and enough bond line control micro glass beads to ensure a proper bond fit.





**DragonPlate™**

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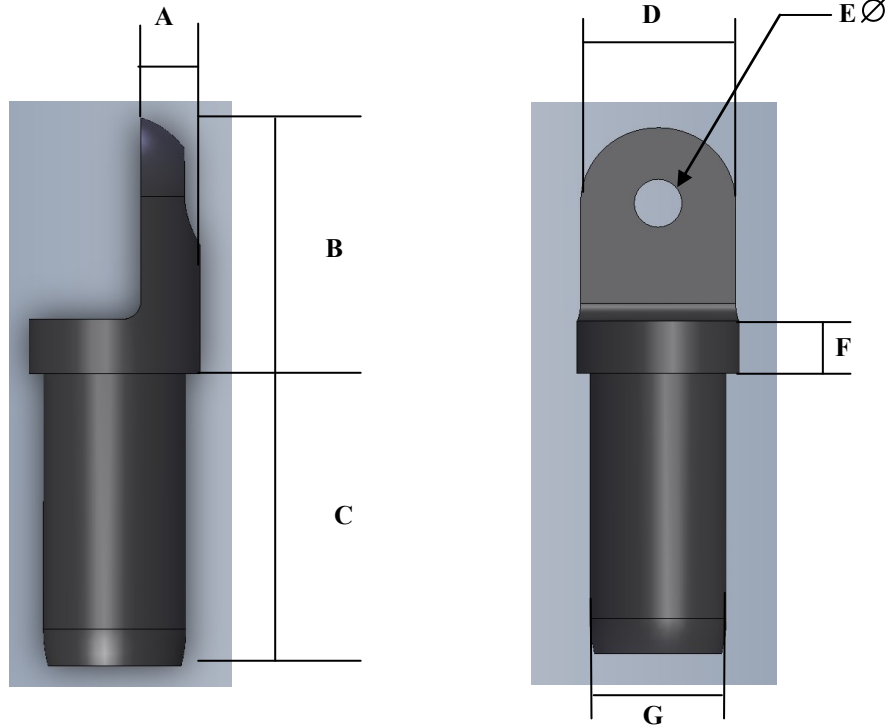
# DragonPlate™

## Material Specifications



### Single Sided Female Modular Connector

- Available in both threaded and un-threaded holes



#### STANDARD SIZES

TUBE SIZE	A	B	C	D	F	F	G
0.5"	0.2"	0.22"	1.13"	0.59"	0.23"	0.23"	0.48"
0.75"	0.3"	1.3"	1.5"	0.87"	0.26"	0.28"	0.73"
1.0"	0.38"	1.73"	2.0"	1.45"	0.26"	0.38"	0.97"



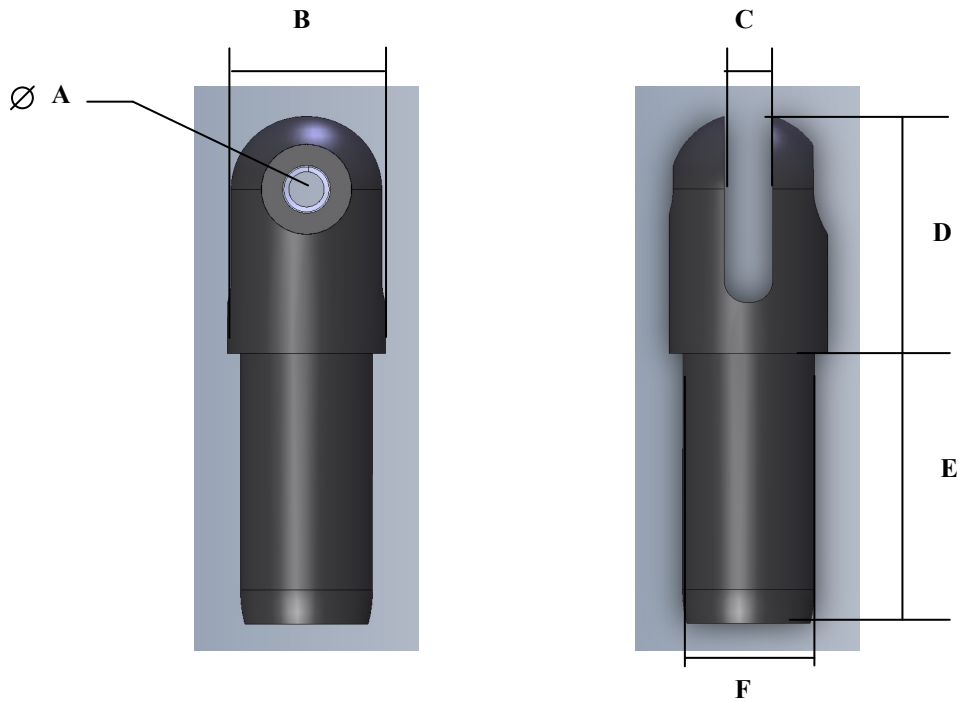
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## Material Specifications



### Female Clevis Connector

- Comes with bondable or with threaded end (see picture for threaded end)
- Bondable comes with blank or threaded hole. Threaded end has threaded hole.



### STANDARD SIZES

TUBE SIZE	A	B	C	D	E	F
0.5"	0.23"	0.62"	0.18"	0.88"	1.13"	0.48"
0.75"	0.27"	0.87"	0.28"	1.63"	1.5"	0.73"
1.0"	0.27"	1.13"	0.36	1.75	2.0"	0.97"



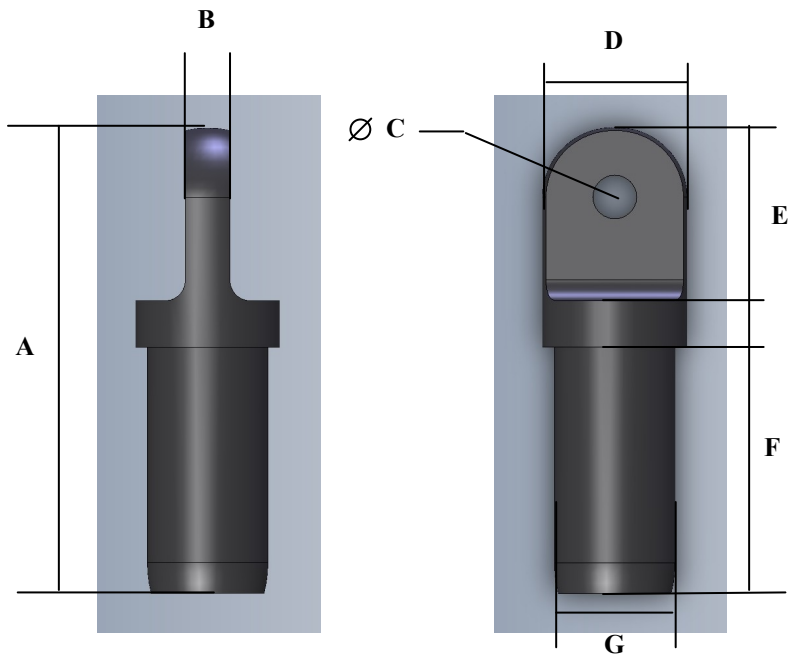
# DragonPlate™

## Material Specifications



### Male Clevis Connector

- Comes with bondable or with threaded end (see picture for threaded end)



### STANDARD SIZES

TUBE SIZE	A	B	C	D	E	F	G
0.5"	2.03"	0.18"	0.2"	0.62"	0.71"	1.13"	0.48"
0.75"	2.85"	0.27"	0.26"	0.87"	1.0"	1.5"	0.73"
1.0"	3.78"	0.36"	0.26"	1.12"	1.41"	1.99"	0.97"



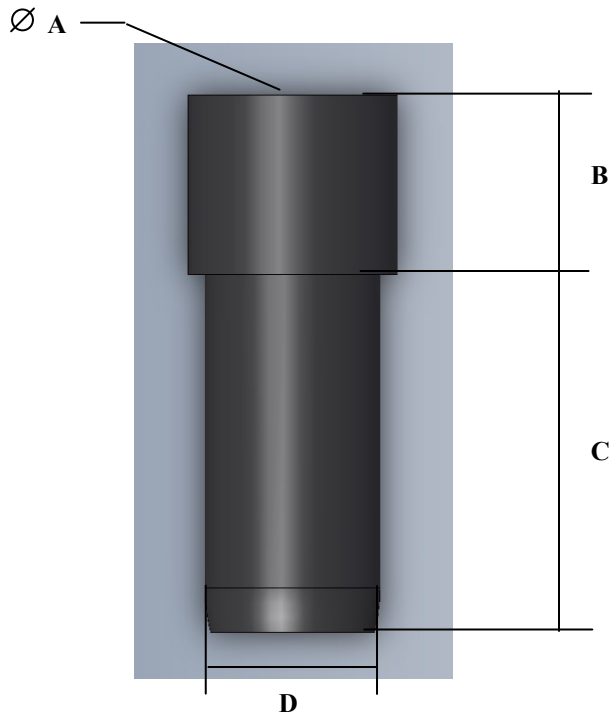
# DragonPlate™

## Material Specifications



### Threaded End Connector

- 0.5" connector uses 10-32 thread
- All other sizes use 1/4"-20 thread



### STANDARD SIZES

TUBE SIZE	A	B	C	D
0.5"	0.62"	0.50"	1.13"	0.48"
0.625"	0.75"	0.63"	1.33"	0.61"
0.75"	0.87"	0.75"	1.50"	0.73"
0.875	1.00"	0.88"	1.50"	0.89"
1.0"	1.12"	1.0"	1.99"	0.97"

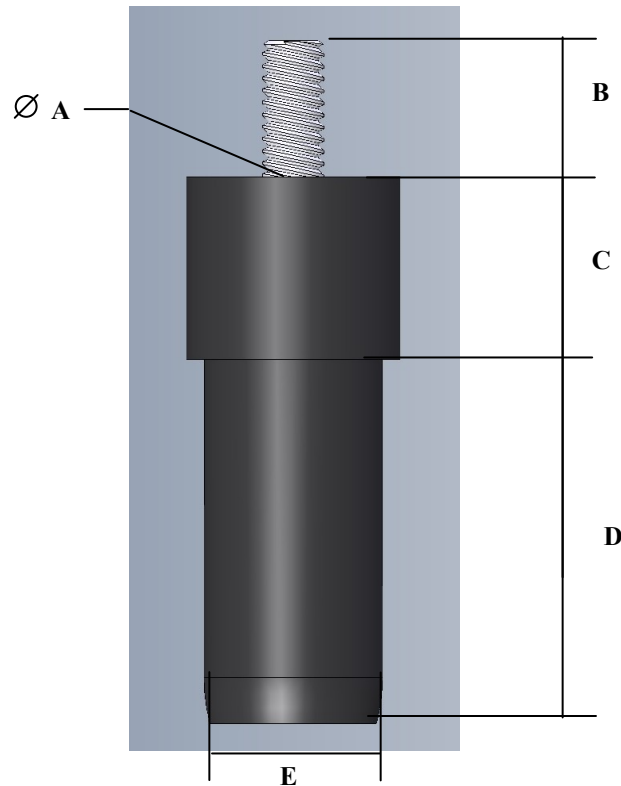


# DragonPlate™

## Material Specifications

### Threaded End with Stud Connector

- .5" has 10-32 thread
- All other sizes use 1/4"-20 thread



### STANDARD SIZES

TUBE SIZE	A	B	C	D	E
0.5"	0.62"	0.50"	0.50"	1.13"	0.48"
0.625"	0.75"	0.50"	0.63"	1.33"	0.61"
0.75"	0.87"	0.75"	0.75"	1.5"	0.73"
0.875"	1.00"	0.50"	0.88"	1.50"	0.89"
1.0"	1.12"	0.75"	1.0"	1.99"	0.97"



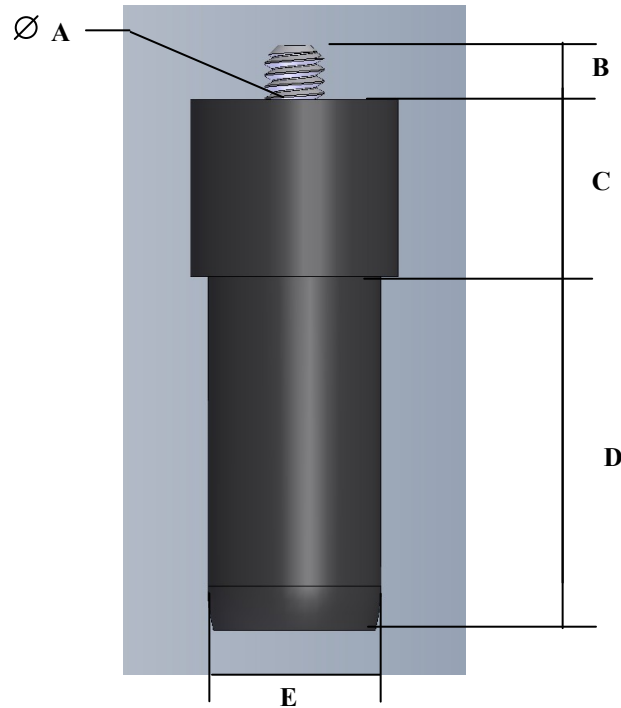


**DragonPlate™**

**Material Specifications**

## Camera Mount Stud Connector

- standard 1/4" -20 thread stud



### STANDARD SIZES

TUBE SIZE	A	B	C	D	E
0.5"	N/A	N/A	N/A	N/A	N/A
0.75"	0.87"	0.21"	0.75"	1.5"	0.73"
1.0"	N/A	N/A	N/A	N/A	N/A



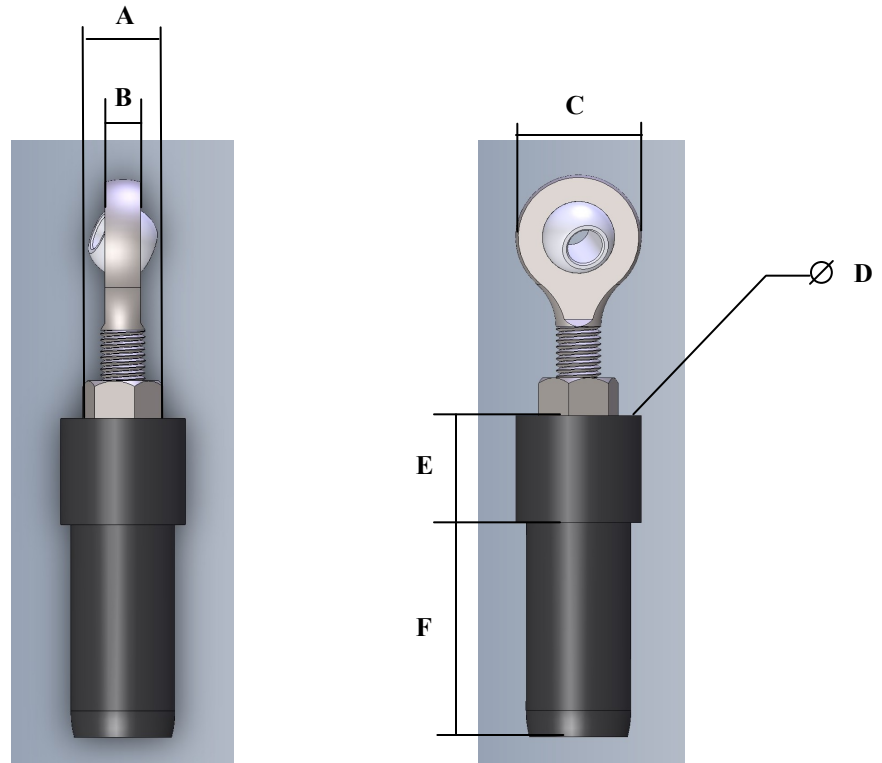
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## Material Specifications



### Heim Joint Connector

- The 0.5" ball swivel accepts a 1/4-20 bolt and allows the end to articulate out-of-plane



### STANDARD SIZES

TUBE SIZE	A	B	C	D	E	F
0.5"	N/A	N/A	N/A	N/A	N/A	N/A
0.75"	0.5"	0.15"	0.88"	0.87"	0.75"	1.5"
1.0"	0.5"	0.15"	0.88"	1.12"	1.0"	1.99"



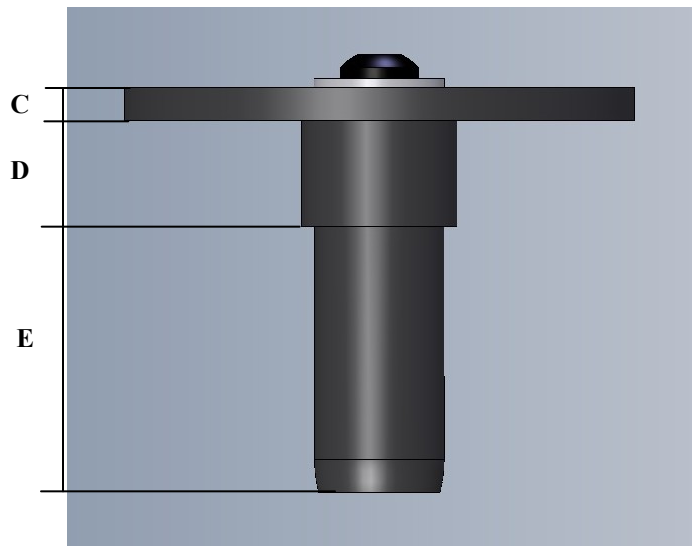
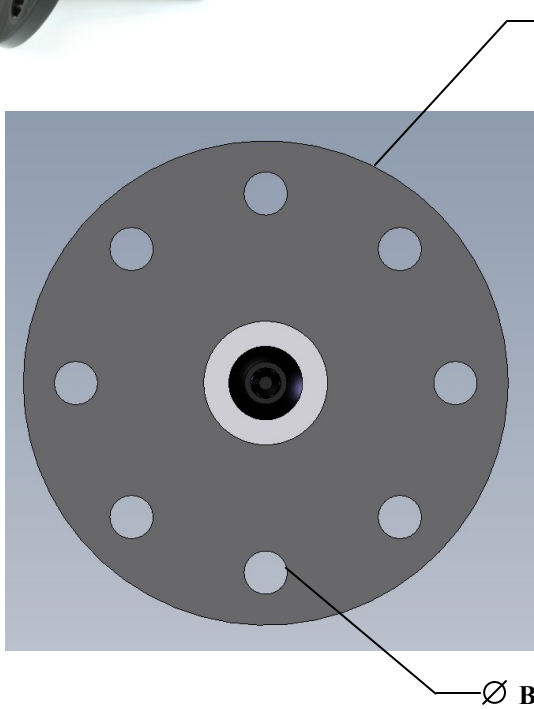
# DragonPlate™

## Material Specifications



### 8 Hole Disk Kit Connector

- disc is held onto the connector with the supplied bolt and washer or alternatively a studded end connector can be used.



### STANDARD SIZES

TUBE SIZE	A	B	C	D	E
0.5"	N/A	N/A	N/A	N/A	N/A
0.75"	2.88"	0.26"	0.19"	0.6"	1.5"
1.0"	2.88"	0.26"	0.19"	0.82"	1.97"

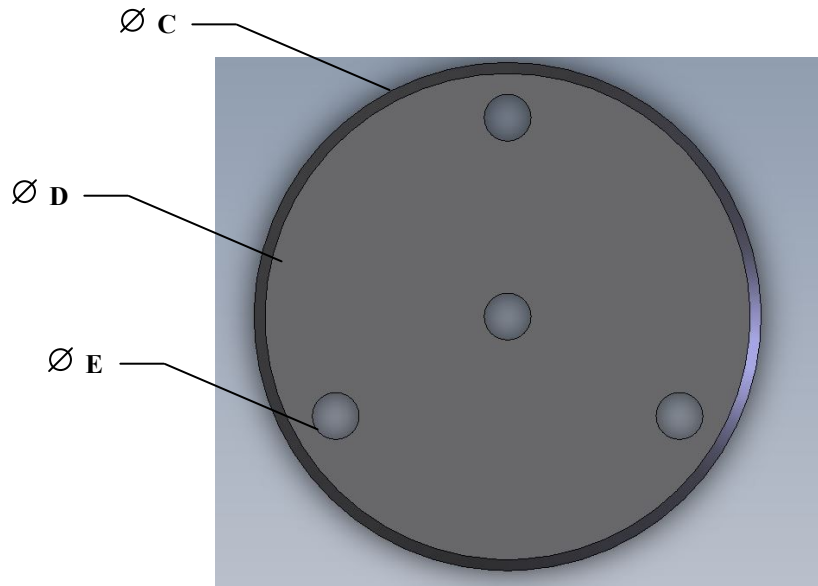


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## Material Specifications

### Flange Connector

-Best when used with threaded end connector without stud



### STANDARD SIZES

TUBE SIZE	A	B	C	D	F	F	G
0.5"	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0.75"	0.3"	1.3"	1.5"	0.87"	0.26"	0.28"	0.73"
1.0"	0.3"	1.3"	1.5"	0.87"	0.26"	0.28"	0.73"

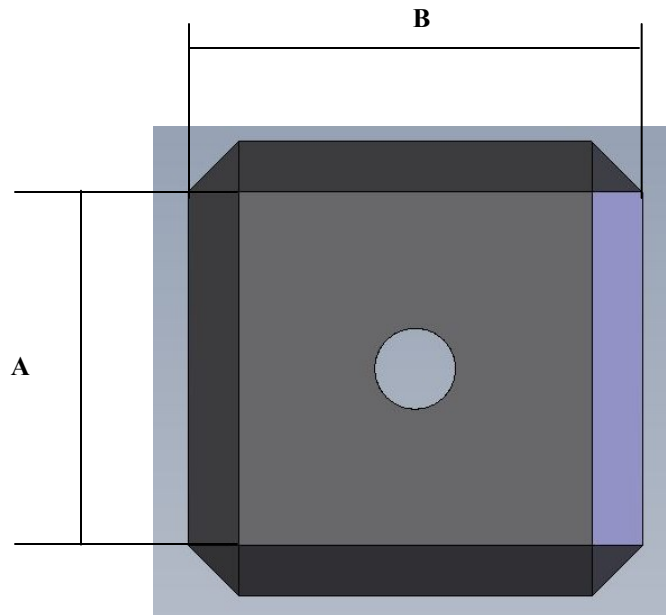


# DragonPlate™

## Material Specifications

### Cube Connector

- 0.75" and 1" uses 1/4"-20 threads
- 0.5" uses 10-32 threads



### STANDARD SIZES

TUBE SIZE	A	B
0.5"	N/A	N/A
0.75"	0.88"	1.13"
1.0"	0.88"	1.13"

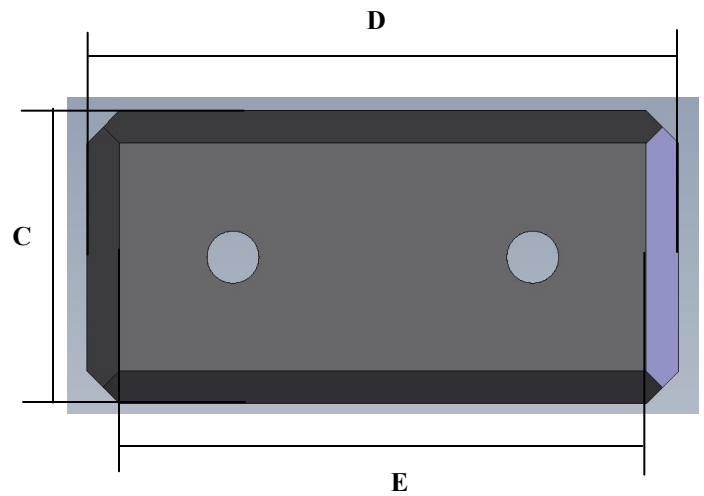
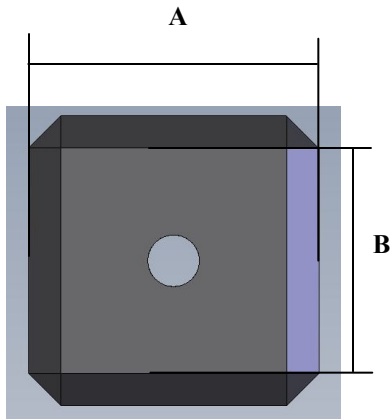


# DragonPlate™

## Material Specifications

### 1X2 Block Connector

- 0.75" and 1" uses 1/4"-20 threads
- 0.5" uses 10-32 threads



### STANDARD SIZES

TUBE SIZE	A	B	C	D	F
0.5"	0.56"	0.43"	0.56"	1.28"	1.16
0.75"	1.13"	.88"	1.13"	2.28"	2.6"
1.0"	1.13"	.88"	1.13"	2.28"	2.6"

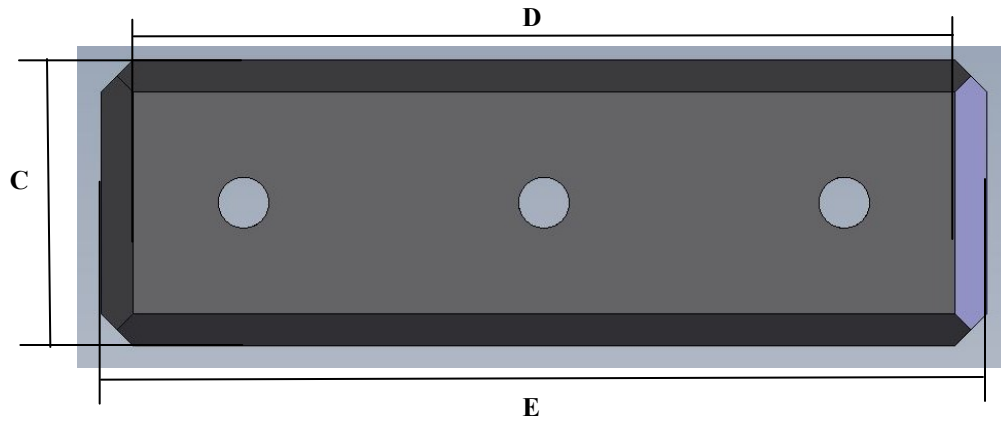
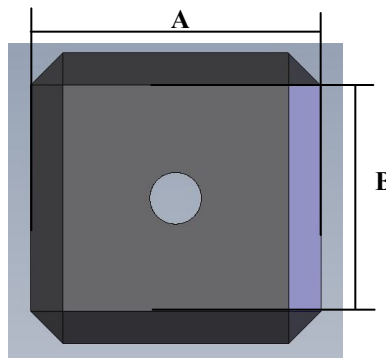


# DragonPlate™

## Material Specifications

### 1X3 Block Connector

- 0.75" and 1" uses 1/4"-20 threads
- 0.5" uses 10-32 threads



### STANDARD SIZES

TUBE SIZE	A	B	C	D	F
0.5"	0.56"	0.45"	0.56"	1.86"	2.0"
0.75"	1.13"	.88"	1.13"	3.26"	3.5"
1.0"	1.13"	.88"	1.13"	3.26"	3.5"



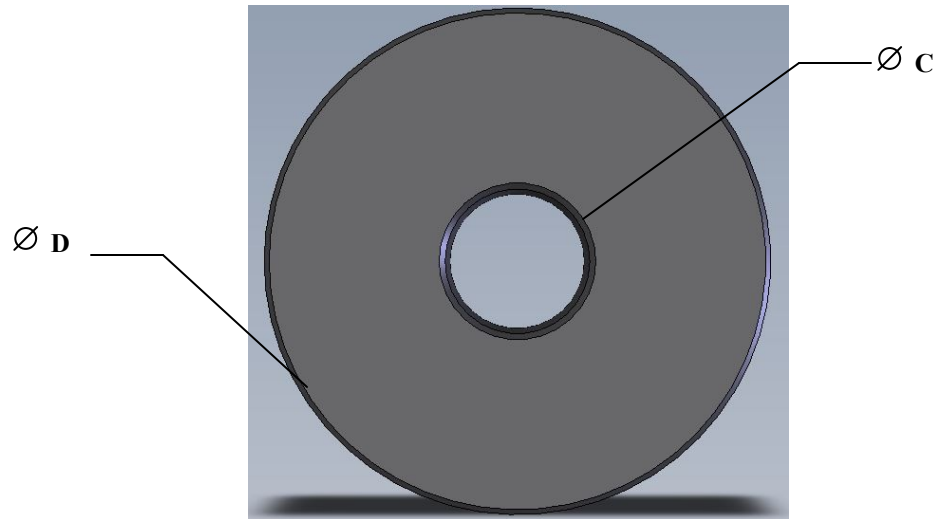
# DragonPlate™

## Material Specifications



### Spacers

- Available in two thicknesses (See A and B)



### STANDARD SIZES

TUBE SIZE	A	B	C	D
0.5"	N/A	N/A	N/A	N/A
0.75"	0.25"	0.63"	1.3"	1.5"
1.0"	N/A	N/A	N/A	N/A



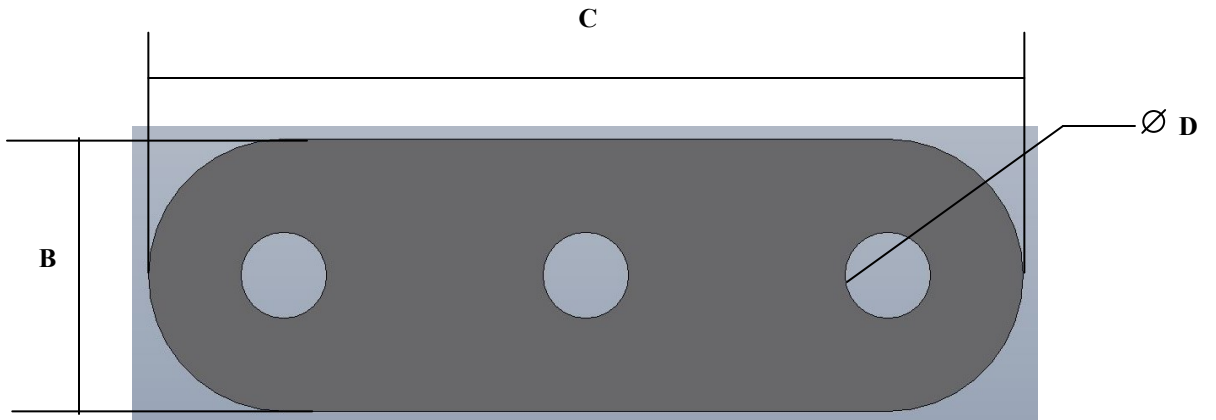
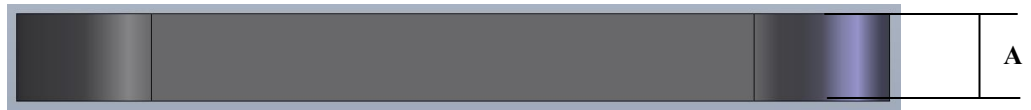


# DragonPlate™

## Material Specifications



### 3 Hole Link



### STANDARD SIZES

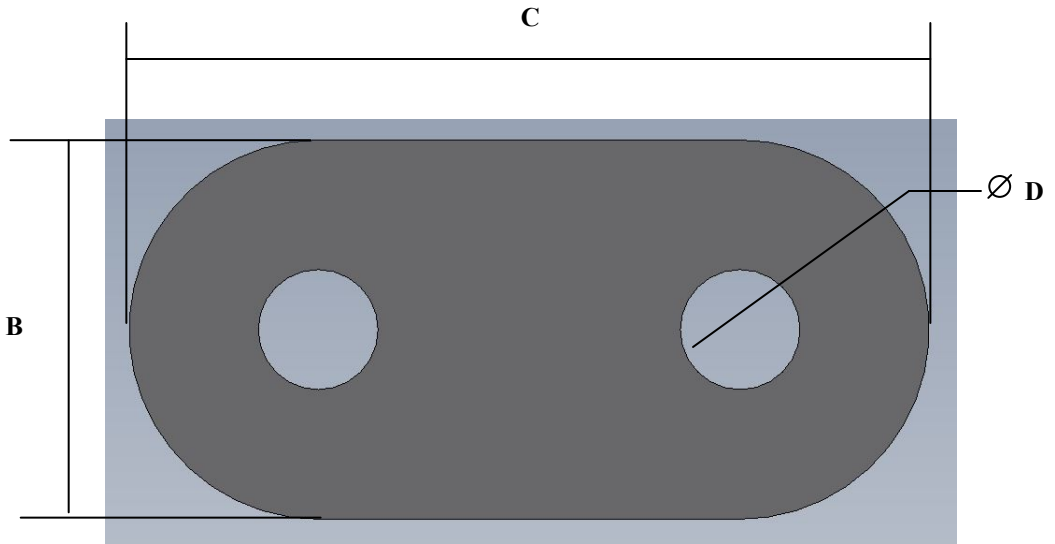
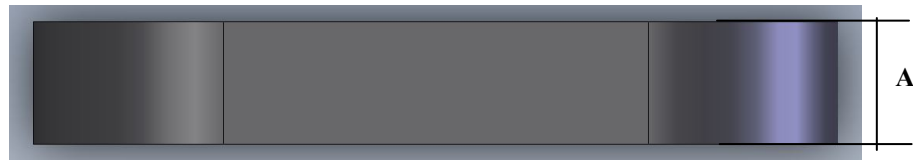
TUBE SIZE	A	B	C	D
0.5"	0.18"	0.63"	2.0"	0.19"
0.75"	0.27"	0.84"	2.72"	0.27"
1.0"	0.27"	0.84"	2.72"	0.27"



**DragonPlate™**

**Material Specifications**

**2 Hole Link**



**STANDARD SIZES**

TUBE SIZE	A	B	C	D
0.5"	0.18"	0.63"	1.33"	0.19"
0.75"	0.27"	0.84"	1.78"	0.27"
1.0"	0.27"	0.84"	1.78"	0.27"



# DragonPlate™

## Material Specifications

### Pre-Assembled Connections

To increase the capabilities of our connectors, we also offer complex and pre-assembled connections to expand the horizons of carbon fiber's capabilities.



This kit connects two tubes using a removable pin allowing for quick connection and disconnection. This kit also comes with foam plugs to contain adhesive and enough bond line control micro glass beads to ensure a proper bond fit.

This swivel mount offers maximum adjustability of camera, Go-Pro camcorder or other hardware. Quickly set position and lock into place using lever. Standard 1/4"-20 thread fits most hardware. Mount comes with 1" end connector, foam plug to contain adhesive and enough bond line control micro glass beads to ensure a proper bond fit. Optional jam nut, if needed.



This kit includes one threaded end connector and one end connector to create a detachable coupler joint.

End mount with standard 1/4"-20 thread stud and adjustable knuckle for maximum maneuverability of connected camera or camcorder. Fits into end of our 0.75" carbon fiber tubes. Mount also comes with a foam plug to contain adhesive and enough bond line control micro glass beads to ensure a proper bond fit.



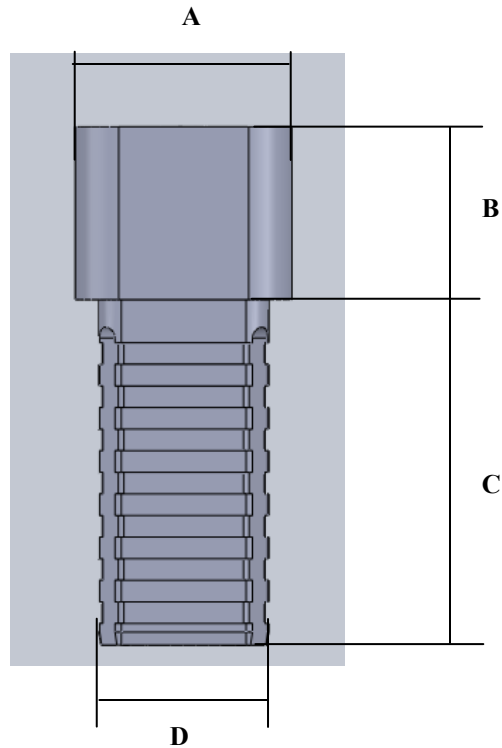


# DragonPlate™

## Material Specifications

### Square Threaded End Connector

- 0.5" connector uses 10-32 thread
- All other sizes use 1/4"-20 thread



#### STANDARD SIZES

TUBE SIZE	A	B	C	D
0.75"	1.00"	0.75"	1.50"	0.73"
1.0"	1.25"	1.0"	2.00"	0.98"



# DragonPlate™

## Material Specifications

### Pultruded Carbon Fiber Modular Connectors

Dragonplate has developed multiple methods for building carbon fiber structures. One method is to use our 0.5" round pultruded tubing. This method allows for customizable structures, with varying heights, widths, depths, cell sizes, and lengths to meet your specific design criteria.

Trusses assembled from our 0.5" tubing connectors provide a cost effective method of manufacture and an extremely stiff lightweight structure. Trusses built from our 0.5" pultruded tubing connectors should be considered light duty and should not be used in aircraft, man carrying or other high risk structures.

Truss structures can be used for wide variety of applications. They are used primarily for Structural applications. But did you know that that truss structures can also be beautiful? Using DragonPlate truss materials, it is possible to create complex frames for many different uses such as furniture.

Using our quick-release connectors you are also able to create carbon fiber structures that can be disassembled for transport and then easily reassembled.

We recommend Scotch-Weld 2216 adhesive for bonding these connectors to the carbon fiber tubes



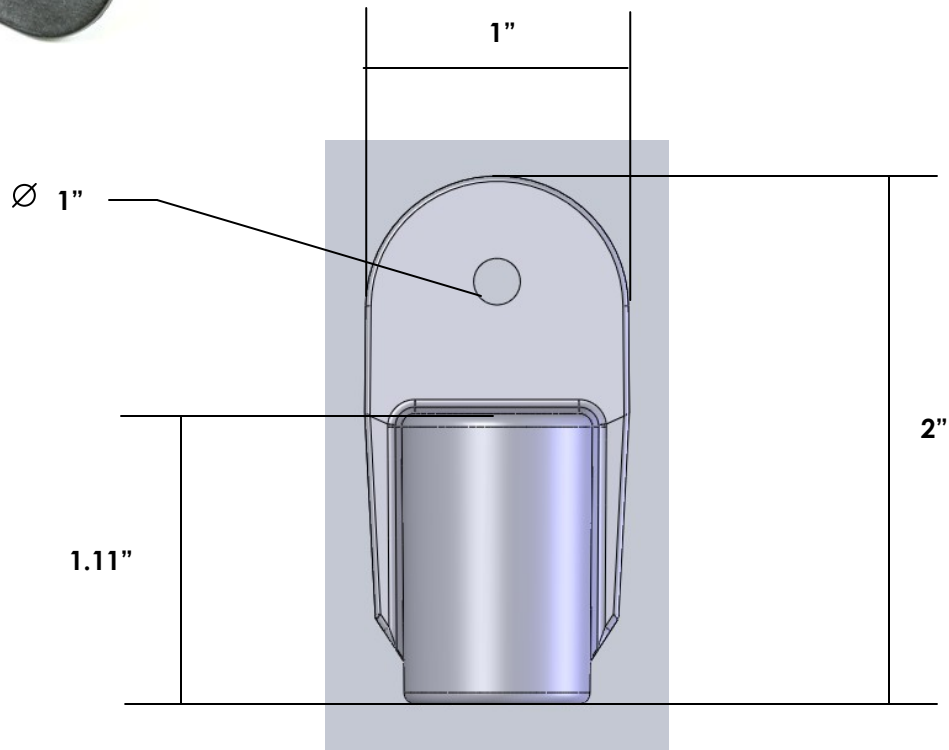


# DragonPlate™

## Material Specifications

### 0.5" Multi-Angle Pultruded Tube End Connector

- Fits .5" OD tube or rod



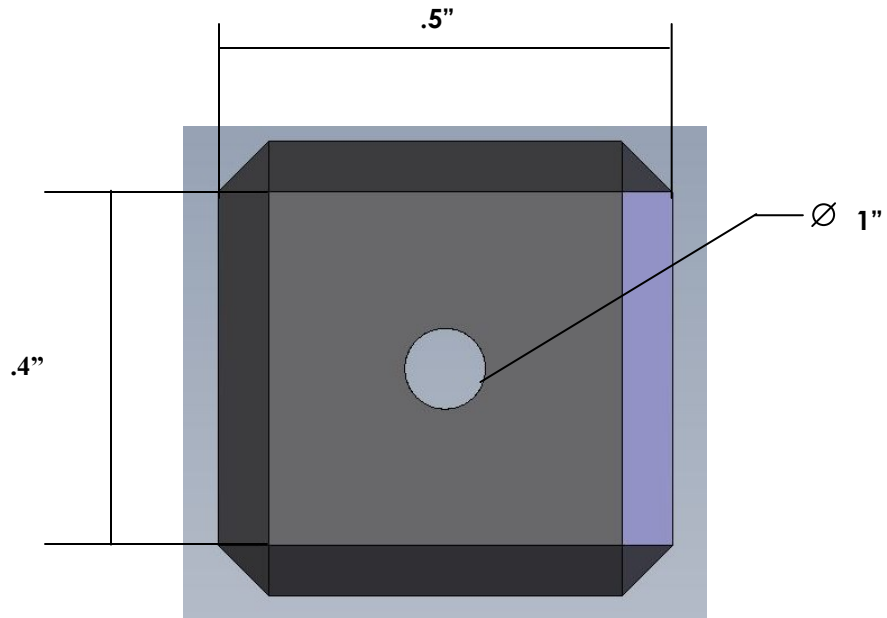


# DragonPlate™

## Material Specifications

### 0.5" Pultruded Cube Connector

- Holes are threaded with 8-32 threads



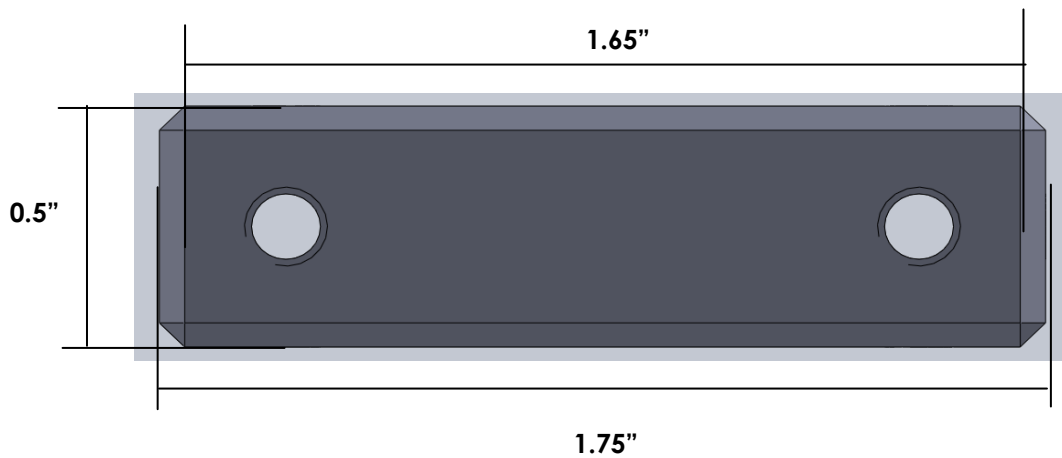
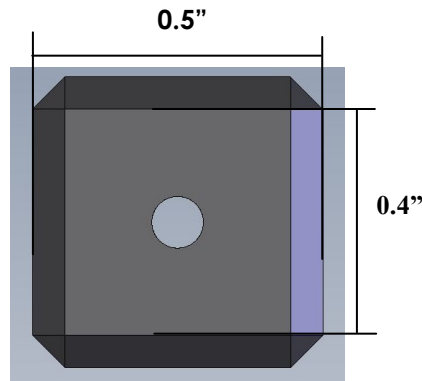


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## Material Specifications

### 1X2 Block Pultruded Connector

- Holes are threaded with 8-32 threads





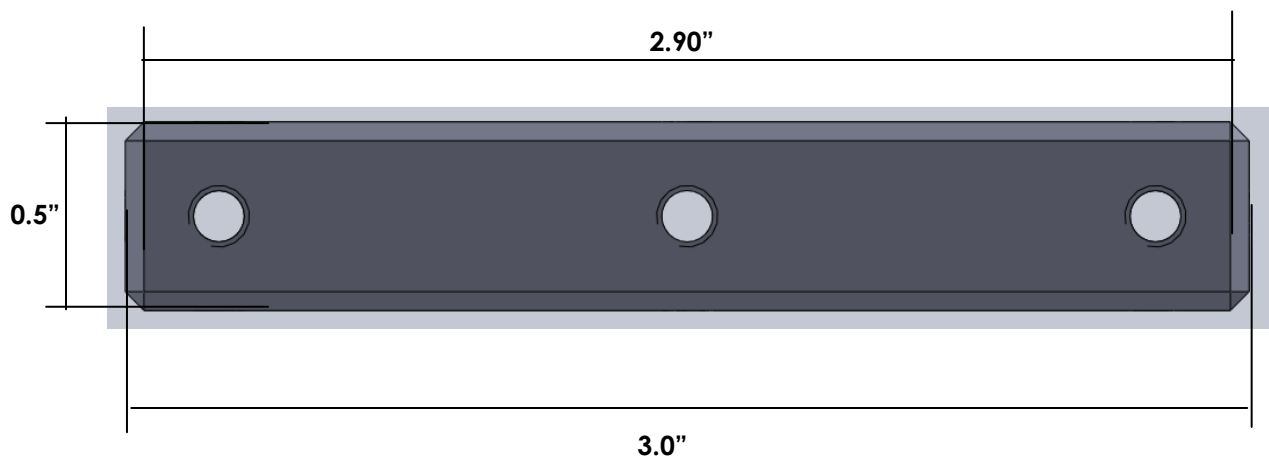
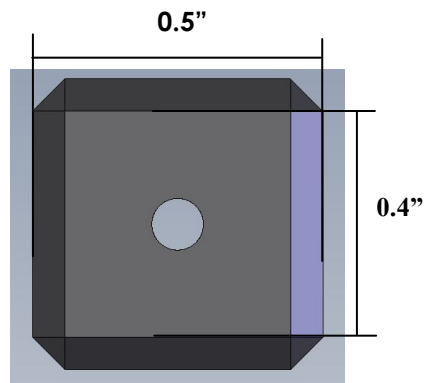


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## Material Specifications

### 1X3 Block Pultruded Connector

- Holes are threaded with 8-32 threads



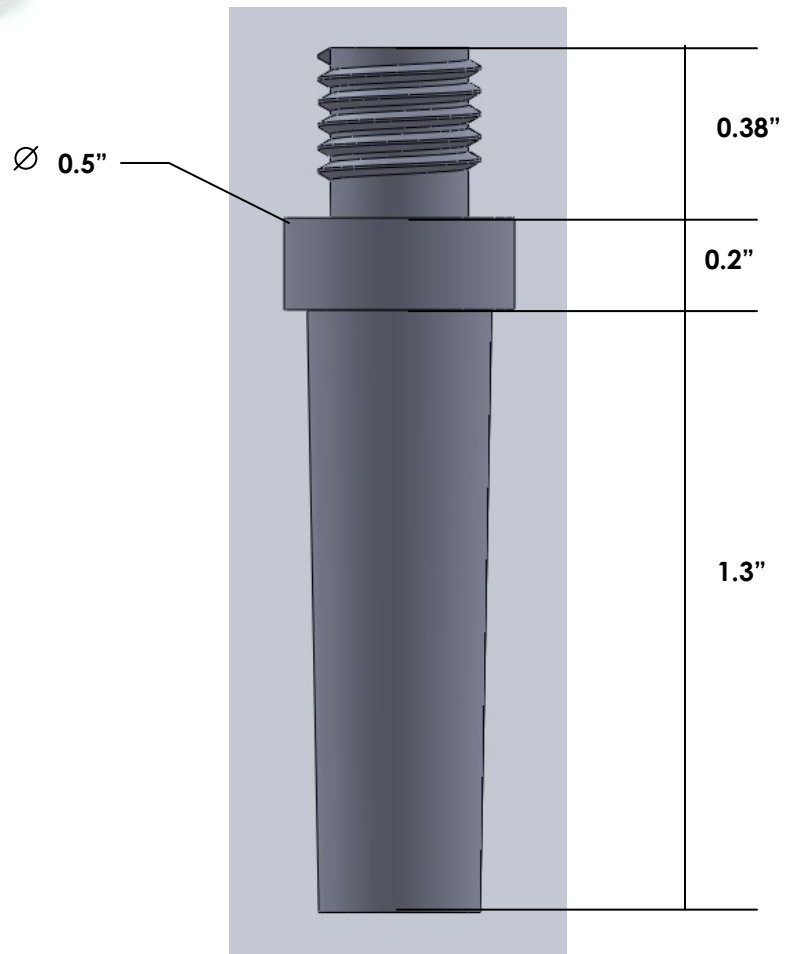


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## Material Specifications

### 0.5" Threaded Pultruded Tube Connector (Male)

- Fits .5" OD x 0.4" ID rod
- Thread is 3/8-20





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## Material Specifications

### 0.5" Threaded Pultruded Tube Connector (Female)

- Fits .5" OD x 0.4" ID rod
- Thread is 3/8-20



Ø 0.5"

0.38"

1.3"

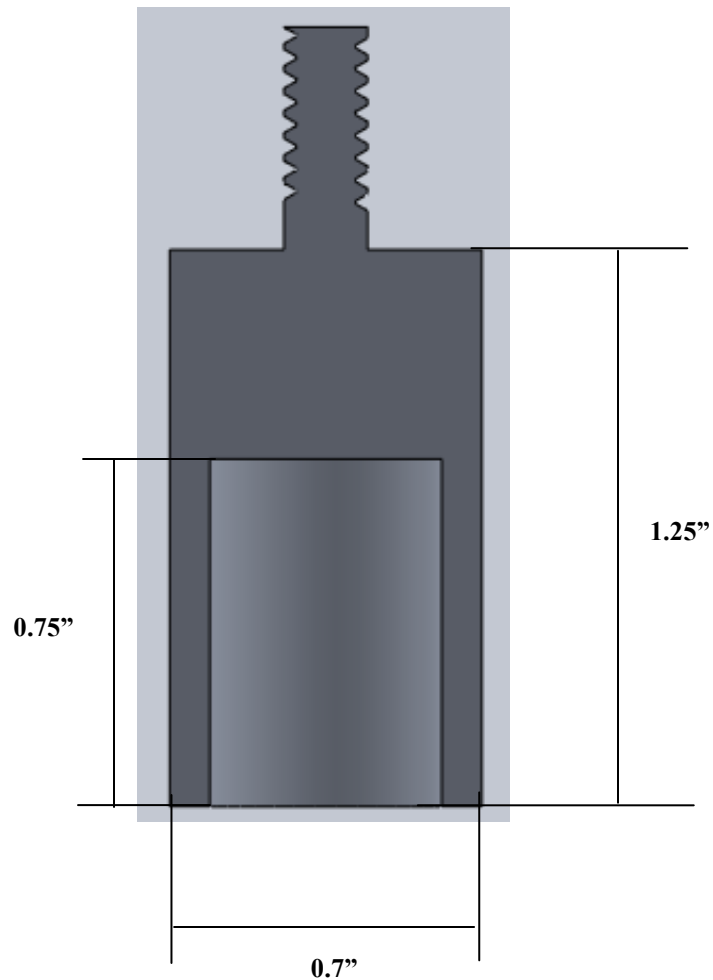


# DragonPlate™

## Material Specifications

### 0.5" OD Pultruded Threaded End Connector (Male and female)

- Fits .5" OD tube or rod
- Comes in 1/4"-20, 10-32, 8-32 thread for both male and female
- Males come as 0.25" or 0.5" length studs





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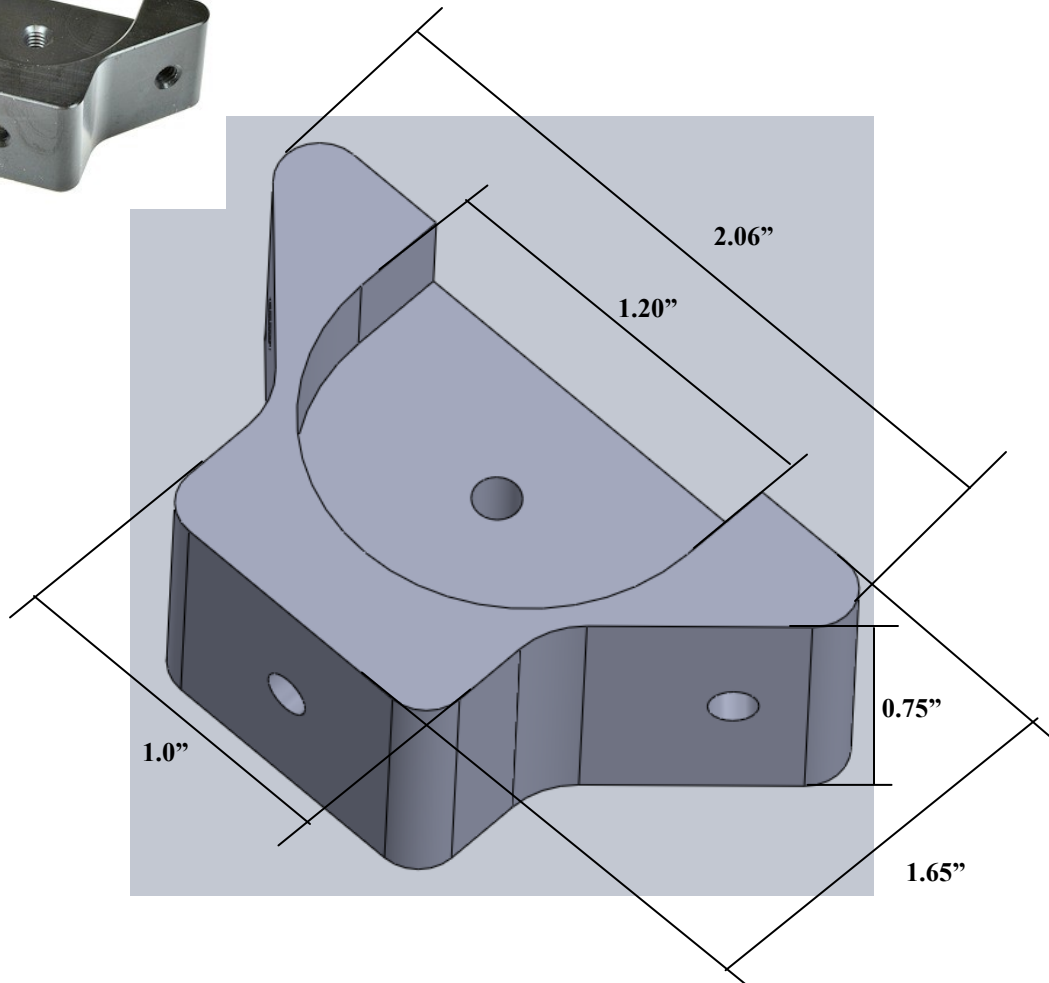
## Material Specifications

### Corner Maker for 0.5" OD Pultruded Tubes

- Fits .5" OD tube or rod
- 8-32 thread



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## Material Specifications

### Pultruded Quick Connections

Pultruded tube quick disconnects allow multiple Dragonplate ½" pultruded carbon fiber tubes to be attached together to form longer tubes or structures. This system is useful for creating long truss structures comprised of shorter sections of up to 8 feet in length. Applications include camera boom arms, lighting fixtures, or inspection tools that break down into easily transportable segments.



**This quick connector is the rotating version that allows rotation when engaged.**



# DragonPlate™

## Material Specifications

### Pultruded Carbon Fiber Molded Connectors

DragonPlate carbon tube connectors incorporate universal design, allowing the user to create extremely light-weight, light-duty structures with a large variety of angles and connections. A separate diagonal connector bonded to the end of a carbon tube can be aligned at any angle, allowing for the creation of unique and custom designed structures.

DragonPlate carbon tube connectors are designed to be used specifically with our .5" pultruded tubes. These connectors are ideal for building light weight, cost effective, and complex structures.

These patented connectors are manufactured out of carbon fiber reinforced plastic, creating an optimized cost-to-strength ratio. The connectors are designed with precision ribs to aid in controlling adhesive thicknesses. DragonPlate carbon tube connectors are designed for use with structural epoxies, specifically Scotchweld 2216. Our connectors capture the ends of the pultruded tube; this strengthens the ends of the tube and eliminates risk of splitting the carbon fiber tube.

Nylon screws and nuts are supplied to aid in the bonding process, eliminating the need for large, heavy clamps during assembly. **These screws are designed for bonding purposes only, and will not contribute to the strength of the structure. STRUCTURAL ADHESIVE MUST BE USED.**



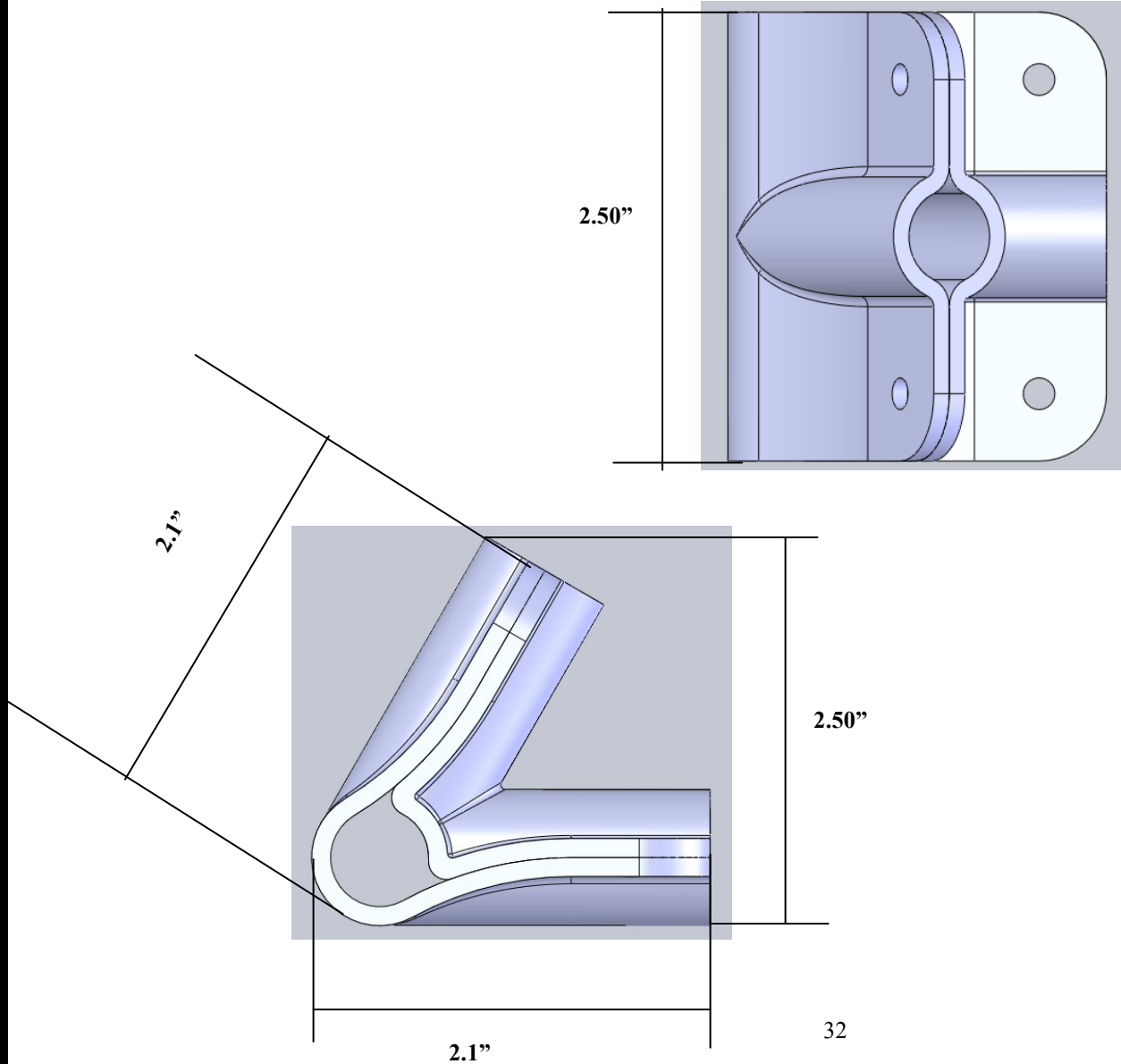


# DragonPlate™

## Material Specifications

### 0.5" Carbon Fiber Tube 60° Connector

- Fits .5" OD tube or rod





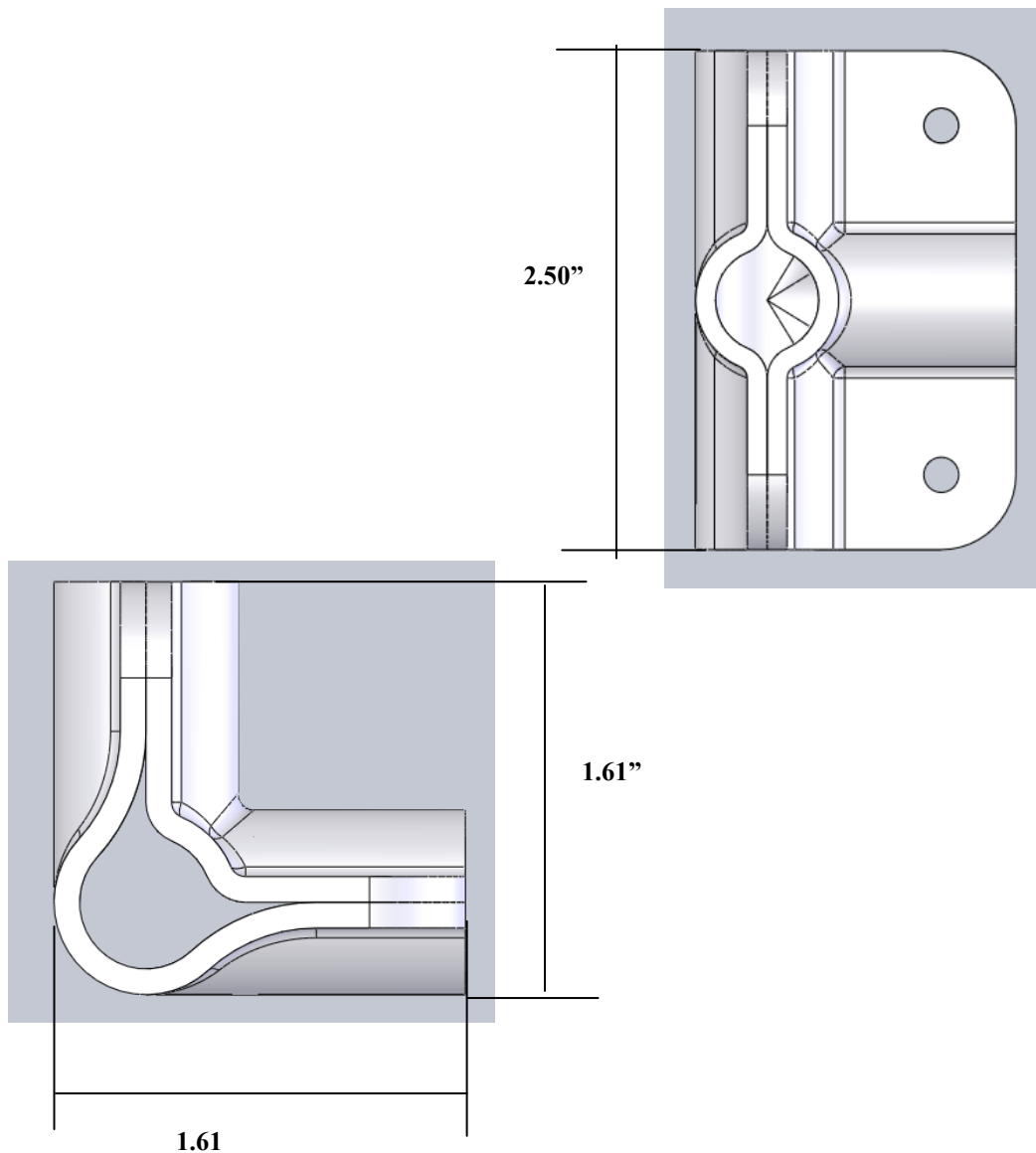


# DragonPlate™

## Material Specifications

### 0.5" Carbon Fiber Tube 90° Connector

- Fits .5" OD tube or rod



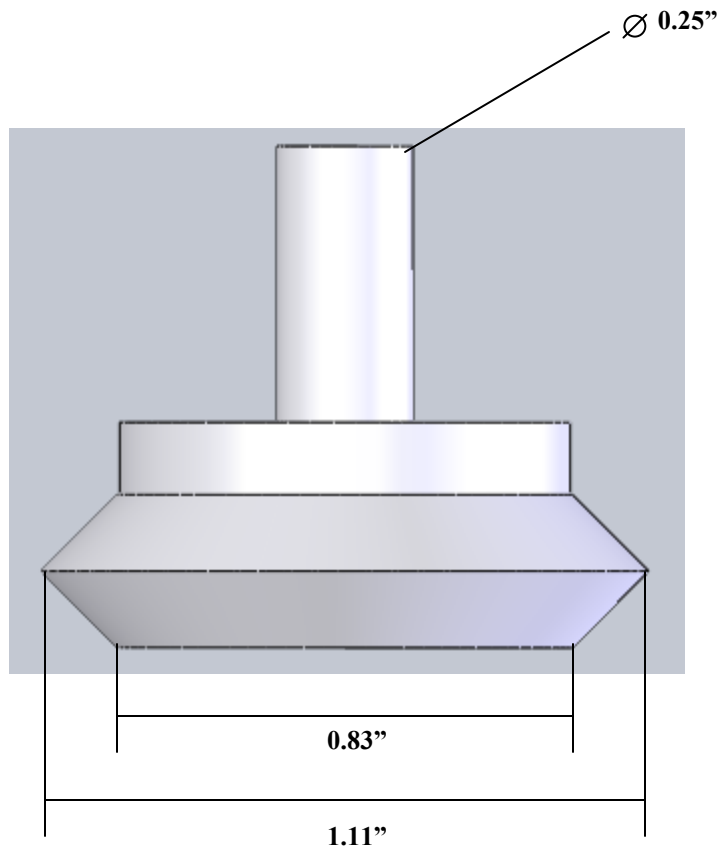


# DragonPlate™

## Material Specifications

### 0.5" Carbon Fiber Tube Foot

- Fits .5" OD tube or rod



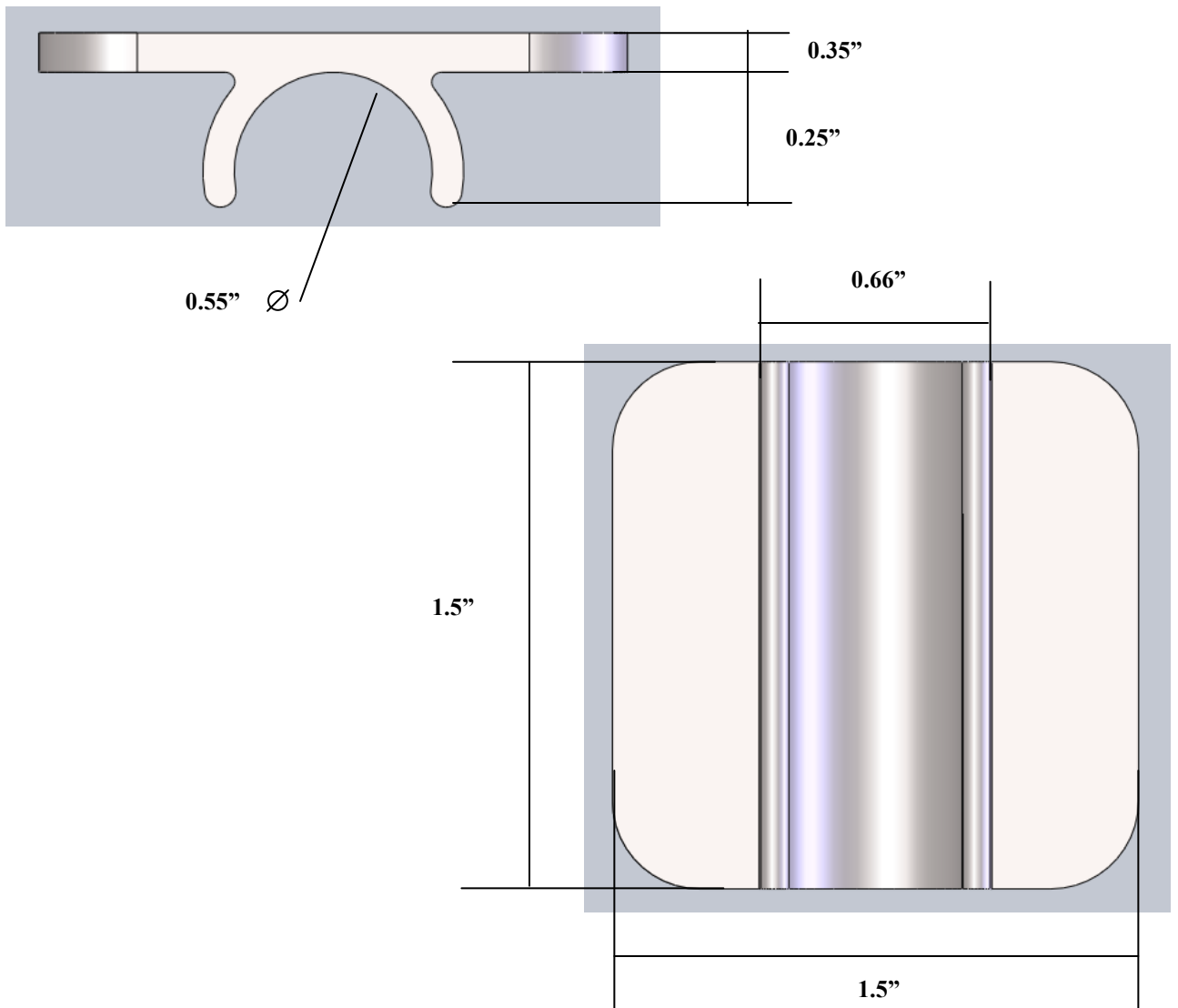


# DragonPlate™

## Material Specifications

### 0.5" Carbon Fiber Horizontal Tube Flange

- Fits .5" OD tube or rod



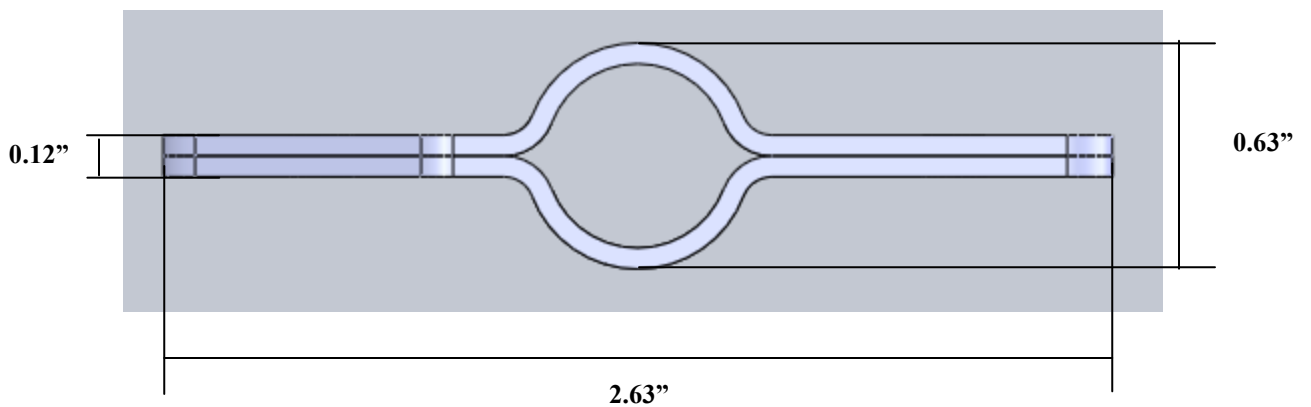
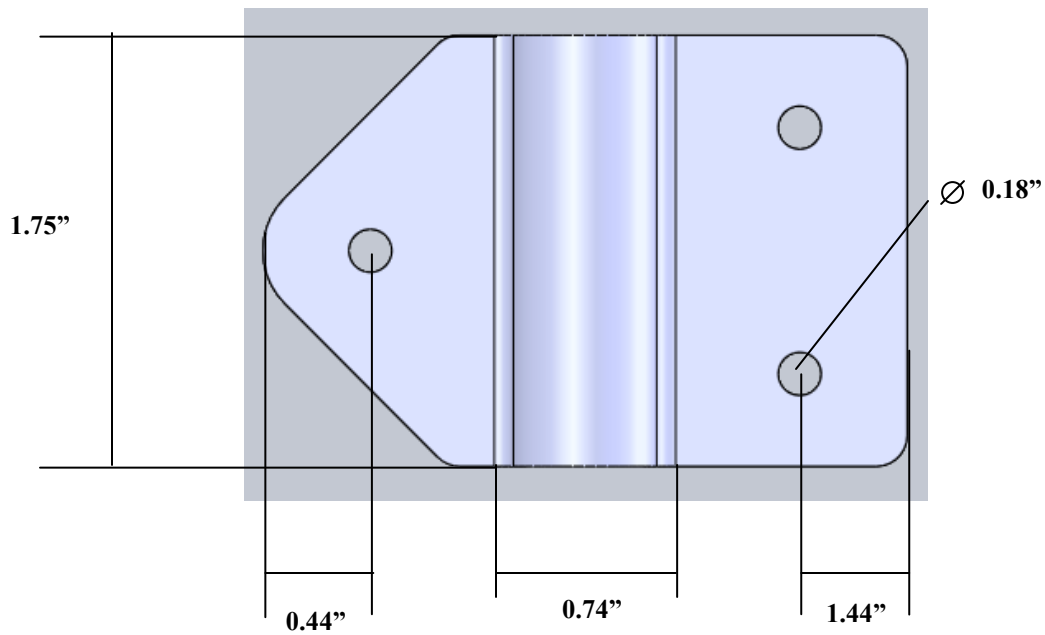


# DragonPlate™

## Material Specifications

### 0.5" Carbon Fiber Inline Multi-Angle Connector

- Fits .5" OD tube or rod



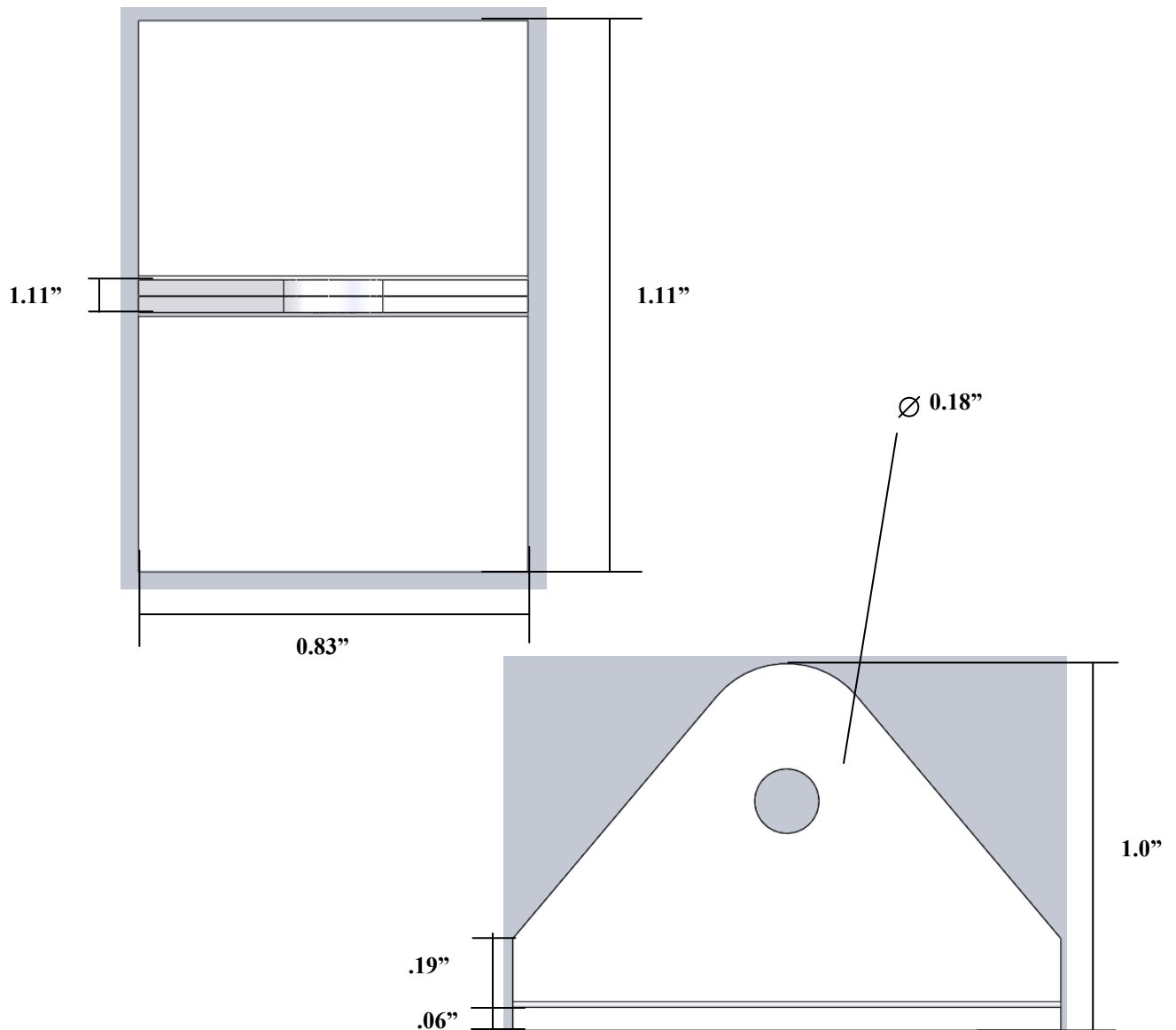


# DragonPlate™

## Material Specifications

### 0.5" Carbon Fiber Multi-Angle Connector

- Fits .5" OD tube or rod



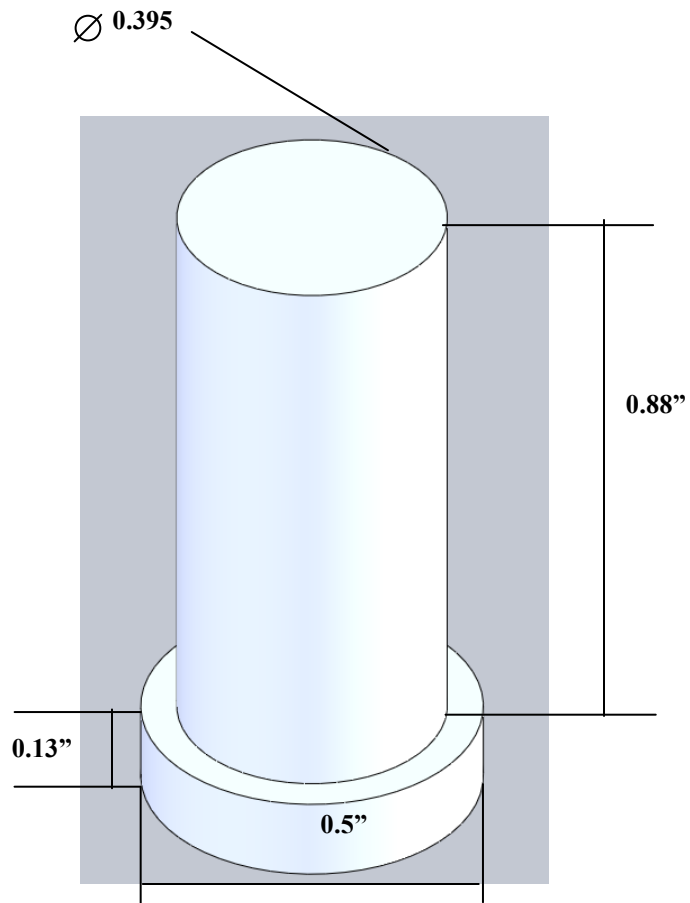


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## Material Specifications

### 0.5" Threaded Tube Insert

- Fits .5" OD tube or rod



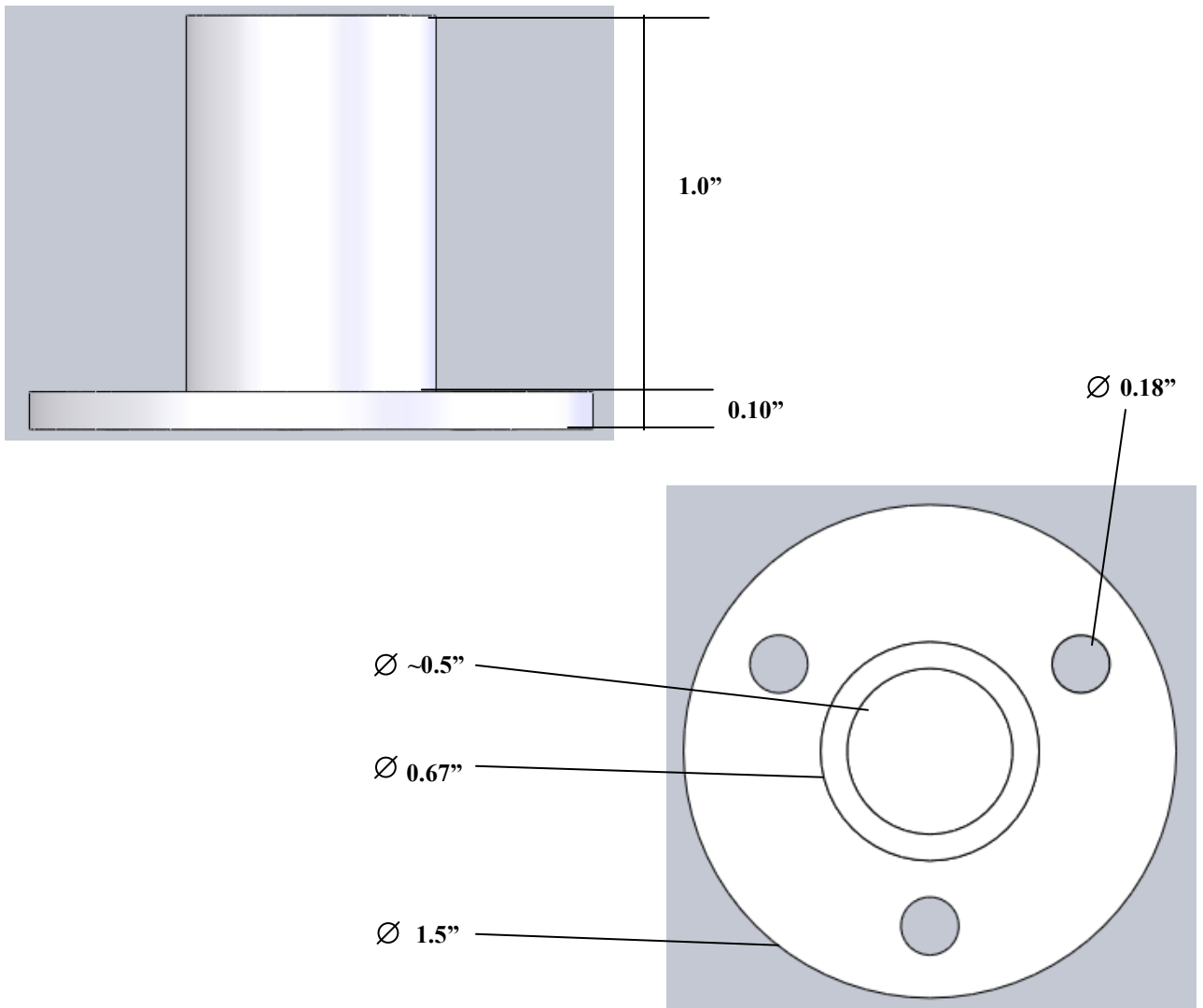


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## Material Specifications

### 0.5" Carbon Fiber Vertical Tube Flange

- Fits .5" OD tube or rod





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## Material Specifications

### Modular Connector Joints—Examples

To further inspire the creative individuals, we have compiled examples of joints that can be made using our modular connectors. Almost any design is possible, it just takes some planning and know-how. Use these examples to your advantage and get those creative ideas flowing!







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## Material Specifications

### Modular Connector Joints—Examples





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### Modular Connector Joints—Examples





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## Material Specifications

# MODULAR CONNECTOR ASSEMBLY INSTRUCTIONS

## Modular Connector Kit

Each Modular Connector Kit comes with an aluminum connector, foam plug (already inserted into the connector) and enough microspheres to ensure proper bond fit.

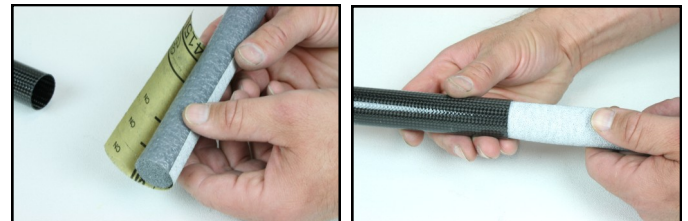
You will also need a two-part epoxy (we recommend 3M Scotch-weld 2216) sold separately.



## Step 1: Sand Bonding Area

Wrap 150 grit sandpaper around the included foam sanding tool and insert into end of tube. Scuff inside of tube to the appropriate depth. Sand hard enough to break the skin of epoxy resin. Do not sand too deeply as the result may cut or damage underlying fibers. This will compromise the integrity of the carbon fiber tube.

Also scuff outside of connector with sandpaper.



## Step 2: Clean Surfaces

The pieces must be cleaned to remove any contaminants. Wipe components to be bonded (inside of tube, and connector) with a solvent such as acetone or isopropyl alcohol to remove all dust, dirt, and grease.



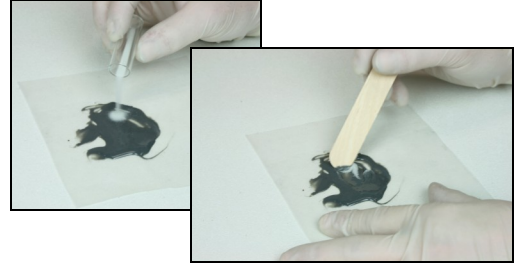


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## Material Specifications

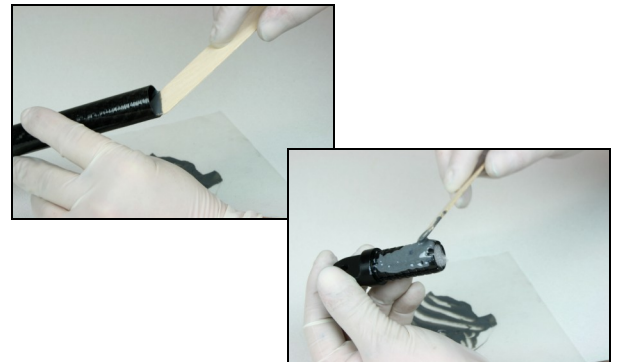
### Step 3: Mixing Epoxy & Microspheres

Mix epoxy according to manufactures instructions and add supplied microspheres. Mix ratio of microspheres is 10% by weight. For example, 0.3 grams of microspheres per 3 grams of epoxy.



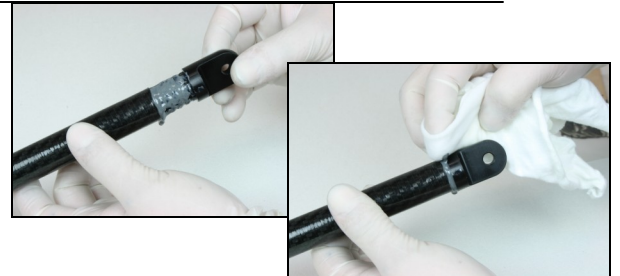
### Step 4: Apply Epoxy

First apply epoxy to the inside of the tube, making sure to get equal coverage to a sufficient depth. Next evenly spread the epoxy on the connector legs.



### Step 5: Insert Connector

Insert connector into tube and remove excess epoxy with a cloth dampened with isopropyl alcohol, acetone, or MEK.



### Step 6: Allow to Cure

Apply masking tape over connector to secure until epoxy has fully cured.

Allow connector to cure overnight at room temperature (75 degrees F). Faster cures are obtained using elevated temperatures. Refer to the tech sheet for your epoxy for further information on cure times.





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### Modular Connector Weights - Ounces

Connector Type	Connector Size				
	.5"	.625"	.75"	.875"	1.0"
Single Sided Female Clevis	0.27	-	0.85	-	1.79
Female Clevis	0.35	-	1.04	-	2.3
Male Clevis	0.29	-	0.96	-	2.09
Threaded End Connector	0.315	0.685	1.15	1.11	2.14
Threaded End Connector with Stud L	0.41	~1.01	1.58	~1.44	2.37
Threaded End Connector with Stud S	-	-	1.27	-	-
Swivel Joint	-	-	7.45	-	8.5
Heim Joint	-	-	2.14	-	3.21
Cube	0.15	-	1.77	-	1.77
1X2 Block	0.49	-	3.99	-	3.99
1X3 Block	0.79	-	6.21	-	6.21
1/4" Spacer	-	-	0.21	-	-
5/8" Spacer	-	-	0.53	-	-
3 Hole Link	0.3	-	0.82	-	2.03
2 Hole Link	0.19	-	0.52	-	1.19
Multi-Angle (Duck Bill)	0.26				
Cube	0.15				
1X2 Block	0.58				
1X3 Block	1.02				
Threaded End Connectors (Tube and Rod)	0.48				
Threaded End Connectors with short stud	0.57				
Threaded End Connectors with long stud	0.64				
Corner Maker for 0.5" OD Pultruded Tubes	1.46				
Pultruded Spacer	0.06				
Pultruded 3-hole connector	0.43				