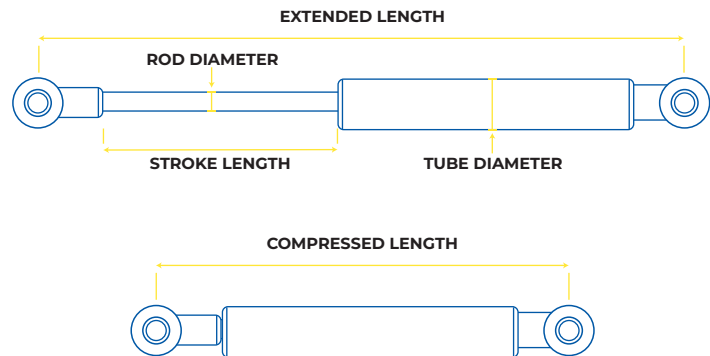


# Universal Catalog Fitment Guide

**Follow these easy steps to select the best universal replacement for your application:**

1. Measure extended length
2. Measure compressed length (or stroke length)
3. Identify end connector type (eyelet or ball socket)
4. Select the Tuff Support part number from this chart that most closely matches your measurements



## Important Notes

- Measure from the center of the attachment points
- Not all gas springs can be compressed by hand – you may need to take the compressed measurement while the gas spring is still installed in the application
- Always replace gas springs in pairs if there are two used in the application
- Install the new gas spring in the same orientation (rod and reservoir ends installed as they were originally)

## Helpful Conversions

### Newton to Pounds

Newton/4.448 = Force in Pounds

### Pounds to Newton

Pounds \* 4.448 = Force in Newtons

### Millimeters to Inches

Millimeters/25.4 = Length in inches

### Inches to Millimeters

Inches \* 25.4 = Length in Millimeters

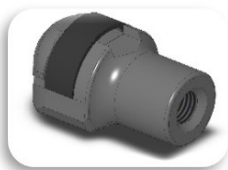
## End Connector Identification



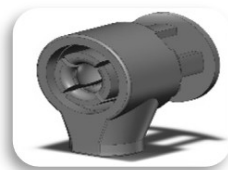
**BSP**  
10mm Standard Plastic  
Ball Socket M6/M8



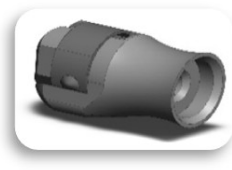
**BSP Ø8**  
8mm Plastic Standard  
Ball Socket



**BSP Palio**  
10mm Compact Plastic  
Ball Socket M6/M8



**BSP PB**  
Push Button 10mm  
Ball Socket



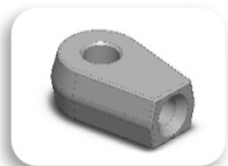
**BSP WN**  
BSP WN 10mm Plastic  
Ball Socket



**BSS**  
Standard 10mm Steel  
Ball Socket M6/M8



**EYELET**  
Eyelet End Fitting M6/M8,  
Various Diameters of the  
Hole



**ZAMAK**  
Zamak Eyelet End  
Fitting M6/M8



**BSP EZ**  
10mm Easy Release  
Plastic Ball Socket



**BSS Ø13**  
Standard 13mm Steel  
Ball Socket M6/M8

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format     | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|--------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                    |                       |                 |
| 4.7           | 3.70       | 1      | 6           | 15           | 33.71       | 150      | Metal End 8mm      | Metal End 8mm         | 614494          |
| 5.9           | 3.70       | 2.2    | 6           | 15           | 33.71       | 150      | Metal End 8mm      | Metal End 8mm         | 614493          |
| 6.5           | 4.90       | 1.6    | 6           | 15           | 11.24       | 50       | Metal End 10mm     | Metal End 10mm        | 614496          |
| 6.9           | 5.10       | 1.8    | 8           | 18           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 614356          |
| 7.4           | 5.10       | 2.4    | 6           | 15           | 76.4        | 340      | Composite End 10mm | Composite End Fitting | 614488          |
| 7.5           | 5.50       | 2      | 6           | 15           | 20          | 89       | Composite End 10mm | Composite End Fitting | 614473          |
| 7.5           | 5.40       | 2.1    | 6           | 15           | 24.94       | 111      | Composite End 10mm | Composite End Fitting | 614471          |
| 7.5           | 5.30       | 2.2    | 6           | 15           | 34.83       | 155      | Composite End 10mm | Composite End Fitting | 614480          |
| 7.5           | 5.50       | 2      | 6           | 15           | 40          | 178      | Composite End 10mm | Composite End Fitting | 614481          |
| 7.5           | 5.40       | 2.1    | 6           | 15           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 614470          |
| 7.5           | 5.30       | 2.2    | 6           | 15           | 60.67       | 270      | Composite End 10mm | Composite End Fitting | 614475          |
| 7.5           | 5.50       | 2      | 6           | 15           | 80          | 356      | Composite End 10mm | Composite End Fitting | 614477          |
| 8             | 5.40       | 2.6    | 6           | 15           | 69.66       | 310      | Eyelet End         | Eyelet End Fitting    | 614388          |
| 9.6           | 6.50       | 3.2    | 6           | 15           | 64.94       | 289      | Composite End 10mm | Composite End Fitting | 614386          |
| 9.6           | 6.50       | 3.2    | 6           | 15           | 79.78       | 355      | Composite End 10mm | Composite End Fitting | 614375          |
| 9.6           | 6.50       | 3.2    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 614374          |
| 9.7           | 6.50       | 3.2    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 614364          |
| 10            | 7.00       | 3      | 6           | 15           | 20          | 89       | Eyelet End         | Eyelet End Fitting    | 614261          |
| 10            | 6.80       | 3.2    | 6           | 15           | 20.22       | 90       | Composite End 10mm | Composite End Fitting | 614267          |
| 10            | 6.10       | 3.9    | 6           | 15           | 25.84       | 115      | Composite End 10mm | Composite End Fitting | 614258          |
| 10            | 6.80       | 3.2    | 6           | 15           | 25.84       | 115      | Eyelet End         | Eyelet End Fitting    | 614305          |
| 10            | 6.60       | 3.4    | 6           | 15           | 34.83       | 155      | Composite End 10mm | Composite End Fitting | 614291          |
| 10            | 6.80       | 3.2    | 6           | 15           | 40          | 178      | Eyelet End         | Eyelet End Fitting    | 614273          |
| 10            | 6.40       | 3.6    | 6           | 15           | 40          | 178      | Composite End 10mm | Composite End Fitting | 614307          |
| 10            | 6.50       | 3.5    | 6           | 15           | 49.44       | 220      | Composite End 10mm | Composite End Fitting | 614322          |
| 10            | 6.80       | 3.2    | 6           | 15           | 50.56       | 225      | Eyelet End         | Eyelet End Fitting    | 614301          |
| 10            | 6.50       | 3.5    | 6           | 15           | 55.06       | 245      | Composite End 10mm | Composite End Fitting | 614294          |
| 10            | 6.80       | 3.2    | 6           | 15           | 60          | 267      | Eyelet End         | Eyelet End Fitting    | 614269          |
| 10            | 6.10       | 3.9    | 6           | 15           | 60.67       | 270      | Composite End 10mm | Composite End Fitting | 614053          |
| 10            | 6.50       | 3.5    | 6           | 15           | 64.27       | 286      | Composite End 10mm | Composite End Fitting | 614204          |
| 10            | 6.80       | 3.2    | 6           | 15           | 69.89       | 311      | Eyelet End         | Eyelet End Fitting    | 614297          |
| 10            | 6.30       | 3.7    | 8           | 18           | 78.88       | 351      | Composite End 10mm | Composite End Fitting | 614285          |
| 10            | 6.10       | 3.9    | 6           | 15           | 80          | 356      | Composite End 10mm | Composite End Fitting | 613661          |
| 10            | 6.80       | 3.2    | 6           | 15           | 80          | 356      | Eyelet End         | Eyelet End Fitting    | 614265          |
| 10            | 6.50       | 3.5    | 6           | 15           | 81.57       | 363      | Composite End 10mm | Composite End Fitting | 614202          |
| 10            | 6.50       | 3.5    | 6           | 15           | 84.49       | 376      | Composite End 10mm | Composite End Fitting | 614216          |
| 10            | 6.80       | 3.2    | 6           | 15           | 89.89       | 400      | Eyelet End         | Eyelet End Fitting    | 614293          |
| 10            | 6.40       | 3.6    | 6           | 15           | 100         | 445      | Composite End 10mm | Composite End Fitting | 614303          |
| 10            | 6.40       | 3.6    | 6           | 15           | 100         | 445      | Eyelet End         | Eyelet End Fitting    | 614304          |
| 10            | 6.80       | 3.2    | 6           | 15           | 110.11      | 490      | Eyelet End         | Eyelet End Fitting    | 614289          |
| 10            | 6.50       | 3.5    | 8           | 18           | 120.22      | 535      | Composite End 10mm | Composite End Fitting | 614186          |
| 10            | 6.50       | 3.5    | 8           | 18           | 174.16      | 775      | Composite End 10mm | Composite End Fitting | 614280          |
| 10            | 7.00       | 3      | 10          | 22           | 188.76      | 840      | Composite End 10mm | Composite End Fitting | 614282          |
| 11            | 7.00       | 4      | 6           | 15           | 24.72       | 110      | Composite End 10mm | Composite End Fitting | 614140          |

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format     | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|--------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                    |                       |                 |
| 11            | 7.00       | 4      | 6           | 15           | 31.01       | 138      | Composite End 10mm | Composite End Fitting | 614154          |
| 11            | 7.00       | 3.9    | 8           | 18           | 35.73       | 159      | Composite End 10mm | Composite End Fitting | 614162          |
| 11            | 7.00       | 4      | 6           | 15           | 35.96       | 160      | Composite End 10mm | Composite End Fitting | 614139          |
| 11            | 7.00       | 4      | 6           | 15           | 35.96       | 160      | Composite End 10mm | Composite End Fitting | 614152          |
| 11            | 7.00       | 4      | 6           | 15           | 69.66       | 310      | Composite End 10mm | Composite End Fitting | 614138          |
| 11            | 7.00       | 4      | 6           | 15           | 75.28       | 335      | Composite End 10mm | Composite End Fitting | 614146          |
| 11            | 7.00       | 4      | 8           | 18           | 110.11      | 490      | Composite End 10mm | Composite End Fitting | 614263          |
| 11.2          | 7.40       | 3.8    | 6           | 15           | 15.73       | 70       | Composite End 10mm | Composite End Fitting | 614260          |
| 11.8          | 7.30       | 4.5    | 6           | 15           | 67.42       | 300      | Composite End 8mm  | Composite End 8mm     | 614016          |
| 11.9          | 8.10       | 3.8    | 8           | 18           | 124.94      | 556      | Composite End 10mm | Composite End Fitting | 614272          |
| 12            | 8.50       | 3.5    | 6           | 15           | 20          | 89       | Composite End 10mm | Composite End Fitting | 613941          |
| 12            | 8.50       | 3.5    | 6           | 15           | 29.89       | 133      | Composite End 10mm | Composite End Fitting | 613949          |
| 12            | 8.10       | 3.9    | 8           | 18           | 30.34       | 135      | Composite End 10mm | Composite End Fitting | 613973          |
| 12            | 7.90       | 4.1    | 6           | 15           | 34.83       | 155      | Composite End 10mm | Composite End Fitting | 613950          |
| 12            | 8.10       | 3.9    | 6           | 15           | 40          | 178      | Composite End 10mm | Composite End Fitting | 613937          |
| 12            | 7.50       | 4.5    | 8           | 18           | 42.7        | 190      | Composite End 10mm | Composite End Fitting | 613919          |
| 12            | 8.10       | 3.9    | 8           | 18           | 55.06       | 245      | Composite End 10mm | Composite End Fitting | 613969          |
| 12            | 8.50       | 3.5    | 6           | 15           | 60          | 267      | Composite End 10mm | Composite End Fitting | 613945          |
| 12            | 7.60       | 4.4    | 8           | 18           | 60          | 267      | Composite End 10mm | Composite End Fitting | 618947          |
| 12            | 8.10       | 3.9    | 8           | 18           | 69.89       | 311      | Composite End 10mm | Composite End Fitting | 613965          |
| 12            | 8.10       | 3.9    | 6           | 15           | 80          | 356      | Composite End 10mm | Composite End Fitting | 613933          |
| 12            | 8.10       | 3.9    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 613961          |
| 12            | 8.10       | 3.9    | 8           | 18           | 100         | 445      | Composite End 10mm | Composite End Fitting | 613929          |
| 12            | 8.10       | 3.9    | 8           | 18           | 110.11      | 490      | Composite End 10mm | Composite End Fitting | 613957          |
| 12            | 8.50       | 3.5    | 8           | 18           | 120.22      | 535      | Composite End 10mm | Composite End Fitting | 613604          |
| 12            | 8.50       | 3.5    | 8           | 18           | 150.56      | 670      | Composite End 10mm | Composite End Fitting | 613605          |
| 12.5          | 7.80       | 4.7    | 8           | 18           | 66.29       | 295      | Composite End 10mm | Composite End Fitting | 613854          |
| 12.8          | 8.10       | 4.7    | 8           | 18           | 30.56       | 136      | Composite End 10mm | Composite End Fitting | 613924          |
| 12.8          | 8.10       | 4.7    | 8           | 18           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 613834          |
| 12.8          | 8.10       | 4.7    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 613835          |
| 13            | 7.90       | 5.1    | 8           | 18           | 17.98       | 80       | Threaded End       | Threaded End          | 613782          |
| 13            | 7.90       | 5.1    | 8           | 18           | 17.98       | 80       | Threaded End       | Threaded End          | 613784          |
| 13            | 8.00       | 5      | 6           | 15           | 25.17       | 112      | Composite End 10mm | Composite End Fitting | 613792          |
| 13            | 8.00       | 5      | 6           | 15           | 35.96       | 160      | Composite End 10mm | Composite End Fitting | 613848          |
| 13            | 7.90       | 5.1    | 6           | 15           | 55.06       | 245      | Composite End 10mm | Composite End Fitting | 613823          |
| 13            | 8.00       | 5      | 6           | 15           | 65.17       | 290      | Composite End 10mm | Composite End Fitting | 613788          |
| 13            | 8.00       | 5      | 8           | 18           | 65.17       | 290      | Composite End 10mm | Composite End Fitting | 613799          |
| 13            | 8.00       | 5      | 6           | 15           | 101.12      | 450      | Composite End 10mm | Composite End Fitting | 613796          |
| 13            | 7.90       | 5.1    | 8           | 18           | 116.85      | 520      | Composite End 10mm | Composite End Fitting | 613791          |
| 13            | 8.00       | 5      | 8           | 18           | 159.55      | 710      | Composite End 10mm | Composite End Fitting | 613798          |
| 13            | 7.90       | 5.1    | 8           | 18           | 171.91      | 765      | Composite End 10mm | Composite End Fitting | 613816          |
| 13.1          | 7.80       | 5.3    | 8           | 18           | 111.24      | 495      | Eyelet End         | Eyelet End Fitting    | 613797          |
| 13.7          | 8.10       | 5.6    | 6           | 15           | 56.18       | 250      | Composite End 10mm | Composite End Fitting | 613735          |
| 14            | 8.60       | 5.4    | 8           | 18           | 25.17       | 112      | Composite End 10mm | Composite End Fitting | 614264          |

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format     | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|--------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                    |                       |                 |
| 14            | 8.60       | 5.4    | 8           | 18           | 37.08       | 165      | Composite End 10mm | Composite End Fitting | 613728          |
| 14            | 8.50       | 5.5    | 8           | 18           | 66.29       | 295      | Composite End 10mm | Composite End Fitting | 613726          |
| 14            | 8.40       | 5.6    | 8           | 18           | 122.47      | 545      | Composite End 10mm | Composite End Fitting | 613760          |
| 14            | 8.30       | 5.8    | 8           | 18           | 130.34      | 580      | Composite End 10mm | Composite End Fitting | 613704          |
| 14.4          | 8.90       | 5.5    | 8           | 18           | 33.71       | 150      | Eyelet End         | Eyelet End Fitting    | 613672          |
| 14.4          | 8.90       | 5.5    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 613954          |
| 14.5          | 9.00       | 5.5    | 8           | 18           | 24.94       | 111      | Composite End 10mm | Composite End Fitting | 613601          |
| 14.5          | 8.80       | 5.7    | 8           | 18           | 32.58       | 145      | Composite End 10mm | Composite End Fitting | 613633          |
| 14.5          | 11.50      | 3      | 6           | 15           | 35.06       | 156      | Composite End 10mm | Composite End Fitting | 613615          |
| 14.5          | 9.30       | 5.2    | 8           | 18           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 613629          |
| 14.5          | 9.30       | 5.2    | 8           | 18           | 60.67       | 270      | Composite End 10mm | Composite End Fitting | 613625          |
| 14.5          | 8.50       | 6      | 8           | 18           | 75.28       | 335      | Composite End 10mm | Composite End Fitting | 613620          |
| 14.5          | 9.50       | 5      | 6           | 15           | 80          | 356      | Composite End 10mm | Composite End Fitting | 613623          |
| 14.5          | 9.30       | 5.2    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 613597          |
| 14.5          | 9.30       | 5.2    | 8           | 18           | 100         | 445      | Composite End 10mm | Composite End Fitting | 613617          |
| 14.5          | 8.30       | 6.2    | 8           | 18           | 120.22      | 535      | Composite End 10mm | Composite End Fitting | 613616          |
| 14.5          | 9.00       | 5.5    | 10          | 22           | 224.72      | 1000     | Composite End 10mm | Composite End Fitting | 613650          |
| 15            | 9.50       | 5.5    | 6           | 15           | 20          | 89       | Eyelet End         | Eyelet End Fitting    | 613503          |
| 15            | 9.30       | 5.7    | 6           | 15           | 26.07       | 116      | Composite End 10mm | Composite End Fitting | 613529          |
| 15            | 8.70       | 6.3    | 6           | 15           | 29.89       | 133      | Composite End 10mm | Composite End Fitting | 613481          |
| 15            | 9.40       | 5.6    | 6           | 15           | 30.34       | 135      | Eyelet End         | Eyelet End Fitting    | 613487          |
| 15            | 9.00       | 6      | 6           | 15           | 33.71       | 150      | Composite End 10mm | Composite End Fitting | 613558          |
| 15            | 9.00       | 6      | 6           | 15           | 35.96       | 160      | Eyelet End         | Eyelet End Fitting    | 613552          |
| 15            | 9.00       | 6      | 6           | 15           | 40.45       | 180      | Composite End 10mm | Composite End Fitting | 613550          |
| 15            | 9.30       | 5.7    | 6           | 15           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 613489          |
| 15            | 9.00       | 6      | 6           | 15           | 49.44       | 220      | Composite End 10mm | Composite End Fitting | 613548          |
| 15            | 9.50       | 5.5    | 6           | 15           | 60          | 267      | Composite End 10mm | Composite End Fitting | 613533          |
| 15            | 8.90       | 6.1    | 8           | 18           | 60.67       | 270      | Threaded End       | Threaded End          | 613536          |
| 15            | 8.90       | 6.1    | 8           | 18           | 60.67       | 270      | Threaded End       | Threaded End          | 613540          |
| 15            | 9.00       | 6      | 6           | 15           | 71.91       | 320      | Composite End 10mm | Composite End Fitting | 613524          |
| 15            | 8.70       | 6.3    | 6           | 15           | 80          | 356      | Composite End 10mm | Composite End Fitting | 613485          |
| 15            | 9.00       | 6      | 8           | 18           | 129.89      | 578      | Composite End 10mm | Composite End Fitting | 613058          |
| 15            | 9.00       | 6      | 8           | 18           | 143.82      | 640      | Composite End 10mm | Composite End Fitting | 613522          |
| 15.2          | 11.00      | 4.3    | 6           | 15           | 80          | 356      | Composite End 10mm | Composite End Fitting | 613515          |
| 15.2          | 9.10       | 6.1    | 8           | 18           | 120         | 534      | Composite End 10mm | Composite End Fitting | 613405          |
| 15.2          | 8.70       | 6.5    | 8           | 18           | 149.44      | 665      | Composite End 10mm | Composite End Fitting | 613603          |
| 15.9          | 9.60       | 6.3    | 8           | 18           | 33.71       | 150      | Composite End 10mm | Composite End Fitting | 613087          |
| 15.9          | 9.60       | 6.3    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 613088          |
| 15.9          | 9.60       | 6.3    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 613083          |
| 15.9          | 9.40       | 6.5    | 8           | 18           | 149.89      | 667      | Composite End 10mm | Composite End Fitting | 613409          |
| 16            | 9.50       | 6.5    | 8           | 18           | 35.96       | 160      | Composite End 10mm | Composite End Fitting | 613412          |
| 16            | 9.70       | 6.3    | 8           | 18           | 61.12       | 272      | Composite End 10mm | Composite End Fitting | 613398          |
| 16            | 9.50       | 6.5    | 8           | 18           | 65.17       | 290      | Composite End 10mm | Composite End Fitting | 613408          |
| 16            | 9.50       | 6.5    | 8           | 18           | 78.65       | 350      | Composite End 10mm | Composite End Fitting | 613380          |

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format         | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|------------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                        |                       |                 |
| 16            | 10.20      | 5.8    | 8           | 18           | 111.91      | 498      | Composite End 10mm     | Composite End Fitting | 613378          |
| 16.1          | 9.80       | 6.3    | 8           | 18           | 249.66      | 1111     | Composite End 10mm     | Composite End Fitting | 613292          |
| 16.9          | 9.80       | 7.1    | 8           | 18           | 13.48       | 60       | Threaded End           | Threaded End          | 613344          |
| 16.9          | 9.80       | 7.1    | 8           | 18           | 13.48       | 60       | Threaded End           | Threaded End          | 613346          |
| 17            | 11.00      | 6      | 6           | 15           | 20          | 89       | Composite End 10mm     | Composite End Fitting | 613282          |
| 17            | 10.00      | 7      | 8           | 18           | 24.72       | 110      | Composite End 10mm     | Composite End Fitting | 613284          |
| 17            | 11.00      | 6      | 6           | 15           | 29.89       | 133      | Composite End 10mm     | Composite End Fitting | 613285          |
| 17            | 10.60      | 6.4    | 6           | 15           | 30.34       | 135      | Composite End 10mm     | Composite End Fitting | 613278          |
| 17            | 10.00      | 7      | 6           | 15           | 30.34       | 135      | Composite End 10mm     | Composite End Fitting | 613288          |
| 17            | 10.00      | 7      | 8           | 18           | 40.45       | 180      | Composite End 10mm     | Composite End Fitting | 613276          |
| 17            | 11.00      | 6      | 6           | 15           | 49.89       | 222      | Composite End 10mm     | Composite End Fitting | 613281          |
| 17            | 11.00      | 6      | 6           | 15           | 60          | 267      | Composite End 10mm     | Composite End Fitting | 613283          |
| 17            | 10.90      | 6.1    | 8           | 18           | 65.17       | 290      | Composite End 10mm     | Composite End Fitting | 612452          |
| 17            | 10.00      | 7      | 8           | 18           | 84.27       | 375      | Composite End 10mm     | Composite End Fitting | 613274          |
| 17            | 11.00      | 6      | 6           | 15           | 89.89       | 400      | Composite End 10mm     | Composite End Fitting | 613277          |
| 17            | 10.00      | 7      | 8           | 18           | 98.88       | 440      | Composite End 10mm     | Composite End Fitting | 613272          |
| 17            | 11.00      | 6      | 8           | 18           | 120         | 534      | Composite End 10mm     | Composite End Fitting | 613287          |
| 17            | 10.00      | 7      | 8           | 18           | 143.82      | 640      | Composite End 10mm     | Composite End Fitting | 613268          |
| 17            | 11.00      | 6      | 8           | 18           | 149.89      | 667      | Composite End 10mm     | Composite End Fitting | 613286          |
| 17.2          | 10.10      | 7.1    | 8           | 18           | 29.21       | 130      | Composite End 10mm     | Composite End Fitting | 613218          |
| 17.2          | 10.70      | 6.5    | 8           | 18           | 40          | 178      | Composite End 10mm     | Composite End Fitting | 613233          |
| 17.2          | 11.00      | 6.2    | 8           | 18           | 55.06       | 245      | Composite End 10mm     | Composite End Fitting | 613229          |
| 17.2          | 11.00      | 6.2    | 8           | 18           | 69.89       | 311      | Composite End 10mm     | Composite End Fitting | 613225          |
| 17.2          | 11.00      | 6.2    | 8           | 18           | 100         | 445      | Composite End 10mm     | Composite End Fitting | 613221          |
| 17.2          | 11.00      | 6.2    | 8           | 18           | 124.94      | 556      | Composite End 10mm     | Composite End Fitting | 613217          |
| 17.2          | 10.10      | 7.1    | 8           | 18           | 146.07      | 650      | Composite End 10mm     | Composite End Fitting | 613224          |
| 17.3          | 10.30      | 7      | 8           | 18           | 100         | 445      | Composite End 10 & 8mm | Composite End Fitting | 613168          |
| 17.5          | 10.40      | 7.1    | 8           | 18           | 44.94       | 200      | Composite End 10mm     | Composite End Fitting | 613086          |
| 17.5          | 10.40      | 7.1    | 8           | 18           | 67.42       | 300      | Composite End 10mm     | Composite End Fitting | 613102          |
| 17.5          | 10.40      | 7.1    | 8           | 18           | 89.89       | 400      | Composite End 10mm     | Composite End Fitting | 613103          |
| 17.5          | 10.40      | 7.1    | 8           | 18           | 112.36      | 500      | Composite End 10mm     | Composite End Fitting | 613085          |
| 17.5          | 10.30      | 7.2    | 8           | 18           | 120         | 534      | Eyelet End             | Eyelet End Fitting    | 613627          |
| 17.5          | 10.40      | 7.1    | 8           | 18           | 134.83      | 600      | Composite End 10mm     | Composite End Fitting | 613104          |
| 17.5          | 10.40      | 7.1    | 8           | 18           | 157.3       | 700      | Composite End 10mm     | Composite End Fitting | 613106          |
| 17.5          | 10.80      | 6.8    | 8           | 18           | 179.78      | 800      | Eyelet End             | Eyelet End Fitting    | 613154          |
| 17.9          | 11.00      | 6.9    | 10          | 22           | 89.89       | 400      | Metal End 10mm         | Metal End 10mm        | 613081          |
| 18.5          | 12.20      | 6.3    | 6           | 15           | 29.89       | 133      | Composite End 10mm     | Composite End Fitting | 613257          |
| 18.5          | 10.70      | 7.7    | 8           | 18           | 30.34       | 135      | Composite End 10mm     | Composite End Fitting | 612960          |
| 18.5          | 10.80      | 7.7    | 8           | 18           | 35.06       | 156      | Composite End 10mm     | Composite End Fitting | 612884          |
| 18.5          | 10.70      | 7.7    | 8           | 18           | 44.94       | 200      | Composite End 10mm     | Composite End Fitting | 612959          |
| 18.5          | 12.20      | 6.3    | 6           | 15           | 44.94       | 200      | Composite End 10mm     | Composite End Fitting | 613261          |
| 18.5          | 10.80      | 7.7    | 8           | 18           | 49.44       | 220      | Composite End 10mm     | Composite End Fitting | 612882          |
| 18.5          | 12.20      | 6.3    | 6           | 15           | 60          | 267      | Composite End 10mm     | Composite End Fitting | 613249          |
| 18.5          | 10.70      | 7.7    | 8           | 18           | 60.67       | 270      | Composite End 10mm     | Composite End Fitting | 612958          |

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format     | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|--------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                    |                       |                 |
| 18.5          | 10.80      | 7.7    | 8           | 18           | 62.92       | 280      | Composite End 10mm | Composite End Fitting | 612880          |
| 18.5          | 12.20      | 6.3    | 6           | 15           | 75.06       | 334      | Composite End 10mm | Composite End Fitting | 613253          |
| 18.5          | 10.70      | 7.7    | 8           | 18           | 78.65       | 350      | Composite End 10mm | Composite End Fitting | 612956          |
| 18.5          | 12.20      | 6.3    | 6           | 15           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 613245          |
| 18.5          | 10.70      | 7.7    | 8           | 18           | 95.51       | 425      | Composite End 10mm | Composite End Fitting | 612955          |
| 18.5          | 10.80      | 7.7    | 8           | 18           | 98.88       | 440      | Composite End 10mm | Composite End Fitting | 612876          |
| 18.5          | 11.00      | 7.5    | 8           | 18           | 98.88       | 440      | Composite End 10mm | Composite End Fitting | 612935          |
| 18.5          | 10.70      | 7.7    | 8           | 18           | 114.61      | 510      | Composite End 10mm | Composite End Fitting | 612954          |
| 18.5          | 10.80      | 7.7    | 8           | 18           | 116.85      | 520      | Composite End 10mm | Composite End Fitting | 612874          |
| 18.5          | 12.20      | 6.3    | 6           | 15           | 120         | 534      | Composite End 10mm | Composite End Fitting | 613246          |
| 19            | 10.70      | 8.3    | 8           | 18           | 60.67       | 270      | Threaded End       | Threaded End          | 612799          |
| 19            | 10.70      | 8.3    | 8           | 18           | 60.67       | 270      | Threaded End       | Threaded End          | 612808          |
| 19            | 10.90      | 8.1    | 10          | 22           | 78.65       | 350      | Threaded End       | Threaded End          | 612806          |
| 19            | 10.90      | 8.1    | 10          | 22           | 78.65       | 350      | Threaded End       | Threaded End          | 612812          |
| 19            | 11.20      | 7.9    | 8           | 18           | 87.64       | 390      | Composite End 10mm | Composite End Fitting | 612816          |
| 19.1          | 11.20      | 7.9    | 8           | 18           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 612847          |
| 19.1          | 11.20      | 7.9    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 612932          |
| 19.1          | 11.10      | 8.1    | 8           | 18           | 111.91      | 498      | Composite End 10mm | Composite End Fitting | 612840          |
| 19.1          | 11.20      | 7.9    | 8           | 18           | 112.36      | 500      | Composite End 10mm | Composite End Fitting | 612848          |
| 19.1          | 11.00      | 8.1    | 8           | 18           | 149.89      | 667      | Composite End 10mm | Composite End Fitting | 612817          |
| 19.5          | 11.40      | 8.1    | 8           | 18           | 60          | 267      | Composite End 10mm | Composite End Fitting | 612556          |
| 19.5          | 11.40      | 8.1    | 8           | 18           | 79.78       | 355      | Composite End 10mm | Composite End Fitting | 612654          |
| 19.5          | 11.40      | 8.1    | 8           | 18           | 114.61      | 510      | Composite End 10mm | Composite End Fitting | 612652          |
| 19.5          | 11.60      | 7.9    | 14          | 27           | 292.13      | 1300     | Special End        | Special End Fitting   | 612706          |
| 19.7          | 11.80      | 7.9    | 8           | 18           | 51.01       | 227      | Composite End 10mm | Composite End Fitting | 612413          |
| 19.7          | 11.80      | 7.9    | 8           | 18           | 59.55       | 265      | Composite End 10mm | Composite End Fitting | 612409          |
| 19.7          | 11.30      | 8.4    | 8           | 18           | 75.28       | 335      | Composite End 10mm | Composite End Fitting | 612522          |
| 19.7          | 11.30      | 8.4    | 8           | 18           | 84.94       | 378      | Composite End 10mm | Composite End Fitting | 612523          |
| 19.7          | 11.80      | 7.9    | 8           | 18           | 95.51       | 425      | Composite End 10mm | Composite End Fitting | 612405          |
| 19.7          | 11.30      | 8.4    | 8           | 18           | 105.62      | 470      | Composite End 10mm | Composite End Fitting | 612518          |
| 19.7          | 11.80      | 7.9    | 8           | 18           | 121.35      | 540      | Composite End 10mm | Composite End Fitting | 612416          |
| 19.7          | 11.20      | 8.5    | 8           | 18           | 124.72      | 555      | Composite End 10mm | Composite End Fitting | 612582          |
| 19.7          | 11.80      | 7.9    | 8           | 18           | 150.56      | 670      | Composite End 10mm | Composite End Fitting | 612401          |
| 19.9          | 12.00      | 7.9    | 10          | 22           | 67.42       | 300      | Metal End 10mm     | Metal End 10mm        | 612363          |
| 20            | 12.00      | 8      | 6           | 15           | 20          | 89       | Composite End 10mm | Composite End Fitting | 612293          |
| 20            | 11.50      | 8.5    | 8           | 18           | 29.21       | 130      | Composite End 10mm | Composite End Fitting | 612374          |
| 20            | 12.00      | 8      | 6           | 15           | 29.89       | 133      | Composite End 10mm | Composite End Fitting | 612313          |
| 20            | 12.00      | 8      | 6           | 15           | 40          | 178      | Composite End 10mm | Composite End Fitting | 612297          |
| 20            | 11.50      | 8.5    | 6           | 15           | 40          | 178      | Composite End 10mm | Composite End Fitting | 612335          |
| 20            | 12.00      | 8      | 6           | 15           | 54.83       | 244      | Composite End 10mm | Composite End Fitting | 612299          |
| 20            | 12.00      | 8      | 6           | 15           | 60          | 267      | Composite End 10mm | Composite End Fitting | 612321          |
| 20            | 12.00      | 8      | 8           | 18           | 80          | 356      | Composite End 10mm | Composite End Fitting | 612305          |
| 20            | 12.00      | 8      | 6           | 15           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 612317          |
| 20            | 12.00      | 8      | 8           | 18           | 104.94      | 467      | Composite End 10mm | Composite End Fitting | 611860          |

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format     | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|--------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                    |                       |                 |
| 20            | 11.50      | 8.5    | 6           | 15           | 114.16      | 508      | Composite End 10mm | Composite End Fitting | 612336          |
| 20            | 12.00      | 8      | 8           | 18           | 120         | 534      | Composite End 10mm | Composite End Fitting | 612301          |
| 20            | 12.00      | 8      | 8           | 18           | 149.89      | 667      | Composite End 10mm | Composite End Fitting | 612303          |
| 20.2          | 12.10      | 8.1    | 10          | 22           | 200         | 890      | Metal End 13mm     | Metal End 13mm        | 611596          |
| 20.3          | 11.80      | 8.5    | 8           | 18           | 180         | 801      | Composite End 10mm | Composite End Fitting | 611584          |
| 20.3          | 11.80      | 8.5    | 8           | 18           | 180         | 801      | Composite End 10mm | Composite End Fitting | 611586          |
| 20.7          | 12.00      | 8.7    | 8           | 18           | 22.47       | 100      | Composite End 10mm | Composite End Fitting | 612158          |
| 20.7          | 12.00      | 8.7    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 611931          |
| 20.7          | 12.00      | 8.7    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 611928          |
| 20.7          | 12.00      | 8.7    | 8           | 18           | 112.36      | 500      | Composite End 10mm | Composite End Fitting | 612167          |
| 20.7          | 12.00      | 8.7    | 8           | 18           | 134.83      | 600      | Composite End 10mm | Composite End Fitting | 611926          |
| 20.7          | 12.00      | 8.7    | 8           | 18           | 179.78      | 800      | Composite End 10mm | Composite End Fitting | 612159          |
| 20.7          | 12.00      | 8.7    | 10          | 22           | 247.19      | 1100     | Composite End 10mm | Composite End Fitting | 612166          |
| 21            | 10.70      | 10.3   | 8           | 18           | 17.98       | 80       | Threaded End       | Threaded End          | 612024          |
| 21            | 10.70      | 10.3   | 8           | 18           | 17.98       | 80       | Threaded End       | Threaded End          | 612035          |
| 21            | 13.10      | 7.9    | 8           | 18           | 40          | 178      | Composite End 10mm | Composite End Fitting | 612338          |
| 21            | 12.70      | 8.3    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 612580          |
| 21.3          | 11.90      | 9.5    | 10          | 22           | 13.48       | 60       | Threaded End       | Threaded End          | 611954          |
| 21.3          | 11.90      | 9.5    | 10          | 22           | 13.48       | 60       | Threaded End       | Threaded End          | 611956          |
| 21.7          | 13.30      | 8.4    | 8           | 18           | 60.67       | 270      | Eyelet End         | Metal End 10mm        | 611754          |
| 21.7          | 12.40      | 9.3    | 8           | 18           | 102.25      | 455      | Metal End 10mm     | Metal End 10mm        | 611777          |
| 21.7          | 12.40      | 9.3    | 8           | 18           | 176.4       | 785      | Metal End 10mm     | Metal End 10mm        | 611773          |
| 22            | 13.00      | 9.1    | 10          | 22           | 152.81      | 680      | Metal End 10mm     | Metal End 10mm        | 611690          |
| 22            | 13.00      | 9.1    | 10          | 22           | 163.15      | 726      | Metal End 10mm     | Metal End 10mm        | 611694          |
| 22            | 13.00      | 9.1    | 10          | 22           | 234.38      | 1043     | Metal End 10mm     | Metal End 10mm        | 611692          |
| 23            | 12.80      | 10.1   | 8           | 18           | 13.48       | 60       | Threaded End       | Threaded End          | 611380          |
| 23            | 12.80      | 10.1   | 8           | 18           | 13.48       | 60       | Threaded End       | Threaded End          | 611382          |
| 23            | 13.20      | 9.8    | 8           | 18           | 22.47       | 100      | Composite End 10mm | Composite End Fitting | 611254          |
| 23            | 13.40      | 9.7    | 8           | 18           | 35.96       | 160      | Metal End 10mm     | Metal End             | 616275          |
| 23            | 13.00      | 10     | 6           | 15           | 40          | 178      | Composite End 10mm | Composite End Fitting | 611365          |
| 23            | 13.20      | 9.8    | 8           | 18           | 44.94       | 200      | Composite End 10mm | Composite End Fitting | 611267          |
| 23            | 13.20      | 9.8    | 8           | 18           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 611264          |
| 23            | 13.20      | 9.8    | 8           | 18           | 70.79       | 315      | Composite End 10mm | Composite End Fitting | 611430          |
| 23            | 13.20      | 9.8    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 611255          |
| 23            | 13.20      | 9.8    | 8           | 18           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 611271          |
| 23            | 13.20      | 9.8    | 8           | 18           | 112.36      | 500      | Composite End 10mm | Composite End Fitting | 611272          |
| 23            | 12.50      | 10.5   | 8           | 18           | 112.36      | 500      | Composite End 10mm | Composite End Fitting | 611410          |
| 23            | 13.20      | 9.8    | 8           | 18           | 134.83      | 600      | Composite End 10mm | Composite End Fitting | 611263          |
| 23            | 13.20      | 9.8    | 10          | 22           | 157.3       | 700      | Composite End 10mm | Composite End Fitting | 611273          |
| 23            | 13.20      | 9.8    | 10          | 22           | 179.78      | 800      | Composite End 10mm | Composite End Fitting | 611270          |
| 23.1          | 13.00      | 10.1   | 10          | 22           | 13.48       | 60       | Threaded End       | Threaded End          | 611330          |
| 23.1          | 13.00      | 10.1   | 10          | 22           | 13.48       | 60       | Threaded End       | Threaded End          | 611336          |
| 23.5          | 13.60      | 9.8    | 10          | 22           | 11.24       | 50       | Metal End 13mm     | Metal End 13mm        | 611519          |
| 26            | 14.60      | 11.3   | 8           | 18           | 60.67       | 270      | Composite End 10mm | Composite End Fitting | 610622          |

| Extended      | Compressed | Stroke | Rod<br>Ø mm | Tube<br>Ø mm | F<br>(Lbs ) | F<br>(N) | Rod End Format     | Tube End Format       | Tuff<br>Support |
|---------------|------------|--------|-------------|--------------|-------------|----------|--------------------|-----------------------|-----------------|
| Length (Inch) |            |        |             |              |             |          |                    |                       |                 |
| 26            | 14.50      | 11.5   | 8           | 18           | 65.17       | 290      | Composite End 10mm | Composite End Fitting | 610586          |
| 26            | 14.60      | 11.4   | 8           | 18           | 81.57       | 363      | Composite End 10mm | Composite End Fitting | 610620          |
| 26.3          | 15.40      | 10.8   | 8           | 18           | 56.18       | 250      | Composite End 10mm | Composite End Fitting | 610587          |
| 26.3          | 15.70      | 10.6   | 10          | 22           | 84.94       | 378      | Metal End 13mm     | Metal End 13mm        | 610594          |
| 26.3          | 15.40      | 10.8   | 10          | 22           | 84.94       | 378      | Composite End 10mm | Composite End Fitting | 610599          |
| 26.3          | 15.40      | 10.8   | 8           | 18           | 84.94       | 378      | Composite End 10mm | Composite End Fitting | 610611          |
| 27            | 15.20      | 11.8   | 8           | 18           | 55.96       | 249      | Eyelet End         | Eyelet End Fitting    | 610461          |
| 27            | 15.20      | 11.8   | 10          | 22           | 56.18       | 250      | Composite End 10mm | Composite End Fitting | 610402          |
| 27            | 15.20      | 11.8   | 10          | 22           | 67.42       | 300      | Composite End 10mm | Composite End Fitting | 610468          |
| 27            | 15.20      | 11.8   | 10          | 22           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 610439          |
| 27            | 15.20      | 11.8   | 10          | 22           | 157.3       | 700      | Composite End 10mm | Composite End Fitting | 610440          |
| 28            | 16.40      | 11.6   | 10          | 22           | 101.12      | 450      | Metal End 13mm     | Metal End 13mm        | 610331          |
| 28            | 15.50      | 12.5   | 10          | 22           | 105.62      | 470      | Composite End 10mm | Composite End Fitting | 610318          |
| 28            | 16.40      | 11.6   | 10          | 22           | 120         | 534      | Metal End 13mm     | Metal End 13mm        | 610330          |
| 28            | 15.50      | 12.5   | 10          | 22           | 122.47      | 545      | Composite End 10mm | Composite End Fitting | 610314          |
| 28            | 15.50      | 12.5   | 10          | 22           | 149.44      | 665      | Composite End 10mm | Composite End Fitting | 610328          |
| 28            | 16.40      | 11.6   | 10          | 22           | 150.56      | 670      | Metal End 13mm     | Metal End 13mm        | 610334          |
| 28            | 16.40      | 11.6   | 10          | 22           | 200         | 890      | Metal End 10mm     | Metal End Fitting     | 610335          |
| 28            | 16.40      | 11.6   | 10          | 22           | 200         | 890      | Metal End 10mm     | Metal End Fitting     | 610335          |
| 28            | 16.40      | 11.6   | 10          | 22           | 210.11      | 935      | Metal End 13mm     | Metal End 13mm        | 610338          |
| 28            | 16.40      | 11.6   | 10          | 22           | 249.89      | 1112     | Metal End 10mm     | Metal End Fitting     | 610332          |
| 28.5          | 16.00      | 12.5   | 10          | 22           | 185.39      | 825      | Composite End 10mm | Composite End Fitting | 610242          |
| 28.9          | 15.90      | 13     | 10          | 22           | 13.48       | 60       | Threaded End       | Threaded End          | 610236          |
| 28.9          | 15.90      | 13     | 10          | 22           | 60.67       | 270      | Threaded End       | Threaded End          | 610235          |
| 28.9          | 21.70      | 7.2    | 10          | 22           | 68.54       | 305      | Special End        | Special End Fitting   | 610238          |
| 28.9          | 20.90      | 8      | 10          | 22           | 184.27      | 820      | Composite End 10mm | Composite End Fitting | 610240          |
| 29            | 17.20      | 11.8   | 10          | 22           | 78.65       | 350      | Metal End 13mm     | Metal End 13mm        | 610376          |
| 29            | 16.00      | 13     | 10          | 22           | 120.22      | 535      | Eyelet End         | Composite End Fitting | 610147          |
| 29            | 16.00      | 13     | 10          | 22           | 140.45      | 625      | Eyelet End         | Composite End Fitting | 610146          |
| 29            | 16.00      | 13     | 10          | 22           | 149.44      | 665      | Eyelet End         | Composite End Fitting | 610145          |
| 29            | 16.20      | 12.8   | 10          | 22           | 152.81      | 680      | Metal End 10mm     | Metal End Fitting     | 610148          |
| 29.1          | 24.70      | 4.3    | 10          | 22           | 114.61      | 510      | Composite End 10mm | Composite End Fitting | 610219          |
| 29.1          | 19.90      | 9.3    | 10          | 22           | 146.07      | 650      | Special End        | Composite End Fitting | 610276          |
| 29.5          | 17.10      | 12.4   | 10          | 22           | 84.94       | 378      | Metal End 13mm     | Metal End Fitting     | 610228          |
| 30.3          | 17.20      | 13.1   | 10          | 22           | 191.01      | 850      | Composite End 10mm | Composite End Fitting | 610188          |
| 30.3          | 17.20      | 13.1   | 10          | 22           | 224.72      | 1000     | Metal End 10mm     | Metal End Fitting     | 610190          |
| 30.9          | 17.10      | 13.8   | 10          | 22           | 89.89       | 400      | Composite End 10mm | Composite End Fitting | 610140          |
| 31.3          | 18.50      | 12.8   | 10          | 22           | 112.36      | 500      | Composite End 10mm | Composite End Fitting | 610139          |
| 32.5          | 20.30      | 12.2   | 10          | 22           | 79.78       | 355      | Metal End 13mm     | Metal End Fitting     | 610122          |
| 35.2          | 19.20      | 16.1   | 10          | 22           | 84.27       | 375      | Composite End 10mm | Composite End Fitting | 610033          |
| 39.4          | 21.70      | 17.7   | 10          | 22           | 67.42       | 300      | Eyelet End         | Eyelet End Fitting    | 610006          |

