

Tabla de bridas y espárragos ASME B16.5 y bridas BS 1560

| Nom Bore | Pressure Class 150lb |           |             |          |          | Pressure Class 300lb |           |             |          |          | Pressure Class 600lb |           |             |          |          |
|----------|----------------------|-----------|-------------|----------|----------|----------------------|-----------|-------------|----------|----------|----------------------|-----------|-------------|----------|----------|
|          | Ring No              | Flange OD | No of Bolts | Bolt Dia | Bolt PCD | Ring No              | Flange OD | No of Bolts | Bolt Dia | Bolt PCD | Ring No              | Flange OD | No of Bolts | Bolt Dia | Bolt PCD |
| 1/2"     |                      | 3.1/2"    | 4           | 1/2"     | 2.3/8"   | R11                  | 3.3/4"    | 4           | 1/2"     | 2.5/8"   | R11                  | 3.3/4"    | 4           | 3/4"     | 2.5/8"   |
| 3/4"     |                      | 3.7/8"    | 4           | 1/2"     | 2.3/4"   | R13                  | 4.5/8"    | 4           | 5/8"     | 3.1/4"   | R13                  | 4.5/8"    | 4           | 4.5/8"   | 3.1/4"   |
| 1"       | R15                  | 4.1/4"    | 4           | 1/2"     | 3.1/8"   | R16                  | 4.7/8"    | 4           | 5/8"     | 3.1/2"   | R16                  | 4.7/8"    | 4           | 4.7/8"   | 3.1/2"   |
| 1.1/4"   | R17                  | 4.5/8"    | 4           | 1/2"     | 3.1/2"   | R18                  | 5.1/4"    | 4           | 5/8"     | 3.7/8"   | R18                  | 5.1/4"    | 4           | 5.1/4"   | 3.7/8"   |
| 1.1/2"   | R19                  | 5"        | 4           | 1/2"     | 3.7/8"   | R20                  | 6.1/8"    | 4           | 3/4"     | 4.1/2"   | R20                  | 6.1/8"    | 4           | 6.1/8"   | 4.1/2"   |
| 2"       | R22                  | 6"        | 4           | 5/8"     | 4.3/4"   | R23                  | 6.1/2"    | 8           | 5/8"     | 5"       | R23                  | 6.1/2"    | 8           | 6.1/2"   | 5"       |
| 2.1/2"   | R25                  | 7"        | 4           | 5/8"     | 5.1/2"   | R26                  | 7.1/2"    | 8           | 3/4"     | 5.7/8"   | R26                  | 7.1/2"    | 8           | 7.1/2"   | 5.7/8"   |
| 3"       | R29                  | 7.1/2"    | 4           | 5/8"     | 6"       | R31                  | 8.1/4"    | 8           | 3/4"     | 6.5/8"   | R31                  | 8.1/4"    | 8           | 8.1/4"   | 6.5/8"   |
| 3.1/2"   | R33                  | 8.1/2"    | 8           | 5/8"     | 7"       | R34                  | 9"        | 8           | 3/4"     | 7.1/4"   | R34                  | 9"        | 8           | 7/8"     | 7.1/4"   |
| 4"       | R36                  | 9"        | 8           | 5/8"     | 7.1/2"   | R37                  | 10"       | 8           | 3/4"     | 7.7/8"   | R37                  | 10.3/4"   | 8           | 7/8"     | 8.1/2"   |
| 5"       | R40                  | 10"       | 8           | 3/4"     | 8.1/2"   | R41                  | 11"       | 8           | 3/4"     | 9.1/4"   | R41                  | 13"       | 8           | 1"       | 10.1/2"  |
| 6"       | R43                  | 11"       | 8           | 3/4"     | 9.1/2"   | R45                  | 12.1/2"   | 12          | 3/4"     | 10.5/8"  | R45                  | 14"       | 12          | 1"       | 11.1/2"  |
| 8"       | R48                  | 13.1/2"   | 8           | 3/4"     | 11.3/4"  | R49                  | 15"       | 12          | 7/8"     | 13"      | R49                  | 16.1/2"   | 12          | 1.1/8"   | 13.3/4"  |
| 10"      | R52                  | 16"       | 8           | 7/8"     | 14.1/4"  | R53                  | 17.1/2"   | 16          | 1"       | 15.1/4"  | R53                  | 20"       | 16          | 1.1/4"   | 17"      |
| 12"      | R56                  | 19"       | 12          | 7/8"     | 17"      | R57                  | 20.1/2"   | 16          | 1.1/8"   | 17.3/4"  | R57                  | 22"       | 20          | 1.1/4"   | 19.1/4"  |
| 14"      | R59                  | 21"       | 12          | 1"       | 18.3/4"  | R61                  | 23"       | 20          | 1.1/8"   | 20.1/4"  | R61                  | 23.3/4"   | 20          | 1.3/8"   | 20.3/4"  |
| 16"      | R64                  | 23.1/2"   | 16          | 1"       | 21.1/4"  | R65                  | 25.1/2"   | 20          | 1.1/4"   | 22.1/2"  | R65                  | 27"       | 20          | 1.1/2"   | 23.3/4"  |
| 18"      | R68                  | 25"       | 16          | 1.1/8"   | 22.3/4"  | R69                  | 28"       | 24          | 1.1/4"   | 24.3/4"  | R69                  | 29.1/4"   | 20          | 1.5/8"   | 25.3/4"  |
| 20"      | R72                  | 27.1/2"   | 20          | 1.1/8"   | 25"      | R73                  | 30.1/2"   | 24          | 1.1/4"   | 27"      | R73                  | 32"       | 24          | 1.5/8"   | 28.1/2"  |
| 24"      | R76                  | 32"       | 20          | 1.1/4"   | 29.1/2"  | R77                  | 36"       | 24          | 1.1/2"   | 32"      | R77                  | 37"       | 24          | 1.7/8"   | 33"      |

| Nom Bore | Pressure Class 900lb |           |             |          |          | Pressure Class 1500lb |           |             |          |          | Pressure Class 2500lb |           |             |          |          |
|----------|----------------------|-----------|-------------|----------|----------|-----------------------|-----------|-------------|----------|----------|-----------------------|-----------|-------------|----------|----------|
|          | Ring No              | Flange OD | No of Bolts | Bolt Dia | Bolt PCD | Ring No               | Flange OD | No of Bolts | Bolt Dia | Bolt PCD | Ring No               | Flange OD | No of Bolts | Bolt Dia | Bolt PCD |
| 1/2"     | R12                  | 4.3/4"    | 4           | 3/4"     | 3.1/4"   | R12                   | 4.3/4"    | 4           | 3/4"     | 3.1/4"   | R13                   | 5.1/4"    | 4           | 3/4"     | 3.1/2"   |
| 3/4"     | R14                  | 5.1/8"    | 4           | 3/4"     | 3.1/2"   | R14                   | 5.1/8"    | 4           | 3/4"     | 3.1/2"   | R16                   | 5.1/2"    | 4           | 3/4"     | 3.3/4"   |
| 1"       | R16                  | 5.7/8"    | 4           | 7/8"     | 4"       | R16                   | 5.7/8"    | 4           | 7/8"     | 4"       | R18                   | 6.1/4"    | 4           | 7/8"     | 4.1/4"   |
| 1.1/4"   | R18                  | 6.1/4"    | 4           | 7/8"     | 4.3/8"   | R18                   | 6.1/4"    | 4           | 7/8"     | 4.3/8"   | R21                   | 7.1/4"    | 4           | 1"       | 5.1/8"   |
| 1.1/2"   | R20                  | 7"        | 4           | 1"       | 4.7/8"   | R20                   | 7"        | 4           | 1"       | 4.7/8"   | R23                   | 8"        | 4           | 1.1/8"   | 5.3/4"   |
| 2"       | R24                  | 8.1/2"    | 8           | 7/8"     | 6.1/2"   | R24                   | 8.1/2"    | 8           | 7/8"     | 6.1/2"   | R26                   | 9.1/4"    | 8           | 1"       | 6.3/4"   |
| 2.1/2"   | R27                  | 9.5/8"    | 8           | 1"       | 7.1/2"   | R27                   | 9.5/8"    | 8           | 1"       | 7.1/2"   | R28                   | 10.1/2"   | 8           | 1.1/8"   | 7.3/4"   |
| 3"       | R31                  | 9.1/2"    | 8           | 7/8"     | 7.1/2"   | R35                   | 10.1/2"   | 8           | 1.1/8"   | 8"       | R32                   | 12"       | 8           | 1.1/4"   | 9"       |
| 4"       | R37                  | 11.1/2"   | 8           | 1.1/8"   | 9.1/4"   | R39                   | 12.1/4"   | 8           | 1.1/4"   | 9.1/2"   | R38                   | 14"       | 8           | 1.1/2"   | 10.3/4"  |
| 5"       | R41                  | 13.3/4"   | 8           | 1.1/4"   | 11"      | R44                   | 14.3/4"   | 8           | 1.1/2"   | 11.1/2"  | R42                   | 16.1/2"   | 8           | 1.3/4"   | 12.3/4"  |
| 6"       | R45                  | 15"       | 12          | 1.1/8"   | 12.1/2"  | R46                   | 15.1/2"   | 12          | 1.3/8"   | 12.1/2"  | R47                   | 19"       | 8           | 2"       | 14.1/2"  |
| 8"       | R49                  | 18.1/2"   | 12          | 1.3/8"   | 15.1/2"  | R50                   | 19"       | 12          | 1.5/8"   | 15.1/2"  | R51                   | 21.3/4"   | 12"         | 2"       | 17.1/4"  |
| 10"      | R53                  | 21.1/2"   | 16          | 1.3/8"   | 18.1/2"  | R54                   | 23"       | 12          | 1.7/8"   | 19"      | R55                   | 26.1/2"   | 12"         | 2.1/2"   | 21.1/4"  |
| 12"      | R57                  | 24"       | 20          | 1.3/8"   | 21"      | R58                   | 26.1/2"   | 16          | 2"       | 22.1/2"  | R60                   | 30"       | 12"         | 2.3/4"   | 24.3/8"  |
| 14"      | R62                  | 25.1/4"   | 20          | 1.1/2"   | 22"      | R63                   | 29.1/2"   | 16          | 2.1/4"   | 25"      | n/a                   | n/a       | n/a         | n/a      | n/a      |
| 16"      | R66                  | 27.3/4"   | 20          | 1.5/8"   | 24.1/4"  | R67                   | 32.1/2"   | 16          | 2.1/2"   | 27.3/4"  | n/a                   | n/a       | n/a         | n/a      | n/a      |
| 18"      | R70                  | 31"       | 20          | 1.7/8"   | 27"      | R71                   | 36"       | 16          | 2.3/4"   | 30.1/2"  | n/a                   | n/a       | n/a         | n/a      | n/a      |
| 20"      | R74                  | 33.3/4"   | 20          | 2"       | 29.1/2"  | R75                   | 38.3/4"   | 16          | 3"       | 32.3/4"  | n/a                   | n/a       | n/a         | n/a      | n/a      |
| 24"      | R78                  | 41"       | 20          | 2.1/2"   | 35.1/2"  | R79                   | 46"       | 16          | 3.1/2"   | 39"      | n/a                   | n/a       | n/a         | n/a      | n/a      |

Torque para espárragos

| Bolt Dia | 30,000psi     |          | 45,000psi     |          | 60,000psi     |          |
|----------|---------------|----------|---------------|----------|---------------|----------|
|          | Torque Ft/lbs | Load lbs | Torque Ft/lbs | Load lbs | Torque Ft/lbs | Load lbs |
| 1/4"     | 4             | 810      | 6             | 1215     | 8             | 1620     |
| 5/16"    | 8             | 1350     | 12            | 2025     | 16            | 2700     |
| 3/8"     | 12            | 2040     | 18            | 3060     | 24            | 4080     |
| 7/16"    | 20            | 2790     | 30            | 4185     | 40            | 5580     |
| 1/2"     | 30            | 3780     | 45            | 5670     | 60            | 7560     |
| 9/16"    | 45            | 4860     | 68            | 7290     | 90            | 9720     |
| 5/8"     | 60            | 6060     | 90            | 9090     | 120           | 12120    |
| 3/4"     | 100           | 9060     | 150           | 13590    | 200           | 18120    |
| 7/8"     | 160           | 12570    | 240           | 18855    | 320           | 25140    |
| 1"       | 245           | 16530    | 368           | 24795    | 490           | 33060    |
| 1.1/8"   | 355           | 21840    | 533           | 32760    | 710           | 43680    |
| 1.1/4"   | 500           | 27870    | 750           | 41805    | 1000          | 55740    |
| 1.3/8"   | 680           | 34650    | 1020          | 51975    | 1360          | 69300    |
| 1.1/2"   | 800           | 42150    | 1200          | 63225    | 1600          | 84300    |
| 1.5/8"   | 1100          | 50400    | 1650          | 75600    | 2200          | 100800   |
| 1.3/4"   | 1500          | 59400    | 2250          | 89100    | 3000          | 118800   |
| 1.7/8"   | 2000          | 69120    | 3000          | 103680   | 4000          | 138240   |
| 2"       | 2200          | 79560    | 3300          | 119340   | 4400          | 159120   |
| 2.1/4"   | 3180          | 102690   | 4770          | 154035   | 6360          | 205380   |
| 2.1/2"   | 4400          | 128760   | 6600          | 193140   | 8800          | 257520   |
| 2.3/4"   | 5920          | 157770   | 8880          | 236655   | 11840         | 315540   |
| 3"       | 7720          | 189720   | 11580         | 284580   | 15440         | 379440   |
| 3.1/4"   | 10000         | 224700   | 15000         | 337050   | 20000         | 449400   |
| 3.1/2"   | 12500         | 262500   | 18750         | 393750   | 25000         | 525000   |
| 3.3/4"   | 15400         | 303300   | 23150         | 454950   | 30900         | 606600   |

**Notas**

Carga en libras sobre los espárragos cuando el torque arriba señalado sea aplicado  
 La cuerda del perno la tuerca y la superficie deben estar lubricados antes de apriete  
 Es muy recomendado que el equipo de apriete hidráulico sea usado en pernos de 1 1/8" hacia arriba  
 Controlar el apriete del perno es muy recomendado para minimizar el riesgo de fugas en el ensamblado  
 En el ensamblado lo que fuga es la brida y no el empaque.