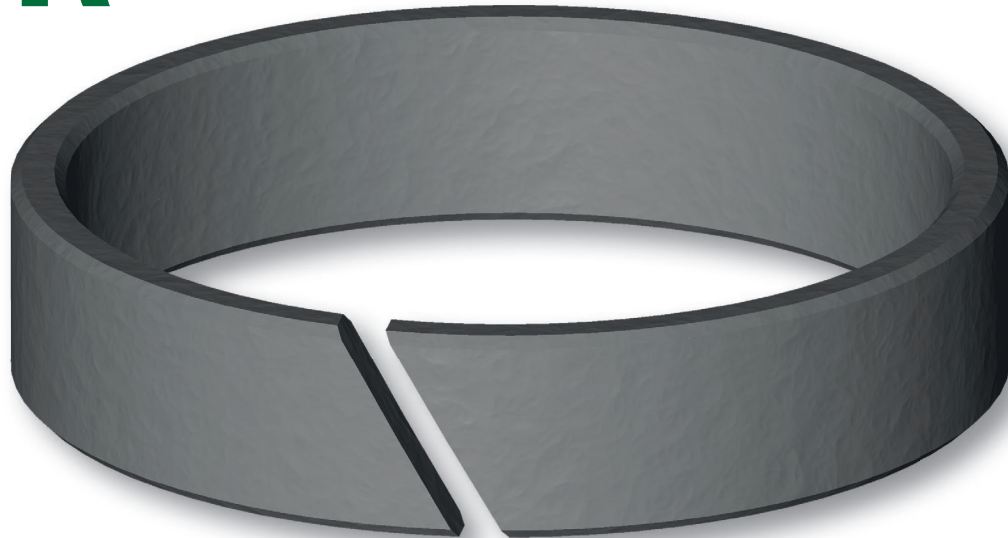


# FR



## MATERIAL



Type Acetal resin with glass fibre  
 Designation BEARITE

## FIELD OF APPLICATION



Fluids Hydraulic oils (mineral oil based)  
 For other fluids contact our technical department

## SURFACE ROUGHNESS

|                 |                            |                            |
|-----------------|----------------------------|----------------------------|
| Dynamic surface | $R_a \leq 0.3 \mu\text{m}$ | $R_t \leq 2.5 \mu\text{m}$ |
| Static surface  | $R_a \leq 2 \mu\text{m}$   | $R_t \leq 10 \mu\text{m}$  |

## CHOICE OF GUIDE RING WIDTH

A rough estimate of guide width can be calculated with the following formula:

$$h_{mm} \geq \frac{F_N \times k}{p_{N/mm^2} \times d_{mm}}$$

where

- $h_{mm}$  • Guide ring width in mm
- $F_N$  • Radial load in N
- $k$  • Safety factor (generally 2)
- $d_{mm}$  • Rod diameter in mm
- $p_{N/mm^2}$  • Surface pressure N/mm<sup>2</sup>  
 40 a 20 °C  
 30 a 70 °C

Before assembly good cleanliness and lubrication are recommended.

The above data are maximum values, they may be maintained for short periods and can not be used at the same time simultaneously.

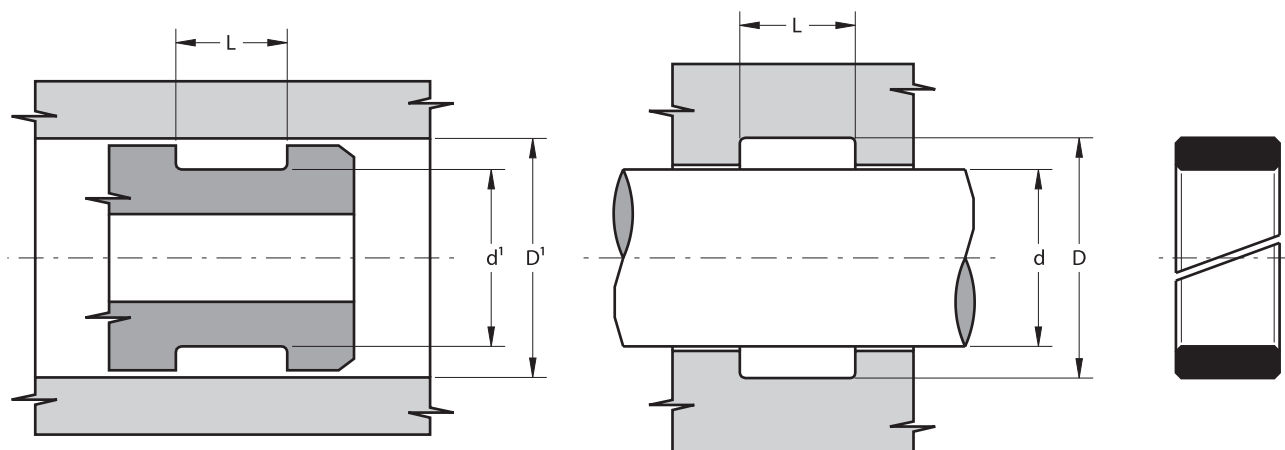
The Aston Seals FR type guide rings have been developed to substitute traditional bronze guides in hydraulic cylinders. They guide the rod or the piston and prevent metallic contact with the cylinder when radial forces act perpendicular to the direction of movement.

Chamfered edges prevent splintering of the material during assembly and make the installation into the groove easier.

The compound used for these guides is a medium viscosity glass fibre reinforced acetal resin characterized by high strength, rigidity, hardness, impact resistance, resilience and excellent stability to high and low temperature.

- Extended service life
- Dimension suitable for both rod and piston
- Excellent wear-resistance
- Simple design of groove and assembly
- Reduce vibrations
- Low friction
- Good resistance to loads
- Good mechanical stability at high temperature
- Easy installation without expensive auxiliaries

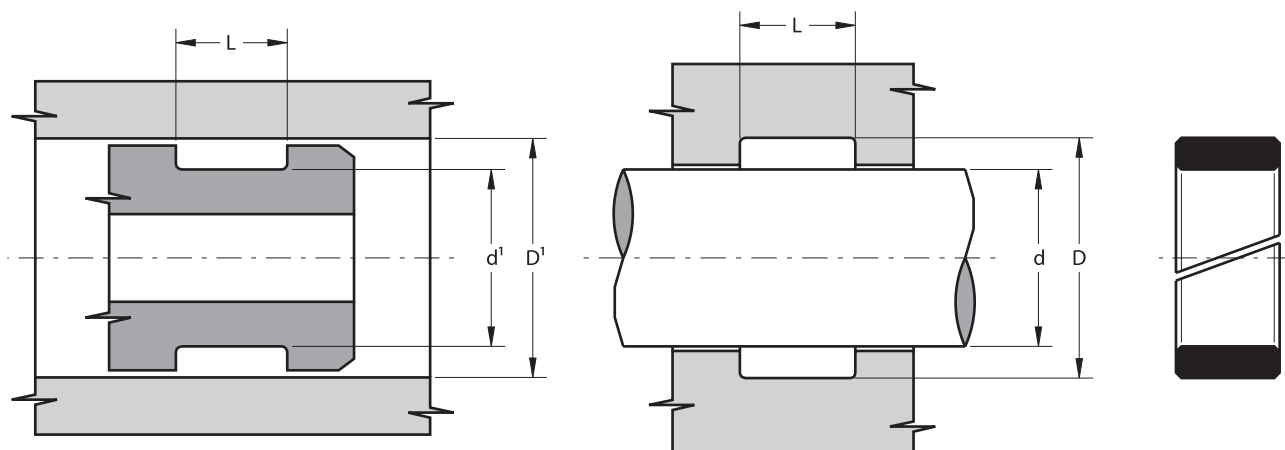
FR



| Part.           | $d_1^{1-0.05}$<br>$d_{f7}$ | $D_1^{H8}$<br>$D_{+0.05}$ | $L_{+0.25}$ |
|-----------------|----------------------------|---------------------------|-------------|
| FR 16 19 5.5    | 16                         | 19                        | 5.5         |
| FR 16 19 6.3    | 16                         | 19                        | 6.3         |
| FR 16 19.1 4    | 16                         | 19.1                      | 4.0         |
| FR 18 21.1 3.9  | 18                         | 21.1                      | 3.9         |
| FR 20 25 5.6    | 20                         | 25                        | 5.6         |
| FR 20 25 9.7    | 20                         | 25                        | 9.7         |
| FR 21.9 25 4    | 21.9                       | 25                        | 4.0         |
| FR 22 25 6      | 22                         | 25                        | 6.0         |
| FR 25 30 5.6    | 25                         | 30                        | 5.6         |
| FR 25 30 9.7    | 25                         | 30                        | 9.7         |
| FR 27 32 4.2    | 27                         | 32                        | 4.2         |
| FR 27 32 5.6    | 27                         | 32                        | 5.6         |
| FR 27.3 32 9.82 | 27.3                       | 32                        | 9.82        |
| FR 30 35 5.6    | 30                         | 35                        | 5.6         |
| FR 30 35 9.7    | 30                         | 35                        | 9.7         |
| FR 30 35 19.4   | 30                         | 35                        | 19.4        |
| FR 32 37 5.6    | 32                         | 37                        | 5.6         |
| FR 32 37 9.7    | 32                         | 37                        | 9.7         |
| FR 32 37 15     | 32                         | 37                        | 15.0        |
| FR 33 38 5.6    | 33                         | 38                        | 5.6         |
| FR 35 40 4.5    | 35                         | 40                        | 4.5         |
| FR 35 40 5.6    | 35                         | 40                        | 5.6         |
| FR 35 40 6.3    | 35                         | 40                        | 6.3         |
| FR 35 40 9.7    | 35                         | 40                        | 9.7         |

| Part.          | $d_1^{1-0.05}$<br>$d_{f7}$ | $D_1^{H8}$<br>$D_{+0.05}$ | $L_{+0.25}$ |
|----------------|----------------------------|---------------------------|-------------|
| FR 36 41 5.6   | 36                         | 41                        | 5.6         |
| FR 38 43 9.7   | 38                         | 43                        | 9.7         |
| FR 40 45 5.6   | 40                         | 45                        | 5.6         |
| FR 40 45 9.7   | 40                         | 45                        | 9.7         |
| FR 40 45 15    | 40                         | 45                        | 15.0        |
| FR 43 48 9.7   | 43                         | 48                        | 9.7         |
| FR 43.7 50 7.2 | 43.7                       | 50                        | 7.2         |
| FR 45 50 5.6   | 45                         | 50                        | 5.6         |
| FR 45 50 6.3   | 45                         | 50                        | 6.3         |
| FR 45 50 8.1   | 45                         | 50                        | 8.1         |
| FR 45 50 9.7   | 45                         | 50                        | 9.7         |
| FR 45 50 15    | 45                         | 50                        | 15.0        |
| FR 45 50 19.4  | 45                         | 50                        | 19.4        |
| FR 45.4 50 6.7 | 45.4                       | 50                        | 6.7         |
| FR 46 50 9.7   | 46                         | 50                        | 9.7         |
| FR 46 50 10.2  | 46                         | 50                        | 10.2        |
| FR 50 55 5.6   | 50                         | 55                        | 5.6         |
| FR 50 55 9.7   | 50                         | 55                        | 9.7         |
| FR 50 55 15    | 50                         | 55                        | 15.0        |
| FR 50 55 20    | 50                         | 55                        | 20.0        |
| FR 55 60 5.6   | 55                         | 60                        | 5.6         |
| FR 55 60 9.7   | 55                         | 60                        | 9.7         |
| FR 55 60 15    | 55                         | 60                        | 15.0        |
| FR 56 60 10.2  | 56                         | 60                        | 10.2        |

| Part.               | $d_1^{1-0.05}$<br>$d_{f7}$ | $D_1^{H8}$<br>$D_{+0.05}$ | $L_{+0.25}$ |
|---------------------|----------------------------|---------------------------|-------------|
| FR 57.18 62.18 19.8 | 57.18                      | 62.18                     | 19.8        |
| FR 58 63 5.6        | 58                         | 63                        | 5.6         |
| FR 58 63 9.7        | 58                         | 63                        | 9.7         |
| FR 58 63 15         | 58                         | 63                        | 15.0        |
| FR 59 63 10         | 59                         | 63                        | 10.0        |
| FR 60 65 5.6        | 60                         | 65                        | 5.6         |
| FR 60 65 9.7        | 60                         | 65                        | 9.7         |
| FR 60 65 15         | 60                         | 65                        | 15.0        |
| FR 60 65 19.4       | 60                         | 65                        | 19.4        |
| FR 60 65 20         | 60                         | 65                        | 20.0        |
| FR 65 70 5.6        | 65                         | 70                        | 5.6         |
| FR 65 70 9.7        | 65                         | 70                        | 9.7         |
| FR 66 70 10.2       | 66                         | 70                        | 10.2        |
| FR 67 72 5.6        | 67                         | 72                        | 5.6         |
| FR 70 75 5.6        | 70                         | 75                        | 5.6         |
| FR 70 75 9.7        | 70                         | 75                        | 9.7         |
| FR 71.2 76.2 20     | 71.2                       | 76.2                      | 20.0        |
| FR 75 80 5.6        | 75                         | 80                        | 5.6         |
| FR 75 80 9.7        | 75                         | 80                        | 9.7         |
| FR 75 80 19.4       | 75                         | 80                        | 19.4        |
| FR 75 80 20         | 75                         | 80                        | 20.0        |
| FR 76 80 10         | 76                         | 80                        | 10.0        |
| FR 80 85 5.6        | 80                         | 85                        | 5.6         |
| FR 80 85 9.7        | 80                         | 85                        | 9.7         |



| Part.             | $d_1^{-0.05}$<br>$d_{f7}$ | $D_1^{H8}$<br>$D_{+0.05}$ | $L^{+0.25}$ |
|-------------------|---------------------------|---------------------------|-------------|
| FR 80 85 15       | 80                        | 85                        | 15.0        |
| FR 85 90 5.6      | 85                        | 90                        | 5.6         |
| FR 85 90 9.7      | 85                        | 90                        | 9.7         |
| FR 88.9 93.9 19.8 | 88.9                      | 93.9                      | 19.8        |
| FR 90 95 5.6      | 90                        | 95                        | 5.6         |
| FR 90 95 9.7      | 90                        | 95                        | 9.7         |
| FR 90 95 19.4     | 90                        | 95                        | 19.4        |
| FR 92 97 9.7      | 92                        | 97                        | 9.7         |
| FR 95 100 5.6     | 95                        | 100                       | 5.6         |
| FR 95 100 9.7     | 95                        | 100                       | 9.7         |
| FR 95 100 15      | 95                        | 100                       | 15.0        |
| FR 96 100 10      | 96                        | 100                       | 10.0        |
| FR 100 105 5.6    | 100                       | 105                       | 5.6         |
| FR 100 105 9.7    | 100                       | 105                       | 9.7         |
| FR 103 108 20     | 103                       | 108                       | 20.0        |
| FR 105 110 9.7    | 105                       | 110                       | 9.7         |
| FR 105 110 15     | 105                       | 110                       | 15.0        |
| FR 105 110 19.4   | 105                       | 110                       | 19.4        |
| FR 110 115 9.7    | 110                       | 115                       | 9.7         |
| FR 115 120 9.7    | 115                       | 120                       | 9.7         |
| FR 115 120 15     | 115                       | 120                       | 15.0        |
| FR 120 125 5.6    | 120                       | 125                       | 5.6         |
| FR 120 125 9.7    | 120                       | 125                       | 9.7         |

| Part.           | $d_1^{-0.05}$<br>$d_{f7}$ | $D_1^{H8}$<br>$D_{+0.05}$ | $L^{+0.25}$ |
|-----------------|---------------------------|---------------------------|-------------|
| FR 122 127 9.7  | 122                       | 127                       | 9.7         |
| FR 122 127 19.4 | 122                       | 127                       | 19.4        |
| FR 130 135 9.7  | 130                       | 135                       | 9.7         |
| FR 135 140 9.7  | 135                       | 140                       | 9.7         |
| FR 135 140 15   | 135                       | 140                       | 15.0        |
| FR 145 150 19.4 | 145                       | 150                       | 19.4        |
| FR 145 150 20   | 145                       | 150                       | 20.0        |
| FR 155 160 15   | 155                       | 160                       | 15.0        |
| FR 170 175 25   | 170                       | 175                       | 25.0        |
| FR 175 180 9.7  | 175                       | 180                       | 9.7         |
| FR 175 180 15   | 175                       | 180                       | 15.0        |
| FR 175 180 25   | 175                       | 180                       | 25.0        |
| FR 176 180 25   | 176                       | 180                       | 25.0        |
| FR 195 200 15   | 195                       | 200                       | 15.0        |
| FR 200 205 15   | 200                       | 205                       | 15.0        |
| FR 200 205 25   | 200                       | 205                       | 25.0        |
| FR 215 220 20   | 215                       | 220                       | 20.0        |
| FR 225 230 15   | 225                       | 230                       | 15.0        |
| FR 225 230 25   | 225                       | 230                       | 25.0        |
| FR 230 235 15   | 230                       | 235                       | 15.0        |
| FR 230 235 25   | 230                       | 235                       | 25.0        |
| FR 235 240 15   | 235                       | 240                       | 15.0        |
| FR 235 240 25   | 235                       | 240                       | 25.0        |

| Part.         | $d_1^{-0.05}$<br>$d_{f7}$ | $D_1^{H8}$<br>$D_{+0.05}$ | $L^{+0.25}$ |
|---------------|---------------------------|---------------------------|-------------|
| FR 240 245 15 | 240                       | 245                       | 15.0        |
| FR 240 245 25 | 240                       | 245                       | 25.0        |
| FR 245 250 15 | 245                       | 250                       | 15.0        |
| FR 245 250 25 | 245                       | 250                       | 25.0        |
| FR 250 255 15 | 250                       | 255                       | 15.0        |
| FR 260 265 15 | 260                       | 265                       | 15.0        |
| FR 265 270 15 | 265                       | 270                       | 15.0        |
| FR 270 275 15 | 270                       | 275                       | 15.0        |
| FR 275 280 15 | 275                       | 280                       | 15.0        |
| FR 280 285 15 | 280                       | 285                       | 15.0        |
| FR 282 287 15 | 282                       | 287                       | 15.0        |
| FR 285 290 15 | 285                       | 290                       | 15.0        |
| FR 290 295 15 | 290                       | 295                       | 15.0        |
| FR 295 300 15 | 295                       | 300                       | 15.0        |
| FR 300 305 15 | 300                       | 305                       | 15.0        |
| FR 305 310 15 | 305                       | 310                       | 15.0        |
| FR 310 315 15 | 310                       | 315                       | 15.0        |
| FR 315 320 15 | 315                       | 320                       | 15.0        |
| FR 320 325 15 | 320                       | 325                       | 15.0        |
| FR 325 330 15 | 325                       | 330                       | 15.0        |
| FR 330 335 15 | 330                       | 335                       | 15.0        |
| FR 332 337 15 | 332                       | 337                       | 15.0        |
| FR 335 340 15 | 335                       | 340                       | 15.0        |