

# PISTON SEALS

## BECA

### 501-503-505



#### DESCRIPTION

The BECA 501 - 503 - 505 profiles are single acting composite piston seals composed of a filled PTFE friction ring and pre-tightened rubber O'Ring. Option of connecting the seal to a back-up ring.

#### ADVANTAGES

Optimal sealing in static and dynamic applications

Low friction coefficient; no stick-slip effect

Excellent abrasion and extrusion resistance

Wide temperature range and excellent chemical resistance, depending on the material selected for the O'Ring

#### APPLICATIONS

- Mobile hydraulics
- Injection presses
- Machine tools
- Presses
- Standard cylinders

#### MATERIALS

##### Friction ring

- Bronze-filled PTFE
- Carbon-filled PTFE
- Blue GL PTFE

##### O'Ring

- NBR 70 Shore A
- FKM 70 Shore A

Other grades of materials are available. Please refer to the materials table on the next page.

#### TECHNICAL DATA

<b>Temperature</b>	-30°C / +200°C
<b>Pressure</b>	50 MPa
<b>Speed</b>	5 m/s
<b>Media</b>	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

#### EXTRUSION GAPS

Radial section S	Radial gap F/2		
	10 MPa	20 MPa	40 MPa
2.45	0.30	0.20	0.15
3.65	0.40	0.25	0.15
5.35	0.50	0.30	0.20
7.55	0.70	0.40	0.25
10.25	0.80	0.60	0.35
12.00	0.90	0.70	0.40
13.65	1.00	0.80	0.50
19.00	1.20	0.90	0.60

#### SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.05 - 0.2 µm	≤1.6 µm	≤3.2 µm
Rz	0.4 - 1.6 µm	≤6.3 µm	≤10.0 µm
Rmax	0.63 - 2.5 µm	≤10.0 µm	≤16.0 µm

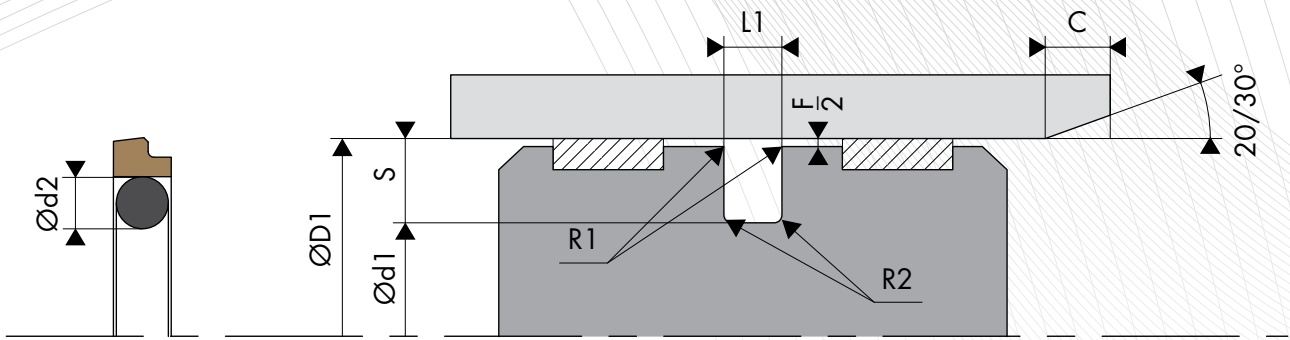
#### CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
2.45	0.30	0.40	3.00
3.65	0.30	0.60	3.00
5.35	0.30	1.00	3.00
7.55	0.30	1.30	5.00
10.25	0.30	1.80	6.00
12.00	0.30	1.80	8.00
13.65	0.30	2.50	10.00
19.00	0.30	3.00	12.00

TABLE MATERIALS

Friction ring					O'Ring			Mating surface material	
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature		
DP	P	Virgin PTFE	White	Resistance to chemical products Impermeability Dielectric Non-stick Low friction coefficient Food industry	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface	
					G6	FKM 70 Shore A	-20°C/+200°C		
					C6	EPDM 70 Shore A	-45°C/+150°C		
					F6	VMQ 70 Shore A	-60°C/+200°C		
DC	C	PTFE + 25% Carbon	Grey	<b>Improvements</b> • <b>Wear properties</b> • <b>Compression set</b> Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
					C6	EPDM 70 Shore A	-45°C/+150°C		
CG	C	PTFE + 23% Carbon + 2% Graphite	Black	High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
					C6	EPDM 70 Shore A	-45°C/+150°C		
DV	V	PTFE + 25 % Glass	Blue	<b>Improvements</b> • <b>Wear properties</b> • <b>Mechanical strength</b> Slightly more abrasive, however, this is corrected by adding MOS2 Maintains its chemical and dielectric properties Well-suited to applications with rotational and simultaneous alternating movements	K6	NBR 70 Shore A	-30°C/+100°C		Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C		
VM	M	PTFE + 15 % Glass + 5% MOS2	Grey	Well-suited to applications with rotational and simultaneous alternating movements	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
DX	X	PTFE GL Blue + Glass + Metal oxides	Turquoise blue	Resistance to compression Resistance to wear Excellent chemical stability Good thermal conductivity	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
DG	G	PTFE + 15% Graphite	Black	<b>Improvements</b> • <b>Wear properties</b> Reduced wear on metal parts Self-lubricating Thermal and electrical conductivity Low permeability Good friction coefficient Anti-static High performing in dynamic self-lubricating applications	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface	
					G6	FKM 70 Shore A	-20°C/+200°C		
					C6	EPDM 70 Shore A	-45°C/+150°C		
K1	K	PTFE + 10% Ekonol	Light brown	<b>Improvements</b> • <b>Better abrasion resistance</b> • <b>Better dimensional stability at high temperatures</b> Use up to +300°C Good friction coefficient and low permeability	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
					C6	EPDM 70 Shore A	-45°C/+150°C		
K2	K	PTFE + 20% Ekonol	Light brown	Good friction coefficient and low permeability	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
					C6	EPDM 70 Shore A	-45°C/+150°C		
DB	B	PTFE + 60% Bronze	Dark brown	<b>Improvements</b> • <b>Wear properties</b> • <b>Warping resistance and creep strength</b> • <b>Compression resistance</b> Self-lubricating Electrical and thermal conductivity Does not alter the metal parts Reduced hold with certain chemical products Used for high-compression dynamic seals and has a low level of wear	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron	
					G6	FKM 70 Shore A	-20°C/+200°C		
B4	B	PTFE + 40% Bronze	Dark brown	Used for high-compression dynamic seals and has a low level of wear	K6	NBR 70 Shore A	-30°C/+100°C		
					G6	FKM 70 Shore A	-20°C/+200°C		
HG	HG	PE-UHMW	White or off-white	Excellent wear resistance on contact with water and air	K6	NBR 70 Shore A	-30°C/+80°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface	
PU	U	Polyurethane	Blue	Strong mechanical resistance Good resistance to wear and abrasion High elasticity modulus	K6	NBR 70 Shore A	-30°C/+90°C		
PUHT	U	High-temperature polyurethane	White or off-white	Good flexibility Very good resistance to ozone and oxidation	K6	NBR 70 Shore A	-30°C/+100°C		

Other grades of materials are available depending on your specificities.



○ INSTALLATION DIMENSIONS

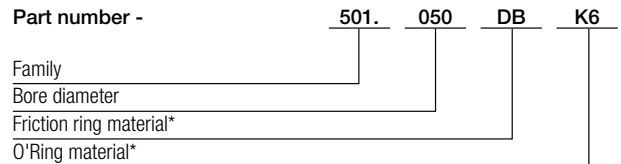
Bore diameter ØD1 H9			Groove diameter	Groove width	Radial section	O'Ring cross-section
BECA 501 Standard range	BECA 503 Light range	BECA 505 Heavy-duty range	Ød1 h9	L1 0/+0.20	S	Ød2
8.0 - 14.9	15.0 - 39.9	---	D1 - 4.90	2.20	2.45	1.78
15.0 - 39.9	40.0 - 79.9	---	D1 - 7.30	3.20	3.65	2.62
40.0 - 79.9	80.0 - 132.9	15.0 - 39.9	D1 - 10.70	4.20	5.35	3.53
80.0 - 132.9	133.0 - 329.9	40.0 - 79.9	D1 - 15.10	6.30	7.55	5.33
133.0 - 329.9	330.0 - 669.9	80.0 - 132.9	D1 - 20.50	8.10	10.25	6.99
330.0 - 669.9	670.0 - 999.9	133.0 - 329.9	D1 - 24.00	8.10	12.00	6.99
670.0 - 999.9	1000.0 - **	330.0 - 669.9	D1 - 27.30	9.50	13.65	8.40
1000.0 - **	---	1000.0 - **	D1 - 38.00	13.80	19.00	12.00

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (bore/piston) or selecting other, more suitable materials. Please contact our experts.

○ EXAMPLE OF CODIFICATION

**STANDARD CODIFICATION**

**Materials** \_\_\_\_\_ : Friction ring, PTFE + 60% Bronze - Code DB  
 \_\_\_\_\_ : NBR 70 Shore A O'Ring - Code K6  
**Bore diameter** \_\_\_\_\_ : ØD1 = 50.00 mm  
**Groove diameter** \_\_\_\_\_ : Ød1 + 39.30 mm  
**Part number** \_\_\_\_\_ : 501. 050DBK6



\* The codes that define the materials are set out in the materials table on the previous page.

**DIMENSIONS**

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h9	Groove width L1 0/+0.20
<b>501.008</b>	<b>8.00</b>	<b>3.10</b>	<b>2.20</b>
501.009	9.00	4.10	2.20
<b>501.010</b>	<b>10.00</b>	<b>5.10</b>	<b>2.20</b>
<b>501.012</b>	<b>12.00</b>	<b>7.10</b>	<b>2.20</b>
501.014	14.00	9.10	2.20
503.015	15.00	10.10	2.20
<b>503.016</b>	<b>16.00</b>	<b>11.10</b>	<b>2.20</b>
505.018	18.00	7.30	4.20
501.018	18.00	10.70	3.20
503.018	18.00	13.10	2.20
<b>505.020</b>	<b>20.00</b>	<b>9.30</b>	<b>4.20</b>
<b>501.020</b>	<b>20.00</b>	<b>12.70</b>	<b>3.20</b>
<b>503.020</b>	<b>20.00</b>	<b>15.10</b>	<b>2.20</b>
505.022	22.00	11.30	4.20
501.022	22.00	14.70	3.20
503.022	22.00	17.10	2.20
<b>505.025</b>	<b>25.00</b>	<b>14.30</b>	<b>4.20</b>
<b>501.025</b>	<b>25.00</b>	<b>17.70</b>	<b>3.20</b>
<b>503.025</b>	<b>25.00</b>	<b>20.10</b>	<b>2.20</b>
505.028	28.00	17.30	4.20
501.028	28.00	20.70	3.20
505.030	30.00	19.30	4.20
501.030	30.00	22.70	3.20
<b>505.032</b>	<b>32.00</b>	<b>21.30</b>	<b>4.20</b>
<b>501.032</b>	<b>32.00</b>	<b>24.70</b>	<b>3.20</b>
505.035	35.00	24.30	4.20
501.035	35.00	27.70	3.20
505.038	38.00	27.30	4.20
501.038	38.00	30.70	3.20
<b>505.040</b>	<b>40.00</b>	<b>24.90</b>	<b>6.30</b>
<b>501.040</b>	<b>40.00</b>	<b>29.30</b>	<b>4.20</b>
<b>503.040</b>	<b>40.00</b>	<b>32.70</b>	<b>3.20</b>
505.042	42.00	26.90	6.30
501.042	42.00	31.30	4.20
503.042	42.00	34.70	3.20
505.045	45.00	29.90	6.30
501.045	45.00	34.30	4.20
503.045	45.00	37.70	3.20
505.048	48.00	32.90	6.30
501.048	48.00	37.30	4.20
503.048	48.00	40.70	3.20
<b>505.050</b>	<b>50.00</b>	<b>34.90</b>	<b>6.30</b>
<b>501.050</b>	<b>50.00</b>	<b>39.30</b>	<b>4.20</b>
<b>503.050</b>	<b>50.00</b>	<b>42.70</b>	<b>3.20</b>
505.052	52.00	36.90	6.30
501.052	52.00	41.30	4.20
503.052	52.00	44.70	3.20
505.055	55.00	39.90	6.30
501.055	55.00	44.30	4.20
503.055	55.00	47.70	3.20
505.058	58.00	42.90	6.30
501.058	58.00	47.30	4.20
503.058	58.00	50.70	3.20
505.060	60.00	44.90	6.30
503.060	60.00	49.30	4.20
505.062	62.00	46.90	6.30
503.062	62.00	51.30	4.20
<b>505.063</b>	<b>63.00</b>	<b>47.90</b>	<b>6.30</b>
<b>503.063</b>	<b>63.00</b>	<b>52.30</b>	<b>4.20</b>
505.065	65.00	49.90	6.30
503.065	65.00	54.30	4.20
505.070	70.00	54.90	6.30

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h9	Groove width L1 0/+0.20
503.070	70.00	59.30	4.20
505.072	72.00	56.90	6.30
503.072	72.00	61.30	4.20
505.075	75.00	59.90	6.30
503.075	75.00	64.30	4.20
505.078	78.00	62.90	6.30
503.078	78.00	67.30	4.20
<b>505.080</b>	<b>80.00</b>	<b>59.50</b>	<b>8.10</b>
<b>501.080</b>	<b>80.00</b>	<b>64.90</b>	<b>6.30</b>
<b>503.080</b>	<b>80.00</b>	<b>69.30</b>	<b>4.20</b>
505.082	82.00	61.50	8.10
501.082	82.00	66.90	6.30
503.082	82.00	71.30	4.20
505.085	85.00	64.50	8.10
501.085	85.00	69.90	6.30
503.085	85.00	74.30	4.20
<b>505.090</b>	<b>90.00</b>	<b>69.50</b>	<b>8.10</b>
<b>501.090</b>	<b>90.00</b>	<b>74.90</b>	<b>6.30</b>
<b>503.090</b>	<b>90.00</b>	<b>79.30</b>	<b>4.20</b>
505.095	95.00	74.50	8.10
501.095	95.00	79.90	6.30
503.095	95.00	84.30	4.20
<b>505.100</b>	<b>100.00</b>	<b>79.50</b>	<b>8.10</b>
<b>501.100</b>	<b>100.00</b>	<b>84.90</b>	<b>6.30</b>
<b>503.100</b>	<b>100.00</b>	<b>89.30</b>	<b>4.20</b>
505.105	105.00	84.50	8.10
501.105	105.00	89.90	6.30
503.105	105.00	94.30	4.20
<b>505.110</b>	<b>110.00</b>	<b>89.50</b>	<b>8.10</b>
<b>501.110</b>	<b>110.00</b>	<b>94.90</b>	<b>6.30</b>
<b>503.110</b>	<b>110.00</b>	<b>99.30</b>	<b>4.20</b>
505.115	115.00	94.50	8.10
501.115	115.00	99.90	6.30
503.115	115.00	104.30	4.20
505.120	120.00	99.50	8.10
501.120	120.00	104.90	6.30
503.120	120.00	109.30	4.20
<b>505.125</b>	<b>125.00</b>	<b>104.50</b>	<b>8.10</b>
<b>501.125</b>	<b>125.00</b>	<b>109.90</b>	<b>6.30</b>
<b>503.125</b>	<b>125.00</b>	<b>114.30</b>	<b>4.20</b>
505.130	130.00	109.50	8.10
501.130	130.00	114.90	6.30
503.130	130.00	119.30	4.20
501.135	135.00	114.50	8.10
503.135	135.00	119.90	6.30
<b>501.140</b>	<b>140.00</b>	<b>119.50</b>	<b>8.10</b>
<b>503.140</b>	<b>140.00</b>	<b>124.90</b>	<b>6.30</b>
501.145	145.00	124.50	8.10
503.145	145.00	129.90	6.30
501.150	150.00	129.50	8.10
503.150	150.00	134.90	6.30
501.155	155.00	134.50	8.10
503.155	155.00	139.90	6.30
<b>501.160</b>	<b>160.00</b>	<b>139.50</b>	<b>8.10</b>
<b>503.160</b>	<b>160.00</b>	<b>144.90</b>	<b>6.30</b>
501.165	165.00	144.50	8.10
503.165	165.00	149.90	6.30
501.170	170.00	149.50	8.10
503.170	170.00	154.90	6.30
501.175	175.00	154.50	8.10
503.175	175.00	159.90	6.30
<b>501.180</b>	<b>180.00</b>	<b>159.50</b>	<b>8.10</b>

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h9	Groove width L1 0/+0.20
<b>503.180</b>	<b>180.00</b>	<b>164.90</b>	<b>6.30</b>
501.190	190.00	169.50	8.10
503.190	190.00	174.90	6.30
<b>505.200</b>	<b>200.00</b>	<b>176.00</b>	<b>8.10</b>
<b>501.200</b>	<b>200.00</b>	<b>179.50</b>	<b>8.10</b>
<b>503.200</b>	<b>200.00</b>	<b>184.90</b>	<b>6.30</b>
505.210	210.00	186.00	8.10
501.210	210.00	189.50	8.10
503.210	210.00	194.90	6.30
<b>505.220</b>	<b>220.00</b>	<b>196.00</b>	<b>8.10</b>
<b>501.220</b>	<b>220.00</b>	<b>199.50</b>	<b>8.10</b>
<b>503.220</b>	<b>220.00</b>	<b>204.90</b>	<b>6.30</b>
505.230	230.00	206.00	8.10
501.230	230.00	209.50	8.10
503.230	230.00	214.90	6.30
505.240	240.00	216.00	8.10
501.240	240.00	219.50	8.10
503.240	240.00	224.90	6.30
<b>505.250</b>	<b>250.00</b>	<b>226.00</b>	<b>8.10</b>
<b>501.250</b>	<b>250.00</b>	<b>229.50</b>	<b>8.10</b>
<b>503.250</b>	<b>250.00</b>	<b>234.90</b>	<b>6.30</b>
505.260	260.00	236.00	8.10
501.260	260.00	239.50	8.10
505.270	270.00	246.00	8.10
501.270	270.00	249.50	8.10
<b>505.280</b>	<b>280.00</b>	<b>256.00</b>	<b>8.10</b>
<b>501.280</b>	<b>280.00</b>	<b>259.50</b>	<b>8.10</b>
505.290	290.00	266.00	8.10
501.290	290.00	269.50	8.10
505.300	300.00	276.00	8.10
501.300	300.00	279.50	8.10
505.310	310.00	286.00	8.10
501.310	310.00	289.50	8.10
<b>505.320</b>	<b>320.00</b>	<b>296.00</b>	<b>8.10</b>
<b>501.320</b>	<b>320.00</b>	<b>299.50</b>	<b>8.10</b>
505.330	330.00	302.70	9.50
501.330	330.00	306.00	8.10
503.330	330.00	309.50	8.10
505.340	340.00	312.70	9.50
501.340	340.00	316.00	8.10
503.340	340.00	319.50	8.10
505.350	350.00	322.70	9.50
501.350	350.00	326.00	8.10
503.350	350.00	329.50	8.10
<b>505.360</b>	<b>360.00</b>	<b>332.70</b>	<b>9.50</b>

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h9	Groove width L1 0/+0.20
<b>501.360</b>	<b>360.00</b>	<b>336.00</b>	<b>8.10</b>
<b>503.360</b>	<b>360.00</b>	<b>339.50</b>	<b>8.10</b>
505.370	370.00	342.70	9.50
501.370	370.00	346.00	8.10
503.370	370.00	349.50	8.10
505.380	380.00	352.70	9.50
501.380	380.00	356.00	8.10
503.380	380.00	359.50	8.10
505.390	390.00	362.70	9.50
501.390	390.00	366.00	8.10
503.390	390.00	369.50	8.10
<b>505.400</b>	<b>400.00</b>	<b>372.70</b>	<b>9.50</b>
<b>501.400</b>	<b>400.00</b>	<b>376.00</b>	<b>8.10</b>
<b>503.400</b>	<b>400.00</b>	<b>379.50</b>	<b>8.10</b>
505.410	410.00	382.70	9.50
501.410	410.00	386.00	8.10
503.410	410.00	389.50	8.10
505.420	420.00	392.70	9.50
501.420	420.00	396.00	8.10
503.420	420.00	399.50	8.10
505.430	430.00	402.70	9.50
501.430	430.00	406.00	8.10
503.430	430.00	409.50	8.10
505.440	440.00	412.70	9.50
501.440	440.00	416.00	8.10
503.440	440.00	419.50	8.10
<b>505.450</b>	<b>450.00</b>	<b>422.70</b>	<b>9.50</b>
<b>501.450</b>	<b>450.00</b>	<b>426.00</b>	<b>8.10</b>
<b>503.450</b>	<b>450.00</b>	<b>429.50</b>	<b>8.10</b>
505.460	460.00	432.70	9.50
501.460	460.00	436.00	8.10
503.460	460.00	439.50	8.10
505.470	470.00	442.70	9.50
501.470	470.00	446.00	8.10
503.470	470.00	449.50	8.10
505.480	480.00	452.70	9.50
501.480	480.00	456.00	8.10
503.480	480.00	459.50	8.10
505.490	490.00	462.70	9.50
501.490	490.00	466.00	8.10
503.490	490.00	469.50	8.10
<b>505.500</b>	<b>500.00</b>	<b>472.70</b>	<b>9.50</b>
<b>501.500</b>	<b>500.00</b>	<b>476.00</b>	<b>8.10</b>
<b>503.500</b>	<b>500.00</b>	<b>479.50</b>	<b>8.10</b>

The figures highlighted in bold correspond to the bore diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.