

## Balls and Seats for High Pressure Check Valves

Sapphire Engineering™ manufactures precision balls and seats for check valves used in liquid chromatography pumps. Each ball and seat is manufactured as a matched pair and is 100 percent tested to guarantee proper sealing. All balls and seats are tested and packaged in our class 10,000 clean room.

### Available Materials

- ▶ Balls: Grade 3 and Grade 5: Ruby, Zirconia Ceramic and Alumina Ceramic
- ▶ Seats: sapphire, Zirconia ceramic and Alumina ceramic

Our Balls and Seats are assembled into a custom cartridge or housing for installation into check valves – helping ensure the valves operate to pressures of 6,000 psi (414 bar). Both standard and custom sizes/geometries are available.

For more information please contact Sapphire Engineering™ or your local OEM Representative.

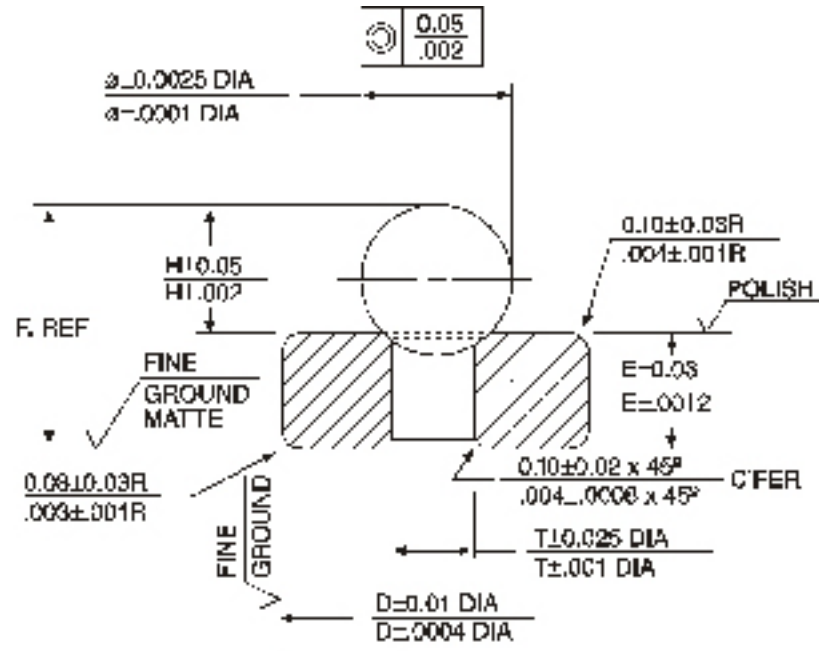


### Standard Ball and Seat Sizes<sup>1</sup>

Product Version	Ball O.D.		D		T		E		H		F		Seat Material <sup>2</sup>
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	
-03	3.000	0.1181	4.57	0.1799	2.15	0.0846	1.57	0.0618	2.32	0.0913	3.89	0.1531	S
-04	3.175	0.1250	4.57	0.1799	2.15	0.0846	1.57	0.0618	2.55	0.1004	4.12	0.1622	C, S
-09	1.750	0.0689	4.00	0.1575	1.20	0.0472	3.00	0.1181	1.30	0.0511	4.30	0.1692	C, S
-16	1.588	0.0625	4.57	0.1799	1.08	0.0425	1.57	0.0618	1.15	0.0453	2.72	0.1071	C, S
-17	4.763	0.1875	6.25	0.2461	3.00	0.1181	2.23	0.0878	4.04	0.1590	6.27	0.2468	C
-20	9.530	0.3752	11.00	0.4331	6.53	0.2570	2.00	0.0787	8.313	0.3273	10.31	0.4059	C
-22	3.175	0.1250	4.57	0.1799	2.15	0.0846	1.57	0.0618	2.55	0.1004	4.12	0.1622	C
-29	3.000	0.1181	4.11	0.1618	2.15	0.0846	1.57	0.0618	2.32	0.0913	3.89	0.1533	S
-33	1.588	0.0625	4.00	0.1575	1.08	0.0425	1.57	0.0618	1.15	0.0453	2.72	0.1071	C
-35	1.750	0.0689	3.95	0.1555	1.20	0.0472	2.95	0.1160	1.30	0.0511	4.24	0.1671	S
-36	3.175	0.1250	4.57	0.1799	2.03	0.0799	1.57	0.0618	2.67	0.1052	4.25	0.1673	S
-435	4.763	0.1875	6.25	0.2461	2.54	0.1001	2.23	0.0878	4.27	0.1681	6.50	0.2559	C

<sup>1</sup> Custom sizes are available

<sup>2</sup> S = Sapphire, C = Ceramic



DIMENSIONS:

MM  
IN

$\text{C}$   $0.05 / .002$