

Symmetrical Seals

8400 and 8500 Profiles

Catalog EPS 5370/USA

8400 Profile, Light Load U-cup with Beveled Lips; 8500 Profile, Light Load U-cup with Scraper Lips



Parker's 8400 and 8500 Series u-cups are symmetrical lip seals for use in either rod or piston sealing applications. The thin, flexible lip design reacts to low pressure and provides an extremely smooth, steady movement with less break away force required because of the inherent low friction. Both the 8400 and 8500 u-cups are produced from the same molds. The 8400 style utilizes a beveled lip, ideal for wiping fluid film, while the 8500 design utilizes a flat, scraper lip that yields additional lip interference and wipes contamination away from the sealing edge. Both u-cup profiles are available in a variety of rubber compounds to cover a wide range of applications. While the 8400 and 8500 u-cups are primarily designed for pneumatic applications, they can also be used in low to medium pressure hydraulic applications. The pressure range of the u-cups may be extended by incorporating an 8700 back-up ring.



8400 Cross-Section



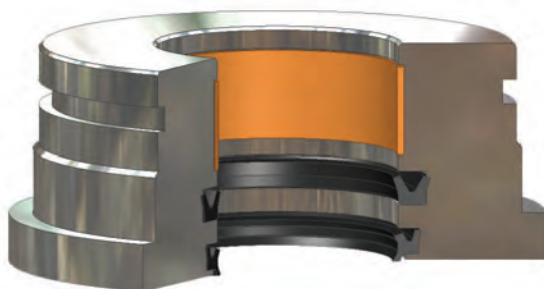
8500 Cross-Section

Technical Data

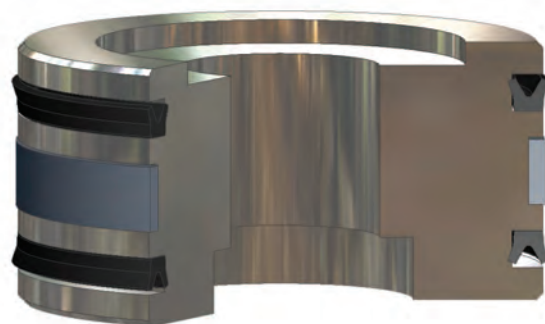
Standard Materials*	Temperature Range	Pressure Range†	Surface Speed
N4180A80	-40°F to 250°F (-40°C to 121°C)	1,250 psi (86 bar)	< 1.6 ft/s (0.5 m/s)
N4274A85	-10°F to 250°F (-23°C to 121°C)	1,750 psi (120 bar)	< 1.6 ft/s (0.5 m/s)
V4208A90	-5°F to 400°F (-21°C to 204°C)	2,000 psi (137 bar)	< 1.6 ft/s (0.5 m/s)
E4259A80	-65°F to 300°F (-54°C to 149°C)	1,750 psi (120 bar)	< 1.6 ft/s (0.5 m/s)

***Alternate Materials:** For applications that may require an alternate material, please contact your local Parker Seal representative.

†**Pressure Range** without wear rings (see Table 2-4, page 2-5).



8400 installed in Rod Gland



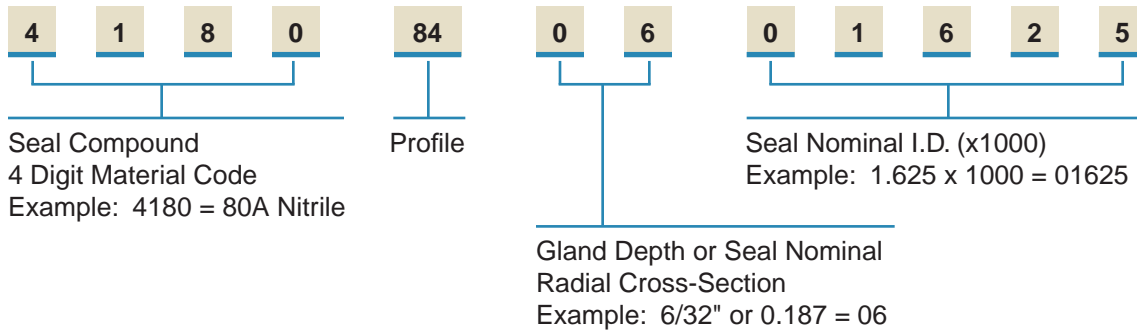
8400 installed in Piston Gland

09/01/07

8400 and 8500 Profiles

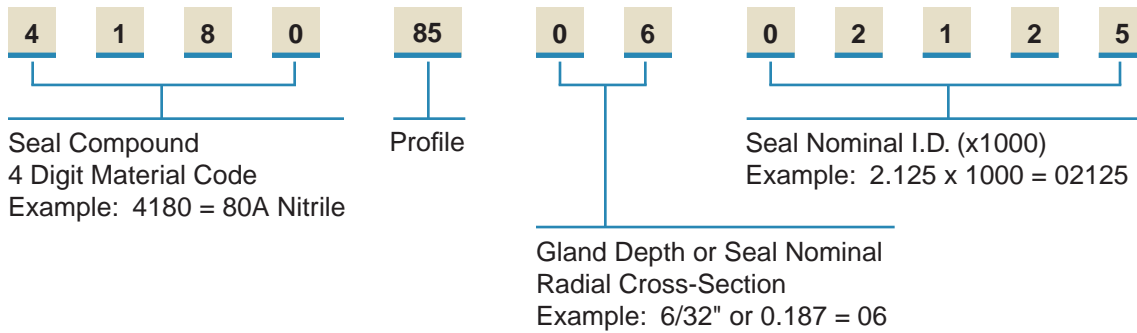
Part Number Nomenclature — 8400 Profile

Table 6-15. 8400 Profile — Inch



Part Number Nomenclature — 8500 Profile

Table 6-16. 8500 Profile — Inch



Gland Dimensions — 8400 and 8500 Profiles

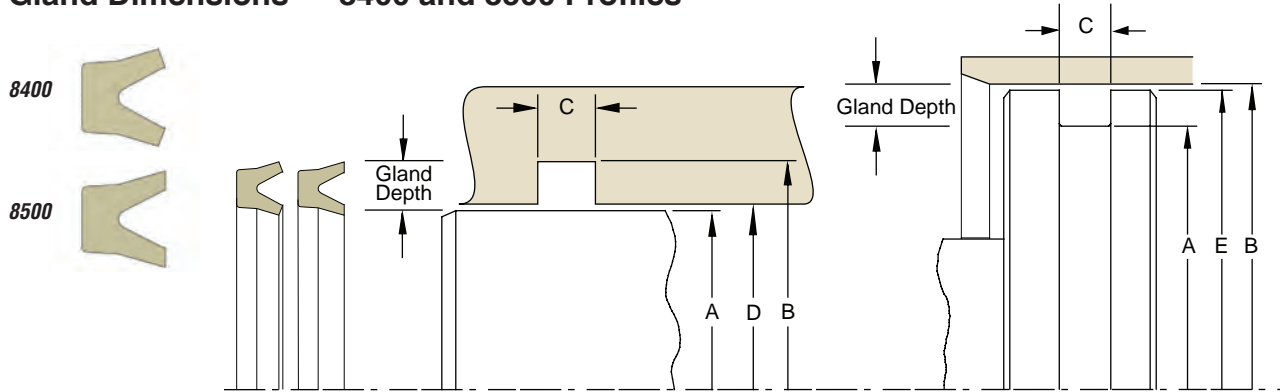


Table 6-17A. Rod Gland Dimension Tolerances

Nominal Gland Depth	A Rod Diameter	B Groove Diameter	C Groove Width	D Throat Diameter
1/8	+0.000/-0.001	+0.002/-0.000	+0.015/-0.000	+0.002/-0.000
3/16	+0.000/-0.002	+0.002/-0.000		+0.002/-0.000
1/4	+0.000/-0.002	+0.003/-0.000		+0.003/-0.000
5/16	+0.000/-0.002	+0.004/-0.000		+0.003/-0.000
3/8	+0.000/-0.002	+0.005/-0.000		+0.004/-0.000
7/16	+0.000/-0.003	+0.006/-0.000		+0.004/-0.000
1/2	+0.000/-0.003	+0.007/-0.000		+0.005/-0.000
5/8	+0.000/-0.003	+0.009/-0.000		+0.006/-0.000
3/4	+0.000/-0.004	+0.011/-0.000		+0.007/-0.000
1	+0.000/-0.005	+0.015/-0.000		+0.009/-0.000

Table 6-17B. Piston Gland Dimension Tolerances

Nominal Gland Depth	B Bore Diameter	A Groove Diameter	C Groove Width	E Piston Diameter
1/8	+0.002/-0.000	+0.000/-0.002	+0.015/-0.000	+0.000/-0.001
3/16	+0.002/-0.000	+0.000/-0.002		+0.000/-0.002
1/4	+0.003/-0.000	+0.000/-0.003		+0.000/-0.002
5/16	+0.003/-0.000	+0.000/-0.004		+0.000/-0.002
3/8	+0.004/-0.000	+0.000/-0.005		+0.000/-0.002
7/16	+0.005/-0.000	+0.000/-0.006		+0.000/-0.002
1/2	+0.005/-0.000	+0.000/-0.007		+0.000/-0.003
9/16	+0.006/-0.000	+0.000/-0.008		+0.000/-0.003
5/8	+0.006/-0.000	+0.000/-0.009		+0.000/-0.003
3/4	+0.007/-0.000	+0.000/-0.010		+0.000/-0.004
7/8	+0.008/-0.000	+0.000/-0.011	+0.000/-0.005	
1	+0.009/-0.000	+0.000/-0.012	+0.000/-0.005	

Please refer to Engineering Section 2, page 2-8 for surface finish and additional hardware considerations.

Table 6-18. 8400 and 8500 Gland Dimensions — Inch

A	B	C	D	E	Compound Code (X = Standard Offering)				Part Number		
Rod Diameter	(Rod) Groove Diameter	(Rod) Groove Width	Throat Diameter*						Compound Code	Profile Code 84 or 85	
(Bore) Groove Diameter	Bore Diameter	(Bore) Groove Width		(Bore) Piston Diameter**	4180	4274	4208	4259			
0.125	0.250	0.093	0.126	0.249	X	X	X	X	XXXX	8x	0200125
0.156	0.343	0.125	0.157	0.342			X		XXXX	8x	0300156
0.187	0.312	0.093	0.188	0.311	X	X	X	X	XXXX	8x	0200187
0.187	0.375	0.125	0.188	0.374	X	X	X	X	XXXX	8x	0300187
0.187	0.437	0.156	0.188	0.436		X	X	X	XXXX	8x	0400187
0.250	0.375	0.093	0.251	0.374	X	X	X	X	XXXX	8x	0200250
0.250	0.437	0.125	0.251	0.436	X	X	X		XXXX	8x	0300250
0.250	0.500	0.156	0.251	0.499		X	X	X	XXXX	8x	0400250
0.312	0.500	0.125	0.313	0.499	X	X	X	X	XXXX	8x	0300312
0.312	0.562	0.156	0.313	0.561	X	X	X	X	XXXX	8x	0400312

*If used with wear rings, refer to wear ring throat diameter, see Section 9.
 **If used with wear rings, refer to wear ring piston diameter, see Section 9.
 For custom groove calculations, see Appendix C.

Table 6-18. 8400 and 8500 Gland Dimensions — Inch (Continued)

A Rod Diameter	B (Rod) Groove Diameter	C (Rod) Groove Width	D Throat Diameter*	E (Bore) Piston Diameter**	Compound Code (X = Standard Offering)				Part Number		
					4180	4274	4208	4259	Compound Code	Profile Code 84 or 85	
0.375	0.500	0.093	0.376	0.499			X		XXXX	8x	0200375
0.375	0.625	0.156	0.376	0.624		X	X	X	XXXX	8x	0400375
0.437	0.687	0.156	0.438	0.686	X	X	X	X	XXXX	8x	0400437
0.500	0.750	0.156	0.501	0.749	X	X	X	X	XXXX	8x	0400500
0.562	0.812	0.156	0.563	0.811	X	X	X		XXXX	8x	0400562
0.625	0.812	0.125	0.626	0.811	X	X			XXXX	8x	0300625
0.625	0.875	0.156	0.626	0.874	X	X	X	X	XXXX	8x	0400625
0.687	0.937	0.156	0.688	0.936	X				XXXX	8x	0400687
0.687	1.000	0.188	0.688	0.999	X				XXXX	8x	0500687
0.750	1.000	0.156	0.751	0.999	X	X	X	X	XXXX	8x	0400750
0.750	1.125	0.218	0.751	1.124	X	X			XXXX	8x	0600750
0.812	1.062	0.156	0.813	1.061	X	X	X	X	XXXX	8x	0400812
0.875	1.125	0.156	0.876	1.124	X	X	X	X	XXXX	8x	0400875
0.875	1.250	0.218	0.876	1.249	X	X			XXXX	8x	0600875
0.937	1.187	0.156	0.938	1.186	X	X	X		XXXX	8x	0400937
0.937	1.250	0.188	0.938	1.249	X	X	X		XXXX	8x	0500937
1.000	1.250	0.156	1.001	1.249	X	X	X	X	XXXX	8x	0401000
1.000	1.312	0.188	1.001	1.311	X	X	X	X	XXXX	8x	0501000
1.000	1.375	0.218	1.002	1.374		X		X	XXXX	8x	0601000
1.000	1.500	0.281	1.001	1.499	X	X	X	X	XXXX	8x	0801000
1.062	1.375	0.188	1.063	1.374	X	X	X	X	XXXX	8x	0501062
1.125	1.375	0.156	1.126	1.374	X	X	X	X	XXXX	8x	0401125
1.125	1.437	0.188	1.126	1.436	X				XXXX	8x	0501125
1.187	1.500	0.188	1.188	1.499	X	X	X	X	XXXX	8x	0501187
1.250	1.500	0.156	1.251	1.499	X				XXXX	8x	0401250
1.250	1.562	0.188	1.251	1.561	X	X	X	X	XXXX	8x	0501250
1.312	1.625	0.188	1.313	1.624	X	X	X	X	XXXX	8x	0501312
1.375	1.687	0.188	1.376	1.686	X	X	X		XXXX	8x	0501375
1.375	1.750	0.218	1.377	1.749	X	X	X	X	XXXX	8x	0601375
1.437	1.750	0.188	1.438	1.749	X				XXXX	8x	0501437
1.500	1.812	0.188	1.501	1.811	X	X	X		XXXX	8x	0501500
1.500	1.875	0.218	1.502	1.874	X		X	X	XXXX	8x	0601500
1.625	2.000	0.218	1.627	1.999	X	X	X	X	XXXX	8x	0601625
1.687	2.062	0.218	1.689	2.061			X		XXXX	8x	0601687
1.750	2.000	0.156	1.751	1.999	X		X		XXXX	8x	0401750
1.750	2.125	0.218	1.752	2.124	X	X	X	X	XXXX	8x	0601750
1.875	2.250	0.218	1.877	2.249	X	X	X	X	XXXX	8x	0601875
1.937	2.375	0.250	1.938	2.374	X		X		XXXX	8x	0701937

*If used with wear rings, refer to wear ring throat diameter, see Section 9.

**If used with wear rings, refer to wear ring piston diameter, see Section 9.

For custom groove calculations, see Appendix C.

Table 6-18. 8400 and 8500 Gland Dimensions — Inch (Continued)

A Rod Diameter	B (Rod) Groove Diameter	C (Rod) Groove Width	D Throat Diameter*	E (Bore) Piston Diameter**	Compound Code (X = Standard Offering)				Part Number		
					4180	4274	4208	4259	Compound Code	Profile Code 84 or 85	
(Bore) Groove Diameter	Bore Diameter	(Bore) Groove Width									
2.000	2.375	0.218	2.002	2.374	X	X	X	X	XXXX	8x	0602000
2.125	2.500	0.218	2.127	2.499	X	X	X	X	XXXX	8x	0602125
2.250	2.625	0.218	2.252	2.624	X	X	X		XXXX	8x	0602250
2.250	3.000	0.406	2.252	2.998	X				XXXX	8x	1202250
2.375	2.750	0.218	2.377	2.749	X	X	X		XXXX	8x	0602375
2.375	3.000	0.344	2.377	2.998	X	X			XXXX	8x	1002375
2.437	2.937	0.281	2.438	2.936		X			XXXX	8x	0802437
2.500	2.875	0.218	2.502	2.874	X	X	X	X	XXXX	8x	0602500
2.500	2.937	0.250	2.501	2.936	X	X	X	X	XXXX	8x	0702500
2.500	3.000	0.281	2.501	2.999	X				XXXX	8x	0802500
2.562	3.000	0.250	2.563	2.999	X	X	X	X	XXXX	8x	0702562
2.625	3.000	0.218	2.627	2.999	X		X	X	XXXX	8x	0602625
2.687	3.125	0.250	2.688	3.124	X				XXXX	8x	0702687
2.750	3.125	0.218	2.752	3.124	X		X	X	XXXX	8x	0602750
2.750	3.187	0.250	2.751	3.186	X				XXXX	8x	0702750
2.750	3.250	0.281	2.751	3.249	X				XXXX	8x	0802750
2.812	3.250	0.250	2.813	3.249	X	X	X		XXXX	8x	0702812
2.875	3.250	0.218	2.877	3.249	X				XXXX	8x	0602875
3.000	3.375	0.218	3.002	3.374	X	X	X	X	XXXX	8x	0603000
3.000	3.437	0.250	3.001	3.436	X	X	X	X	XXXX	8x	0703000
3.062	3.500	0.250	3.063	3.499	X	X	X	X	XXXX	8x	0703062
3.375	3.875	0.281	3.376	3.874	X				XXXX	8x	0803375
3.500	4.000	0.281	3.501	3.999	X	X	X	X	XXXX	8x	0803500
3.625	4.000	0.218	3.627	3.999	X				XXXX	8x	0603625
3.750	4.250	0.281	3.751	4.249	X	X	X		XXXX	8x	0803750
3.875	4.375	0.281	3.876	4.374		X			XXXX	8x	0803875
4.000	4.250	0.156	4.001	4.249	X				XXXX	8x	0404000
4.000	4.500	0.281	4.001	4.499	X		X	X	XXXX	8x	0804000
4.250	4.750	0.281	4.251	4.749	X	X	X		XXXX	8x	0804250
4.437	5.000	0.312	4.438	4.999	X	X	X	X	XXXX	8x	0904437
4.500	5.000	0.281	4.501	4.999	X	X	X	X	XXXX	8x	0804500
4.750	5.250	0.281	4.751	5.249	X		X		XXXX	8x	0804750
5.000	5.562	0.312	5.001	5.561	X	X	X		XXXX	8x	0905000
5.125	5.750	0.344	5.127	5.748	X				XXXX	8x	1005125
5.375	6.000	0.344	5.377	5.998	X	X	X	X	XXXX	8x	1005375
5.437	6.000	0.312	5.438	5.999	X	X	X	X	XXXX	8x	0905437
5.500	6.125	0.344	5.502	6.123	X	X	X	X	XXXX	8x	1005500
5.937	6.500	0.312	5.938	6.499	X	X			XXXX	8x	0905937

*If used with wear rings, refer to wear ring throat diameter, see Section 9.

**If used with wear rings, refer to wear ring piston diameter, see Section 9.

For custom groove calculations, see Appendix C.

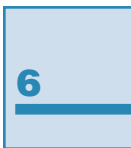


Table 6-18. 8400 and 8500 Gland Dimensions — Inch (Continued)

A Rod Diameter	B (Rod) Groove Diameter	C (Rod) Groove Width	D Throat Diameter*	E (Bore) Piston Diameter**	Compound Code (X = Standard Offering)				Part Number		
					4180	4274	4208	4259	Compound Code	Profile Code 84 or 85	
6.000	6.625	0.344	6.002	6.623	X	X			XXXX	8x	1006000
6.375	7.000	0.344	6.377	6.998	X	X	X		XXXX	8x	1006375
6.437	7.000	0.312	6.438	6.999	X				XXXX	8x	0906437
6.969	7.593	0.344	6.971	7.591	X			X	XXXX	8x	1006969
7.000	7.625	0.344	7.002	7.623	X		X	X	XXXX	8x	1007000
7.375	8.000	0.344	7.377	7.998	X	X	X	X	XXXX	8x	1007375
7.750	8.375	0.344	7.752	8.373	X				XXXX	8x	1007750
8.500	9.125	0.344	8.502	9.123	X			X	XXXX	8x	1008500
9.000	9.750	0.406	9.002	9.748			X		XXXX	8x	1209000
9.312	10.000	0.375	9.314	9.998	X	X	X		XXXX	8x	1109312
11.000	11.750	0.406	11.002	11.748					XXXX	8x	1211000
11.000	12.000	0.531	11.002	11.998	X				XXXX	8x	1611000
11.250	12.000	0.406	11.252	11.998	X		X	X	XXXX	8x	1211250
13.000	14.000	0.531	13.002	13.998	X	X	X	X	XXXX	8x	1613000
13.187	14.000	0.437	13.189	13.998	X	X	X		XXXX	8x	1313187
17.125	18.000	0.469	17.127	17.998	X				XXXX	8x	1417125

*If used with wear rings, refer to wear ring throat diameter, see Section 9.

**If used with wear rings, refer to wear ring piston diameter, see Section 9.

For custom groove calculations, see Appendix C.

NOTE: For sizes larger than those shown in the table, please contact your local Parker Seal representative.