

### **3. Design recommendations – static seal**

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## 4. Maßliste

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Als Hersteller von O-Ringen sind wir in der Lage Ihnen jede beliebige O-Ring-Abmessung zu liefern. Aus wirtschaftlichen Gründen ist es jedoch sinnvoll, soweit möglich auf bestehende Größen zurückzugreifen. Wir empfehlen dafür die Größen unserer 2-xxx-Serie, die nachstehend aufgelistet sind.

Die 2-xxx-Serie entspricht den Größen der amerikanischen Norm AS 568B, die weltweit angewendet wird. Auch in der DIN 3771 / Teil 1 und in der ISO 3601 / Teil 1 wurden die darin enthaltenen Abstufungen der Schnurdurchmesser übernommen.

Die 2-xxx-Serie bietet darüber hinaus zwei besondere Vorteile:

1. Diese Größen werden in folgenden Werkstoffen lagermäßig geführt:  
N 674-70 (NBR 70 Shore A)  
N 552-90 (NBR 90 Shore A)  
E 540-80 (EPDM 80 Shore A)  
V 747-75 (FKM 75 Shore A)
2. Für jede Größe aus der Serie 2-xxx können wir Ihnen dazu passende Parker Parbak®-Stützringe anbieten, wenn der O-Ring hohen Drücken ausgesetzt wird. (Weitere Informationen dazu in Kapitel 8. „Stützringe“.)

2-0xx Größen: Schnurstärke  $d_2 = 1.78$  mm

Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm
2-001*	0.74	2-010	6.07	2-019	20.35	2-028	34.65	2-037	63.22	2-046	107.67
2-002*	1.07	2-011	7.65	2-020	21.95	2-029	37.82	2-038	66.40	2-047	114.02
2-003*	1.42	2-012	9.25	2-021	23.52	2-030	41.00	2-039	69.57	2-048	120.37
2-004	1.78	2-013	10.82	2-022	25.12	2-031	44.17	2-040	72.75	2-049	126.72
2-005	2.57	2-014	12.42	2-023	26.70	2-032	47.35	2-041	75.92	2-050	133.07
2-006	2.90	2-015	14.00	2-024	28.30	2-033	50.52	2-042	82.27		
2-007	3.68	2-016	15.60	2-025	29.87	2-034	53.70	2-043	88.62		
2-008	4.47	2-017	17.17	2-026	31.47	2-035	56.87	2-044	94.97		
2-009	5.28	2-018	18.17	2-027	33.05	2-036	60.05	2-045	101.32		

2-1xx Größen: Schnurstärke  $d_2 = 2.62$  mm

Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm	Parker Nr.	Innen-durchmesser mm
2-102	1.24	2-115	17.12	2-128	37.77	2-141	58.42	2-154	94.92	2-167	177.47
2-103	2.06	2-116	18.72	2-129	39.34	2-142	59.99	2-155	101.27	2-168	183.82
2-104	2.84	2-117	20.29	2-130	40.94	2-143	61.60	2-156	107.62	2-169	190.17
2-105	3.63	2-118	21.89	2-131	42.52	2-144	63.17	2-157	113.97	2-170	196.52
2-106	4.42	2-119	23.47	2-132	44.12	2-145	64.77	2-158	120.32	2-171	202.87
2-107	5.23	2-120	25.07	2-133	45.69	2-146	66.34	2-159	126.67	2-172	209.22
2-108	6.02	2-121	26.64	2-134	47.29	2-147	67.95	2-160	133.02	2-173	215.57
2-109	7.59	2-122	28.24	2-135	48.90	2-148	69.52	2-161	139.37	2-174	221.92
2-110	9.19	2-123	29.82	2-136	50.47	2-149	71.12	2-162	145.72	2-175	228.27
2-111	10.77	2-124	31.42	2-137	52.07	2-150	72.69	2-163	152.07	2-176	234.62
2-112	12.37	2-125	32.99	2-138	53.64	2-151	75.87	2-164	158.42	2-177	240.97
2-113	13.94	2-126	34.59	2-139	55.25	2-152	82.22	2-165	164.77	2-178	247.32
2-114	15.54	2-127	36.17	2-140	56.82	2-153	88.57	2-166	171.12		

\* Bitte beachten Sie: bei 2-001 Schnurstärke  $d_2 = 1.02$  mm  
bei 2-002 Schnurstärke  $d_2 = 1.27$  mm  
bei 2-003 Schnurstärke  $d_2 = 1.52$  mm

## 4. Size list

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As a manufacturer of O-rings we can produce any O-ring size required. However, from the economic point of view it is important to select from standard sizes available ex-stock, particularly our 2-xxx series.

Our 2-xxx series complies with American Standard AS 568 B and is recognized worldwide. These sizes also have been adopted by DIN 3771 Part 1 and ISO 3601 Part 1.

The 2-xxx series from Parker provides two particular advantages to the user:

1. Ex-stock in the following compounds:  
N 674-70 (NBR 70 Shore A)  
N 552-90 (NBR 90 Shore A)  
E 540-80 (EPDM 80 Shore A)  
V 747-75 (FKM 75 Shore A)
2. For each 2-xxx series O-ring we can offer a fitting Parker Parbak® back-up ring. This is particularly important where large clearance gaps and/or high pressures exist. (Further information in section 8. Backup rings).

#### 2-0xx Sizes: Cross-section $d_2 = 1.78$ mm

Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm
2-001*	0.74	2-010	6.07	2-019	20.35	2-028	34.65	2-037	63.22	2-046	107.67
2-002*	1.07	2-011	7.65	2-020	21.95	2-029	37.82	2-038	66.40	2-047	114.02
2-003*	1.42	2-012	9.25	2-021	23.52	2-030	41.00	2-039	69.57	2-048	120.37
2-004	1.78	2-013	10.82	2-022	25.12	2-031	44.17	2-040	72.75	2-049	126.72
2-005	2.57	2-014	12.42	2-023	26.70	2-032	47.35	2-041	75.92	2-050	133.07
2-006	2.90	2-015	14.00	2-024	28.30	2-033	50.52	2-042	82.27		
2-007	3.68	2-016	15.60	2-025	29.87	2-034	53.70	2-043	88.62		
2-008	4.47	2-017	17.17	2-026	31.47	2-035	56.87	2-044	94.97		
2-009	5.28	2-018	18.17	2-027	33.05	2-036	60.05	2-045	101.32		

#### 2-1xx Sizes: Cross-section $d_2 = 2.62$ mm

Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm
2-102	1.24	2-115	17.12	2-128	37.77	2-141	58.42	2-154	94.92	2-167	177.47
2-103	2.06	2-116	18.72	2-129	39.34	2-142	59.99	2-155	101.27	2-168	183.82
2-104	2.84	2-117	20.29	2-130	40.94	2-143	61.60	2-156	107.62	2-169	190.17
2-105	3.63	2-118	21.89	2-131	42.52	2-144	63.17	2-157	113.97	2-170	196.52
2-106	4.42	2-119	23.47	2-132	44.12	2-145	64.77	2-158	120.32	2-171	202.87
2-107	5.23	2-120	25.07	2-133	45.69	2-146	66.34	2-159	126.67	2-172	209.22
2-108	6.02	2-121	26.64	2-134	47.29	2-147	67.95	2-160	133.02	2-173	215.57
2-109	7.59	2-122	28.24	2-135	48.90	2-148	69.52	2-161	139.37	2-174	221.92
2-110	9.19	2-123	29.82	2-136	50.47	2-149	71.12	2-162	145.72	2-175	228.27
2-111	10.77	2-124	31.42	2-137	52.07	2-150	72.69	2-163	152.07	2-176	234.62
2-112	12.37	2-125	32.99	2-138	53.64	2-151	75.87	2-164	158.42	2-177	240.97
2-113	13.94	2-126	34.59	2-139	55.25	2-152	82.22	2-165	164.77	2-178	247.32
2-114	15.54	2-127	36.17	2-140	56.82	2-153	88.57	2-166	171.12		

\* Please note: for 2-001 cross-section  $d_2 = 1.02$  mm  
for 2-002 cross-section  $d_2 = 1.27$  mm  
for 2-003 cross-section  $d_2 = 1.52$  mm

## 4. Maßliste

2-2xx Größen: Schnurstärke  $d_2 = 3.53$  mm

Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm
2-201	4.34	2-215	26.57	2-229	59.92	2-243	104.37	2-257	148.82	2-271	234.54
2-202	5.94	2-216	28.17	2-230	63.09	2-244	107.54	2-258	151.99	2-272	240.89
2-203	7.52	2-217	29.74	2-231	66.27	2-245	110.72	2-259	158.34	2-273	247.24
2-204	9.12	2-218	31.34	2-232	69.44	2-246	113.89	2-260	164.69	2-274	253.59
2-205	10.12	2-219	32.92	2-233	72.62	2-247	117.07	2-261	171.04	2-275	266.29
2-206	12.29	2-220	34.52	2-234	75.79	2-248	120.24	2-262	177.39	2-276	278.99
2-207	13.87	2-221	36.09	2-235	78.97	2-249	123.42	2-263	183.74	2-277	291.69
2-208	15.47	2-222	37.69	2-236	82.14	2-250	126.59	2-264	190.09	2-278	304.39
2-209	17.04	2-223	40.87	2-237	85.32	2-251	129.77	2-265	196.44	2-279	329.79
2-210	18.64	2-224	44.04	2-238	88.49	2-252	132.94	2-266	202.79	2-280	355.19
2-211	20.22	2-225	47.22	2-239	91.67	2-253	136.12	2-267	209.14	2-281	380.59
2-212	21.82	2-226	50.39	2-240	94.84	2-254	139.29	2-268	215.49	2-282	405.26
2-213	23.39	2-227	53.57	2-241	98.02	2-255	142.47	2-269	221.84	2-283	430.66
2-214	24.99	2-228	56.74	2-242	101.19	2-256	145.64	2-270	228.19	2-284	456.06

2-3xx Größen: Schnurstärke  $d_2 = 5.33$  mm

Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm
2-309	10.46	2-324	34.29	2-339	81.92	2-354	129.54	2-369	202.57	2-384	380.37
2-310	12.07	2-325	37.47	2-340	85.09	2-355	132.72	2-370	208.92	2-385	405.26
2-311	13.64	2-326	40.64	2-341	88.27	2-356	135.89	2-371	215.27	2-386	430.66
2-312	15.24	2-327	43.82	2-342	91.44	2-357	139.07	2-372	221.62	2-387	456.06
2-313	16.81	2-328	46.99	2-343	94.62	2-358	142.24	2-373	227.97	2-388	481.41
2-314	18.42	2-329	50.17	2-344	97.79	2-359	145.42	2-374	234.32	2-389	506.81
2-315	19.99	2-330	53.34	2-345	100.97	2-360	148.59	2-375	240.67	2-390	532.21
2-316	21.59	2-331	56.52	2-346	104.14	2-361	151.77	2-376	247.02	2-391	557.61
2-317	23.16	2-332	59.69	2-347	107.32	2-362	158.12	2-377	253.37	2-392	582.68
2-318	24.77	2-333	62.87	2-348	110.49	2-363	164.47	2-378	266.07	2-393	608.08
2-319	26.34	2-334	66.04	2-349	113.67	2-364	170.82	2-379	278.77	2-394	633.48
2-320	27.94	2-335	69.22	2-350	116.84	2-365	177.17	2-380	291.47	2-395	658.88
2-321	29.51	2-336	72.39	2-351	120.02	2-366	183.52	2-381	304.17		
2-322	31.12	2-337	75.57	2-352	123.19	2-367	189.87	2-382	329.57		
2-323	32.69	2-338	78.74	2-353	126.37	2-368	196.22	2-383	354.97		

2-4xx Größen: Schnurstärke  $d_2 = 6.99$  mm

Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm	Parker Nr.	Innen-durch-messer mm
2-425	113.67	2-434	142.24	2-443	189.87	2-452	291.47	2-461	405.26	2-470	532.26
2-426	116.84	2-435	145.42	2-444	196.22	2-453	304.17	2-462	417.96	2-471	557.66
2-427	120.02	2-436	148.59	2-445	202.57	2-454	316.87	2-463	430.66	2-472	582.68
2-428	123.19	2-437	151.77	2-446	215.27	2-455	329.57	2-464	443.36	2-473	608.08
2-429	126.37	2-438	158.12	2-447	227.97	2-456	342.27	2-465	456.06	2-474	633.48
2-430	129.54	2-439	164.47	2-448	240.67	2-457	354.97	2-466	468.76	2-475	658.88
2-431	132.72	2-440	170.82	2-449	253.37	2-458	367.67	2-467	481.46		
2-432	135.89	2-441	177.17	2-450	266.07	2-459	380.37	2-468	494.16		
2-433	139.07	2-442	183.52	2-451	278.77	2-460	393.07	2-469	506.86		

**4. Size list****2-2xx Größen: Schnurstärke  $d_2 = 3.53$  mm**

Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm
2-201	4.34	2-215	26.57	2-229	59.92	2-243	104.37	2-257	148.82	2-271	234.54
2-202	5.94	2-216	28.17	2-230	63.09	2-244	107.54	2-258	151.99	2-272	240.89
2-203	7.52	2-217	29.74	2-231	66.27	2-245	110.72	2-259	158.34	2-273	247.24
2-204	9.12	2-218	31.34	2-232	69.44	2-246	113.89	2-260	164.69	2-274	253.59
2-205	10.12	2-219	32.92	2-233	72.62	2-247	117.07	2-261	171.04	2-275	266.29
2-206	12.29	2-220	34.52	2-234	75.79	2-248	120.24	2-262	177.39	2-276	278.99
2-207	13.87	2-221	36.09	2-235	78.97	2-249	123.42	2-263	183.74	2-277	291.69
2-208	15.47	2-222	37.69	2-236	82.14	2-250	126.59	2-264	190.09	2-278	304.39
2-209	17.04	2-223	40.87	2-237	85.32	2-251	129.77	2-265	196.44	2-279	329.79
2-210	18.64	2-224	44.04	2-238	88.49	2-252	132.94	2-266	202.79	2-280	355.19
2-211	20.22	2-225	47.22	2-239	91.67	2-253	136.12	2-267	209.14	2-281	380.59
2-212	21.82	2-226	50.39	2-240	94.84	2-254	139.29	2-268	215.49	2-282	405.26
2-213	23.39	2-227	53.57	2-241	98.02	2-255	142.47	2-269	221.84	2-283	430.66
2-214	24.99	2-228	56.74	2-242	101.19	2-256	145.64	2-270	228.19	2-284	456.06

**2-3xx Sizes: Cross-section  $d_2 = 5.33$  mm**

Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm
2-309	10.46	2-324	34.29	2-339	81.92	2-354	129.54	2-369	202.57	2-384	380.37
2-310	12.07	2-325	37.47	2-340	85.09	2-355	132.72	2-370	208.92	2-385	405.26
2-311	13.64	2-326	40.64	2-341	88.27	2-356	135.89	2-371	215.27	2-386	430.66
2-312	15.24	2-327	43.82	2-342	91.44	2-357	139.07	2-372	221.62	2-387	456.06
2-313	16.81	2-328	46.99	2-343	94.62	2-358	142.24	2-373	227.97	2-388	481.41
2-314	18.42	2-329	50.17	2-344	97.79	2-359	145.42	2-374	234.32	2-389	506.81
2-315	19.99	2-330	53.34	2-345	100.97	2-360	148.59	2-375	240.67	2-390	532.21
2-316	21.59	2-331	56.52	2-346	104.14	2-361	151.77	2-376	247.02	2-391	557.61
2-317	23.16	2-332	59.69	2-347	107.32	2-362	158.12	2-377	253.37	2-392	582.68
2-318	24.77	2-333	62.87	2-348	110.49	2-363	164.47	2-378	266.07	2-393	608.08
2-319	26.34	2-334	66.04	2-349	113.67	2-364	170.82	2-379	278.77	2-394	633.48
2-320	27.94	2-335	69.22	2-350	116.84	2-365	177.17	2-380	291.47	2-395	658.88
2-321	29.51	2-336	72.39	2-351	120.02	2-366	183.52	2-381	304.17		
2-322	31.12	2-337	75.57	2-352	123.19	2-367	189.87	2-382	329.57		
2-323	32.69	2-338	78.74	2-353	126.37	2-368	196.22	2-383	354.97		

**2-4xx Sizes: Cross-section  $d_2 = 6.99$  mm**

Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm	Parker no.	Inside diameter mm
2-425	113.67	2-434	142.24	2-443	189.87	2-452	291.47	2-461	405.26	2-470	532.26
2-426	116.84	2-435	145.42	2-444	196.22	2-453	304.17	2-462	417.96	2-471	557.66
2-427	120.02	2-436	148.59	2-445	202.57	2-454	316.87	2-463	430.66	2-472	582.68
2-428	123.19	2-437	151.77	2-446	215.27	2-455	329.57	2-464	443.36	2-473	608.08
2-429	126.37	2-438	158.12	2-447	227.97	2-456	342.27	2-465	456.06	2-474	633.48
2-430	129.54	2-439	164.47	2-448	240.67	2-457	354.97	2-466	468.76	2-475	658.88
2-431	132.72	2-440	170.82	2-449	253.37	2-458	367.67	2-467	481.46		
2-432	135.89	2-441	177.17	2-450	266.07	2-459	380.37	2-468	494.16		
2-433	139.07	2-442	183.52	2-451	278.77	2-460	393.07	2-469	506.86		

## 4. Maßliste

Die zwei wichtigsten Parameter bei der Auslegung einer O-Ring-Dichtung, die von der O-Ring-Größe bestimmt werden, sind die Dehnung bzw. Stauchung und die Verpressung, d. h. die diametrale Verformung des Schnurdurchmessers im eingebauten Zustand. Hierfür gibt es Einbauempfehlungen (siehe Kapitel 2), die letztlich von der Art des O-Ring-Einsatzes bestimmt werden. Geringfügige Über- oder Unterschreitungen der Einbauempfehlungen sind dabei oft möglich, ohne dass dadurch Funktion oder Lebensdauer der Dichtung beeinträchtigt werden. Im Zweifelsfall sollten Sie sich an unsere Ingenieure wenden.

### Toleranzen

Parker-Präzisions-O-Ringe werden in sehr engen Toleranzbereichen gefertigt. Die zulässigen Toleranzen sind genormt in DIN 3771 und ISO 3601-1 (bis zu einer Schnurstärke von 7.00 und einem Innendurchmesser von 670 mm). Die entsprechenden

Toleranzen zeigen Ihnen die folgenden Tabellen. Die in den Tabellen enthaltenen zulässigen Toleranzen sind ausgelegt für O-Ringe aus Nitril-Butadien-Kautschuk (NBR) mit einer Härte von 70 IRHD. Für andere Werkstoffe können sich wegen unterschiedlichen Materialschwundes abweichende Toleranzgrößen und -lagen ergeben. Wenn dadurch die Funktionseigenschaften beeinträchtigt werden, ist es erforderlich, entsprechende Werkzeuge zu erstellen, um die Toleranzen exakt einhalten zu können.

### Bestellbeispiel:

Für einen Parker Präzisions-O-Ring:

Innendurchmesser: 14.00 mm

Schnurstärke: 1.78 mm

Werkstoff: N 674-70 (NBR 70 Shore A)

**O-Ring, 14 x 1.78, 2-015, N 674-70**

### Schnurstärke-Toleranzen

Schnurstärke (mm)	1.80	2.65	3.55	5.30	7.00	8.00	10.00	12.00
Zulässige Toleranz(mm)	±0.08	±0.09	±0.10	±0.13	±0.15	±0.18	±0.21	±0.25

### Innendurchmesser-Toleranzen

Innen- durchmesser (mm)	1.80 bis 6.30	6.70 bis 11.20	11.80 bis 21.20	22.40 bis 40.00	41.20 bis 80.00	82.50 bis 160	165 bis 300	300 bis 650	670 bis 910	910 bis 1180
Zulässige Toleranz (mm)	±0.13 mm	±0.16 mm	±0.19 mm	±0.95 %	±0.86 %	±0.78 %	±0.74 %	±0.67 %	±0.60 %	±0.55 %
vom entsprechenden Innendurchmesser										

## 4. Size list

An O-ring seal is designed to Section 2 taking into account design, O-ring size, stretching (or compression) of the O-ring circumference, and deformation of the cross-section. Small deviations from our design recommendations which do not lead to leakage or failure often are possible. If you have any doubt please contact our application engineers for further advice.

### Tolerances

Parker precision O-rings are manufactured to very narrow tolerances. These tolerances are standardized in DIN 3771 and ISO 3601-1 (up to 7 mm cross-section and 670 mm inner diameter). The tolerances laid down in the following tables are specific for nitrile butadiene rubber O-rings, hardness 70 IRHD. For other compounds, individual material shrinkage factors could lead to different tolerances and designs. If with variation of compound and hardness, the ability to function is affected, it is necessary to

manufacture a corresponding mould to remain within the specified tolerance band.

### Example of order:

For Parker precision O-rings:  
 Inner diameter: 14.00 mm  
 Cross-section: 1.78 mm  
 Compound: 674-70 (NBR 70 Shore A)

**O-ring, 14 x 1.78, 2-015, N 674-70**

Cross-section Tolerances								
Cross-section (mm) up to	1.80	2.65	3.55	5.30	7.00	8.00	10.00	12.00
Allowable tolerance (mm)	±0.08	±0.09	±0.10	±0.13	±0.15	±0.18	±0.21	±0.25

Inside diameter Tolerances										
Inside diameter (mm)	1.80	6.70	11.80	22.40	41.20	82.50	165	300	670	910
	to 6.30	to 11.20	to 21.20	to 40.00	to 80.00	to 160	to 300	to 650	to 910	to 1180
Allowable tolerance (mm)	±0.13 mm	±0.16 mm	±0.19 mm	±0.95 %	±0.86 %	±0.78 %	±0.74 %	±0.67 %	±0.60 %	±0.55 %
of corresponding inside diameter										