MECHANICAL · CHEAT SHEET

O-ring *size chart* (AS568).

AS568 dash-number O-ring sizes — the US standard. **Dash number, inside diameter, cross-section, and series**. ISO 3601 metric equivalents noted where applicable.

The chart

DASH #	ID (INCH)	ID (MM)	CROSS-SECTION	SERIES / NOTE
001	0.029"	0.74 mm	0.040" (1.02 mm)	Very small (0xx)
004	0.070"	1.78 mm	0.070" (1.78 mm)	Small bore
008	0.176"	4.47 mm	0.070" (1.78 mm)	Small bore
010	0.239"	6.07 mm	0.070" (1.78 mm)	Small bore
012	0.364"	9.25 mm	0.070" (1.78 mm)	Small bore
014	0.489"	12.42 mm	0.070" (1.78 mm)	Small bore
016	0.614"	15.60 mm	0.070" (1.78 mm)	Small bore
020	0.864"	21.95 mm	0.070" (1.78 mm)	Small bore
024	1.114"	28.30 mm	0.070" (1.78 mm)	Common small (0xx)
030	1.614"	41.00 mm	0.070" (1.78 mm)	0xx series
040	2.864"	72.74 mm	0.070" (1.78 mm)	Larger 0xx
104	0.139"	3.53 mm	0.103" (2.62 mm)	1xx series

DASH #	ID (INCH)	ID (MM)	CROSS-SECTION	SERIES / NOTE
110	0.362"	9.19 mm	0.103" (2.62 mm)	1xx series
120	0.987"	25.07 mm	0.103" (2.62 mm)	1xx series
200	0.114"	2.90 mm	0.139" (3.53 mm)	2xx series begins
210	0.734"	18.64 mm	0.139" (3.53 mm)	2xx common
214	0.984"	25.00 mm	0.139" (3.53 mm)	Common metric-equivalent
218	1.234"	31.34 mm	0.139" (3.53 mm)	2xx common
222	1.484"	37.69 mm	0.139" (3.53 mm)	2xx common
226	1.984"	50.39 mm	0.139" (3.53 mm)	2xx common
230	2.484"	63.09 mm	0.139" (3.53 mm)	2xx larger
240	3.734"	94.84 mm	0.139" (3.53 mm)	2xx large
312	0.612"	15.54 mm	0.210" (5.33 mm)	3xx series
318	0.987"	25.07 mm	0.210" (5.33 mm)	3xx series
325	1.487"	37.77 mm	0.210" (5.33 mm)	3xx series
335	2.987"	75.87 mm	0.210" (5.33 mm)	3xx series
345	4.487"	113.97 mm	0.210" (5.33 mm)	3xx series
425	4.475"	113.67 mm	0.275" (6.99 mm)	4xx series
440	6.975"	177.17 mm	0.275" (6.99 mm)	4xx large

About AS568. The Aerospace Standard 568 (SAE) defines 369 specific O-ring sizes by dash number. Each series has a constant cross-section, with inside diameters scaling by series: 0xx = 0.070" (1.78 mm) CS,

> 1xx = 0.103" (2.62 mm) CS, 2xx = 0.139" (3.53 mm) CS, 3xx = 0.210" (5.33 mm) CS, 4xx = 0.275" (6.99 mm) CS. The above shows a representative sample; a full catalog is from Parker, McMaster-Carr, or AS568 reference.

Common applications

APPLICATION TYPE	RECOMMENDED MATERIAL	NOTES
Standard fluid (oil/water 0-100°C)	NBR (Buna-N)	Cheapest, default for most applications
Hot oil (100-150°C)	FKM (Viton)	High temperature; petroleum oils
Steam, hot water	EPDM	Polar fluids; NOT petroleum
Aerospace fuel	FKM or FFKM	Resistant to JP-fuels
Cryogenic	Silicone	Down to ~-100°C
Food contact	FDA-grade silicone or EPDM	Confirm FDA 21 CFR 177.2600 compliance
High vacuum	FKM or low-outgassing FKM	Avoid plasticizer-rich elastomers
Strong acids	FFKM or Aflas	PTFE may also be used (with care)
High pressure (>3000 psi)	Standard + backup ring	Or harder durometer (90A vs 70A)

Common pitfalls

- **'AS568-214' specifies size only, not material.** Different materials (Buna-N, Viton, EPDM, silicone, FFKM) work for very different chemical and temperature conditions. Always specify both size *and* material.
- **O-ring stretches in service.** An installed O-ring should be stretched to about 1-5% of its free ID for static face seals. Less stretch = leakage; more stretch = premature failure.
- **Squeeze ratio matters.** A static face seal is typically squeezed 15-25% of cross-section thickness. Less = leakage; more = extrusion or compression set. Manufacturer recommendations vary by application.
- **Hardness (durometer) affects performance.** Standard is 70 Shore A. Softer (50A) seals at lower pressures but extrudes under high pressure. Harder (90A) handles high pressure but needs higher squeeze and surface finish.
- **Surface finish matters more than people think.** For dynamic seals (sliding/rotating), the mating surface should be Ra 8-32 μin (0.2-0.8 μm) — neither too rough (wears the ring) nor too smooth (microscratching). For static seals, Ra 32-63 μin is typical.

Common questions

How do I choose between standard sizes for a custom application?

Pick a groove first (depth and width based on standard size charts), then choose the O-ring size that fits with proper squeeze (typically 15-30% for static, 10-20% for dynamic). The cross-section affects squeeze; the inside

diameter affects stretch. AS568 size charts list the standard combinations — start there to avoid custom tooling.

What's 'squeeze' and why does it matter?

Squeeze is how much the O-ring cross-section is compressed in the groove. Too little (< 8%) and it won't seal under pressure spikes; too much (> 30% for static, > 20% for dynamic) and it extrudes through gaps or fails from compression set. Static seals tolerate more squeeze than dynamic ones — moving seals heat up from friction at high squeeze.

What material should I use for fuel exposure?

Nitrile (Buna-N, NBR) is the standard for gasoline and most petroleum fuels. For diesel and biodiesel, hydrogenated nitrile (HNBR) is better — biodiesel attacks standard nitrile over time. For aviation fuels, fluorocarbon (Viton, FKM) is the choice. Always check the chemical compatibility chart against your specific fluid.

Why is my O-ring leaking even though it's the right size?

Common causes in order: surface finish too rough (need 16-32 μin Ra for static seals), wrong material for the fluid, twisted during installation, groove dimensions out of spec, extrusion through clearance gaps under pressure, or too low squeeze. Inspect the O-ring for cuts, flat spots, or chemical degradation before assuming sizing is the problem.

What's the difference between AS568 and metric O-rings?

AS568 is the US standard with 369 dash numbers, mostly fractional-inch dimensions. Metric O-rings use mm dimensions and aren't standardized to AS568. Some sizes are close to interchangeable — e.g. AS568 -010 (0.239" ID × 0.07" cross-section) is very close to metric 6×1 mm — but always verify before swapping.

Sources

- **O-ring sizes (US):** SAE AS568 — Aerospace Standard for O-ring Sizes.
- **O-ring sizes (international):** ISO 3601-1 — Pneumatic and hydraulic fluid systems — Sealing elements — Part 1: Inside diameters, cross-sections, tolerances and designation codes.
- **O-ring design:** Parker O-Ring Handbook (free PDF, industry standard reference).
- **Materials:** ASTM D2000 — Standard Classification for Rubber Products in Automotive Applications.

Disclaimer. O-ring selection is a function of fluid, temperature, pressure, sliding velocity, surface finish, and groove geometry. For pressure-critical or safety-critical applications, consult the Parker O-Ring Handbook or equivalent industry reference.