

Pneumatic Cylinder Selection — ISO 15552 / ISO 6431 / VDMA 24562

cBallast · ISO 15552:2018 · Selection guide

Standard family and interchangeability

ISO 15552 (2018) supersedes ISO 6431 (1992) and VDMA 24562. All three standards specify the same mounting envelope per bore — cylinders from any compliant OEM drop into existing brackets without modification.

Bore sizing from force

$F = P \times A \times \eta$; P = pilot pressure Pa. A = effective piston area m^2 . η = mechanical efficiency (0.85-0.95 fresh; 0.75-0.85 worn). For retraction subtract rod area. Design practice: 1.3-1.5 load factor over required load.

Force at 6 bar (extension)

Bore mm	Piston area mm ²	Ext Force N	Ret Force with rod
32	804	482	294 (12 mm)
40	1257	754	566 (16 mm)
50	1963	1178	962 (20 mm)
63	3117	1870	1550 (20 mm)
80	5027	3016	2565 (25 mm)
100	7854	4712	4098 (25 mm)
125	12272	7363	6558 (32 mm)
160	20106	12064	11056 (40 mm)
200	31416	18850	17275 (40 mm)
250	49087	29452	27100 (50 mm)

Stroke-to-bore ratio (buckling)

Piston rod acts as slender column under compression on extension. Long strokes at small bore = Euler buckling. Manufacturer publishes buckling diagram; design below curve with 3.5+ safety factor. Rule: stroke "d 15× bore foot-mounted; "d 20× bore rod-end constrained.

Mounting styles

Code	Style	Best for
MP1/MP2	Foot mount	Rigid frame, no misalignment
MF1/MF2	Front/rear flange	Through-plate, tension or compression

MS1/MS2	Side lug rectangular	Machine cabinets
MT4	Trunnion mid-body	Rotating load, swing arm
ME1/ME2	Male/female clevis rear	Angular displacement
MP4	Male clevis with pin	Simple pin-jointed

Family cross-reference

ISO 15552	SMC	Festo	Parker
Standard tie-rod	CDA2, C96	DSBC, DNC	P1D-S, P1D-B
Low-friction	CDA2W	DSBG	P1E
Compact short-stroke	CDQ2	ADN	P1P
ATEX / IECEx	CD*-XC22	DSBC/DSBG-EX	P1D-EX
Stainless food/pharma	C96SC / CDA2S	DSBG-CI	P1D-C

Related on cBallast

- <https://cballast.com/brands/SMC>
- <https://cballast.com/brands/Festo>
- [https://cballast.com/brands/Parker Hannifin](https://cballast.com/brands/Parker-Hannifin)
- <https://cballast.com/categories/Pneumatics>

Reference compiled by cBallast. Trademarks are the property of their respective owners. Consult the governing standard and OEM manual for the current revision before installation, procurement or warranty work. <https://cballast.com>