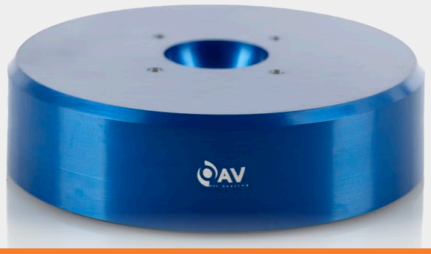
FLAT RECTANGULAR AIR BEARINGS

We offer a line of flat air bearings designed to meet the non-contact requirements at low cost while yielding high performance. OAV Flat Air Bearings are often used as a standard off-the-shelf solutions for providing axial constraint in rotary motion applications. Our standard product line is available in metric sizing as well as the custom sizing made to order upon request.

Part Number	Size	Input Pressure	Ideal Load	Stiffness	Flow Rate	Bearing Weight	Bearing Height	Flatness
OAVF20L40	20 mm x 40 mm	40 psi - 100 max psi	161 N (36 lbs)	15.77 N/µ (0.09 lbs/µin)	0.90 NLPM (2.0 SCFH)	25 g	13 mm	0.0005 mm (0.00002 in)
OAVF25L50	25 mm x 50 mm	40 psi - 100 max psi	250 N (56 lbs)	22 N/µ (0.13 lbs/µin)	1.1 NLPM (2.4 SCFH)	47 g	17 mm	0.0005 mm (0.00002 in)
OAVF25L100	25 mm x 100 mm	40 psi - 100 max psi	499 N (112 lbs)	46 N/µ (0.26 lbs/µin)	1.9 NLPM (4.0 SCFH)	163 g	25 mm	0.0005 mm (0.00002 in)
OAVF40L50	40 mm x 50 mm	40 psi - 100 max psi	401 N (90 lbs)	35 N/µ (0.20 lbs/µin)	1.3 NLPM (2.9 SCFH)	55 g	17 mm	0.0005 mm (0.00002 in)
OAVF40L80	40 mm x 80 mm	40 psi - 100 max psi	637 N (143 lbs)	58 N/µ (0.33 lbs/µin)	1.8 NLPM (3.8 SCFH)	143 g	20 mm	0.0005 mm (0.00002 in)
OAVF50L100	50 mm x 100 mm	40 psi - 100 max psi	1184 N (266 lbs)	97 N/µ (0.56 lbs/µin)	2.3 NLPM (4.8 SCFH)	295 g	25 mm	0.0005 mm (0.00002 in)
OAVF100L200	100 mm x 200 mm	40 psi - 100 max psi	5136 N (1154 lbs)	505.44 N/µ (2.89 lbs/µin)	4.5 NLPM (9.6 SCFH)	1877 g	39 mm	0.0005 mm (0.00002 in)
OAVF1000L100	1000 mm x 100 mm	40 psi - 100 max psi	20697 N (4651 lbs)	2,037.10 N/µ (11.63 lbs/µin)	21.0 NLPM (44.6 SCFH)	11,164 g	42 mm	0.0005 mm (0.00002 in)
OAVCB6060	The OAV Air Bearing Bar generates an evenly distributed film of gas between the surface and the substrate. Because of low gas viscosity and friction losses by viscous shearing, mechanical contact is avoided. The combination of air pressure and vacuum allows the OAV air bearing bar to hold the substrate down while simultaneously lifting it from the surface for ultimate precision and fly height (20 to 120 µm at stability of ±5 µm).							



FLAT ROUND AIR BEARINGS

Part Number	Size		Ideal Load	Stiffness	Flow Rate	Bearing Weight	Bearing Height	Flatness
OAVR025R	25 mm	0.28 to 0.68 MPa (40 to 100 PSI)	98 N (22 lbs)	18.4 N/µ (0.11 lbs/µ in)	0.6 NLPM (1.3 SCFH)	14 g	13 mm	0.0005 mm (0.00002 in)
OAVR040R	40 mm	0.28 to 0.68 MPa (40 to 100 PSI)	254 N (57 lbs)	29.43 N/µ (0.17 lbs/µ in)	0.93 NLPM (2.0 SCFH)	34 g	13 mm	0.0005 mm (0.00002 in)
OAVR050R	50 mm	0.28 to 0.68 MPa (40 to 100 PSI)	392 N (88 lbs)	60.71 N/µ (0.35 lbs/µ in)	1.2 NLPM (2.5 SCFH)	61 g	13 mm	0.0005 mm (0.00002 in)
OAVR065R	65 mm	0.28 to 0.68 MPa (40 to 100 PSI)	664 N (149 lbs)	91.98 N/µ (0.53 lbs/µ in)	1.5 NLPM (3.2 SCFH)	149 g	20 mm	0.0005 mm (0.00002 in)
OAVR080R	80 mm	0.28 to 0.68 MPa (40 to 100 PSI)	1189 N (267 lbs)	116.94 N/µ (0.67 lbs/µ in)	1.9 NLPM (4.0 SCFH)	231 g	20 mm	0.0005 mm (0.00002 in)

Part Number	Size		Ideal Load	Stiffness	Flow Rate	Bearing Weight	Bearing Height	Flatness
OAVR100R	100 mm	0.28 to 0.68 MPa (40 to 100 PSI)	1856 N (417 lbs)	182.64 N/µ (1.04 lbs/µ in)	2.4 NLPM (5.1 SCFH)	436 g	25 mm	0.0005 mm (0.00002 in)
OAVR125R	125 mm	0.28 to 0.68 MPa (40 to 100 PSI)	2897 N (651 lbs)	285.13 N/µ (1.63 lbs/µ in)	3.0 NLPM (6.4 SCFH)	1028 g	35 mm	0.0005 mm (0.00002 in)
OAVR150R	150 mm	0.28 to 0.68 MPa (40 to 100 PSI)	4535 N (1019 lbs)	446.31 N/µ (2.55 lbs/µ in)	3.6 NLPM (7.7 SCFH)	2085 g	50 mm	0.0005 mm (0.00002 in)
OAVR200R	200 mm	0.28 to 0.68 MPa (40 to 100 PSI)	8064 N (1812 lbs)	793.64 N/µ (4.53 lbs/µ in)	4.8 NLPM (10.1 SCFH)	4765 g	70 mm	0.0005 mm (0.00002 in)

Typical Configurations

Preload: Flat bearings can be preloaded in 4 different ways.

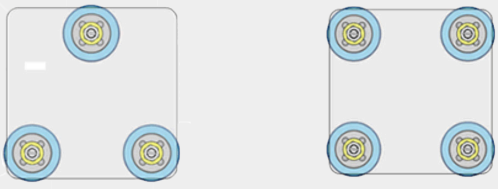
1) Opposite Bearing: The most common way is to preload with a bearing on the opposite end. This requires more space and adds more weight, but it provides for more stiffness and load capacity. To achieve the highest stiffness and balance, it is recommended to make sure the two bearings are placed opposite of one another, and that both surfaces are parallel to each other.
When preloading with other air bearings, the preload force needs to be considered in order to determine the appropriate size bearing.
Preloading with other air bearings is typically utilized to provide a load capacity in both directions, as well as for increasing the stiffness.
2) Weights: Flat bearings can also be preloaded if there is a constant force pushing down on them. This type of preload is typically used when moving large objects. It is recommended to use a minimum of 3 bearings for this configuration.

3) Magnets: Magnets are a good option if low mass is desired. Typically, there will be one magnet on the bearing and one along the entire length of the guide.
4) Vacuum: Vacuum preloaded air bearings use a vacuum to preload. The vacuum gives more control over the air film thickness and in turn maintains optimal stiffness and performance while reducing the overall weight and size of the system.
Other considerations: It is best to keep the resulting force of the load distribution in the center of the bearing. In order to determine the proper size of the bearing, it is best to ask the following questions:

-Where is the resulting load located on the bearing?

-What is the surface roughness of the guide?

-What is the maximum load being applied to the bearing?



Keep in mind that the load capacities for each bearing are based on the maximum load being applied to the center of the bearing. Smoother surface finishes will always result in a better performance. However, if a smooth surface finish is not possible, you will need a bigger bearing and high input pressure because it will be crucial to maintain a higher fly height and to improve on the damping capabilities.

When supporting a load on a flat surface, it is most reliable to use 3 bearings (rather than 4). Assuming that the location of the load is maintained between the three bearings, this will add the most stability. 3 bearings are especially best when the guide surface is not perfectly flat because the bearings will always maintain their approximate fly height. If 4 bearings are used on an uneven surface, there will always be one or two bearings suspended too high until the weight shifts, or the surface changes.

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