

There are dozens of papers regarding the outgassing of materials in vacuum. This short bibliography includes work with aluminum and stainless steel which are the materials in which we are the most interested. M. Wong has an excellent and comprehensive bibliography in his work of 21 March 2002. He lists approximately seventy-five papers dealing with cleaning and outgassing.

	<u>mbar l/sec cm²</u>
Aluminum baked 20 hours at 100 °C	5 X 10 ⁻¹⁴
304 Stainless Steel, electro polished, 30 hours at 250 °C	4 X 10 ⁻¹²
<i>Vacuum Technology, CERN Accelerator</i> Scanticon Conference Centre, Snekersten, Denmark, 28 May-3 June 1999: Proceedings, editors [sic], S. Turner ISBN 10 9290831499	

	<u>mbar l/sec cm²</u>
Aluminum baked 20 hours at 100 °C	5 X 10 ⁻¹⁴
304 Stainless Steel, electro polished, 30 hours at 250 °C	4 X 10 ⁻¹²
<i>Vacuum Science & Technology</i> CERN CAS Accelerator, Platja D'Aro, Spain, May 16-24, 2006 H.F. Dylla, Thomas Jefferson National Accelerator Facility, Newport News, VA	

	<u>mbar l/sec cm²</u>
Aluminum, detergent cleaned-acetone rinse, baked 15 hours at 250 °C	4 X 10 ⁻¹³
304 Stainless Steel, glass beaded, 30 hours at 250 °C	2 X 10 ⁻¹²
<i>Vacuum Technology - Practice for Scientific Instruments</i> Nagamitsu Yoshimura 2008 Springer-Verlag Berlin Heidelberg ISBN 978-3-540-74432-0	

	<u>mbar l/sec cm²</u>
Aluminum, 5 hours after 24 hours at 150 °C - 250 °C	1 X 10 ⁻⁹
304 Stainless Steel, 5 hours after 24 hours at 150 °C - 250 °C	≈ 1.5 X 10 ⁻⁸
<i>Vacuum System</i> Oswald Gröbner CAS, Small Accelerator course, Zeegse, Netherlands, 24 May - 2 June, 2005 Oswald Gröbner, retired, CERN Vacuum Group	

GATE VALVES

ANSI Flange Size	Port Diameter	Molecular Conductance liter/sec.	Cylinder Capacity Liters	Approximate Close/Open Times @ 70 PS1
2 Inch	2.25 Inch	192	0.207	1.5/1.5 sec.
3 Inch	3.37 Inch	567	0.408	1.5/1.5 sec.
4 Inch	5.37 Inch	1,219	0.408	2/2 sec.
6 Inch	7.12 Inch	3,887	0.985	2/2 sec.
8 Inch	8 Inch	9,213	1.223	3/2 sec.
10 Inch	10 Inch	17,014	1.704	3/2 sec.
12 Inch	12 Inch	29,400	3.063	4/4 sec.
16 Inch	16 Inch	49,600	3.887	5/5 sec.
20 Inch	20 Inch	79,970	10.207	7/8 sec.
24 Inch	24 Inch	128,010	14.95	11/12 sec.
ISO Flange Size	Port Diameter	Molecular Conductance liter/sec.	Cylinder Capacity Liters	Approximate Close/Open Times @ 70 PS1
ISO 63	63 mm	192	0.207	1.5/1.5 sec.
ISO 100	100 mm	1,219	0.408	2/2 sec.
ISO 160	160 mm	3,887	0.985	2/2 sec.
ISO 200	200 mm	9,213	1.223	3/2 sec.
ISO 250	250 mm	17,014	1.740	3/2 sec.
ISO 320	320 mm	29,400	3.063	4/4 sec.
ISO 400	400 mm	49,600	3.90	6/7 sec.
ISO 500	500 mm	79,970	10.20	7/8 sec.
ISO 630	630 mm	128,010	14.95	11/12

ANGLE VALVES

ANSI Flange Size	Port Diameter	Molecular Conductance liter/sec.	Cylinder Capacity Liters	Approximate Close/Open Times @ 70 PS1
2 Inch	2 Inch	113	0.285	<1/<1 sec.
3 Inch	3 Inch	295	0.348	<1/<1 sec.
4 Inch	4 Inch	440	0.782	1/1 sec.
6 Inch	6 Inch	1,000	1.020	2/2 sec.
8 Inch	8 Inch	1,920	4,598	2/2 sec.
10 Inch	10 Inch	3,000	6.697	2/2 sec.
12 Inch	12 Inch	5,065	6.985	3/2 sec.
16 Inch	16 Inch	8,550	8.622	4/3 sec.
20 Inch	20 Inch	13,567	9.5	5/6 sec.
24 Inch	24 Inch	21,847	9.5	7/8 sec.
ISO Flange Size	Port Diameter	Molecular Conductance liter/sec.	Cylinder Capacity Liters	Approximate Close/Open Times @ 70 PS1
ISO 63	63 mm	160	0.285	<1/<1 sec.
ISO 100	100 mm	440	0.782	1/1 sec.
ISO 160	160 mm	1,000	1.020	2/2 sec.
ISO 200	200 mm	1,920	4.598	2/2 sec.
ISO 250	250 mm	3,000	6.697	2/2 sec.
ISO 320	320 mm	5,065	6.985	3/2 sec.
ISO 400	400 mm	8,550	8.622	4/4 sec.
ISO 500	500 mm	13,560	9.5	5/6 sec.
ISO 630	630 mm	21,847	12.5	8/9 sec.