Syringe Selection Guide

Common Syringe Data - Diameter and Plunger Surface Area

The following list is a guide to common syringes and their associated diameters and surface area. Syringe diameter data, in mm, is listed below for each syringe. All Harvard Apparatus microprocessor syringe pumps require the user to input syringe diameter information. The pump uses this diameter data to set flow rates. The PHD 22/2000 series of syringe pumps also has this information built into the pump memory in a handy Syringe Look Up Table. Surface area information

was used to calculate PSI (pounds per square inch) data for the pressure table on page A93. Average pressures for any syringe pump and syringe combination can be calculated by dividing the average (nominal) syringe pump force by the syringe diameter (in square inches) to obtain PSI. Example, nominal pressure obtained using a 25 ml Hamilton Gastight syringe on a PHD 22/2000 standard pressure syringe pump would be: $50 \text{ lbs} / 0.644 \text{ in}^2 = 77.6 \text{ PSI } (5.35 \text{ bars})$.

Common Syr	inges and Their	Diameters						
Volume	Dia. (mm)	Area (in2)	Volume	Dia. (mm)	Area (in2)	Volume	Dia. (mm)	Area (in2)
BD Plastic			Ranfac Glass			Hamilton Ga	stight Glass	
1 ml	4.78	0.027815	2 ml	9.12	0.101254	0.5 μΙ	0.103	0.000013
3 ml	8.66	0.091297	5 ml	12.34	0.185376	1 μΙ	0.1457	0.000026
5 ml	12.06	0.177059	10 ml	14.55	0.257720	2 μΙ	0.206	0.000052
10 ml	14.5	0.255952	20 ml	19.86	0.480154	5 μΙ	0.3257	0.000129
20 ml	19.13	0.445505	30 ml	23.2	0.655237	10 μΙ	0.46	0.000258
30 ml	21.7	0.573247	50 ml	27.6	0.927343	25 μΙ	0.729	0.000647
50/60 ml	26.7	0.867851	Terumo Plasti	ic		50 μl	1.031	0.001294
BD Glass	•	•	3 ml	8.95	0.097514	100 µl	1.46	0.002595
).5 ml	4.64	0.026209	5 ml	13	0.205735	250 µl	2.3	0.006440
l ml	4.64	0.026209	10 ml	15.8	0.303904	500 μl	3.26	0.012938
2.5 ml	8.66	0.091297	20 ml	20.15	0.494279	1000 μΙ	4.61	0.025872
5 ml	11.86	0.171235	30 ml	23.1	0.649601	2.5 ml	7.28	0.064519
0 ml	14.34	0.250335	60 ml	29.1	1.030881	5 ml	10.3	0.129151
0 ml	19.13	0.445505	Air-Tite All Pl	astic		10 ml	14.57	0.258429
0 ml	22.7	0.627298	2.5 ml	9.6	0.112193	25 ml	23	0.643989
i0 ml	28.6	0.995760	5 ml	12.45	0.188695	50 ml	32.6	1.293772
00 ml	34.9	1.482768	10 ml	15.9	0.307763	Unimetrics -	4000 and 5000	Glass
SGE Glass			20 ml	20.05	0.489386	10 μΙ	0.46	0.000258
25 μl	0.73	0.000649	30 ml	22.5	0.616293	25 μΙ	0.729	0.000647
i0 μl	1.03	0.001292	50 ml	29	1.023808	50 μl	1.031	0.001294
l00 μl	1.46	0.002595	Popper & Sons Perfectum Glass			100 μΙ	1.46	0.002595
250 µl	2.3	0.006440	0.5 ml	3.45	0.014490	250 µl	2.3	0.006440
500 µl	3.26	0.012938	1 ml	4.5	0.024652	500 μl	3.26	0.012938
ml	4.61	0.025872	2 ml	8.92	0.096862	1000 μΙ	4.61	0.025872
2.5 ml	7.28	0.064519	3 ml	8.99	0.098388	Kendall Mon	oject Plastic	
5 ml	10.3	0.129151	5 ml	11.7	0.166646	1 ml	4.65	0.026323
0 ml	14.57	0.258429	10 ml	14.7	0.263061	3 ml	8.94	0.097297
Harvard Stainless Steel			20 ml	19.58	0.466711	6 ml	12.7	0.196350
3 ml	9.525	0.110447	30 ml	22.7	0.627298	12 ml	15.9	0.307763
20 ml	19.13	0.445505	50 ml	29	1.023808	20 ml	20.4	0.506621
50 ml	28.6	0.995760	100 ml	35.7	1.551525	35 ml	23.8	0.689567
100 ml	34.9	1.482768				60 ml	26.6	0.861362
200 ml	44.75	2.438382				140 ml	38.4	1.795084

Syringe Selection Guide

How to Select the Correct Syringe for Your Application

Syringe Type/Size	Swage Lock	Luer Lock	RN	Threaded 1/4• 28	Leur Slip Fit	Pressure Maximum p.s.i.	Compatibility with Substance in Syringe	Accuracy 1%	Accuracy 5%	Materials
Stainless Stee	l Syringes,	see page	A70							
8 ml	•					1,500	Maximum	•		316 / Chemraz
20 ml						750	Maximum	•		316 / Viton or Chemraz
50 ml						750	Maximum			316 / Viton or Chemraz
100 ml						750	Maximum			316 / Viton or Chemraz
200 ml						750	Maximum			316 / Viton or Chemraz
Glass GasTigh	t Syringes,	see page	s A73 a	nd A74		•				
1 to 100 µl			•		•	1,000	Maximum			Glass and Teflon
250 to 500 µl					•	500	Maximum			Glass and Teflon
1 to 10 ml			•			200	Maximum			Glass and Teflon
25 to 100 ml						100	Maximum			Glass and Teflon
Glass Multifit	Syringes, se	ee page A	75							
2 to 50 ml						100	Maximum			Glass Only
Plastic Syringe	es, see page	es A76 to	A77			Ċ	•		,	'
1 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber
5 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber
10 ml					•	125	Minimum		•	Polypropylene and Natural Rubber
20 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber
30 ml		•			٠	125	Minimum		•	Polypropylene and Natural Rubber
50/60 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber
140 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber