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 lbs / 0.644 in^2 = 77.6 PSI (5.35 bars).

Common Syringes and Their Diameters

Volume	Dia. (mm)	Area (in2)
BD Plastic		
1 ml	4.78	0.027815
3 ml	8.66	0.091297
5 ml	12.06	0.177059
10 ml	14.5	0.255952
20 ml	19.13	0.445505
30 ml	21.7	0.573247
50/60 ml	26.7	0.867851
BD Glass		
0.5 ml	4.64	0.026209
1 ml	4.64	0.026209
2.5 ml	8.66	0.091297
5 ml	11.86	0.171235
10 ml	14.34	0.250335
20 ml	19.13	0.445505
30 ml	22.7	0.627298
50 ml	28.6	0.995760
100 ml	34.9	1.482768
SGE Glass		
25 µl	0.73	0.000649
50 µl	1.03	0.001292
100 µl	1.46	0.002595
250 µl	2.3	0.006440
500 µl	3.26	0.012938
1 ml	4.61	0.025872
2.5 ml	7.28	0.064519
5 ml	10.3	0.129151
10 ml	14.57	0.258429
Harvard Stainless Steel		
8 ml	9.525	0.110447
20 ml	19.13	0.445505
50 ml	28.6	0.995760
100 ml	34.9	1.482768
200 ml	44.75	2.438382

Volume	Dia. (mm)	Area (in2)
Ranfac Glass		
2 ml	9.12	0.101254
5 ml	12.34	0.185376
10 ml	14.55	0.257720
20 ml	19.86	0.480154
30 ml	23.2	0.655237
50 ml	27.6	0.927343
Terumo Plastic		
3 ml	8.95	0.097514
5 ml	13	0.205735
10 ml	15.8	0.303904
20 ml	20.15	0.494279
30 ml	23.1	0.649601
60 ml	29.1	1.030881
Air-Tite All Plastic		
2.5 ml	9.6	0.112193
5 ml	12.45	0.188695
10 ml	15.9	0.307763
20 ml	20.05	0.489386
30 ml	22.5	0.616293
50 ml	29	1.023808
Popper & Sons Perfectum Glass		
0.5 ml	3.45	0.014490
1 ml	4.5	0.024652
2 ml	8.92	0.096862
3 ml	8.99	0.098388
5 ml	11.7	0.166646
10 ml	14.7	0.263061
20 ml	19.58	0.466711
30 ml	22.7	0.627298
50 ml	29	1.023808
100 ml	35.7	1.551525

Volume	Dia. (mm)	Area (in2)
Hamilton Gastight Glass		
0.5 µl	0.103	0.000013
1 µl	0.1457	0.000026
2 µl	0.206	0.000052
5 µl	0.3257	0.000129
10 µl	0.46	0.000258
25 µl	0.729	0.000647
50 µl	1.031	0.001294
100 µl	1.46	0.002595
250 µl	2.3	0.006440
500 µl	3.26	0.012938
1000 µl	4.61	0.025872
2.5 ml	7.28	0.064519
5 ml	10.3	0.129151
10 ml	14.57	0.258429
25 ml	23	0.643989
50 ml	32.6	1.293772
Unimetrics - 4000 and 5000 Glass		
10 µl	0.46	0.000258
25 µl	0.729	0.000647
50 µl	1.031	0.001294
100 µl	1.46	0.002595
250 µl	2.3	0.006440
500 µl	3.26	0.012938
1000 µl	4.61	0.025872
Kendall Monoject Plastic		
1 ml	4.65	0.026323
3 ml	8.94	0.097297
6 ml	12.7	0.196350
12 ml	15.9	0.307763
20 ml	20.4	0.506621
35 ml	23.8	0.689567
60 ml	26.6	0.861362
140 ml	38.4	1.795084

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 Steel 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 GasTight Syringes, see pages A73 and 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, see page A75										
2 to 50 ml		•				100	Maximum	•		Glass Only
Plastic Syringes, see pages A76 to A77										
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		•			•	125	Minimum		•	Polypropylene and Natural Rubber
50/60 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber
140 ml		•			•	125	Minimum		•	Polypropylene and Natural Rubber