



Capillaries and Rotifers

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Capillaries Sizes



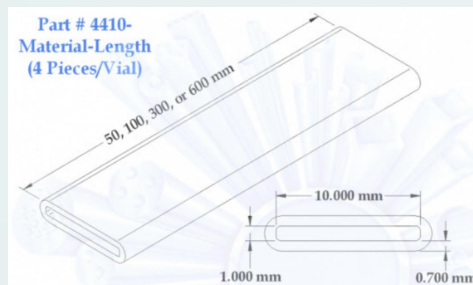
Capillaries sizes by VitroCom



- Round tubing:
 - a. The most used inner diameter is typically 50 micrometers
 - b. Several sizes with different ID, OD, and Pcs/Val (next slide)
- Rectangular tubing:
 - a. Cross-sections of 10 micrometers by 100 micrometers to 100 millimeter cross-section sizes
 - b. Several different sizes with different path lengths, width, wall, Pcs/val (shown on next slide)
- Thick walled tubing (Heavy Roll):
 - a. Standard legs 300mm and 600mm
 - b. Sizes on next slide
- Square walled tubing:
 - a. Standard length of 50 mm, 100 mm, 300mm, 600mm
 - b. Sizes on next slide
- Multi Bore glass tubing:
 - a. Still in production
- Standards
 1. Standard glass types are borosilicate, clear fused quartz, and synthetic fused silica
 2. Standard tolerances: 10% ID (inner diameter) and 10% OD (outer diameter)
 3. Standard End Finish: 100 mm, 300 mm, and 600 mm

Rectangular Tubing

Product	Path Length (mm)	Width (mm)	Wall (mm)	Pcs / Vial
5001	0.010	0.100	0.007	25
5002	0.020	0.200	0.014	30
5003	0.030	0.300	0.021	33
5004	0.040	0.400	0.028	36
5005	0.050	0.500	0.035	44
5015	0.050	1.000	0.050	50
5010	0.100	1.000	0.070	40
5012	0.100	2.000	0.100	45
3520	0.200	2.000	0.140	36
3524	0.200	4.000	0.200	36
3530	0.300	3.000	0.210	31
3536	0.300	6.000	0.300	24
2540	0.400	4.000	0.280	28
2548	0.400	8.000	0.400	18
4905	0.500	5.000	0.350	14
4806	0.600	6.000	0.420	12
4707	0.700	7.000	0.490	9
4608	0.800	8.000	0.560	7
4509	0.900	9.000	0.630	6
4410	1.000	10.000	0.700	4



Sizes:

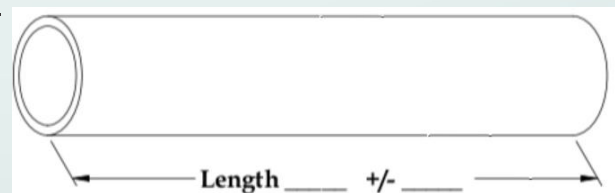
<https://www.vitrocom.com/categories/view/69/Miniature-Hollow-Rectangle-Tubing-VitroTubes>
50 mm = \$25

Round Tubing

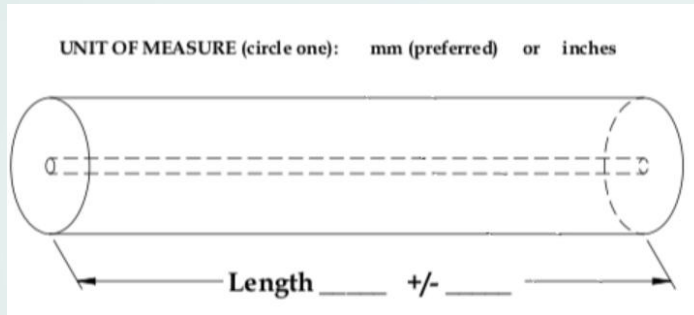
Product	ID (mm)	OD (mm)	Pcs / Vial
CV0508	0.05	0.08	100
CV1017	0.10	0.17	100
CV1525	0.15	0.25	100
CV2033	0.20	0.33	100
CV3040	0.30	0.40	75
CV4055	0.40	0.55	75
CV5070	0.50	0.70	75
CV6084	0.60	0.84	75
CV7087	0.70	0.87	50
CV8010	0.80	1.00	50
CV9011	0.90	1.10	50
CV1012	1.00	1.20	25
CV1518	1.50	1.80	25
CV2024	2.00	2.40	25

Sizes:

<https://www.vitrocom.com/categories/view/71/Miniature-Hollow-Round-Tubing-VitroTubes>

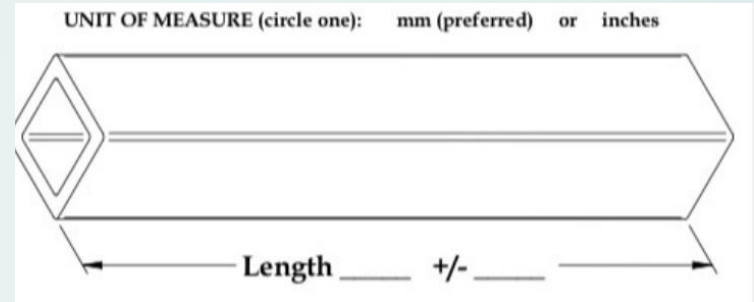


Thick walled tubing (Heavy Roll)



Sizes:
<https://www.vitrocom.com/categories/view/43/Heavy-Wall-Capillary>

Square walled tubing



Sizes:
<https://www.vitrocom.com/categories/view/25/Square-Glass-Tubing>

2mm = \$10



Vitrocom Capillaries

Use/Environment



1. Capillaries furnish an environment more nearly like that of soil or mud in nature, than any method possible until now. More realistic environment.
2. Supplied in convenient plastic vials for easy handling and storage. Provide efficient method for collecting, viewing, and storing liquid samples. Such samples can be retained for referencing by cementing or fusing open ends.
3. Rectangular dimensions of the capillary cells use: Flat surfaces let interior contents of the tube to be observed under the various magnifications available with the compound microscope. Thus the development and growth of various organisms can be studied in an undisturbed situation.
4. Supported VitroTubes can be placed in an upright position at various depths in the bottom sediments

An abstract graphic design featuring organic, flowing shapes in teal, orange, and dark grey. A central orange circle contains the white number '02'. To its left, a dark grey shape with an orange interior is connected by a thin orange line. Below the central circle, a teal shape with a dark grey interior is connected by a thin teal line. The background is a light blue-grey with scattered small circles in orange, teal, and white.

02

Rotifers

Introduction To Rotifers

01

General Information

Activity:

Multicellular organism (approx. 1000 cells)
Motile and free swimming

Food:

Filter feeders
Use sensory information
Eat organic detritus → dead, bacteria, algae, and protozoans
Eat particles up to 10 μm in size

02

What are their sizes?

Rotifers are small organisms with sizes that range from 100 μm to 1000. Elongate species could exceed 2000 μm .
Mainly 0.1-0.5 mm long
Can range from 50 μm to 2mm (other source claims 100 μm to 30 mm)

03

Environment

Rotifers usually are found living in mainly freshwater environments, along with small areas of water such as tide pools and near shore marine habitats. They also prefer lower temp. waters



Rotifer Stress



Heat Stress

- Contain 3 essential heat shock proteins that can help it survive in hotter temperatures
- Prefer moderately lower temperatures

Physical Stress

- Have many sensitive bristles on skin → can sense mechanical forces (do not want too tight of a capillary)

Chemical Stress

- Have sensory bristles and paired ciliary pits thought to be chemosensitive (can sense chemicals)
- Have one photosensitive pigment cup (can sense light)
- High concentrations of heavy-metals are toxic to rotifers



CAPILLARIES FOR ROTIFERS



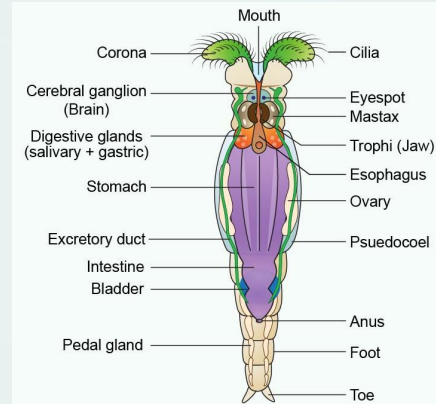
Inferences

1. Round tubing could be efficient for imaging the rotifers because Vitrocom offers a flexible amount of sizes, where a specific ID could be beneficial to its size. For example, the first size is .05 ID, which is the beginning of the size range for the rotifers.
 - a. Drawback: Harder to examine with the microscope, especially a light microscope where the light could be refracted due to the shape.
2. The thick walled tubing wouldn't be ideal because there's not enough space to fit in the rotifers. The outer diameter is too wide and the inner diameter is too small for these microorganisms.
 - a. Potential benefit: optical system can give good possible resolution
3. The squared tubing could work well with the rotifers as it offers more space for their movement in comparison to the rectangular version, and it also offers a flat base making it easily accessible by microscope
 - a. Potential drawback - The shape of the square could be uncomfortable for the rotifers, removing the ability for a very natural reading
4. Rectangular tubing could be efficient for keeping the rotifers horizontally, but the vertical space might not be enough to fit them.

Rotifers Under Microscope



Rotifers Anatomy



Sources links

Capillaries Research

- <https://www.vitrocom.com/categories/>
- <https://www.vitrocom.com/pdf/VITROTUBES-techniques-experiments.pdf>

Rotifers Research

- <https://www.nature.com/articles/s41598-020-70173-0>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4841702/>
- <https://ucmp.berkeley.edu/phyla/rotifera/rotifera.html>
- <https://www.britannica.com/animal/rotifer>
- <https://www.sciencedirect.com/science/article/abs/pii/S0022098111005260>
- <https://en.wikipedia.org/wiki/Rotifer>
- <https://www.intechopen.com/chapters/49635>
- <https://animaldiversity.org/accounts/Rotifera/>