

Precision Tube Manufacturing / OHBAKIKO Co., Ltd.

[1 Tube Manufacturing]

▼ Main Materials

SUS304	Widely used as corrosion-resistant steel or heat-resistant steel.
SUS316L	More corrosion-resistant to seawater or other media than SUS304.
Ni201	Highly corrosion-resistant, conductive and workable; usually used for electronic components such as electrodes.
C-22	Hastelloy; Highly corrosion-resistant and perfect diamagnetic material; usually used for analyzers and chemical machineries.

We can deal with materials other than the above if it is obtainable.
(tubulation, lengthen, cut and fabrication)

We will also respond tubulation or fabrication of the material you supplied.



▼ The Sizes and Lot Quantity

Outside diameter	Less than or equal to 4mm. Note: For honeycomb tubes, less than or equal to 30 mm.
Inside diameter	Less than or equal to 3.6 mm.
Length	Arbitrary. We can coil or straighten the tube. The maximum length of straight tubes is 2000 mm.
Standard sizes	There is no standards except figure-of-eight shaped tubes.
Stock sizes	We offer you the best or closest size from our stock.
Lot Quantity	We take order from one piece to mass production. Note: Costs varies as the process varies.

Please ask us about the stock sizes.

[2 Precision Tubes]

We have an integrated system of production from tubulation to cut.
(tubulation, lengthen, correction and cut)

We take order of any outside & inside diameter and can produce from one piece to mass production.



▼ The Sizes and Lot Quantity

Outside diameter	Less than or equal to 4.0 mm.	
Inside diameter	Less than or equal to 3.6 mm. Note: Wall thickness is between 0.05 mm to 0.25 mm. It varies as the outside diameter varies. The minimum size is outer diameter 0.05 mm × inner diameter 0.02 mm. We are able to produce microfiber tubes that is finer than a human hair.	
Length	Arbitrary. We can cut at the requested length. The tubes are elongated or coiled.	
Size tolerance	Minimum outside diameter ± 0.005 / Minimum inside diameter ± 0.01 Note: The value varies as the specification varies.	
Hardness	We consider the process to fit your request.	
Standard sizes	We take order of any size.	
Stock sizes	Less than or equal to 2.0 mm in outside diameter.	
Lot Quantity	We take order from one piece to mass production. Note: Costs varies as the process varies.	
Delivery period	For the new line; about one month, but it will vary as the process varies. From our stocks, one to two weeks.	

Our system is basically built to order.

If you are in a hurry, we search the size that best suite for your request from our stock.

[3 Redrawn tubes]

We can produce various shaped tubes other than the simple circular ones. The cross-sectional shape can be square, rectangle, triangle, hexagon, octagon, figure of eight, fan-like form and many others. We are able to produce them uniformly and precisely

▼ The Sizes and Lot Quantity

Outside diameter	Opposing corner should be less than or equal to 5.0 mm. (The smallest opposing corner is 0.6 mm)	
Wall thickness	0.05 mm~0.25 mm. It varies as outer size and shapes varies.	
Length	Arbitrary. We can cut at the requested length. Elongated only.	
Size tolerance	Minimum outer size ± 0.01 / Minimum outer size ± 0.02 Note: The value varies as the specification varies.	
Hardness	We consider the processes to fit your request.	
Standard sizes	No standards. We take order of any size.	
Stock sizes	No settings.	
Lot Quantity	We take order from one piece to mass production. Note: Costs varies as the process varies.	
Delivery period	About one to one and half months. It will vary as the process varies.	

Special die is needed and this is separate from other costs.

[4 Honeycomb Tubes]

Put many smaller tubes in a bigger one, then lengthen & fix. If it can put in, the smaller ones could be shaped tubes, rods, or even different materials such as resin. This will be a special member that has a special pattern according to materials, shapes, diameters and the number of smaller tubes inside. There is no standards, and rectification, laminar flow, thermal exchange depends on how you use it. There are many examples of use of honeycomb tubes in nozzles and rectifying tubes.

▼ The Sizes and Lot Quantity

Outside diameter of outer tuber	0.4 mm to 30.0 mm. (For a shaped tube, the outside size is 0.5 mm to 5.0 mm.)
Wall thickness	Thickener than 0.05 mm. It varies as outer size and shapes varies.
Size of inner tubes	Smaller than the inner diameter of the outer tube. Note: there could be changes in shape and holes according to a specification.
Length	Arbitrary. We can cut at the requested length. Elongated only.
Size tolerance	Minimum outer size ± 0.03 Note: The value varies as the specification varies.
Hardness	We consider the process to fit your request.
Standard sizes	No standards. We take order of any size.
Stock sizes	No settings.
Lot Quantity	We take order from one piece to mass production. Note: Costs varies as the process varies.
Delivery period	About one to one and half months. Note: The costs will vary as the process varies.

- If there are a lot of inner tubes, the basic request is "as much as possible."
- We basically do not use adhesive agents; therefore you can take advantage of the material's characteristics that has not changed.
- There is a possibility of change in shapes of inner tubes and holes according to a specification.
- Special die is needed for shaped tubes, and the initial cost is separate from other costs.



[5 Multi-layer Tubes]

By layering tubes made from different materials in a larger tube, we can add special features to a larger one. It is a very unique tube which has the cross-section like a Baumkuchen. For this type of tube, it is possible to get an inner hole that extends as 1000 mm as long. (Usually, it is very difficult to create a long hole by using a drill.) If we change the material of inner tubes, the completed one will have each characteristics of these, and can be used as composite components. We can even layer resin and wires. It is very easy to create many kinds of multi-layer tubes, and they are very special.

▼ The Sizes and Lot Quantity

Outside diameter of outer tuber	0.4 mm ~ 5.0 mm.
Inside diameter	0.05 mm ~ 4.0 mm. Note: There is a possibility of holes if the layers are too many.
Combination	Possible to layer the same material, as well as different materials.
Length	Arbitrary. We can cut at the requested length. Elongated only.
Size tolerance	Minimum outer size ± 0.01 / Minimum inner size ± 0.01 Note: The value varies as the specification varies.
Hardness	We consider the process to fit your request.
Standard sizes	No standards. We take order of any size.
Stock sizes	No settings.
Lot Quantity	We take order from one piece to mass production. Note: Costs varies as the process varies.
Delivery period	About one to one and half months. Note: This will vary as the process varies.

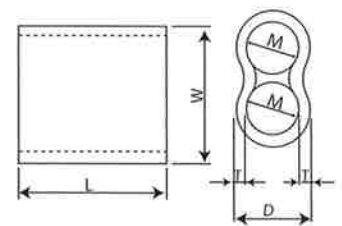
- We basically do not use adhesive agents; therefore you can take advantage of the material's characteristics.
- There is a possibility of holes according to a specification.

[6 Figure-of-eight Shaped Tubes]

Figure-of-eight shaped tubes are the only ones that have standards in our system. These are produced by using our shaped tube technologies and usually used for wire swaging. Since the wall thickness is set as 0.2 mm to 0.65 mm, these are best suited for the places where strength is needed.

▼ Standards (in mm)

size (M)	inner diameter (M)	outer diameter 1 (D)	outer diameter 2 (W)	wall thickness (T)
For 0.3	0.40~0.55	0.9 ± 0.05	1.6 ± 0.05	0.20 ± 0.05
For 0.4	0.50~0.65	1.2 ± 0.05	2.2 ± 0.05	0.30 ± 0.05
For 0.5	0.65~0.80	1.2 ± 0.05	2.2 ± 0.05	0.25 ± 0.05
For 0.61	0.65~0.80	1.2 ± 0.05	2.2 ± 0.05	0.25 ± 0.05
For 0.71	0.80~0.95	1.2 ± 0.05	2.2 ± 0.05	0.20 ± 0.05
For 1.0	1.25~1.40	2.3 +0.15,-0	4.0 ± 0.10	0.50 ± 0.05
For 1.5	1.75~1.90	2.8 +0.15,-0	4.8 ± 0.10	0.50 ± 0.05
For 2.0	2.30~2.45	3.4 ± 0.10	6.0 ± 0.10	0.50 ± 0.05
For 2.5	2.65~2.85	3.9 +0.15,-0.05	6.7 ± 0.10	0.55 ± 0.05
For 3.18	3.27~3.40	4.6 +0.15,-0.05	8.2 ± 0.10	0.65 ± 0.05



▼ Brief Overview of Other Things and Lot Quantity

Length	Arbitrary. We can cut at the requested length. Elongated only.
Hardness	We consider the process to fit your request.
Standard sizes	As remarked above.
Stock	Please ask us.
Lot Quantity	We take order from one piece to mass production. Note: Costs varies as the process varies.
Delivery period	One week to one months.

- We take order of any size, however, special die is needed.
- We do not need the initial cost of the special die, if its size is the same as the outer diameter. Note: Material warranty or lot condition could be needed for some specification.

[7 Squeezed tubes]

By using the production method that derived from pullout technologies, we are able to create tubes that have different sizes and shapes at the both ends.

Circular tubes as well as shaped tubes can be squeezed.

▼ Main specification / outline (For small quantity of trials; quantity output: 500 pcs / month)

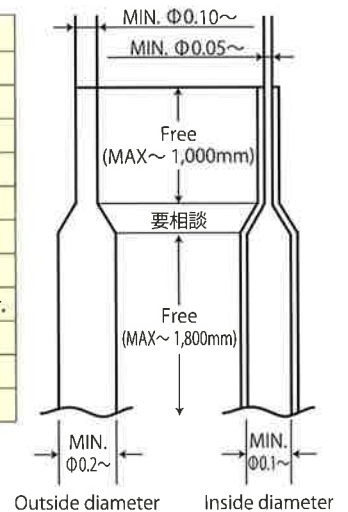
Original tube outer diameter	0.2mm~4.0mm
Original tube wall thickness	0.1mm~0.5mm
Original tube inner diameter	0.1mm~3.6mm
Original tube length	Less than or equal to 1800mm
Taper length	0.5mm~2.0mm Note: The value varies as the specification varies.
Taper angle	Depends on a process.
Squeezed part length	Less than or equal to 1000mm. (Less than or equal to 1800 mm for the total of original tube length and taper length.)
Squeezed part outer diameter	0.1mm~3.0mm
Squeezed part wall thickness	Almost the same as the original tube.
Squeezed part inner diameter	0.05mm~2.6mm
Lot quantity	1~500 /per month
Initial cost	None. (It is needed for the shaped end-form)

- Since mechanical correction is unable, linearity will decrease as the squeezed part becomes long
- We can deal with end forming of other shapes that is different from the original tube.
- It is also possible to create squeezed honeycomb ending or squeezed multi-layer ending.
- Squeeze both ends or squeeze several parts of a tube is also possible.



▼ Specification / outline (for mass production)

Original tube outer diameter	0.5mm~4.0mm
Original tube wall thickness	0.1mm~0.5mm
Original tube inner diameter	0.3mm~3.6mm
Original tube length	Less than or equal to 1000mm
Taper length	Arbitrary. Note: The value varies as the specification varies.
Taper angle	Arbitrary. Note: The value varies as the specification varies.
Squeezed part length	Please ask us.
Squeezed part outer diameter	0.2mm~3.6mm
Squeezed part wall thickness	Depends on the original tube and the squeezed part's outer diameter.
Squeezed part inner diameter	0.2mm~3.2mm
Lot quantity	More than 500 per month
Initial cost	Needed. The cost varies as the specification varies.



- The manufacturing processes are different from the ones from small quantity of trials.

[8 Cuts, End treatments, Various tube fabrications]

Our business started from cutting large amount of tubes, but now we offer you various tube fabrications to meet many kinds of needs.

We take order from low-volume trials to high-volume production. Even without a concrete plan, you can ask us about the image you have.

We can offer complex products by combining different fabrications such as tube bending, drilling, flare welding, coiling, or swaging.

We are experts for special nozzles, probes and other special things that can fit in the special needs.

▼ Precision cuts / End treatments

Outer diameter	Less than or equal to 4.0mm
Inner diameter	Less than or equal to 3.8mm
Length	More than or equal to 0.5mm *
Size tolerance	Minimum ± 0.03 *
Methods of cutting	Abrasive cutting or wire cutting
Deburring process	Gold buff, chemical grinding, blast finishing, barrel finishing, etc
Lot quantity	We take order from one piece to mass production. *
Delivery period	From one week *

*The conditions will vary as the tube size, material, specialists varies.

- We take order of deburring only or cuttings of brought in materials.
- We can consider about cuttings of thin, rod type materials such as wire rods or wires.
- We take order of R and C chamferings, skew-cuts, edge sealing and edge finishing.

▼ Various tube fabrications

- bending We can deal with 2-dimensional or 3-dimensional hand processing to die machining.
- slitting Drilling circular holes, quadrilateral holes, slits or cutouts of a tube's side.
- flare welding We open a tube's end like a trumpet.
- joining Tubes can be joined to other things such as machined nuts.
- coiling Making a coiled tube; but it is not a spring.
- swaging Reducing a inner diameter by hammering with a die.



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