# Machining guidelines for Vesconite

Vesconite and Vesconite Hilube are easily machined to fine tolerances on standard metal working equipment.

Vesconite should not be clamped like a metal, but should be clamped carefully to avoid distortion.

Cooling water should be used where possible to cool the cutting surface.

Take cuts no more than 2 mm (0.1") deep at a time.

Allow the bush to cool before taking the final cut.

**Cutting speeds** - Maximum of 300 m/min (1000 fpm)

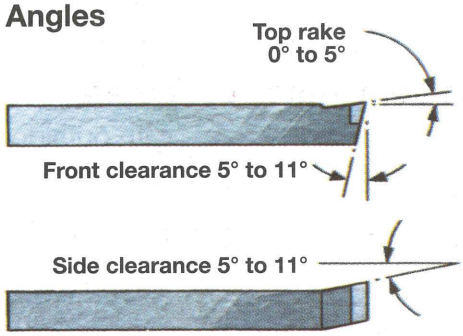
| Diameter mm | 200 | 300 | 400 | 500 | 600 | 700 |
|---|---|---|---|---|---|---|
| Diameter | 8" | 12" | 16" | 20" | 24" | 28" |
| RPM | 350 | 300 | 200 | 150 | 100 | 70 |

**Cutting Feeds**

*Rough turning:* 0,5 - 0,7 mm per revolution (0.020" - 0.030" per revolution)

*Finish turning:* 0,3 - 0,4 mm per revolution (0.012" - 0.016" per revolution.)

**Cutting Angles**




## Machining straight and flanged bushes in small quantities

### STEP 1 Cut to length

Allow extra length for chucking, parting and facing, usually 25 mm (1").

Cut bushing to length with a cut-off saw.

### STEP 2 Chuck with internal support disc

Set the bush squarely in the chuck.

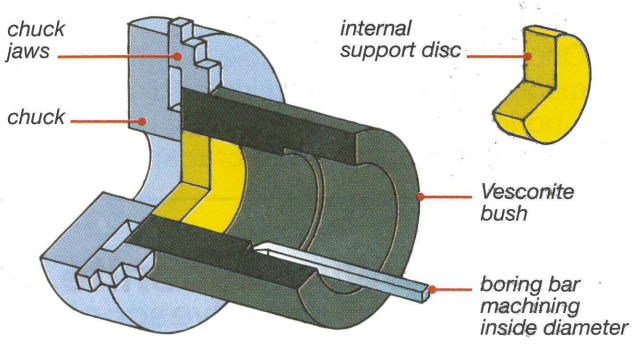
Use an internal support disc machined to size, made of any available material, approximately 10 to 25 mm thick ($1/2$" to 1").

Tighten the chuck lightly - only enough to support the bush. Vesconite should not be clamped like a metal.

### STEP 3 Machine inside diameter

Machine bush inside diameter using a boring bar. Ensure that there is not an excessive build-up of shavings inside the bush.

Grooves may be added at this stage if required.

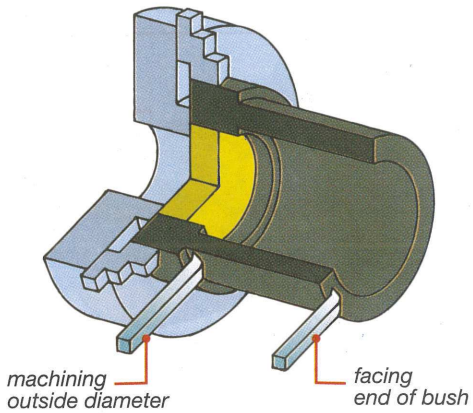



### STEP 4 Machine outside diameter

Machine bush outside diameter using an external turning tool.

Machine flange outside diameter if needed.

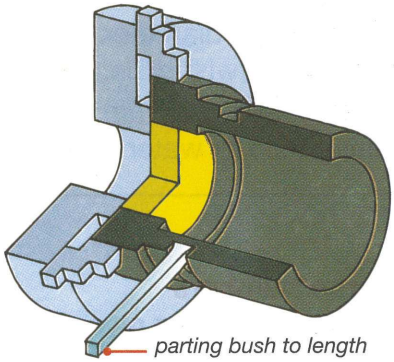
Face the end of the bush.




### STEP 5 Part to length

Part bush to length using a parting tool.

Ensure that bush does not fall when parted.




**Bushes can also be machined on numerically controlled lathes.**
**Take care to ensure that the clamping pressure does not distort the Vesconite.**

# Machining bushes in production quantities

When machining many Vesconite bushes on center lathes, this procedure saves time and material

## STEP 1 Cut to length

Cut bush to final length using a cut-off circular saw. Take care to ensure that the cut is square.

If a fine length tolerance is required, allow extra material for facing both ends of the bush later.

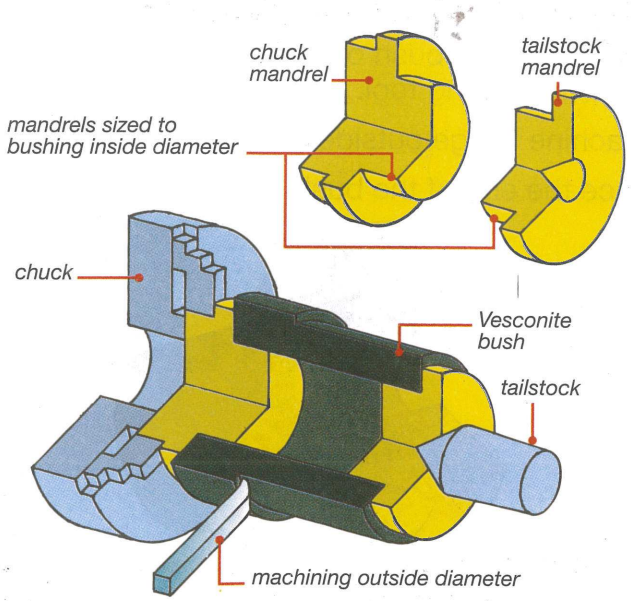
## STEP 2 Machine outside diameter

Machine two mandrels with outside diameters the size of bushing inside diameter.

Machine one for the chuck and another for the tail stock.

Mandrels can be made of Vesconite, steel or other readily available rigid material.

Support the bush between these two mandrels by applying a light pressure, and machine outside diameter using an external turning tool.




## STEP 3 Machine the inside diameter

Machine a *pot* from suitable available material (eg Vesconite, steel, etc). The pot inside diameter should be size to size to the outside diameter of the bush already machined.

Make the length of the pot about 10-25 mm ($1/2$" to 1") shorter than the length of the bush.

The wall thickness of the pot must be sufficient to support the bush.

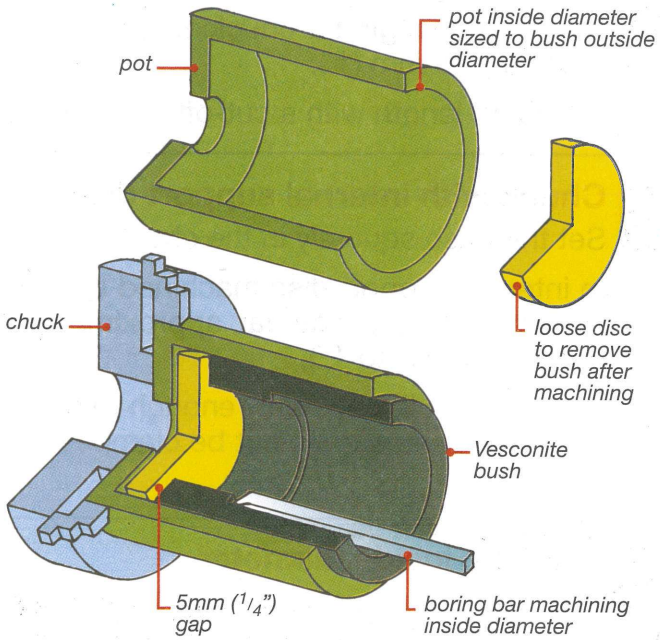
Drill a hole in the end of the pot so that the bush may be removed after machining by pushing a rod through this hole.

Machine a disc to be placed loosely inside the pot for removal of the bush after machining.

Push the bush lightly into the pot.

Machine bush inside diameter using a boring bar. Ensure there is not a large buildup of shavings inside the bush being machined.

Grooves or other internal details may be added.




## Drilling solid rod

When drilling a large diameter Vesconite rod:

- Use high speed twist drills.
- Drill a pilot hole of ±15 mm ($1/2$") initially.
- Use cutting fluid or water generously.
- It is very important to remove the shavings while drilling. It is best to regularly withdraw drill and remove shavings.
- Once the 15 mm ($1/2$") hole is achieved, machine to the required inside diameter using a boring bar on a lathe. Do **not** use a larger drill as this could lead to cracking.