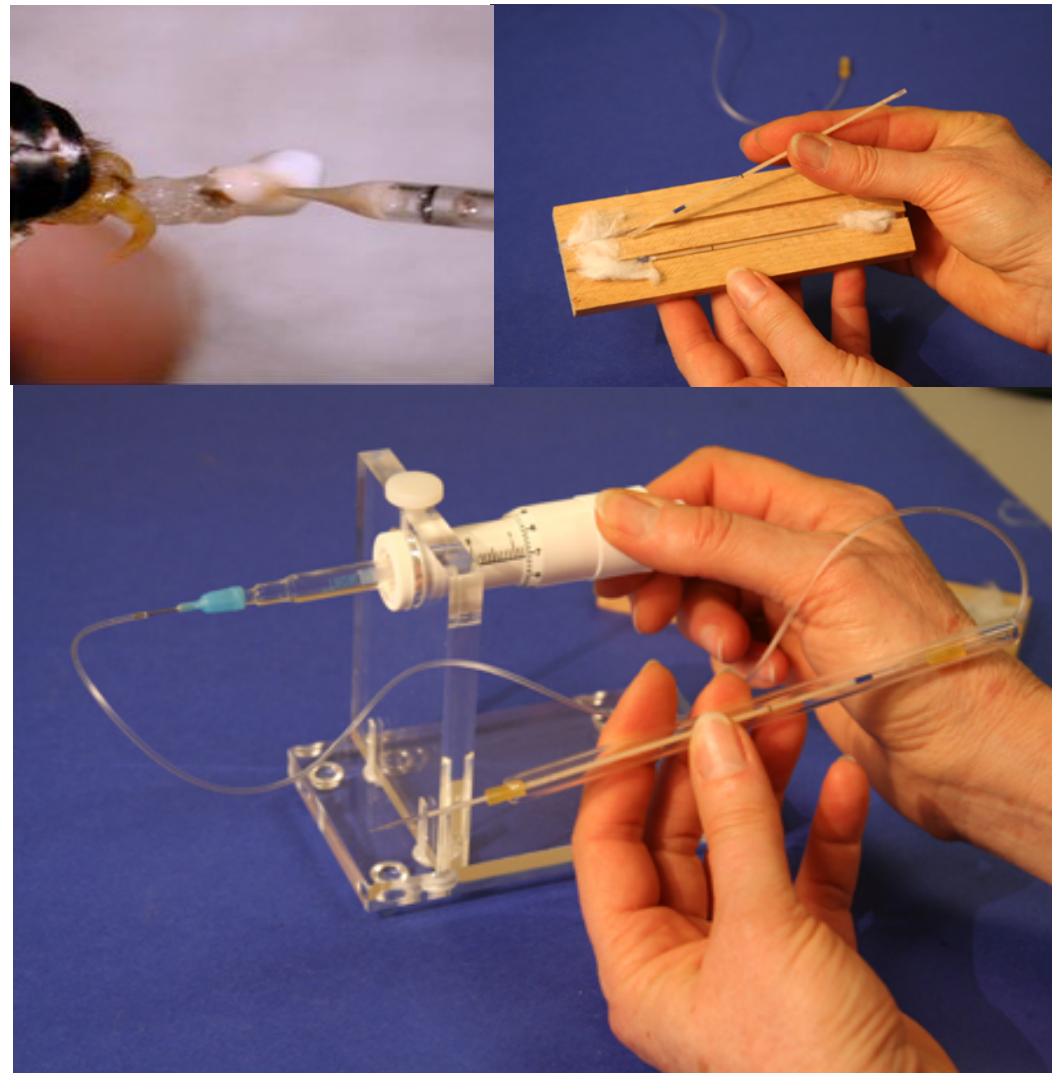


# Harbo Syringe User Manual



**HONEY BEE INSEMINATION SERVICE**

**[WWW.HONEYBEEINSEMINATION.COM](http://WWW.HONEYBEEINSEMINATION.COM)**

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# Harbo Syringe Instruction Manual

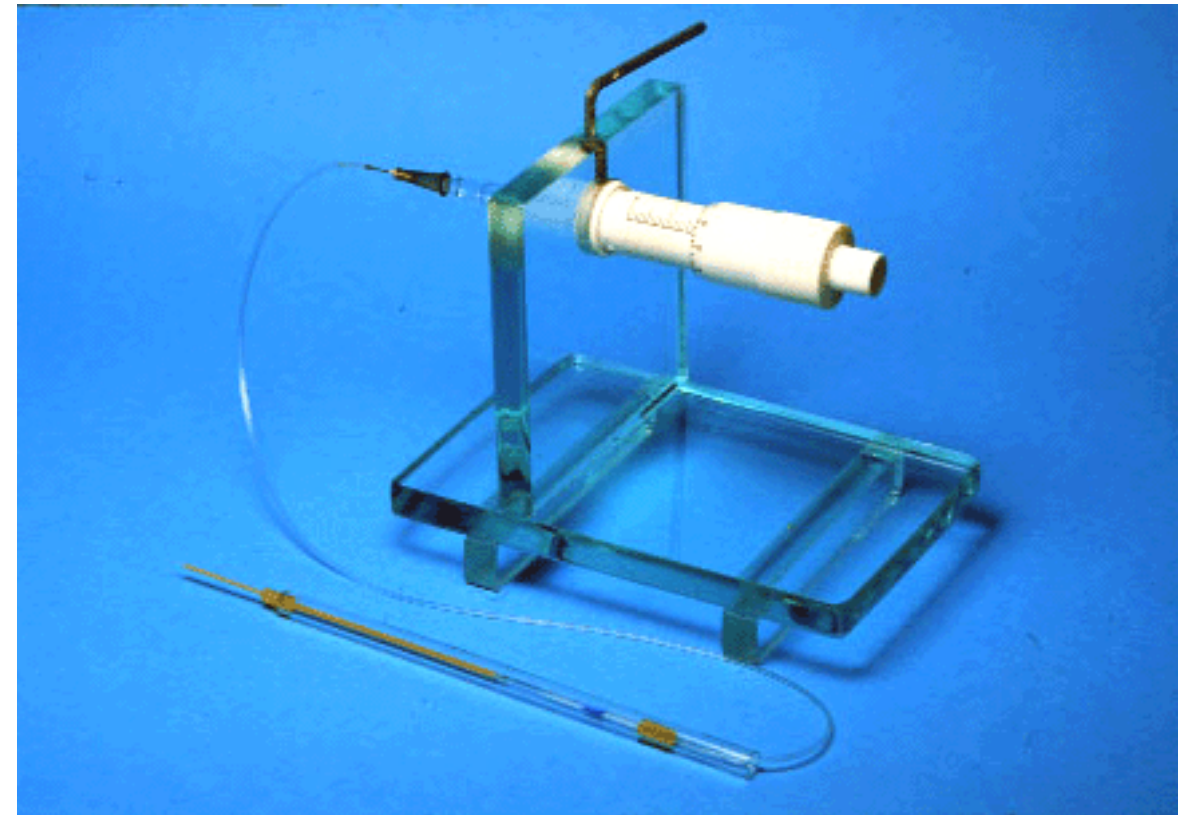
An innovative large capacity syringe designed to simplify the collection, handling, storage and shipment of semen, the Harbo syringe increases efficiency and provides specific requirements for specialized research purposes. It is compatible with most insemination instruments on the market.

Available from:

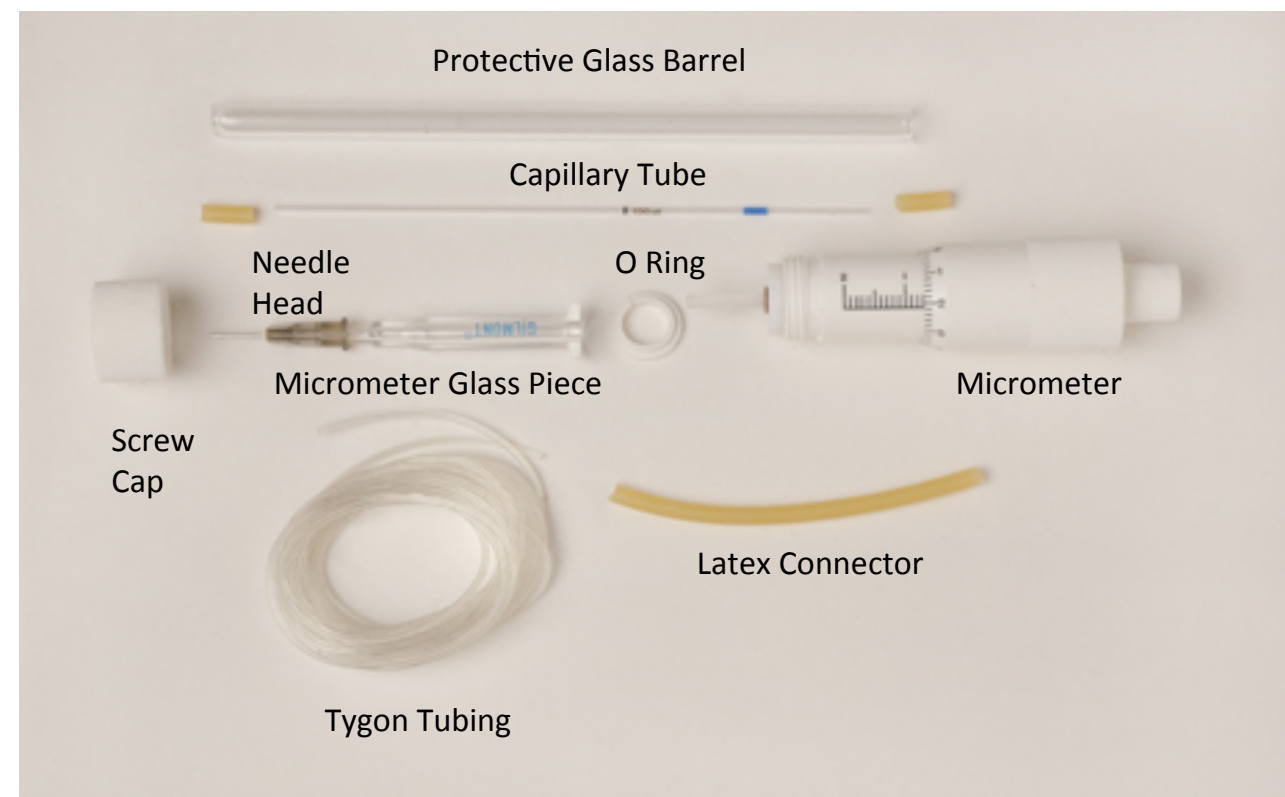
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## SYRINGE PARTS



# Features

## **Precise Measurement Of Semen Volum**

The micrometer enables delivery of accurate and readable measurements. The 200  $\mu\text{L}$  capacity is calibrated in microliters, in divisions of 0.2  $\mu\text{L}$ , providing precise inseminations of specific amounts of semen for specialized and production work. For example, several queens can be inseminated with the semen of one drone or one queen can be inseminated with a portion of homogenized semen from hundreds of drones.

## **Unlimited Capacity**

Semen is collected in easily detachable capillary tubes, enabling efficient collection of an unlimited quantity of semen. The handling, storage and shipping, and the homogenizing of semen is simplified.

## **Detachable Glass Tips**

Glass tips are easily changeable and connected to the capillary tube with a small piece of latex tubing. This also provides tip flexibility and helps prevent breakage.

## **Protective Glass Barrel**

The protective glass barrel houses the capillary semen storage tube which fits into the syringe holder of the various instrument models.

## **Flexibility Of Connection Points Provides Convenience**

The glass tips and capillary semen storage tubes are attached with a piece of latex tubing providing easy and quick exchange of tips and semen storage tubes, and enable the versatility of adjusting the quantity of saline in the syringe if necessary during semen collection.

## **A Separate Syringe Stand**

The syringe micrometer is held in its own separate stand. This helps reduce the chance of unwanted movement of the syringe tip once it is properly positioned. For production work, the separate stand allow the easy transfer of semen loads between operators.

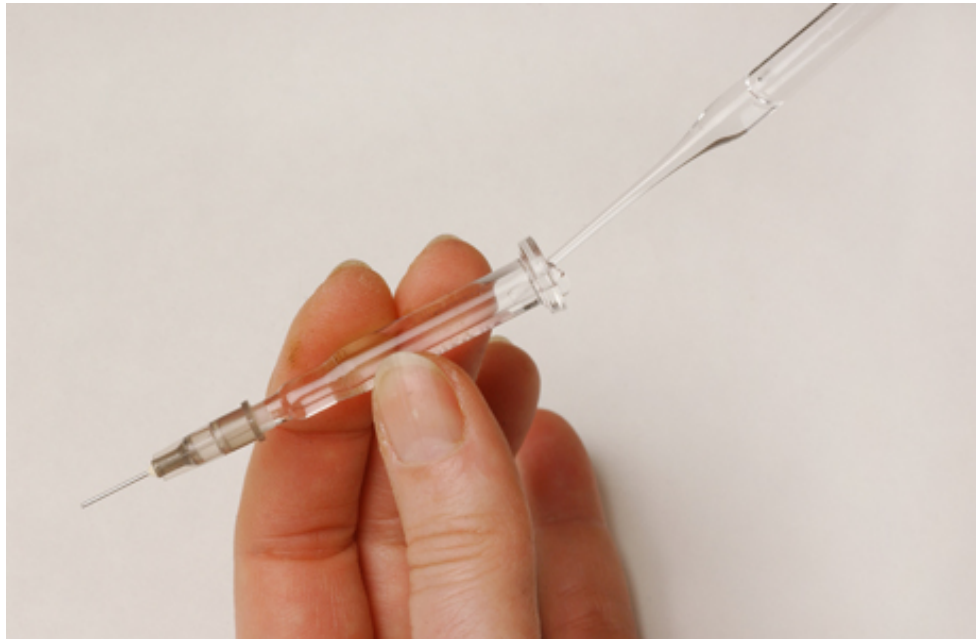


## STERILIZATION

Sterilize syringe parts before and after usage. Glass parts may be heat sterilized, 350°F for 30 minutes, or flushed with alcohol and rinsed with distilled water. The tygon tubing and rubber latex connectors are flushed with alcohol, followed by thoroughly rinsing with distilled water. Use a squeeze bottle or pipette.

## ASSEMBLY

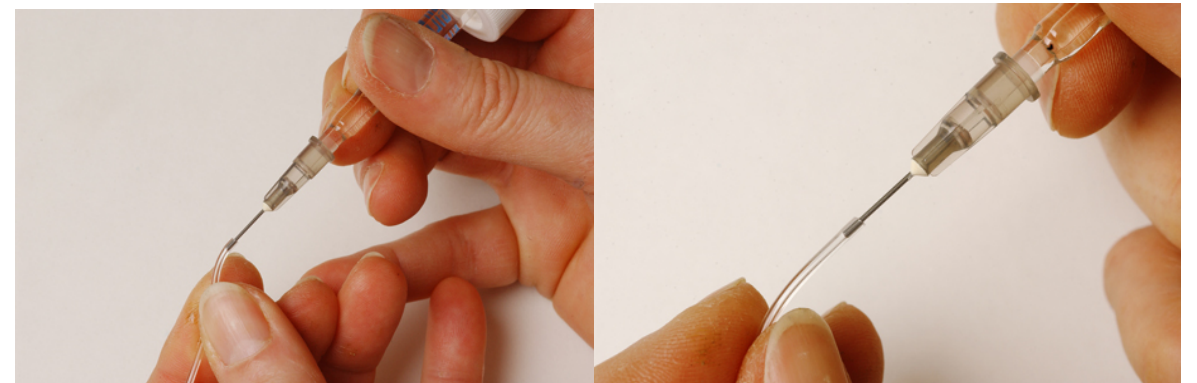
1. Sterilize all syringe parts and accessories. Wash hands (thoroughly) and work area with alcohol, before assembly. During assembly be sure not to touch parts coming in direct contact with the diluent (or saline solution) or semen.
2. Fill the syringe barrel (needle attached) with solution using a pipette, voiding of air bubbles.



3. Place the syringe barrel over the plunger of the micrometer, followed by the O ring and screw cap.



4. Expel some of the solution to remove any air bubbles (a light tap will loosen air bubbles from the neck of the needle). Take up additional solution.
5. Fit the tygon tubing over the needle and expel solution to fill the tube while making sure no air bubbles are present in the line.



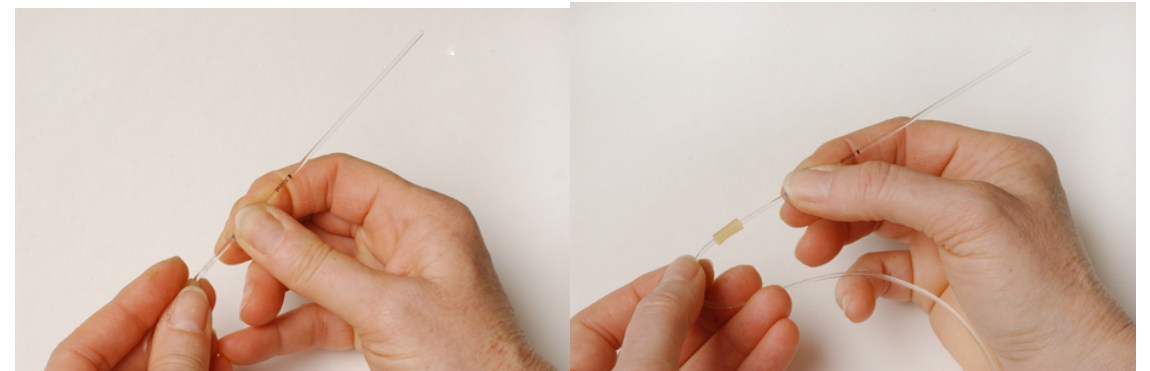
6. Attach the rubber latex connector to the tygon tubing and expel solution to fill the connector.



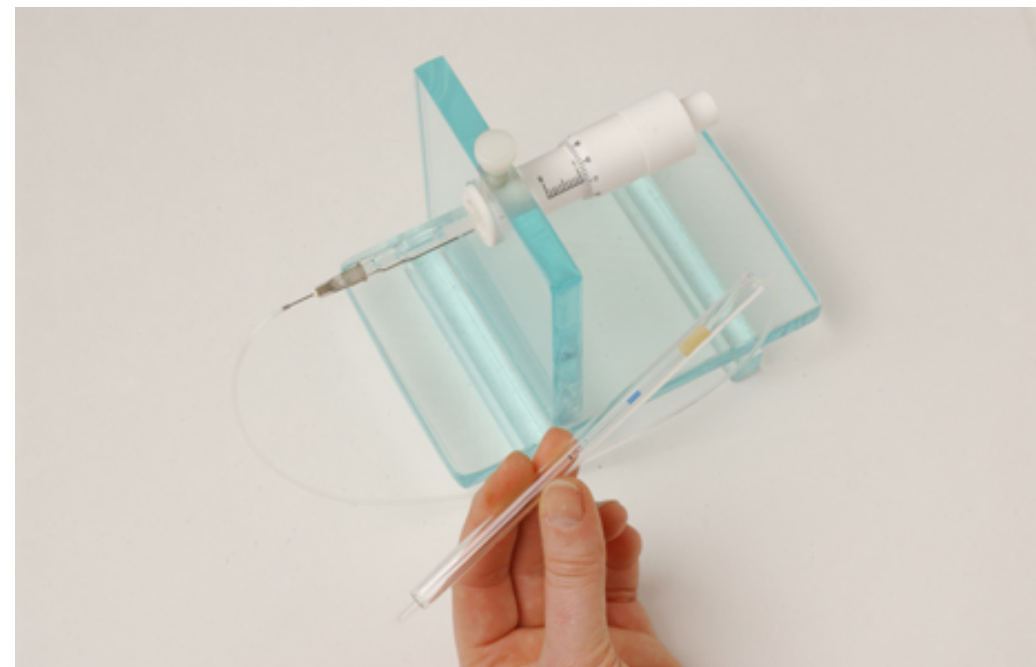
7. Fill the capillary tube with solution by capillary action before attachment.



8. Attach the filled capillary tube to the other end of the latex connector, avoid collecting air bubbles.



9. Pull the capillary tube and tygon tubing through the opening of the plexiglass stand and place the screw cap of the micrometer into the opening of the stand, tighten lightly with the set screw.





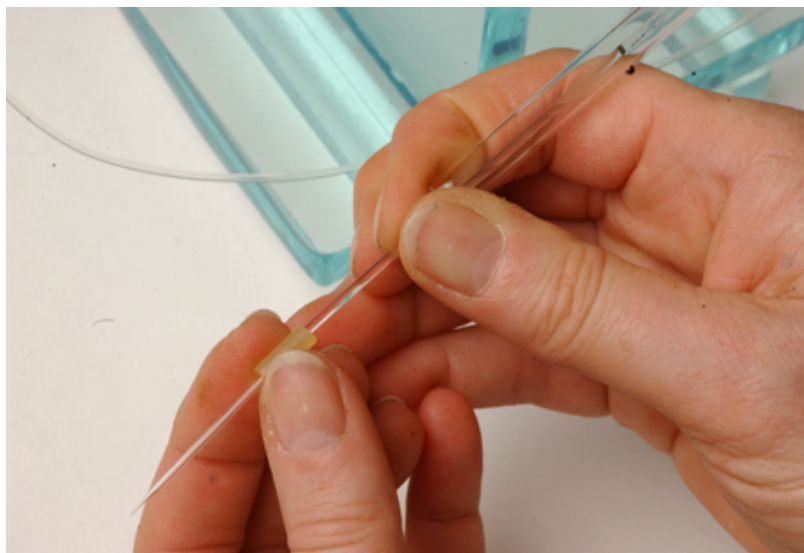
10. Place the glass barrel in the insemination instrument syringe stand with the smaller end facing down.

11. Placed the attached capillary tube through the glass barrel and push the capillary tube a short distance past the opening of the glass barrel.

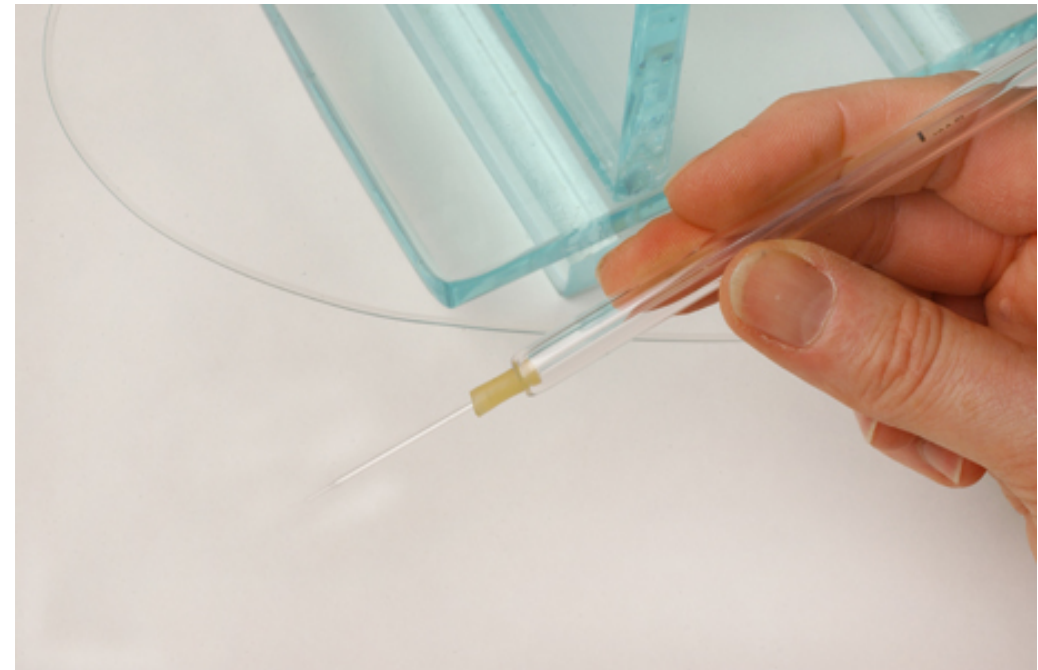
12. Fit the glass tip into a second latex connector.



13. Carefully attach the latex connector with the tip onto the capillary tube.



14. Twist the latex connector with the attached glass tip to fit snugly into the glass barrel opening.



15. Expel enough solution to allow for semen uptake and to rinse the tip with solution.

16. Be sure to leave an air space between the solution and the semen before collection. During collection, between drones, keep a small amount of solution in the tip to prevent drying.

17. After inseminations clean all parts with alcohol and rinse thoroughly with distilled water.

18. Canned air can be used to clean the tip.

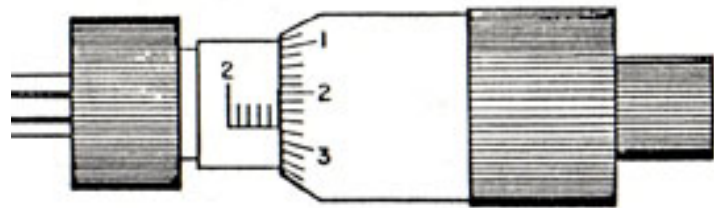
20. Store equipment in a clean place.

## GLASS TIP CLEAN UP

Remove and flush glass tips after usage with distilled water. To remove semen residue and mucus, soak tips in a 5% hypochlorite solution overnight. This will loosen residue. Flush with distilled water.

To remove difficult residue from glass tips, use a cleaning wire. Use the wire from the large end to avoid breakage of the tip. Store equipment in a dry clean place.

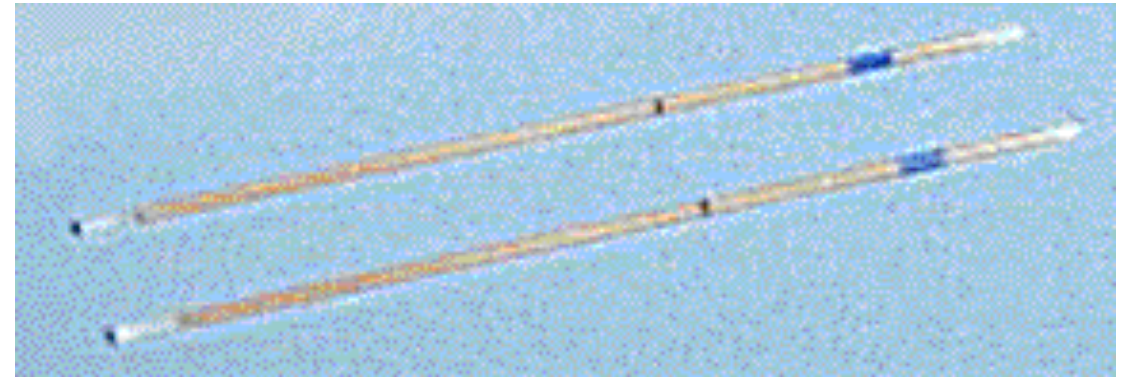
## SEMEN VOLUME MEASUREMENT



The micrometer provides precision measurement and has a 200  $\mu\text{L}$  (microliter) capacity. Each division on the sleeve corresponds to 1  $\mu\text{L}$ , calibrated in divisions of 0.2  $\mu\text{L}$ . Each division on the barrel corresponds to 10  $\mu\text{L}$ , or one complete rotation of the sleeve. The vacuum seal provides precision collection and delivery. Accuracy is 0.5 % of the reading of 1  $\mu\text{L}$ . If response is spongy, check the line for air bubbles and leaks.

Each drone produces about 1  $\mu\text{L}$  of semen. For routine inseminations each queen requires a semen dosage of 8 to 12  $\mu\text{L}$ .

## SHORT TERM SEMEN STORAGE



To store semen a petrolatum seal is placed in each end of the semen filled capillary tube. The semen and petrolatum can be separated by a small air space.

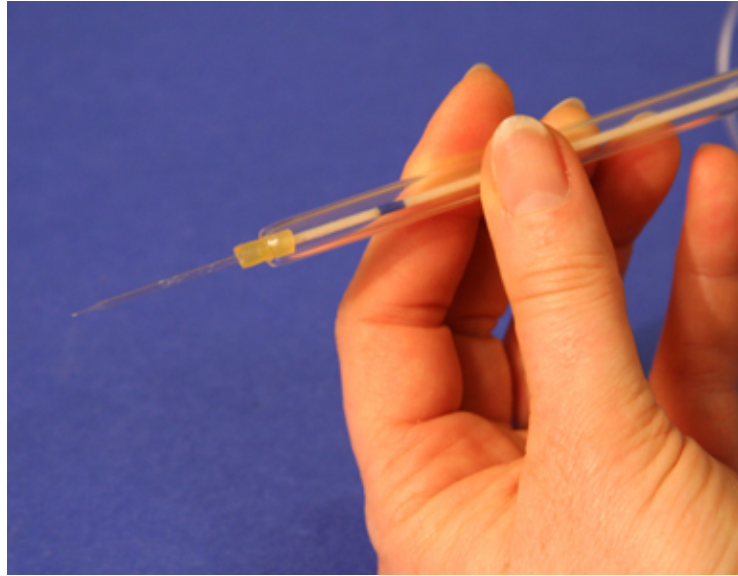
Semen can be held at room temperature for two weeks and maintain good viability. **DO NOT REFRIGERATE!** For best results hold at 13° C (55°F), avoid sunlight and temperature extremes.

Sterilize all parts before use. Good sanitation is critical to avoid contamination.

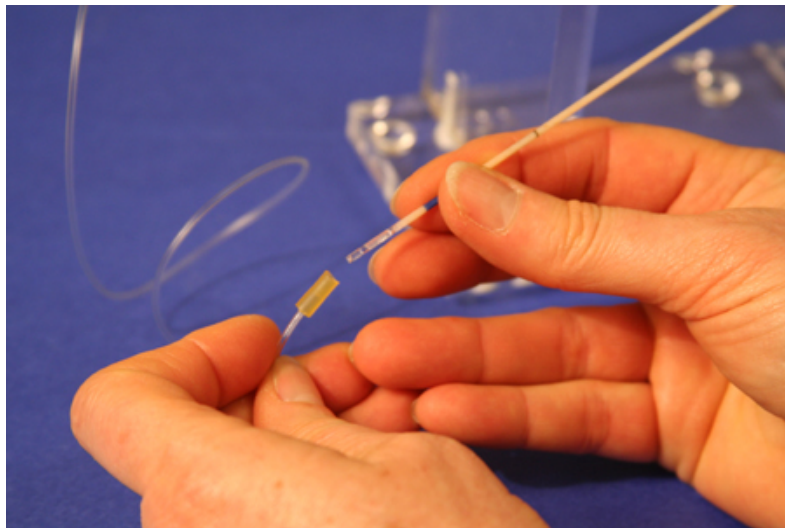


## TO SEAL SEMEN STORAGE TUBE

1. After semen collection, draw all the semen into the capillary tube and remove the glass tip and latex connector.



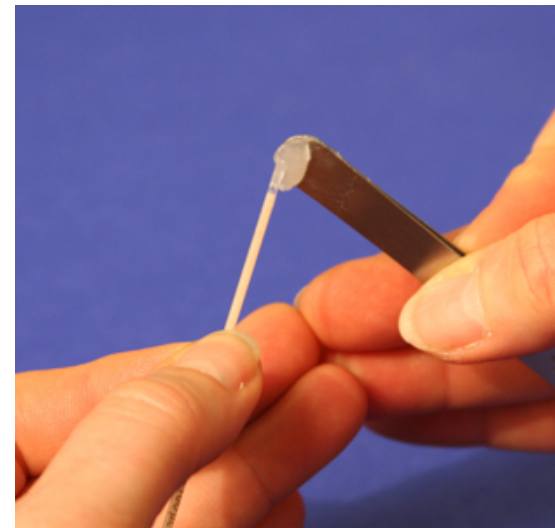
2. Remove the capillary tube from the glass barrel, do not detach from the micrometer.



3. Use the micrometer to push the semen flush with the end of the capillary tube.

4. Detach the semen filled capillary tube from the syringe.

5. Petrolatum is then forced into the capillary tube from the end flush with semen. This is accomplished by holding the capillary tube vertical and forcing petrolatum (which has been placed on a flat surfaced spatula) into the tube which will push the semen column up making an airtight seal.

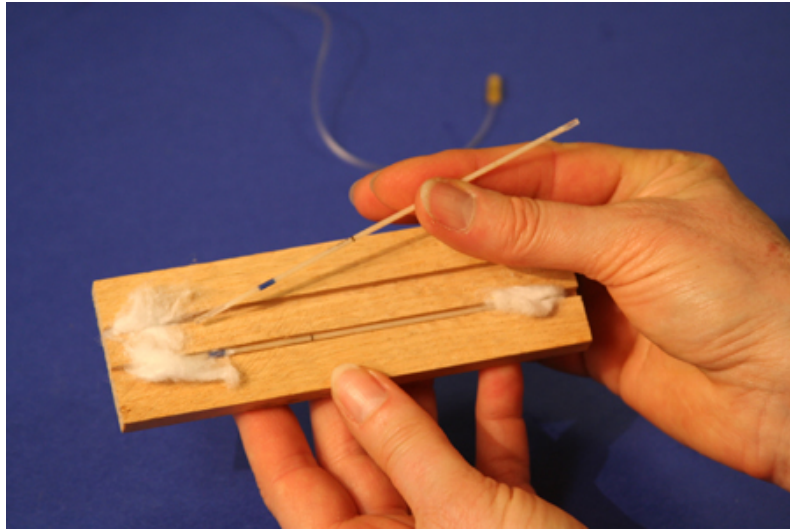


6. When the capillary tube contains about 7 mm. of petrolatum, slide the capillary tube sideways across the flat spatula to retain the seal.

7. Reconnect the petrolatum sealed end of the capillary tube to the micrometer and push the column of semen flush with the other end of the tube. If the tube is not completely filled it may be cut leaving enough space for a petrolatum seal at both ends.

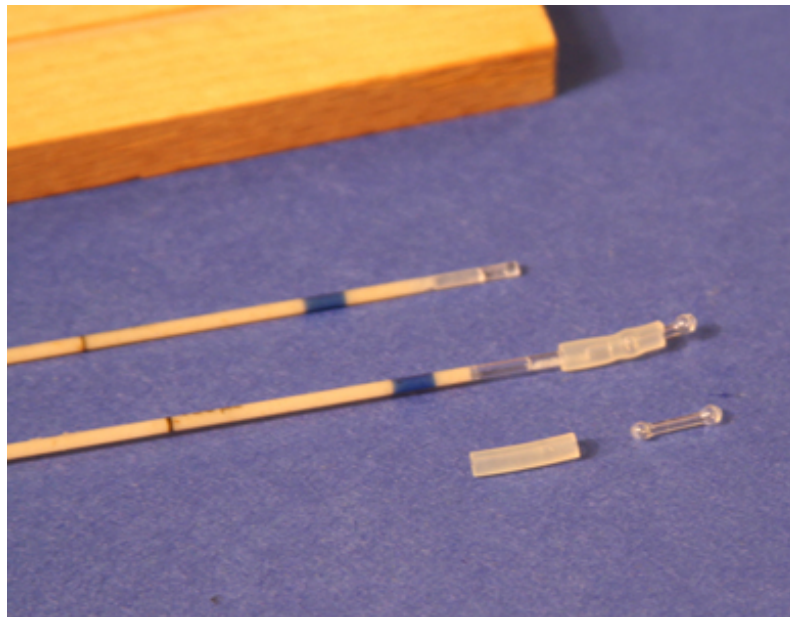


8. Repeat the above procedure to seal both ends of the capillary tube.



9. Place the sealed tubes of semen in protected packaging for storage & shipping. Avoid exposure to sunlight.

An alternative to the petrolatum seal is use of glass beads connected with pieces of silicone tubing.

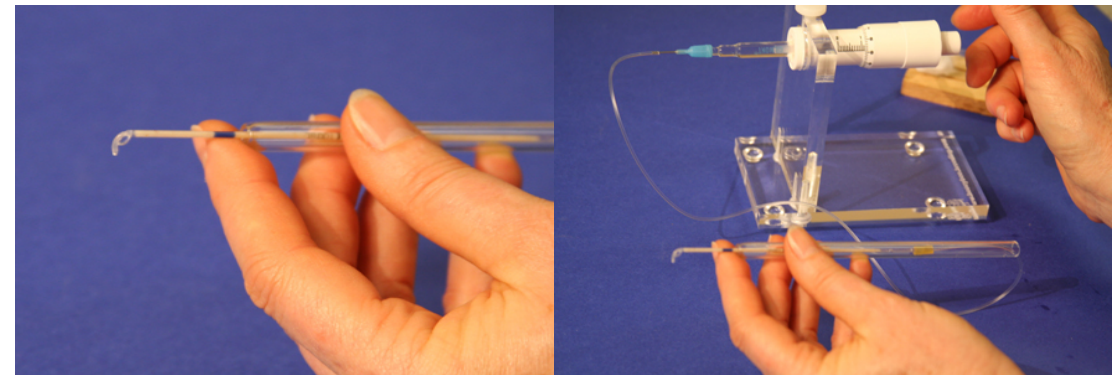


## SHORT TERM SEMEN STORAGE

**DO NOT REFRIGERATE.** Semen can be held at room temperature for several weeks. For best results hold at 21 C. Avoid sunlight and temperature extremes.

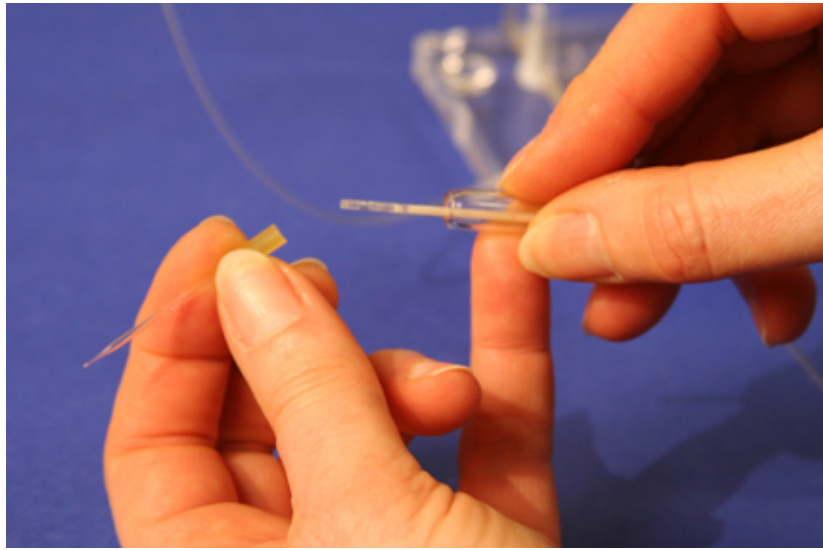
### TO REMOVE PETROLATUM SEAL

1. Assemble the syringe without the glass tip leaving both petrolatum seals in the semen filled capillary tube. Collect a small air space between the petrolatum seal and solution when assembling the syringe. The petrolatum seal on this end remains and will serve to separate semen from solution.
2. After assembly of the syringe and before the tip is in place, use the micrometer to push out the petrolatum seal on the tip end of the capillary tube. The seal at the other end of the tube is kept in place during insemination.

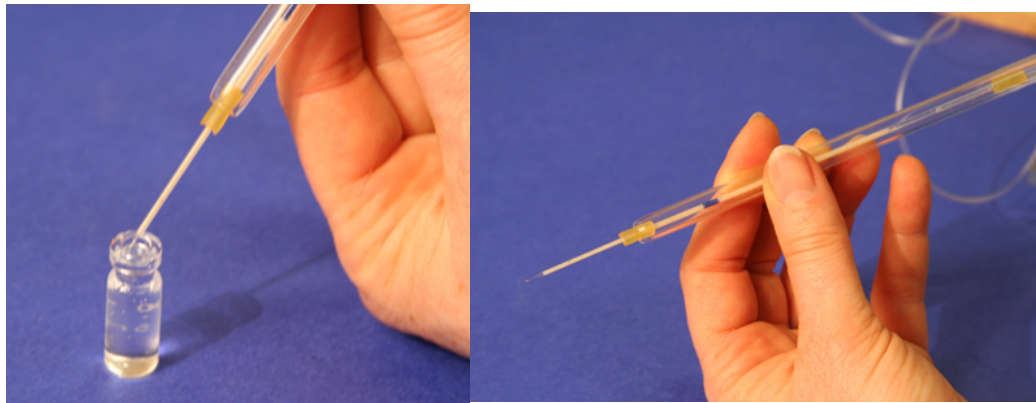


3. Take up several microliters of solution leaving an air space between the semen and solution.

4. Attach the glass tip and use the solution to rinse the tip.



5. Collect a drop of diluent in the tip to precede the first insemination.



6. Do not use the last micrometer of semen. After the inseminations are performed, take up enough saline to remove the petrolatum seal from the tip and back into the capillary tube for disposal. Be sure not to get petrolatum in the narrow part of the glass tip, this will be very difficult to remove.

7. Clean the syringe and glass tip and store.

### **\*IMPORTANT: REPLACEMENT PARTS**

The micrometer glass barrel is custom made for HBIS , designed with a larger bore in the luer tip of the syringe. This has an 1.5 mm I.D. as compared to the standard 0.25mm I.D. This dimensional specification is important to avoid air bubbles lodging in the needle head which will cause a “spongy” response.