CLAIMS

1. A method of manufacturing an ultra-low profile aerostatic bearing comprising the steps of:

   i. providing a substrate (10) having a surface and being a housing for the aerostatic bearing;

   ii. preparing a hypodermic tubing (20) having an internal volume and bending the hypodermic tubing (20) to a shape based on an aerostatic bearing design, wherein the hypodermic tubing (20) has an internal diameter, an outer diameter and a wall thickness

   iii. mounting the hypodermic tubing (20) from step (ii) to the substrate (10), and making alignment of the hypodermic tubing (20) with respect to the substrate (10);

   iv. positioning the substrate (10) with the hypodermic tubing (20) with respect to a molding master with an accurate geometry;

   v. injecting an encapsulating substance between the substrate (10) and the molding master;

   vi. demolding the substrate (10) from the molding master once the encapsulating substance cures, and the cured encapsulating substance forming a solid layer on the substrate (10) as an encasement layer (70); and

   vii. machining a plurality of orifices (22) on the hypodermic tubing (20), thereby the ultra-low profile aerostatic bearing is obtained.

2. The method as recited in claim 1, wherein the hypodermic tubing (20) is fixed to the surface of the substrate (10) forming into a gas distribution system which supplies externally pressurized gas.

3. The method as recited in claim 2, wherein a pressurized gas source (80) provides the pressurized gas to the hypodermic tubing (20).

4. The method as recited in claim 1 , wherein the hypodermic tubing (20) is terminated with a gas fitting (72), and the internal volume of the hypodermic tubing (20) is in fluidic communication.

5. The method as recited in claim 1, wherein the orifices (22) are made at locations with respect to the aerostatic bearing design.

6. The method as recited in claim 1 or 2, wherein the orifices (22) are of a size according to the aerostatic bearing design.

7. The method as recited in claim 6, wherein the orifices (22) have a diameter ranging from 1 micro meter to 300 micro meter.

8. The method as recited in claim 1, wherein the outer diameter of the hypodermic tubing (20) is ranging from 0.1 to 3 mm.

9. The method as recited in claim 1, wherein the wall thickness of the hypodermic tubing (20) is ranging from 0.01mm to 0.5mm, preferably ranging from 0.01mm to 0.1mm.

10. The method as recited in claim 1, wherein the encapsulating substance has an overall thickness ranging from 0.1 mm to 5 mm .

11. The method as recited in claim claim 10, wherein the overall thickness of the encapsulating substance is preferably between 0.25mm to 0.5mm .

12. The method as recited in claim 1, wherein an adhesive is employed to bond the hypodermic tubing (20) to the substrate (10).

13. The method as recited in claim 1, wherein the hypodermic tubing (20) is made from material comprising stainless steel, glass, ceramic, polymer or composite material.

14. The method as recited in claim 1, wherein the hypodermic tubing (20) has a circular, rectangular or square cross section.

15. The method as recited in claim 1, further comprising the step of applying a mold releasing agent to the molding master prior to the injection of the encapsulating substance.

16. An ultra-low profile aerostatic bearing comprising

    a. a substrate (10) having a planar surface;

    b. a network of hypodermic tubing (20) with at least one orifice (22) and having an internal volume fixed to the planar surface of the substrate (10) forming into a gas distribution system which supplies externally pressurized gas from a pressurized gas source (80), wherein one end of the hypodermic tubing (20) is terminated with a gas fitting (72), and the internal volume of the hypodermic tubing (20) is in fluidic communication; and

    c. an encasement layer (70) being formed from an encapsulating substance applied to the planar surface of the substrate (10) such that the encapsulating substance completely encases the hypodermic tubing (20), wherein the encapsulating substance forms an adhesive bond with the network of the hypodermic tubing (20) and the surface of the substrate (10).

17. The ultra-low profile aerostatic bearing as recited in claim 16, wherein the orifice (22) has a diameter ranging from 1 micrometer to 300 micrometer.

18. The ultra-low profile aerostatic bearing as recited in claim 16, wherein the hypodermic tubing (20) has an outer diameter ranging from 0.1 to 3 mm.

19. The ultra-low profile aerostatic bearing as recited in claim 16, wherein the hypodermic tubing (20) has a wall thickness ranging from 0.01mm to 0.5mm, preferably ranging from 0.01mm to 0.1mm.

20. The ultra-low profile aerostatic bearing as recited in claim 16, wherein the encasement layer (70) has a thickness ranging between 0.1 to 5 mm .

21. The ultra-low profile aerostatic bearing as recited in claim 20, wherein the thickness of the encasement layer (70) is preferably ranging from 0.25mm to 0.5mm.

22. The ultra-low profile aerostatic bearing as recited in claim 18, wherein the hypodermic tubing (20) is made from metallic material.

23. The ultra-low profile aerostatic bearing as recited in claim 16, wherein the gas fitting (72) is connected to the pressurized gas source (80).