CLAIMS

1. A rotary valve 00 comprising:
   a. a stator 50 comprising a stator face 52 and a plurality of passages 54, each passage comprising a port 53 at the stator face;
   b. a rotor 10 operably connected to the stator and comprising a rotational axis 16, a rotor valving face 12, and a flow channel 40 having an inlet 41 and an outlet 42 at the rotor valving face, wherein the flow channel contains a porous solid support 45; and
   c. a retention element 90 biasing the stator and the rotor together at a rotor-stator interface 02 to form a fluid tight seal.

2. The rotary valve of Claim 1, wherein a cross-section of the flow channel 40 is not concentric with the rotational axis 16.

3. The rotary valve of Claim 1, wherein the porous solid support is polymeric.

4. The rotary valve of Claim 1, wherein the porous solid support is selected from the group consisting of alumina, silica, celite, ceramics, metal oxides, porous glass, controlled pore glass, carbohydrate polymers, polysaccharides, agarose, Sepharose™, Sephadex™, dextran, cellulose, starch, chitin, zeolites, synthetic polymers, polyvinyl ether, polyethylene, polypropylene, polystyrene, nylons, polyacrylates, polymethacrylates, polyacrylamides, polymaleic anhydride, membranes, hollow fibers and fibers, and any combination thereof.

5. The rotary valve of Claim 1, wherein the rotor valving face 12 comprises a gasket 80 interposed at the rotor-stator interface 02.

6. The rotary valve of Claim 5, wherein the gasket 80 comprises an aperture 83 therethrough and wherein the stator comprises an arcing rail 70 for laterally constraining the gasket.

7. The rotary valve of Claim 1, wherein the rotor valving face comprises a fluidic connector 86, wherein in a first rotor position a first port 53a of the stator is fluidically connected to a second port 53b of the stator via the fluidic connector 86.

8. The rotary valve of Claim 7, wherein the first port is located at a first radial distance from the rotational axis and the second port is located at a second, different, radial distance.

9. The rotary valve of Claim 7, wherein in a second rotor position a third port 53c is fluidically connected to a fourth port 53d via the fluidic connector 86.

10. The rotary valve of Claim 1, wherein the rotor valving face comprises a fluidic selector 87 having an arcing portion having center line arcing equidistant from the rotational axis and a radial portion extending from the arcing portion radially toward the rotational axis or away from the rotational axis.

11. The rotary valve of Claim 10, wherein in a first rotor position, a first port 53a at a first radial distance from the rotational axis 16 is fluidically connected to a second port 53b at a second radial distance from the rotational axis via the fluidic selector 87, and in a second rotor position, the first port is fluidically connected to a third port 53c at the second radial distance from the rotational axis via the fluidic selector, and wherein the first port remains fluidically connected with the fluidic selector while the rotor is rotated between the first rotor position and the second rotor position.

12. The rotary valve of Claim 1, wherein the rotor comprises a plurality of flow channels 40, each flow channel comprising an inlet 41, an outlet 42, and a porous solid support 45.

13. The rotary valve of Claim 1, wherein the rotor comprises a main body 11 and a cap 30 operably connected to the main body, and wherein one wall of the flow channel 40 is defined by the cap.

14. The rotary valve of Claim 1, further comprising a gasket 80 between the stator face 52 and the rotor valving face 12, and wherein the stator comprises a displaceable spacer 60 for preventing the gasket from sealing against at least one of the rotor 10 and stator 50, and wherein, when the spacer is displaced the gasket seals the rotor and stator together in a fluid-tight manner.

15. The rotary valve of Claim 1, wherein the retention element 90 comprises a retention ring 91 and a biasing element 96.

16. The rotary valve of Claim 15, wherein the retention ring 91 is fixedly coupled to the stator 50 and the biasing element 96 is a spring biasing the rotor and stator together.