Cassette 11 is secured to a work surface 27 with clamps 23 and 24. The port at 17 is sealed with O-ring 30 against the work surface 27. The cassette is then backfilled with a gas through line 31, rotary valve 29, port 17, and cassette valve 18. Once the cassette is backfilled and the pressure inside the cassette approximates the atmospheric pressure outside the cassette, the cassette may be opened (the door to the cassette is not illustrated), the semiconductor wafers 16 removed, and processed. After processing, the semiconductor wafers are returned to the cassette, and the cassette evacuated through valve 18, port 17, and rotary valve 29 to the vacuum pump through line 32.

FIG. 3 illustrates a vacuum cassette with two ports and two valves. The use of two valves and two ports allows separation of the backfill and vacuum pump-down functions to prevent cross contamination of the semiconductor wafers. It also provides for direct purging of the interior of the vacuum cassette through the base of the vacuum cassette in the event of particle contamination.

Vacuum cassette 40 has a base 42 with alignment holes 50 and 51, and ports 48 and 49. Access to vacuum chamber 41 is through two paths: port 48, valve 45 and channel 47; and port 49, valve 43 and channel 55. Two baffles, 52 and 53, are located in chamber 41. These baffles are used to prevent direct flow of gases across the semiconductor wafers 54. Valve 45 is actuated by lever 46 and valve 43 is actuated by lever 44.

FIG. 4 shows the vacuum cassette of FIG. 3 mounted on a work surface 60 and clamped thereto with clamps 61 and 62. Vacuum cassette 40 is aligned on the work surface 60 with alignment pins 50*a* and 51*a*. Port 48 of the vacuum cassette is aligned with port 63 of the work surface and sealed thereto with O-ring 75. Port 49 of the vacuum cassette is aligned with port 49*a* of the work surface 60 and the two ports, 49, and 49*a* are sealed with O-ring 74. Valve 43 is actuated by valve actuator 70. Actuator 70 is coupled to valve 43 by actuator lever 71 and valve lever 44. Valve 45 is actuated by valve actuator 72. Actuator 72 is coupled to valve 45 by actuator lever 73 and valve lever 46.

Baffles 52 and 53 are arranged to baffle and diffuse the gas flow into and through the chamber 41. The baffle is used to minimize the particle disturbance from either backfill or pump down, and to maximize the rate of backfill and/or pump down for production considerations. Gas velocities above a critical level can introduce settled particles back into the inside environment with the possibility of wafer contamination.

The valves in FIG. 4 are shown in a purge mode. A purge gas is introduced into line 69 through valve 68, line 67, filter 66, and into the cassette through port 48, and valve 45 and channel 47. The purge gas flows into cassette chamber 41, then out through valve 43, port 49 and through valve 64 to the vacuum pump.

To evacuate vacuum chamber 41, valve 45 is closed and the vacuum pump pulls the vacuum through valve 43, port 49 and valve 64. When the vacuum in chamber 41 is at the desired level, then valve 43 is closed.

When chamber 41 has a vacuum therein, and it is desirable to remove the vacuum so that the semiconductor wafers may be removed, valves 45 and 68 are opened and a suitable gas, commonly clean air or other gas is introduced into the chamber. Backfilling of the chamber with the clean gas brings the chamber to a pressure approximately equal to the pressure outside the cassette.

As vacuum cassettes become more common in semiconductor production, it will be important to minimize the cost of the interface with non-vacuum equipment. The vacuum cassettes and interface system described above will cost considerably less than a load-lock system.

What is claimed:

1. A semiconductor wafer storage cassette, comprising:
- a plurality of walls defining a chamber for holding semiconductor wafers, said plurality of walls having a first opening and a second opening into said chamber;
- a first channel connecting said first opening with the outside of the cassette;
- a second channel connecting said second opening with the outside of the cassette;
- a first valve in said first channel;
- a second valve in said second channel;
- a first baffle within said chamber, said first baffle adjacent and substantially perpendicular to said first opening, said first baffle located below the semiconductor wafers and extending from one of said plurality of walls; and
- a second baffle within said chamber, said second baffle adjacent said second opening, said second baffle having a first portion surrounding at least some of the semiconductor wafers and extending above the semiconductor wafers.

2. The storage cassette according to claim 1 for mounting on a work surface, including,
- alignment pin holes in the cassette for aligning the cassette on a work surface.

3. The storage cassette according to claim 1, wherein one of said valves is used in evacuating the cassette chamber.

4. The storage cassette according to claim 1, wherein one of said valves is used in backfilling the vacuum chamber with a gas.

5. A semiconductor processing system, comprising:
- a semiconductor wafer cassette, including:
- a plurality of walls defining a chamber for holding semiconductor wafers, said plurality of walls having a first opening and a second opening into said chamber;
- a first channel connecting said first opening with the outside of the cassette;
- a second channel connecting said second opening with the outside of the cassette;
- a first valve in said first channel;
- a second valve in said second channel;
- a first baffle within said chamber, said first baffle adjacent and substantially perpendicular to said first opening, said first baffle located below the semiconductor wafers and extending from one of said plurality of walls;
- a second baffle within said chamber, said second baffle adjacent said second opening, said second baffle having a first portion surrounding at least some of the semiconductor wafers and extending above the semiconductor wafers; and
- a work station, including:
- a work station mounting surface having a first opening for interfacing with said first channel and a second opening for interfacing with said second channel.

6. The semiconductor processing system of claim 5, in which one of said plurality of walls is a base for