

What is claimed is:

1. A purge diffuser for use in a system for transporting substrates comprising:
 - i) a purge diffuser core having an internal purge gas channel, one or more diffuser ports and an outer surface;
 - ii) filter media, comprising a porous polymer film or polymer membrane, secured to the outer surface of the purge diffuser core; and
 - iii) a purge port connector for mounting the purge diffuser to a purge port of a substrate container for transporting substrates; and
~~arranged in an arrangement~~ such that there is a continuous path for purge gas entering through the purge port connector to enter the internal purge gas channel, exit the internal purge gas channel through the diffuser ports, and pass through the filter media.
2. The purge diffuser according to claim 1 wherein the purge diffuser core is a unitary article.
3. The purge diffuser according to claim 1 wherein the purge diffuser core is a unitary article comprising an injection-moldable, melt processable polymer.
4. The purge diffuser according to ~~any of claims 1-3~~ wherein the filter media is directly bound to the outer surface of the purge diffuser core by weld bonds.
5. The purge diffuser according to ~~any of claims 1-3~~ wherein the filter media is secured to the outer surface of the purge diffuser core by an adhesive.
6. The purge diffuser according to ~~any of claims 1-3~~, further comprising a scrim disposed over the filter media.
7. The purge diffuser according to ~~any of claims 1-6~~ wherein the filter media is a porous hydrophobic film comprising a polyolefin, polyester, polysulfone, or fluoropolymer.
8. The purge diffuser according to ~~any one of claims 1-6~~ wherein the filter media is a hydrophobic membrane comprising a polyolefin, polyester, polysulfone or fluoropolymer.

9. The purge diffuser according to ~~any of claims 1-8~~ wherein the filter media is a hydrophobic ultra-high molecular weight polyethylene membrane.

10. The purge diffuser according to ~~any of claims 1-9~~ wherein the purge diffuser core additionally comprises one or more diverters which project into the internal purge gas channel from an inner surface of the purge diffuser core bordering the internal purge gas channel.

11. The purge diffuser according to ~~any of claims 1-10~~ wherein the diffuser ports are staggered such that every portion of the internal purge gas channel between the diffuser port closest to the purge port connector and the diffuser port most distant from the purge port connector ~~may be~~ is accessed through a diffuser port along a line perpendicular to the length of the purge diffuser.

12. The purge diffuser according to claim 1 wherein the filter media is a porous polymer film.

~~12~~13. A system for transporting substrates comprising:

a) a substrate container comprising a container portion with an opening, a door adapted to be received in the opening, and a purge port to admit purge gas to an interior of the container portion; and

b) a purge diffuser ~~according to any of claims 1-11~~ mounted to the purge port by the purge port connector, arranged such that there is a continuous path for purge gas entering through the purge port to enter the internal purge gas channel, exit the internal purge gas channel through the diffuser ports, and pass through ~~the~~ a filter media into the interior of the substrate container,

wherein the purge port is defined in a first wall of the substrate container which faces an opposite wall of the substrate container across the interior of the substrate container; wherein a height of the substrate container is measured from a top wall to a bottom wall of the container portion and wherein a length of the purge diffuser is not more than 85% of the height the substrate container; and

wherein the filter media comprising a porous polymer film or polymer membrane, and secured to the outer surface of the purge diffuser core.

~~13. The system according to claim 12 wherein the purge port is defined in a first wall of the substrate container which faces an opposite wall of the substrate container across the interior of the substrate container; wherein a height of the substrate container is measured from a top wall to a bottom wall of the container portion and wherein a length of the purge diffuser is not more than 85% of the height the substrate container.~~

14. The system according to ~~any of claims 12-13~~13 wherein the substrate container is a front opening unified pod (FOUP).

15. A method of making a purge diffuser according to ~~any of claims 1-11~~ comprising:

- a) molding the purge diffuser core as single unitary article; and
- b) securing filter media to the outer surface of the purge diffuser core.

16. The method according to claim 15 wherein step a) is accomplished by injection molding.

17. The method according to claim 15 ~~or 16~~ wherein step b) is accomplished by welding.

18. A method of purging a system for transporting substrates according to ~~any of claims 12-14~~13, comprising passing a flow of purge gas through the purge port into the purge diffuser and thereby into the interior of the substrate container.

19. The method according to claim 18 wherein the purge gas is nitrogen and the purge diffuser provides a greater flow of purge gas to lower portions of the interior of the substrate container than to higher portions of the interior of the substrate container.