

Claims:

1. A chamber having an inner circumference, the chamber comprising:
a liner assembly, comprising:
a cylindrical body having an outer surface and an inner surface, the outer surface having an outer circumference less than the inner circumference, the inner surface forming walls of a process volume; and
a plurality of gas passages formed in connection with the cylindrical body;
an exhaust port positioned opposite to the plurality of gas passages;
a crossflow port positioned non parallel to the exhaust port; and
a thermal sensing port positioned separate from the crossflow port; and
an inject insert in fluid connection with the liner assembly, the inject insert comprising:
a monolithic body having:
an interior connecting surface for connecting with the liner assembly; and
an exterior surface to connect with a gas delivering device;
a plurality of inject ports formed through the monolithic body, each inject port forming an opening in the interior connecting surface and the exterior surface, the plurality of inject ports creating at least:
a first zone with a first number of inject ports of the plurality of inject ports;
a second zone with a second number of inject ports of the plurality of inject ports, the second number of inject ports being different from the first number of inject ports; and
a third zone with a third number of inject ports of the plurality of inject ports, the third number of inject ports being different from the first number of inject ports and the second number of inject ports; and
a plurality of inject inlets, each of the plurality of inject inlets being connected with at least one of the plurality of inject ports,
wherein the plurality of gas passages create a plurality of flow zones, the plurality of flow zones being parallel to one another and perpendicular to a bisecting line from the crossflow port.