

Claims:

1. A cooled process tool adapter, comprising:
 - an annular body surrounding a central opening;
 - a coolant channel disposed in the annular body;
 - one or more features to facilitate supporting a process tool within the central opening;
 - an inlet and an outlet disposed in the annular body and fluidly coupled to the coolant channel; ~~and~~
 - a power connection coupled to the annular body having a terminal to couple the annular body to a bias power source; and
 - a plurality of orientation features to facilitate centering and orientation of the cooled process tool adapter with respect to a process chamber in which the cooled process tool adapter is to be installed.
2. The cooled process tool adapter of claim 1, wherein the one or more features to facilitate supporting the process tool comprise a radially inwardly extending shelf disposed along an inner diameter of the annular body.
3. The cooled process tool adapter of claim 2, further comprising:
 - a plurality of through holes disposed through the shelf to facilitate coupling a process tool to the annular body.
4. The cooled process tool adapter of claim 2, further comprising:
 - one or more alignment pins to facilitate aligning a process tool to the cooled process tool adapter.
5. The cooled process tool adapter of claim 4, wherein the one or more alignment pins are three alignment pins.

6. The cooled process tool adapter of any of claims 1 to 5, wherein the annular body further comprises a substantially planar upper surface and a substantially planar lower surface.

7. The cooled process tool adapter of claim 6, further comprising:
an annular groove disposed along the substantially planar upper surface; and
an annular groove disposed along the substantially planar lower surface.

8. The cooled process tool adapter of any of claims 1 to 5, wherein the coolant channel comprises:

a channel disposed along an outer diameter of the annular body; and
a cap disposed over the channel to seal the coolant channel.

~~9. The cooled process tool adapter of any of claims 1 to 5, further comprising:
a plurality of orientation features to facilitate centering and orientation of the cooled process tool adapter with respect to a process chamber in which the cooled process tool adapter is to be installed.~~

~~109.~~ The cooled process tool adapter of claim ~~91~~, wherein the plurality of orientation features further comprise:

an upper alignment feature to align the cooled process tool adapter with components disposed above the cooled process tool adapter; and

~~an~~ lower alignment feature to align the cooled process tool adapter with components disposed ~~above~~ below the cooled process tool adapter.

~~1110.~~ The cooled process tool adapter of claim ~~91~~, wherein the plurality of orientation features are two diametrically opposed orientation features.

~~1211.~~ A process chamber, comprising:

a body including a ground adapter and a lid assembly partially defining an interior volume of the process chamber;

a cooled process tool adapter as described in any of the preceding claims 1 to 5, wherein the central opening of the annular body faces the interior volume of the process chamber;

an insulator ring disposed between the cooled process tool adapter and the lid assembly; and

an insulator ring disposed between the cooled process tool adapter and the ground adapter.

~~13~~12. The process chamber of claim ~~12~~11, further comprising at least one of:

a coolant connector housing enclosing the inlet and the outlet of the cooled process tool adapter and having a supply inlet to couple to a coolant source; or

a coolant channel disposed within the ground adapter.

~~14~~13. The process chamber of claim ~~12~~11, further comprising a coolant channel disposed within the ground adapter, wherein the coolant channel of the ground adapter and the coolant channel of the cooled process tool adapter are fluidly coupled in series.

~~15~~14. The process chamber of ~~any of claims 12 to 14~~ claim 11, wherein the body of the process chamber is grounded, and further comprising:

a bias power source coupled to the cooled process tool adapter; and

a process tool coupled to the cooled process tool adapter, wherein the process tool is coupled to the bias power source via the cooled process tool adapter.