

Claims:

1. A method of manufacturing a chuck body, comprising:
coating a porous plug with a coating comprising a fluoroelastomer composition;
inserting the porous plug having the coating formed thereon into a cavity formed in a chuck body; and
curing the coating to form a sealing layer between the porous plug and a wall of the cavity.
2. The method of claim 1, wherein the coating has a thickness of about 25 microns to about 1,000 microns.
3. The method of claim 1, further comprising partially curing the coating to form a partially-cured fluoroelastomer layer on the porous plug prior to inserting the porous plug.
4. The method of claim 1, wherein the sealing layer forms a radial seal between the porous plug and the wall of the cavity.
5. The method of claim 4, wherein the sealing layer further forms at least one of a first axial seal between the porous plug and a cooling base bonded to the chuck body and a second axial seal between a top surface of the porous plug and a second wall of the cavity.
6. The method of claim 1, wherein the fluoroelastomer composition is in the form of a paste having a viscosity of about 50 cP to about 5,000 cP.
7. The method of claim 6, wherein the fluoroelastomer composition comprises at least one perfluoropolymer.

8. The method of claim 7, wherein the fluoroelastomer composition further comprises at least one of curing agents, adhesion promoters, thickening agents, solvents, and fillers.
9. A method of manufacturing a chuck body, comprising:
coating a wall of a cavity formed in a chuck body with a coating comprising a fluoroelastomer composition;
inserting a porous plug into the cavity having; and
curing the coating to form a sealing layer between the porous plug and the wall of the cavity.
10. The method of claim 9, further comprising partially curing the coating to form a partially-cured fluoroelastomer layer on the wall of the cavity prior to inserting the porous plug.
11. The method of claim 9, wherein the sealing layer forms a radial seal between the porous plug and the wall of the cavity.
12. The method of claim 9, wherein the sealing layer further forms at least one of a first axial seal between the porous plug and a cooling base bonded to the chuck body and a second axial seal between a top surface of the porous plug and a second wall of the cavity.
13. The method of claim 9, wherein the fluoroelastomer composition is in the form of a paste having a viscosity of about 50 cP to about 5,000 cP.
14. The method of claim 13, wherein the fluoroelastomer composition comprises at least one perfluoropolymer.
15. The method of claim 14, wherein the fluoroelastomer composition further comprises at least one of curing agents, adhesion promoters, thickening agents, solvents, and fillers.

16. A method of manufacturing a chuck body, comprising:
coating a porous plug with a first coating comprising a fluoroelastomer composition;
coating a wall of a cavity formed in a chuck body with a second coating comprising the fluoroelastomer composition;
inserting the porous plug having the first coating formed thereon into the cavity having the second coating formed thereon; and
curing the first coating and the second coating to form a sealing layer between the porous plug and the wall of the cavity.
17. The method of claim 16, further comprising partially curing at least one of the first coating and the second coating to form a partially-cured fluoroelastomer layer on at least one of the porous plug and the wall of the cavity prior to inserting the porous plug.
18. The method of claim 16, wherein the sealing layer forms a radial seal between the porous plug and the wall of the cavity.
19. The method of claim 18, wherein the sealing layer further forms at least one of a first axial seal between the porous plug and a cooling base bonded to the chuck body and a second axial seal between a top surface of the porous plug and a second wall of the cavity.
20. The method of claim 18, wherein the fluoroelastomer composition is in the form of a paste having a viscosity of about 50 cP to about 5,000 cP and comprises at least one perfluoropolymer and optionally at least one of curing agents, adhesion promoters, thickening agents, solvents, and fillers.