CLAIMS

1. A method of coating a surface of a valve component comprising:

    a. applying a base layer of a mixture of a primer and a thermoplastic to the surface;

    b. applying a thermoplastic layer on a side of the base layer opposite the side on the surface;

    c. applying an outer layer of thermoplastic and lubricant disposed on a side of the thermoplastic layer opposite the base layer; and

    d. actuating the valve so that the outer layer is in sliding contact with a metal surface.

2. The method of claim 1, further comprising bonding the base layer with the thermoplastic layer by melting the thermoplastic in the base layer.

3. The method of claim 1, wherein the primer comprises a polymer selected from the group consisting of a thermoplastic amorphous polymer, a polyimide, a polyamideimide, polyetheretherketone, and combinations thereof.

4. The method of claim 1, wherein the thermoplastic comprises a polymer selected from the group consisting of polyetheretherketone, polyetherketoneketone, polyetherimide, polyethersulfone, chlorinated polyethylene, polyketone, and combinations thereof.

5. The method of claim 1, wherein the lubricant comprises a polymer selected from the group consisting of a fluoropolymer, polyvinylfluoride, polyvinylidene fluoride, polychlorotrifluoroethylene, perfluoroalkoxy, fluorinated ethylene-propylene, ethylene tetrafluoroethylene, polytetrafluoroethylene, polyethylenechlorotrifluoroethylene, and combinations thereof.

6. The method of claim 1, wherein the primer comprises polyamideimide and the thermoplastic comprises polyetheretherketone (PEEK).

7. The method of claim 1, wherein the amount of polyamideimide in the base layer comprises from about 60% to about 90% by volume and the amount of PEEK in the base layer comprises from about 10% to about 40% by volume.

8. The method of claim 1, wherein the thermoplastic comprises polyetheretherketone (PEEK) and the lubricant comprises polytetrafluoroethylene (PTFE).

9. The method of claim 8, wherein the amount of PEEK in the outer layer comprises from about 10% to about 40% by volume and the amount of PTFE in the outer layer comprises from about 60% to about 90% by volume.

10. The method of claim 1, wherein the surface is on a metal seal.

11. A method of coating a surface of a metal seal of a valve component, the method comprising:

    a. applying a base layer of a polyamideimide primer and a polyetheretherketone thermoplastic to the metal surface;

    b. applying a thermoplastic layer of polyetheretherketone on a side of the base layer opposite the side on the surface;

    c. applying an outer layer of about 10% to about 40% by volume of polyetheretherketone and about 60% by volume to about 90% by volume of polytetrafluoroethylene on a side of the thermoplastic layer opposite the base layer;

    d. bonding the base layer with the thermoplastic layer by melting the polyetheretherketone in the base layer; and

    e. actuating the valve so that the outer layer is in sliding contact with a metal surface.

12. A valve assembly for use in handling fluids produced from a subterranean formation comprising:

    components that are in sliding contact with one another;

    a coating on a surface of one of the components comprising:

    a base layer on the surface having primer mixed with thermoplastic,

    a thermoplastic layer on a side of the base layer opposite the side on the surface,

an outer layer of thermoplastic and lubricant disposed on a side of the thermoplastic layer opposite the base layer.

13. The valve assembly of claim 12, wherein the primer comprises a polymer selected from the group consisting of a thermoplastic amorphous polymer, a polyimide, a polyamideimide, polyetheretherketone, and combinations thereof.

14. The valve assembly of claim 12, wherein the thermoplastic comprises a polymer selected from the group consisting of polyetheretherketone, polyetherketoneketone, polyetherimide, polyethersulfone, chlorinated polyethylene, polyketone, and combinations thereof.

15. The valve assembly of claim 12, wherein the thermoplastic layer contacts the base layer along an interface that is planar.

16. The valve assembly of claim 12, wherein the primer comprises polyamideimide and the thermoplastic comprises polyetheretherketone (PEEK).

17. The valve assembly of claim 16, wherein the amount of polyamideimide in the base layer comprises from about 60% to about 90% by volume and the amount of PEEK in the base layer comprises from about 10% to about 40% by volume.

18. The valve assembly of claim 12, wherein the thermoplastic comprises polyetheretherketone (PEEK) and the lubricant comprises polytetrafluoroethylene (PTFE).

19. The valve assembly of claim 18, wherein the amount of PEEK in the outer layer comprises from about 10% to about 40% by volume and the amount of PTFE in the outer layer comprises from about 60% to about 90% by volume, so that when the components are subjected to decompression, the coating remains free from bubbles and cracks.

20. The valve assembly of claim 12, wherein surfaces of the components in sliding contact comprise metal and one of the components comprises a seal.

21. A valve assembly for use in handling fluids produced from a subterranean formation comprising:

components that are in sliding contact with one another;

a coating on a surface of one of the components comprising:

a base layer on the surface having primer mixed with thermoplastic,

a thermoplastic layer on a side of the base layer opposite the side on the surface that is foamed fully from a thermoplastic,

an outer layer of thermoplastic and lubricant disposed on a side of the thermoplastic layer opposite the base layer

so that when the components are subjected to decompression, the coating remains free from bubbles and cracks.

22. The valve assembly of claim 21, wherein the thermplastic in the thermoplastic layer consists of polyetheretherketone.

23. The valve assembly of claim 21, wherein the thermoplastic layer has a thickness that exceeds a thickness of the base layer.

24. The valve assembly of claim 21, wherein the components comprise a stem and a stem seal, and wherein the coating is on a one of the surfaces of the stem or the stem seal.

25. A valve assembly for use in handling fluids produced from a subterranean formation comprising:

a bonnet;

an annular stem seal in the bonnet;

a stem that that is in sliding contact with the stem seal;

a coating on a surface of one of the annular stem seal comprising:

a base layer on the surface having primer mixed with thermoplastic,

a thermoplastic layer on a side of the base layer opposite the side on the surface that is formed fully from a thermoplastic,

an outer layer of thermoplastic and lubricant disposed on a side of the thermoplastic layer opposite the base layer.

26. The valve assembly of claim 25, wherein stem seal blocks pressure communication along an axial portion of the stem.

27. The valve assembly of claim 25, wherein the thermoplastic in the thermoplastic layer consists of polyetheretherketone.

28. The valve assembly of claim 25, wherein all of the outer layer is spaced axially away from the base layer.