CLAIMS

1. A flexible pig for cleaning a coke deposit from an internal surface of a process equipment, the flexible pig comprising:

a flexible body comprising a molded polymeric body, wherein the molded polymeric body comprises a polymeric material, wherein the molded polymeric body further comprises an axial portion and a plurality of radial portions formed in spaced intervals along the axial portion, wherein a diameter of the axial portion is less than an outer diameter of each of the plurality of radial portions;

a plurality of bristles, wherein at least a portion of each of the plurality of bristles are partially encapsulated by the polymeric material of the molded polymeric body; and

wherein at least one of the plurality of bristles comprises a metal protective layer containing stannide.

2. The flexible pig of claim 1, wherein the plurality of bristles comprises polymer bristles.

3. The flexible pig of claim 1, wherein the plurality of bristles comprises steel bristles.

4. The flexible pig of claim 1, wherein the plurality of bristles comprises natural bristles.

5. The flexible pig of claim 1, wherein the plurality of bristles comprises any combination of polymer bristles, steel bristles, or natural bristles, or a combination thereof.

6. The flexible pig of claim 1, wherein the at least a portion of each of the plurality of bristles that are partially encapsulated by the polymeric material of the molded polymeric body are in the axial portion, or a combination of the axial portion and the one of the plurality of radial portions.

7. The flexible pig of claim 1, wherein the flexible pig is configured to clean the coke deposit without damaging a metal protective layer of the internal surface of the process equipment.

8. A system comprising:

a process equipment having a coke deposit formed on an internal surface comprising a metal protective layer;

a flexible pig according to claim 1and

a fluid source which provides a fluid force of less than 60 psig to an end of the flexible pig causing at least one of the plurality of bristles of the flexible pig to contact the coke deposit without damaging the metal protective layer of the internal surface of the process equipment.

9. The system of claim 8, wherein the process equipment comprises a furnace tube.

10. The system of claim 8, wherein the fluid source is configured to provide the fluid force using a fluid comprising an aqueous solution.

11. The system of claim 10, wherein the fluid further comprises one or more additives selected from a surfactant, a rheology modifier, an emulsifier, an anti-foaming agent, ammonia, or combinations thereof.

12. The system of claim 1, wherein the at least a portion of each of the plurality of bristles that are partially encapsulated by the polymeric material of the molded polymeric body are in the axial portion, one of the plurality of radial portions, or in the axial portion and the one of the plurality of the radial portions.