CLAIMS

1. A method for forming a hard disk drive base plate with an extended height, comprising:

forming an initial hard disk drive base plate from a blank cut from an extruded sheet, the initial hard disk drive base plate having walls of an initial height that extend vertically around a perimeter of the initial hard disk drive base plate;

forming a filler shim;

forming a shroud, wherein the formed shroud is hollow with a top and a bottom of the formed shroud being open and the formed shroud having a cross-sectional shape that corresponds to a shape of a marrying surface of the initial hard disk drive base plate; and

joining the initial hard disk drive base plate, the filler shim, and the shroud to extend the initial height of the walls of the formed initial hard disk drive base plate and to form the hard disk drive base plate with the extended height.

2. The method of claim 1, wherein joining the initial hard disk drive base plate, the filler shim, and the shroud further comprises:

arranging the initial hard disk drive base plate and the filler shim to align the marrying surface of the initial hard disk drive base plate with a first marrying surface of the filler shim;

arranging the shroud and the aligned initial hard disk drive base plate and filler shim to align a marrying surface of the shroud with a second marrying surface of the filler shim; and

welding along an interior path and an exterior path of the arranged initial hard disk drive base plate, filler shim, and shroud to join the initial hard disk drive base plate, the filler shim, and the shroud.

3. The method of claim 2, wherein each of the initial hard disk drive base plate, the shroud, and the filler shim are pre-heated prior to the welding, and the joined initial hard disk drive base plate, the filler shim, and the shroud are cooled after the welding, to prevent against thermal shock, thermal crack, and material distortion.

4. The method of claim 2, wherein the filler shim is disposed in-between the initial hard disk drive base plate and the shroud during the arrangement of the initial hard disk drive base plate, the filler shim, and the shroud.

5. The method of claim 1, wherein the hard disk drive base plate with the extended height has a total height of at least 15 millimeters.

6. The method of claim 1, wherein the initial hard disk drive base plate is formed by performing a sequence of forgings on the blank to progressively form parts of a hard disk drive base plate.

7. The method of claim 1, wherein the shroud is formed by cutting a section from a hollow bar, and wherein the hollow bar is formed from a metal extrusion process that generates the hollow bar.

8. The method of claim 1, wherein the shroud is formed by performing a sequence of forgings on an initial blank to form a finished shroud.

9. The method of claim 1, wherein the filler shim is formed from punching the filler shim from a sheet of metal, wherein the sheet of metal has a thickness in the range of 0.3 to 0.8 millimeters.

10. The method of claim 1, further comprising:

cleaning the formed hard disk drive base plate with the extended height;

applying a surface treatment to the cleaned hard disk drive base plate with the extended height;

performing machining on the surface treated and cleaned hard disk drive base plate with the extended height to refine one or more parts of the surface treated and cleaned hard disk drive base plate with the extended height; and

cleaning the machined hard disk drive base plate with the extended height to produce a finished hard disk drive base plate with an extended height.

11. The method of claim 10, wherein the applied surface treatment is one of an Electroless Nickel plating, Electro-coating, or Bimetal Black Electroless Nickel plating.

12. The method of claim 1, wherein the initial hard disk drive base plate, the shroud, and the filler shim are each formed from an aluminum alloy.

13. The method of claim 12, wherein the initial hard disk drive base plate and the shroud are formed from aluminum 6061, and the filler shim is formed from aluminum 4047.

14. The method of claim 12, wherein the initial hard disk drive base plate, the shroud, and the filler shim are each formed from a single type of aluminum alloy, and wherein the single type of aluminum alloy is a 1000 series aluminum alloy.

15. A production system for forming a hard disk drive base plate with an extended height, comprising:

a first stage of the production system to advance a blank cut from an extruded sheet through multiple stations of a transfer die assembly to forge and form an initial hard disk drive base plate, the initial hard disk drive base plate having walls of an initial height that extend vertically around a perimeter of the initial hard disk drive base plate;

a second stage of the production system to punch a filler shim from a sheet of metal;

a third stage of the production system to form a shroud, wherein the formed shroud is hollow with a top and a bottom of the formed shroud being open and the

formed shroud having a cross-sectional shape that corresponds to a shape of a marrying surface of the initial hard disk drive base plate; and

a fourth stage of the production system to join the initial hard disk drive base plate, the filler shim, and the shroud to extend the initial height of the walls of the formed initial hard disk drive base plate and to form the hard disk drive base plate with the extended height.

16. The production system of claim 15, wherein the third stage of the production system further comprises a metal extruder to form a hollow bar with the cross-sectional shape that corresponds to the shape of the marrying surface of the initial hard disk drive base plate, and a saw to cut a section from the hollow bar to form the shroud.

17. The production system of claim 15, wherein the third stage of the production system performs a sequence of forgings on an initial blank to form the shroud.

18. The production system of claim 15, further comprising:

a welding stage to join the initial hard disk drive base plate, the filler shim, and the shroud, the welding stage to

align the marrying surface of the initial hard disk drive base plate with a first marrying surface of the filler shim,

align a marrying surface of the shroud with a second marrying surface of the filler shim, and

weld along an interior path and an exterior path of the aligned initial hard disk drive base plate, filler shim, and shroud.

19. The production system of claim 15, further comprising:

a first cleaning stage to clean the formed hard disk drive base plate with the extended height,

a surface treatment stage to apply a surface treatment to the cleaned hard disk drive base plate with the extended height, wherein the applied surface treatment is one of an Electroless Nickel plating, Electro-coating, or Bimetal Black Electroless Nickel plating,

a machining stage to perform one or more machining operations on the surface treated and cleaned hard disk drive base plate with the extended height to refine one or more parts of the surface treated and cleaned hard disk drive base plate with the extended height, and

a second cleaning stage to clean the machined hard disk drive base plate with the extended height to produce a finished hard disk drive base plate with an extended height.

20. The production system of claim 15, wherein the initial hard disk drive base plate and the shroud are formed from aluminum 6061, and the filler shim is formed from aluminum 4047.