We claim:

1. A method of forming a sputter target assembly, comprising the steps of:

providing a backing plate having a top surface, and pre-wetting the top surface with a solder layer;

providing a sputter target having a bottom surface, and pre-wetting the bottom surface with a solder layer;

introducing a bonding foil, between the backing plate and the sputter target, wherein the bonding foil is an ignitable heterogeneous stratified structure for the propagation of an exothermic reaction;

pressing the backing plate and the sputter target together and igniting the bonding foil, therebetween to melt and bond the solder layer on the backing plate with the solder layer on the sputter target without affecting the microstructure or flatness of the sputter target in the formation of the sputter target assembly.

2. The method of forming a sputter target assembly of claim 1, further comprising,

aligning the target and backing plate in a press, prior to pressing and thereafter applying a load of at least 50,000 lbs.

3. The method of forming a sputter target assembly of claim 1, wherein the backing plate and the sputter target are made of different materials.

4. The method of forming a sputter target assembly of claim 1, wherein the solder layers are eutectic solder comprising tin in an amount of 63 weight percent and the balance is lead.

5. The method of forming a sputter target assembly of claim 1, further comprising connecting the negative lead from a DC source to the backing plate and the positive lead from a DC source to the bonding foil to ignite the foil and initiate the exothermic reaction.

6. The method of forming a sputter target assembly of claim 1, wherein the thickness of the bonding foil ranges from about 0.002 to about 0.003 inches.

7. The method of forming a sputter target assembly of claim 1, wherein the bonding foil is selected from among silicides, aluminides, borides, carbides, thermite reacting compounds, alloys, metallic glasses and composites.

8. The method of forming a sputter target assembly of claim 1, the solder material is selected from among indium-tin, tin-lead, or tin-silver-copper.

9. The method of forming a sputter target assembly of claim 1, wherein the sputter target is a substantially circular, disc-shaped high-purity ferromagnetic nickel, nickel alloy, cobalt, or cobalt alloy target.

10. The method of forming a sputter target assembly of claim 1, wherein the magnetic flux across the sputter target is symmetrically distributed.

11. A sputter target assembly, comprising: a sputter target, a backing plate and a bonding foil, disposed between the backing plate and the sputter target, wherein the bonding foil is an ignitable heterogeneous stratified structure for the propagation of an exothermic reaction in order to bond the sputter target to the backing plate without affecting the microstructure or the flatness of the sputter target in the formation of the sputter target assembly.

12. The sputter target assembly of claim 11, further comprising a first solder bond layer disposed between the backing plate and the bonding foil and a second solder bond layer between the target and the bonding foil.

13. The sputter target assembly of claim 11, wherein the bonding foil is selected from among silicides, aluminides, borides, carbides, thermite reacting compounds, alloys, metallic glasses and composites.

14. The sputter target assembly of claim 11, wherein the sputter target is a substantially circular, disc-shaped high-purity ferromagnetic nickel, nickel alloy, cobalt, or cobalt alloy target.

15. The sputter target assembly of claim 11, wherein the magnetic flux across the sputter target is symmetrically distributed.

IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1 A sputter target assembly, comprising:

an untapered ferromagnetic sputter target, a backing plate and a bonding foil, disposed between the backing plate and the ferromagnetic sputter target, wherein the bonding foil is an ignitable heterogeneous stratified structure for the propagation of an exothermic reaction in order to bond the ferromagnetic sputter target to the backing plate without affecting the microstructure or the flatness of the ferromagnetic sputter target across an interface of the backing plate and the ferromagnetic sputter target in the formation of the sputter target assembly, wherein said ferromagnetic sputter target has a magnetic flux across the ferromagnetic sputter target that is symmetrically distributed.

2. The sputter target assembly of claim 1, further comprising a first solder bond layer disposed between the backing plate and the bonding foil and a second solder bond layer between the ferromagnetic sputter target and the bonding foil.

3. The sputter target assembly of claim 1, wherein the thickness of the bonding foil ranges from about 0.002 to about 0.003 inches.

4. The sputter target assembly of claim 2, further comprising solder layers having a thickness ranging from about 0.005 to 0.010 inches.

5. The sputter target assembly of claim 1, wherein the bonding foil is selected from among silicides, aluminides, borides, carbides, thermite reacting compounds, alloys, metallic glasses and composites.

6. The sputter target assembly of claim 1, wherein the ferromagnetic sputter target is a substantially circular, disc-shaped high-purity ferromagnetic nickel, nickel alloy, cobalt, or cobalt alloy target.

7. The sputter target assembly of claim 6, wherein the ferromagnetic sputter target is formed from said high purity nickel alloy, wherein said nickel alloy is selected from the group consisting of NiFe and NiFeCo.

8. The sputter target of claim 6, wherein the ferromagnetic sputter target is formed from said high purity cobalt alloy, wherein said cobalt alloy is selected from the group consisting of CoCr and CoCrPt.

9. The sputter target assembly of claim 1, wherein the ferromagnetic sputter target is a substantially circular, disc-shaped high-purity ferromagnetic sputter target formed from iron-based alloys or pure iron.

10. The sputter target assembly of claim 10, wherein said ferromagnetic sputter target is formed from said iron-based alloys, wherein said iron-based alloy is selected from the group consisting of FeTa, FeCo and FeNi.

11. The sputter target assembly of claim 6, wherein said high-purity ferromagnetic material is formed from nickel, nickel alloy, cobalt, or cobalt alloy target having a purity of at least about 99.99 weight percent.

12. The sputter target assembly of claim 1, wherein the ferromagnetic sputter target is oval, square, or rectangular shaped.

13. The sputter target assembly of claim 1, in combination with an anode, wherein said sputter target assembly and said anode are configured in an evacuated chamber having inert gas and magnets therewithin.

14. The sputter target assembly of claim 1, wherein the backing plate is formed from aluminum (Al), titanium (Ti), copper (Cu), and alloys thereof.

15. The sputter target assembly of claim 2, wherein solder materials can be selected from the group consisting of indium-tin, tin-lead, tin-silver-copper and tin-based alloys.