manufacturing, which is also useful in STT-RAM (spin transfer torque random access memory) technology to build magnetic tunnel junctions (MTJ).

[0007a] In one aspect, there is provided a method for finishing a surface of a sputtering target, comprising: blasting the surface of the sputtering target with spherical beads to remove machining defects and contaminants from the surface;

dry ice blasting the surface;

blowing hot air over the surface to remove moisture; and

annealing the sputtering target to remove surface residual stress;

wherein the sputtering target comprises iridium (Ir), ruthenium (Ru), tungsten (W), an iron-cobalt-boron alloy, or magnesium oxide, or an alloy selected from the group consisting of $Fe_xCo_yB_{10}$, $Fe_xCo_yB_{20}$, $Fe_xCo_yB_{30}$.

[0007b] Also disclosed is a sputtering target with a finished surface, made by: bead blasting a surface of the sputtering target to polish the surface; dry ice blasting the surface of the sputtering target; hot air drying the surface of the sputtering target; and annealing the sputtering target to remove surface residual stress; wherein the sputtering target comprises iridium (Ir), ruthenium (Ru), tungsten (W), an iron-cobalt-boron alloy, or magnesium oxide, or an alloy selected from the group consisting of $Fe_xCo_yB_{10}$, $Fe_xCo_yB_{20}$, $Fe_xCo_yB_{30}$.

[0008] The sputtering targets in this disclosure may be made from metals such as tantalum (Ta), iridium (Ir), cobalt (Co), ruthenium (Ru), tungsten (W), or an iron-cobalt-boron (FeCoB) series alloy, or may be made from ceramics such as magnesium oxide (MgO). In particular embodiments, the sputtering target comprises an alloy selected from the group consisting of $Fe_xCo_yB_{10}$, $Fe_xCo_yB_{20}$, $Fe_xCo_yB_{30}$. Here, the numbers refer to the atomic fraction of each element. The values for x and y can independently be from 0.05 to 0.75. In some embodiments, x=y.

[0009] The beads may comprise zirconia or silica. In desirable embodiments, the beads are in the form of a powder composed of finely divided spherical particles with high wear resistance, high fracture roughness, smooth surface, good roundness, and narrow size distribution. In particular embodiments, the beads have an average diameter of about 10 micrometers (μm) to about 100 μm.

[0010] The blasting may be performed using compressed air at a pressure from about 60 psi to about 100 psi (0.34-0.69 MPa). The distance between the blasting nozzle and the target surface may be from about 40 mm to about 100 mm. The angle between the blasting nozzle and the target surface may range from about 5° to about 45°. The blasting time period may vary with the pressure of the compressed air and the surface hardness of the blasting beads, and usually ranges from about 0.05 to about 2.0 seconds/cm^2 of the sputtering target surface. The amount of the sputtering target surface that needs to be blasted may be determined by visual inspection of the surface. A homogeneous surface usually shows a homogeneous contrast under a regular light illumination. The blasting may be performed a temperature of about 25°C to about 35°C**.** During blasting, the blasting nozzle may move across the sputtering target, and/or the sputtering target maybe rotated to uniformly blast the surface. The process can be repeated in order to obtain a uniform sputtering target surface.

[0011] The surface of the unfinished sputtering target may be formed by surface grinding, lathing, and milling prior to the blasting.

[0012] While bead blasting can remove surface defects such as contaminants, cracks, and scratches caused by machining, post-processing steps are very helpful in

5. The method of claim 1, wherein the beads are blasted with a nozzle, and an angle between the blasting nozzle and the surface of the sputtering target is from 5° to 45°.

6. The method of claim 1, wherein the beads are blasted with a nozzle, and a distance between the blasting nozzle and the surface of the sputtering target is from 5 mm to 100 mm.

7. The method of claim 1, wherein the blasting is performed at a temperature of 20°C to 35°C with air or argon protection.

8. The method of claim 1, wherein the blasting is performed of a time period of 0.05 to 2.0 seconds/cm^2 of the surface of the sputtering target.

9. The method of claim 1, wherein the surface of the sputtering target is formed by grinding or lathing prior to the blasting with beads.