CLAIMS

1. A thin film stress control-based coating method for large-area coating, the method comprising:

preparing a base member;

depositing inorganic particles on the base member at a deposition rate of 2 to 5 Å/sec to form a first coating layer as a relatively low-hardness coating layer having a first hardness; and

depositing inorganic particles on the first coating layer at a deposition rate of 0.5 to 1.5 Å/sec to form a second coating layer as a relatively high-hardness coating layer having a second hardness that is higher than the first hardness.

2. The method of claim 1, wherein the first coating layer and the second coating layer are formed by plasma chemical vapor deposition, sputtering deposition, or electron-beam deposition.

3. The method of claim 1, wherein the inorganic particles are particles of at least one material selected from among oxides, fluorides, fluorinated oxides, nitrides, oxynitrides, and carbides of at least one metal selected from among Al, Y, Ti, W, Zn, Si, Mo, and Mg.

4. The method of claim 1, wherein the base member has a diameter in a range of 10 to 80 cm and an area in a range of 78.5 to 5,024 cm^2.

5. The method of claim 1, wherein the base member comprises at least one selected from among oxides, fluorides, fluorinated oxides, nitrides, oxynitrides, and carbides of at least one material selected

from among Al, Y, W, Zn, Si and Mo.

6. The method of claim 1, wherein the first coating layer and the second coating layer are formed at a process temperature in a range of 100°C to 600°C.

7. The method of claim 1, wherein electric power applied to an ion-assisted deposition apparatus is in a range of 200 to 750 W when forming the first coating layer, and

electric power is in a range of 800 to 1500 W when forming the second coating layer.

8. The method of claim 1, wherein at least one gas selected from among Ar, O_2 and N_2 is used to form the first and second coating layers, and the gas is supplied at a flow rate of 5 to 100 sccm.

9. A thin film stress control-based coating structure for large-area coating, the coating structure being manufactured by the method of any one of claims 1 to 8.

10. A coating structure comprises:

a first coating layer having a relatively low hardness of 5 to 8 GPa and formed by depositing inorganic particles on a base member; and

a second coating layer having a relatively high hardness of 10 to 13 GPa and formed by depositing inorganic particles on the first coating layer,

wherein a proportion of the thickness of the second coating layer with respect to the overall thickness of the coating structure including the first coating layer and the second coating layer is within a range

of 80% to 90%.

11. The coating structure of claim 10, wherein the base member has a diameter in a range of 10 to 80 cm and an area in a range of 78.5 to 5,024 cm^2.

12. The coating structure according to claim 10, wherein the base member comprises at least one material selected from among oxides, fluorides, fluorinated oxides, nitrides, oxynitrides, and carbides of at least one material selected from among Al, Y, W, Zn, Si and Mo.

13. The coating structure of claim 10, wherein the inorganic particles are particles of at least one material selected from among oxides, fluorides, fluorinated oxides, nitrides, oxynitrides, and carbides of at least one metal selected from among Al, Y, Ti, W, Zn, Si, Mo, and Mg.

14. The coating structure according to claim 10, wherein the first coating layer and the second coating layer have an overall thickness of 1 to 20 μm in total.

15. The coating structure according to claim 10, wherein the first coating layer and the second coating layer have the same crystalline phase.

16. The coating structure according to claim 10, wherein the first coating layer and the second coating layer have a cubic crystalline phase.

17. The coating structure of claim 10, wherein the coating structure including the first coating layer and the second coating layer has an XRD crystallization ratio of 80% to 84%.

18. The coating structure of claim 10, wherein the first coating layer has an adhesion of 10 to 13 N, and

the second coating layer has an adhesion of 6 to 8 N.

19. The coating structure of claim 10, wherein the coating structure including the first coating layer and the second coating layer has an overall hardness of 8 to 13 GPa and an overall adhesion of 9 to 13 N.