CLAIMS:

1. A molybdenum alloy target, comprising molybdenum and a first additive metal, wherein the first additive metal comprises rhenium, ruthenium or a combination thereof; based on the total atoms of the molybdenum alloy target, an amount of total atoms of the first additive metal is higher than or equal to 3 atomic percent and less than or equal to 10 atomic percent; a number of metallographic phase of the molybdenum alloy target is higher than or equal to 2; an oxygen content of the molybdenum alloy target is less than or equal to 600 ppm.

2. The molybdenum alloy target as claimed in claim 1, wherein the molybdenum alloy target comprises a second additive metal, and the second additive metal comprises chromium, tantalum, tungsten, niobium, vanadium, or any combination thereof.

3. The molybdenum alloy target as claimed in claim 1 or 2, wherein based on the total atoms of the molybdenum alloy target, the amount of total atoms of the second additive metal is higher than 0 atomic percent and less than or equal to 3 atomic percent, and the amount of total atoms of the first additive metal and the second additive metal is higher than or equal to 3 atomic percent and less than or equal to 10 atomic percent.

4. The molybdenum alloy target as claimed in any one of claims 1 to 3, wherein based on the total atoms of the molybdenum alloy target, the amount of total atoms of the first additive metal is higher than or equal to 4 atomic percent and less than or equal to 10 atomic percent.

5. The molybdenum alloy target as claimed in any one of claims 1 to 4, wherein a relative density of the molybdenum alloy target is higher than or equal to 98%.

6. A method for manufacturing a molybdenum alloy target, comprising the steps of:

mixing a molybdenum powder with a first additive metal to obtain a mixing powder, wherein the first additive metal comprises rhenium, ruthenium or a combination thereof, an oxygen content of the molybdenum powder is less than or equal to 1500 ppm, and an amount of total atoms of the first additive metal is higher than or equal to 3 atomic percent and less than or equal to 10 atomic percent based on the total atoms of the mixing powder;

sintering the mixing powder at a temperature between 1000°C and 1500°C for more than or equal to 1 hour to obtain a sintered body; and

processing the sintered body by wire electrical discharge machining and lathing to obtain the molybdenum alloy target.

7. The method as claimed in claim 6, wherein the mixing powder comprises a second additive metal, and the second additive metal comprises chromium, tantalum, tungsten, niobium, vanadium, or any combination thereof.

8. The method as claimed in claim 6 or 7, wherein based on the total atoms of the mixing powder, the amount of total atoms of the second additive metal is higher than 0 atomic percent and less than or equal to 3 atomic percent, and the amount of total atoms of the first additive metal and the second additive metal is higher than or equal to 3 atomic percent and less than or equal to 10 atomic percent.

9. A molybdenum alloy layer, which is sputtered from the molybdenum alloy target as claimed in any one of claims 1 to 5, wherein a surface roughness of the molybdenum alloy layer is less than or equal to 1.5 nanometers.