CLAIMS

1. ~~(Amended)~~ A tantalum sputtering target, wherein on a sputtering surface of the tantalum sputtering target, an orientation rate of a (200) plane is 38.6% or more and 70% or less, an orientation rate of a (222) plane is 20.4% or more and 37.8% or less, an average crystal grain size is 50 μm or more and 150 μm or less, and a variation in a crystal grain size is 30 μm or less.

~~2. (Deleted)~~

~~3. (Deleted)~~

~~4. (Amended) A thin film for a diffusion barrier layer formed using the sputtering target according to claim 1.~~

~~5. A semiconductor device that uses the thin film for a diffusion barrier layer according to claim 4.~~

6~~2~~. ~~(Amended)~~ A method of producing the tantalum sputtering target according to claim 1, wherein a molten tantalum ingot is subject to forging and recrystallization annealing, and thereafter subject to rolling and heat treatment.

7~~3~~. The method of producing a tantalum sputtering target according to claim 6~~2~~, wherein cold rolling is performed using a rolling mill roll having a rolling mill roll diameter of 500 mm or more at a rolling speed of 10 m/min or more and a reduction exceeding 80%.

8~~4~~. The method of producing a tantalum sputtering target according to claim 6~~2~~, wherein rolling and heat treatment are repeated two or more times, and cold rolling is performed using a rolling mill roll having a rolling mill roll diameter of 500 mm or more at a rolling speed of 10 m/min or more and a reduction of 60% or more.

9~~5~~. The method of producing a tantalum sputtering target according to any one of claims 6 ~~2~~ to 8~~4~~, wherein heat treatment is performed at a temperature of 900°C to 1400°C.

10~~6~~. The method of producing a tantalum sputtering target according to any one of claims 6 ~~2~~ to 9~~5~~, wherein forging and recrystallization annealing are repeated two or more times.

11~~7~~. The method of producing a tantalum sputtering target according to any one of claims 6 ~~2~~ to 10~~6~~, wherein, after rolling and heat treatment are performed, surface finishing is performed via machining or polishing.