CLAIMS

~~1. (Deleted)~~

~~2~~ 1. A tantalum sputtering target, wherein, on a sputtering surface of the tantalum sputtering target, an orientation rate of a (200) plane exceeds 70%, an orientation rate of a (222) plane is 30% 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.

~~3~~ 2. A tantalum sputtering target, wherein, on a sputtering surface of the tantalum sputtering target, an orientation rate of a (200) plane is 80% or more, an orientation rate of a (222) plane is 20% 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.

~~4~~ 3. ~~(Amended)~~ A thin film for a diffusion barrier layer formed using the sputtering target according to claim ~~2~~ 1 or claim ~~3~~ 2.

~~5~~ 4. A semiconductor device that uses the thin film for a diffusion barrier layer according to claim ~~4~~ 3.

~~6. (Deleted)~~

~~7~~ 5. A method of producing a tantalum sputtering target, wherein a molten tantalum ingot is subject to forging and recrystallization annealing, and thereafter subject to rolling and heat treatment to form a crystal structure having, on a sputtering surface of the target, an orientation rate of a (200) plane that exceeds 70%, an orientation rate of a (222) plane that is 30% or less, an average crystal grain size of 50 μm or more and 150 μm or less, and a variation in a crystal grain size of 30 μm or less.

~~8~~ 6. A method of producing a tantalum sputtering target, wherein a molten tantalum ingot is subject to forging and recrystallization annealing, and thereafter subject to rolling and heat treatment to form a crystal structure having, on a sputtering surface of the target, an orientation rate of a (200) plane that is 80% or more, an orientation rate of a (222) plane that is 20% or less, an average crystal grain size of 50 μm or more and 150 μm or less, and a variation in a crystal grain size of 30 μm or less.

~~9~~ 7. (~~Amended~~) The method of producing a tantalum sputtering target according to claim ~~7~~ 5 or claim ~~8~~ 6, wherein cold rolling is performed using a rolling mill roll having a rolling mill roll diameter of 500 mm or less at a rolling speed of 10 m/min or more and a reduction exceeding 80%.

~~10~~ 8. (~~Amended~~) The method of producing a tantalum sputtering target according to anyone of claims ~~7~~ 5 to ~~9~~ 7, wherein heat treatment is performed at a temperature exceeding 900°C to 1400°C.

~~11~~ 9. (~~Amended~~) The method of producing a tantalum sputtering target according to anyone of claims ~~7~~ 5 to ~~10~~ 8, wherein, after rolling and heat treatment are performed, surface finishing is performed via machining or polishing.