CLAIMS

WHAT IS CLAIMED IS:

1. A blank mask comprising a transparent substrate and a light shielding film disposed on the transparent substrate,

wherein the light shielding film comprises a transition metal and at least one selected from the group consisting of oxygen and nitrogen,

wherein a surface of the light shielding film has a Rsk value, which is a height skewness of the surface of the light shielding film, of -2 to 0.1, and a Rku value, which is kurtosis of the surface of the light shielding film, of 3.5 or less, and

wherein when an optical density of the light shielding film is measured ten times by a light with a wavelength of 193 nm, a standard deviation of measured optical density is 0.009 or less.

2. The blank mask of claim 1, wherein a value obtained by subtracting a minimum value of the measured optical density from a maximum value of the measured optical density is less than 0.03.

3. The blank mask of claim 1, wherein the measured optical density is an average value of optical density values measured at a total of 49 measuring points on the surface of the light shielding film, respectively, and

wherein a total of ten measured optical densities are obtained by repeating ten times of measuring at the total of 49 measuring points on the surface of the light shielding film, respectively, wherein, in each of the ten measurement, the total of 49 measuring points are same.

4. The blank mask of claim 1, wherein when a reflectance of the light shielding film is measured ten times by a light with a wavelength of 193 nm, a standard deviation of measured reflectance values is 0.032 % or less, and

wherein a value obtained by subtracting a minimum value of the measured reflectance values from a maximum value of the measured reflectance values is 0.09 % or less.

5. The blank mask of claim 1, wherein a reflectance value of the light shielding film with respect to a light with a wavelength of 190 nm to 550 nm is 15 % to 35 %.

6. The blank mask of claim 1, wherein a Rp, which is a maximum height of a peak, of the surface of the light shielding film is 4.7 nm or less.

7. The blank mask of claim 1, wherein a Rpv, which is a sum of maximum height of a peak and maximum depth of a valley, of the surface of the light shielding film is 8.5 nm or less.

8. The blank mask of claim 1, wherein the light shielding film comprises a first light shielding layer and a second light shielding layer disposed on the first light shielding layer, and

wherein the second light shielding layer has a greater amount of the transition metal than the first light shielding layer.

9. The blank mask of claim 1, wherein the transition metal comprises at least one selected from the group consisting of Cr, Ta, Ti, and Hf.

10. A photomask comprising a transparent substrate and a light shielding pattern film disposed on the transparent substrate,

wherein the light shielding pattern film comprises a transition metal and at least one selected from the group consisting of oxygen and nitrogen,

wherein an upper surface of the light shielding pattern film has a Rsk value, which is a height skewness of the upper surface of the light shielding pattern film, of -2 to 0.1, and a Rku value, which is kurtosis of the upper surface of the light shielding pattern film, of 3.5 or less, and

wherein when an optical density of an upper surface of the light shielding pattern film is measured ten times by a light with a wavelength of 193 nm, a standard deviation of measured optical density is 0.009 or less.

11. The photomask of claim 10, wherein a value obtained by subtracting a minimum value of the measured optical density from a maximum value of the measured optical density is less than 0.03.

12. A method of manufacturing a blank mask comprising:

disposing a transparent substrate and a sputtering target inside a sputtering chamber;

injecting an atmosphere gas into the sputtering chamber and supplying an electric power to the sputtering target to form a light shielding film on the transparent substrate;

thermally treating the light shielding film;

cooling the light shielding film;

stabilizing the blank mask after the cooling operation in an atmosphere; and

treating a surface of the light shielding film to obtain a Rsk value, which is a height skewness of the surface of the light shielding film, of -2 to 0.1, and a Rku value, which is kurtosis of the surface of the light shielding film, of 3.5 or less.

13. The method of claim 12, wherein the treating the surface of the light shielding film comprises a surface oxidation treatment process of applying an oxidizer solution to the surface of the light shielding film.

14. The method of claim 12, further comprising a rinsing process of performing rinsing to the surface of the light shielding film.

15. The method of claim 13, wherein the oxidizer solution comprises at least one selected from the group consisting of a hydrogen water and SC-1 solution.

16. The method of claim 15, wherein an amount of ammonia water within SC-1 solution is 0.02 volume% to 2 volume% based on a total volume of the SC-1 solution.

17. The method of claim 12, wherein the light shielding film is thermally treated at a temperature of 160 to 300 ℃ for 5 to 30 minutes.