CLAIMS

WHAT IS CLAIMED IS:

1. A method of manufacturing a blank mask, comprising

providing a transparent substrate,

disposing a light shielding film on the transparent substrate, and

measuring a skewness value Rsk and a kurtosis value Rku of a surface of the light shielding film; wherein the light shielding film comprises a transition metal comprising Cr and at least one selected from the group consisting of oxygen and nitrogen,

wherein disposing the light shielding film on the transparent substrate comprises controlling a first contact angle of the surface of the light shielding film to be 40 ° to 45 ° measured by using diiodo-methane as a first liquid contacting the surface of the light shielding film,

wherein when evaluated based on ISO_4287, the surface of the light shielding film has an Rsk value, which is a skewness value, of -1 to 0, and

the surface of the light shielding film has an Rku value, which is kurtosis value, of 7 or less.

2. The method of claim 1, wherein a ratio of a dispersion component of a surface energy of the surface of the light shielding film to the surface energy of the surface of the light shielding film is 0.84 to 0.865.

3. The method of claim 2, wherein the dispersion component of the surface energy of the surface of the light shielding film is 37 mN/m to 40 mN/m.

4. The method of claim 2, wherein the light shielding film has the surface energy of 43 mN/m to 47 mN/m.

5. The method of claim 1, wherein the first contact angle divided by a second contact angle of the light shielding film measured by using pure water as a second liquid contacting the surface of the light shielding film is 0.58 to 0.604.

6. The method of claim 1, wherein the surface of the light shielding film has an Rku value of 2 or more.

7. The method 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.

8. The method of claim 7, wherein an amount of the transition metal in the second light shielding layer is greater than an amount of the transition metal in the first light shielding layer.

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

10. A method of manufacturing a photomask, comprising

providing a transparent substrate,

disposing a light shielding pattern film on the transparent substrate, and

measuring a skewness value Rsk and a kurtosis value Rku of a surface of the light shielding pattern film;

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

wherein disposing the light shielding pattern film on the transparent substrate comprises controlling a contact angle of an upper surface of the light shielding pattern film to be 40 ° to 45 ° measured by using diiodo-methane as a liquid contacting the surface of the light shielding film,

wherein when evaluated based on ISO_4287, the surface of the light shielding pattern film has an Rsk value, which is a skewness value, of -1 to 0, and

the surface of the light shielding pattern film has an Rku value, which is kurtosis value, of 7 or less.

11. A method of manufacturing a semiconductor element comprising:

preparing a light source, a photomask, and a semiconductor wafer, onto which a resist film has been applied;

selectively transmitting a light incident from the light source through the photomask onto the semiconductor wafer; and

developing a pattern on the semiconductor wafer,

wherein preparing the photomask comprises

providing a transparent substrate,

disposing a light shielding pattern film on the transparent substrate, and

measuring a skewness value Rsk and a kurtosis value Rku, of a surface of the light shielding pattern film;

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

wherein disposing the light shielding pattern film on the transparent substrate comprises controlling a contact angle of an upper surface of the light shielding pattern film to be 40 ° to 45 ° measured by using diiodo-methane as a liquid contacting the surface of the light shielding film,

wherein when evaluated based on ISO_4287, the surface of the light shielding pattern film has an Rsk value, which is a skewness value, of -1 to 0, and

the surface of the light shielding pattern film has an Rku value, which is kurtosis value, of 7 or less.