	shielding Film				5
Comparative Example 1	Adhesion Strengthening Layer	1.8	10	5	$Ar:N_2:O_2$=5:4:1
	First Light shielding Film	1.85	10	200 to 250	$Ar:N_2:O_2$=3:2:5
Comparative Example 2	Adhesion Strengthening Layer	1	5	8	$Ar:N_2$=5.5:4.5
	First Light shielding Film	1.85	10	200 to 250	$Ar:N_2:O_2$=3:2:5
Comparative Example 3	Upper Light shielding Layer	1.5	10	10 to 30	$Ar:N_2$=6.5:3.5
	Adhesion Strengthening Layer	1.83	10	5	$Ar:N_2$=7:3
	First Light shielding Film	1.85	10	200 to 250	$Ar:N_2:O_2$=3:2:5
Comparative Example 4	Upper Light shielding Layer	1.5	10	10 to 30	$Ar:N_2$=6.5:3.5
	Adhesion Strengthening Layer	1.83	10	5	$Ar:N_2$=7:3
	First Light shielding Film	1.85	10	200 to 250	$Ar:N_2:O_2$=3:2:5
Comparative Example 5	First Light shielding Film	1.85	10	200 to 250	$Ar:N_2:O_2$=3:2:5

CLAIMS

WHAT IS CLAIMED IS:

1. A photomask comprising:

a transparent substrate; and

a multi-layer light shielding pattern film disposed on the transparent substrate,

wherein the multi-layer light shielding pattern film comprises:

a first light shielding film; and

a second light shielding film disposed on the first light shielding film, wherein both the first light shielding film and the second light shielding film comprise a transition metal, wherein the transition metal comprises Cr, and at least one selected from the group consisting of oxygen and nitrogen, and

wherein a side surface of the multi-layer light shielding pattern film comprises a measuring zone corresponding to a zone between a first spot spaced apart from a first point on an upper boundary of the first light shielding film in a direction to a lower boundary of the first light shielding film and a second spot spaced apart from a second point on a lower boundary of the second light shielding film in a direction to an upper boundary of the second light shielding film, wherein a surface roughness Wr of the measuring zone satisfies Equation 1 below:

[Equation 1]

$0\ nm < Wr - Wo \leq 3\ nm$

where, in the Equation 1 above, Wo is a surface roughness of the measuring zone before soaking and washing processes, Wr is a surface roughness of the measuring zone after soaking in SC-1 (standard clean-1) solution and washing with ozone water, and the SC-1 solution comprises NH_4OH, H_2O_2, and H_2O.

2. The photomask of claim 1, wherein the SC-1 solution comprises NH_4OH of 14.3 wt%, H_2O_2 of 14.3 wt%, H_2O of 71.4 wt% based on a total weight of the SC-1 solution, wherein the photomask is soaked in the SC-1 solution for 800 seconds, and wherein the ozone water comprises 20 ppm of ozone in an ultrapure water based on a total weight of the ozone water.

3. The photomask of claim 1, wherein the first spot is spaced apart from the first point by 5 nm and the second spot is spaced apart from the second point by 5 nm.

4. The photomask of claim 1, wherein the first light shielding film and the second light shielding film are disposed to form an interface between the first light shielding film and the second light shielding film, and wherein a surface roughness Wr is the greatest in the measuring zone corresponding to a zone comprising the interface.

5. The photomask of claim 1, wherein a roughness Rz of a lower surface of the second light shielding film is 4 nm or more.

6. The photomask of claim 1, wherein the second light shielding film comprise an upper light shielding layer and an adhesion strengthening layer, wherein the adhesion strengthening layer is disposed between the upper light shielding layer and the first light shielding film.

7. The photomask of claim 6, wherein the adhesion strengthening layer comprises a transition metal, and an amount of the transition metal in the adhesion strengthening layer is higher than an amount of the transition metal in the first light shielding film.

8. The photomask of claim 6, wherein the upper light shielding layer and the adhesion strengthening layer comprise a transition metal, and an amount in the transition metal of the adhesion strengthening layer is same or higher than an amount of the transition metal in the upper light shielding layer.

9. The photomask of claim 7, wherein a ratio of the amount of the transition metal in the adhesion strengthening layer compared to the amount of the transition metal in the first light shielding film is 1.1 to 2.5.

10. The photomask of claim 6, wherein a thickness of the adhesion strengthening layer is 5 to 25 Å.

11. The photomask of claim 1, wherein the first light shielding film comprises the transition metal in an amount of 30 to 60 at%, and wherein the second light shielding film comprises the transition metal in an amount of 50 to 80 at%.

12. The photomask of claim 1, wherein a sum of an amount of the oxygen and an amount of the nitrogen in the first light shielding film is 40 to 70 at%, and wherein a sum of an amount of the oxygen and an amount of the nitrogen in the second light shielding film is 20 to 50 at%.

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

14. The photomask of claim 1, wherein a height skewness (Rsk) of an upper surface of

the adhesion strengthening layer after formation of the adhesion strengthening layer is -1 or less.

15. The photomask of claim 1, wherein a kurtosis (Rku) of an upper surface of the adhesion strengthening layer after formation of the adhesion strengthening layer is 7 or more.

16. The photomask of claim 1, wherein an average of surface heights (Ra) measured across an upper surface of the adhesion strengthening layer just after formation of the adhesion strengthening layer is 0.5 nm or more.

17. The photomask of claim 1, wherein a mean roughness depth (Rz) of an upper surface of the adhesion strengthening layer after formation of the adhesion strengthening layer is 6 nm or more.

18. A photomask blank comprising:

a transparent substrate; and

a multi-layer light shielding film disposed on the transparent substrate,

wherein the multi-layer light shielding film comprises:

a first light shielding film; and

a second light shielding film disposed on the first light shielding film, wherein both the first light shielding film and the second light shielding film comprise a transition metal, wherein the transition metal comprises Cr, and at least one selected from the group consisting of oxygen and nitrogen, and

wherein a side surface of the multi-layer light shielding film comprises a measuring zone corresponding to a zone between a first spot spaced apart from a first point on an upper boundary of the first light shielding film in a direction to a lower boundary of the first light shielding film and a second spot spaced apart from a second point on a lower boundary of the second light shielding film in a direction to an upper boundary of the second light shielding film, wherein a surface roughness Wr of the measuring zone satisfies Equation 1 below:

[Equation 1]

$0\ \text{nm} < Wr - Wo \leq 3\ \text{nm}$

where, in the Equation 1 above, Wo is a surface roughness of the measuring zone before soaking and washing processes, Wr is a surface roughness of the measuring zone after soaking in SC-1 (standard clean-1) solution and washing with ozone water, and the SC-

1 solution comprises NH_4OH, H_2O_2, and H_2O.

19. A method of manufacturing a semiconductor element comprising:

disposing a light source, a photomask, and a semiconductor wafer, on which a resist film has been applied in a sputtering chamber;

selectively transmitting an incident light from the light source through the photomask; and

developing a pattern on the semiconductor wafer,

wherein the photomask comprises:

a transparent substrate; and

a multi-layer light shielding pattern film disposed on the transparent substrate,

wherein the multi-layer light shielding pattern film comprises:

a first light shielding film; and

a second light shielding film disposed on the first light shielding film, wherein both the first light shielding film and the second light shielding film comprise a transition metal, wherein the transition metal comprises Cr, and at least one selected from the group consisting of oxygen and nitrogen, and

wherein a side surface of the multi-layer light shielding pattern film comprises a measuring zone corresponding to a zone between a first spot spaced apart from a first point on an upper boundary of the first light shielding film in a direction to a lower boundary of the first light shielding film and a second spot spaced apart from a second point on a lower boundary of the second light shielding film in a direction to an upper boundary of the second light shielding film, wherein a surface roughness Wr of the measuring zone satisfies Equation 1 below:

[Equation 1]

$0\ nm < Wr - Wo \leq 3\ nm$

where, in the Equation 1 above, Wo is a surface roughness of the measuring zone before soaking and washing processes, Wr is a surface roughness of the measuring zone after soaking in SC-1 (standard clean-1) solution and washing with ozone water, and the SC-1 solution comprises NH_4OH, H_2O_2, and H_2O.