

CLAIMS

What is claimed is:

1. A resist sensitivity evaluation method comprising:
 - a process of forming a resist coating film on a surface of a base-member by a spin coating method using a resist material containing a photosensitive resin, a photo acid generator, a basic compound, a surfactant, and a solvent;
 - a process of measuring the film thickness of the resist coating film and generating a first film thickness map;
 - a process of heat treating the resist coating film to give a resist layer;
 - a process of measuring the film thickness of the resist layer and generating a second film thickness map; and
 - a process of dividing a film reduction amount which is a difference between the film thickness of the resist coating film in the first film thickness map and the film thickness of the resist layer in the second film thickness map, by the film thickness of the resist coating film, and calculating a film reduction ratio, to thereby generate a resist film reduction ratio map before and after heat treatment; and
 - a process of evaluating a resist sensitivity distribution of the resist layer based on the resist film reduction ratio map.
2. The resist sensitivity evaluation method of claim 1, wherein the resist material is a chemically amplified resist material.
3. The resist sensitivity evaluation method of claim 1 or 2, wherein the heat treatment is a treatment for removing the solvent in the resist coating film.
4. A transfer mask manufacturing method comprising:
 - a process of forming a resist coating film on a mask blank having a thin film, on the thin film side surface of the mask blank, by a spin coating method using a resist material containing a photosensitive resin, a photo acid generator, a basic compound, a surfactant, and a solvent;
 - a process of measuring the film thickness of the resist coating film and

generating a first film thickness map;

a process of heat treating the resist coating film to give a resist layer;

a process of measuring the film thickness of the resist layer and generating a second film thickness map;

a process of dividing a film reduction amount which is a difference between the film thickness of the resist coating film in the first film thickness map and the film thickness of the resist layer in the second film thickness map, by the film thickness of the resist coating film, and calculating a film reduction ratio, to thereby generate a resist film reduction ratio map before and after heat treatment;-and

a process of determining an exposure intensity by utilizing the resist film reduction ratio map, or a resist sensitivity distribution map of the resist layer generated based on the resist film reduction ratio map, and performing patterned exposure of the resist layer.

5. The transfer mask manufacturing method of claim 4, wherein the resist material is a chemically amplified resist material.

6. The transfer mask manufacturing method of claim 4 or 5, wherein the heat treatment is a treatment for removing the solvent in the resist coating film.

7. An imprint mold manufacturing method comprising:

a process of forming a resist coating film on a surface of an imprint mold blank, by a spin coating method using a resist material containing a photosensitive resin, a photo acid generator, a basic compound, a surfactant, and a solvent;

a process of measuring the film thickness of the resist coating film and generating a first film thickness map;

a process of heat treating the resist coating film to give a resist layer;

a process of measuring the film thickness of the resist layer and generating a second film thickness map;

a process of dividing a film reduction amount which is a difference between the film thickness of the resist coating film in the first film thickness map and the film thickness of the resist layer in the second film thickness map, by the film thickness of

the resist coating film, and calculating a film reduction ratio, to thereby generate a resist film reduction ratio map before and after heat treatment; and

a process of determining an exposure intensity by utilizing the resist film reduction ratio map, or a resist sensitivity distribution map of the resist layer generated based on the resist film reduction ratio map, and performing patterned exposure of the resist layer.

8. The imprint mold manufacturing method of claim 7, wherein the resist material is a chemically amplified resist material.

9. The imprint mold manufacturing method of claim 7 or 8, wherein the heat treatment is a treatment for removing the solvent in the resist coating film.

10. A resist-affixed base-member supply method employed for a resist-affixed base-member obtained by forming a resist coating film on the surface of a base-member, by a spin coating method using a resist material containing a photosensitive resin, a photo acid generator, a basic compound, a surfactant, and a solvent, then heat treating the resist coating film to give a resist layer, when supplying the resist-affixed base-member, the resist-affixed base-member supply method comprising:

dividing a film reduction amount which is a difference between the film thickness of the resist coating film in the first film thickness map and the film thickness of the resist layer in the second film thickness map, by the film thickness of the resist coating film, and calculating a film reduction ratio, to thereby generate a resist film reduction ratio map before and after heat treatment; and

supplying the resist-affixed base-member accompanied by at least one out of the resist film reduction ratio map or a resist sensitivity distribution map of the resist layer generated based on the resist film reduction ratio map.

11. The resist-affixed base-member supply method of claim 10, wherein the resist material is a chemically amplified resist material.

12. The resist-affixed base-member supply method of claim 10 or 11, wherein the heat treatment is a treatment for removing the solvent in the resist coating film.