CLAIMS

1. A system for controlling a polisher that locally polishes a substrate, the substrate processing control system comprising:

a film thickness distribution estimation unit that measures the film thickness of the substrate and estimates the film thickness distribution of the substrate based on the measurement result;

a local polishing region setting unit for setting a local polishing region on the substrate based on the film thickness distribution;

a polishing head selection unit for selecting a polishing head based on the size of the local polishing region;

a model storage holding a recipe generating model that defines the relation between an input node and an output node, the input node being an attribute of the local polishing region, the output node comprising a recipe for a polishing process;

a polishing recipe generator that puts an attribute of the local polishing region set by the local polishing region setting unit into the input node of the recipe generating model and determines a polishing recipe for polishing the local polishing region; and

a polishing recipe transmitter for transmitting data of the polishing recipe to a polisher that performs local polishing.

2. The substrate processing control system according to claim 1, wherein the input node of the recipe generating model comprises a plurality of input nodes that are the outline of the local polishing region and the average film thickness thereof.

3. The substrate processing control system according to claim 1 or 2, wherein the local polishing region setting unit changes a criterion for setting a local polishing region depending on whether the precision or throughput of substrate processing is given priority.

4. The substrate processing control system according to any of claims 1 to 3, wherein the film thickness distribution estimation unit estimates the film thickness distribution also based on an etching pattern of a substrate to be polished.

5. The substrate processing control system according to any of claims 1 to 4, the substrate processing control system controlling local polishing to be performed on an entirely polished

substrate, wherein the recipe generating model has a condition of the entire polishing as an input node.

6. The substrate processing control system according to any of claims 1 to 5, comprising a simulator that simulates the film thickness distribution of a substrate and throughput to be achieved by local polishing according to the polishing recipe and determines whether the polishing recipe is to be adopted or not based on the simulation result.

7. The substrate processing control system according to claim 6,

wherein the model storage holds a plurality of recipe generating models of different types,

wherein the polishing recipe generator determines a plurality of polishing recipes using different recipe generating models, and

wherein the simulator determines a single polishing recipe based on simulation results of a plurality of polishing recipes determined by using different recipe generating models.

8. The substrate processing control system according to claim 7, comprising a learning unit for performing learning on the recipe generating model based on results of simulations performed on a plurality of local polishing regions by the simulator.

9. The substrate processing control system according to claim 7, comprising a learning unit for performing learning on the recipe generating model based on a result of local polishing actually performed according to the polishing recipe.

10. The substrate processing control system according to claim 6, having an actual result data storage holding a previously generated polishing recipe and data on the film thickness distribution of a substrate polished by using the polishing recipe,

wherein the substrate processing control system reads from the actual result data storage a predetermined number of polishing recipes approximate to the film thickness distribution of a substrate estimated by the film thickness distribution estimation unit, and

wherein the simulator determines a single polishing recipe based on simulation results of a plurality of polishing recipes.

11. The substrate processing control system according to any of claims 6 to 10, comprising an output unit for outputting a simulation result obtained by the simulator.

12. The substrate processing control system according to any of claims 6 to 11, wherein the

simulator comprises a simulation model.

13. The substrate processing control system according to claim 12, wherein the simulation model performs learning based on a result of local polishing actually performed according to the polishing recipe.

14. The substrate processing control system according to any of claims 1 to 13, comprising a data receiver for receiving data on local polishing transmitted from a plurality of polishers connected to the data receiver via a network.

15. A method of a controller controlling a polisher that locally polishes a substrate, the substrate processing control method comprising the steps of:

the controller measuring the film thickness of the substrate and estimating the film thickness distribution of the substrate based on the measurement result;

the controller setting a local polishing region on the substrate based on the estimated film thickness distribution;

the controller selecting a polishing head based on the size of the local polishing region;

the controller reading from a storage a model that defines the relation between an input node and an output node, the input node being an attribute of the local polishing region, the output node comprising a recipe for a polishing process;

the controller putting an attribute of the local polishing region into the input node of the model and determining a polishing recipe for polishing the local polishing region; and

the controller transmitting data of the polishing recipe to a polisher that performs local polishing.

16. A program for controlling a polisher that locally polishes a substrate, the program causing a computer to execute the steps of:

measuring the film thickness of the substrate and estimating the film thickness distribution of the substrate based on the measurement result;

setting a local polishing region on the substrate based on the estimated film thickness distribution;

selecting a polishing head based on the size of the local polishing region;

reading from a storage a model that defines the relation between an input node and an

output node, the input node being an attribute of the local polishing region, the output node comprising a recipe for a polishing process;

putting an attribute of the local polishing region into the input node of the model and determining a polishing recipe for polishing the local polishing region; and

transmitting data of the polishing recipe to a polisher that performs local polishing.

17. A polisher comprising:

an entire polishing unit for performing entire polishing on a wafer to be processed;

a local polishing unit for performing local polishing on the wafer;

a film thickness measurement unit for measuring the film thickness of the wafer;

a film thickness distribution estimation unit for estimating a first film thickness distribution of the wafer yet to be polished based on the film thickness measured by the film thickness measurement unit; and

a local polishing region setting unit for estimating, based on at least the first film thickness distribution, a second film thickness distribution on the assumption that the wafer has been entirely polished and setting a local polishing region on the wafer to be subjected to the local polishing based on the second film thickness distribution.

18. The polisher according to claim 17, comprising:

a polishing head selection unit for selecting a polishing head based on the size of the local polishing region;

a model storage holding a recipe generating model that defines the relation between an input node and an output node, the input node being an attribute of the local polishing region, the output node being a recipe for a polishing process; and

a polishing recipe generator that puts an attribute of the local polishing region into the input node of the recipe generating model and generates a polishing recipe for the local polishing to be performed on the local polishing region.

19. The polisher according to claim ,18 comprising a recipe generating model learning unit for performing learning on the recipe generating model with learning data being film thickness data obtained by the film thickness measurement unit measuring the film thickness of the wafer after the local polishing.

20. The polisher according to any of claims 17 to 19, wherein the local polishing unit performs local polishing on a subsequent wafer with a polishing recipe used for a previously processed wafer.

21. The polisher according to any of claims 17 to 20, wherein the local polishing unit is placed downstream of the entire polishing unit.

22. The polisher according to any of claims 17 to 20, wherein the local polishing unit is placed upstream of the entire polishing unit.

23. A polishing method of performing entire and local polishing on a wafer to be processed, the polishing method comprising the steps of:

a polisher measuring the film thickness of the wafer;

the polisher estimating a first film thickness distribution of the wafer based on the film thickness of the wafer measured before polishing;

the polisher estimating, based on at least the first film thickness distribution, a second film thickness distribution on the assumption that the wafer has been entirely polished and setting a local polishing region on the wafer to be subjected to the local polishing based on the second film thickness distribution;

the polisher performing entire polishing on the wafer; and

the polisher performing local polishing on the wafer.

24. A program for controlling a polisher to perform entire and local polishing on a wafer to be processed, the program causing the polisher to execute the steps of:

measuring the film thickness of the wafer;

estimating a first film thickness distribution of the wafer based on the film thickness of the wafer measured before polishing;

estimating, based on at least the first film thickness distribution, a second film thickness distribution on the assumption that the wafer has been entirely polished and setting a local polishing region on the wafer to be subjected to the local polishing based on the second film thickness distribution;

performing entire polishing on the wafer; and

performing local polishing on the wafer.